Installation and service instructions

for contractors

Vitocal 250-A Compact

Air/water heat pump in monoblock design for heating and cooling operation, indoor unit with integral DHW cylinder

VITOCAL 250-A COMPACT



6249718 GB 01/2026

Please keep safe.

Safety instructions

⚠ Please follow these safety instructions closely to prevent accidents and material losses.

Safety instructions explained

⚠ **Danger**
This symbol warns against the risk of injury.

! **Please note**
This symbol warns against the risk of material losses and environmental pollution.

Note
Details identified by the word "Note" contain additional information.

The outdoor unit contains easily flammable refrigerant in safety group A3 according to ISO 817 and ANSI/ASHRAE Standard 34.

Target group

These instructions are exclusively intended for qualified contractors.

- Work on the refrigerant circuit with flammable refrigerant in safety group A3 may only be carried out by authorised contractors. These contractors must be trained in accordance with EN 378 Part 4 or IEC 60335-2-40, Section HH. The certificate of competence from an industry-accredited body is required.
- Brazing/soldering work on the refrigerant circuit may only be carried out by contractors certified in accordance with ISO 13585 and AD 2000, datasheet HP 100R. And only by contractors qualified and certified for the processes to be carried out. The work must fall within the range of applications purchased and be carried out in accordance with the prescribed procedures.
  Brazing/soldering work on accumulator connections requires certification of personnel and processes by a notified body according to the Pressure Equipment Directive (2014/68/EU).
- Work on electrical equipment may only be carried out by a qualified electrician.
- All safety-relevant points must be checked regularly by the particular certified heating contractors. This applies especially before initial commissioning, as well as during maintenance, inspection and decommissioning.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.

Safety instructions (cont.)

Regulations to be observed

- National installation regulations
- Statutory regulations for the prevention of accidents
- Statutory regulations for environmental protection
- Statutory requirements for pressure equipment:
  Pressure Equipment Directive 2014/68/EU
- Codes of practice of the relevant trade associations
- Relevant country-specific safety regulations
- Applicable regulations and guidelines for operation, service, maintenance, repair and safety of cooling, air conditioning and heat pump systems containing flammable and explosive refrigerant.

Safety instructions for working on the system

The outdoor unit contains flammable refrigerant R290 (propane C3H8). If there is a leak, the escaping refrigerant may form a flammable or explosive atmosphere in the ambient air. A safety zone is defined in the immediate vicinity of the outdoor unit, in which special rules apply when working on the appliance.

Working in the safety zone

⚠ **Danger**
Risk of explosion: Escaping refrigerant may form a flammable or explosive atmosphere in the ambient air.
Take the following measures to prevent fire and explosion in the safety zone:

- Keep ignition sources away, e.g. naked flames, hot surfaces, electrical devices not free of ignition sources, mobile devices with integrated batteries (e.g. mobile phones, fitness watches, robotic lawn mowers, etc.).
- Permissible tools:
  All tools for working in the safety zone must be designed and explosion-protected in accordance with the applicable standards and regulations for refrigerant in safety group A3, e.g. brushless machines (cordless screwdrivers), extraction equipment, disposal containers, installation aids, vacuum pumps, conductive hoses, mechanical tools of non-sparking material, etc.
  Note
  The tools must also be suitable for the pressure ranges in use.
  Tools must be in perfect maintenance condition.
- The electrical equipment must meet the requirements for areas at risk of explosion, zone 2. This equipment must not be a source of electrical ignition.
- Do not use flammable materials, e.g. sprays or other flammable gases.

Safety instructions (cont.)

- Discharge static: Before beginning work, touch earthed objects, such as heating or water pipes.
- Do not remove, block or bridge safety equipment.
- Do not make any changes:
  Do not modify the outdoor unit, inlet/outlet lines, electrical connections/cables or the surroundings. Do not remove any components or seals.

Working on the system

- Switch off the power supply to the indoor unit and outdoor unit, e.g. at a separate fuse or mains isolator. Check that the system is no longer live.
  Note
  In addition to the control circuit there may be several power circuits.

  ⚠ **Danger**
  Contact with live components can result in severe injuries. Some components on PCBs remain live even after the power supply has been switched off.
  Prior to removing covers from the appliances, wait at least 4 minutes until the voltage has completely dropped out.
- Safeguard the system against reconnection.
- Wear suitable personal protective equipment when carrying out any work.

⚠ **Danger**
Hot surfaces and fluids can result in burns or scalding. Cold surfaces may cause frostbite.
- Prior to servicing or maintenance tasks, switch off and allow the equipment to cool down or warm up.
- Do not touch hot or cold surfaces on the appliance, fittings or pipework.

! **Please note**
Electronic assemblies can be damaged by electrostatic discharge. Before beginning work, touch earthed objects, such as heating or water pipes, to discharge any static.

Work on the refrigerant circuit

R290 refrigerant (propane) is an air displacing, colourless, flammable, odourless gas which forms explosive mixtures with air.
Refrigerant drained must be properly disposed of by authorised contractors.

Perform the following measures before beginning work on the refrigerant circuit:
- Check the refrigerant circuit for leaks.
- Ensure very good ventilation especially in the floor area and sustain this for the duration of the work.
- Secure the area surrounding the work area.
- Inform the following persons of the type of work to be carried out:
  - All maintenance personnel
  - All persons in the vicinity of the system.
- Inspect the area immediately around the heat pump for flammable materials and ignition sources:
  Remove all flammable, movable materials and any ignition sources from the safety zone.
- Before, during and after the work, check the surrounding area for escaping refrigerant using an explosion-proof refrigerant detector suitable for R290. This refrigerant detector must not generate any sparks and must be suitably sealed.

Safety instructions (cont.)

- A CO_2 or powder extinguisher must be to hand in the following cases:
  - Refrigerant is being drained.
  - Refrigerant is being topped up.
  - Soldering or welding work is being carried out.
- Display signs prohibiting smoking.

⚠ **Danger**
Escaping refrigerant can lead to fire and explosions that result in very serious injuries or death.
- Do not drill or apply heat to a refrigerant circuit filled with refrigerant.
- Do not operate Schrader valves unless a fill valve or extraction equipment is attached.
- Take measures to prevent electrostatic charge.
- No smoking! Prevent naked flames and sparks. Never switch lights or electrical appliances on or off.
- Components that contain or contained refrigerant must be labelled, and stored and transported in well ventilated areas in accordance with the applicable regulations and standards.

⚠ **Danger**
Direct contact with liquid and gaseous refrigerant can cause serious damage to health, e.g. frostbite and/or burns. There is a risk of asphyxiation if it is breathed in.
- Prevent direct contact with liquid and gaseous refrigerant.
- Wear personal protective equipment when handling liquid and gaseous refrigerant.
- Never breathe in refrigerant vapours.

⚠ **Danger**
Refrigerant is under pressure:
Mechanical loading of lines and components can cause leaks in the refrigerant circuit.
Do not apply loads to the lines and components, e.g. by supporting or placing tools.

⚠ **Danger**
Hot and cold metallic surfaces of the refrigerant circuit may cause burns or frostbite if skin contact is made.
Wear personal protective equipment to protect against burns or frostbite.

! **Please note**
When refrigerant is being removed, hydraulic components may freeze. Drain heating water from the heat pump beforehand.

⚠ **Danger**
Damage to the refrigerant circuit can cause refrigerant to enter the hydraulic system.
After completion of the work, vent the hydraulic system correctly.
When doing so, ensure the area is sufficiently ventilated.

Safety instructions (cont.)

Installation

Frost protection

Please note
Freezing can cause damage to the heat pump.
- Thermally insulate all the hydraulic lines.
- In order to activate the frost protection function, electrically connect the heat pump before filling the secondary circuit. Switch on the power supply. Switch on the ON/OFF switch on the indoor unit.
- Only fill the secondary circuit with suitable fill water in accordance with VDI 2035, not with media containing antifreeze.

Connecting cables

Danger
With short electrical cables, should there be leakage in the refrigerant circuit, gaseous refrigerant may reach the inside of the building.
- Seal the pipe entry to the building using the most suitable current technology. Route the pipes into the building through, for example, a suitable pipe liner with wall seal flanges.
- Min. length of the electrical connecting cables between the indoor and the outdoor unit: 3 m

Repair work

Please note
Repairing components that fulfil a safety function can compromise the safe operation of the system.
- Abgedichtete elektrische Komponenten dürfen nicht repariert werden.
- Faulty components must be replaced with original spare parts from the manufacturer.
- Do not undertake any repairs on the inverter. Replace the inverter if there is a defect.

Auxiliary components, spare and wearing parts

Please note
Auxiliary components, spare parts and wearing parts that have not been tested together with the system can compromise its function. Installing non-authorised components and making non-approved modifications or conversions can compromise safety and may invalidate our warranty.
For installation and replacement, use only original parts from the manufacturer or spare parts approved by the manufacturer.

Safety instructions for operating the system

What to do if refrigerant escapes

Danger
Escaping refrigerant can lead to fire and explosions that result in very serious injuries or death.
Take the following measures to prevent fire and explosion:
- Ensure very good ventilation especially in the floor area of the outdoor unit.
- No smoking! Prevent naked flames and sparks. Never switch lights or electrical appliances on or off.
- Evacuate any people from the danger zone.

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Safety instructions (cont.)

- From a safe position, switch off the electricity supply for all system components.
- Remove ignition sources from the danger zone.
- Let the system user know that no ignition source may be brought into the danger zone for the duration of the repair.
- Repair work must be carried out by an authorised contractor.
- Do not restart the system until repairs and a leak test have been carried out. Perform a leak test for both the refrigerant circuit and the connections on the heating water side.

⚠ **Danger**
Direct contact with liquid and gaseous refrigerant can cause serious damage to health, e.g. frostbite and/or burns.
Prevent direct contact with liquid and gaseous refrigerant.

⚠ **Danger**
Breathing in refrigerant may cause suffocation.
Never breathe in refrigerant vapours.

If water escapes from the appliance

⚠ **Danger**
If water escapes from the appliance there is a risk of electric shock.
Switch off the heating system at the external isolator (e.g. fuse box, domestic distribution board).

⚠ **Danger**
If water escapes from the appliance, there is a risk of scalding.
Never touch hot heating water.

What to do if the outdoor unit ices up

! **Please note**
A build-up of ice in the condensate pan and in the fan area of the outdoor unit can cause damage to the equipment.
Please note the following:

- Do not use mechanical items/aids for the removal of ice.
- Before using electrical heating appliances, check the refrigerant circuit for leaks with a suitable measuring device.
  - The heating appliance should not be a source of ignition.
  - The heating appliance must meet the requirements of EN 60335-2-30.
- If ice regularly builds up on the outdoor unit (e.g. in areas where frost and heavy fog occur frequently), install a fan ring heater that is suitable for refrigerant R290 and/or an electric ribbon heater in the condensate pan (accessories or factory-fitted).

Safety instructions for storage of the outdoor unit

The outdoor unit is charged at the factory with refrigerant R290 (propane).

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Safety instructions (cont.)

⚠ **Danger**
Escaping refrigerant can lead to fire and explosions that result in very serious injuries or death. There is a risk of asphyxiation if it is breathed in.
Store the outdoor unit in the following conditions:

- An explosion prevention plan must be in place for storage.
- Ensure there is sufficient ventilation at the storage location.
- Temperature range for storage: –25 °C to 70 °C
- Only store the outdoor unit in its ex-factory protective packaging.
- Protect the outdoor unit against damage.
- The maximum number of outdoor units that may be stored in one place is determined by local conditions.

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Disposal of packaging

Please dispose of packaging waste in line with statutory regulations.

Symbols

Symbols in these instructions

Symbol	Meaning
	Reference to other document containing further information
	Step in a diagram: The numbers correspond to the order in which the steps are carried out.
	Warning of personal injury
	Warning of material losses and environmental pollution
	Live electrical area
	Pay particular attention.
	▪ Component must audibly click into place. or ▪ Acoustic signal
	▪ Fit new component. or ▪ In conjunction with a tool: Clean the surface.
	Dispose of component correctly.
	Dispose of component at a suitable collection point. Do **not** dispose of component in domestic waste.

The steps in connection with commissioning, inspection and maintenance are found in the "Commissioning, inspection and maintenance" section and identified as follows:

Symbol	Meaning
	Steps required during commissioning
	Not required during commissioning
	Steps required during inspection
	Not required during inspection
	Steps required during maintenance
	Not required during maintenance

Symbols on the heat pump

Symbol	Meaning
	Warning of flammable materials (ISO 7010 - W021)
	Observe the operating manual (ISO 7000 - 0790)
	Observe the instructions for use/operating instructions (ISO 7000 - 1641)
	Service indicator: Refer to the operating manual (ISO 7000 - 1659)
	Warning of hot surface (ISO 7010 - W017)

Intended use

The appliance is only intended to be installed and operated in sealed unvented heating systems that comply with EN 12828, with due attention paid to the associated installation, service and operating instructions.

Depending on the version, the appliance can only be used for the following purposes:
- Central heating
- Central cooling
- DHW heating

Intended use (cont.)

The range of functions can be extended with additional components and accessories.

Intended use presupposes that a fixed installation in conjunction with permissible, system-specific components has been carried out.

Commercial or industrial usage for a purpose other than central heating/cooling or DHW heating shall be deemed inappropriate.

Incorrect usage or operation of the appliance (e.g. the appliance being opened by the system user) is prohibited and will result in an exclusion of liability. Incorrect usage also occurs if the components in the heating system are modified from their intended function.

Note
The appliance is intended exclusively for domestic or semi-domestic use, i.e. even users who have not had any instruction are able to operate the appliance safely.

Product information

Layout and functions

Vitocal 250-A Compact is an air/water heat pump in monoblock design, comprising 1 indoor unit with integral DHW cylinder and 1 outdoor unit.

Refrigerant circuit

The refrigerant circuit works with refrigerant R290 (propane).
All components of the refrigerant circuit are located in the outdoor unit, including the refrigerant circuit controller with 2 electronic expansion valves. Subject to operating conditions, compressor output is matched via inverter control.
To provide room cooling, there is an electronically controlled reversal of the refrigerant flow direction within the refrigerant circuit.

Hydraulics

The indoor and outdoor units are connected to each other hydraulically.
The hydraulic components for room heating and cooling are located in the indoor unit. 1 high efficiency circulation pump is installed to supply the heating/cooling circuits.
Switching between room heating, DHW heating and defrosting is done with the integrated 4/3-way valve.
The heat required to defrost the evaporator is provided by the integrated buffer cylinder in the indoor unit. The overflow valve function to guarantee the minimum system volume flow rate is also achieved via the 4/3-way valve.

Instantaneous heating water heater

In the indoor unit, an instantaneous heating water heater is built into the heating water flow from the outdoor unit. This instantaneous heating water heater supports the heat pump in room heating and/or DHW heating if the heating output of the heat pump is insufficient under certain conditions. In power-OFF mode or a fault in the heat pump, this instantaneous heating water heater can also be switched on as the sole heat source, e.g. for frost protection of the system, including the outdoor unit.

DHW cylinder

A 190 l DHW cylinder is integrated in the indoor unit.

Heating/cooling circuits

The max. number of heating/cooling circuits that can be connected depends on whether an external buffer cylinder is connected.

System without external buffer cylinder

1 heating/cooling circuit without mixer can be connected to the heat pump.
The flow temperature is controlled by modulating the heat pump.

System with external buffer cylinder

- Up to 4 heating/cooling circuits can be connected to the heat pump:
  1 heating/cooling circuit without mixer and up to 3 heating/cooling circuits with mixer
- An external cooling water buffer cylinder or external heating/cooling water buffer cylinder is required to use the cooling function.
- The cooling function cannot be used for systems with a heating water buffer cylinder with integral DHW heating.

Product information (cont.)

Heat pump control unit

The heat pump control unit built into the indoor unit monitors and regulates the entire heating system.
The indoor and outdoor units communicate via CAN bus.

The following operating elements can be used to make settings and perform checks on the system:
- ViGuide, apps
- HMI programming unit of the heat pump control unit:
  Operating instructions for the heat pump
- Wireless remote control, if installed:
  Operating instructions, installation and service instructions for the remote control

System network

Compatible appliances with the same control platform can form a system network. In this system network, the appliances are networked and can be operated in an energy-optimised manner, e.g. heat pump in conjunction with a photovoltaic system and battery storage unit.

Integrated Energy Management enables balanced operation of all components in the house that consume and generate electricity. This optimises self-consumption of the power generated on site.
The appliances in a system network can be operated together via the ViCare app.

Type plates

Indoor unit

- The type plate is located on the top of the appliance.
- **QR code marked "i"**:
  This QR code contains the credentials for the registration and product information portal.
  The position of the QR code is either next to or on the type plate, depending on the appliance.
  Note
  Using the QR code marked "i", the 16-digit serial number, for example, can be read out.

Outdoor unit

The type plate is located at the back of the appliance.

Product identification according to type plate

	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓗ	Ⓚ	Ⓛ	Ⓜ	Ⓝ	Ⓞ
Indoor unit													
	IDU-A Compact	A	W	M	I	T				. A1	. 19	–	V053
Outdoor unit													
	Vitocal 250-A	A	W	M	O	F	– 2	5	1	. A1	. 10	– 230	– V001

Pos.	Value	Meaning
Ⓐ	Name	
	IDU-A Compact	Indoor unit (**I**n**D**oor **U**nit) with integral DHW cylinder (**Compact** design)
	Vitocal 250-A	Product name of the outdoor unit (ODU), product segment **2**00
Ⓑ	Medium, primary circuit	
	A	**A**ir
Ⓒ	Medium, secondary circuit	
	W	**W**ater
Ⓓ	Refrigerant circuit design	
	M	**M**onoblock design
Ⓔ	Siting	
	I	Indoor installation (**I**ndoor)
	O	Outdoor installation (**O**utdoor)

Pos.	Value	Meaning
Ⓕ	Type	
	F	Floorstanding outdoor unit (**F**loorstanding)
	T	Floorstanding indoor unit as a compact unit (**T**ower)
Ⓖ	Product segment	
	2	200
Ⓗ	Flow temperature	
	5	High flow temperature
Ⓚ	Number of compressors in refrigerant circuit	
	1	1 compressor
Ⓛ	**A1**	Product generation
Ⓜ	**04** to **19**	Heat pump size

Product information (cont.)

Pos.	Value	Meaning
Ⓝ	Compressor power supply	
	230	1/N/PE 230 V~/50 Hz
	400	3/N/PE 400 V~/50 Hz
Ⓞ	Product version	
	V001 to **V049**	Outdoor unit
	V050 to **V099**	Indoor unit
	V100 to **V...**	Heat pump: See following table.

Heat pump product version

Heat pump			DEV	Buffer							
V108											
▪ ..-230-V001 + V053	1	1 ... 4	■	■	■	230 V~	230 V~/ 400 V~	—	230 V~	□	□
▪ ..-400-V001 + V053	1	1 ... 4	■	■	■	230 V~	230 V~/ 400 V~	—	400 V~	□	□
V109											
▪ ..-230-V002 + V053	1	1 ... 4	■	■	■	230 V~	230 V~/ 400 V~	—	230 V~	■	■
▪ ..-400-V002 + V053	1	1 ... 4	■	■	■	230 V~	230 V~/ 400 V~	—	400 V~	■	■
V110											
▪ ..-230-V001 + V053	1	1 ... 4	■	■	■	—	—	230 V~	230 V~	□	□
▪ ..-400-V001 + V053	1	1 ... 4	■	■	■	—	—	230 V~	400 V~	□	□
V111											
▪ ..-230-V002 + V053	1	1 ... 4	■	■	■	—	—	230 V~	230 V~	■	■
▪ ..-400-V002 + V053	1	1 ... 4	■	■	■	—	—	230 V~	400 V~	■	■

- Integral heating/cooling circuits
- Heating/cooling circuits via external buffer cylinder
- DEV: Expansion vessel 12 l
- Buffer: Buffer cylinder 16 l
- 190 l DHW cylinder
- Rated voltage, control unit/PCB, indoor unit
- Rated voltage, instantaneous heating water heater
- Central mains connection, indoor unit (accessories in standard delivery)
- Rated voltage, outdoor unit
- Electric ribbon heater for condensate pan
- Fan ring heater
- ■ Integrated
- □ Accessories

System examples

Available system examples: **schematics.viessmann-climatesolutions.com**

Maintenance parts and spare parts

You can identify and order maintenance parts and spare parts directly online.

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Product information (cont.)

PartnerShop

shop.viessmann-climatesolutions.com

ViParts web application

viparts.viessmann-climatesolutions.com

ViParts spare part app

Download on the App Store

GET IT ON Google Play

Requirements for on-site connections

Indoor unit

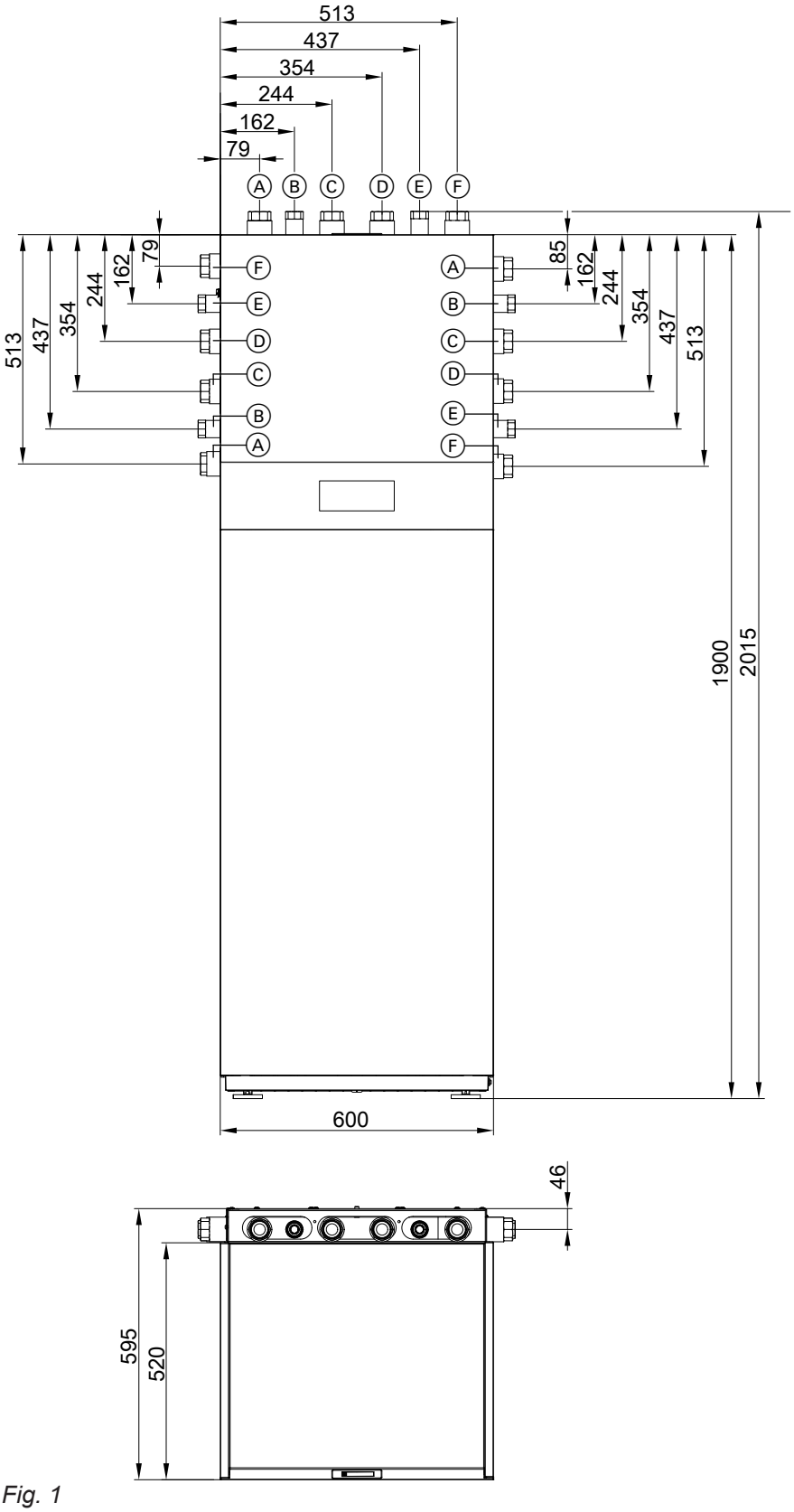


Fig. 1

Ⓐ Secondary circuit flow (heating/cooling circuit 1/ external buffer cylinder), connection G 1¼
Ⓑ Cold water, connection G 1
Ⓒ Heating water **from** the outdoor unit, connection G 1¼
Ⓓ Heating water **to** the outdoor unit, connection G 1¼

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Requirements for on-site connections (cont.)

Ⓔ DHW, connection G 1
Ⓕ Secondary circuit return (heating/cooling circuit 1/ external buffer cylinder), connection G 1¼

Note
The specified connection dimensions of the flow and return connections are the connection dimensions to the installation aid/hydraulic connection set (must be added to the order):

Separate installation instructions

Dimensions of outdoor unit with 1 fan

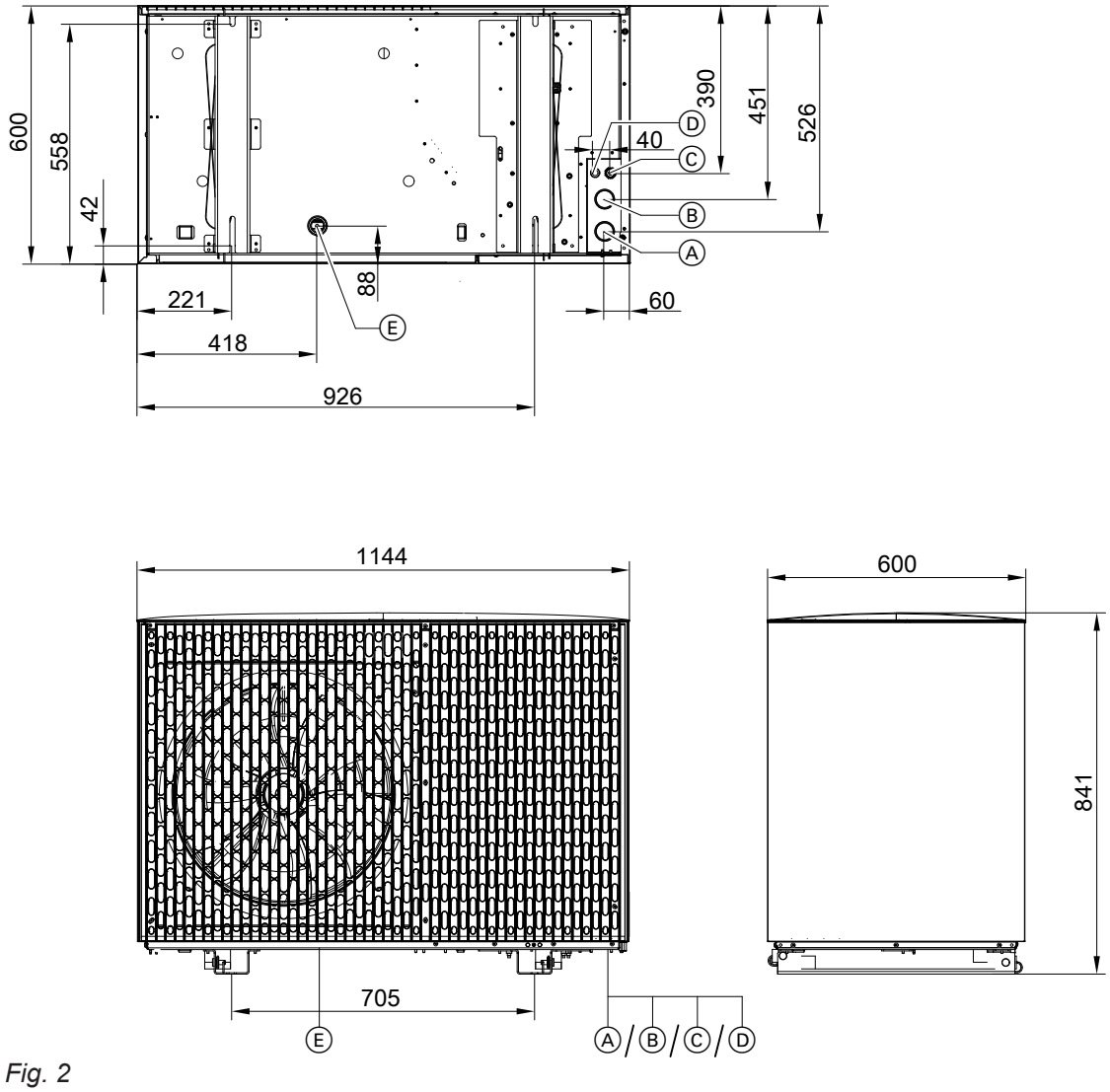


Fig. 2

Ⓐ Heating water **to** indoor unit (heating water outlet): Plug-in connection for Cu 28 x 1.0 mm
Ⓑ Heating water **from** indoor unit (heating water inlet): Plug-in connection for Cu 28 x 1.0 mm
Ⓒ Power cable
Ⓓ CAN bus communication cable (accessories)
Ⓔ Condensate drain

Requirements for on-site connections (cont.)

Outdoor unit with 2 fans, sizes 10 to 13

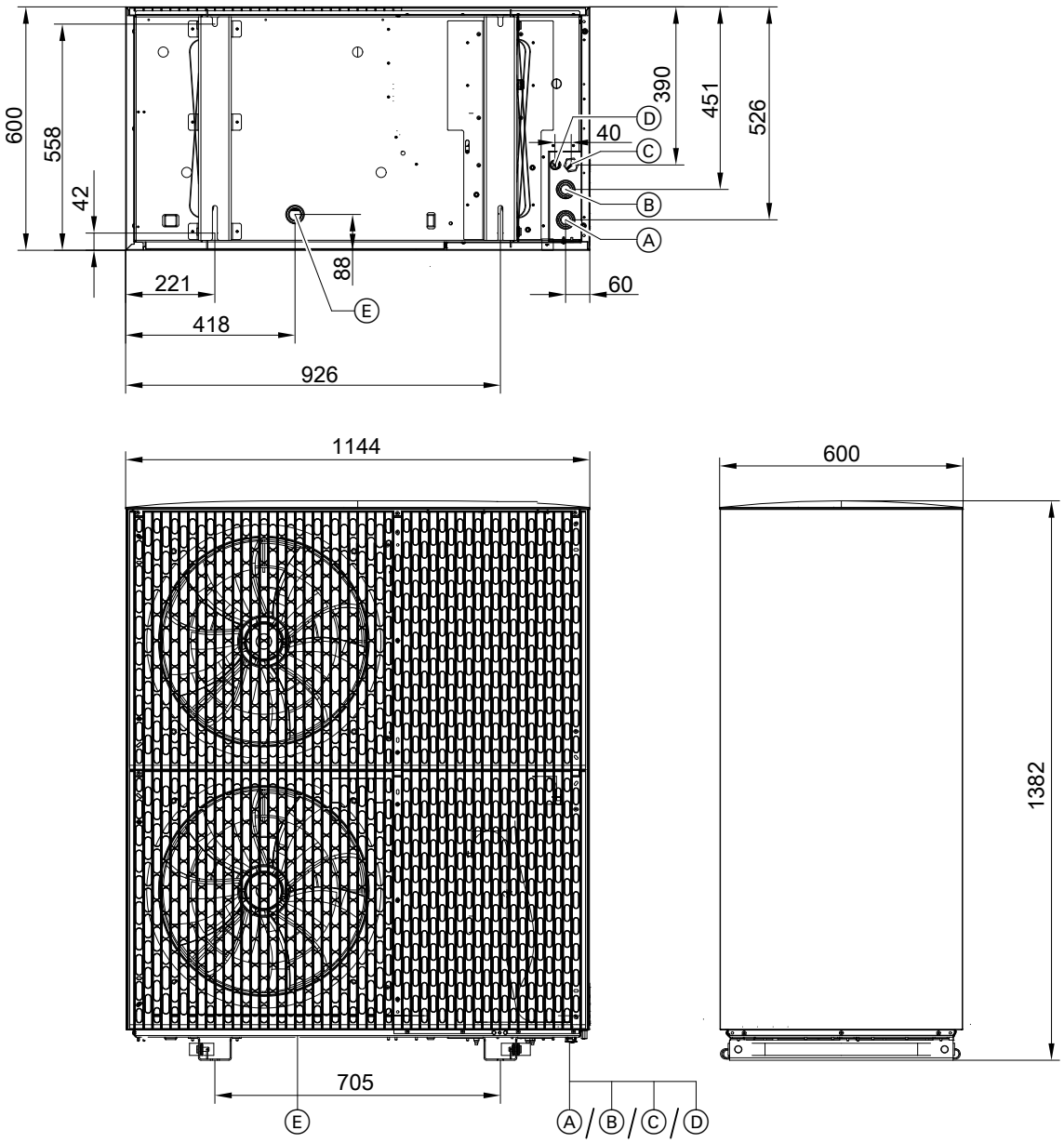


Fig. 3

Ⓐ Heating water **to** indoor unit (heating water outlet): Plug-in connection for Cu 28 x 1.0 mm
Ⓑ Heating water **from** indoor unit (heating water inlet): Plug-in connection for Cu 28 x 1.0 mm
Ⓒ Power cable
Ⓓ CAN bus communication cable (accessories)
Ⓔ Condensate drain

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Requirements for on-site connections (cont.)

Outdoor unit with 2 fans, sizes 16 to 19

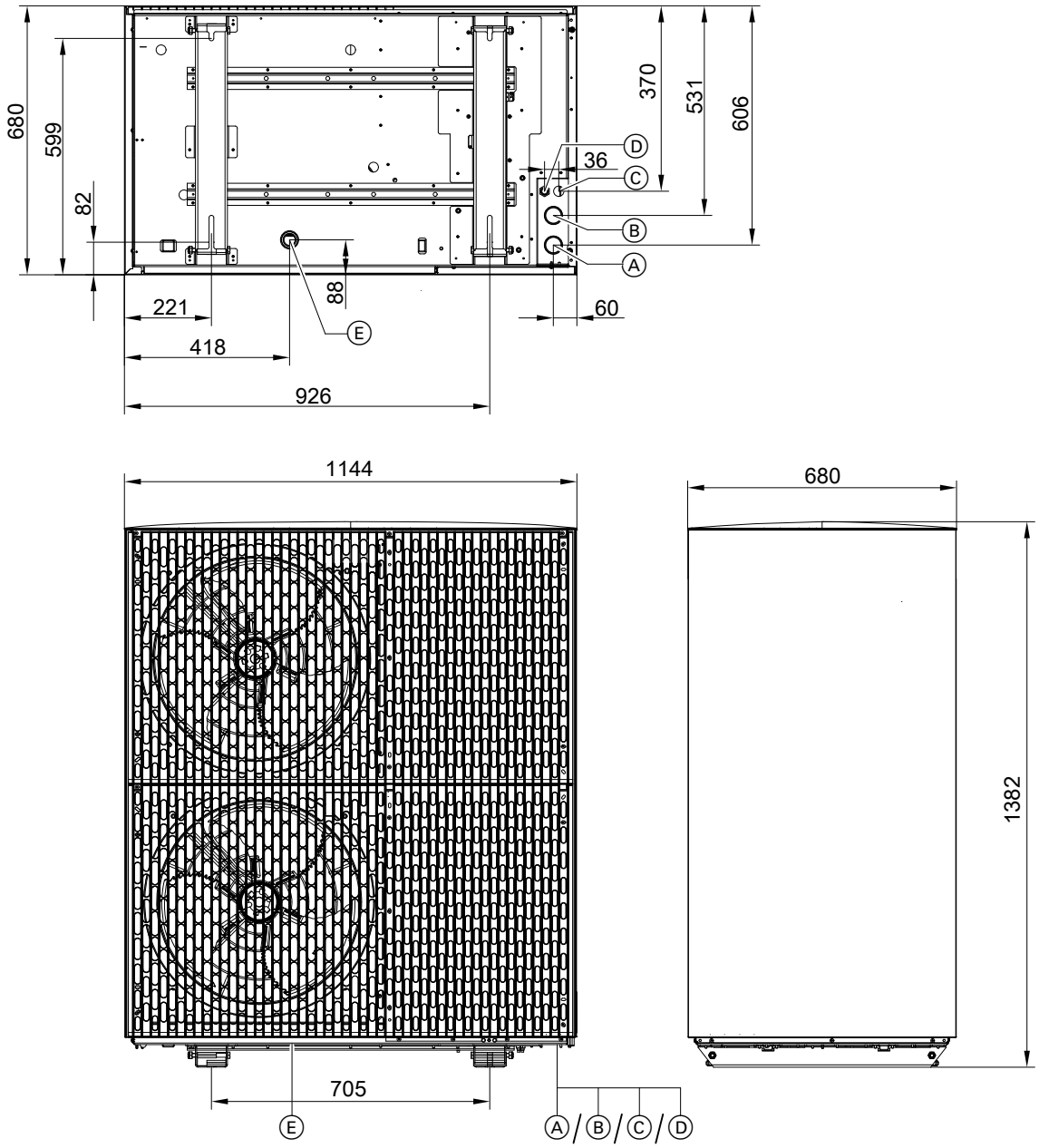


Fig. 4

Ⓐ Heating water **to** indoor unit (heating water outlet): Plug-in connection for Cu 28 x 1.0 mm
Ⓑ Heating water **from** indoor unit (heating water inlet): Plug-in connection for Cu 28 x 1.0 mm
Ⓒ Power cable
Ⓓ CAN bus communication cable (accessories)
Ⓔ Condensate drain

Storing the outdoor unit

Please note
Storing the outdoor unit for more than 12 months may damage the ball bearing of the fan motor.
- Do not store the outdoor unit for more than 12 months before commissioning.
- Do not shut down the outdoor unit for more than 12 months.
- If the outdoor unit needs to be stored for longer:
  - Turn the fan by hand at regular intervals: Min. 30 turns per month
  - Before commissioning, replace the ball bearing if required: After 2 years of storage at the latest

Transporting the outdoor unit

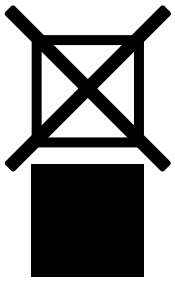
Danger
The outdoor unit is filled with refrigerant R290 (propane): Mechanical stress can lead to leaks in the refrigerant circuit. If a refrigerant leak occurs, there is a risk of explosion and asphyxiation.
- Prevent vibration during transport.
- Set the outdoor unit down carefully after transport.
- Remove the packaging from the outdoor unit only after transporting.
- When being transported, protect the evaporator on the rear side of the outdoor unit against mechanical loading, e.g. with cardboard packaging or bubble wrap.
- Equipment damaged in transit should not be used.

Please note
Shock, pressure and tensile loads can damage the equipment.
- Do **not** load the appliance top, front and side panels as well as the evaporator on the rear side of the equipment.
- The outdoor unit must only be transported with the transport aid (standard delivery), the transport and siting aid (accessories) or a crane.

Please note
Scratches on the surface coating will lead to corrosion.
- If possible, only remove the packaging from the outdoor unit after transporting.
- Protect the outdoor unit against direct contact with tools and transporting equipment, e.g. using cardboard packaging or bubble wrap.

Please note
Excessive tilting of the outdoor unit will lead to equipment damage.
- Max. tilting angle: 45°
- Following transport, wait at least 30 min before commissioning.

Please note
Stacking outdoor units can lead to appliance damage.
Only stack outdoor units during transportation and storage in accordance with the instructions on the packaging.
Information shown here: "Do not stack."



Note
The centre of gravity of the outdoor unit is marked with a ⌖.

Transporting the outdoor unit (cont.)

Handling using transport aids

Danger
If the transport aids are damaged, the outdoor unit may fall. This can lead to refrigerant circuit damage. If damage to the refrigerant circuit occurs, there is the risk of explosion or asphyxiation.
- Check transport aids for damage **before** handling.
- Use the transport aid **only once** to transport the outdoor unit.
- Do **not** use the transport aids when transporting by crane.
- Take note of the weight of the outdoor unit: See chapter "Specification".

For 230 V~ outdoor units, sizes 10 to 13, the transport aids are fitted at the factory.
In the other outdoor units, all transport aids are located in a mounting rail under the outdoor unit. The transport aids must be fitted.

Required transport aids:
- Outdoor units with 1 fan: 1 transport aid at the front and one at the rear of each mounting rail
- Outdoor units with 2 fans: Due to the unequal weight distribution at the front and rear, 1 transport aid on the left-hand mounting rail and 2 transport aids on the right-hand mounting rail: See Fig. 5.

Fitting the transport aids

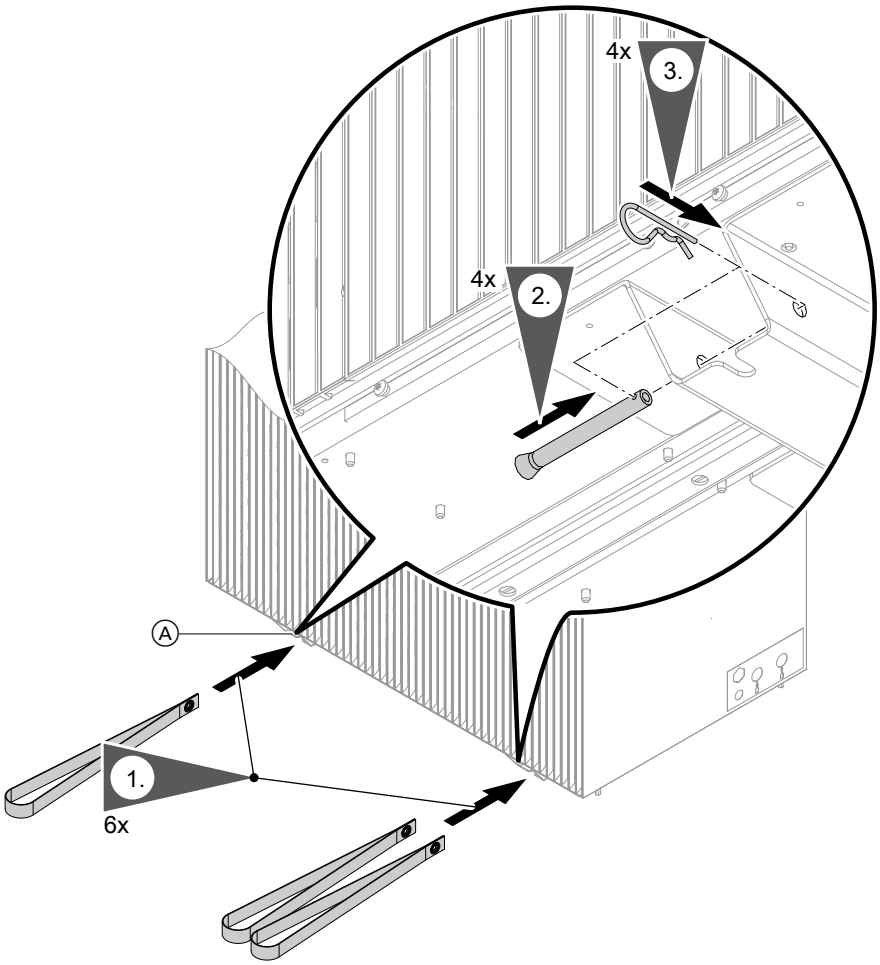


Fig. 5

Ⓐ Mounting rail with transport aids (delivered condition)

4. Use the transport aids to lift and transport the outdoor unit. Wear personal protective equipment, e.g. protective gloves and safety shoes.

Transporting the outdoor unit (cont.)

Removing the transport aids

After transport, dismantle and dispose of all transport aids.

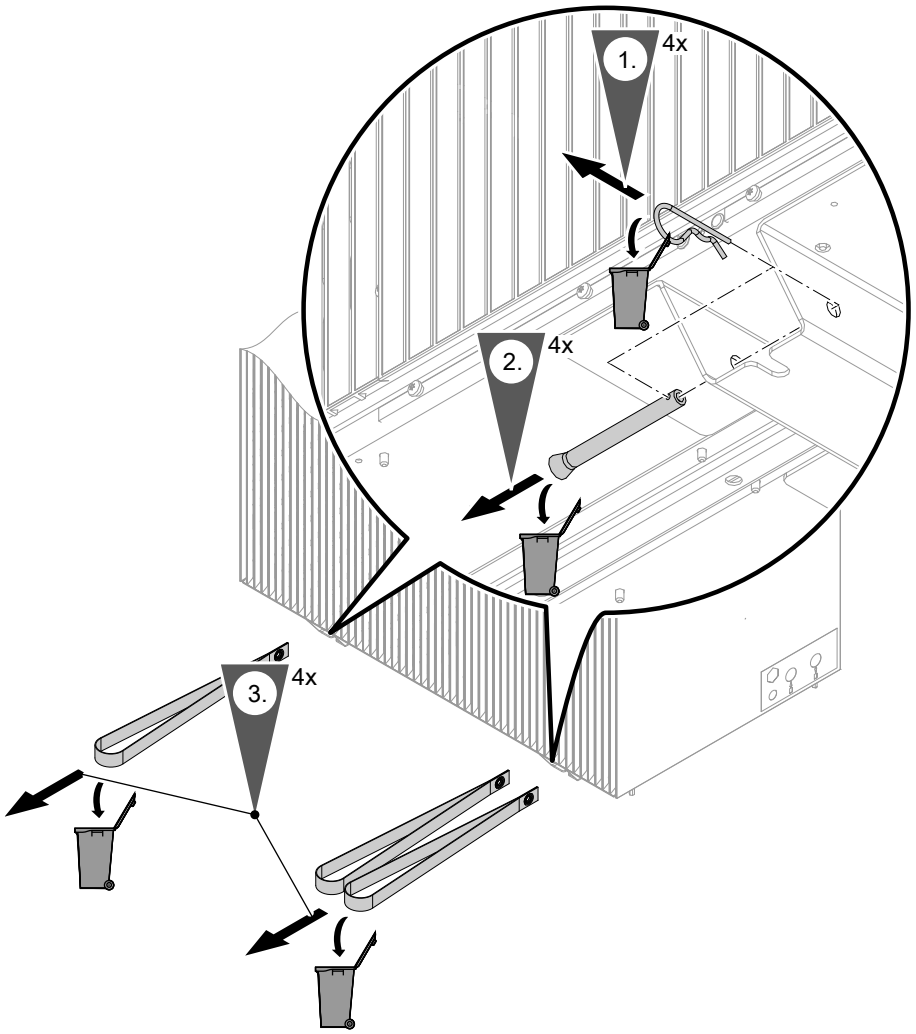


Fig. 6

Transporting with the transport and siting aid (accessories)

Installation and operating instructions for "Transport and siting aid"

Transporting the outdoor unit (cont.)

Transport by crane

Danger
Incorrect unloading and transportation can result in damage to the outdoor unit. Should damage to the refrigerant circuit occur, there is the risk of explosion or asphyxiation.
- Do **not** use the transport aids when transporting by crane.
- **Before** transport, check on-site aids, e.g. slings and boards, for damage.
- Take note of the weight of the outdoor unit: See chapter "Specification".
- Prevent vibration during transport.
- Avoid mechanical damage to the outdoor unit.

Do **not** commission outdoor units with transport damage.

1. Remove **outer** packaging from the outdoor unit before transport.
2. Protect the evaporator on the rear side of the outdoor unit against damage:
   - Position a wooden board (customer to supply) at the bottom.
   - Protect the entire evaporator, e.g. with cardboard or bubble wrap.
3. Position edge protection brackets on site at the front and rear upper edges of the outdoor unit. Place slings properly around the outdoor unit: See Fig. 7.
4. After transportation, set the outdoor unit down carefully. Remove the remaining packaging from the outdoor unit.

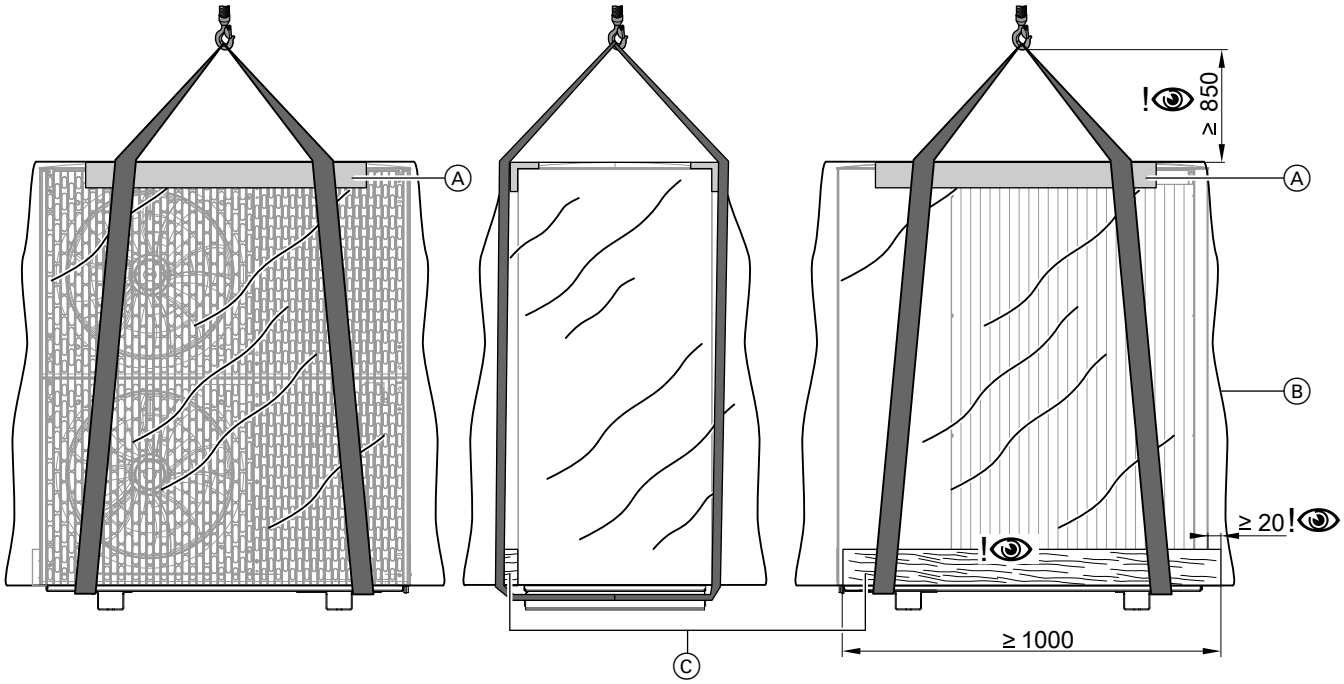


Fig. 7 Transport by crane using the example of the outdoor unit with 2 fans

Ⓐ Edge protection
Ⓑ Protective wrap
Ⓒ Wooden board

Installation information

Please note
Excessive tilting of the outdoor unit will lead to equipment damage.
- Max. tilting angle during siting and installation: 45°
- Following siting and installation, wait at least 30 min before commissioning.

The height differential between the hydraulic connections of the outdoor unit and the indoor unit must not exceed 15 m.

Installation information (cont.)

Floorstanding installation

- Particularly in adverse climatic environments (minus temperatures, snow and humidity) a distance to the substrate of at least 300 mm is required.
- Secure the outdoor unit with supports for floorstanding installation (accessories) to a concrete foundation.
  Use ground anchors with a tensile force of at least 2.5 kN to secure the support to the foundation.
- If the support cannot be used, site the outdoor unit on a concrete foundation ≥ 150 mm high using an anti-vibration base (accessories).
  If the outdoor unit is installed under a snow-free awning, (e.g. a carport) a lower plinth can be used.
- Take the weight of the outdoor unit into account: See chapter "Specification".

Wall mounting

- Use the wall mounting bracket set (accessories).
- The wall must meet the structural requirements.
  Use suitable fixing materials, depending on the wall structure.
- If there is no level access to the outdoor unit, ensure it is easily accessible all year round for service and maintenance. Provide sufficient maintenance areas.
  Install suitable protection equipment, e.g. fall protection.

Roof installation

Flat roof installation

Note
Due to the higher static loads (roof/wind load) and the higher acoustic requirements for roof installation, the structural calculations and sound concept require input from specialist design engineers.

If the outdoor unit is to be installed on a flat roof, in addition to the requirements for floor and wall installation, the planning measures to be taken into account include the following:

- As the outdoor unit is located higher up when installed on a flat roof, operating noise propagation is more intense than when the unit is installed on the ground. Roof surfaces are normally more reverberant than areas on the ground.
  To prevent noise nuisance, install the outdoor unit at a sufficient distance from neighbouring buildings. If required, provide suitable noise reduction measures.
  Take into account sound reflection from the surfaces of buildings when analysing sound propagation: See technical guide.
- Provide on-site wind protection measures if required, e.g. screens, walls, etc.
- Check to ensure that the installed height of the outdoor unit does not exceed the permissible building height, e.g. as specified in outline planning restrictions.
- Provide easy, year-round access to the outdoor unit for service and maintenance. Provide sufficient maintenance areas which comply with the safety regulations.
  Install suitable protection equipment which complies with the safety regulations, e.g. anchorage points.
- Recommendation: Install the heat pump on a steel-reinforced concrete roof
- Installation on flat roofs with a low weight per unit area (e.g. roofs made from timber rafters or trapezoidal sheet metal) is **not permissible**.
- With flat roof installation, considerable wind loads may occur, depending on the relevant wind zone and the height of the building. Have the substructure designed according to DIN 1991-1-4 by a specialist design engineer.
- The higher roof and wind loads must be taken into account in the structural calculations and the fixture system of the outdoor unit.
  It is essential to comply with the specifications provided by the design engineer with regard to statics, distances from building edges and the sound concept.
- Where design casings are concerned, check that these are able to withstand wind and snow loads.
  Some of the design casings are only attached to the outdoor unit by means of magnets.

Pitched roof installation

Recommendation: Installation on floor, wall or flat roof.
If the outdoor unit is nevertheless installed on a pitched roof, the same requirements apply as for flat roof installation.

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Installation information (cont.)

Siting

- In accordance with EN 378-3, the outdoor unit may only be installed in the open air.
- The refrigerant circuit in the outdoor unit contains easily flammable refrigerant belonging to safety group A3 according to ANSI/ASHRAE Standard 34. Therefore a safety zone is defined in the immediate vicinity of the outdoor unit, in which special requirements apply: See chapter "Safety zone".
- Observe the information regarding noise levels. Sound emission regulations (TA Lärm in Germany) must be observed.
- When siting the heat pump, always take into account the distances to neighbouring properties in accordance with local building regulations.
- Do not install with the discharge side facing towards the house wall or the main wind direction.
- During defrosting, cool vapour escapes from the outdoor unit air discharge vents. This vapour discharge must be taken into consideration during installation (choosing the installation location, orientation of the heat pump).
- Provide wall outlets and protective conduits for the hydraulic connection lines and electrical connecting cables without moulded parts or changes of direction.
  Building entry points, whether below or above ground level, must be sealed in accordance with current engineering standards. Safety zone requirements must be observed in all cases.
- Provide equipment for the protection of the outdoor unit against mechanical damage e.g. Impact damage from footballs.
- Take environmental and weather influences into account in the selection of the installation location, e.g. flooding, wind, snow, ice damage, etc. Install suitable protection equipment if required.

Siting in garages, multi-storey car parks and car parking areas:

- Prior to installation, it must be established for the case in question whether the installation is permissible under local garage and parking area regulations (German regulations GaStellV, GaStplVO, BetrVO).
- Systems with refrigerants belonging to safety group A3 must be fitted with impact protection. This impact protection must be designed so that a strike by a vehicle at the applicable maximum speed does not result in damage to the refrigerant circuit.
- Mark the outdoor unit safety zone with prohibition notices to identify ignition sources.
- Siting in underground car parks is **not** permissible.

Siting in coastal areas: Distance < 1000 m

- In coastal areas salt and sand particles in the air increase the likelihood of corrosion:
  Site the heat pump where it is protected from direct onshore wind.
- If necessary provide a wind break on site. Observe the minimum clearances to the heat pump: See chapter "Minimum clearances".

Weather influences

- Observe wind loads when installing the unit on sites exposed to the wind.
- Fit the pipework exposed to the outdoor air outside the support for floorstanding installation (accessories) with adequately thick thermal insulation in accordance with the German Buildings Energy Act (GEG): See the following table.

Pipework internal ∅	Min. thickness of thermal insulation layer with λ = 0.035 W/(m·K)
≤ 22 mm	40 mm
> 22 mm	60 mm

λ Thermal conductivity

- The thermal insulation must be UV-resistant.
- If a design casing for the support for floorstanding installation (accessories) is used:
  For pipework inside the support, use the thermal insulation supplied.
- Incorporate the outdoor unit into the lightning protection system.
- Note the heat absorbed (heating mode) and heat emitted (cooling mode) by the appliance when designing weatherproofing measures or an enclosure.

Condensate

In regions where the outside temperature is often below 0 °C, we recommend installing an electrical ribbon heater (accessories) for the condensate pan of the outdoor unit. For outdoor unit versions V002, an electric ribbon heater is factory-fitted.

Installation information (cont.)

Floorstanding installation:
- Ensure that condensate can drain freely.
- Allow condensate to seep away into a gravel bed or into a deep seepage layer, or direct it into the waste water system: See page 32 onwards.

Danger
If refrigerant gets into the waste water system (e.g. as a result of a leak in the refrigerant circuit), there is a risk of explosion.
Only connect the condensate drain to the waste water system via a trap.

Wall mounting:
- Ensure that condensate can drain freely.
- Allow condensate to seep away into the gravel bed: See page 32.

Flat roof installation:
- Allowing the condensate to drain freely onto the roof surface is not permissible, as this may result in the formation of layers of ice. Layers of ice on the roof may prevent further condensate from draining freely, resulting in increased roof loads.
- Use an electric ribbon heater for the condensate pipe (accessories).
- To drain the condensate, connect the condensate hose on the outdoor unit to an insulated condensate pipe. The condensate pipe is part of the standard delivery of the electric ribbon heater for the condensate pipe.
  If necessary, insert the condensate hose via a trap insert.

Structure-borne noise insulation and vibration isolation between the building and outdoor unit

- Route cables/leads between the indoor and outdoor units so they are not stressed.
- Installation only on walls with a high weight per unit area (> 250 kg/m^2); in other words not on lightweight walls, roof structures, etc.
- Vibration isolation components are included in the standard delivery of the wall mounting bracket.
- Do not use additional anti-vibration mounts, springs, rubber mounts, etc.
- When installing the outdoor unit on roof surfaces, there is a risk that structure-borne noise and vibrations will be transmitted into the building.
  If the outdoor unit is installed on freestanding garages, insufficient structure-borne noise insulation and vibration isolation can cause excessive noise due to resonance amplification.
- When using a KG conduit:
  After installing the hydraulic connection lines, fill the KG conduit with sand.

Technical guide

Installation location

- Maximum geographical height of the installation location: 1500 m above sea level
- Select a site with good air circulation so that the cooled air can dissipate and be replaced by warm air.
- Do not install in recesses or between walls. This could result in an "air short circuit" between the air being discharged and the air being drawn in.

Please note
An air short circuit during **heating mode** will result in the cooled, discharged air re-entering the unit. This can result in reduced heat pump efficiency and defrosting problems.
Avoid air short circuits.

Please note
An air short circuit during **cooling mode** will result in the heated, discharged air re-entering the unit. This can lead to high pressure faults.
Avoid air short circuits.

Installation location (cont.)

- If siting the appliance in a location that is exposed to wind, ensure that the wind cannot influence the fan area. Strong wind can have a negative influence on the air flow through the evaporator.
- Select an installation location where the evaporator cannot be blocked by leaves, snow, etc.
- Install the outdoor unit outside the area at risk of snowfall from roofs.
- Select the installation location giving due consideration to the physical laws of sound propagation and reflection.

   Technical guide
- Do not install above cellar shafts or floor troughs.
- Do not install near bedroom windows.
- To avoid increased wind loads, maintain 1 m distance from building edges and corners.
- Maintain a clearance of at least 3 m to pathways, downpipes or sealed surfaces. The cooled air in the discharge area creates a risk of ice forming when outside temperatures are below 10 °C.
- The installation location must be easily accessible, for example for maintenance work: See chapter "Minimum clearances".

Additional requirements for flat roof installation:
- Never install the outdoor unit on a flat roof immediately next to or above living rooms or bedrooms.
- Do not locate in front of windows, or keep a distance of 1 m from them.
- Due to the higher static loads (roof/wind load) and the higher acoustic requirements for roof installation, input from a specialist design engineer is required. The specialist design engineer specifies the requirements for structural calculations, distances from building edges and sound concepts.

Safety zone

The refrigerant circuit in the outdoor unit contains easily flammable refrigerant from safety group A3, as set out in ISO 817 and ANSI/ASHRAE Standard 34. Therefore a safety zone is defined in the immediate vicinity of the outdoor unit, in which special requirements apply.

The following conditions must not be present or occur within the safety zone:
- Openings:
  - Building openings, e.g. windows, doors, light wells, flat roof windows
  - Outdoor air and exhaust air apertures from ventilation and air conditioning systems
  - Pump shafts, inlets to waste water systems, downpipes and waste water shafts, etc.
  - Other slopes, troughs, depressions, shafts
- Property boundaries, neighbouring properties, footpaths and driveways
- Electrical house supply connections
- Electrical systems, sockets, lamps, light switches
- Snowfall from roofs

Requirements if other heat pumps are installed in the vicinity:
- Only outdoor units of the same type and with the same refrigerant from safety group A3, as set out in ISO 817 and ANSI/ASHRAE Standard 34, may be installed within the safety zone. The total safety zone results from the overlap of all safety zones.
- The following heat pumps must be sited outside the safety zone:
  - Heat pumps of a different type
  - Heat pumps with different refrigerant
  - Heat pumps from another manufacturer

Do not introduce ignition sources into the safety zone, e.g.:
- Naked flames or burner gauze assemblies
- Tools that generate sparks
- Electrical devices not free of ignition sources, mobile devices with integrated batteries
- Objects with temperatures above 360 °C

Note
The particular safety zone is dependent on the surroundings of the outdoor unit.
- *The safety zones shown in the following are for the floorstanding installation of an outdoor unit with 2 fans.*
  - *These safety zones also apply to outdoor units with 1 fan.*
  - *These safety zones also apply to wall and roof installation.*
- *In the case of wall installation, the requirements listed above also apply to the area **below** the outdoor unit, down to the ground.*
- *If openings in the safety zone cannot be avoided, the following measures are required:*
  - *Öffnungen dauerhaft gasdicht verschließen. Die Öffnungen dürfen nur mit einem Werkzeug zu öffnen sein.*
    Or
  - *Install a permanent, gas-tight barrier between the outdoor unit and any openings, e.g. a wall or partition.*
    Observe the note on the floor area of the safety zone.

Installation location (cont.)

Floor area of safety zone
If necessary, it is possible to deviate from the dimensions of 1000 mm to the side and 1800 mm to the front. Please note the following:
- *There **must** be a safety zone to the front and side.*
- *The floor area of the safety zone **must** be observed.*

Freestanding positioning of the outdoor unit

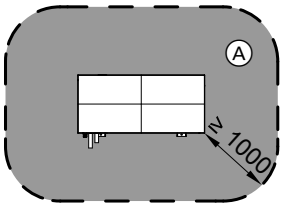


Fig. 8

Ⓐ Safety zone

Siting the outdoor unit in front of an external wall

Floorstanding outdoor unit

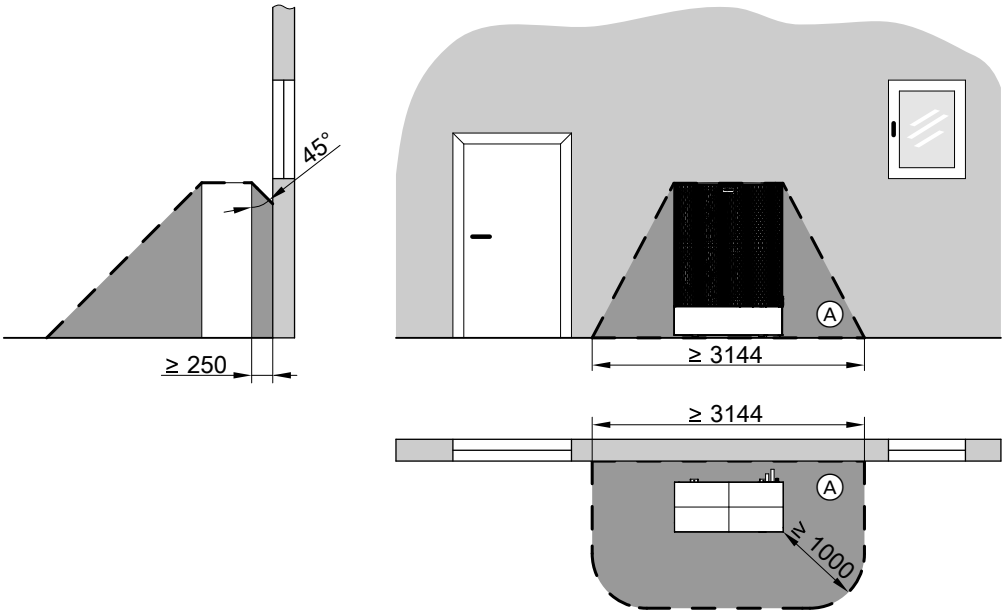


Fig. 9

Ⓐ Safety zone

Installation location (cont.)

Wall mounted outdoor unit

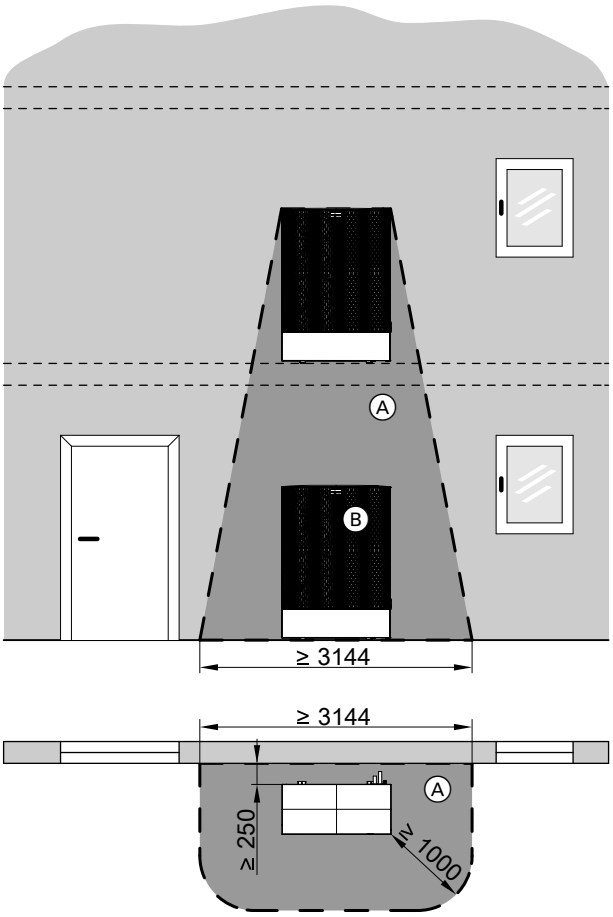


Fig. 10

Ⓐ Safety zone
Ⓑ Other heat pump in the immediate vicinity

Corner positioning of the outdoor unit, right

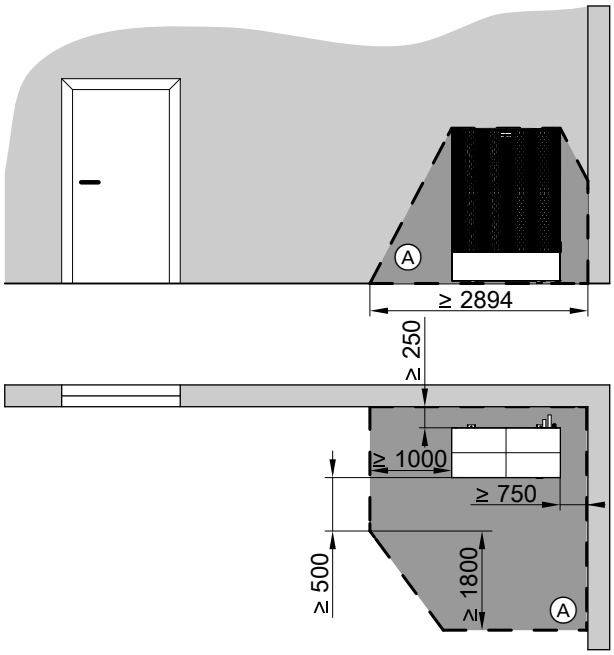


Fig. 11

Ⓐ Safety zone

Corner positioning of the outdoor unit, left

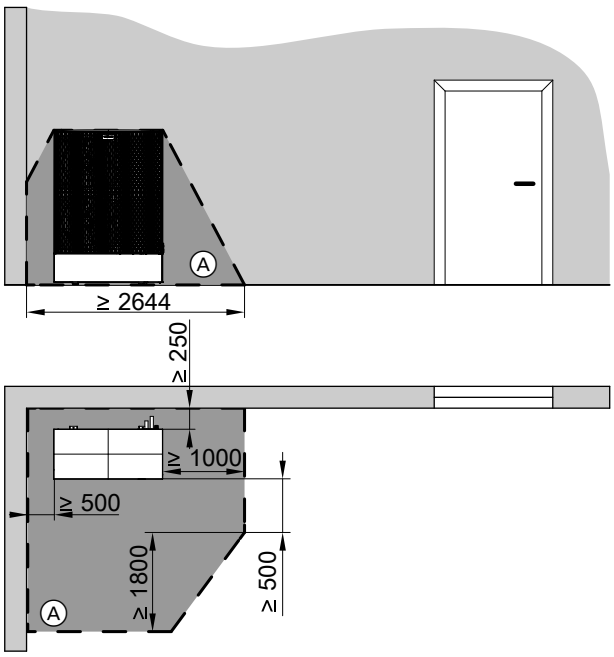


Fig. 12

Ⓐ Safety zone

Minimum clearances

Note
Installing the outdoor unit in a recess with 3 adjacent walls leads to higher sound reflection and therefore to high sound pressure levels.

Recommended installation versions:
- *Freestanding installation*
- *Installation in front of a wall*
- *Corner installation*

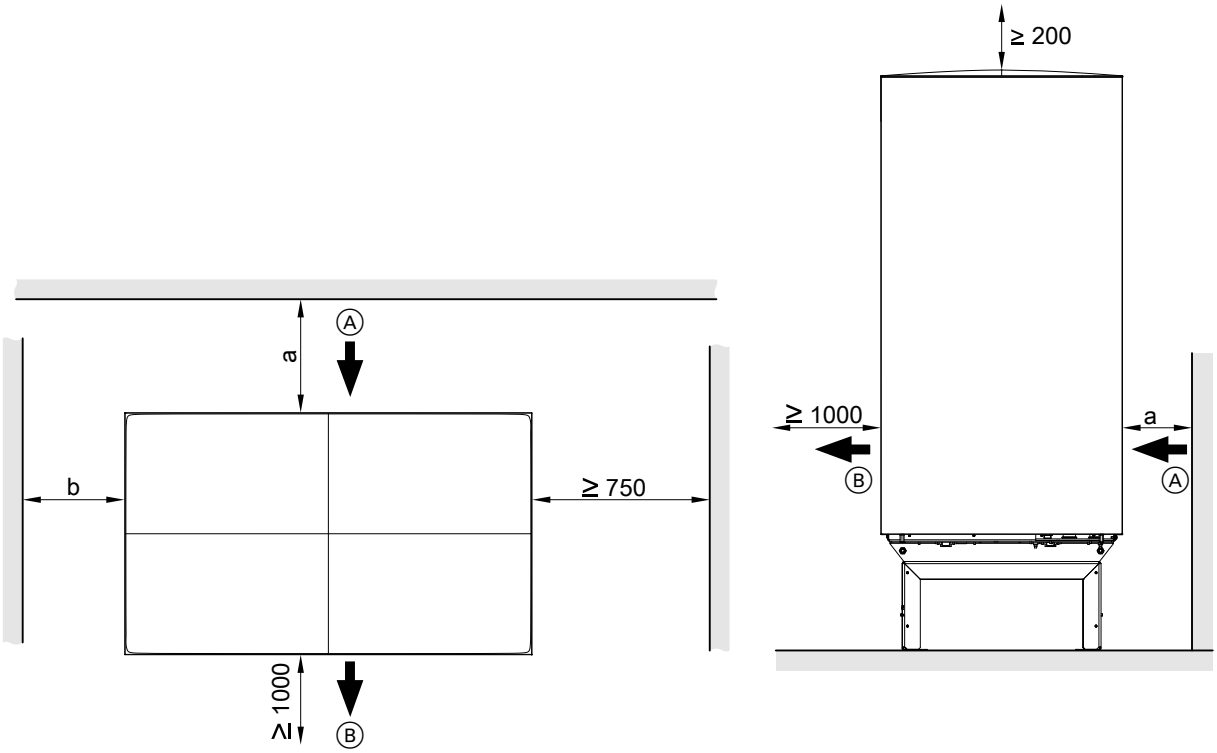


Fig. 13

Ⓐ Air intake
Ⓑ Air discharge

a Clearance between wall and outdoor unit dependent on line routing:
- Line entry **above** ground level: ≥ 250 mm
- Line entry **below** ground level when laying the Quattro connection line in a **straight trench**: ≥ 940 mm
- Line entry **below** ground level when laying the Quattro connection line in a **trench with a bend**: ≥ 250 mm

b Dependent on transport used:
- Transport aid (standard delivery): ≥ 500 mm
- Transport and siting aid (accessories): ≥ 2500 mm

Condensate drain

Free condensate drain without drain pipe

Allow the condensate to drain away freely **without** a drain pipe into a gravel bed beneath the outdoor unit.

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Condensate drain (cont.)

Central condensate drain via drain pipe

Note

- *To ensure correct function of the condensate drain even at low temperatures, provide a ribbon heater in the drain pipe (accessories).*
- *The dripping water that occurs during evaporator defrosting undergoes controlled discharge via the central drain (drain pipe, pos. Ⓕ).*
  During operation, condensate may form in other places in the outdoor unit and may escape from the appliance at other points. We therefore recommend that you provide a water-permeable surface, such as drainage gravel or a lawn area, even when installing the electric ribbon heater for the condensate drain (accessories) below the outdoor unit.
  Installation on surfaces that are impermeable to water (e.g. paved areas) can lead to the formation of black ice and therefore to the risk of a fall.

Central condensate drain via drain pipe in seepage layer

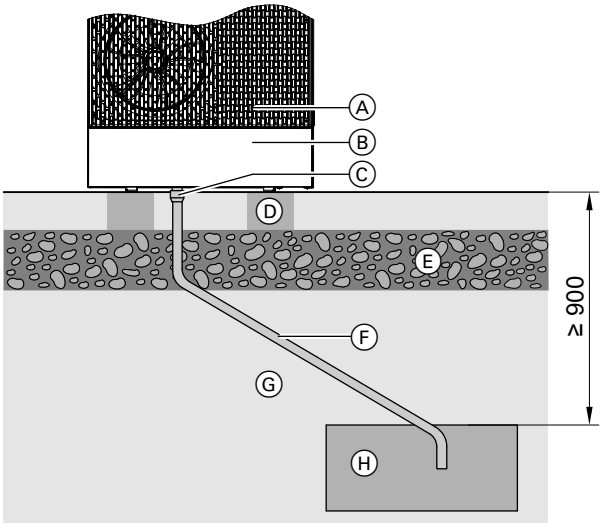


Fig. 14

Ⓐ Outdoor unit
Ⓑ Support for floorstanding installation (accessories) with design casing (accessories)
Ⓒ Condensate drain connector
Ⓓ Foundation
Ⓔ Frost protection (compacted crushed stone)
Ⓕ Drain pipe (at least DN 40) with ribbon heater (accessories)
Ⓖ Ground
Ⓗ Seepage layer for removal of condensate

Central condensate drain via waste water system

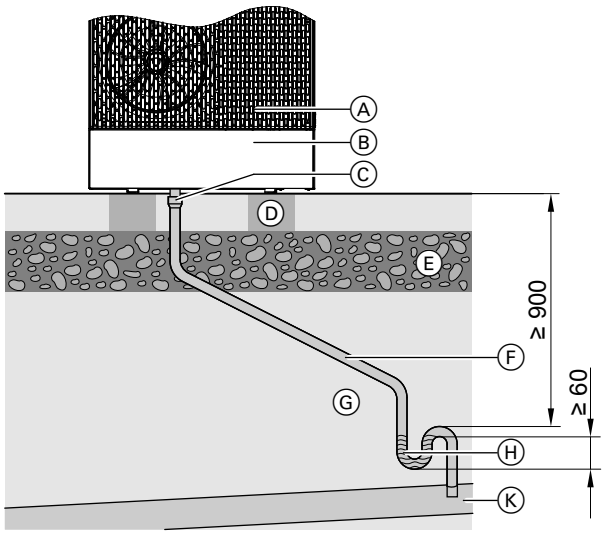


Fig. 15

Ⓐ Outdoor unit
Ⓑ Support for floorstanding installation (accessories) with design casing (accessories)
Ⓒ Condensate drain connector
Ⓓ Foundation
Ⓔ Frost protection (compacted crushed stone)
Ⓕ Drain pipe (at least DN 40) with ribbon heater (accessories)
Ⓖ Ground
Ⓗ Stench trap in an area free from the risk of frost
Ⓚ Drain

Floorstanding installation

Danger
Incorrect installation can lead to equipment damage and personal injury, e.g. if the outdoor unit falls down or falls over.
Only install the outdoor unit in accordance with the specifications in these instructions.

Recommendation: Installation with prefabricated foundation (accessories)
Separate installation instructions

Floorstanding installation (cont.)

Foundation for installation with support for floorstanding installation (accessories)

Provide 2 horizontal foundation strips.
- Max. tilt tolerance: ±10 mm for every 1 m of length

Recommendation: Construct concrete foundations in accordance with the following diagram. The stated thickness of the layers represents an average value. These values should be adjusted to suit the local conditions. Observe the standard rules of building engineering.

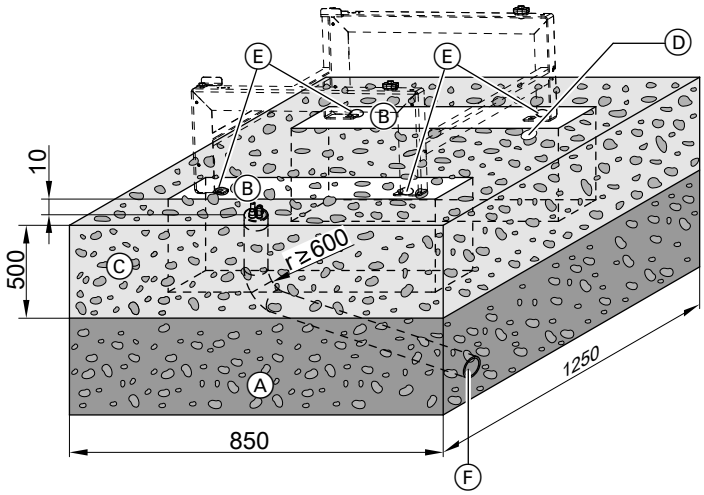


Fig. 16

Floorstanding installation (cont.)

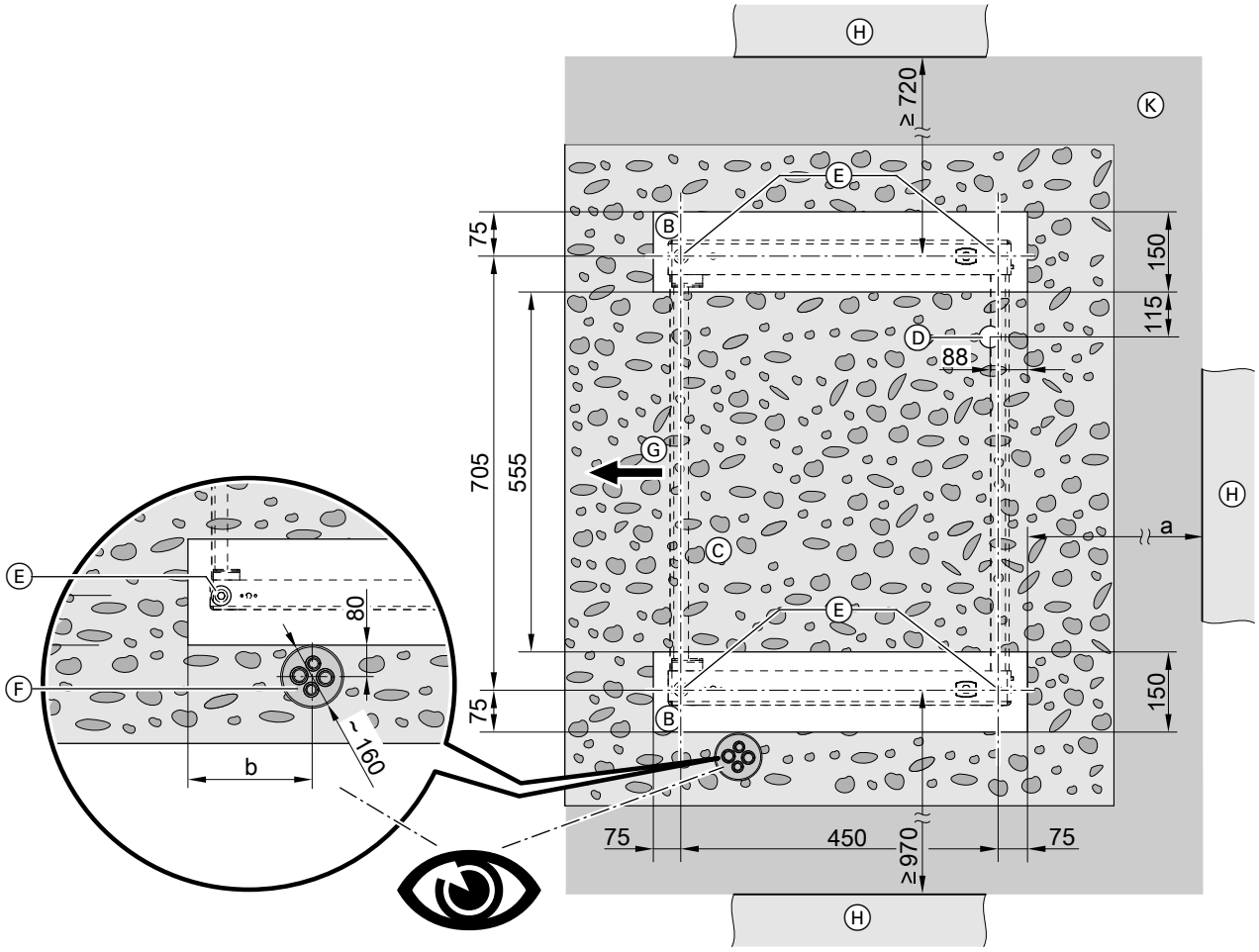


Fig. 17

Ⓐ Frost protection for foundations: compacted crushed stone (e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations
Ⓑ Foundation strip of reinforced concrete
Ⓒ For free flowing condensate:
Gravel bed as soakaway
Or
Ⓓ In conjunction with central condensate drain and electric ribbon heater for condensate drain (accessories):
Drain pipe (min. DN 40) for draining condensate via waste water system or seepage layer
Ⓔ Fixing points for support:
Use ground anchors with a tensile force of at least 2.5 kN.
Ⓕ Quattro connection line (accessories) for use when cable/line entry is below ground level:
So that the connection set for supports for floor-standing installation (accessories) can be used, align the flow and return of the Quattro connection line (accessories) flush with and parallel to the edge of the foundation.
Ⓖ Air discharge
Ⓗ Wall
Ⓚ Flexible separating layer between the foundations and the wall, in accordance with local requirements and the standard rules of building engineering
a, b For line entries below ground level only: See the following tables.
r Bending radius

Floorstanding installation (cont.)

Hinweis zum zentralen Kondenswasserablauf
Das beim Abtauen des Verdampfers abtropfende Wasser wird über den zentralen Ablauf (Abflussrohr, Pos. Ⓓ) kontrolliert abgeführt.
Im laufenden Betrieb kann sich an anderen Stellen in der Außeneinheit Kondenswasser bilden, das ggf. an anderen Stellen aus dem Gerät austreten kann.
Daher empfehlen wir, auch bei Installation der elektrischen Begleitheizung für den Kondenswasserablauf (Zubehör) unterhalb der Außeneinheit einen wasserdurchlässigen Untergrund vorzusehen, z. B. Drainagekies oder Rasenfläche.
Die Aufstellung auf wasserundurchlässigen Oberflächen (z. B. Pflaster) kann zu Glatteisbildung und damit zu Sturzgefahr führen.

Installation with support for floorstanding installation (accessories)

Installation instructions for "support set for floorstanding installation"
Use M10 x 80 ground anchors with a tensile force of at least 2.5 kN to secure the support.

When laying the Quattro connection line in a straight trench

Outdoor unit	a	b
Sizes 04 to 13	≥ 940 mm	175 mm
Sizes 16 to 19	≥ 980 mm	215 mm

When laying the Quattro connection line in a trench with a bend

Outdoor unit	a	b
Sizes 04 to 13	≥ 250 mm	175 mm
Sizes 16 to 19	≥ 290 mm	215 mm

Foundation for installation with anti-vibration base (accessories)

Provide 2 horizontal foundation strips.
- Max. tilt tolerance: ±10 mm for every 1 m of length

Recommendation: Construct concrete foundations in accordance with the following diagram. The stated thickness of the layers represents an average value. These values should be adjusted to suit the local conditions. Observe the standard rules of building engineering.

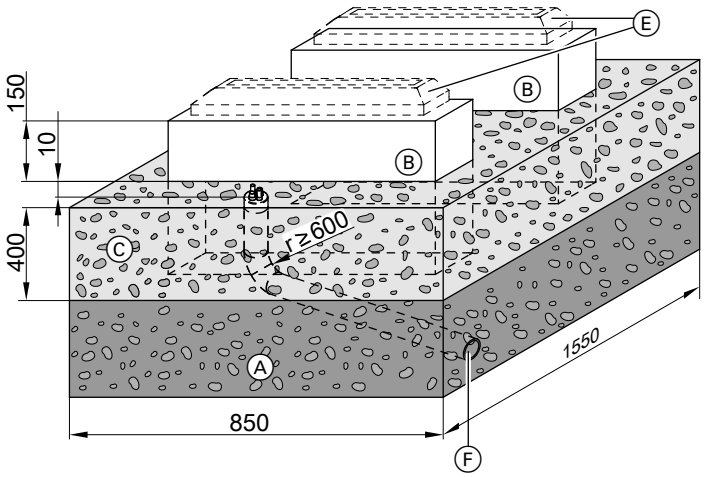


Fig. 18

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Floorstanding installation (cont.)

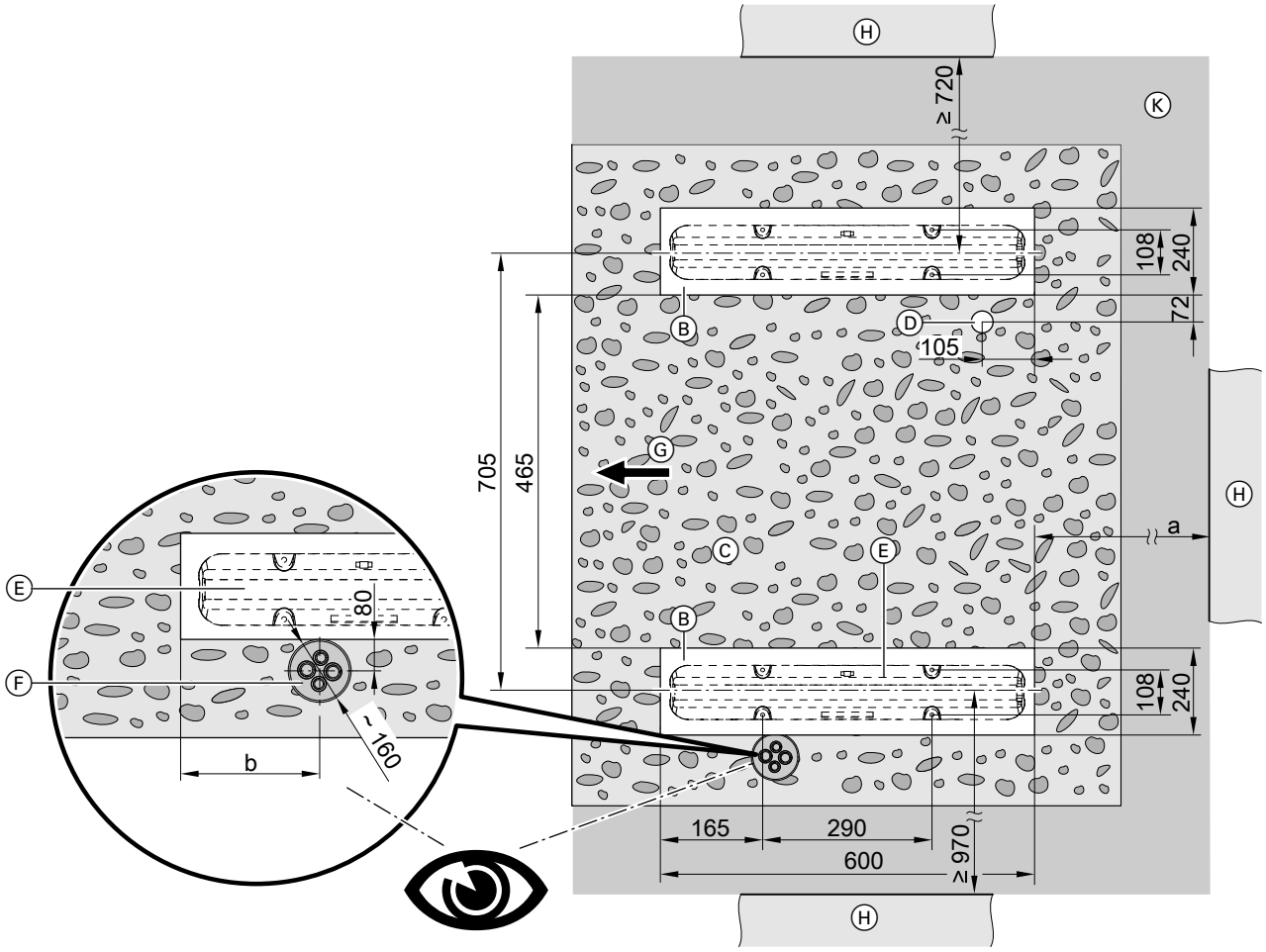


Fig. 19

Ⓐ Frost protection for the foundations: Compacted crushed stone, e.g. 0 to 32/56 mm; thickness of layer subject to local requirements and building regulations
Ⓑ Foundation strip of reinforced concrete
Ⓒ For free flowing condensate:
Gravel bed as soakaway
or
Ⓓ In conjunction with central condensate drain and electric ribbon heater for condensate drain (accessories):
Drain pipe (min. DN 40) for draining condensate via waste water system or seepage layer
Ⓔ Anti-vibration feet (accessories):
Observe installation instructions.
Ⓕ Quattro connection line (accessories) for use when cable/line entry is below ground level:
So that the connection set for supports for floorstanding installation (accessories) can be used, align the flow and return of the Quattro connection line (accessories) flush with and parallel to the edge of the foundation.
Ⓖ Air discharge
Ⓗ Wall
Ⓚ Flexible separating layer between the foundations and the wall, in accordance with local requirements and the standard rules of building engineering
a, b For line entries below ground level only: See the following tables.
r Bending radius

Floorstanding installation (cont.)

Installation instructions for anti-vibration base

- *Align the anti-vibration base horizontally on the foundation using the spirit levels supplied.*
- *Use tension rods with a tensile force of at least 1.25 kN per fixing point.*
- *Drill holes at the markings based on the nominal diameter of the tension rods.*
- *Increase bearing surface of screw heads or nuts with washer.*

Hinweis zum zentralen Kondenswasserablauf

Das beim Abtauen des Verdampfers abtropfende Wasser wird über den zentralen Ablauf (Abflussrohr, Pos. Ⓓ) kontrolliert abgeführt.
Im laufenden Betrieb kann sich an anderen Stellen in der Außeneinheit Kondenswasser bilden, das ggf. an anderen Stellen aus dem Gerät austreten kann.
Daher empfehlen wir, auch bei Installation der elektrischen Begleitheizung für den Kondenswasserablauf (Zubehör) unterhalb der Außeneinheit einen wasserdurchlässigen Untergrund vorzusehen, z. B. Drainagekies oder Rasenfläche.
Die Aufstellung auf wasserundurchlässigen Oberflächen (z. B. Pflaster) kann zu Glatteisbildung und damit zu Sturzgefahr führen.

When laying the Quattro connection line in a straight trench

Outdoor unit	a	b
Sizes 04 to 13	≥ 940 mm	175 mm
Sizes 16 to 19	≥ 980 mm	215 mm

When laying the Quattro connection line in a trench with a bend

Outdoor unit	a	b
Sizes 04 to 13	≥ 250 mm	175 mm
Sizes 16 to 19	≥ 290 mm	215 mm

Line entry below ground level: Laying lines in a straight trench

Note

- *The following information for floorstanding installation applies to outdoor units with 1 or 2 fans. The outdoor unit with 2 fans is shown as an example.*
- *The following information applies to installation with a support and an anti-vibration base. Installation with a support is shown as an example.*

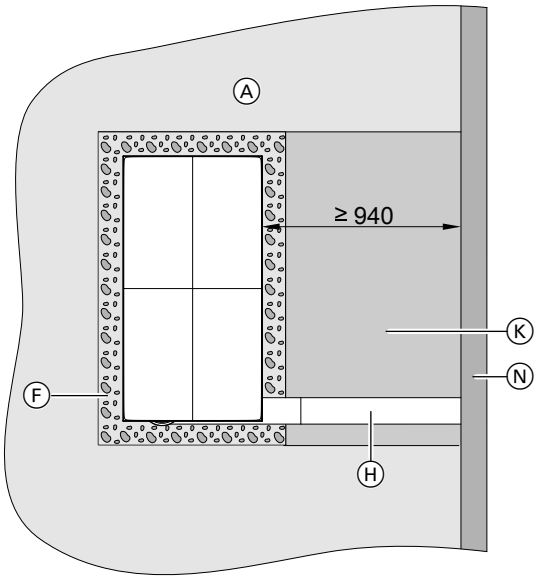


Fig. 20

Ⓐ Ground
Ⓕ For free drainage of condensate: Gravel bed as soakaway
Ⓗ Quattro connection line laid underground (accessories)
Ⓚ Flexible separating layer between the foundations and the wall
Ⓝ Wall

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Floorstanding installation (cont.)

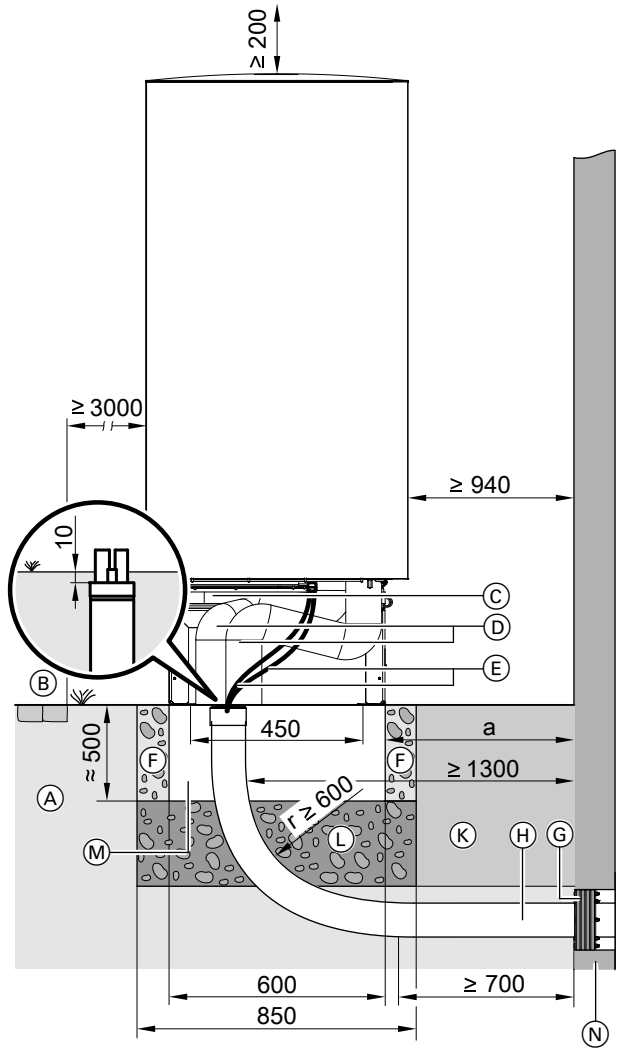


Fig. 21

Ⓐ Ground
Ⓑ Pathway, patio
Ⓒ Support for floorstanding installation (accessories)
Ⓓ Connection set, floorstanding installation (accessories)
Ⓔ Indoor/outdoor unit CAN bus communication cable and outdoor unit power cable:
Route the cables free of strain.
Ⓕ For free drainage of condensate: Gravel bed as soakaway
Ⓖ Ring seal (accessories)
Ⓗ Quattro connection line laid underground (accessories)
Ⓚ Flexible separating layer between the foundations and the wall
Ⓛ Frost protection for foundations (compacted crushed stone, e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations
Ⓜ Foundation strips
Ⓝ Wall
a Clearance between wall and foundation strip:
- Sizes 04 to 13: ≥ 940 mm
- Sizes 16 to 19: ≥ 980 mm

r Bending radius

Further installation instructions for the Quattro connection line
Separate installation instructions

Note
- *Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See table on page 27.*
- *Protect the pipework against damage. Avoid trip hazards.*

Line entry below ground level: Laying lines in a trench with a bend

Note
- *The following information for floorstanding installation applies to outdoor units with 1 or 2 fans. The outdoor unit with 2 fans is shown as an example.*
- *The following information applies to installation with a support and an anti-vibration base. Installation with a support is shown as an example.*

Floorstanding installation (cont.)

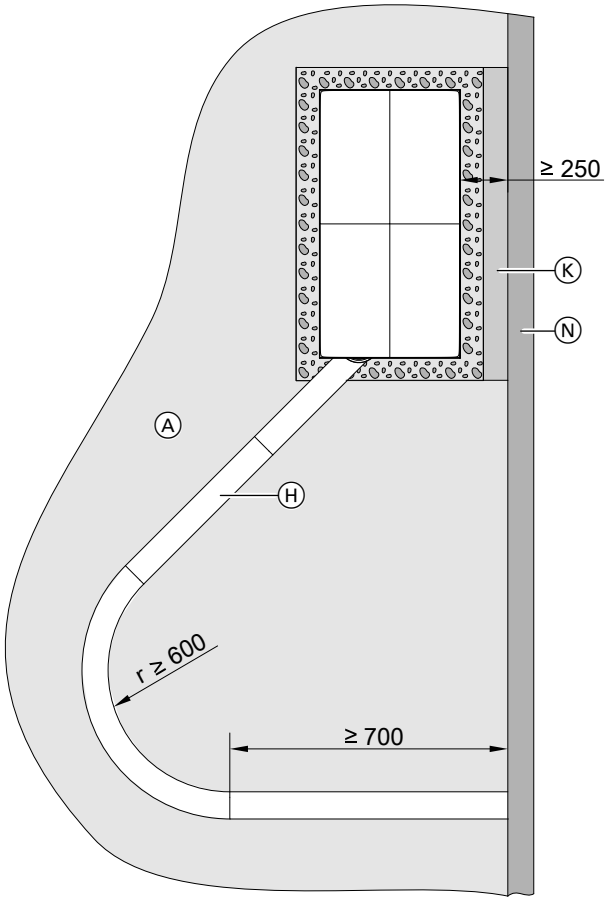


Fig. 22

Ⓐ Ground
Ⓗ Quattro connection line laid underground (accessories)
Ⓚ Flexible separating layer between the foundations and the wall
Ⓝ Wall
r Bending radius

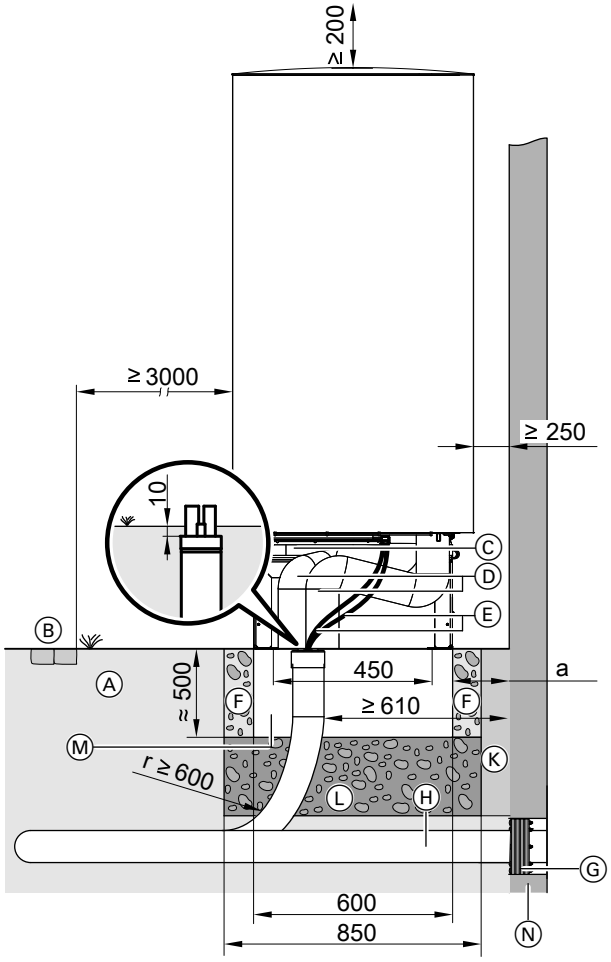


Fig. 23

Ⓐ Ground
Ⓑ Pathway, patio
Ⓒ Support for floorstanding installation (accessories)
Ⓓ Connection set, floorstanding installation (accessories)
Ⓔ Indoor/outdoor unit CAN bus communication cable and outdoor unit power cable:
Route the cables free of strain.
Ⓕ For free drainage of condensate: Gravel bed as soakaway
Ⓖ Ring seal (accessories)
Ⓗ Quattro connection line laid underground (accessories)
Ⓚ Flexible separating layer between the foundations and the wall
Ⓛ Frost protection for foundations (compacted crushed stone, e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations
Ⓜ Foundation strips
Ⓝ Wall
a Clearance between wall and foundation strip:
- Sizes 04 to 13: ≥ 250 mm
- Sizes 16 to 19: ≥ 290 mm

r Bending radius

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Floorstanding installation (cont.)

Further installation instructions for the Quattro connection line
Separate installation instructions

Note
- *Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See table on page 27.*
- *Protect the pipework against damage. Avoid trip hazards.*

Line entry above ground level

Note
- *The following information for floorstanding installation applies to outdoor units with 1 or 2 fans. The outdoor unit with 2 fans is shown as an example.*
- *The following information applies to installation with a support and an anti-vibration base. Installation with a support is shown as an example.*

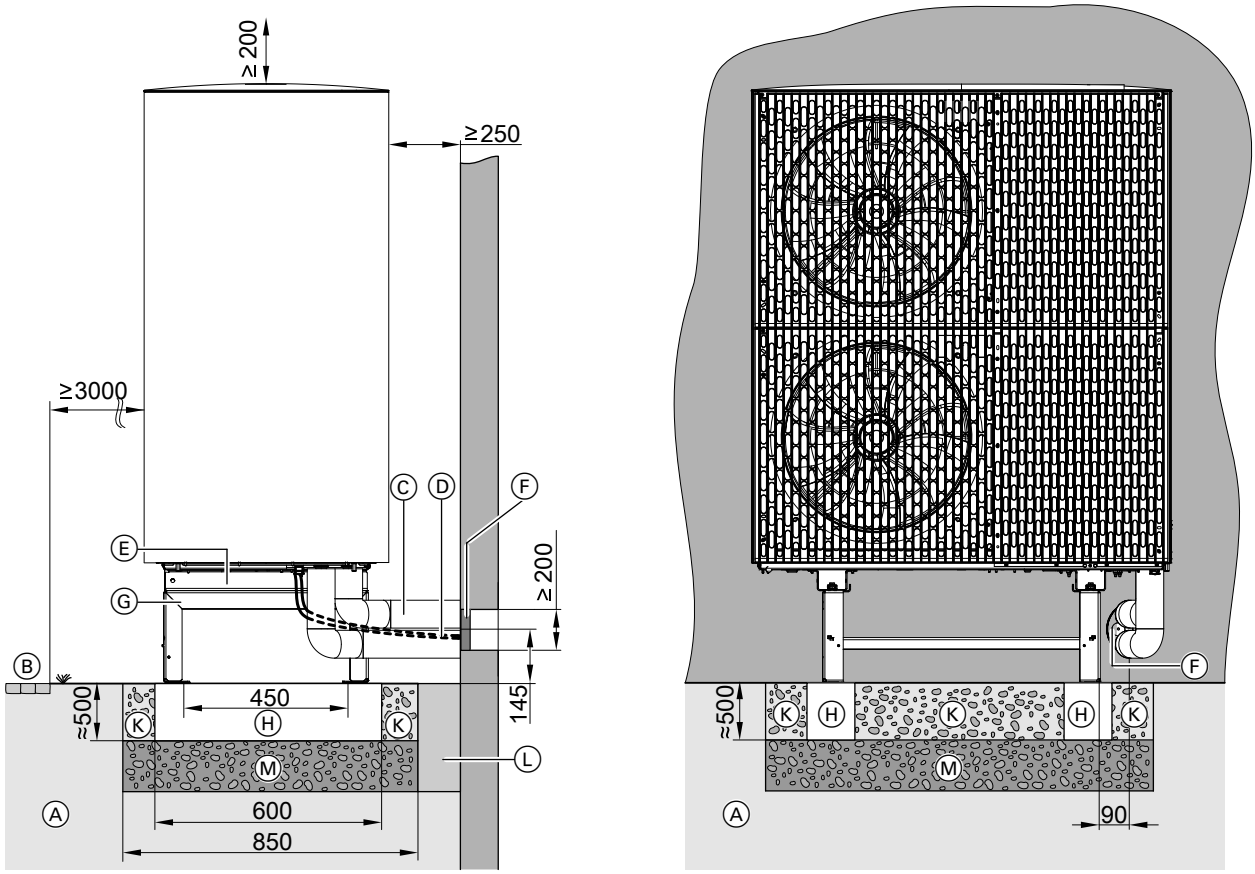


Fig. 24 Max. wall separation with design casing (accessories): 300 mm

Ⓐ Ground
Ⓑ Pathway, patio
Ⓒ Hydraulic connection lines, indoor/outdoor unit
Ⓓ Indoor/outdoor unit CAN bus communication cable and outdoor unit power cable:
Route the cables free of strain.
Ⓔ Condensate drain in the base plate:
Do not connect anything if the condensate can drain freely.
Ⓕ Wall outlet (accessories) for electrical cables and hydraulic lines
Ⓖ Support for floorstanding installation (accessories), illustration without design casing (accessories)
Ⓗ Foundation strips
Ⓚ For free drainage of condensate: Gravel bed as soakaway
Ⓛ Flexible separating layer between the foundations and the building
Ⓜ Frost protection for foundations (compacted crushed stone, e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations

Floorstanding installation (cont.)

Note
- *Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See table on page 27.*
- *Protect the pipework against damage. Avoid trip hazards.*

Wall mounting: Only permissible for sizes 04 to 13

Installation should **only** be performed with the bracket set for wall mounting (accessories).

Separate installation instructions for mounting bracket set for wall-mounting

Danger
Incorrect installation can lead to equipment damage and personal injury, e.g. if the outdoor unit falls down or falls over.
Only install the outdoor unit in accordance with the specifications in these instructions.

Installation with bracket set for wall mounting

Note
The following information for wall mounting applies to outdoor units with 1 or 2 fans. The outdoor unit with 2 fans is shown as an example.

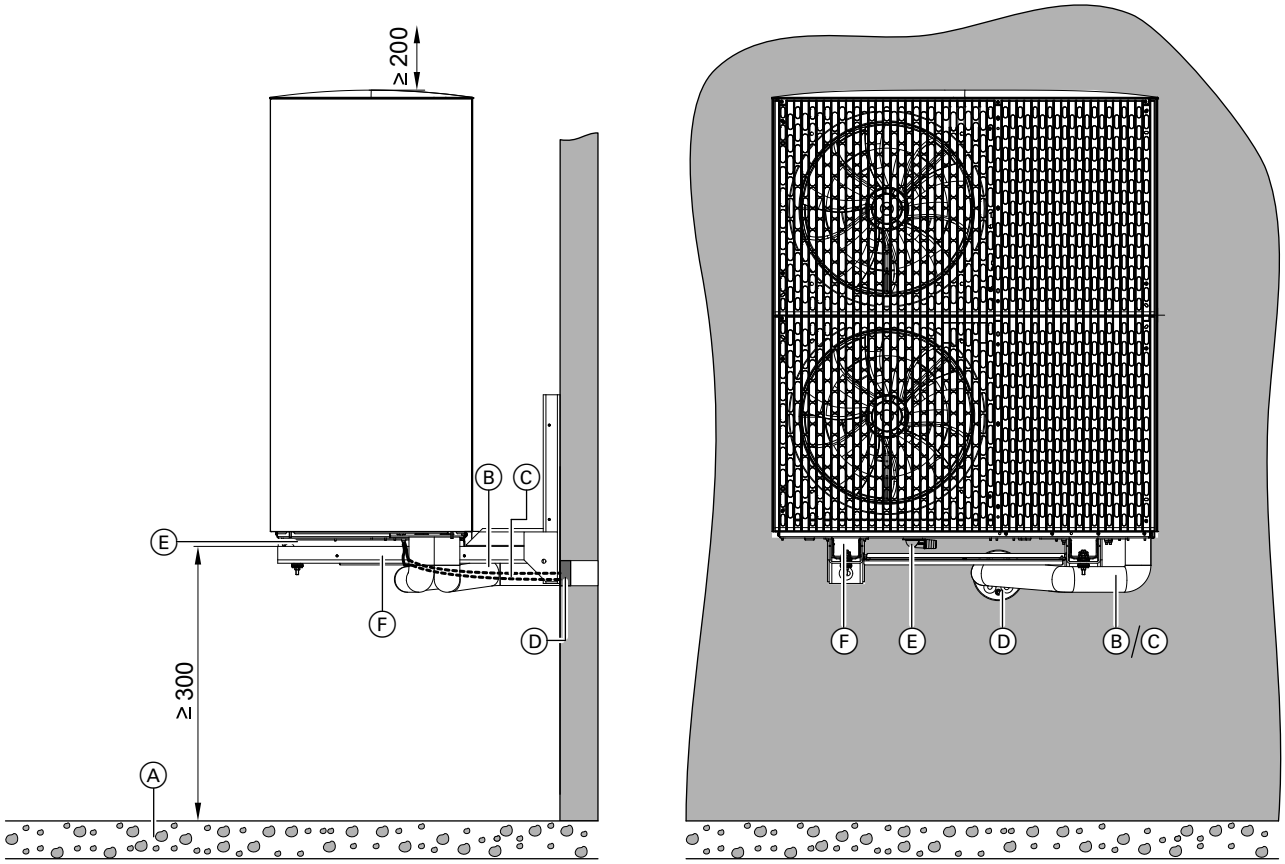


Fig. 25

Ⓐ Gravel bed as condensate soakaway
Ⓑ Connection set for wall mounting bracket (accessories)
Ⓒ Indoor/outdoor unit CAN bus communication cable and outdoor unit power cable:
Route the cables free of strain.
Ⓓ Wall outlet (accessories) for electrical cables and hydraulic lines

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Wall mounting: Only permissible for sizes 04… (cont.)

Ⓔ Condensate drain in the base plate:
Do not seal the opening.
Ⓕ Bracket for wall mounting (accessories), illustration without design casing (accessories)

Note

- *For the exact location of the drill holes for the wall mounting bracket and wall opening: Use the drilling template supplied with the wall mounting bracket.*
- *Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See table on page 27.*

Transporting the indoor unit

! **Please note**
Impacts, compression and tensile loads can cause damage to the outside panels of the appliance.
Never apply loads/weight to the top, front or side panels of the appliance.

Splitting the indoor unit

To facilitate handling in confined spaces, the hydraulic unit can be separated from the DHW cylinder.

Transporting the indoor unit (cont.)

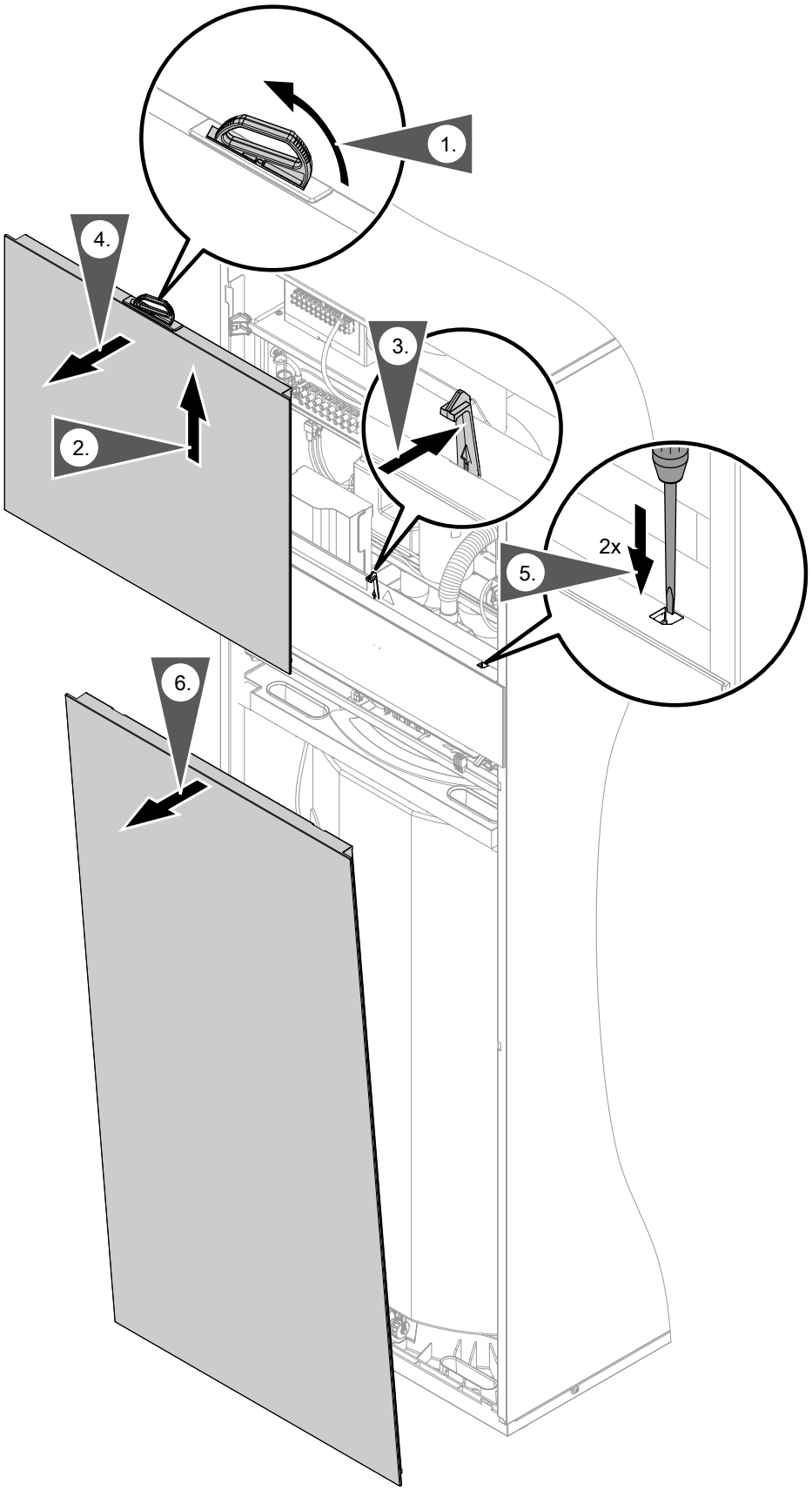


Fig. 26

Transporting the indoor unit (cont.)

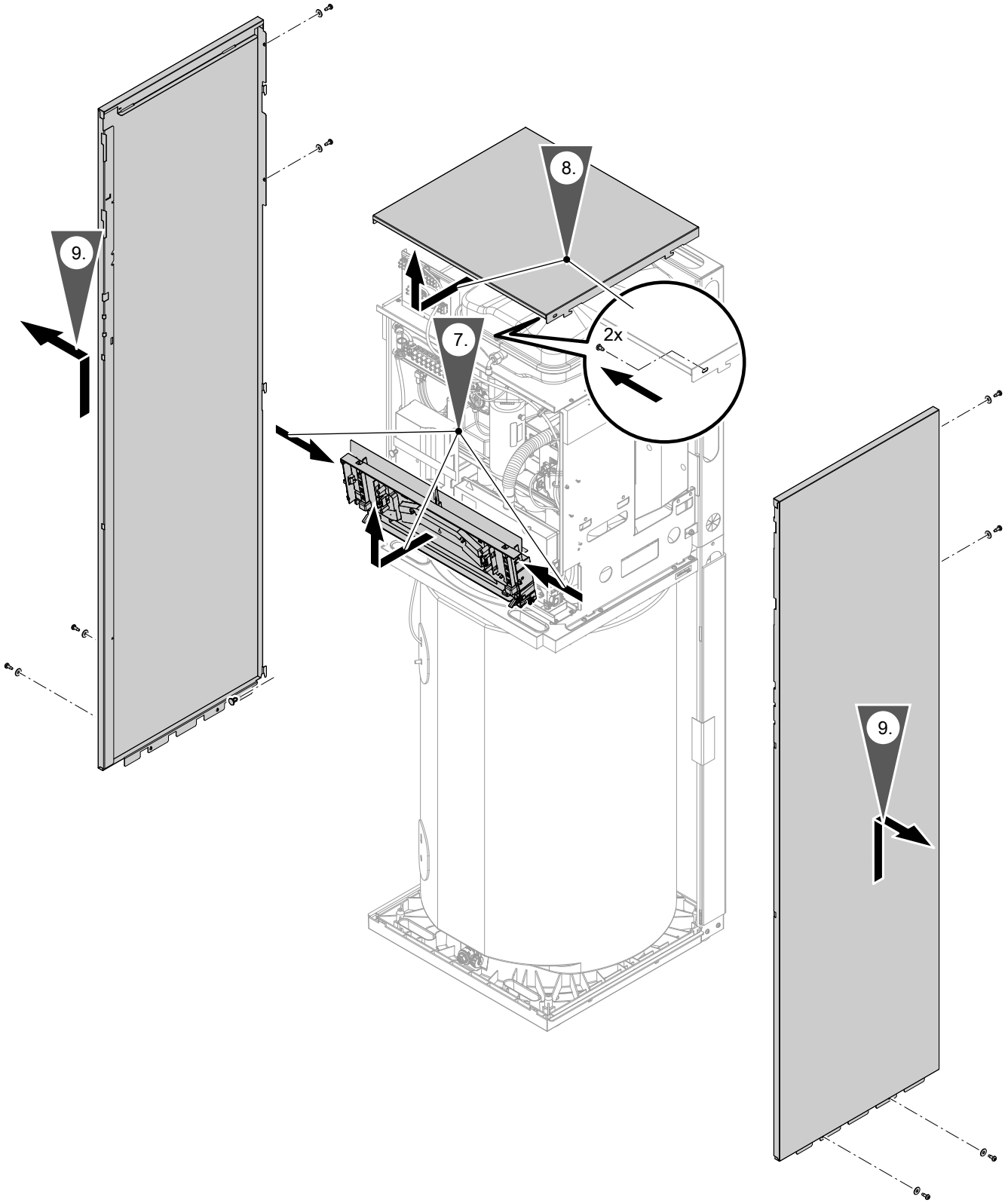


Fig. 27

Transporting the indoor unit (cont.)

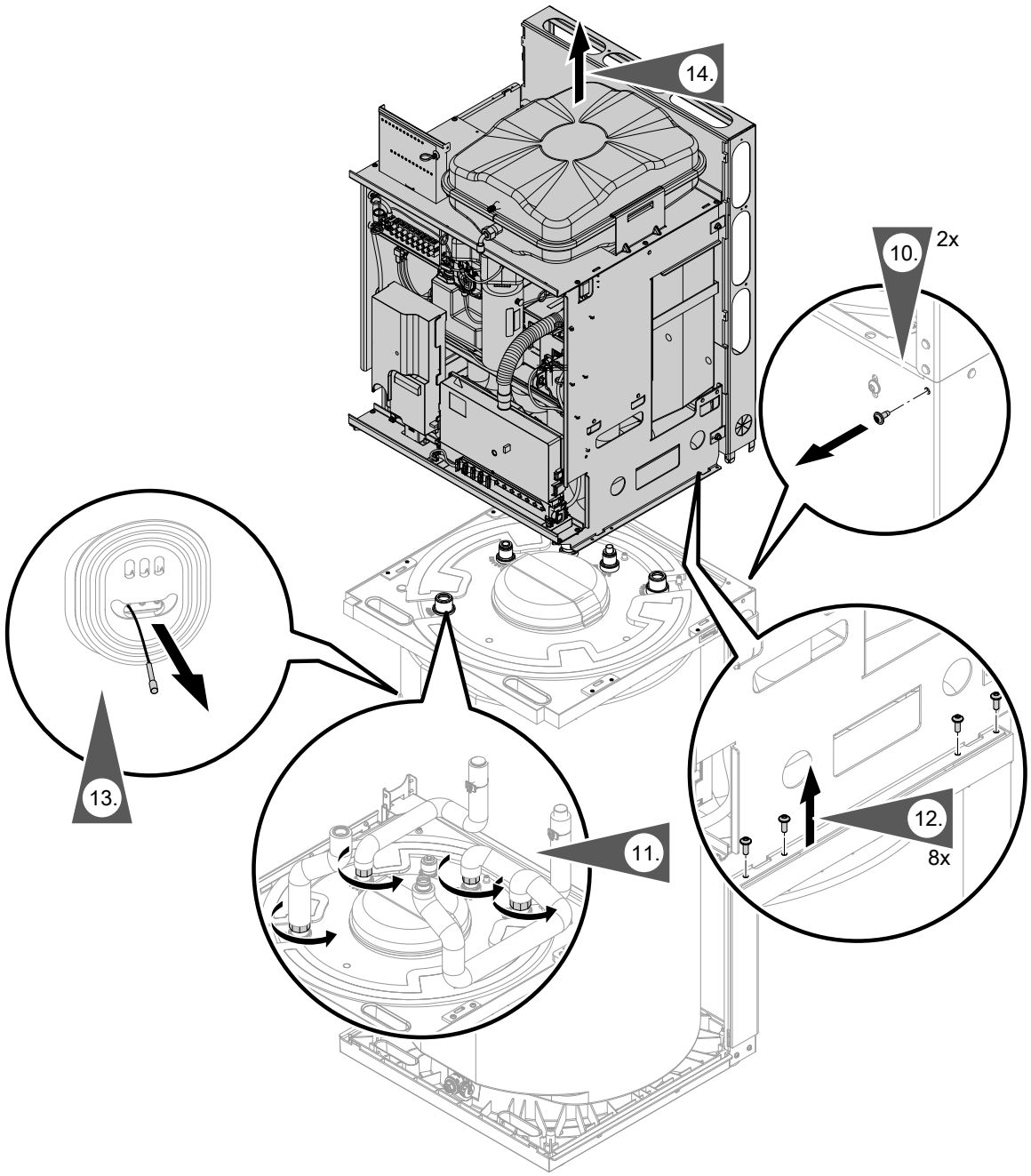


Fig. 28

Requirements for the installation room

⚠ **Danger**
Dust, gases and vapours can be damaging to health and trigger explosions.
Prevent dust, gases and vapours in the installation room.

! **Please note**
An unfavourable indoor environment can lead to malfunctions and appliance damage.
- The installation room must be dry and free from the risk of frost.
- Ensure ambient temperatures between 0 and 35 °C.
- Max. 70 % relative humidity (corresponding to an absolute humidity of approx. 25 g water vapour/kg of dry air at 35 °C)

Requirements for the installation room (cont.)

WiFi operational reliability and system requirements

The appliance is equipped with an integral WiFi communication module. This WiFi communication module supports maintenance and servicing via ViGuide as well as operation via the app.

WiFi router system requirement
- WiFi router with activated WiFi:
  The WiFi router must be protected by a sufficiently secure WPA2 password.
  Note
  - *The WPA2 password is a sequence of 8 to 63 characters.*
  - *Upper and lower case letters, numbers and special characters in ASCII are permitted.*

  The WiFi router must always have the latest firmware version via updates.
  Unencrypted connections between the WiFi router and the heat generator are not permitted.
- Internet connection with high availability:
  "Flat rate" (flat rate tariff without restriction on time or data volume)
- Set the WiFi frequency to 2.4 GHz.
- Dynamic IP addressing (DHCP, delivered condition) in the network (WiFi):
  Have this checked on site by an IT expert **prior** to commissioning. Arrange for setup if necessary.
- Set routing and security parameters in the IP network (LAN).
  Note
  Length of password and permitted special characters depend on the respective router.
  Enable the following ports for direct outgoing connections:
  - Port 80
  - Port 123
  - Port 443
  - Port 8883

  Have this checked on site by an IT expert **prior** to commissioning. Arrange for enabling if required.

Note
Alternatively, the connection from the heat pump control unit to the router can be established via LAN. The extension module LAN (accessories) is required for this.

Wireless signal range of WiFi connection

The range of wireless signals may be reduced by walls, ceilings and interior fixtures. The following circumstances will reduce the strength of the wireless signal and can disrupt reception:
- On their way between transmitter and receiver, wireless signals are **damped**, e.g. by air or when penetrating walls.
- Wireless signals are **reflected** by metallic objects, e.g. reinforcements embedded in walls, the metal foil in thermal insulation, and thermal glazing with metallised thermal vapour deposit.
- Wireless signals are **isolated** by service ducts and lift shafts.
- Wireless signals are **disrupted** by devices that also operate with high frequency signals. Distance to such appliances: **Min. 2 m**.
  Examples of devices with high frequency signals:
  - Computers
  - Audio and video systems
  - Devices with active WiFi connection
  - Electronic transformers
  - Time & temperature controllers

Install the heat generator as close as possible to the WiFi router to ensure a good WiFi connection. The signal strength can be displayed on the programming unit: See operating instructions.

Note
The WiFi signal strength can be increased with WiFi repeaters.

Angle of penetration

The reception quality remains best if wireless signals hit the walls vertically.
Depending on the angle of penetration, the effective wall thickness changes and so does the extent to which the electromagnetic waves are damped.

Requirements for the installation room (cont.)

Flat (unfavourable) angle of penetration

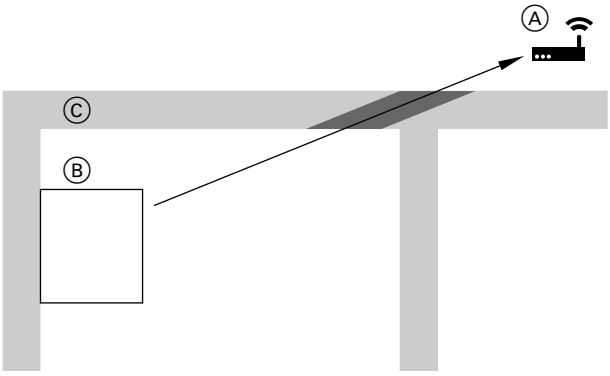


Fig. 29

Ⓐ WiFi router
Ⓑ Heat generator
Ⓒ Wall

Ideal angle of penetration

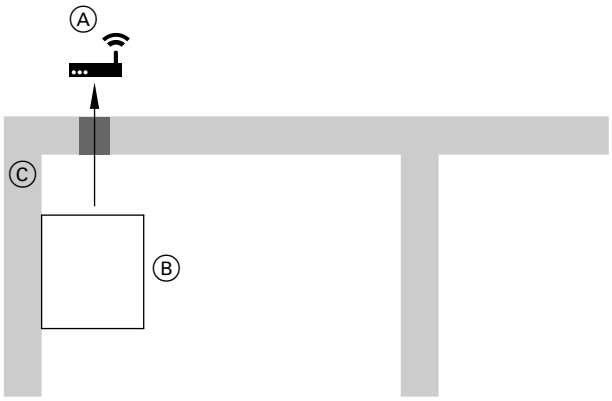


Fig. 30

Ⓐ WiFi router
Ⓑ Heat generator
Ⓒ Wall

Minimum clearances

Secondary circuit connections, left/top

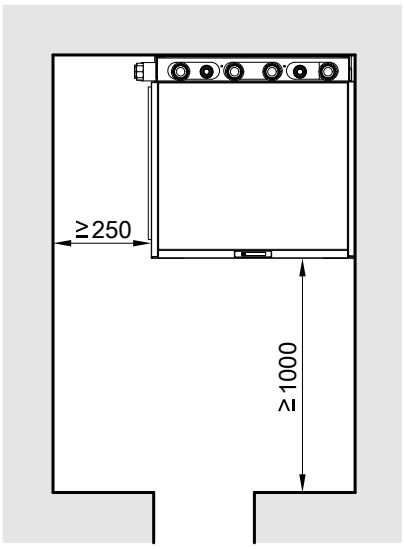


Fig. 31

Secondary circuit connections, right/top

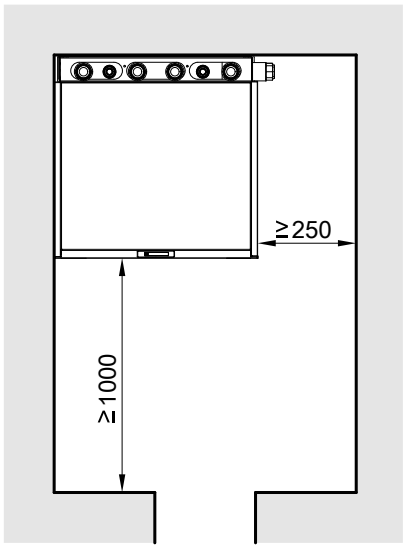


Fig. 32

Minimum room height

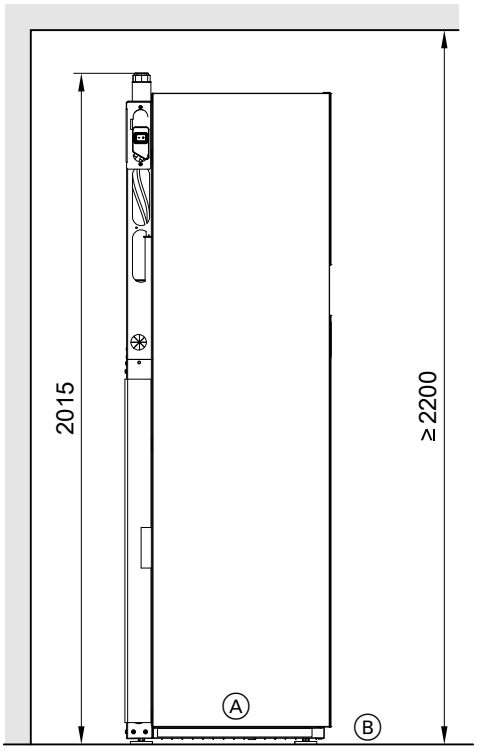


Fig. 33

Ⓐ Indoor unit with integral DHW cylinder
Ⓑ Finished floor level or top edge of platform for unfinished floors

Note
Remove the packaging upwards before positioning.

Pressure points

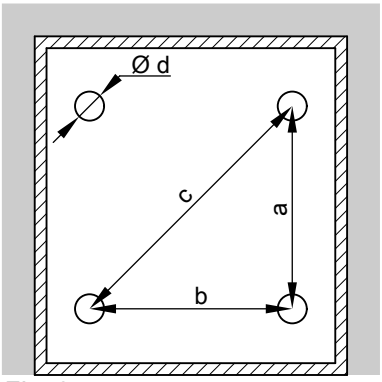


Fig. 34

a 478 mm
b 478 mm
c 677 mm
d 64 mm

Note
- *Observe the permissible floor load.*
- *Level the appliance horizontally.*
- *If the adjustable feet are used to compensate for an uneven floor (max. 10 mm), distribute the pressure load on the individual feet evenly.*

Pressure points (cont.)

- The total weight of the indoor unit with filled DHW cylinder and 1 integral heating/cooling circuit is 386 kg.
  Each pressure point (each with an area of 3217 mm^2) is subject to a load of up to 96.5 kg.
- The total weight of the indoor unit with filled DHW cylinder and 2 integral heating/cooling circuits is 426 kg.
  Each pressure point (each with an area of 3217 mm^2) is subject to a load of up to 109 kg.

Hydraulic connection of the outdoor unit

Opening the outdoor unit

Note
The following information for opening the outdoor unit applies to outdoor units with 1 or 2 fans. The outdoor unit with 2 fans is shown as an example.

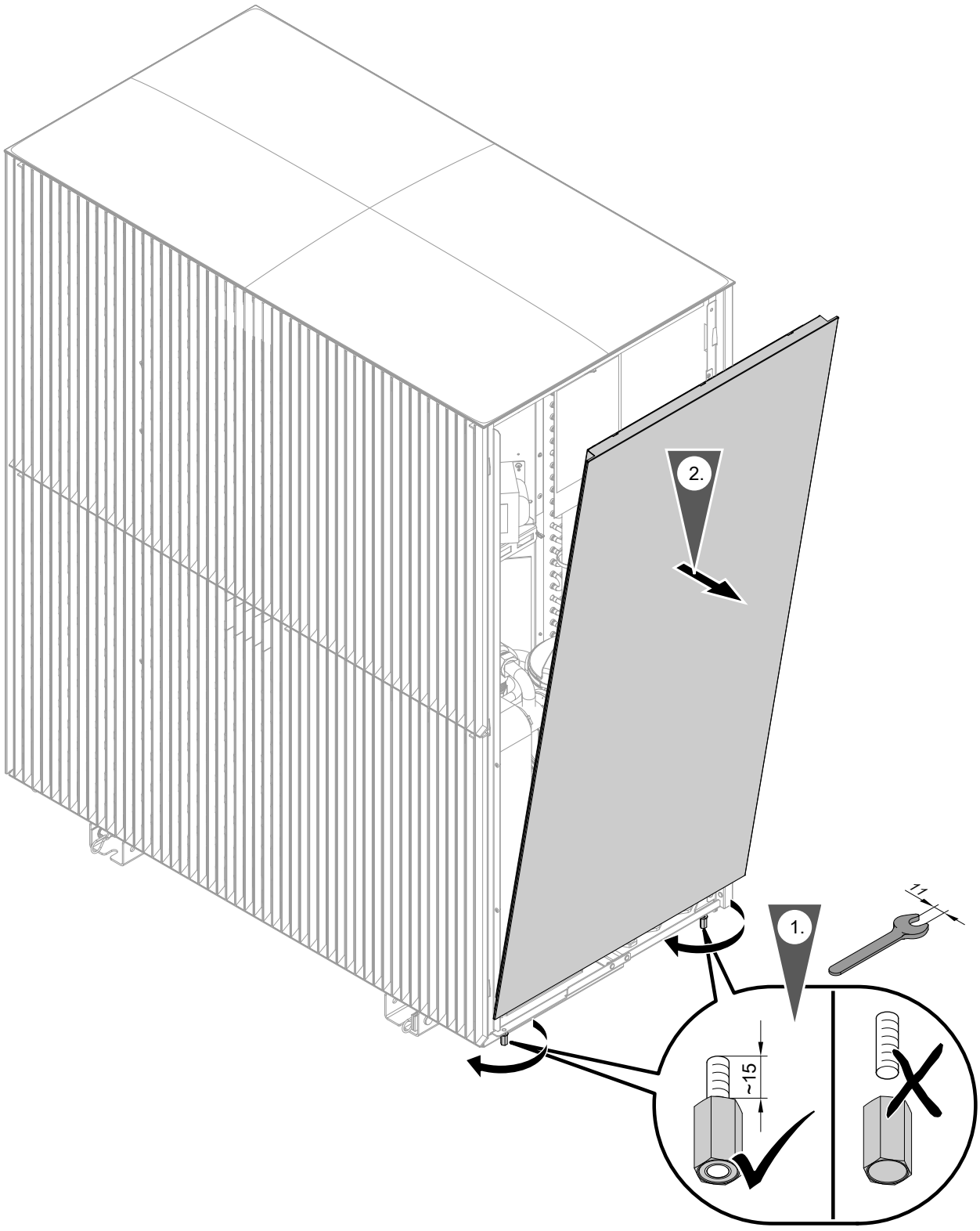


Fig. 35

3. Check visible components of the outdoor unit for transport and storage damage.

Hydraulic connection of the outdoor unit (cont.)

Connecting the hydraulic connection lines

Connect the connection lines of the hydraulic connection set (accessories) to the underside of the outdoor unit using either copper pipe or corrugated stainless steel pipe, dependent upon the connection set.

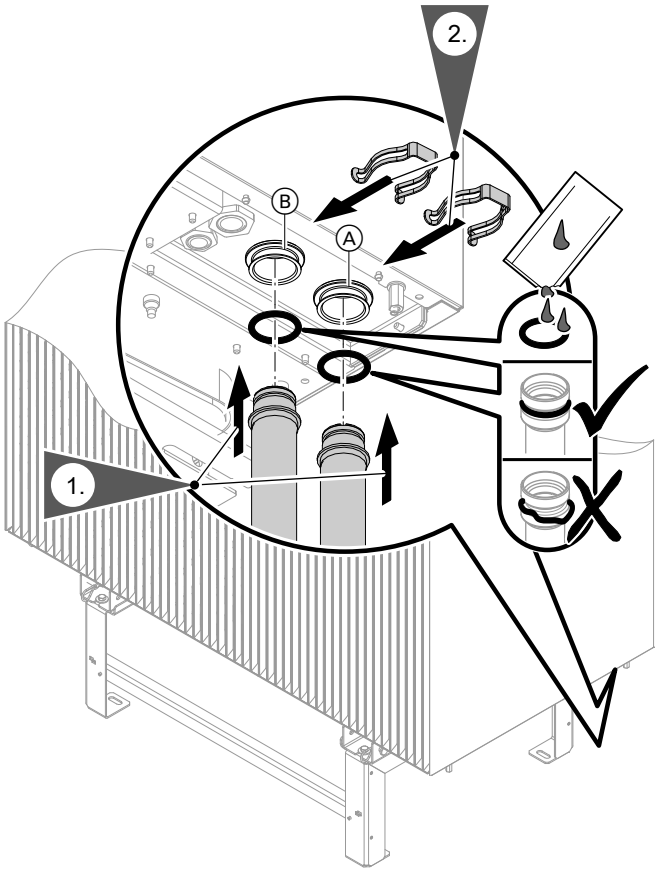


Fig. 36

Ⓐ Heating water **to** indoor unit (heating water outlet, flow from outdoor unit)
Ⓑ Heating water **from** indoor unit (heating water inlet, return to outdoor unit)

Requirements to be met by on-site lines

Requirements to be met, e.g. regarding cross-section, system pressure: See technical guides.

Installing the heating water filter

Install a heating water heater filter in the return to the outdoor unit in the following cases:
- Required when modernising the heating system
- Required when the pipe network is contaminated
- Recommended in new build

Note
Recommendation: Heating filter with magnetite separation (accessories), as the filter properties of this heating water filter are matched to the heat pump.

Checking the transport bracket

! **Please note**
Premature loosening of the transport bracket may cause damage to the outdoor unit.
Do not release the transport bracket until **after** the filling and venting process.

Hydraulic connection of the outdoor unit (cont.)

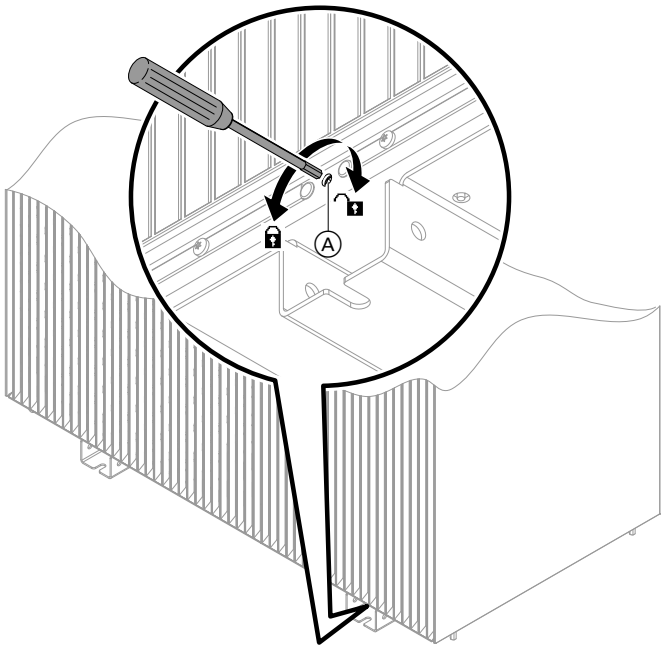


Fig. 37

Ⓐ Locking screw
🔒 Rotational direction for locking the transport bracket
🔓 Rotational direction for releasing the transport bracket

After positioning of the outdoor unit, check whether the transport bracket is completely secured with an Allen key (size 5).
Torque of the locking screw: Max. 4 Nm

Hydraulic connection of the indoor unit

Requirements for on-site connections

Observe the following requirements:
- Components reflect current technology.
- Components are approved for sealed unvented heating systems with operating pressures up to 3 bar.
- Observe the manufacturer's instructions on installation.

Equip the heating system on site with an expansion vessel in the heating return, built in accordance with EN 13831 and approved in accordance with 2014/68/EU.

Note
With underfloor heating circuits, always install a temperature limiter to restrict the maximum temperature of the underfloor heating.

Preparing the connections on the DHW side

For connecting the DHW side, observe EN 806, DIN 1988, DIN 4753, TrinkwV Drinking Water Ordinance [Germany] and DVGW (CH: SVGW regulations). Observe other country-specific standards as applicable.

Hydraulic connection of the indoor unit (cont.)

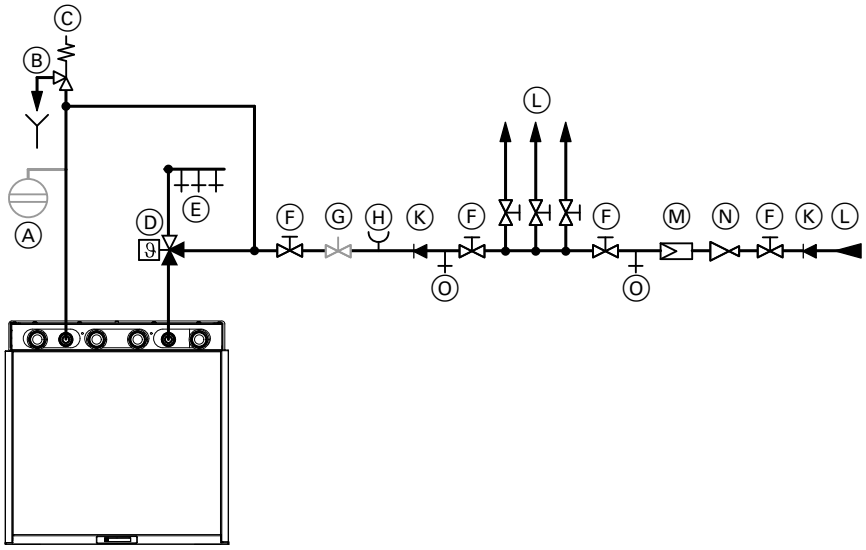


Fig. 38

Ⓐ Expansion vessel, suitable for drinking water
Ⓑ Visible discharge pipe outlet point
Ⓒ Safety valve
Ⓓ Automatic thermostatic mixing valve
Ⓔ DHW
Ⓕ Shut-off valve
Ⓖ Flow regulating valve
Ⓗ Pressure gauge connection
Ⓚ Non-return valve/pipe separator
Ⓛ Cold water
Ⓜ Drinking water filter
Ⓝ Pressure reducer to DIN 1988-200:2012-05
Ⓞ Drain valve

Safety valve

The DHW cylinder **must** have a safety valve to protect against unduly high pressure.
Recommendation: Install safety valve above top edge of cylinder. This means the DHW cylinder will not need to be drained when working on the safety valve.
CH: According to W3 "Principles for creating potable water installations", safety valves must be drained directly via a visible unrestricted drain or via a short outlet line to the drain network.

Drinking water filter

According to DIN 1988-2, a drinking water filter must be installed in systems with metal pipework. Viessmann also recommends the installation of a drinking water filter when using plastic pipes to DIN 1988 to prevent contaminants entering the DHW system.

Automatic thermostatic mixing valve

With appliances that heat DHW to temperatures above 60 °C, an automatic thermostatic mixing valve must be installed in the DHW line as protection against scalding.
This also particularly applies when connecting solar thermal systems.

Preparing the hydraulic connections

Comply with the following requirements on site:
- Components reflect current technology.
- Components are approved in sealed unvented heating systems with operating pressures up to 3 bar.
- Comply with manufacturer's instructions on installation.

Hydraulic connection of the indoor unit (cont.)

Note
*So that the system can be filled and flushed via the commissioning assistant, fit a **3-way ball valve** into each of the following lines:*
- *Flow and return lines for heating/cooling circuit 1/ external buffer cylinder and heating/cooling circuit 2 (if present)*
- *Flow and return lines to the outdoor unit*

If required, install 1 shut-off valve in each flow and return line to the DHW cylinder.

Installing the hydraulic connection set (accessories)

"Hydraulic connection set" installation instructions

Grease with valve grease (supplied).

Note
The following diagram shows an example of the hydraulic connection set for surface mounting with upward connection.

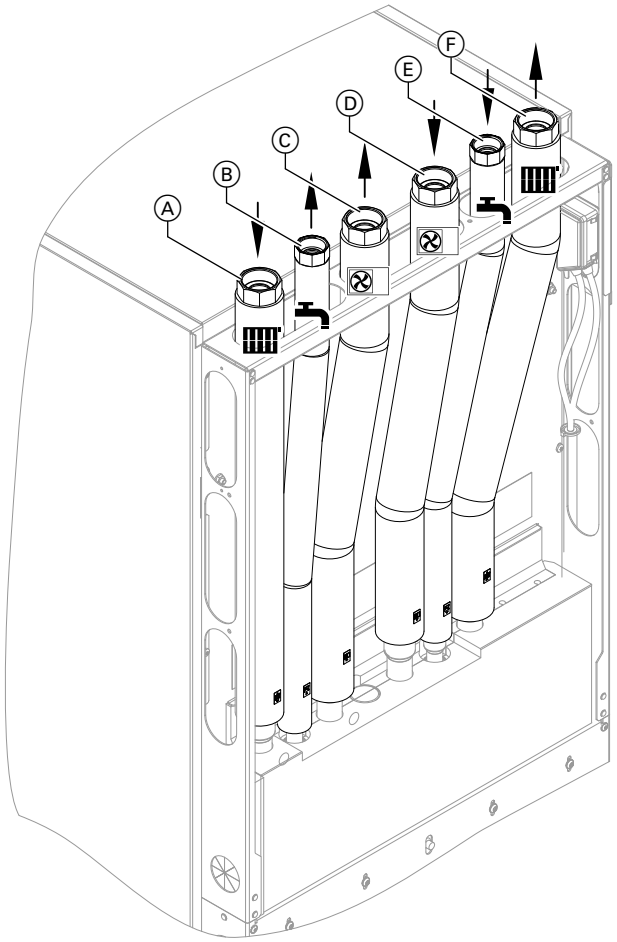


Fig. 39

Ⓐ Heating water return, heating/cooling circuit 1: G 1¼ (female thread)
Ⓑ DHW: G ¾ (female thread)
Ⓒ Heating water **to** outdoor unit: G 1¼ (female thread)
Ⓓ Heating water **from** outdoor unit: G 1¼ (female thread)
Ⓔ Cold water: G ¾ (female thread)
Ⓕ Heating water flow, heating/cooling circuit 1: G 1¼ (female thread)

Hydraulic connections

1. If the expansion vessel fitted in the indoor unit is insufficient, equip the secondary circuit on site with an additional expansion vessel.

2. Connect all secondary side hydraulic lines (room heating/cooling, DHW heating) to the indoor unit.

   Please note
   Hydraulic connections subjected to mechanical loads lead to leaks, vibrations and appliance damage.
   Connect on-site lines so that they are free of load and torque stress.

   Note
   Recommendation: Install a suitable heating water filter in the secondary circuit, e.g. the Dirtstop XL heating filter (accessories), to remove magnetic and non-magnetic dirt particles.

   Please note
   Contamination in the secondary circuit will lead to blockage of the heating water filter in the outdoor unit.
   Before making the hydraulic connection of the indoor and outdoor unit, thoroughly flush the secondary circuit.

3. Grease and connect the hydraulic connection lines to the outdoor unit at the indoor unit.

4. Recommendation: Check for leaks with nitrogen.

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Hydraulic connection of the indoor unit (cont.)

5. **Please note**
Leaking hydraulic lines and joints will cause damage to the system or to the building.
Do not thermally insulate joints until after completion of the leak test following filling: See chapter "Building up the system pressure".

Ensure pipework inside the building is fitted with sufficiently thick thermal insulation in accordance with the Buildings Energy Act (GEG). If room cooling is planned for the building, use thermal and vapour diffusion-proof insulation.

Pipework internal ∅	Min. thickness of thermal insulation layer with λ = 0.035 W/(m·K)
≤ 22 mm	20 mm
> 22 mm	30 mm

λ Thermal conductivity

6. Connect the drain hose from the safety valve to the waste water system with a fall and an atmospheric pipe vent in accordance with EN 12828, e.g. via a drain outlet or waste water inlet.
- Terminate the drain hose outlet point 20 to 40 mm above the waste water inlet.
- Ensure there is a maximum of 2 bends in the drain hose.
- Do not reduce the hose cross-section.
- Min. waste water pipe cross-section: Twice the drain pipe cross-section

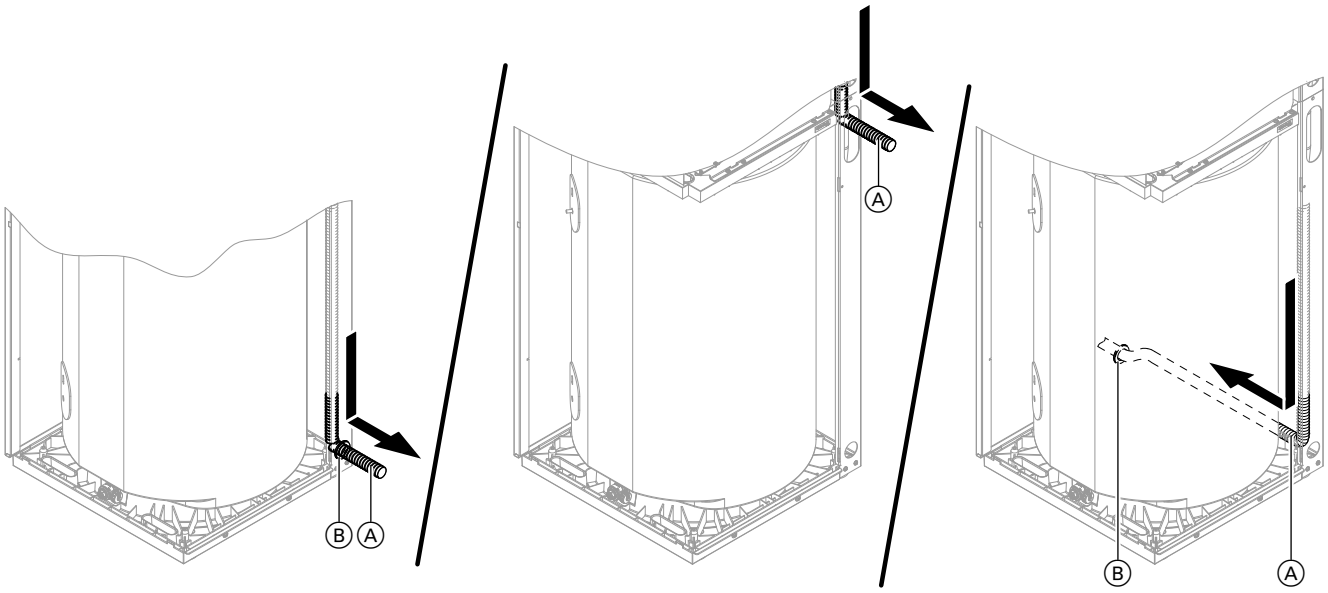


Fig. 40

Ⓐ Drain hose
Ⓑ Feedthrough for drain hose

To install the drain hose, remove the side panel: See page 46.

Temperature limiter

With underfloor heating circuits, install a temperature limiter to restrict the maximum temperature in the flow of underfloor heating systems.
This temperature limiter is triggered as soon as the flow temperature exceeds the set value.

Once the temperature limiter has been triggered, the room heating ceases in the particular heating/cooling circuit.

Hydraulic connection of the indoor unit (cont.)

Contact humidistat

For area cooling systems (e.g. underfloor heating circuit, chilled ceiling), a contact humidistat (accessories) is required.

- Installation inside the room to be cooled in the cooling water flow: Remove thermal insulation if necessary.
- If several rooms with different relative humidity levels are part of the cooling circuit, fit and connect several contact humidistats in series:
  Design the switching contacts as N/C contacts.

Systems without external buffer cylinder

Connect the 24 V⎓ contact humidistat for heating/cooling circuit 1: See "Electrical connection of the indoor unit".

Systems with external buffer cylinder

For each of the heating/cooling circuits 1 to 4, connect 1 230 V~ contact humidistat.
The connection is made to the respective mixer extension kit of the heating/cooling circuit (ADIO electronics module).

Note
Cooling is not possible in systems with a heating water buffer cylinder with integral DHW heating.

Operation without outdoor unit

The indoor unit can be operated without the outdoor unit, e.g. for screed drying. In this instance, room heating runs via the integrated instantaneous heating water heater.
The two connections **from** and **to** the outdoor unit are hydraulically connected for this purpose. It is essential to install an air vent valve and a non-return valve in this connection line: See the following illustration.

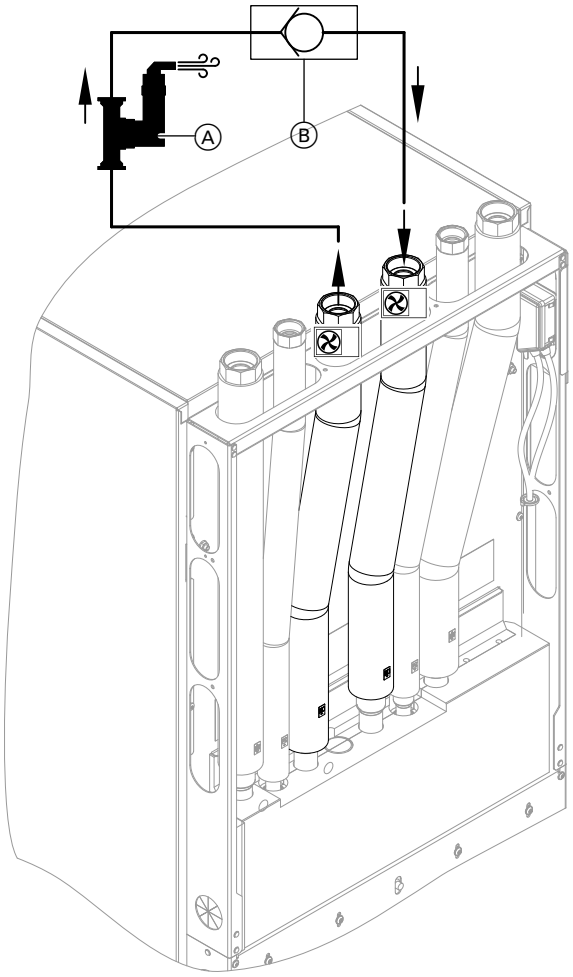


Fig. 41

Ⓐ Air vent valve
Ⓑ Non-return valve

Hydraulic connection of the indoor unit (cont.)

Aligning the indoor unit

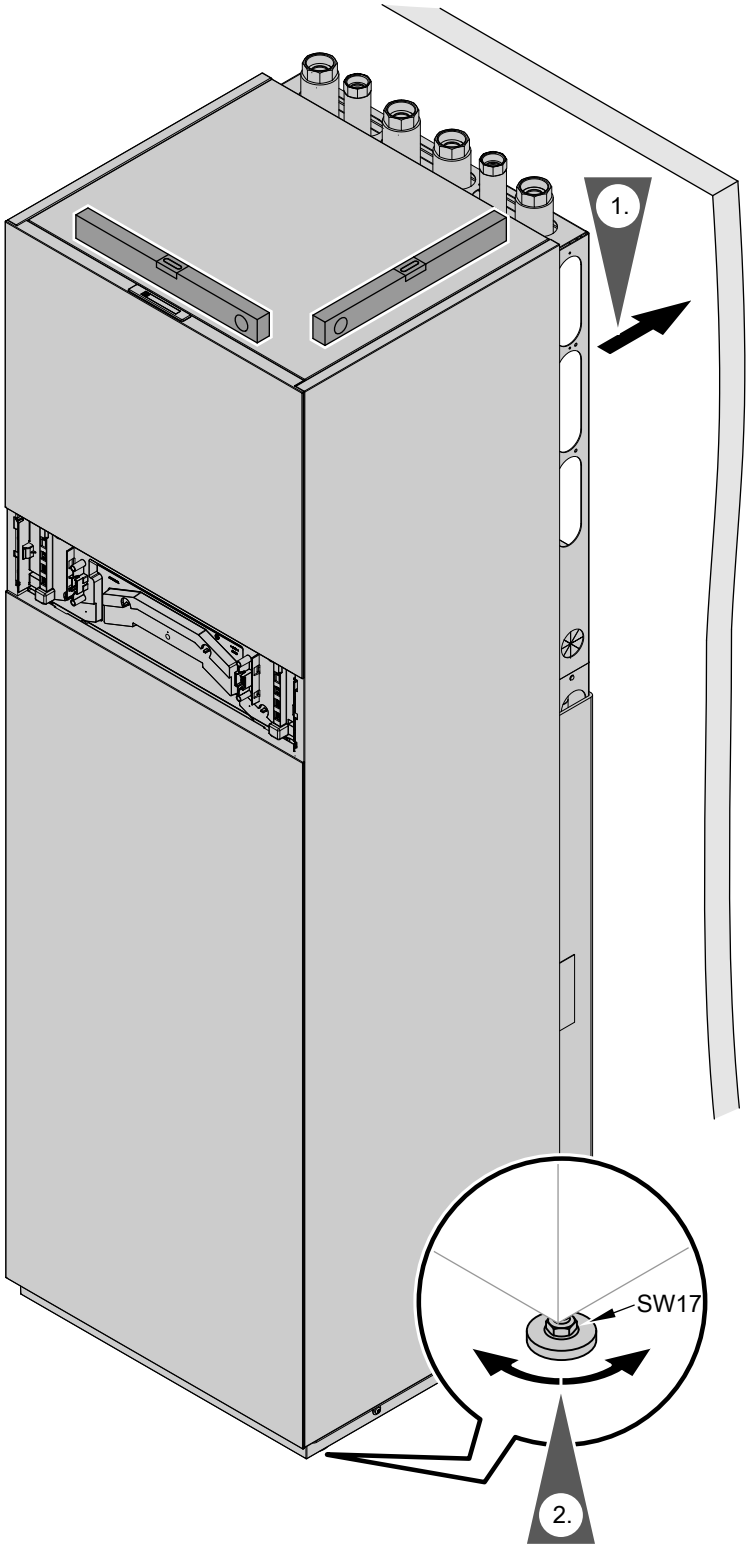


Fig. 42

Preparing the electrical connections

Cables
- For cable lengths and cable cross-sections: See the following tables.
- For accessories:
  Cables with the required number of cores for external connections.
  Prepare an on-site distribution box.

Cable lengths in the indoor unit

Connection cables	Cable lengths in the indoor unit
▪ 230 V~, e.g. for circulation pumps ***Note*** *Route the cables to the HPMU electronics module so they are flexible.*	1.3 m
▪ < 42 V, e.g. for sensors	1.3 m

Recommended power cables

Indoor unit

Power supply		Cable	Max. cable length
230 V~ control unit/PCB		3 x 1.5 mm²	50 m
Grid-Lock/power-OFF		3 x 1.5 mm²	50 m
Instantaneous heating water heater			
400 V~ 3-phase	▪ 2-stage	5 x 2.5 mm²	25 m
	▪ 3-stage	5 x 2.5 mm²	25 m
230 V~ 1-phase	▪ 1-stage	3 x 2.5 mm²	25 m
	▪ 2-stage in the three-phase network	5 x 2.5 mm²	25 m
	▪ 2-stage in the 1-phase network	7 x 2.5 mm²	25 m
	▪ 3-stage	7 x 2.5 mm²	25 m

Heat pumps with central mains connection

Power supply	Cable	Max. cable length
Indoor unit 230 V~	3 x 6.0 mm²	30 m

Outdoor units

Power supply	Cable	Max. cable length
Outdoor unit 230 V~	3 x 2.5 mm²	20 m
	Or	
	3 x 4.0 mm²	32 m
Outdoor unit 400 V~	5 x 2.5 mm²	30 m

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Electrical connection of the indoor unit

Indoor unit: Removing the front panels

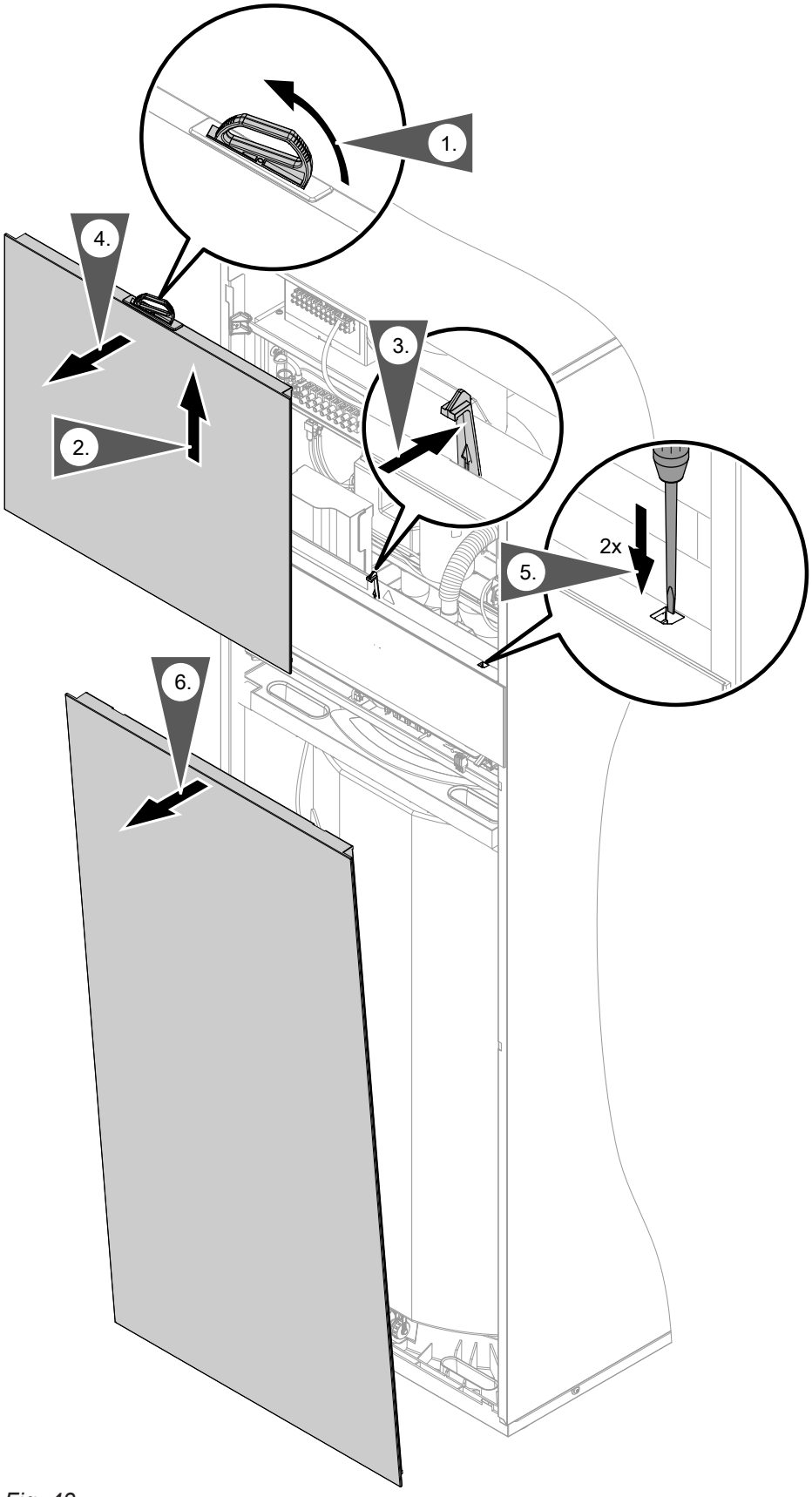


Fig. 43

Electrical connection of the indoor unit (cont.)

Relocating the ON/OFF switch

Depending on the installation situation, the ON/OFF switch can be installed either on the right or the left side of the indoor unit. The ON/OFF switch is factory-fitted on the left side of the appliance.

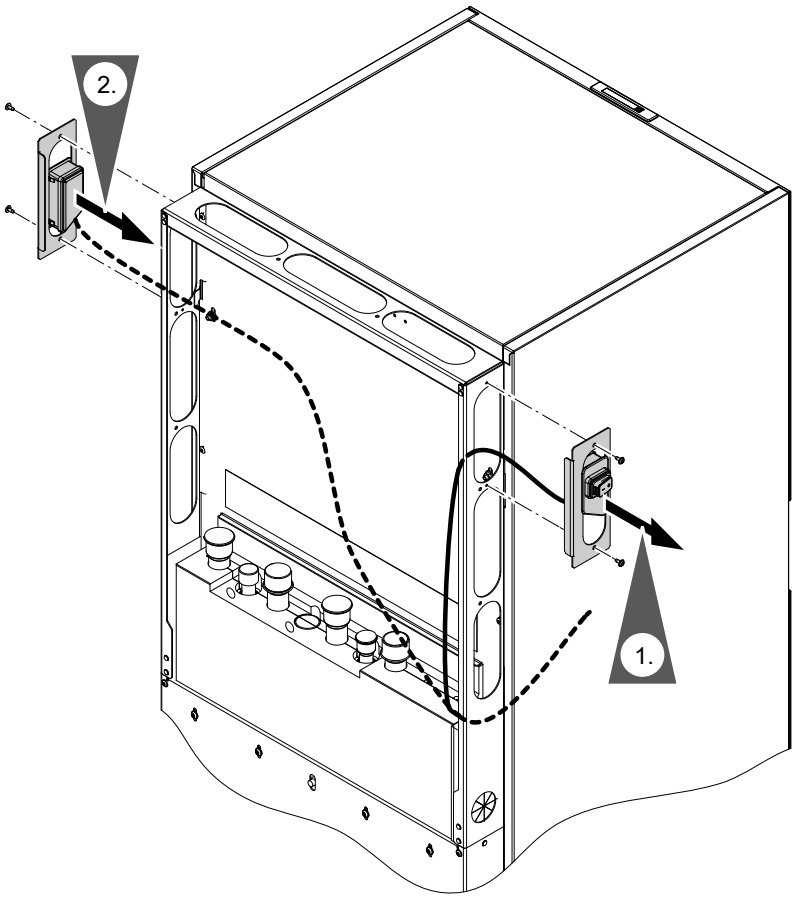


Fig. 44

Open the electrical wiring chamber of the HPMU. Disconnect and remove the cable of the ON/OFF switch: See chapter "Electrical connections".

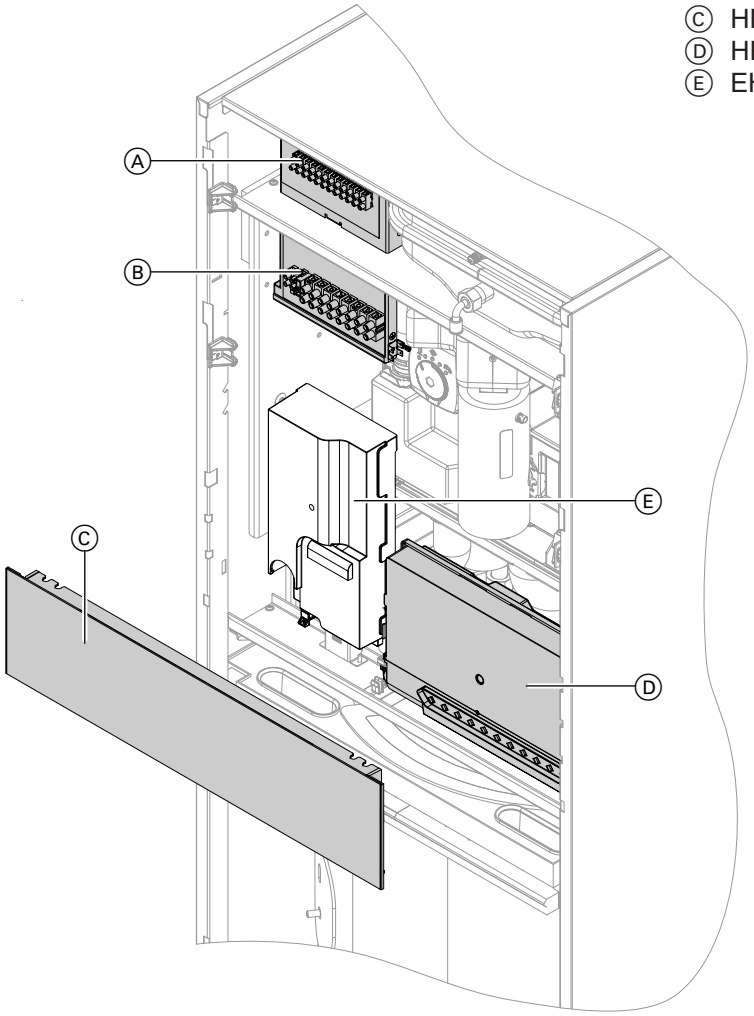
1. Remove the retainer with the ON/OFF switch. Pull out the ON/OFF switch with its cable.

2. Insert and fit the retainer with the ON/OFF switch into the required opening. Reconnect the cable in the HPMU wiring chamber and apply strain relief.

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Electrical connection of the indoor unit (cont.)

Overview of electrical terminal areas



Ⓒ HMI programming unit
Ⓓ HPMU electronics module
Ⓔ EHCU electronics module

Fig. 45

Ⓐ Terminal area for extra low voltage (ELV) < 42 V (upper PCB)
Ⓑ 230 V~/400 V~ terminal area (lower PCB)

Opening electrical terminal areas

! **Please note**
Electronic assemblies can be damaged by electrostatic discharge.
Before beginning work, touch earthed objects, e.g. heating or water pipes, to discharge any static.

Electrical connection of the indoor unit (cont.)

Removing the programming unit bracket

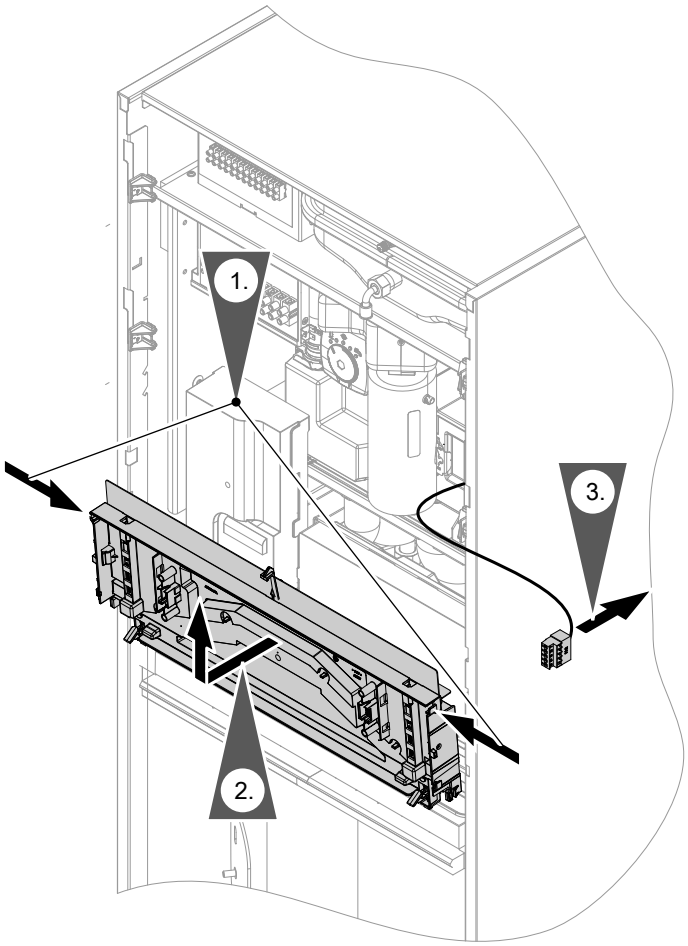


Fig. 46

Electrical connection of the indoor unit (cont.)

Moving the bracket to the maintenance position

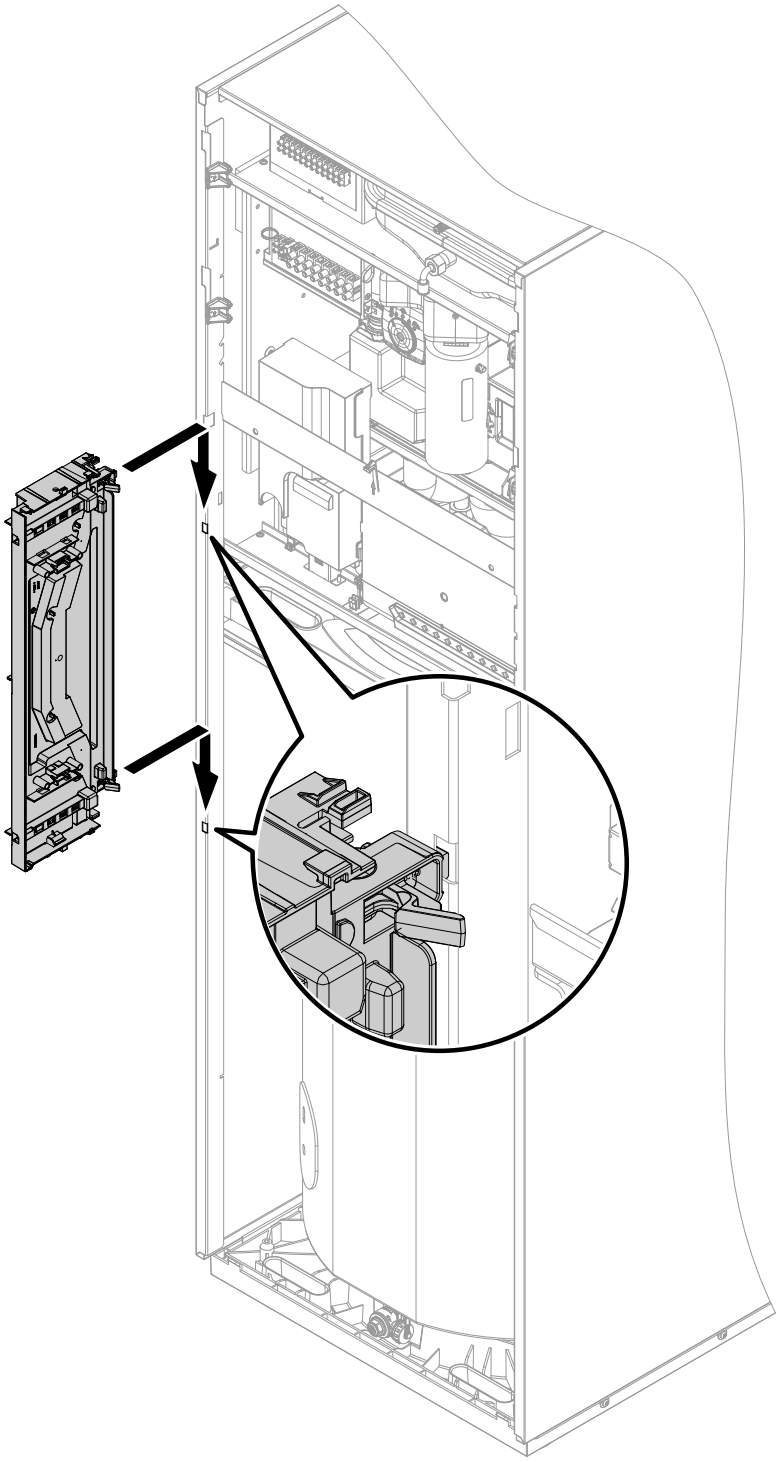


Fig. 47

Electrical connection of the indoor unit (cont.)

Opening the HPMU electronics module

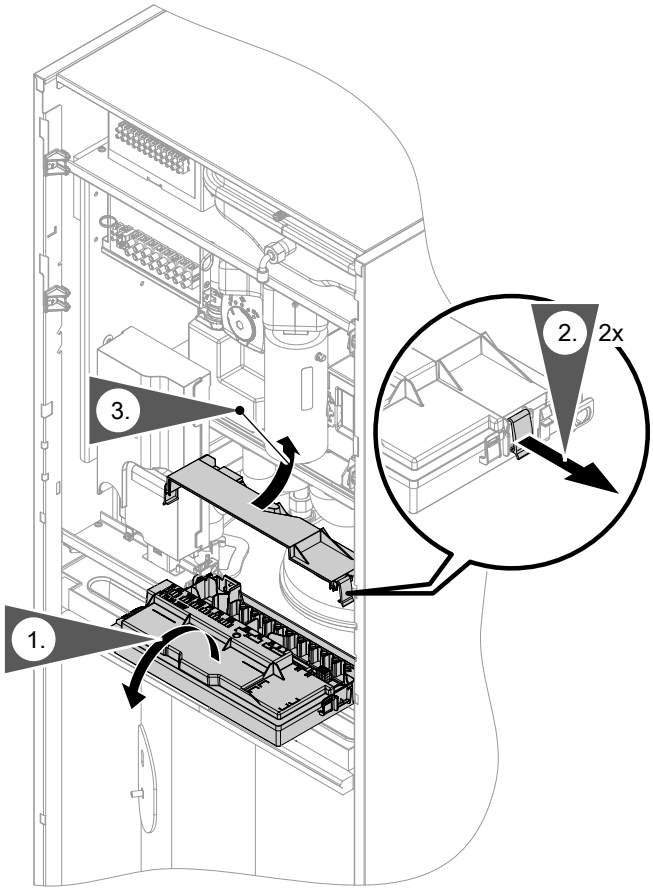


Fig. 48

Indoor unit: Routing cables to the terminal area

Danger
Damaged cable insulation can lead to serious injury from electric shock and result in appliance damage.
Route cables so that they cannot touch very hot, vibrating or sharp-edged components.

Danger
Incorrect wiring can lead to serious injury from electrical current and result in appliance damage.
Take the following measures to prevent wires drifting into the adjacent voltage area:
- Route extra low voltage (ELV) leads < 42 V separately from cables > 42 V/230 V~/400 V~. Secure with cable ties.
- Strip as little of the insulation as possible, directly before the terminals. Bundle the cables close to the corresponding terminals.
- If 2 components are connected to the same terminal, press both cores together in a **single** wire ferrule.

Please note
Openly routed cables can be damaged by vibration.
Fasten all cables inserted into the appliance, along with the existing cable harness, with cable ties.

Electrical connection of the indoor unit (cont.)

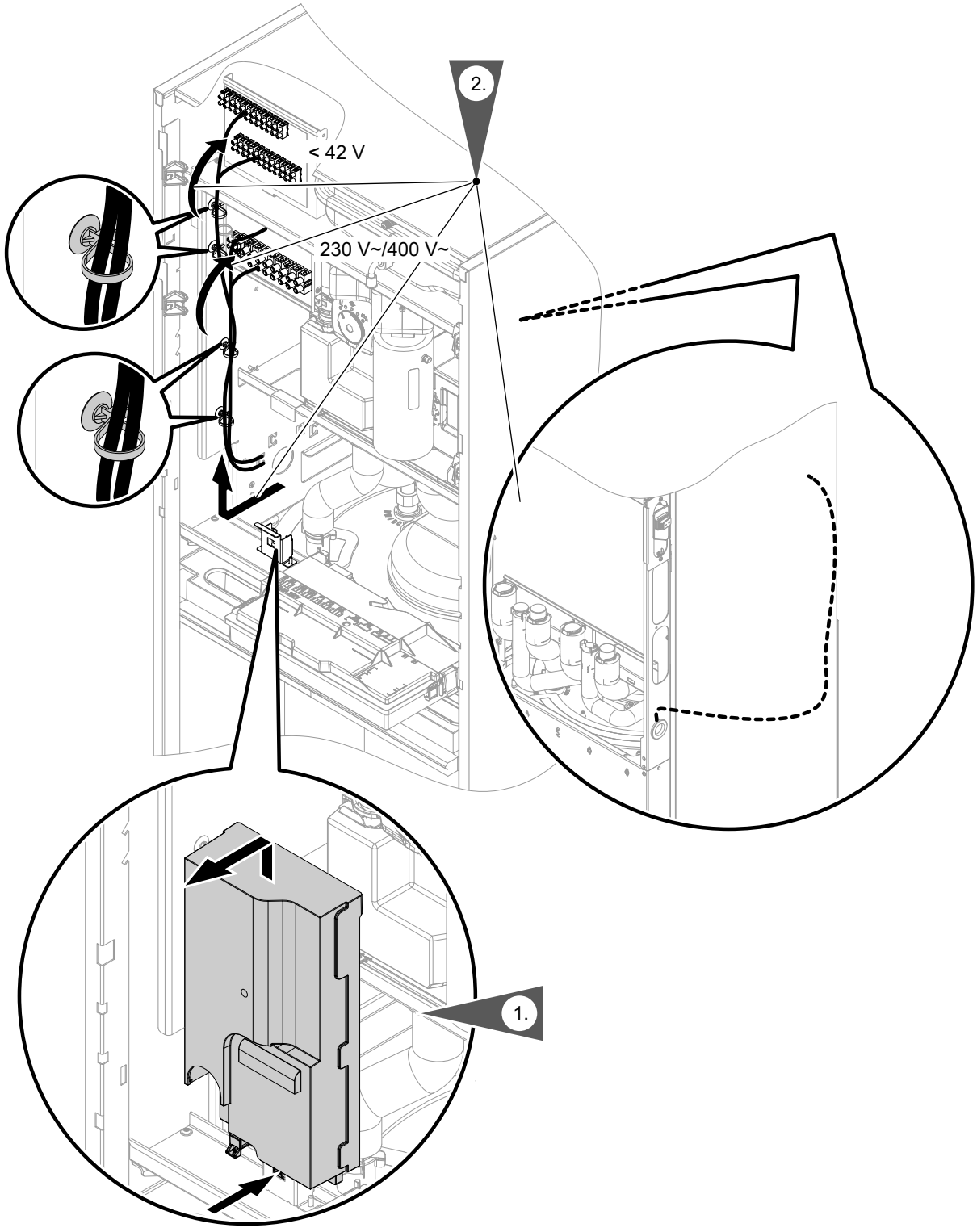


Fig. 49

Electrical connection of the indoor unit (cont.)

Notes regarding the connection values

- The specified output is the recommended connected load.
- The total output of all components connected directly to the electronics control module (e.g. pumps, valves, message facilities, contactors): **Max.** 1000 W
  If the total output is < 1000 W, the individual rating of a component (e.g. pump, valve, message facility, contactor) can be greater than specified. However, the breaking capacity of the relevant relay must not be exceeded.
- The specified current indicates the max. switching current of the switching contact. Observe total current of 5 A.

Terminal area, extra low voltage (ELV) < 42 V

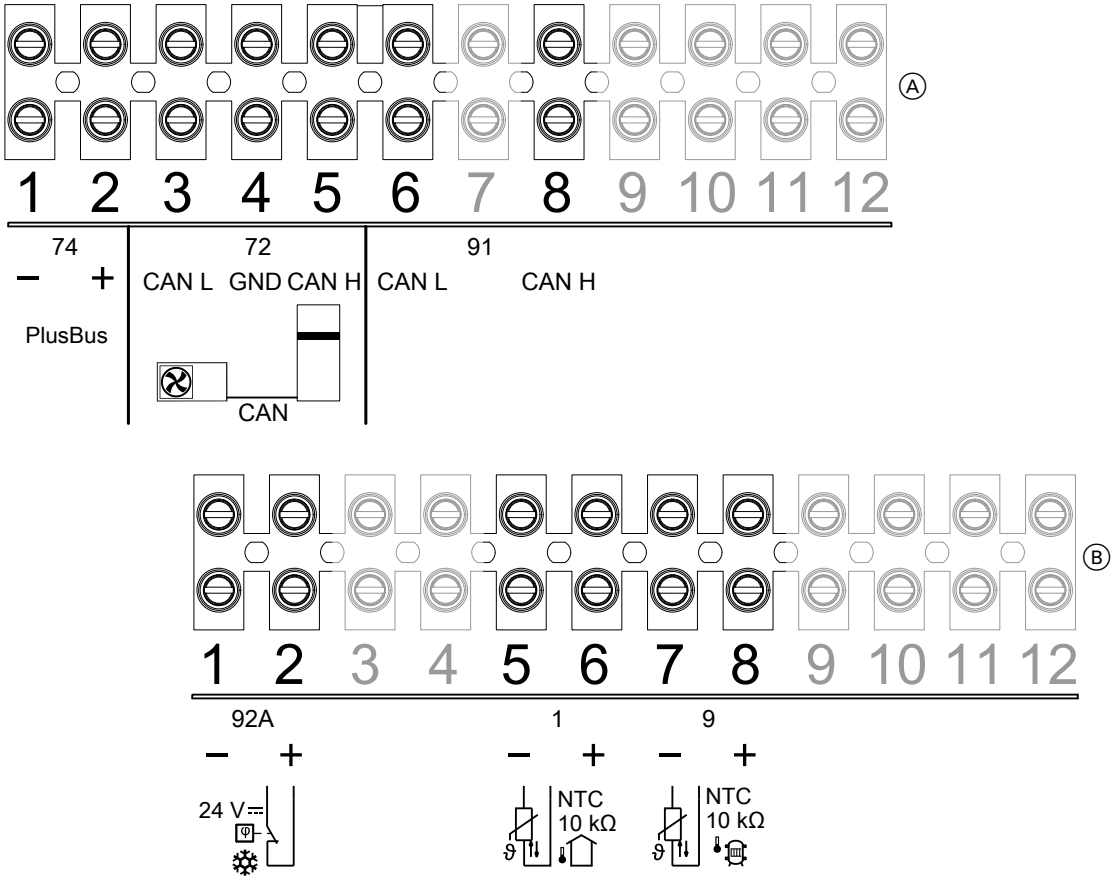


Fig. 50

Ⓐ Bus connections
Ⓑ Sensors

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Electrical connection of the indoor unit (cont.)

Upper luster terminal Ⓐ: Bus connections

Terminals	Component	Explanation
1 and 2 74.1 74.2	Connection of additional PlusBus subscribers, e.g. mixer extension kit	Cores are interchangeable Recommended connecting cable: ▪ Unshielded data cable: 2 x 0.34 mm^2 ▪ Max. cable length: 50 m
3 to 5 72.L 72.GND 72.H	Connection, CAN bus communication cable to indoor/outdoor unit	Connection for integration into the **internal** CAN bus system When wiring on site, connect additional shielding to 72.GND. If the indoor unit is operated without the outdoor unit (e.g. for screed drying), plug the terminator into terminal 72 between 72.L and 72.H. Recommended connecting cable: ▪ Pre-assembled bus communication cable (accessories) For further information: See chapter "Connecting the indoor/outdoor unit CAN bus communication cable".
6 to 8 91.L 91.H	Connection of an additional CAN bus subscriber, e.g. Vitocharge VX3	To integrate the heat pump into an **external** CAN bus system: For recommended connecting cable and further information: See chapter "Connecting to additional appliances via CAN bus". The connection is routed internally to plug 91 in the HPMU electronics module. Do **not** connect CAN Ground (GND)! ***Note*** *Plug 72 of the indoor/outdoor unit CAN bus communication cable may **only** be connected to terminal 72.*

Electrical connection of the indoor unit (cont.)

Lower luster terminal Ⓑ: Sensors

Terminals	Component	Explanation
1 and 2 92A.1 GND 92A.2 24V	24 V⎓ contact humidistat for heating/cooling circuit 1	Recommended connecting cable: ▪ 2 x 0.75 mm² Max. cable length: 25 m or ▪ 2 x 1.5 mm² Max. cable length: 50 m
5 and 6	Outside temperature sensor	Sensor type: NTC 10 kΩ Cores are interchangeable Recommended connecting cable: ▪ 2 x 1.5 mm² ▪ Max. cable length: 35 m
7 and 8	Temperature sensor in external buffer cylinder	Sensor type: NTC 10 kΩ Cores are interchangeable Recommended connecting cable: ▪ 2 x 1.5 mm² ▪ Max. cable length: 35 m

230 V~/400 V~ terminal area

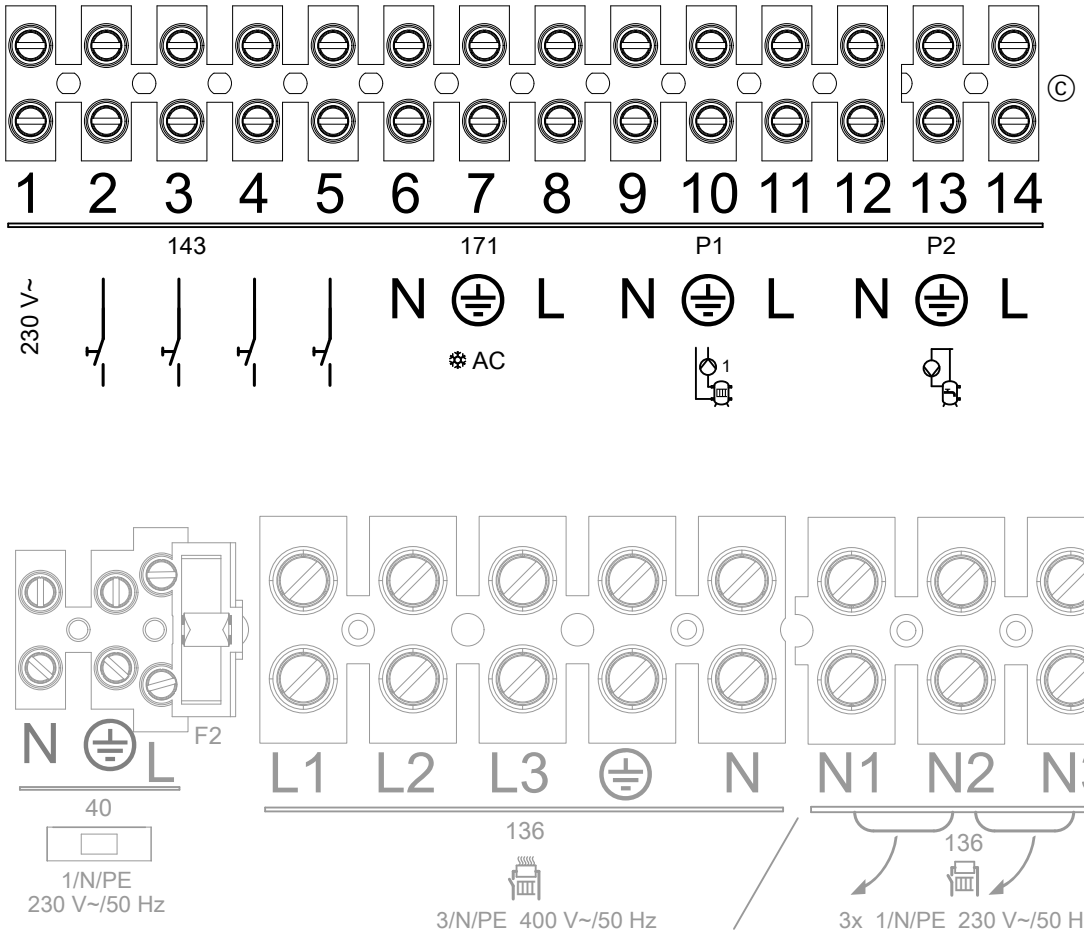


Fig. 51

Electrical connection of the indoor unit (cont.)

Upper luster terminal ⓒ: 230 V~ components and digital inputs

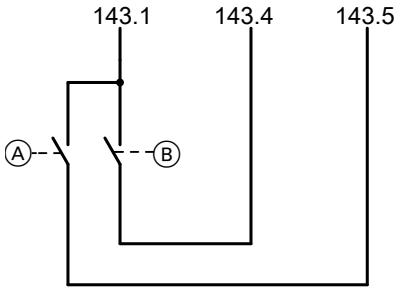
Terminals	Component/function	Explanation
1 to 5		
143.1	Power supply for configurable digital inputs 143.2 to 143.5	Voltage: 230 V~
143.2 143.3 143.4 143.5	Configurable digital inputs 1 to 4 Possible functions: See chapter "Digital input functions"	Set the required parameters during commissioning: See chapter "Commissioning assistant". Breaking capacity: 230 V~, 0.15 A Recommended connecting cable: ▪ 2 x 0.75 mm² ▪ Max. cable length: 50 m
6 to 8 171.N 171.⏚ 171.L **❄ AC**	Control of cooling Active cooling function	▪ Output: 230 W ▪ Voltage: 230 V~ ▪ Max. switching current: 1 A Recommended connecting cable: ▪ 3 x 1.5 mm² ▪ Max. cable length: 50 m
9 to 11 P1.N P1.⏚ P1.L	For example, circulation pump for buffer discharge	Configurable connection ▪ Output: 230 W ▪ Voltage: 230 V~ ▪ Max. switching current: 1 A Recommended flexible connecting cable: ▪ 3 x 1.5 mm² ▪ Max. cable length: 50 m
12 to 14 P2.N P2.⏚ P2.L 	DHW circulation pump	▪ Output: 230 W ▪ Voltage: 230 V~ ▪ Max. switching current: 1 A Recommended connecting cable: ▪ 3 x 1.5 mm² ▪ Max. cable length: 50 m

Digital input functions

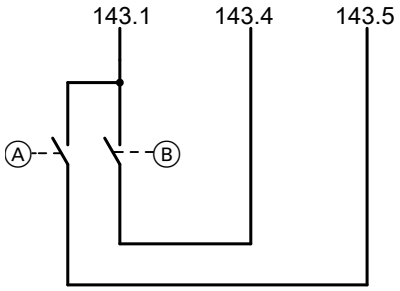
- The simultaneous connection of several functions to 1 digital input is **not** possible.
- With on site power supply, ensure phase matching with the control unit voltage input: See chapter "Indoor unit: Heat pump control unit power supply 230 V~".
- Set the required parameters during commissioning: See chapter "Commissioning assistant"

Electrical connection of the indoor unit (cont.)

The following functions are available via the 4 digital inputs:

Functions	Switching contacts				Explanation
	143.2	143.3	143.4	143.5	
Power-OFF **or** Output restriction	—	—	X	—	The heat pump can be switched off by the power supply utility or the power consumption can be limited. The output restriction is set during commissioning. ▪ With power-OFF, it is possible to select the stages to be switched off for the instantaneous heating water heater. ▪ To avoid malfunctions, lay the mains connection of the heat pump control unit (3 x 1.5 mm^2) and the cable for the power-OFF signal (lock or output restriction) separately. ▪ For further information regarding the power-OFF signal: See chapter "Power supply". Floating contact (on site) for power-OFF: ▪ Closed: Heat pump in operation ▪ Open: Heat pump not operational Floating contact (on site) for output restriction: ▪ Closed: Heat pump with restricted output in operation ▪ Open: Heat pump in operation Possible operating states: See chapter "Explanation of the operating states for power-OFF, output restriction, Smart Grid".
Power-OFF **and** Output restriction	—	—	X	X	Power-OFF and output restriction can be combined **without** Smart Grid.  Ⓐ Floating contact (on site) Ⓑ Floating contact (on site) ▪ Both contacts open: Heat pump in control mode ▪ Contact 143.4 closed and contact 143.5 open: Output restriction: Heat pump and instantaneous heating water heater with restricted output in operation ▪ Both contacts closed: Power-OFF: Heat pump not operational Possible operating states: See chapter "Explanation of the operating states for power-OFF, output restriction, Smart Grid".

Electrical connection of the indoor unit (cont.)

Functions	Switching contacts				Explanation
	143.2	143.3	143.4	143.5	
Smart Grid SG Ready	—	—	X	X	Power-OFF is included in the Smart Grid range of functions. Power-OFF or output restriction can be combined **with** Smart Grid. The output restriction is set during commissioning.  Ⓐ Floating contact (on site) Ⓑ Floating contact (on site) Explanations for Smart Grid: See chapter "Explanation of the operating states for power-OFF, output restriction, Smart Grid".
DHW circulation pump demand	X	—	—	—	External demand, DHW circulation pump  Ⓐ Floating contact (on site)

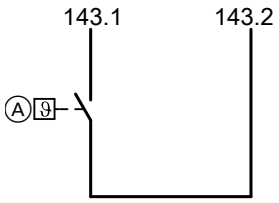
Electrical connection of the indoor unit (cont.)

Functions	Switching contacts				Explanation
	143.2	143.3	143.4	143.5	
External room temperature demand	X	—	—	—	Demand for room heating via a room thermostat  Ⓐ Floating contact (on site) ▪ Closed: Room heating ▪ Open: No room heating No frost protection for the heating/cooling circuit ***Note*** ▪ *If the external room temperature demand is only connected for 1 of the max. 4 heating/cooling circuits, the room thermostat of this heating/cooling circuit is connected directly to digital input 143.2 of the heat pump control unit.* ▪ *If the external room temperature demand for 2, 3 or 4 heating/cooling circuits is connected, connections to the EM-EA1 extension are required. Regardless of how many room thermostats are connected, the following assignment applies:* *Heating/cooling circuit 1: DI1 of the EM-EA1 extension* *Heating/cooling circuit 2: DI2 of the EM-EA1 extension* *Heating/cooling circuit 3: DI3 of the EM-EA1 extension* *Heating/cooling circuit 4: Digital input 143.2 of the heat pump control unit* *If room thermostats are only connected for e.g. heating/cooling circuits 1 and 3, both room thermostats are connected to the EM-EA1 extension and contacts DI1 and DI3.*
External blocking	X	—	—	—	External blocking of refrigerant circuit and instantaneous heating water heater  Ⓐ Floating contact (on site) ▪ Closed: No room heating, no DHW heating No frost protection for the system ▪ Open: Normal operation

Electrical connection of the indoor unit (cont.)

Functions	Switching contacts				Explanation
	143.2	143.3	143.4	143.5	
External demand for heating	—	X	—	—	Only in conjunction with a heating water buffer cylinder: External demand from an additional consumer circuit, e.g. swimming pool. The external demand is configured during commissioning. The flow temperature parameter for the consumer circuit is set to a fixed value.  Ⓐ Floating contact (on site) ▪ Closed: Heating mode additional consumer circuit ▪ Open: No heating mode additional consumer circuit ***Note*** *The external demand for the system flow temperature via the EM-EA1 extension (connection 0 to 10 V)* ***cannot*** *be combined with the "External demand for heating" via digital input 143.3. Only one of the two connections is possible.*

Electrical connection of the indoor unit (cont.)

Functions	Switching contacts				Explanation
	143.2	143.3	143.4	143.5	
External operating program changeover between heating/cooling	—	X	—	—	Only in conjunction with a heating/cooling water buffer cylinder: Switching between heating mode and cooling mode via an external switch as an alternative option to setting via the **"buffer mode"** menu. **Setting "buffer mode":** Operating instructions for the heat pump  Ⓐ Floating contact (on site) ▪ Closed: Heating mode ▪ Open: Cooling mode
Temperature limiter, heating/cooling circuit 1	X	—	—	—	Temperature limiter to restrict the maximum temperature of underfloor heating circuits  Ⓐ Temperature limiter, heating/cooling circuit 1 ***Note*** *Systems with external buffer cylinder:* *For **all** heating/cooling circuits 1 to 4 (if installed), the temperature limiters are connected to the mixer extension kit.*

Explanation of the operating states for power-OFF, output restriction, Smart Grid

The operating status of the heat pump depends on the connected power-OFF signal at contacts 143.4 and 143.5 and the respective switching state of the contacts.

Contact switching state		Heat pump operating status	Required commissioning assistant settings
143.4	143.5		
Only power-OFF			
Closed	—	Heat pump in control mode	1. **"Smart Grid"** > **"Grid-Lock"** 2. **"Output restriction"** > **"Inactive"**
Open	—	Power-OFF active: Heat pump not operational	

Electrical connection of the indoor unit (cont.)

Contact switching state 143.4	143.5	Heat pump operating status	Required commissioning assistant settings
Output restriction only			
Open	—	Heat pump in control mode	1. **"Smart Grid"** > **"Inactive"** 2. **"Output restriction"** > **"Floating contacts"** 3. **"Default value reference restriction"** > Value
Closed	—	Output restriction active	
Power-OFF and output restriction			
Open	Open	Heat pump in control mode	1. **"Smart Grid"** > **"Grid-Lock"** 2. **"Output restriction"** > **"Floating contacts"** 3. **"Default value reference restriction"** > Value
Closed	Open	Output restriction active	
Closed	Closed	Power-OFF active: Heat pump not operational	
Smart Grid and power-OFF			
Open	Open	Heat pump in normal operation (Smart Grid mode 2)	1. **"Smart Grid"** > **"SG Ready via floating contacts"** 2. **"Output restriction"** > **"Inactive"**
Closed	Open	Power-OFF active: Heat pump out of operation (Smart Grid mode 1)	
Open	Closed	Heat pump operation with adjusted set temperatures (recommended mode, Smart Grid Mode 3)	
Closed	Closed	Forced operation with temperature limits (Smart Grid mode 4)	
Smart Grid and output restriction			
Open	Open	Heat pump in normal operation (Smart Grid mode 2)	1. **"Smart Grid"** > **"SG Ready via floating contacts"** 2. **"Output restriction"** > **"Floating contacts"** 3. **"Default value reference restriction"** > Value
Closed	Open	Output restriction active (Smart Grid mode 1)	
Open	Closed	Heat pump operation with adjusted set temperatures (recommended mode, Smart Grid Mode 3)	
Closed	Closed	Forced operation with temperature limits (Smart Grid mode 4)	

Operating states of the heat pump

Power-OFF active:
- Heat pump not operational
- Room heating via external buffer cylinder (if installed)
- Support for room heating by booster heaters: Instantaneous heating water heater (separate enabling required), external heat generator (if installed)
- No room cooling

Output restriction active:
- Limited power consumption of the heat pump and instantaneous heating water heater, therefore possibly lower heating output
- Room heating/room cooling via external buffer cylinder (if available)
- If necessary, support for room heating by the external heat generator (if installed)

Heat pump operation with adjusted set temperatures:
- Increased temperature set values for room heating, buffer heating, DHW heating
- Lower temperature set values for room cooling
- The heat pump is switched on if a time phase is active in the respective time program.
- The increased temperature values have no influence on the instantaneous heating water heater. The instantaneous heating water heater is only switched on with demand.

Forced operation with temperature limits:
- Heating of all system components to the max. possible temperatures
- Cooling of all system components to the min. possible temperatures
- The heat pump is switched on immediately, even outside the time program.

Electrical connection of the indoor unit (cont.)

HPMU electronics module: Accessory 230 V~ and BUS connection

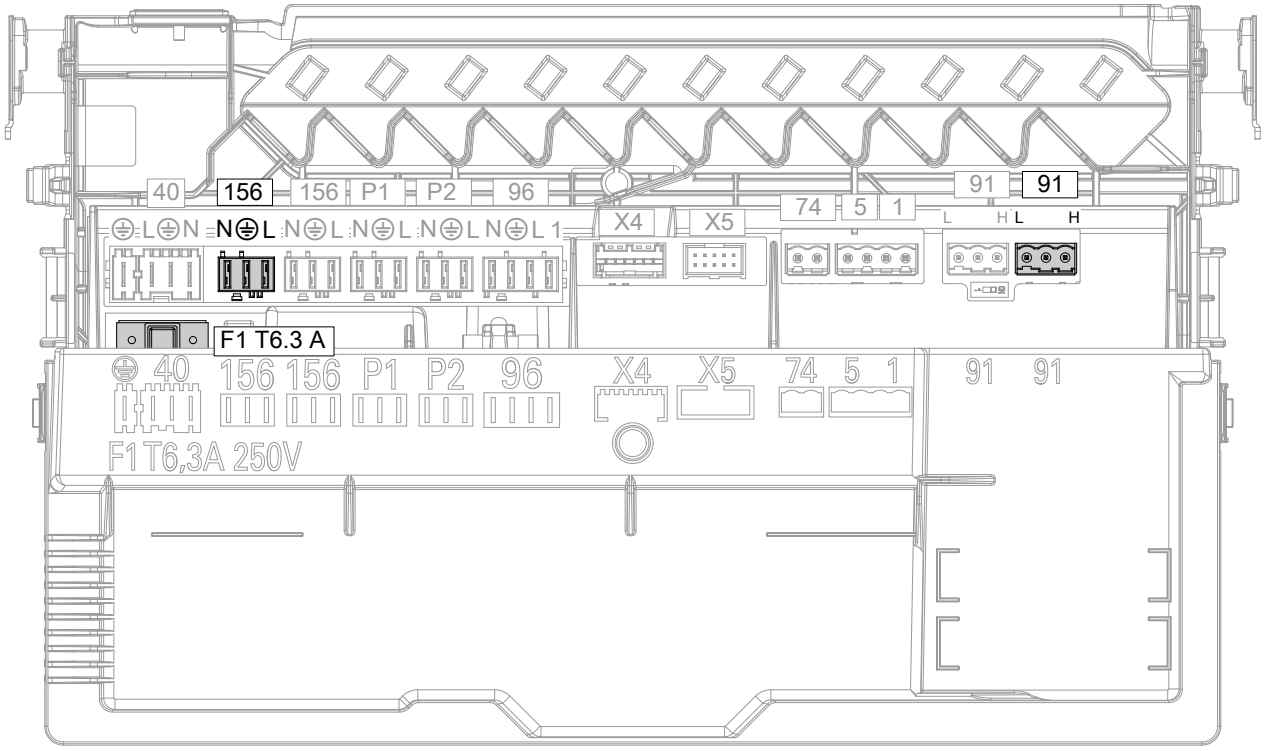


Fig. 52

F1 Fuse 6.3 A H (slow)

Make all connections with **flexible** cables.

230 V~ connections		
Terminals	**Component**	**Explanation**
156.N 156.⏚ 156.L	Switched mains output for mains connection, accessories, e.g. mixer extension kit	▪ Output: 230 W ▪ Voltage: 230 V~ ▪ Max. switching current: 1 A Recommended flexible connecting cable: ▪ 3 x 1.5 mm^2 ▪ Max. cable length: 50 m

Extra low voltage (ELV) connections < 42 V		
Terminals	**Component**	**Explanation**
91.L 91.H	Connection of an additional CAN bus subscriber, e.g. Vitocharge VX3	Integration of the heat pump as central subscriber into an **external** CAN bus system Recommended connecting cable: ▪ Pre-assembled bus cable (accessories) Further information: See chapter "Connecting with other appliances via the CAN bus". Do **not** connect CAN Ground (GND)! ***Note*** *Plug 72 of the indoor/outdoor unit CAN bus communication cable may **only** be connected to terminal 72.*

Electrical connection of the indoor unit (cont.)

Power supply, accessories, 230 V ~

Power supply to all accessories via plug 156 (230 V~)

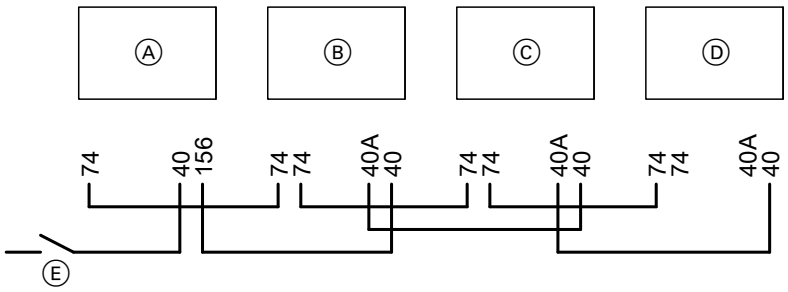


Fig. 53

Ⓐ Indoor unit terminal areas
- 40 Control unit/PCB power supply in the 230 V~ terminal area
- 74 Connecting PlusBus to the upper luster terminal in the low voltage (ELV) < 42 V terminal area
- 156 Power supply for PlusBus subscribers in the HPMU electronics module

Ⓑ Mixer extension kit
Ⓒ Mixer extension kit
Ⓓ Mixer extension kit
Ⓔ ON/OFF switch

Some accessories with direct power supply

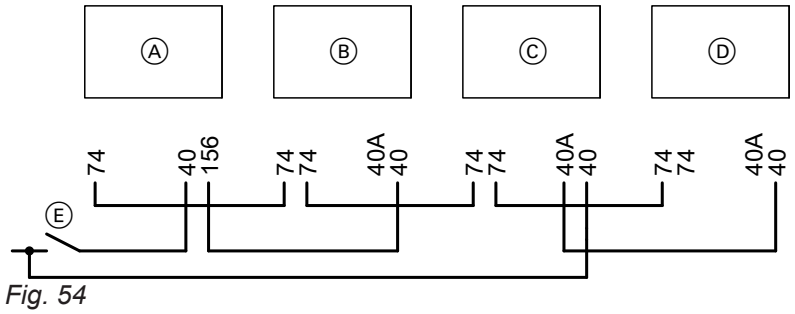


Fig. 54

Ⓐ Indoor unit terminal areas
- 40 Control unit/PCB power supply in the 230 V~ terminal area
- 74 Connecting PlusBus to the upper luster terminal in the low voltage (ELV) < 42 V terminal area
- 156 Power supply for PlusBus subscribers in the HPMU electronics module

Ⓑ Mixer extension kit
Ⓒ Mixer extension kit
Ⓓ Mixer extension kit
Ⓔ ON/OFF switch

Connecting to additional appliances via CAN bus

The heat pump can form a system network with other compatible appliances via the external CAN bus. Combining appliances with the same control platform brings benefits such as shared use of a connectivity module or even joint commissioning and operation via an app.

- The appliance CAN bus is designed for "line" bus topology with a terminator at both ends: See Fig. 55.
- With CAN bus, the transmission quality and the cable lengths depend on the electrical properties of the cable.
- Only use **one** cable type within a CAN bus.

Note
For commissioning any CAN bus subscriber: See chapter "Commissioning the system".

Electrical connection of the indoor unit (cont.)

Recommended cable

- Recommended cable:
  Bus cable (accessories), length: 5, 15 or 30 m
- For wiring on site:
  Only use cable types listed in the following tables.

Recommended cable type (on site):

CAN bus cable	Twisted pair cable compliant with ISO 11898-2, shielded
▪ **Cable cross-section**	0.34 to 0.6 mm^2
▪ **Characteristic impedance**	95 to 140 Ω
▪ **Max. length** (entire CAN bus system)	200 m

Alternative cable types (on site):

CAN bus cable	2-core, CAT7, shielded
▪ Max. length (entire CAN bus system)	200 m
CAN bus cable	2-core, CAT5, shielded
▪ Max. length (entire CAN bus system)	200 m

Routing the CAN bus cable

Please note
Incorrectly executed electrical installations can cause appliance damage.
- Protect the CAN bus communication cable from damage.
- Do not crush or cut the wires when securing the cable.

Please note
A bending radius that is too small can cause damage to the CAN bus cable and impair data transmission.
- Do not kink the CAN bus cable.
- Do not twist the CAN bus cable.
- Observe and adhere to the required bending radius:
  - Fixed installation
    Bending radius ≥ 10 times the cable cross-section
  - Movable installation
    Bending radius ≥ 15 times the cable cross-section

Please note
Voltages ≥ 230 V~ in the direct vicinity of the CAN bus cable can interfere with data transmission.
- Do not route the CAN bus cable alongside 230 V~/400 V~ mains power cables.
- Do not route the CAN bus cable in the vicinity of motors or motor drives.
- Strip as little of the insulation as possible, directly before the terminals.

Terminator for external CAN bus system

When integrating into an external CAN bus system, a distinction is made as to whether a CAN bus subscriber is the first, last or central subscriber.
In order to avoid communication interferences, only 1 terminator with 120 Ω may be present at the first and last subscriber for the termination of the external CAN bus system.
If the heat pump is connected as the central subscriber, the factory-connected terminator must be removed: See the following chapters.
To check this, the resistance at one of the CAN bus connections between CAN L and CAN H can be measured after all CAN bus connections have been completed. For correct measurement of the resistance, the power supply to all appliances in the CAN bus system must be interrupted.

Measured resistance:
- Target value:
  60 Ω ±10 %.
- Measured value < 60 Ω:
  More than 2 terminators installed
- Measured value > 60 Ω:
  Only 1 terminator installed
  or
  Terminator not equal to 120 Ω

Electrical connection of the indoor unit (cont.)

The heat pump is the first or last subscriber

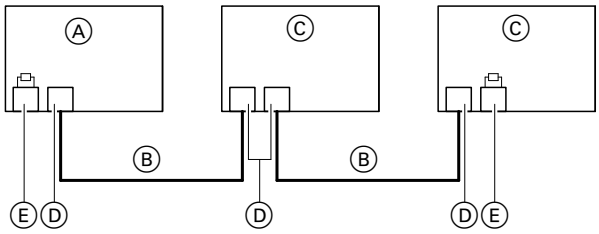


Fig. 55

Ⓐ Heat pump connected as first or last CAN bus subscriber

In this case, 1 connection is required on the heat pump:
- 1 connection in the terminal area for extra low voltage (ELV) < 42 V on the upper luster terminal, terminals 6 and 8
  Connection 91
  Do **not** connect CAN Ground (GND)!
- Do **not** remove the factory-fitted plug 91 in the HPMU electronics module.
  This plug contains the terminator.

Ⓑ CAN bus cable
Ⓒ Other CAN bus subscribers
Ⓓ Connection of external CAN bus without terminator
Ⓔ Connection of external CAN bus with terminator

The heat pump is the central subscriber

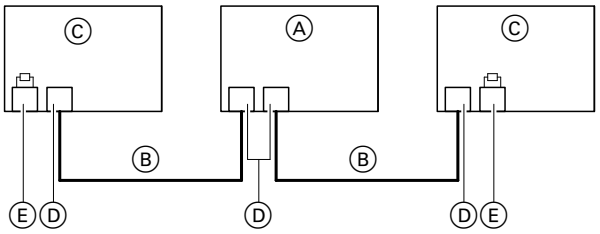


Fig. 56

Ⓐ Heat pump as central CAN bus subscriber

In this case, 2 connections are required on the heat pump:
- 1 connection in the terminal area for extra low voltage (ELV) < 42 V on the upper luster terminal, terminals 6 and 8
  Connection 91
  Do **not** connect CAN Ground (GND)!
- 1 connection in the HPMU electronics module: Remove the factory-fitted plug 91. Insert the bus cable (accessories) into the same slot.
  Or for wiring on site:
  1 connection at factory-fitted plug 91 on HPMU electronics module: Remove terminator from this plug 91.
  Do **not** connect CAN Ground (GND)!

Ⓑ CAN bus cable
Ⓒ Other CAN bus subscribers
Ⓓ Connection of external CAN bus without terminator
Ⓔ Connection of external CAN bus with terminator

Connecting the energy meter

The energy meter is installed on the main distribution board. It is connected to the building's power supply and to the external CAN bus system according to the connection diagrams in the system schemes.
Recommended cable type: See chapter "Connecting with other appliances via the CAN bus".

! **Please note**
Incorrect core assignment can result in appliance faults.
Never interchange wires.

CAN bus subscriber number
The CAN bus subscriber number "97" is preset.
If more than 1 energy meter is used within a CAN bus system, the energy meters must each have their own CAN bus subscriber number; if necessary, change to "98", "111" or "112".

Installation and service instructions for the "Energy meter"

Electrical connection of the indoor unit (cont.)

Fitting the programming unit

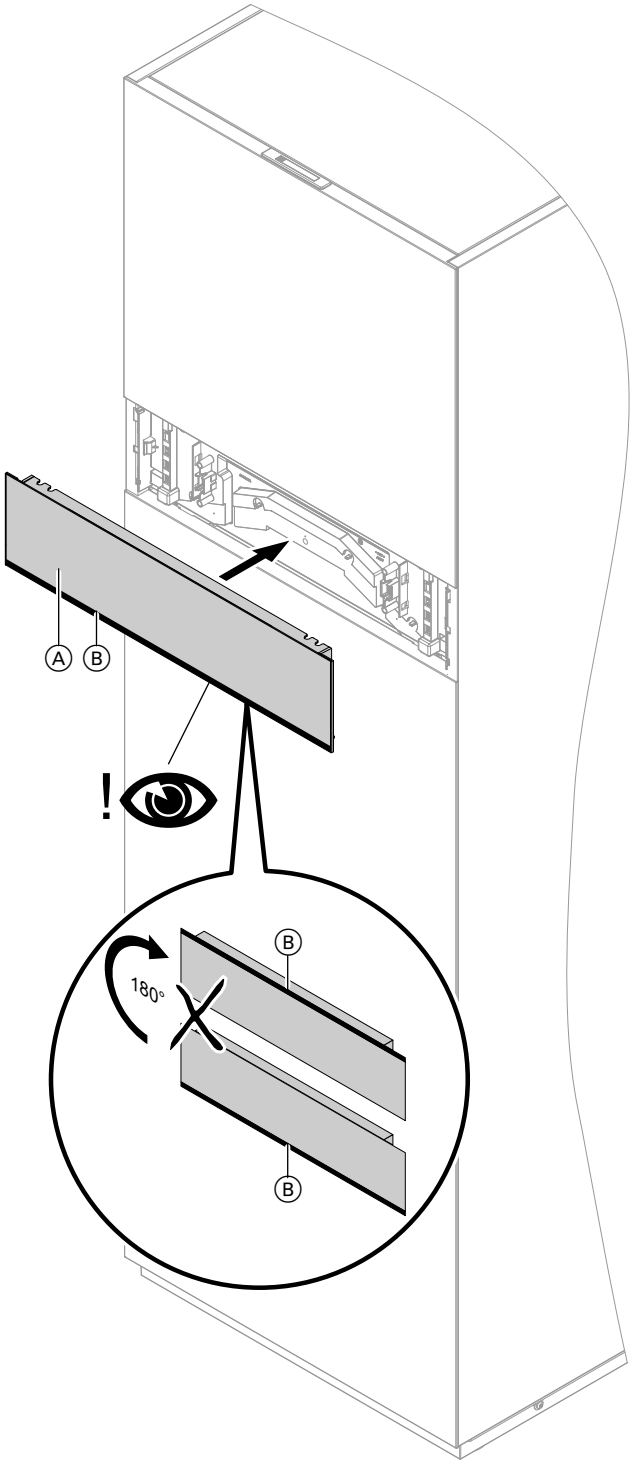


Fig. 57

Ⓐ Programming unit

Electrical connection of the outdoor unit

Cable routing to the terminal area

Outdoor unit with 1 fan

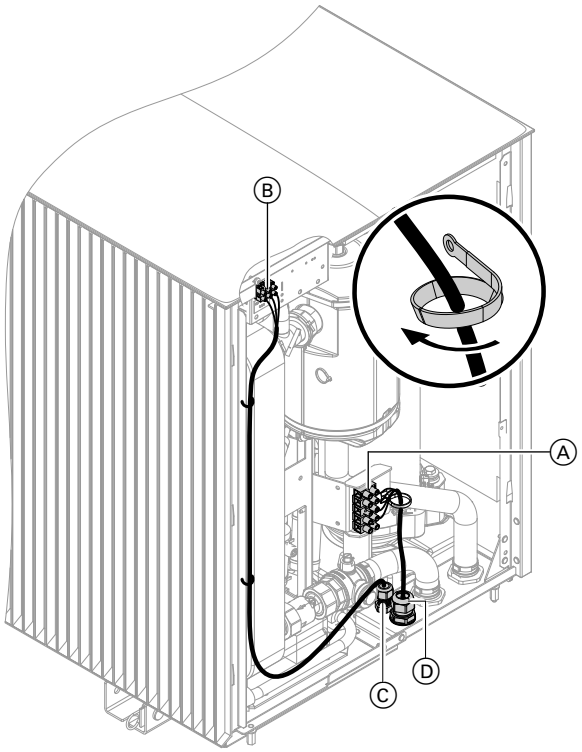


Fig. 58

Ⓐ 230 V~ compressor power supply
Ⓑ Connection for CAN bus communication cable (accessories)
Ⓒ Cable entry for CAN bus communication cable
Torque: 6 Nm
Ⓓ Cable entry for power cable
Torque: 8 Nm

Lengths of cable in appliance:
- 230 V~ compressor power cable: 300 mm
- CAN bus communication cable: 900 mm

Electrical connection of the outdoor unit (cont.)

Outdoor unit with 2 fans, 230 V~

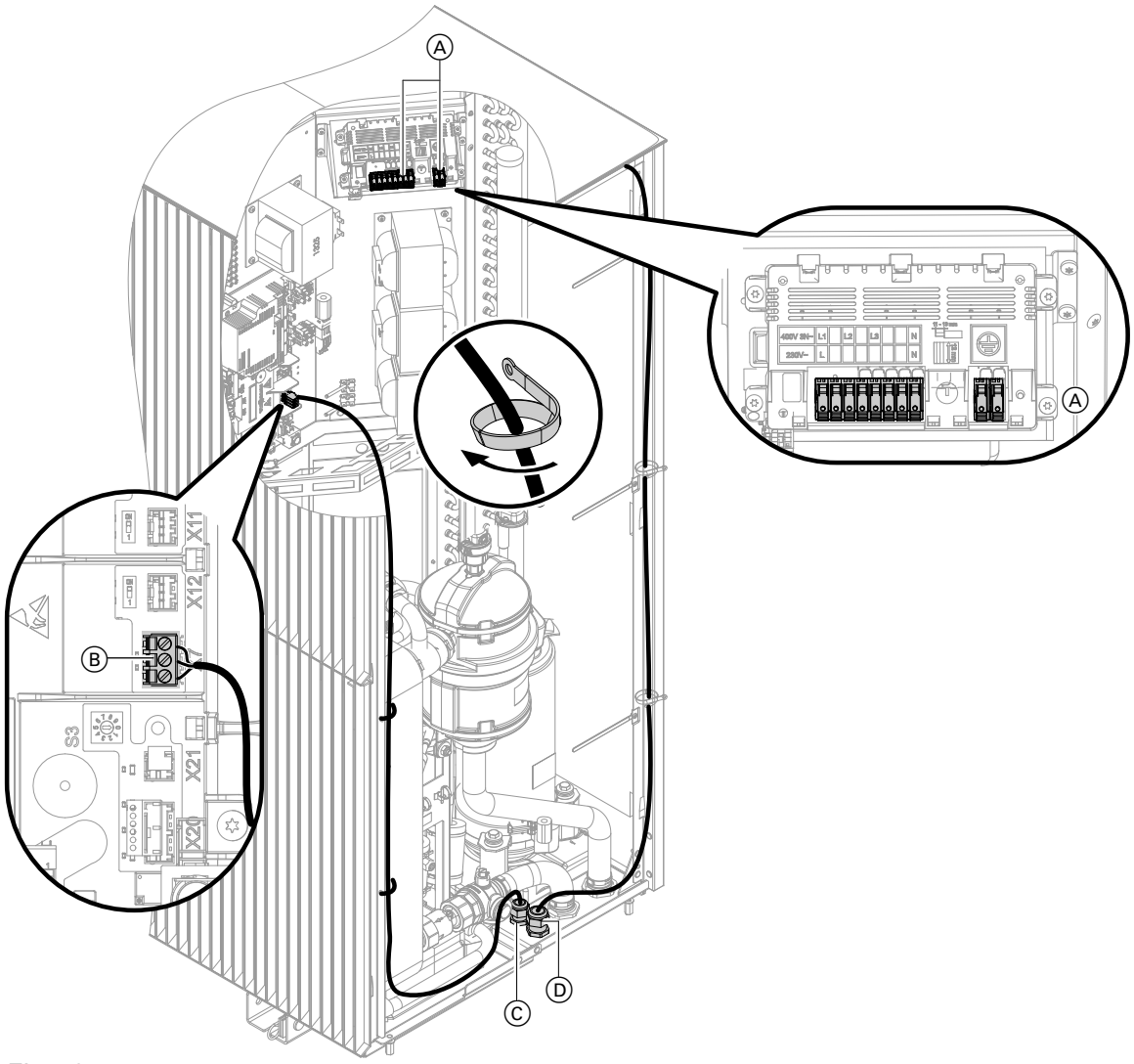


Fig. 59

Ⓐ 230 V~ compressor power supply
Ⓑ Connection for CAN bus communication cable (accessories)
Ⓒ Cable entry for CAN bus communication cable
Torque: 6 Nm
Ⓓ Cable entry for power cable
Torque: 8 Nm

Lengths of cable in appliance:
- 230 V~ compressor power cable: 1900 mm
- CAN bus communication cable: 1500 mm

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Electrical connection of the outdoor unit (cont.)

Outdoor unit with 2 fans, 400 V~, sizes 10 to 13

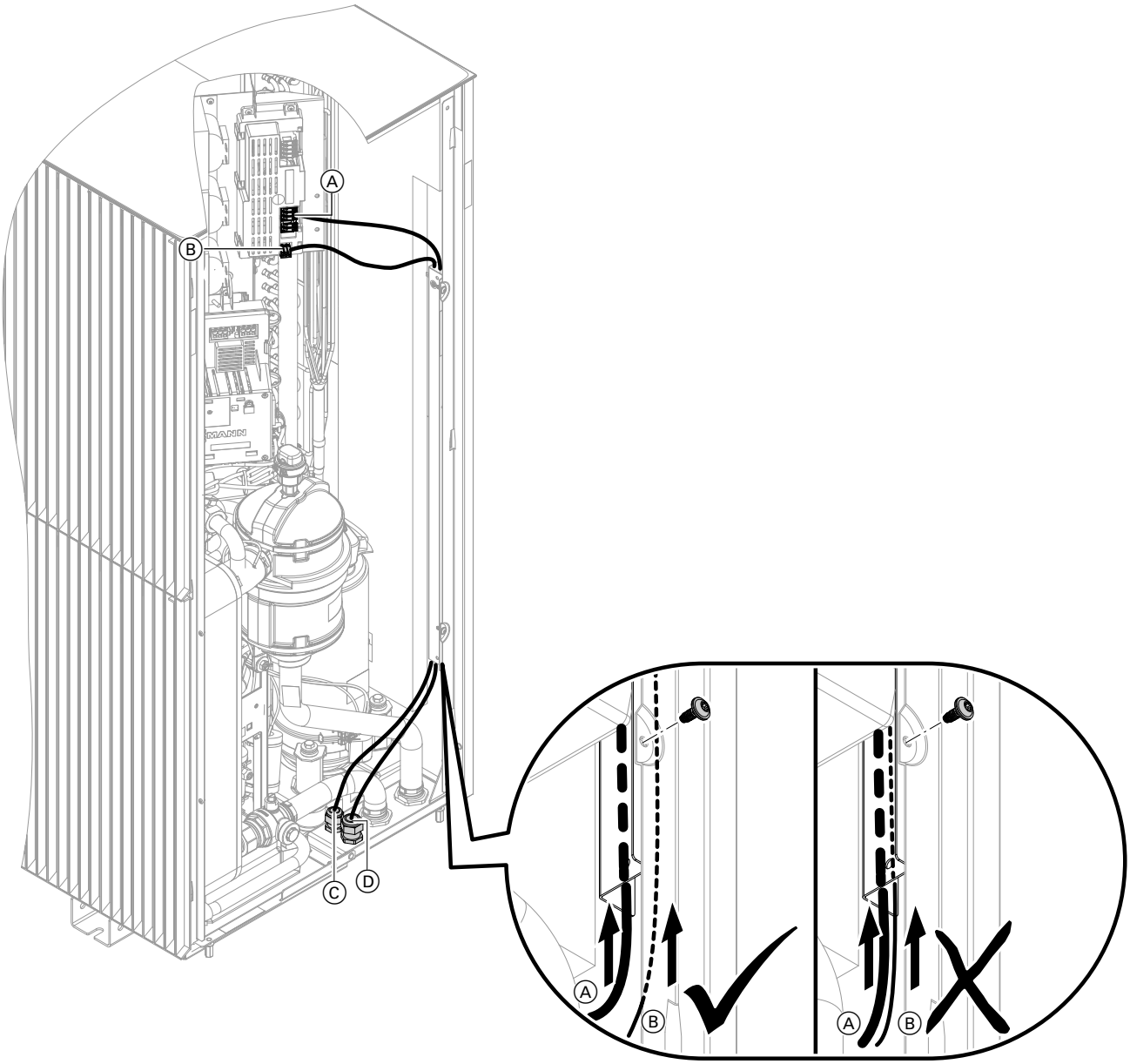


Fig. 60

Ⓐ 400 V~ compressor power supply
Ⓑ Connection for CAN bus communication cable (accessories)
Ⓒ Cable entry for CAN bus communication cable
Torque: 6 Nm
Ⓓ Cable entry for power cable
Torque: 8 Nm

Lengths of cable in appliance:
- 400 V~ compressor power cable: 1600 mm
- CAN bus communication cable: 1700 mm

Electrical connection of the outdoor unit (cont.)

Outdoor unit with 2 fans, 400 V~, sizes 16 to 19

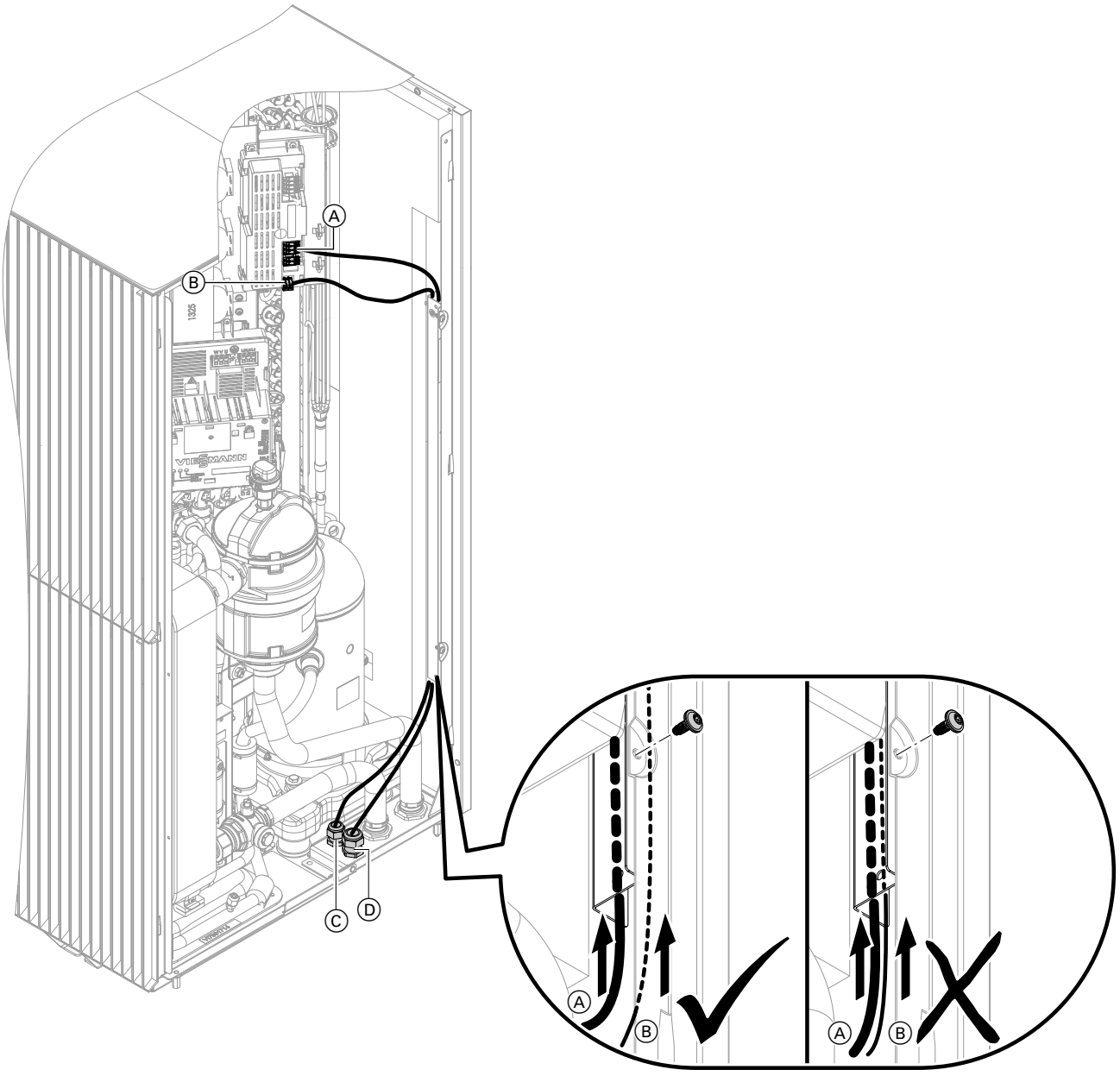


Fig. 61

Ⓐ 400 V~ compressor power supply
Ⓑ Connection for CAN bus communication cable (accessories)
Ⓒ Cable entry for CAN bus communication cable
Torque: 6 Nm
Ⓓ Cable entry for power cable
Torque: 8 Nm

Lengths of cable in appliance:
- 400 V~ compressor power cable: 1600 mm
- CAN bus communication cable: 1700 mm

Connecting the indoor/outdoor unit CAN bus communication cable (accessories)

The indoor unit and outdoor unit are integrated into the internal CAN bus system via the CAN bus communication cable.

Connecting the indoor/outdoor unit CAN bus… (cont.)

Recommended cable

Recommended cable: **Indoor/outdoor unit bus communication cable** (accessories), length 5, 15 or 30 m

For wiring on site:
- Only use the cable types listed in the following two tables.
- Only use cables with shielding:
  Also connect shielding to the "GND" connection of each of the following:
  - Connection of outdoor unit
  - In the terminal area on the underside of the appliance: Connection 72

  If necessary, remove the terminator from terminal 72.
- Cable length between indoor and outdoor unit:
  - Min. 3 m
  - Max. 30 m

Recommended cable type (on site):

CAN bus cable	In line with ISO 11898-2, twisted pair cable, shielded
▪ **Cable cross-section**	0.34 to 0.6 mm^2
▪ **Characteristic impedance**	95 to 140 Ω
▪ **Max. length** (entire CAN bus system)	120 m

Alternative cable types (on site):

CAN bus cable	2-core, CAT7, shielded
▪ Max. length (entire CAN bus system)	120 m
CAN bus cable	2-core, CAT5, shielded
▪ Max. length (entire CAN bus system)	120 m

Terminator for internal CAN bus system

The two terminators required are connected at the factory.

Routing the CAN bus cable

! **Please note**
Incorrectly executed electrical installations can cause appliance damage.
- Protect the CAN bus communication cable from damage.
- Do not crush or cut the wires when securing the cable.

! **Please note**
A bending radius that is too small can cause damage to the CAN bus cable and impair data transmission.
- Do not kink the CAN bus cable.
- Do not twist the CAN bus cable.
- Observe and adhere to the required bending radius:
  - Fixed installation
    Bending radius ≥ 10 times the cable cross-section
  - Movable installation
    Bending radius ≥ 15 times the cable cross-section

Connecting the indoor/outdoor unit CAN bus… (cont.)

! **Please note**
Voltages ≥ 230 V~ in the direct vicinity of the CAN bus cable can interfere with data transmission.
- Do not route the CAN bus cable alongside 230 V~/400 V~ mains power cables.
- Do not route the CAN bus cable in the vicinity of motors or motor drives.
- Strip as little of the insulation as possible, directly before the terminals.

Connecting the CAN bus communication cable

Outdoor unit with 1 fan

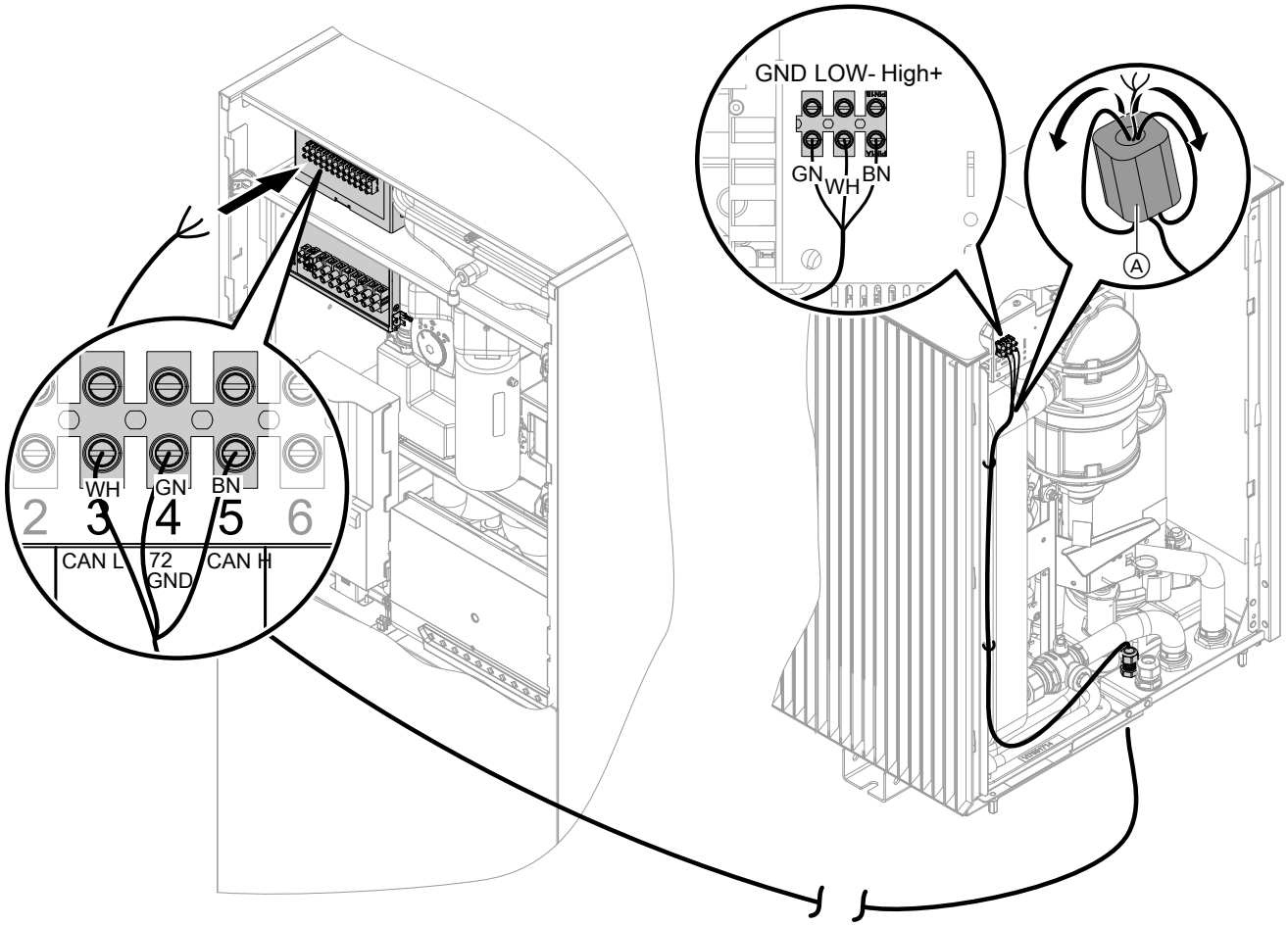


Fig. 62

Ⓐ Ferrite

Colour coding to IEC 60757:
BN Brown
GN Green
WH White

Connecting the indoor/outdoor unit CAN bus… (cont.)

Outdoor unit with 2 fans, 230 V~, sizes 10 to 13

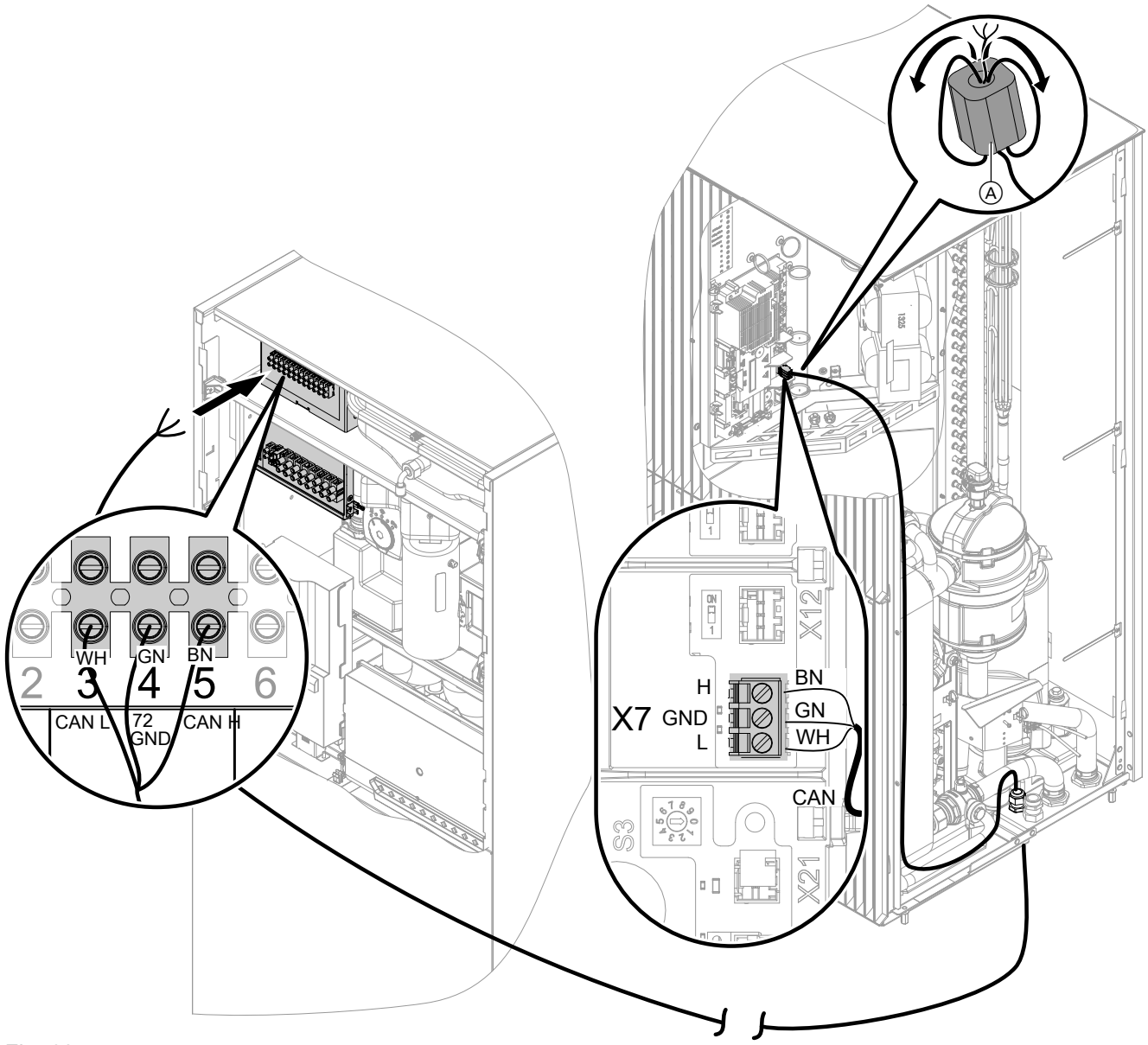


Fig. 63

Ⓐ Ferrite

Colour coding to IEC 60757:
BN Brown
GN Green
WH White

Connecting the indoor/outdoor unit CAN bus… (cont.)

Outdoor unit with 2 fans, 400 V~, sizes 10 to 13

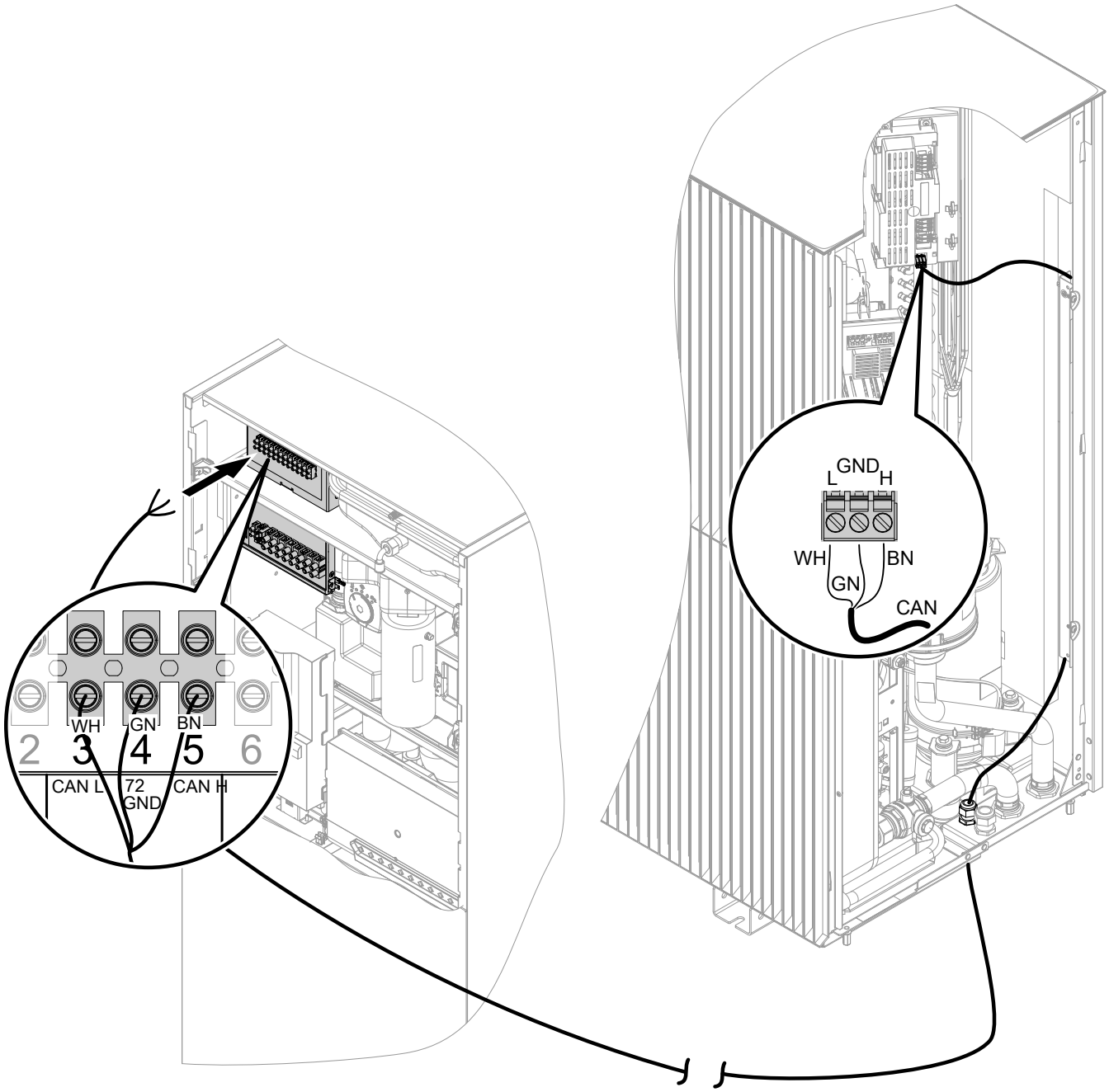


Fig. 64

Colour coding to IEC 60757:
BN Brown
GN Green
WH White

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Connecting the indoor/outdoor unit CAN bus… (cont.)

Outdoor unit with 2 fans, 400 V~, sizes 16 to 19

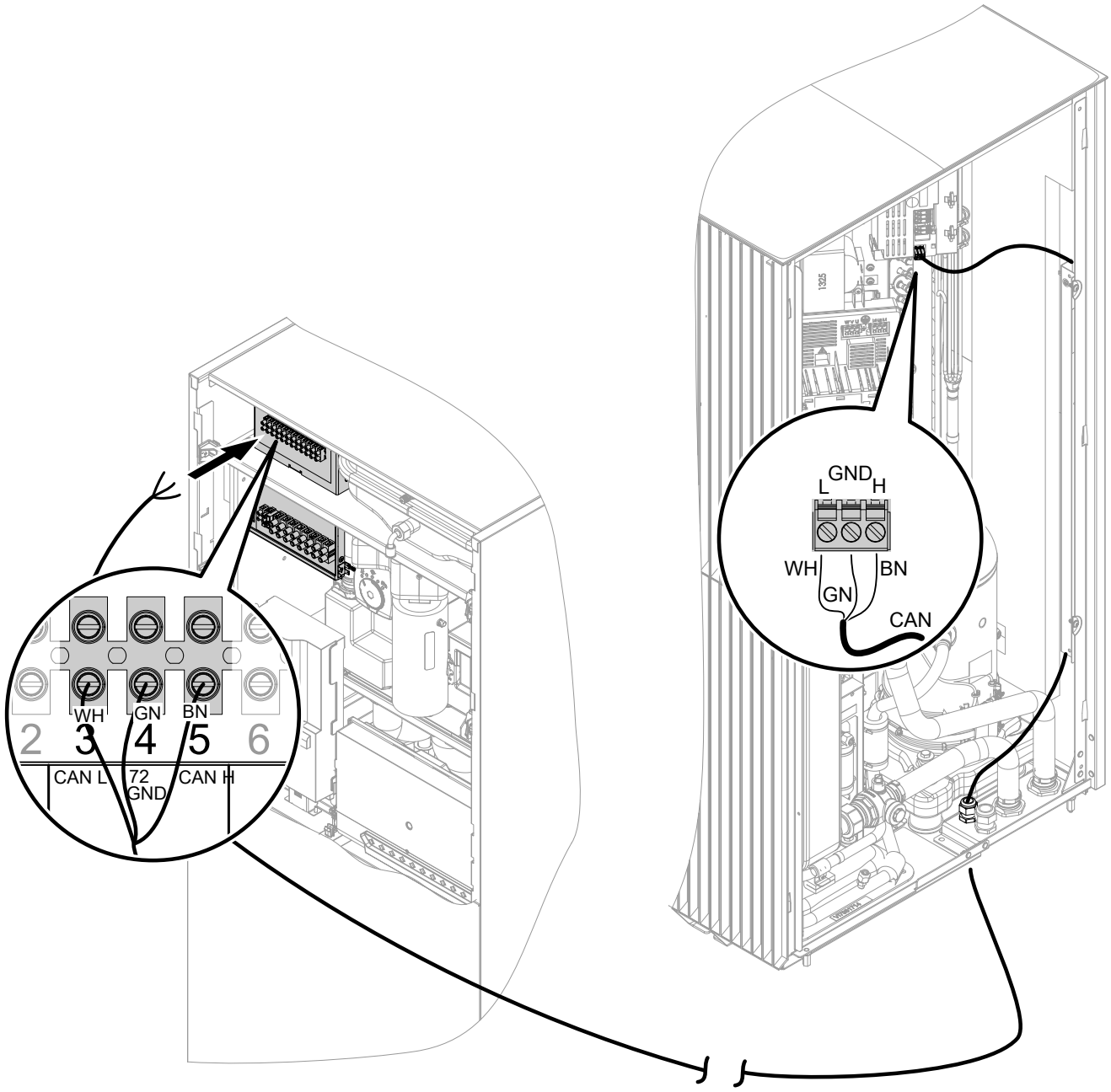


Fig. 65

Colour coding to IEC 60757:
BN Brown
GN Green
WH White

Power supply

Isolators for non-earthed conductors

- In der Netzanschlussleitung eine Trennvorrichtung vorsehen, die alle aktiven Leiter allpolig vom Netz trennt und der Überspannungskategorie III (3 mm) für volle Trennung entspricht. Diese Trennvorrichtung muss gemäß den Errichtungsbestimmungen in der festverlegten elektrischen Installation eingebaut werden, z. B. Hauptschalter oder vorgeschalteter Leitungsschutzschalter.
- Zusätzlich eine allstromsensitive Fehlerstrom-Schutzeinrichtung installieren mit einem Nenn-Fehlerstrom von höchstens 30 mA (FI Klasse B) für Gleich(fehler)ströme, die durch energieeffiziente Betriebsmittel entstehen können.
- Select and size RCDs to DIN VDE 0100-530.

Danger
Incorrect electrical installations can lead to serious injury from electrical current and result in appliance damage.

Connect the power supply and implement all safety measures (e.g. RCD circuit) in accordance with the following regulations:
- IEC 60364-4-41
- VDE regulations
- TAR low voltage VDE-AR-N-4100

Danger
Incorrect electrical installations can lead to serious injury from electrical current and result in appliance damage.
- Protect the power cable against damage.
- In the outside area, the power cable must not be lighter than rubber sheathed cables with polychloroprene cover. Only use cables marked with 60245 IEC 57.

Danger
The absence of system component earthing can lead to serious injury from electrical current and component damage in the event of an electrical fault.
The appliance and pipework must be connected to the equipotential bonding of the building.

Danger
Incorrect core assignment can lead to serious injury from electrical current and result in appliance damage.
Do not interchange cores "L" and "N".

Note
Incorrectly executed electrical installations may cause undesirable electromagnetic interaction with other electronic devices.

- Consult your power supply utility, which may offer different supply tariffs for the power circuits. Observe the technical connection conditions of the power supply utility.
- If the compressor and/or instantaneous heating water heater are operated at an economy tariff (power-OFF), either provide an additional cable (e.g. 3 x 1.5 mm^2) for the power-OFF signal from the distribution board (meter box) to the heat pump control unit.
- The assignment of the power-OFF (for compressor and/or instantaneous heating water heater) is made via the type of connection and by setting parameters in the heat pump control unit.
  In Germany, the power supply can be switched off for a maximum of 3 x 2 hours per day (24 h).
  Output restriction
  Instead of being switched off completely (power-OFF), the heat pump output is restricted to a maximum of 4.2 kW. The calculated or specified output restriction for the system is set during commissioning.
- The power supply to the **heat pump control unit/PCB** must **not** be able to be switched off by the power supply utility. Tariffs subject to possible shutdown must not be used here.
- In relation to self-consumption (on-site use of power generated by the photovoltaic system):
  During the power-OFF period, it is **not** possible to operate the compressor via self-consumption.
- Protect the power cable to the heat pump control unit with a fuse of max. 16 A.
- For accessories and external components that will not be connected to the heat pump control unit, provide the power supply via the same fuse, or at least on the same phase, as the heat pump control unit. Connection to the same fuse provides additional safety in the event of the power being switched off. Observe the power consumption of the connected consumers.
- If the power supply to the appliance is connected with a flexible power cable, ensure that the live conductors are pulled taut before the earth conductor in the event of strain relief failure. The length of the earth conductor wire will depend on the design.

Power supply (cont.)

Only for heat pumps with central power supply on the indoor unit

Shared power supply for heat pump control unit and instantaneous heating water heater:

- Only for instantaneous heating water heaters with 230 V~ power supply
- 230 V~ power supply kit (accessories) required

  Installation instructions "230 V~ mains connection kit"

Note

Fuse in "230 V~ mains connection kit" for appliance protection only.

- Power supply: 1/N/PE 230 V~/50 Hz
- Recommended power cable: 3 x 6.0 mm^2
- Max. cable length: 30 m
- Max. fuse rating: 32 A
- Standard tariff: No economy tariff with power-OFF facility possible

Indoor unit: Heat pump control unit power supply 230 V~

The mains connection is made in the 230 V~/400 V~ terminal area.

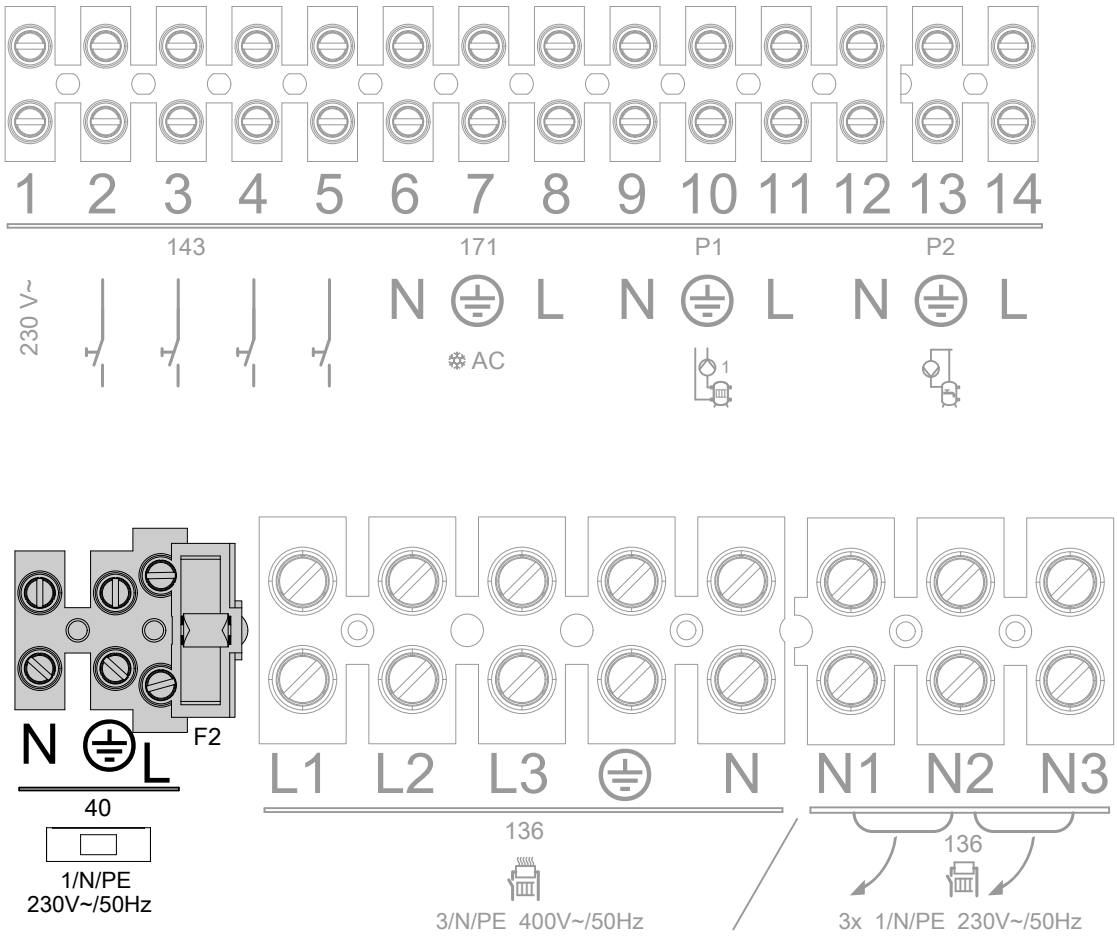
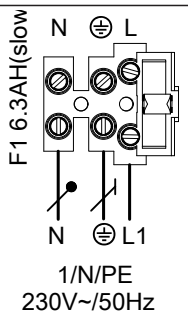


Fig. 66

F2 Fuse 6.3 A H (slow)

Mains terminal for heat pump control unit power supply

Power supply (cont.)

Heat pump control unit	▭
Power supply	1/N/PE 230 V~/50 Hz
	
Recommended power cable	
▪ ▭ **Control unit/PCB 230 V~**	3 x 1.5 mm²
▪ **Grid-Lock/power-OFF**	3 x 1.5 mm²
Max. cable length	50 m
Max. fuse rating	16 A
Tariff	Standard tariff ▪ No economy tariff with power-OFF facility possible ▪ This supply must **never** be blocked.

Indoor unit: Instantaneous heating water heater power supply 230 V~/400 V~

- The mains connection is made in the 230 V~/400 V~ terminal area.
- The 230 V~ mains connection is 1-phase and can be designed as 1-stage, 2-stage or 3-stage.
- The 400 V~ mains connection is 3-phase and can be designed as 2-stage or 3-stage.

Depending on the version, the output restriction for the instantaneous heating water heater must be set during commissioning: See the following tables.

Power supply (cont.)

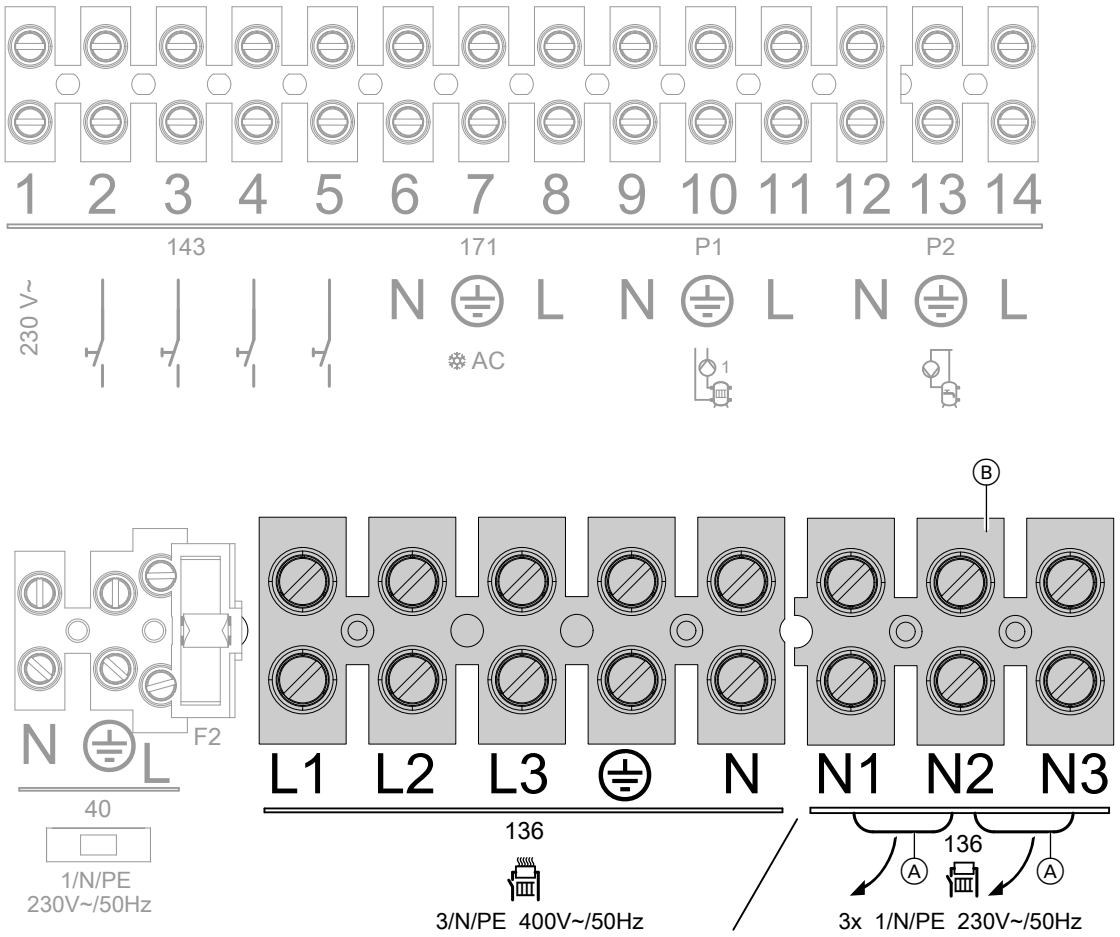


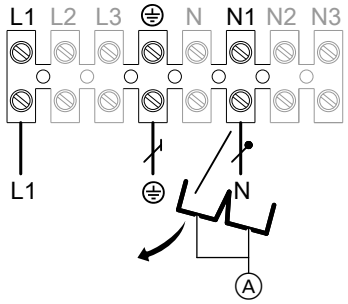
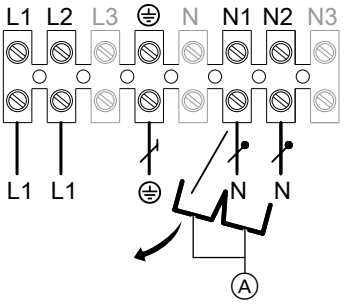
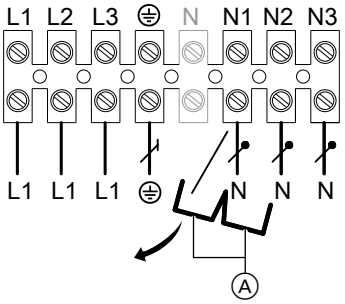
Fig. 67

Ⓐ Jumpers
Ⓑ Mains terminals for the instantaneous heating water heater

Power supply (cont.)

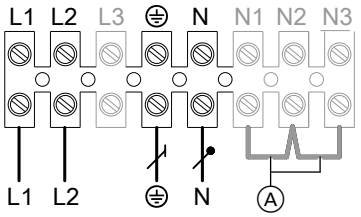
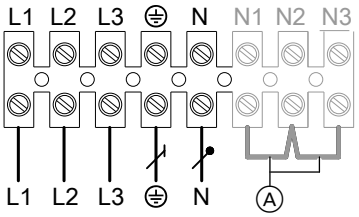
Instantaneous heating water heater power supply 230 V~

1-phase power supply

	1-stage	2-stage	3-stage
	 1x 1/N/PE 230V~/50Hz	 2x 1/N/PE 230V~/50Hz	 3x 1/N/PE 230V~/50Hz
Jumpers Ⓐ at terminals N1 to N3	Remove!	▪ In 3-phase network: Jumper at terminals N1, N2 can be removed. ▪ In 1-phase network: Remove jumper!	Remove!
Recommended power cable	3 x 2.5 mm²	▪ In 3-phase network: 5 x 2.5 mm² ▪ In 1-phase network: 7 x 2.5 mm²	7 x 2.5 mm²
Max. cable length	25 m	25 m	25 m
Max. fuse rating	16 A	16 A	16 A
Tariff	Economy tariff and power-OFF can be applied		
Output restriction during commissioning	3 kW	6 kW	8 kW

Instantaneous heating water heater power supply 400 V~

3-phase power supply

	2-stage	3-stage
	 2/N/PE 400V~/50Hz	 3/N/PE 400V~/50Hz
Jumpers Ⓐ at terminals N1 to N3	Never remove!	Never remove!
Recommended power cable	5 x 2.5 mm²	5 x 2.5 mm²
Max. cable length	25 m	25 m
Max. fuse rating	16 A	16 A
Tariff	Economy tariff and power-OFF can be applied	Economy tariff and power-OFF can be applied
Output restriction during commissioning	6 kW	8 kW

Power supply (cont.)

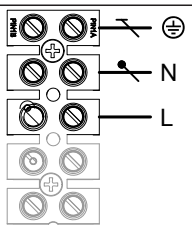
Outdoor unit: Compressor power supply 230 V~/400 V~

Danger
Risk of explosion: Electrical components can cause sparks which may be ignited by escaping refrigerant.
Before inserting or removing the power supply plug, isolate the system from the power supply e.g. at the separate fuse or main switch. Check that the system is no longer live.

Please note
Incorrect phase sequence can cause damage to the appliance.
Connect the 400 V~ compressor power supply **only** in the phase sequence specified (see terminals) with a **clockwise** rotating field.

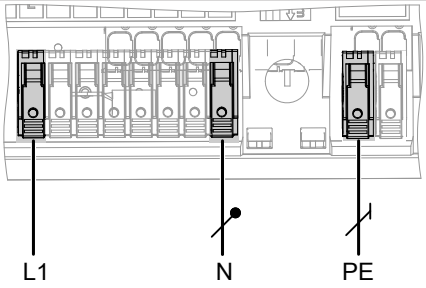
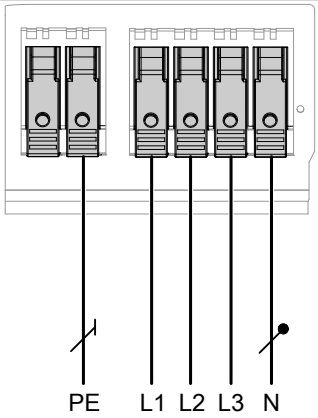
- Outdoor unit terminal area: See chapter "Cable routing to the terminal area".
- Shield the power cable from direct sunlight.

Outdoor unit with 1 fan

Compressor power supply	**230 V~**
	 1/N/PE 230 V~/50 Hz
Recommended power cable	
	3 x 2.5 mm² **Or** 3 x 4.0 mm²
Max. cable length	
▪ For 3 x 2.5 mm²	20 m
▪ For 3 x 4.0 mm²	32 m
Max. fuse rating	16 A

Power supply (cont.)

Outdoor unit with 2 fans

Compressor power supply	**230 V~**	**400 V~**
	 1/N/PE 230 V~/50 Hz	 3/N/PE 400 V~/50 Hz
Recommended power cable		
	3 x 2.5 mm² **Or** 3 x 4.0 mm²	5 x 2.5 mm²
Max. cable length depends on power cable		
3 x 2.5 mm²	20 m	—
3 x 4.0 mm²	32 m	—
5 x 2.5 mm²	—	30 m
Max. fuse rating	B25A	16 A

Power supply with power-OFF: Without on-site load disconnect

The power-OFF signal is connected directly in the 230 V~/400 V~ terminal area of the indoor unit.

Electrical connections of the power supply:

- Indoor unit:
  See following chapter:
  - "Terminal area 230 V~/400 V~"
  - "Indoor unit: Heat pump control unit power supply"
  - "Indoor unit: Power supply for instantaneous heating water heater"
- Outdoor unit:
  See chapter "Outdoor unit: Compressor power supply".

Note

Observe the technical connection requirements of the relevant power supply utility.

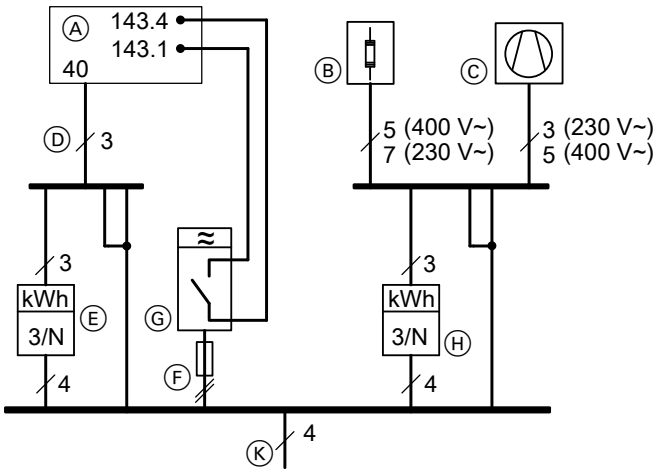


Fig. 68 Diagram excluding fuses and RCD

Ⓐ 230 V~/400 V~ terminal area
Ⓑ Instantaneous heating water heater
Ⓒ Compressor
Ⓓ Heat pump control unit power supply
Ⓔ Premium tariff meter
Ⓕ Ripple control receiver backup fuse
Ⓖ Ripple control receiver (contact open: Power-OFF active); feed: TNC system
Ⓗ Economy tariff meter
Ⓚ Feed: TNC system

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Power supply (cont.)

Mains power supply in conjunction with self-consumption

For available connection diagrams for self-consumption as well as further information: See **climate-solutions.com/energymanagement**.

Fig. 69

Closing the indoor unit

⚠ **Danger**
The absence of system component earthing can lead to serious injury from electrical current and component damage in the event of an electrical fault.
- Before closing the indoor unit, restore all protective conductor connections.
- Check whether equipment and pipe connections are connected to the equipotential bonding of the building. Restore the connections if required.

! **Please note**
If a casing door is not securely closed this can lead to damage from condensation, vibrations and excessive noise.
- Check all-round seal of front panel for damage.
- Close appliance correctly.
- On pipe and hose outlets, ensure the thermal insulation is seated correctly.

Closing the indoor unit (cont.)

Indoor unit: Fitting the front panel

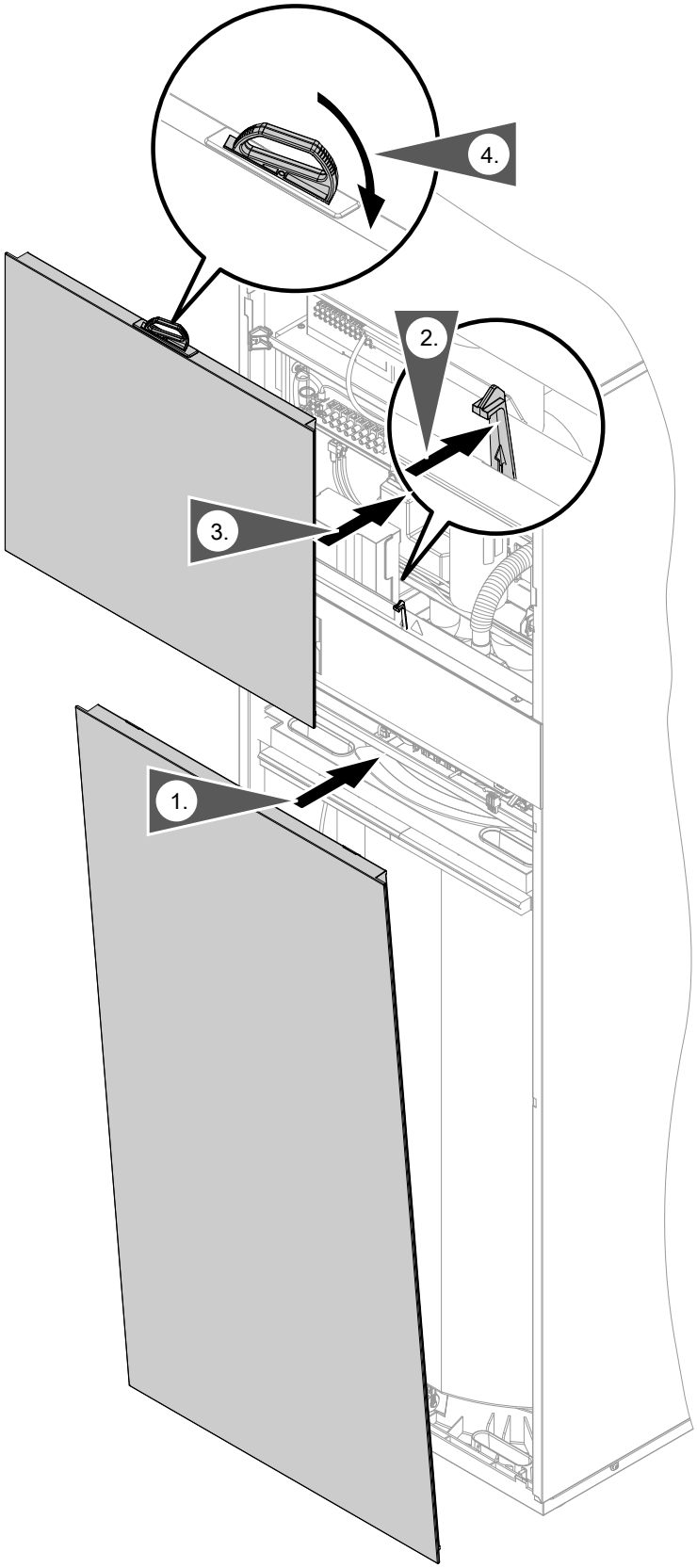


Fig. 70

Closing the outdoor unit

Note
The following information for closing the outdoor unit applies to outdoor units with 1 or 2 fans. The outdoor unit with 2 fans is shown as an example.

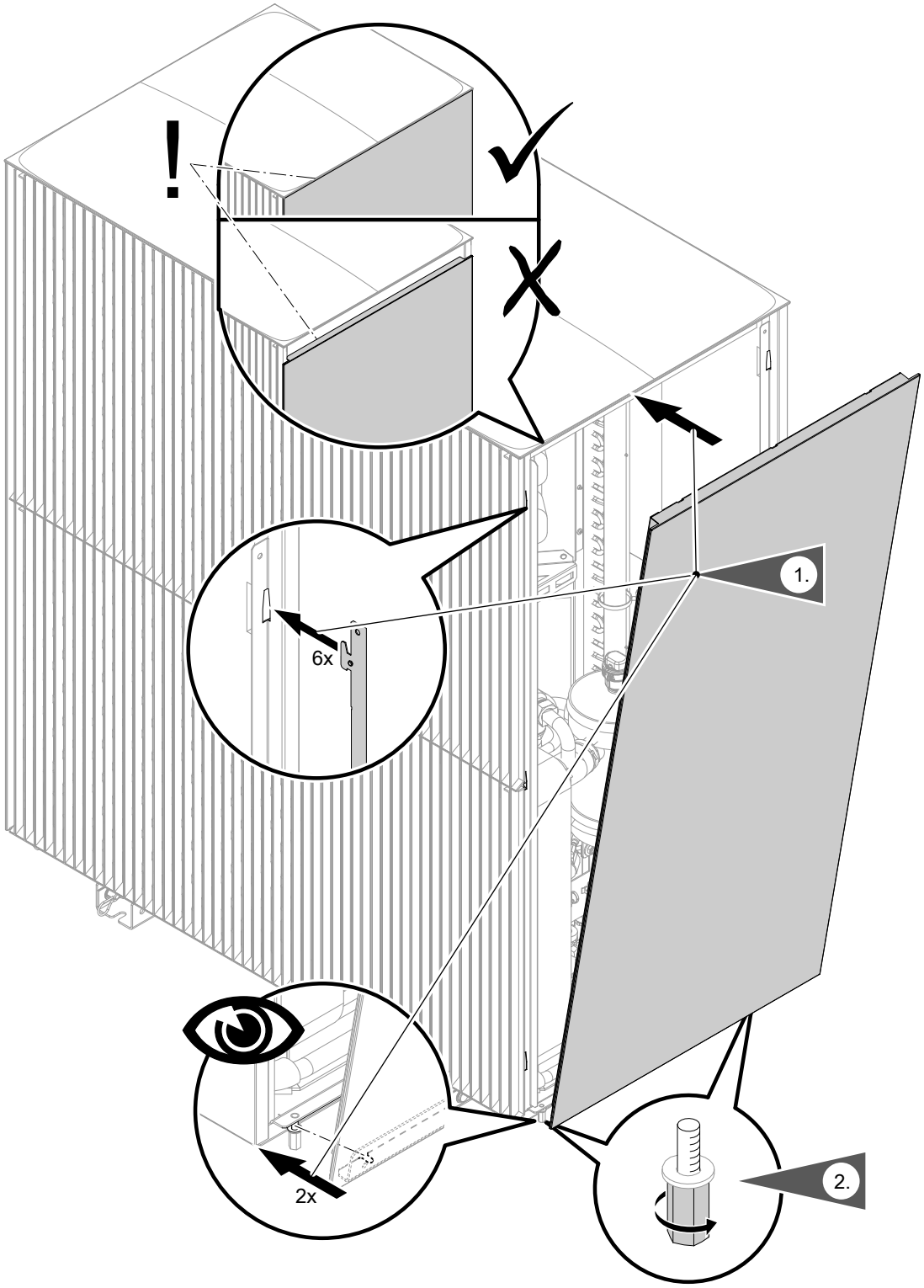
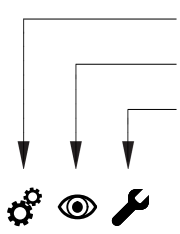


Fig. 71

2. Torque 1.5 +1.0 Nm

Steps - commissioning, inspection and maintenance



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Compiling reports

Enter the readings taken during commissioning in the reports on page 242 onwards and the operator's log (if available).

Sizes 16 to 19 only: Removing the compressor transport bracket

Danger
Operating the outdoor unit with the compressor transport bracket still installed may cause damage to the outdoor unit.
Remove the compressor transport bracket **before** commissioning **and** dispose of it.

Danger
If the compressor transport bracket is re-used, there is a risk of explosion due to defective protection from electrostatic discharge.
Remove the compressor transport bracket **before** commissioning **and** dispose of it.

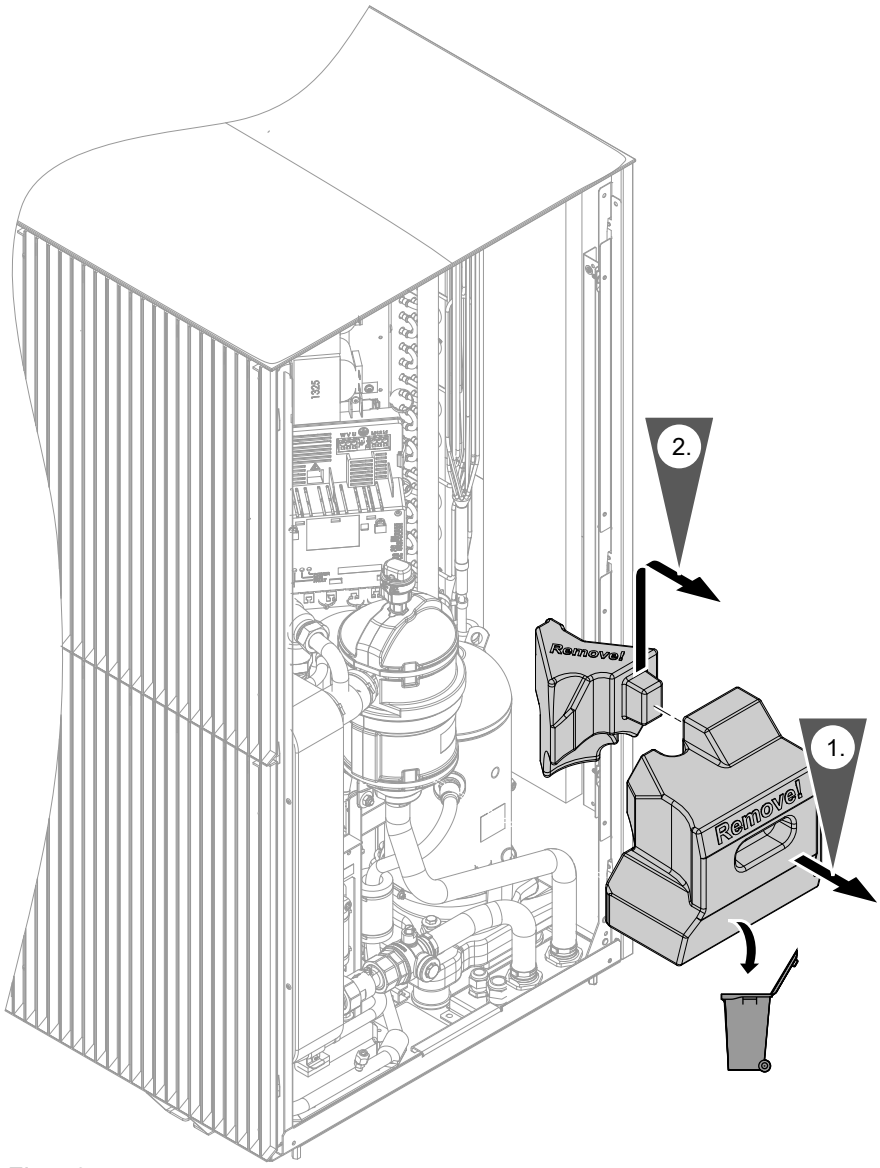


Fig. 72

Commissioning the system

Commissioning requirements

Please note
Commissioning immediately after installation of the outdoor unit can lead to appliance damage. Wait at least **30 min** between installing the outdoor unit and commissioning the heat pump.

- All hydraulic lines are connected to the heat pump and have been checked for leaks.
- The indoor and outdoor units are connected to each other hydraulically.
  For modernisation projects:
  - The system has been thoroughly flushed.
  - A heating water filter (accessories) is installed between the outdoor and indoor units, in the return to the outdoor unit.
- The system is **not** yet filled with heating water.
- All electrical components of the system are connected.
- All CAN bus connections have been made:
  For internal CAN bus: See "Connecting the indoor/outdoor unit CAN bus communication cable".
  For external CAN bus: See "Connecting with other appliances via the CAN bus".
- The indoor unit, the instantaneous heating water heater and the outdoor unit are connected to the mains supply.
- Sizes 16 to 19 only: The compressor transport bracket has been removed.

Credentials for the access point

For commissioning via the ViGuide app, a WiFi connection is established via the heat pump's access point.
Three labels with the credentials required for establishing the connection are attached at the factory to the front of the programming unit. The access code is marked .

Remove these 3 labels. Apply the labels in the following positions:
- For commissioning, affix a label to the place marked on the type plate.
- For later use, affix a label here:

Fig. 73

- Affix a label in the space provided in the operating instructions.

Start sequence for indoor/outdoor units

If this start sequence is not observed, communication errors are displayed and the system does not start.

1. Switch on the power supply at the main fuse.
2. Switch on power supply to indoor unit. Wait until the default display is shown on the HMI programming unit.

Please note
Freezing can cause damage to the heat pump and to the system.
Leave the indoor unit power supply and ON/OFF switch permanently switched on. Only switch off the power supply and ON/OFF switch for short periods, e.g. for work on the heat pump.

Heat pump start-up at outside temperatures below –10 °C
For technical reasons, heat pump start-up is delayed by several minutes in the following cases:
- *When carrying out initial commissioning*
- *After long downtimes*

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Commissioning the system (cont.)

3. Switch on power supply to outdoor unit.

Commissioning the heat pump as a single appliance

Commissioning of the heat pump as a single appliance is carried out via the commissioning assistant. The commissioning assistant can be accessed either via the HMI programming unit or the ViGuide app.

1. **Start the heat pump:**
   It is **essential** to observe the start sequence: See chapter "Start sequence for indoor/outdoor unit".

2. **Start commissioning:**
   Launch the commissioning process on the heat pump via the commissioning assistant:
   - If the heat pump hasn't been switched on yet, the commissioning assistant starts automatically.
   - If the heat pump has already been switched on: See chapter "Calling up the commissioning assistant at a later point".

   - For commissioning via the HMI programming unit: Select **"With programming unit (HMI)"**.
     Or
   - For commissioning via the ViGuide app: Select **"Commissioning with software tool"**. The heat pump automatically activates the access point. A direct WiFi connection to a mobile device is established via the access point. This WiFi connection is independent of the home WiFi network.

3. **Commission and set up the system:**
   - When commissioning via the HMI programming unit:
     See chapter "Commissioning assistant".
     Or
   - When commissioning via the ViGuide app:
     Start the ViGuide app on the mobile device. Follow the instructions.
     - Scan the QR code on the label.
       Or
     - Enter the name of the access point (SSID) and the password ("WPA2"). SSID and WPA2: See label.

     Perform all necessary settings in the ViGuide app.

   Note
   Depending on the heat generator type, the accessories connected and other settings, not all menu points are displayed.

4. **Further settings via the ViCare app:**
   The heat pump must be connected to the server via the internet in order to perform settings via the ViCare app. This internet connection is established via the home WiFi.
   To set up the internet connection:

   Operating instructions

Commissioning the heat pump in a system network

In a system network, all appliances with the same control platform can be commissioned using the **ViGuide app** via the access point of the heat pump (main appliance).

Note
The ViGuide app for commissioning and servicing is available for iOS and Android devices.

Download on the App Store

GET IT ON Google Play

Alternatively, the heat pump can be commissioned via the heat pump **HMI** programming unit. The other appliances in the system network can then be commissioned using the ViGuide app or, in the case of the following external heat generators, also via the HMI programming unit:
- Vitodens 200-W, type B2HH
  And
  Vitodens 300-W, type B3HH
- With hybrid extension set (accessories):
  Vitodens 200-W, types B2HE and B2HF
  And
  Vitodens 300-W, types B3HF and B3HG

In conjunction with a photovoltaic system
Vitocharge VX3 can only be put into operation with the ViGuide app.

Commissioning the system (cont.)

1. Where one or more of the other appliances have already been operational as a single appliance, **first** restore the factory settings on these appliances.

   Installation and service instructions of the relevant appliance

2. **Switch the appliance on:**
   - Switch on all appliances in the system network.
   - It is **essential** to observe the start sequence for the heat pump: See chapter "Start sequence for indoor/outdoor units".

3. **Start commissioning on the heat pump (main appliance):**
   Launch the commissioning process on the heat pump via the commissioning assistant:
   - If the heat pump hasn't been switched on yet, the commissioning assistant starts automatically.
   - If the heat pump has already been switched on: See chapter "Calling up the commissioning assistant at a later point".

   - For commissioning via the HMI programming unit: Select **"With programming unit (HMI)"**.
     Or
   - For commissioning via the ViGuide app: Select **"Commissioning with software tool"**. The heat pump automatically activates the access point. A direct WiFi connection to a mobile device is established via the access point. This WiFi connection is independent of the home WiFi network.

   The connected additional appliances detect the connection to the heat pump (main appliance). Some appliances indicate on the HMI programming unit that connection was successful.

4. **Carry out commissioning of the heat pump (main appliance) again:**
   - When commissioning via the **HMI programming unit**:
     See chapter "Commissioning assistant".
     Or
   - When commissioning via the **ViGuide app**:
     Start the ViGuide app on the mobile device. Follow the instructions.
     - Scan the QR code on the label.
       Or
     - Enter the name of the access point (SSID) and the password ("WPA2"). SSID and WPA2: See label.

     Perform all necessary settings in the ViGuide app.

5. **Commission and set up further appliances in the system network:**
   When commissioning using the HMI programming unit of the above-mentioned Vitodens:
   - The commissioning assistant on the Vitodens starts automatically.
   - Follow the commissioning assistant.

     Vitodens installation and service instructions

   When commissioning via the ViGuide app:
   - Commission all further appliances via the heat pump's access point using the ViGuide app.
   - Start the ViGuide app on the mobile device. Follow the instructions.
     Perform all necessary settings in the ViGuide app.

6. **Further settings via the ViCare app:**
   The heat pump must be connected to the server via the internet in order to perform settings via the ViCare app. This internet connection is established via the home WiFi.
   To set up the internet connection:

   Operating instructions

Examples of the commissioning of a system network:
Separate instructions "Sample applications for commissioning appliances in a system network"

Commissioning the system (cont.)

Setting up the internet connection

For maintenance and service via ViGuide and for operation via the app, an internet connection between the heat pump and the server is required.

To set up the internet connection:
Operating instructions

Calling up the commissioning assistant at a later point

If you need to continue commissioning later, the commissioning assistant can be restarted at any time.

Tap the following buttons:

1. ☰
2. **"Service"**
3. Enter password **"viservice"**.
4. Use ✔ to confirm.
5. **"Commissioning"**

Commissioning assistant: Procedure

Commissioning	Explanations and references
Language	Select the required menu language for the programming unit.
Commissioning tool ▪ With programming unit (HMI) ▪ Commissioning with software tool	 Commissioning is continued with the programming unit. The access point of the heat pump is switched on automatically. For the next commissioning steps, follow the instructions in ViGuide.
Demo operation	In demo operation, sensor values and hydraulic settings are simulated. The activated demo operation can be terminated from the Service menu. Upon return to normal operation, a restart is carried out.
Language	Select the required menu language for the programming unit.
Country	Select the country of installation.
Date and time	Set the date and time.
Units of measurement	Select the system of units.
Altitude	Set the geographical height of the installation location.
Installation conditions of outdoor unit ▪ Yes, installation conditions have been met ▪ No, the installation conditions have not been met.	Installation conditions of outdoor unit: See installation information. Continue commissioning with the outdoor unit. Commission the system without the outdoor unit, e.g. for screed drying: ▪ Room heating via the integral instantaneous heating water heater ▪ No room cooling ▪ DHW heating via the integral instantaneous heating water heater

Commissioning the system (cont.)

Commissioning	Explanations and references
Refrigerant circuit installation	
▪ Yes, enable outdoor unit	The outdoor unit is installed in accordance with these installation and servicing instructions and ready for operation: Continue commissioning.
▪ No, continue with deactivated outdoor unit.	Outdoor unit not ready for operation: ▪ Room heating via the integral instantaneous heating water heater ▪ No room cooling ▪ DHW heating via the integral instantaneous heating water heater
Safety information	The safety information must be confirmed in order for commissioning to continue.

System scheme	Explanations and references
Low loss header/buffer cylinder	Configuration in accordance with system equipment (in conjunction with external buffer cylinder)
▪ Not available	
▪ Buffer cylinder, heating only	System with heating water buffer cylinder with 1 buffer temperature sensor
▪ Buffer cylinder with heating and cooling	System with heating/cooling water buffer cylinder with 1 buffer temperature sensor

Commissioning the system (cont.)

System scheme	Explanations and references
Heating/cooling circuit 1 to Heating/cooling circuit 4	Configuring the heating/cooling circuits
▪ Function	▪ Not available ▪ Heating/cooling circuit without mixer ▪ Heating/cooling circuit with mixer (not for heating/cooling circuit 1)
▪ Operating mode	▪ Heating only ▪ Cooling only An external buffer cylinder (if installed) must be configured for "Heating and cooling". ▪ Heating and cooling An external buffer cylinder (if installed) must be configured for "Heating and cooling".
▪ Type	Type of energy distribution, e.g. radiators, underfloor heating ***Note*** *If the "Cooling only" or "Heating and cooling" operating mode is selected, the "Radiator" type cannot be selected.*
▪ Control method	▪ Weather-compensated without room temperature hook-up ▪ Weather-compensated with room temperature hook-up Only in conjunction with a room temperature sensor: This room temperature hook-up is enabled and set via additional parameters for the "room temperature influence". The higher the room temperature influence is set, the greater the adjustment of the set flow temperature will be. ▪ Weather-compensated with external room temperature hook-up A room thermostat must be connected to switching contact 143.2: See chapter "230 V~ junction box: 230 V~ function components and switching contacts". – Contact closed: Room heating – Contact open: No room heating No frost protection for the heating/cooling circuit Further required setting: **"Digital input 1"** > **"External room temperature hook-up"** ***Note*** *If only 1 of the max. 4 heating/cooling circuits is connected, it is connected directly to digital input 143.2 of the heat pump control unit. If 2, 3 or 4 heating/cooling circuits are connected, connections to the EM-EA1 extension are required: See chapter "Functions of the digital inputs"*
DHW	System components for DHW heating
▪ Not available	System without DHW heating
▪ Cylinder with one sensor	DHW cylinder with 1 cylinder temperature sensor
▪ Cylinder with one sensor and DHW circulation pump	DHW cylinder with 1 cylinder temperature sensor and DHW circulation pump

Filling assistant	Explanations and references
System pressure	Select the system pressure values.
▪ Set value	Set value of the heating water side system pressure in bar
▪ Range	Tolerance range of the system pressure in bar: If this value deviates for a determined period by more than the given range, warning message A.11 is displayed.

Commissioning the system (cont.)

Filling assistant	Explanations and references
Filling ▪ Filling DHW ▪ Filling defrost buffer ▪ Filling heating/cooling circuit 1	Fill the system with heating water. See chapter "Filling the consumer circuits".
▪ Building up the system pressure	See chapter "Building up the system pressure".
Air vent valve	The system is vented via air vent valves in the indoor and outdoor unit: ▪ Automatic quick-action air vent valve in the outdoor unit on the float air vent valve ▪ Automatic air vent valve on the heating circuit pump of the indoor unit ▪ Manual air vent valve on the internal buffer cylinder Venting function: See chapter "Venting the system". ***Note*** *If the outdoor unit is not yet connected, connect both the flow and return connections of the outdoor unit to the indoor unit on site. Vent via the air vent valve on the integral buffer: See chapter "Operation without outdoor unit".* ***Note*** ▪ *The venting process can take up to 20 min.* ▪ *Only release the transport bracket after successful venting: See chapter "Releasing the outdoor unit transport bracket".*

Extensions	Explanations and references
Smart Grid	Activation of power-OFF or Smart Grid: Connection of floating contacts of the power supply utility, terminals 143.4 and 143.5: See chapter "230 V~/400 V~ terminal area". Overview of the settings depending on the connection: See chapter "Explanation of the operating states for power-OFF, output restriction, Smart Grid" Smart Grid, power-OFF and output restriction can be combined. ***Smart Grid in conjunction with Energy Management (EMS)*** *As an alternative to connecting Smart Grid via switching contacts, Smart Grid can be activated via Energy Management (EMS). The system is integrated into Energy Management (EMS) via EEBUS.* *The output restriction is set during commissioning via the ViGuide app. Changes to the output restriction via the HMI programming unit terminate communication via EEBUS with Energy Management (EMS). To restore communication via EEBUS, commissioning must be carried out again via the ViGuide app.*
▪ Inactive	Neither power-OFF nor Smart Grid is connected.
▪ Grid-Lock	Power-OFF via floating contact 143.4
▪ SG Ready via floating contacts	Smart Grid and power-OFF or Smart Grid and output restriction via the floating contacts 143.4 and 143.5

Commissioning the system (cont.)

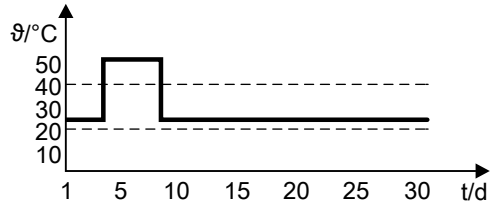
Extensions	Explanations and references
Output restriction	Instead of being switched off completely (power-OFF), the output of the heat pump and instantaneous heating water heater is restricted. The calculated or specified output restriction for the system is set in **"Default value reference restriction"**. ▪ If only contact 143.4 is connected, the heat pump is operated with the set restricted output during the power-OFF time with demand. ▪ When both contacts 143.4 and 143.5 are connected, the heat pump is operated in accordance with the specifications for Smart Grid: See chapter "Operating states of the heat pump". Connection of floating contacts of the power supply utility, terminals 143.4 and 143.5 in the 230 V~/400 V~ terminal area Overview of the settings depending on the connection: See chapter "Explanation of the operating states for power-OFF, output restriction, Smart Grid"
▪ Inactive	No output restriction
▪ Floating contacts	▪ Output restriction via floating contact 143.4 or ▪ Output restriction and power-OFF via floating contacts 143.4 and 143.5 or ▪ Smart Grid and output restriction via floating contacts 143.4 and 143.5
Default value reference restriction	The calculated or specified output restriction for the system is set here, in the **"Floating contacts"** setting under **"Output restriction"**.
Electric booster heater	Enabling the integral instantaneous heating water heater
▪ Not available	The instantaneous heating water heater is not enabled for room heating or DHW heating: Instantaneous heating water heater only is switched on only for frost protection of the heat pump and the system.
▪ Heating only	The instantaneous heating water heater only is switched on for room heating, e.g. if the heat pump output is insufficient.
▪ DHW only	The instantaneous heating water heater only is switched on for DHW reheating, e.g. if the set DHW temperature value is not reached with the heat pump alone.
▪ Heating and DHW	The instantaneous heating water heater only is switched on for room heating and DHW reheating, e.g. if the heat pump output is insufficient.
▪ Maximum output, electric booster heater	Output restriction for the instantaneous heating water heater Depending on the power supply to the instantaneous heating water heater, the max. output must be limited as follows: Max. output with 230 V~ power supply ▪ 1-phase: 3 kW ▪ 2-phase: 6 kW ▪ 3-phase: 8 kW Max. output with 400 V~ power supply ▪ 2-phase: 6 kW ▪ 3-phase: 8 kW
▪ Stop limit for electric booster heater	Stop limit: If the outside temperature exceeds the set temperature limit, the instantaneous heating water heater is **not** switched on. ▪ Activate or deactivate the function with ON/OFF. ▪ The temperature limit can only be adjusted if the function is enabled.

Commissioning the system (cont.)

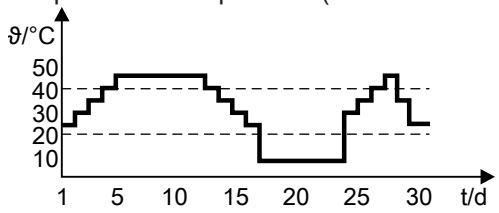
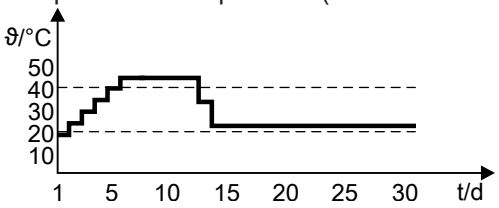
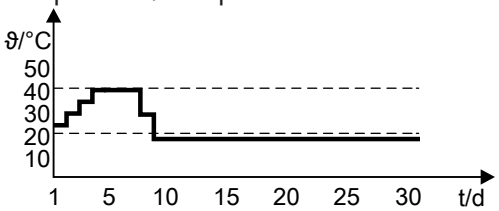
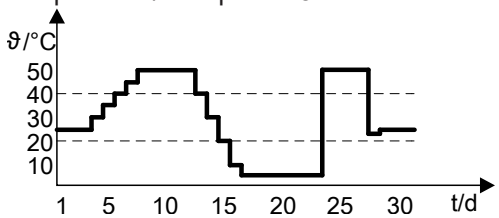
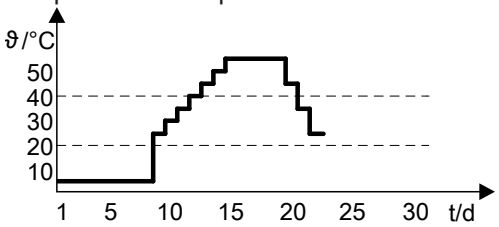
Extensions	Explanations and references
Digital input 1	Function of the floating contact at terminal 143.2 in the 230 V~/400 V~ terminal area
▪ No function	No floating contact connected
▪ External demand, DHW circulation pump	If the connected button is pressed, the DHW circulation pump runs for 5 min.
▪ Blocking the heating/cooling circuit	If the temperature limiter to restrict the maximum temperature for underfloor heating circuit 1 responds, the room heating for this heating/cooling circuit is switched off.
▪ External room temperature hook-up	Weather-compensated control with external room temperature hook-up A room thermostat must be connected to contact 143.2. Further required setting: **"Regulation type"** > **"Weather-compensated with room temperature hook-up"** ***Note*** *If the external room temperature demand is only connected for 1 of the max. 4 heating/cooling circuits, the room thermostat of this heating/cooling circuit is connected directly to digital input 143.2 of the heat pump control unit. If the external room temperature demand for 2, 3 or 4 heating/cooling circuits is connected, connections to the EM-EA1 extension are required: See chapter "Functions of the digital inputs"*
▪ External blocking	Refrigerant circuit and instantaneous heating water heater are blocked.
Digital input 2	Function of the floating contact at terminal 143.3 in the 230 V~/400 V~ terminal area
▪ No function	No floating contact connected
▪ Fault message input	Fault message from an additional appliance in the system network, e.g. inverter
▪ External demand, flow temperature, heating	Only in conjunction with a heating/cooling water buffer cylinder: External demand for room heating from an additional consumer circuit, e.g. swimming pool When the contact is closed, the heating/cooling water buffer cylinder is heated to the temperature set value. ▪ Room heating independent of the time program ▪ The fixed flow temperature for the consumer circuit can be set. ***Note*** ***"External demand, flow temperature, heating"*** *via digital input 143.3* ***cannot*** *be combined with* ***"External set flow temperature of the heat generator 0-10V"*** *via the EM-EA1 extension (connection 0 to 10 V). Only one of the two connections is possible.*
▪ External switch, heating/cooling	Only in conjunction with a heating/cooling water buffer cylinder: External operating program changeover for switching between heating mode and cooling mode via an external switch as an alternative option to setting via the **"buffer mode"** menu. A switch must be connected to switching contact 143.3. ***Note*** *Not possible with external demand for a set flow temperature via a 0 to 10 V signal from the EM-EA1extension (DIO electronics module)*

Commissioning the system (cont.)

Extensions	Explanations and references
EM-EA1 (DIO): Function selection	Enabling the function connected to the EM-EA1 extension
▪ Not available	No EM-EA1 extension connected
▪ External set flow temperature of the heat generator 0-10V	External demand for a set flow temperature via a 0 to 10 V signal Installation and service instructions for the "EM-EA1 extension" ***Note*** ***"External set flow temperature of the heat generator 0-10V"*** *via the EM-EA1 extension (connection 0 to 10 V)* ***cannot*** *be combined with* ***"External demand, flow temperature, heating"*** *via digital input 143.3. Only one of the two connections is possible.*
▪ External room temperature hook-up, heating/cooling circuits 1-4	Weather-compensated mode with external room temperature hook-up Assignment of the connected room thermostats of the heating/cooling circuits to contacts DI1 to DI3 of the EM-EA1 extension. ***Note*** ▪ *If only 1 of the max. 4 heating/cooling circuits is connected, it is connected directly to digital input 143.2 of the heat pump control unit.* ▪ *If 2, 3 or 4 heating/cooling circuits are connected, connections to the EM-EA1extension are required. Regardless of how many heating/cooling circuits are connected, the assignment to the contacts is as follows:* *Heating/cooling circuit 1: DI1 of the EM-EA1 extension* *Heating/cooling circuit 2: DI2 of the EM-EA1 extension* *Heating/cooling circuit 3: DI3 of the EM-EA1 extension* *Heating/cooling circuit 4: Digital input 143.2 of the heat pump control unit* *If, for example, only heating/cooling circuits 1 and 3 are connected, the connection for both heating/cooling circuits is made to the EM-EA1extension and contacts DI1 and DI3.*

System configuration	Explanations and references
Low-noise mode	Outdoor unit low-noise mode: During low-noise mode, the compressor and fan are operated at reduced speed.
▪ Function	Enable/disable low-noise mode.
▪ Time program	Set the time program for low-noise mode: See operating instructions.
▪ Adjustable by system user	Enable setting of the time program for low-noise mode by the system user.
Screed drying	If a profile is selected, screed drying begins with the respective temperature/time profile, after the commissioning assistant finishes.
▪ Not active	Screed drying is not switched on.
▪ Profile A	Temperature/time profile 1 (in acc. with EN 1264-4) 

Commissioning the system (cont.)

System configuration	Explanations and references
▪ Profile B	Temperature/time profile 2 (in acc. with ZV parquet and flooring technology) 
▪ Profile C	Temperature/time profile 3 (in acc. with ÖNORM) 
▪ Profile D	Temperature/time profile 4 
▪ Profile E	Temperature/time profile 5 
▪ Profile F	***Note*** *This profile ends after 21 days.* Temperature/time profile 6 
Abort startup	▪ Use ✓ to restart the system. ▪ Use ✗ to return to system configuration

Installing and connecting the wireless remote control (accessories)

Installation and service instructions for the wireless remote control

The appliance, e.g. heat generator or ventilation unit, is connected to the wireless remote control via low power radio.

Note
The wireless remote control is commissioned via the ViGuide app.

Filling the system

The filling of the system is menu-guided with the commissioning assistant.

! **Please note**
Filling and venting the system with the transport bracket loose can cause damage to the outdoor unit.
Before filling and venting the system, check whether the transport bracket is secured: See page 53.

Fill and top-up water

Do not use antifreeze (e.g. water/glycol mixture) in the heating water.

! **Please note**
Ungeeignetes Füll- und Ergänzungswasser fördert Ablagerungen und Korrosionsbildung. Dadurch können sich die Leistungswerte der Wärmepumpe vermindern oder Schäden an der Anlage entstehen, insbesondere am gegebenfalls eingebauten Heizwasser-Durchlauferhitzer.
- Flush the heating system thoroughly before filling.
- Only fill with water of potable quality.
- Use only softened fill and top-up water complying with VDI 2035.

For further information about fill and top-up water: See technical guide "Heat pump principles".

We recommend filling the entire system with potable quality water first.

Treat the heating water with one of the following options:
- Direct filling via descaling system while maintaining the minimum flow rate
- Filling with purge pump and treated water
- Filling with circulation process between flow and return

Filling the consumer circuits

DHW circuit (**"Filling DHW"**), integral buffer cylinder (**"Filling defrost buffer"**) and heating/cooling circuits (**"Filling heating/cooling circuit"**) are filled in turn.

Filling starts automatically, once **"Filling assistant"** has been called up in the commissioning assistant.

Filling the system (cont.)

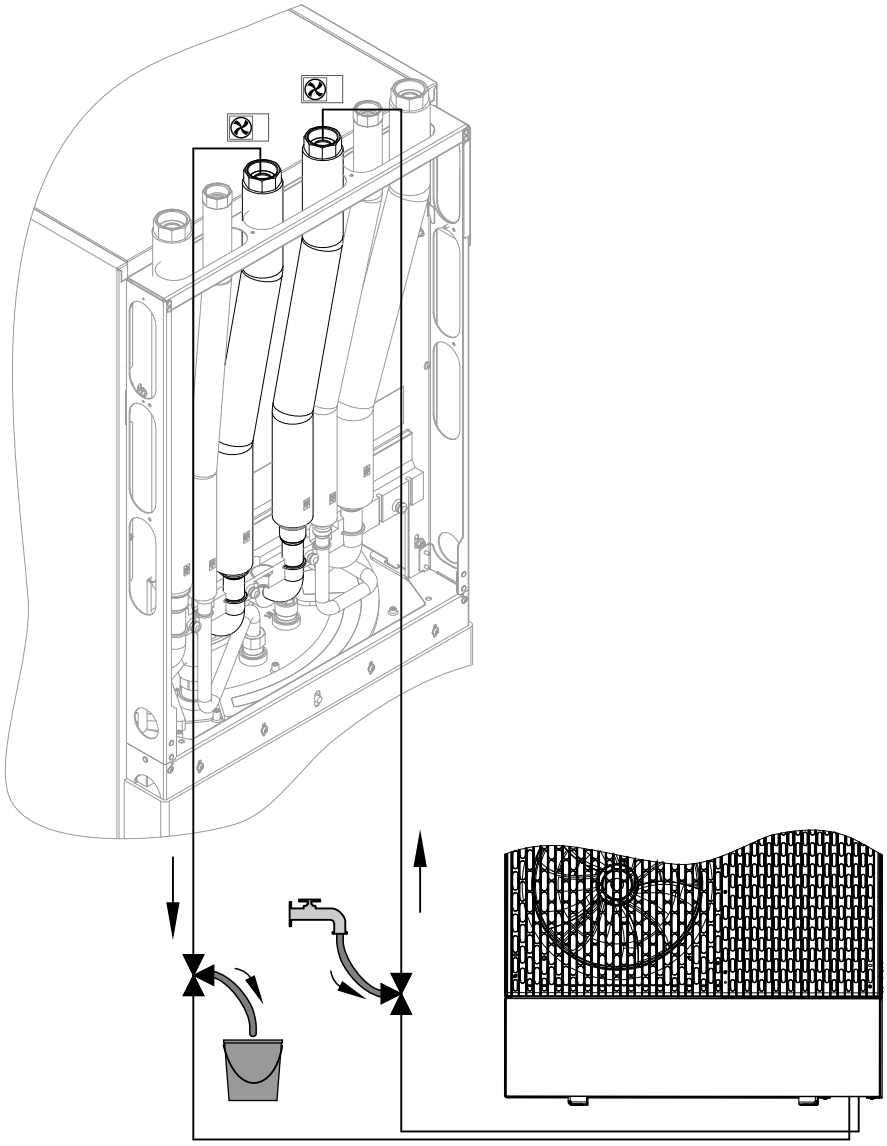


Fig. 74

1. Connect the fill hose to the 3-way ball valve in the outdoor unit flow of the installation aid (indoor unit heating water inlet).

2. Connect the drain hose to the 3-way ball valve in the outdoor unit return of the installation aid (indoor unit heating water outlet). Route the hose into a suitable container or drain outlet.

3. Open the 3-way ball valves in the outdoor unit flow and return as shown in the previous diagram:
   Open in all directions
   Allow the heating water to flow in via the fill hose.

   Required flow rate for filling with heating water:
   - Min. 300 l/h
   - Max. 1500 l/h

   Charge pressure: 0.3 to 0.5 bar (30 to 50 kPa) higher than the pre-charge pressure of the integral expansion vessel (if installed)
   Factory-set pre-charge pressure of the integral expansion vessel: 0.75 bar (0.075 MPa) to 0.95 bar (0.095 MPa)

4. Start the filling process in the commissioning assistant.
   The filling of the 1st consumer circuit begins.

Filling the system (cont.)

5. As soon as air bubbles stop coming out of the drain hose, start the filling of the next consumer circuit with ✔.
6. After filling all consumer circuits, end the filling process with ✔.
   The commissioning assistant switches to building up the system pressure.
7. Close both 3-way ball valves.
8. Remove the fill and drain hoses.
9. Clean the heating water filter in the outdoor unit return: See chapter "Cleaning the filter in the ball valve".

Calling up the filling function

To activate this function, start the commissioning assistant.

See page 107.

Building up the system pressure

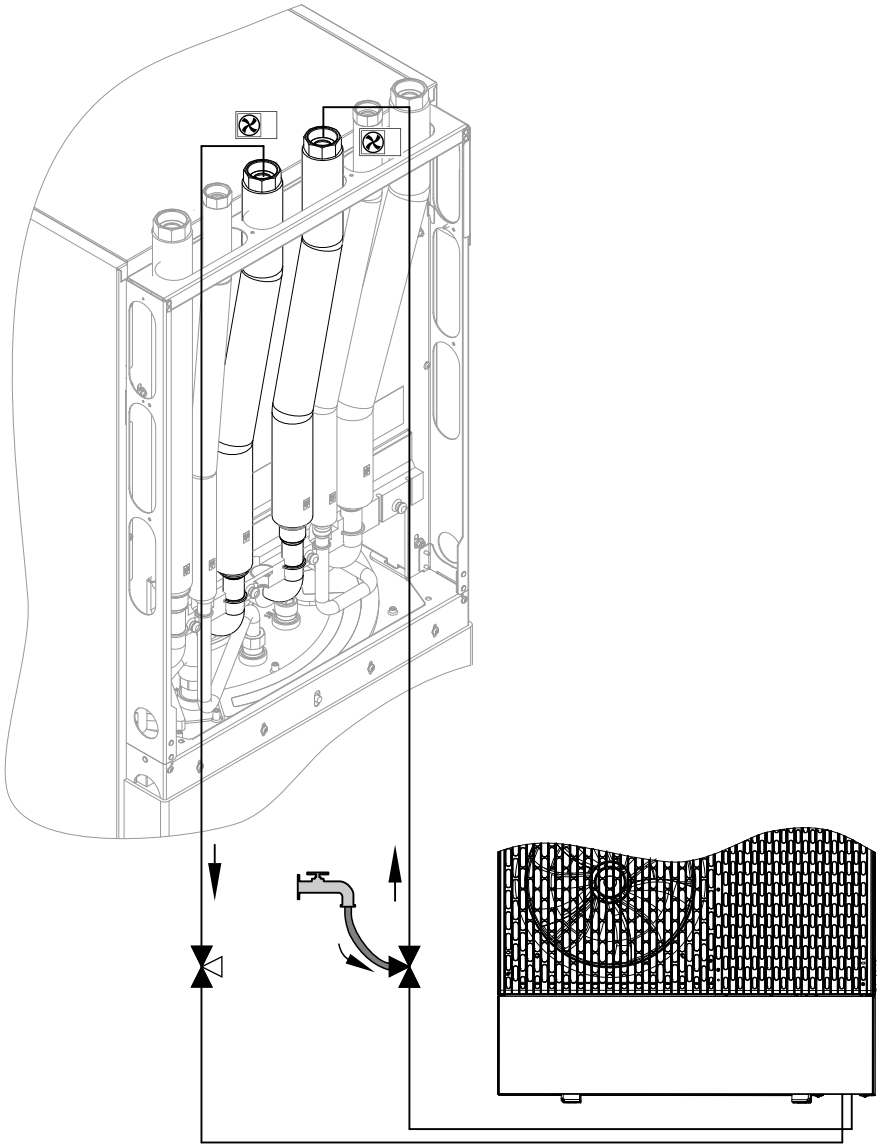


Fig. 75

Filling the system with the filling function is completed.

The **"Build system pressure"** function then starts automatically.

Building up the system pressure (cont.)

1. Connect the fill hose to the 3-way ball valve in the outdoor unit flow of the installation aid (indoor unit heating water inlet).
2. Open the 3-way ball valve in the outdoor unit flow of the installation aid (indoor unit heating water inlet) as shown in the previous diagram: **Open in all directions**
3. Open the 3-way ball valve in the outdoor unit return of the installation aid (indoor unit heating water outlet): See previous diagram.
4. Allow the heating water to flow in slowly via the fill hose.
   Check the system pressure on the display.
5. As soon as the required system pressure has been reached, end the process in the commissioning assistant.
6. Close the 3-way ball valve in the outdoor unit flow of the installation aid (indoor unit heating water inlet) in the direction of the fill hose. The flow direction from the outdoor unit to the indoor unit remains open.
   Remove the fill hose.
7. Check the internal and on-site hydraulic connections for leaks.
   Recommended test pressure: 2 to 2.5 bar (0.2 to 0.25 MPa)

   ⚠ **Danger**
   There is a risk of electric shock from escaping heating water or DHW.
   Check all water side connections for leaks.

   ! **Please note**
   Leaking hydraulic connections lead to appliance damage.
   - Check the internal and on-site hydraulic connections for leaks.
   - In the event of leaks, switch off the appliance immediately. Drain the heating water. Check the seating of seal rings. **Always** replace displaced seal rings.
8. Thermally insulate the hydraulic connections.

Refilling device (on site)
In conjunction with a refilling device, the filling pressure must be limited to 2.5 bar (0.25 MPa). The integral safety valve responds at a higher filling pressure.

Activate system pressure function

To activate this function, start the commissioning assistant.

See page 107.

Venting the system

1. In the commissioning assistant, the **"Venting"** function can be started directly after filling:
   Confirm the query **"Would you like to continue with the venting program?"** with ✔.
2. After the **"Venting"** function is started, the entire system is automatically vented via air vent valves in the indoor and outdoor unit:
   - Quick-action air vent valve in the outdoor unit on the float air vent valve
   - Automatic air vent valve on the heating circuit pump of the indoor unit

   For this the 4/3-way valve moves through different positions in turn.
3. The **"Venting"** function ends automatically.
   The display shows the system pressure.
   The venting process can take up to 20 min.

   Note
   - *In the case of a large system pressure drop, top up with water immediately to restore the system pressure: See chapter "Building up the system pressure".*
     Maintain a minimum system pressure of 0.8 bar (80 kPa) even during venting.
   - *Only release the transport bracket after successful venting: See chapter "Releasing the outdoor unit transport bracket".*

If required, the manual air vent valve on the internal buffer cylinder can also be used for venting: For the position, see chapter "Indoor unit maintenance", "Overview of internal components".

Venting the system (cont.)

Please note
Water splashes can cause electrical faults.
Protect the electrical components of the heat pump from water splashes. To vent, connect the hose to the manual air vent valve.

Activating the venting function

To activate this function, start the commissioning assistant.
See page 107.

Note
Once the system has been filled, pressurised to the system pressure and vented, the flow rate can be set: See chapter "Setting max. flow rate manually" on page 132.

Opening the heat pump

Danger
Contact with live components can lead to serious injury from electric current. Some components on PCBs remain live even after the power supply has been switched off.
- **Never touch** electrical terminal areas.
- When working on the indoor or outdoor unit, isolate the system from the power supply, e.g. at a separate fuse or a main switch. Check that no installed power circuits of the indoor and outdoor unit are still live. Safeguard against unauthorised reconnection.
- Prior to working on the appliance, wait at least 4 min until the voltage has completely dropped out.

Danger
The absence of system component earthing can lead to serious injury from electrical current and component damage in the event of an electrical fault.
All earth conductor connections **must** be reconnected.
The appliance and pipework must be connected to the equipotential bonding of the building.

Please note
Refrigerant can escape when working on the refrigerant circuit.
- It is essential that regulations and guidelines on handling refrigerant are always observed and adhered to: See "Safety instructions".
- Work on the refrigerant circuit must **only** be carried out by a certified contractor (in accordance with Regulations (EU) 2024/573 and (EU) 2015/2067).

Opening the indoor unit

See page 45.

Opening the outdoor unit

See page 52.

Checking the expansion vessel and system pressure

- Use the calculation to EN 12828 to check whether the installed expansion vessel is adequate for the system water volume.
  If the expansion vessel fitted is insufficient, equip the secondary circuit on site with an additional expansion vessel.
- Check the pre-charge pressure of the expansion vessel once a year.
  Carry out this test on a cold system.

1. Drain the system until "0" is shown on the pressure indicator.

   Checking the system pressure
   Operating instructions

2. If the pre-charge pressure of the expansion vessel is lower than the static system pressure: Top up with nitrogen at the valve of the diaphragm expansion vessel until the pre-charge pressure is 0.1 to 0.2 bar (10 to 20 kPa) higher than the static system pressure.

   Note
   - *Do not allow the pre-charge pressure to fall below 0.7 bar (70 kPa) (boiling noises).*
   - *Factory-set pre-charge pressure: 0.75 to 0.95 bar (75 to 95 kPa)*

3. Top up with water until the charge pressure of the cooled system is at least 1.0 bar (0.1 MPa), and is 0.3 to 0.5 bar (30 to 50 kPa) higher than the pre-charge pressure of the expansion vessel: See chapter "Filling the system".
   Permiss. operating pressure: 3 bar (0.3 MPa)

Refilling device (on site)
In conjunction with a refilling device, the filling pressure must be limited to 2.5 bar (0.25 MPa). The integral safety valve may respond at a higher filling pressure.

Filling and venting the DHW cylinder on the DHW side

1. Open all DHW draw-off points in the building.

2. Open the on-site drinking water supply.

3. Once air stops coming out of the DHW draw-off point, the DHW cylinder is completely filled.

Testing the anode connection

Check that the earth cable is connected to the protective magnesium anode.

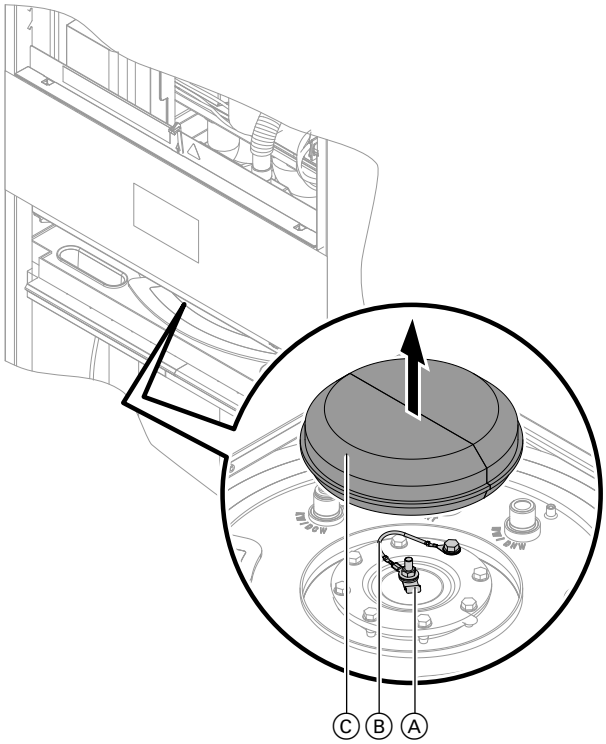


Fig. 76

Ⓐ Protective magnesium anode
Ⓑ Earth cable
Ⓒ Thermal insulation

Checking the anode earth current with an anode tester

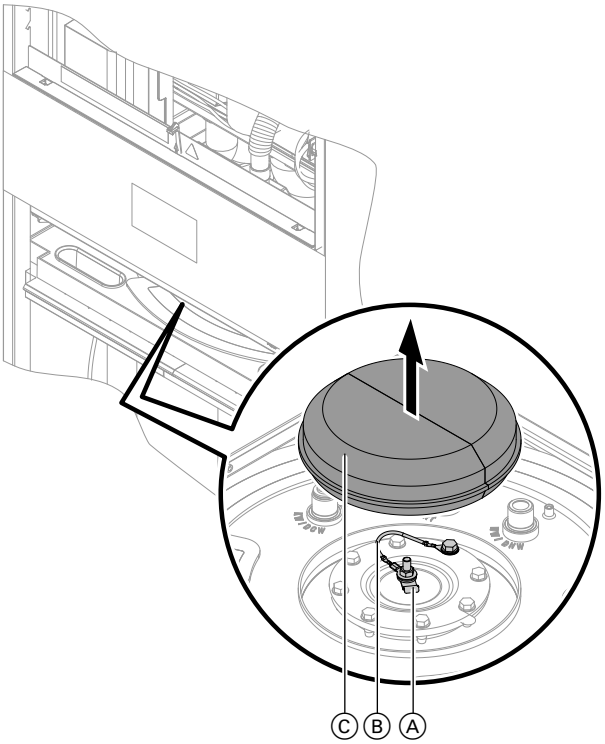


Fig. 77

Ⓐ Protective magnesium anode
Ⓑ Earth cable
Ⓒ Thermal insulation

Remove the earth cable. Connect the measuring device to the push-on tab of the protective magnesium anode and the earth cable in series.
Use the measuring device in the measuring range up to 5 mA.

Anode earth current	Protective magnesium anode
> 0.3 mA	Function OK
< 0.3 mA	Visual inspection required: See chapter "Checking the protective magnesium anode".

Checking the protective magnesium anode

We recommend replacing the protective magnesium anode once it has been reduced to a diameter of 10 to 15 mm.

Replacing the protective magnesium anode

Note
If the protective magnesium anode needs to be replaced, a maintenance-free impressed current anode (accessories) can be used.

For removal of the protective magnesium anode: See diagram in chapter "Cleaning the DHW cylinder".

Draining the heat pump on the DHW side

Please note
Negative pressure in the DHW cylinder can cause material damage.
The air vent valve must always be open when draining the DHW cylinder with a suction pump.

Draining the heat pump on the DHW side (cont.)

DHW cylinder with drain valve

1. Shut off the drinking water supply.

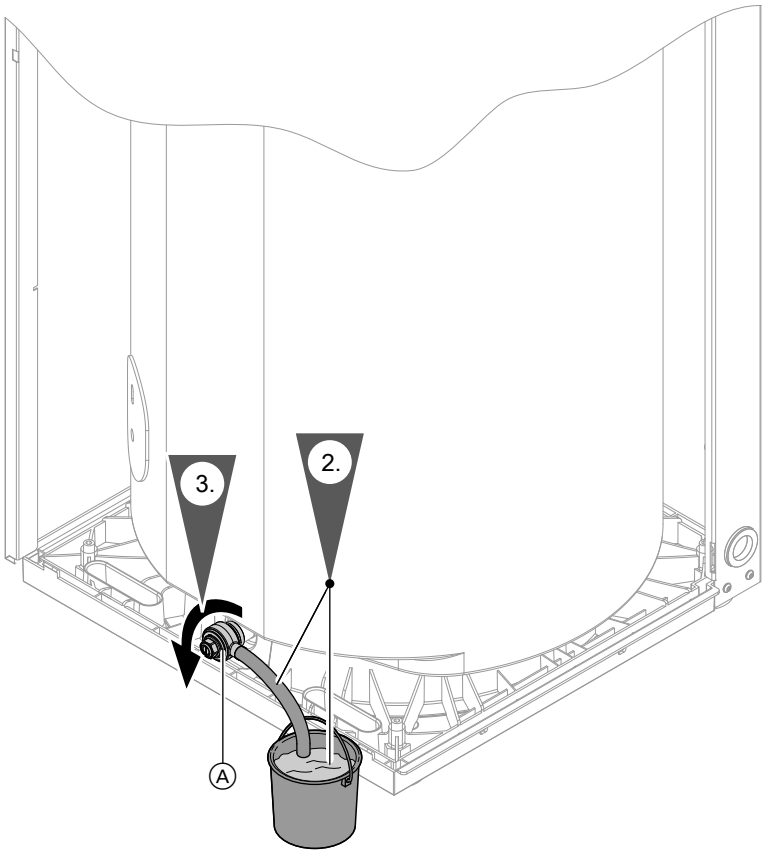


Fig. 78

2. Connect a hose to drain valve Ⓐ of the DHW cylinder.

3. Ensure adequate ventilation in the DHW pipework. Do this by opening a cold and hot water tap.

4. Open the drain valve.

Checking all connections on the heating water and DHW sides for leaks

⚠ **Danger**
There is a risk of electric shock from escaping heating water or DHW.
When commissioning and after carrying out maintenance work, check all water side connections for leaks.

! **Please note**
Leaking hydraulic connections lead to appliance damage.
- Check the internal and on-site hydraulic connections for leaks.
- In the event of leaks, switch off the appliance immediately. Drain the heating water. Check the seating of seal rings. **Always** replace displaced seal rings.

Releasing the outdoor unit transport bracket

Please note
Premature loosening of the transport bracket may cause damage to the outdoor unit.
- Only release the transport lock once the system has been completely filled and vented.
- Re-engage the transport lock **before** topping up heating water.

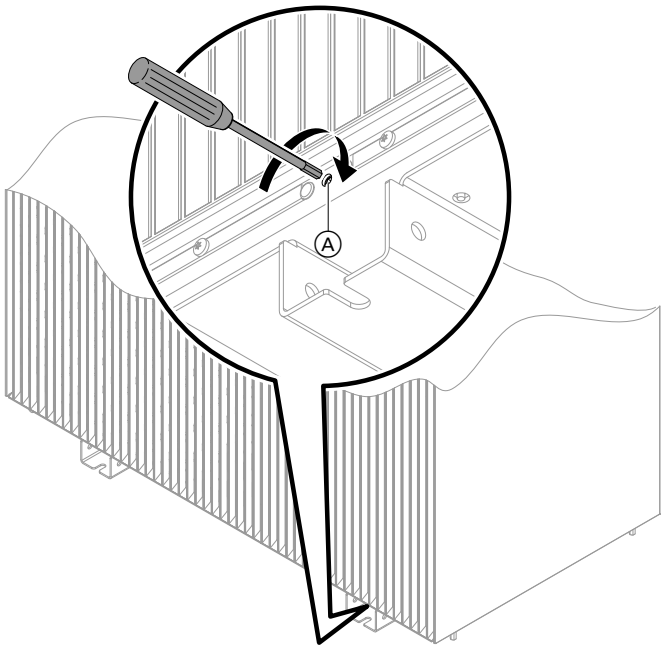


Fig. 79

To **release** the transport bracket securing screw Ⓐ with an Allen key (size 5), turning it fully to the **right**.

Testing the refrigerant circuit

Pressure equipment in the refrigerant circuit according to Pressure Equipment Directive 2014/68/EU

Outdoor unit with 1 fan

Pipework	$\varnothing_{max}$	PS x DN	Category
Pipework according to article 4, paragraph 3 And Pipework evaporator	< DN 25	< 546 barmm	—

Cylinder	V_{max}	PS x V_{max}	Category
Accumulator 1	2.5 l	76 barl	II
Accumulator 2 (compressor)	1.1 l	34 barl	I
Compressor	1.5 l	46 barl	I
Vessel according to article 4, paragraph 3	< 1 l	< 30.3 barl	—

Safety components	Switching pressure	Category
High pressure switch PSH	30.3 bar (3.03 MPa)	IV

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Testing the refrigerant circuit (cont.)

PS Permissible operating pressure: See "Specification".

Outdoor unit with 2 fans, sizes 10 to 13, 230 V~

Pipework	$\varnothing_{max}$	PS x DN	Category
Pipework according to article 4, paragraph 3	< DN 25	< 546 barmm	—
Pipework evaporator	DN 32	970 barmm	I

Cylinder	V_{max}	PS x V_{max}	Category
Accumulator 1	4.1 l	125 barl	II
Accumulator 2 (compressor)	1.1 l	34 barl	I
Compressor	1.5 l	46 barl	I
Vessel according to article 4, paragraph 3	< 1 l	< 30.3 barl	—

Safety components	Switching pressure	Category
High pressure switch PSH	30.3 bar (3.03 MPa)	IV

PS Permissible operating pressure: See "Specification".

Outdoor unit with 2 fans, sizes 10 to 13, 400 V~

Pipework	$\varnothing_{max}$	PS x DN	Category
Pipework to Article 4, paragraph 3 And Evaporator pipework	< DN 25	< 546 bar mm	—

Vessel	V_{max}	PS x V_{max}	Category
Accumulator 1	4.1 l	125 bar l	II
Accumulator 2 (compressor)	1.1 l	34 bar l	I
Compressor	1.5 l	46 bar l	I
Vessel to Article 4, paragraph 3	< 1 l	< 30.3 bar l	—

Safety components	Switching pressure	Category
High pressure switch PSH	30.3 bar (3.03 MPa)	IV

PS Permissible operating pressure: See "Specification".

Outdoor unit with 2 fans, sizes 16 to 19, 400 V~

Pipework	$\varnothing_{max}$	PS x DN	Category
Pipework according to article 4, paragraph 3	< DN 25	—	—

Cylinder	V_{max}	PS x V_{max}	Category
Accumulator 1	4.5 l	136.35 barl	II
Compressor	4.4 l	133.32 barl	II
Vessel according to article 4, paragraph 3	< 1 l	< 30.3 barl	—

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Testing the refrigerant circuit (cont.)

Safety components	Switching pressure	Category
High pressure switch PSH	30.3 bar (3.03 MPa)	IV

PS Permissible operating pressure: See "Specification".

Maintain pressure equipment and safety equipment according to the local and national regulations and guidelines.

Recommended annual maintenance for outdoor units with 1 and 2 fans

Visual checks:
- Check all components for damage.
- Check all components and pipes for corrosion.
- Check insulation materials for damage and ageing.
- Check the outdoor unit interior for oil residue.
- Check all screw connections for firm seating.
- Check all components containing water for leaks.
- Check all electrical components and connections for damage, ageing and firm seating.
- Check all dampers and brackets.
- Check that the safety zone requirements are met.

Repairs:
- Rectify any defects found during the visual inspection.
  If necessary replace components, gaskets and insulation.
- Observe regulations and specifications for working on the refrigerant circuit.
  See also chapter "Checklist for maintenance work".

Cleaning work:
- Clean the filter in the outdoor unit return: See chapter "Cleaning the filter in the ball valve".
- Clean the cladding of the external panels and the interior of the outdoor unit.
- Clean the evaporator: See chapter "Cleaning the outdoor unit heat exchanger (evaporator)".
- Ensure the condensate can drain freely: See chapter "Cleaning the condensate pan and condensate drain".

Further tests:
- Leak test: See chapter "Checking the refrigerant circuit for leaks".
- Test the quality of the heating water: See chapter "Fill and top-up water".

Maintenance after max. 12 years for outdoor units with 1 and 2 fans

Due to the refrigerant R290, a special test and service of pressure equipment and safety equipment is required after 12 years. The test may require replacing components.

Repair or dispose of the outdoor unit in the following cases:
- If it is suspected that the components are no longer suitable for safe operation.
- If the components do not pass the inspection.

For working on the refrigerant circuit: See also chapter "Checklist for maintenance work".

Note
The specified maintenance work and the Pressure Equipment Directive must also be complied with for commercial use. Any additional regulations for commercial use must also be observed.

- Test the safety chain **annually**: Request information about the test procedure from the manufacturer's technical support.
- Replace the high pressure switch PSH at least **every 12 years**.
- Replace the high limit safety cut-out at least **every 12 years**.

Checking the refrigerant circuit for leaks

Check the connections for refrigerant leaks.

⚠ **Danger**
Direct contact with refrigerant can be harmful to the skin.
Wear safety goggles and protective gloves when working on the refrigerant circuit.

! **Please note**
Refrigerant can escape when working on the refrigerant circuit.
- Always observe regulations and guidelines on handling this type of refrigerant.
- Work on the refrigerant circuit must **only** be carried out by a certified contractor (in accordance with Regulations (EU) 2024/573 and (EU) 2015/2067).

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Testing the refrigerant circuit (cont.)

Specialist personnel working on a refrigerant circuit with flammable refrigerant are required to have specific qualifications and certification: See "Safety information".

Cleaning the filter in the ball valve

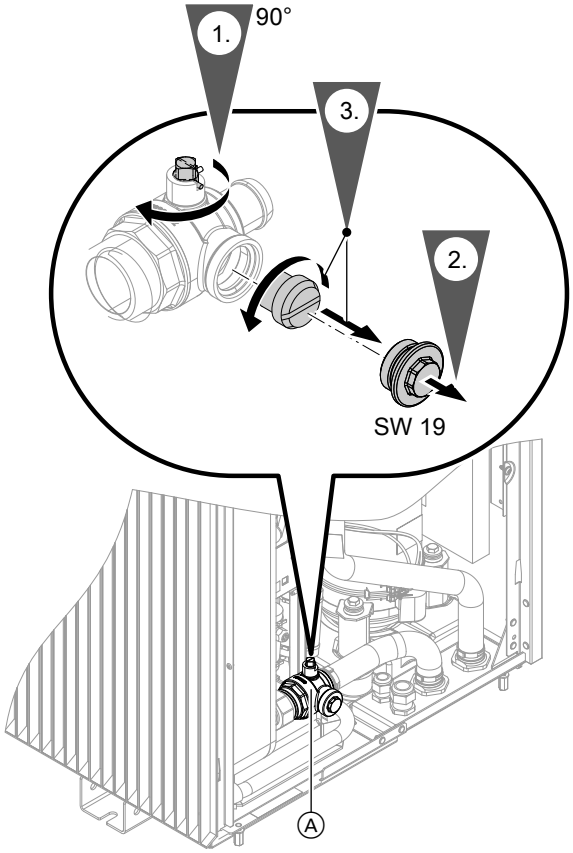


Fig. 80

Ⓐ Ball valve with filter

4. Rinse the filter under running water.

5. Refit filter in reverse order (steps 3 to 1 in reverse order).

Torque for the top cover:
10.0 ±0.5 Nm

Checking that the fan in the outdoor unit can run freely

Danger
Contact with the fans while they are operating can result in serious cutting injuries.
- Isolate the outdoor unit from the power supply. Safeguard against unauthorised reconnection.
- Do not open the appliance until the fan has come to a stop.

Danger
Operating the outdoor unit with an out-of-balance fan can cause severe vibrations and damage to the outdoor unit. This may result in life threatening injuries.
Do **not** modify, move or remove the balancing weights.

Checking that the fan in the outdoor unit can… (cont.)

Danger
A blocked fan may break during operation. Flying fragments can cause life threatening injuries.
Remove any blockages **before** commissioning.

1. Remove fan grille: See page 19.

2. Turn the fan by hand.

Torque for the screws:
1.5 ±0.25 Nm

Cleaning the outdoor unit heat exchanger (evaporator)

Danger
If you touch live components or they come into contact with water, this can result in serious injury due to electric shock.
- Isolate the outdoor unit from the power supply. Safeguard against unauthorised reconnection.
- Protect the outdoor unit against moisture.

Danger
Easily flammable liquids and materials can cause deflagration and fires; e.g. naphtha/petrol, solvents, cleaning agents, paints or paper.
- Do **not** use substances containing acids or solvents, such as vinegar-based cleaners, cellulose or synthetic resin thinners, nail varnish remover, ethyl alcohol, sprays, etc.
- Do **not** use substances containing chloride or ammonia.

Danger
The sharp edges of the heat exchanger (evaporator) can cause injuries.
Avoid contact.

Please note
Commercially available domestic cleaning agents and special cleaning agents can damage the heat exchanger (evaporator).
- Clean the fins of the heat exchanger (evaporator) on the back of the outdoor unit with a long-haired hand brush, e.g. with the finned brush from the "heat pump service set."
- Only use mild water-based domestic cleaning agents.
- Do **not** use substances that contain abrasive particles such as polishes, scouring agents, dirt erasers or scouring pads.

1. Checking the evaporator
Check the heat exchanger (evaporator) regularly for dirt (visual inspection).

Please note
A dirty heat exchanger (evaporator) reduces the heating output and may cause the heat pump to shut down.
Clean the evaporator if necessary.

2. Cleaning the evaporator
Clean the evaporator with a long-haired hand brush or, if necessary, with compressed air.

Please note
Excessive air pressure from the front and sides can result in the deformation of the aluminium fins of the heat exchanger.
Only point the compressed air gun at the heat exchanger from the front and from an adequate distance.

3. Checking the aluminium fins
Check the aluminium fins of the heat exchanger for deformation and scratches. If necessary, repair with a suitable tool, e.g. with the flexible fin comb from the "heat pump service set".

Checking the condensate pan and condensate drain

Danger
If you touch live components or they come into contact with water, this can result in serious injury due to electric shock.
- Isolate the outdoor unit from the power supply. Safeguard against unauthorised reconnection.
- Protect the outdoor unit against moisture.

Danger
Contact with the fans while they are operating can result in serious cutting injuries.
Isolate the outdoor unit from the power supply. Safeguard against unauthorised reconnection.

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Checking the condensate pan and condensate drain (cont.)

Danger
Easily flammable liquids and materials (e.g. naphtha/petrol, solvents, cleaning agents, paints or paper) can cause deflagration and fire.
- Do **not** use substances containing acids or solvents, such as vinegar-based cleaners, cellulose or synthetic resin thinners, nail varnish remover, ethyl alcohol, sprays, etc.
- Do **not** use substances containing chloride or ammonia.

Please note
Commercially available domestic cleaning agents and special cleaning agents can damage the condensate pan.
- Only clean with clear water. Do not use any cleaning agents.
- Do **not** use substances that contain abrasive particles such as polishes, scouring agents, dirt erasers or scouring pads.

Please note
Prevent damage due to condensate.
Cover electronic components with suitable watertight material.

Please note
Repeated mounting and dismounting of the fan causes the fixings to lose their holding force. The fan can no longer be secured correctly.
Do not remove the fan.

1. Check whether the condensate is draining off. To do this, carefully pour clear water through the evaporator into the inside of the outdoor unit.
2. If necessary, loosen the condensate hose from below. Remove any blockages, e.g. with the flexible cleaning brush from the "heat pump service set".

Cleaning the DHW cylinder

According to EN 806, a visual inspection and (if necessary) cleaning must be carried out no later than 2 years after commissioning, and as required thereafter.

1. Shut off the drinking water supply. Ensure adequate ventilation in the DHW pipework by opening a cold and hot water tap.
   Remove the thermal insulation.

   Danger
   The uncontrolled escape of DHW can cause scalding and building damage.
   Only open DHW and heating water connections with a depressurised DHW cylinder.

Cleaning the DHW cylinder (cont.)

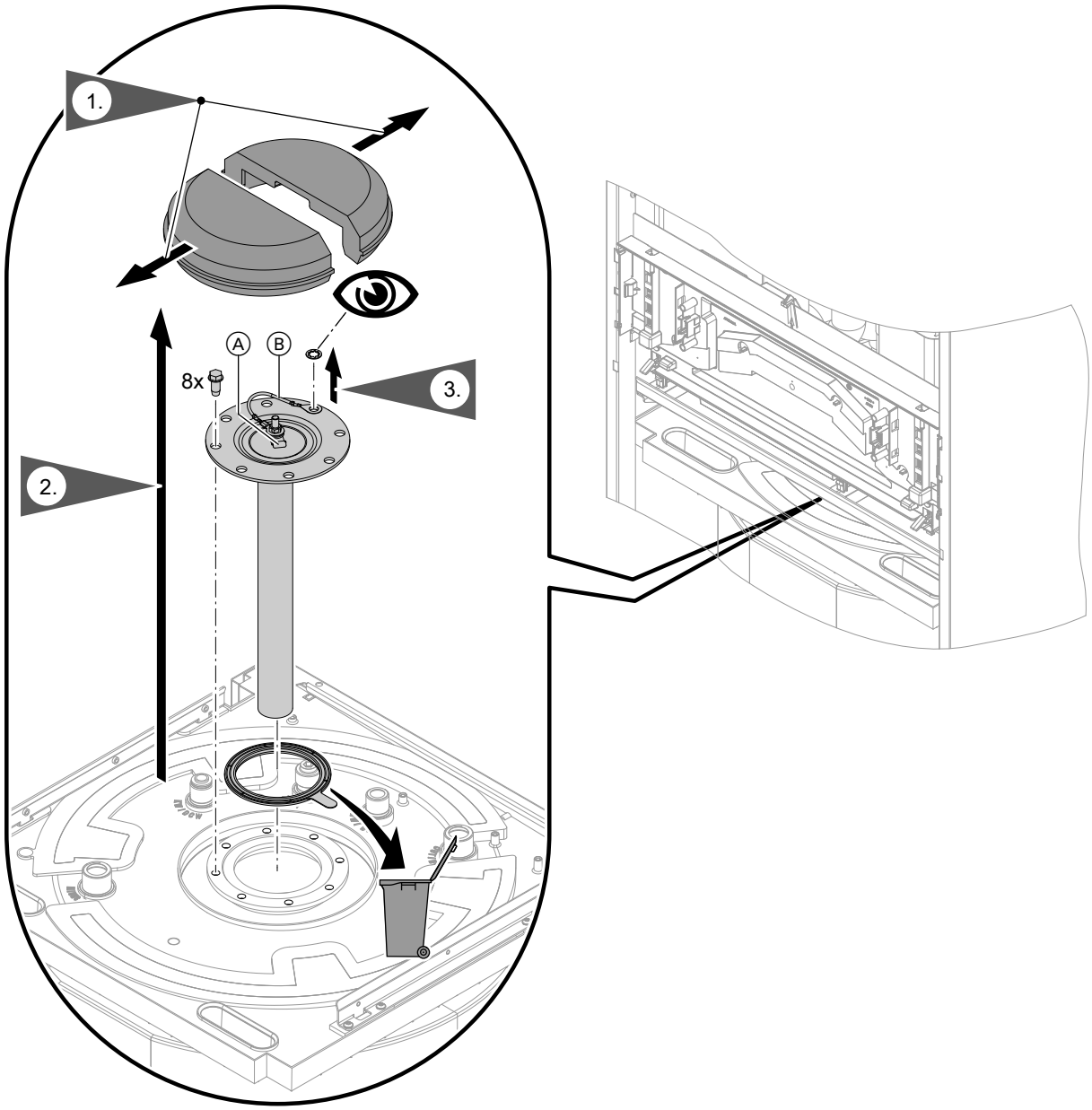


Fig. 81

Ⓐ Protective magnesium anode
Ⓑ Earth cable

4. Insert a hose into the DHW cylinder. Drain with a pump.

> **Please note**
> Negative pressure in the DHW cylinder can cause material damage.
> The air vent valve must always be open when draining the DHW cylinder with a suction pump.

5. To prevent contaminants entering the pipework: Separate the DHW cylinder from the pipework.

6. Remove loose deposits with a high pressure cleaner.

> **Please note**
> Water splashes can cause electrical faults. Protect the electrical components of the heat pump from water splashes.

> **Please note**
> Pointed or sharp cleaning tools will damage the cylinder interior.
> Only use plastic cleaning equipment to clean the inside.

Cleaning the DHW cylinder (cont.)

7. Use a chemical cleaning agent to remove hard deposits that cannot be removed with a high pressure cleaner.

   Danger
   Cleaning agent residues can result in poisoning.
   Fully drain all cleaning agent.
   Always observe the information provided by the cleaning agent manufacturer.

   Please note
   Cleaning agents containing hydrochloric acid will attack the DHW cylinder material.
   Only use pH-neutral cleaning agents.

8. Flush the DHW cylinder thoroughly after cleaning.

9. Refit protective magnesium anode with a new gasket.

10. Open valves. Fill the DHW cylinder.

Checking the indoor unit electrical connections for firm seating

Danger
Contact with live components can lead to serious injury from electric current.
When working on the indoor unit, isolate the system from the power supply, e.g. at a separate fuse or a main switch. Wait at least 4 min until the voltage has dropped out. Check that it is no longer live. Safeguard against reconnection.

Checking the outdoor unit electrical connections for firm seating

Danger
Contact with live components can lead to serious injury from electric current. Some components on PCBs remain live even after the power supply has been switched off.

- When working on the outdoor unit, isolate the system from the power supply, e.g. at a separate MCB/fuse or a mains isolator. Check the system is no longer live and safeguard against reconnection.
- Prior to working on the appliance, wait at least 4 min until the voltage on the charged capacitors has completely dropped out.

Resetting the high limit safety cut-out

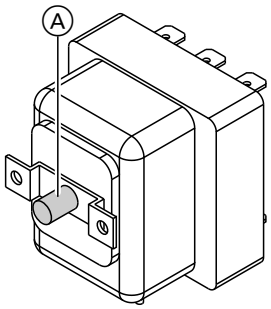


Fig. 82

Ⓐ High limit safety cut-out reset button

Please note
If the heat pump is exposed to temperatures below –10 °C, e.g. during storage or transport, the high limit safety cut-out of the instantaneous heating water heater may respond. In this case, the instantaneous heating water heater will not switch on.
Heat up the high limit safety cut-out to above 20 °C. Press the reset button of the high limit safety cut-out.

Note
The high limit safety cut-out can only be reset if the temperature at the sensor is below 82 °C.

Setting max. flow rate manually

The max. flow rate can be restricted manually, e.g. for hydronic balancing.
The setting is only possible for systems without an external heating/cooling water buffer cylinder.

Tap the following buttons:

1. ☰
2. 🔧 **"Service"**
3. Enter password **"serviceaccess"**.
4. **"Actuator test and function check"**
5. ✓ to confirm the security prompt.

   Note
   If an actuator test or function check is not possible because another process is running, a message is displayed.
6. Use ∧/∨ to select the **"Heating"** group.
7. Use › to select **"4/3-way valve position"**.
8. Use ∧/∨ to set "50 %".
9. ⮌
10. Use › to select **"Secondary circuit pump speed"**.
11. Use ∧/∨ to set the max. flow rate via the speed of the secondary pump.
    During the adjustment procedure, the flow rate can be checked as follows:
    Use 🗎 to switch to Diagnosis. Select **"Refrigerant circuit overview"**. Flow rate display: See chapter "Refrigerant circuit". Use ⮌ to return to the actuator.
12. Use ⊙ to stop all actuator tests.
13. Set the calculated values in the parameters for the max. speed of the heating/cooling circuit pumps:

    Separate service instructions for heat pumps: "System configuration and diagnostics"

Closing the heat pump

Danger
The absence of system component earthing can lead to serious injury from electrical current and component damage in the event of an electrical fault.
- Before closing the indoor unit, restore all protective conductor connections.
- Check whether equipment and pipe connections are connected to the equipotential bonding of the building. Restore the connections if required.

Please note
If a casing door is not securely closed this can lead to damage from condensation, vibrations and excessive noise.
- Check all-round seal of front panel for damage.
- Close appliance correctly.
- On pipe and hose outlets, ensure the thermal insulation is seated correctly.

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Closing the heat pump (cont.)

Please note
Leaking hydraulic connections cause appliance damage.
- Check the internal and on-site hydraulic connections for leaks.
- In the event of leaks, switch off the appliance immediately. Drain the heating water. Check the seal rings for correct fit. Replace any seal rings that may have become dislodged.

Closing the indoor unit

In reverse order: See page 45.

Closing the outdoor unit

See page 101.

Checking the heat pump for noise

Check indoor and outdoor units for unusual noises.

Examples:
- Fan operating noises
- Compressor operating noises
- Circulation pump operating noises
- Vibration on the refrigerant lines

Vent hydraulic circuits again if necessary.

Note
If noise problems occur due to sound transmission: See chapter "Sound transmission checklist".

Adjusting the heating curve

Tap the following buttons:

1. ☰
2. **"Indoor environment"**
3. Select the required heating/cooling circuit, e.g. **"Climate circuit 1"**.
4. **"Heating curve"**
5. + − for the required value regarding **"Slope"** and **"Level"** respectively, depending on the system requirements
6. ✓ to confirm

Naming the heating/cooling circuits

In the delivered condition, the heating/cooling circuits are designated **"Heating/cooling circuit 1"**, **"Heating/cooling circuit 2"** etc.
If the system user prefers, the heating/cooling circuits can be renamed to suit the specific system.

Tap the following buttons:

1. ☰
2. **"Settings"**
3. **"Rename heating/cooling circuits"**
4. Select the required heating/cooling circuit, e.g. **"Climate circuit 1"**
5. Type in the required name, e.g. "Ground floor" (1 to 20 characters).
6. ✓ to confirm

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Entering the contractor's contact details

The system operator can call up contact details when required and notify the contractor.

Tap the following buttons:

1. ☰
2. ⓘ **"Information"**
3. **"Contractor contact details"**
4. Enter contact details.
5. ✔ to confirm

Instructing the system user

The system installer should hand the operating instructions to the system user and explain to the user how to operate the system. This also includes all components added as accessories, such as remote controls.

The system installer should also provide information on the required maintenance.

Service menu

Calling up the service menu

Tap the following buttons:

1. ☰
2. 🔧 **"Service"**
3. Enter password **"serviceaccess"**.
4. Use ✔ to confirm.
5. Select required menu.

Note
Not all menus will be available, depending on the system equipment level.

Service menu overview

Service menu	
Access point on/off	
Change passwords	
Commissioning	
Appliances detected	
Actuator test and function check	
System configuration	
Diagnostics	
	Refrigerant circuit
	General
	Heating/cooling circuit 1
	Heating/cooling circuit 2
	Heating/cooling circuit 3
	Heating/cooling circuit 4
	DHW
Exit demo operation	
Reset to factory settings	
Exiting the service menu	

Changing the service password

In the delivered condition, **"serviceaccess"** is preset as the password for accessing the **"Service menu"**.

Tap the following buttons:

1. ☰
2. 🔧 **"Service"**
3. Enter password **"serviceaccess"**.
4. Use ✔ to confirm.
5. **"Change passwords"**.
6. **"Service menu"**
7. Enter current password.
8. Use ✔ to confirm.
9. Enter new password.
10. Confirm twice with ✔.

Service menu (cont.)

Resetting all passwords to delivered condition

Tap the following buttons:

1. Request the master password from the manufacturer's technical support.
2. ☰
3. 🔧 **"Service"**
4. Enter password **"serviceaccess"**.
5. Use ✓ to confirm.
6. **"Change passwords"**
7. **"Reset all passwords"**
8. Enter master password.
9. Confirm twice with ✓.

Switching access point on/off

The WiFi connection is used for service purposes.

Tap the following buttons:

1. ☰
2. 🔧 **"Service"**
3. Enter password **"serviceaccess"**.
4. ✓ to confirm
5. **"Access point on/off"**
6. **"On"** to switch the access point on
   "Off" to switch the access point off
7. ✓ to confirm

System configuration

The parameters can be adjusted via 3 user interfaces:
- HMI programming unit of the heat pump control unit
- ViGuide app
- All ViGuide web applications: ViGuide Plus, ViGuide Pro, ViGuide Business

For further information on ViGuide: **www.viguide.info**
- Depending on the system equipment and which user interface is selected, not all parameters may be available.
- Some parameters are set during commissioning with the help of the commissioning assistant.
- The factory settings and setting ranges for the parameters may vary for different heat pumps and system configurations.
- The names of the parameters in the instructions may differ from the names on the user interfaces.

Setting parameters on the HMI programming unit

Tap the following buttons:

1. ☰
2. 🔧 **"Service"**
3. Enter password **"serviceaccess"**.
4. Use ✓ to confirm.
5. **"System configuration"**
6. Use › to select the required parameter group, e.g. **"DHW"**.
7. Use ∧/∨ to select the required parameter category, e.g. **"Domestic Hot Water Setpoint Metadata"**.
8. Use › to select the required parameter, e.g. **"504.1 Low"**.
9. Use ∧/∨ to select the required value, e.g. **"30 °C"**.
10. Use ✓ to confirm.

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System configuration (cont.)

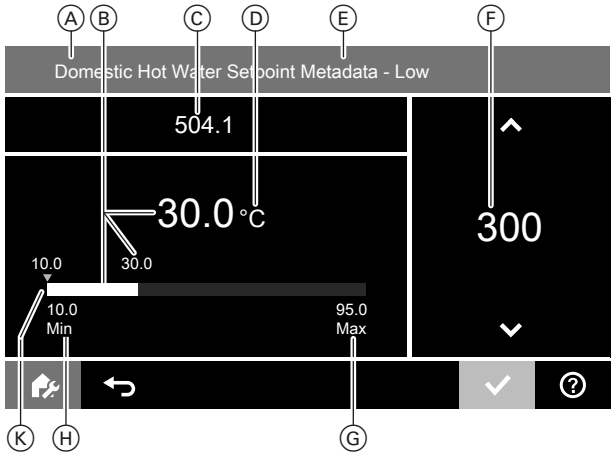


Fig. 83

Ⓐ Parameter category
Ⓑ Set value
- Display with decimal point and
- Display with light-coloured bar

Ⓒ Number of parameter
Ⓓ Unit for selected value
Ⓔ Name of parameter
Ⓕ Adjust value with ^/v
- Display without decimal point
- Step for temperatures: 0.1 °C

Ⓖ Upper limit of the setting range
Ⓗ Lower limit of the setting range
Ⓚ Factory setting marked with ▼

Parameter

Descriptions of the parameters are available online:
https://climate-solutions.com/documents/6200041

Fig. 84

Diagnostics

Checking operating data

Only the operating data that correspond to the actual system equipment level are shown.

Note
*If a checked sensor is faulty, **"- - -"** appears on the display.*

Calling up operating data

Tap the following buttons:

1. ☰
2. 🔧 **"Service"**
3. Enter password **"serviceaccess"**.
4. Use ✔ to confirm.
5. **"Diagnosis"**
6. Select the required group, e.g. **"General"**.

Diagnostics (cont.)

Refrigerant circuit

Tap the following buttons:

1. ☰
2. 🔧 **"Service"**
3. Enter password **"serviceaccess"**.
4. **"Diagnosis"**
5. **"Refrigerant circuit"**

Notes

- *The symbols on the display are animated if the components are operational (e.g. circulation pumps).*
- *The values shown are examples.*
- *Depending on the features of the system, not all of the displays may be available.*

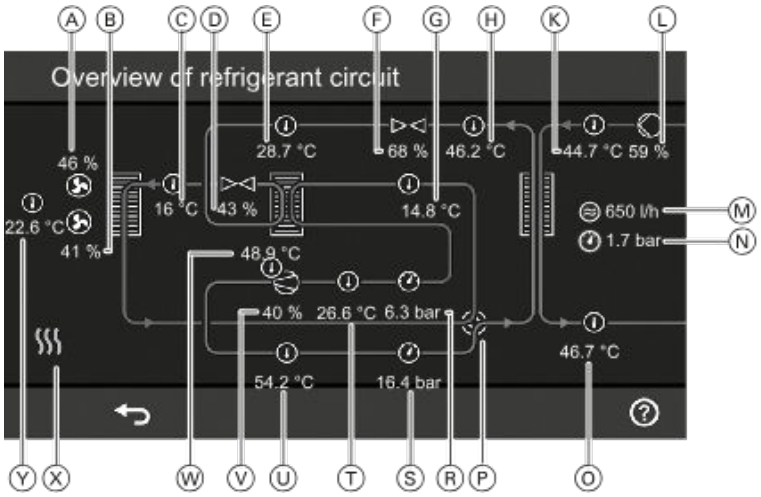


Fig. 85

Pos.	Meaning
	Fan Animated symbol: Fan is running.
Ⓐ	Only outdoor units with 2 fans: Speed of fan 2 in %
Ⓑ	Speed of fan 1 in %
Ⓒ	Liquid gas temperature – cooling, in °C (BT6)
Ⓓ	Aperture width of electronic expansion valve 2 in %
Ⓔ	Liquid gas temperature – heating, in °C (BT9)
Ⓕ	Aperture width of electronic expansion valve 1 in %
Ⓖ	Suction gas temperature – evaporator, in °C (BT3)
Ⓗ	Liquid gas temperature – condenser, in °C (BT2)
Ⓚ	Secondary circuit return temperature in °C (T4)
	Secondary pump Animated symbol: Pump is running.
Ⓛ	Secondary pump speed in %
Ⓜ	Flow rate in l/h
Ⓝ	System pressure in bar
Ⓞ	Secondary circuit flow temperature downstream of condenser in °C (BT1)
Ⓟ	4-way valve, refrigerant circuit Heating mode Cooling mode
Ⓡ	Suction gas pressure – compressor, in bar
Ⓢ	Condensing pressure – compressor, in bar

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Diagnostics (cont.)

Pos.	Meaning
	Compressor Animated symbol: Compressor is running.
Ⓣ	Suction gas temperature – compressor, in °C (BT5)
Ⓤ	Hot gas temperature in °C (BT4)
Ⓥ	Compressor output in %
Ⓦ	Oil sump temperature in °C (BT8)
Ⓧ	Heating mode Cooling mode Defrost Grid-Lock/Power-OFF
Ⓨ	Air inlet temperature – evaporator, in °C (BT7)

Testing outputs and functions (actuator test & function check)

Calling up the actuator test and function check

- If not all actuator tests and function checks are displayed, update the software of the programming unit and all electronics modules via ViGuide.
- The system must have been commissioned, filled and vented.
- When an actuator test or function check starts, all actuators are initially switched off. Valves are moved to a defined position.
  Any available mixers in the heating circuits remain in their most recent state.
- Preparing an actuator test or function check usually takes 1 to 5 min and can take up to 15 min.

Function checks:
- The function checks can only be started if the heat pump is in normal operation:
  - Outdoor unit is not locked
  - Power-OFF disabled
  - Switch-on conditions for the selected function are fulfilled.
- Actuators are switched as in normal operation.
- Depending on the function check, generated heat is conveyed to the DHW cylinder and/or buffer cylinder and heating/cooling circuits.
- Generated cooling energy is conveyed to the buffer cylinder and/or heating/cooling circuits.
- Ensure adequate heat transfer. If the heat cannot be distributed, the function check is not started or is aborted.
- Even if scald protection is switched on or the set DHW temperature is < 60 °C, temperatures > 60 °C may still be reached.

  Danger
  DHW temperatures above 60 °C lead to scalding.
  Inform the residents before starting the function check.

Tap the following buttons:

1. ☰
2. **"Service"**
3. Enter password **"serviceaccess"**.
4. **"Actuator test and function check"**
5. ✓ to confirm the security prompt.

   Note
   If an actuator test or function check is not possible because another process is running, a message is displayed.

6. Use ∧/∨ to select the required group: See the following table.
   Actuator tests are marked with .
   Function checks are marked with .
7. Use › to select the required actuator test or function check.
   If the function check does not end automatically but has to be stopped actively, a message is displayed.

Testing outputs and functions (actuator test &… (cont.)

8. **Actuator test:**
   - Use ∧/∨ to select the required value. Confirmation is not required.
   - As soon as the actuator test is active, it is marked with ✳.

   Note
   - *Use to switch to Diagnosis, e.g. to display the **"Refrigerant circuit overview"**. Use ⮌ to go back to the actuator test.*
   - *Use ⊙ to end the actuator test.*

   Function checks:
   - Use ⊙ to start the function check.
   - **"Test active"** is displayed.

   Note
   - *If the function check cannot be started, use ⚠ to read out the messages.*
   - *If the function check is active, use to switch to Diagnosis, e.g. to display the **"Refrigerant circuit overview"**. Use ⮌ to return to the function check.*
   - *Use ⊙ to stop the function check if it does not end automatically.*
     Note that the next function check can only be started once the current function check has ended. In addition, the temperatures must be within the limit range. Information is displayed.

9. **Actuator test only:**
   Use ⮌ to return to the overview to check other actuators if applicable.

   Note
   - *This does not stop actuator tests that have already been started.*
   - *shows the number of active actuator tests.*

10. **Actuator test only:**
    Use to switch to the overview of all active actuator tests.
    - Individual actuator tests can be stopped with **"0%"** or **"Off"**.
    - Use ⊙ to stop all active actuator tests.

    Note
    An actuator test is terminated automatically if no operation is performed for 30 min.

Overview of actuator tests and function checks

Depending on the features of the system, not all of the following actuator tests and function checks may be available.

Actuator test
Function check

Heating group

Display			Meaning
	Primary circuit pump, set speed	Set value	Speed of internal secondary pump/heating circuit pump, heating/cooling circuit 1, in %
	4/3-way valve position	Set value	4/3-way valve position in % 0 % Integral buffer cylinder (defrost) ≥ 0 % to ≤ 50 % Mixed operation: ▪ Integral buffer cylinder **and** ▪ Secondary circuit (heating/cooling circuit 1 or external buffer cylinder) 50 % Secondary circuit (heating/cooling circuit 1 or external buffer cylinder) 100 % DHW heating
	Heating circuit pump, heating/cooling circuit 1	On Off	Switches the internal secondary pump/heating circuit pump, heating/cooling circuit 1, on and off.
	Heating circuit pump, heating/cooling circuit 2		Only in conjunction with an external buffer cylinder: External heating circuit pump, heating/cooling circuit 2
		Set value	Speed of heating circuit pump, heating/cooling circuit 2 in %
		On/Off	Switches the heating circuit pump, heating/cooling circuit 2, on and off.

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Testing outputs and functions (actuator test &… (cont.)

Display			Meaning
	Mixer for heating/cooling circuit 2	Open	Only in conjunction with an external buffer cylinder: Mixer for heating/cooling circuit 2 opens.
		Stop	Current position is maintained.
		Close	Mixer closes.
	Heating circuit pump, heating/cooling circuit 3		Only in conjunction with an external buffer cylinder: External heating circuit pump, heating/cooling circuit 3
		Set value	Speed of heating circuit pump, heating/cooling circuit 3 in %
		On/Off	Switches the heating circuit pump, heating/cooling circuit 3, on and off.
	Mixer for heating/cooling circuit 3	Open	Only in conjunction with an external buffer cylinder: Mixer for heating/cooling circuit 3 opens.
		Stop	Current position is maintained.
		Close	Mixer closes.
	Heating circuit pump, heating/cooling circuit 4		Only in conjunction with an external buffer cylinder: External heating circuit pump, heating/cooling circuit 4
		Set value	Speed of heating circuit pump, heating/cooling circuit 4 in %
		On/Off	Switches the heating circuit pump, heating/cooling circuit 4, on and off.
	Mixer for heating/cooling circuit 4	Open	Only in conjunction with an external buffer cylinder: Mixer for heating/cooling circuit 4 opens.
		Stop	Current position is maintained.
		Close	Mixer closes.
	Signal-cooling	On	Cooling mode active
		Off	Cooling mode off
	Cooling the cooling water buffer cylinder	On	Switch on the function check for cooling operation via the refrigerant circuit: ▪ All heating circuit pumps are switched off. ▪ All heating circuit mixers close. ▪ The external heat generator is switched off. ▪ Max. possible compressor output is set. ▪ The cooling energy generated is transferred to the heating/cooling water buffer cylinder or cooling water buffer cylinder. – If cooling consumption is not possible, the function check is not started. A status message is displayed. – If the minimum temperatures are reached during the function check, the function check is aborted. A status message is displayed. ***Note*** *This function check must be stopped manually.*
		Off	Switch off the function check for cooling operation via the refrigerant circuit

Testing outputs and functions (actuator test &… (cont.)

Display			Meaning
	Heating the heating water buffer cylinder	On	Switch on the function check for heating operation via the refrigerant circuit: ▪ All heating circuit pumps are switched off. ▪ All heating circuit mixers close. ▪ The external heat generator can switch on depending on the outside temperature. ▪ Max. possible compressor output is set. ▪ The heat generated is transferred to the heating/cooling water buffer cylinder or heating water buffer cylinder. – If no heat transfer is possible, the function check is not started. A status message is displayed. – If the max. temperatures are reached during the function check, the function check is aborted. A status message is displayed. ***Note*** ▪ *This function check can also be performed without the outdoor unit connected.* ▪ *This function check must be stopped manually.*
		Off	Switch off the function check for heating operation via the refrigerant circuit

Heat generator group

Display			Meaning
	Primary circuit pump, set speed	Set value	Speed of internal secondary pump/heating circuit pump, heating/cooling circuit 1, in %
	Fan outdoor unit, bottom	Set value	Fan speed 1 in %
	Fan outdoor unit, top	Set value	Only outdoor units with 2 fans: Fan speed 2 in %
	Oil sump heater	On/Off	Switch the oil sump heater on and off.
	Fan ring heater	On/Off	Switch the fan ring heater on and off.
	Ribbon heater for condensate pan	On/Off	Switch the electric ribbon heater for condensate pan on and off.
	Electronic expansion valve 1	Set value	Position of the electronic expansion valve in % ***Note*** *Opening from 0 to 100 % can take approx. 20 s.*
	Electronic expansion valve 2	Set value	Position of the electronic expansion valve in % ***Note*** *Opening from 0 to 100 % can take approx. 20 s.*
	Manual defrosting	On/Off	▪ The defrost function starts. ▪ As in normal operation, defrosting ends as soon as the corresponding condition is met. or Defrosting ends after 20 min.

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Testing outputs and functions (actuator test &…) (cont.)

Display			Meaning
☑	Diagnostics for heat generation via instantaneous heating water heater	On/Off	**Danger** During this function check, the DHW may be heated to over 60 °C. DHW temperatures above 60 °C lead to scalding. Inform the residents before starting the function check. ***Note*** *If the 4/3-way valve moves to a different position during the function check, the function test is aborted. To avoid this, ensure that the heating water temperature in the heat pump is > 20 °C before starting this function check.* ▪ The external heat generator is switched off. ▪ 4/3-way valve is set according to the heat demand. ▪ Circulation pumps, mixers and valves are set in accordance with normal operation. ▪ The instantaneous heating water heater is switched on with max. output. ▪ The heat generated is distributed to the DHW cylinder, heating/cooling water buffer cylinder or heating/cooling circuit 1, depending on the heat demand. – If no heat transfer is possible, the function check is not started. A status message is displayed. – If the max. temperatures are reached during the function check, the function check is aborted. A status message is displayed. ***Note*** ▪ *This function check can also be performed without the outdoor unit connected.* ▪ *This function check ends with an information message. Further measures may be necessary.*

Testing outputs and functions (actuator test &… (cont.)

Display			Meaning
☑=	Heat generation via refrigerant circuit	On/Off	⚠ **Danger** During this function check, the DHW may be heated to over 60 °C. DHW temperatures above 60 °C lead to scalding. Inform the residents before starting the function check. ▪ Internal secondary pump/heating circuit pump for heating/cooling circuit 1 and the outdoor unit fan are switched on. ▪ 4/3-way valve is set according to the heat demand. ▪ The external heat generator is switched off. ▪ Max. possible compressor output is set. ▪ The heat generated is distributed to the DHW cylinder, heating/cooling water buffer cylinder or heating/cooling circuit 1, depending on the heat demand. – If no heat transfer is possible, the function check is not started. A status message is displayed. – If the max. temperatures are reached during the function check, the function check is aborted. A status message is displayed. ***Note*** *This function check must be stopped manually.*
☑=	Cooling via refrigerant circuit	On/Off	▪ Circulation pumps, mixers and valves are set in accordance with normal operation. ▪ Max. compressor output is set. ▪ Secondary circuit regulates to the minimum return temperature. The heat generated is distributed to the heating/cooling water buffer cylinder or heating/cooling circuit 1, depending on the heat demand. ***Note*** *This function check must be stopped manually.*

DHW group

Display			Meaning
	Secondary circuit pump speed	Set value	Speed of internal secondary pump/heating circuit pump, heating/cooling circuit 1, in %
	DHW circulation pump	On/Off	Switch the DHW circulation pump on and off.
	4/3-way valve position	Set value	4/3-way valve position in % 0 % Integral buffer cylinder (defrost) ≥ 0 % to ≤ 50 % Mixed operation: ▪ Integral buffer cylinder **and** ▪ Secondary circuit (heating/cooling circuit 1 or external buffer cylinder) 50 % Secondary circuit (heating/cooling circuit 1 or external buffer cylinder) 100 % DHW heating

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Testing outputs and functions (actuator test &… (cont.)

Display			Meaning
	Actuator for DHW heating	On/Off	Switch the diverter valve for the heating water buffer cylinder with integral DHW heating on and off.
	DHW heating	On/Off	**Danger** During this function check, the DHW may be heated to over 60 °C. DHW temperatures above 60 °C lead to scalding. Inform the residents before starting the function check. ▪ Secondary pump starts. ▪ 4/3-way valve set to "DHW heating" ▪ Outdoor unit fan is started. ▪ The external heat generator is switched on depending on the outside temperature. ▪ Secondary circuit regulates to the maximum return temperature. The heat generated is fed into the DHW cylinder. – If no heat transfer is possible, the function check is not started. A status message is displayed. – If the max. temperatures are reached during the function check, the function check is aborted. A status message is displayed. ***Note*** ▪ *This function check can also be performed without the outdoor unit connected.* ▪ *This function check must be stopped manually.*

Checking the subscribers and software version

Tap the following buttons:

1. ☰
2. **"Service"**
3. Enter password **"serviceaccess"**.
4. Use ✓ to confirm.
5. **"Appliances detected"**
   All detected subscribers, e.g. CAN bus subscribers, are displayed.
   Possible subscribers: See chapter "Subscriber numbers".
   For CAN bus subscribers in the internal CAN bus system, e.g. the HPMU electronics module, the software version is shown under **"Software version"**.

Resetting the heat pump to its factory settings

The configuration, settings and parameters will be reset to the factory settings. After this, the heat pump will have to be commissioned again.
We recommend creating an acceptance log via ViGuide beforehand to save all existing settings.

Tap the following buttons:

1. ☰
2. **"Service"**
3. Enter password **"serviceaccess"**.
4. Use ✓ to confirm.
5. **"Reset to factory settings"**
6. Use ✓ to confirm the message.
   The heat pump is restarted.
   The commissioning assistant is called up.

Message display on the programming unit

If there are messages pending in the system, the message and ⚠ are displayed. The Lightguide flashes.

Types of messages	Meaning
Status	▪ Operating message ▪ No faults in system in normal operation
Warnings	▪ The cause of the message must be remedied. ▪ Limited normal operation
Information	▪ Action may be required ▪ System in normal operation
Faults	▪ The cause of the message must be remedied **without delay**. ▪ No normal operation

Calling up messages

1. Tap ✔ to hide the message.
   ⚠ flashes in the navigation area.

2. In the navigation area, tap ⚠.
   All pending messages are displayed in a message list:
   - The entries are grouped by the type of message **"Status"**, **"Warnings"**, **"Information"** and **"Faults"**.
   - The messages in each group are listed in chronological order.
   - A message consists of the message code, time and message text.

If "Connection error" and ⚠ are displayed:
Check connecting cable and plug between HPMU electronics module and HMI programming unit.

Acknowledging messages

Use ✔ to acknowledge that message causes have been remedied.

Note
*✔ acknowledges **all** messages in the message list.*

⚠ no longer flashes.

Note
If an acknowledged service is not carried out, the service message is redisplayed the following Monday.

Calling up acknowledged messages

Tap the following buttons:

1. ☰

2. **"Message lists"**

3. If there are any corresponding messages:
   - **"Status"**
   - **"Warnings"**
   - **"Information"**
   - **"Faults"**

   The messages are displayed in chronological order.

The following information is displayed:
- Date and time of the occurrence of the fault
- Fault code

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Message display on the programming unit (cont.)

- Short description of the fault
- Subscriber number of the component affected: See the following lists.

Note
When troubleshooting, always observe the subscriber number of the component.
Check the component displayed. Remedy fault if applicable. The subscriber number of the component depends on the position of rotary switch S1 on the corresponding extension. The rotary switch was set during installation.
To identify the extension affected, check the setting of rotary switch S1 on the extensions in question, if necessary.

Subscriber numbers

PlusBus subscriber:

0	EM-S1 extension (ADIO electronics module)
1 to 15	EM-M1, EM-MX and EM-P1 extensions (ADIO electronics module)
17 to 31	EM-EA1 extension (DIO electronics module)
32 to 47	M2IO electronics module
64	SM1A extension (SDIO electronics module)
67	EM-HB1 extension (HIO electronics module)

CAN bus subscriber in the internal CAN bus system:

1	Main control unit of the heat pump: HPMU electronics module
45	Inverter
54	VCMU refrigerant circuit controller
58	Communication module TCU 301
59	HMI programming unit
67	EHCU electronics module

CAN bus subscriber in the external CAN bus system:

1	Main control unit of the appliance that was commissioned first: ***Note*** *This main control unit is the main appliance in both the internal and external CAN bus system.*
71 to 85	Further appliances in the system network
90	Gateway (KNX, BACnet, Modbus)
97, 98	Energy meter
111, 112	Other energy meters

Low power radio subscriber:

49 to 63	Vitotrol 300-E, Vitotrol 100-EH

Unblocking outdoor unit

If there is a fault in the refrigerant circuit, it may be blocked. Once the fault has been rectified, the refrigerant circuit can be reset.

! **Please note**
Escaping refrigerant will cause environmental pollution.
Do not unlock refrigerant circuit multiple times in quick succession.

Tap the following buttons:

1. ☰
2. 🔧 **"Service"**
3. Enter password **"serviceaccess"**.
4. Use ✓ to confirm.
5. ⚠ in the navigation area
6. ⚠ **"Reset outdoor unit"**
   A warning message is displayed.
7. Read warning message. Use ✓ to confirm.
   A further warning message is displayed.
8. Read warning message. ☑ Tick **"Reset"**.
   Or
   Use ✕ to cancel the process.
9. Use ✓ to confirm the **"Reset"**.
10. ↩ to exit the menu.
11. ⚠ to call up any further messages.

Message display on the programming unit (cont.)

Troubleshooting measures

Descriptions of the messages and actions required are available online:
https://climate-solutions.com/documents/6200041



Fig. 86

Note
The possible faults vary according to the system equipment. Therefore, not all fault messages will come up for every system.

! **Please note**
Refrigerant can escape when working on the refrigerant circuit.
- It is essential that regulations and guidelines on handling refrigerant are always observed and adhered to: See "Safety instructions".
- Work on the refrigerant circuit must **only** be carried out by a certified contractor (in accordance with Regulations (EU) 2024/573 and (EU) 2015/2067).

! **Please note**
Repairing components that fulfil a safety function can compromise the safe operation of the system.
- Do not undertake any repairs on the inverter. Replace the inverter if there is a defect.
- Faulty components must be replaced with original spare parts from the manufacturer.

Overview of electrical terminal areas

See page 63 onwards.

Removing electrical components

Danger
Contact with live components can lead to serious injury from electric current. Some components on PCBs remain live even after the power supply has been switched off.

- **Do not touch** electrical terminal areas.
- When working on the indoor or outdoor unit, isolate the system from the power supply, e.g. at a separate fuse or a main switch.
  Note
  The indoor unit and outdoor unit can be fused separately.
  Check that no voltage is present. Safeguard against unauthorised reconnection.
- Before working on the appliance, wait at least 4 min until the voltage has dropped out.

Danger
The absence of system component earthing can lead to serious injury from electrical current and component damage in the event of an electrical fault.
All earth conductor connections **must** be reconnected.
The appliance and pipework must be connected to the equipotential bonding of the building.

Note
Incorrectly executed electrical installations may cause undesirable electromagnetic interaction with other electronic devices.

Removing electrical components (cont.)

Removing the HMI programming unit

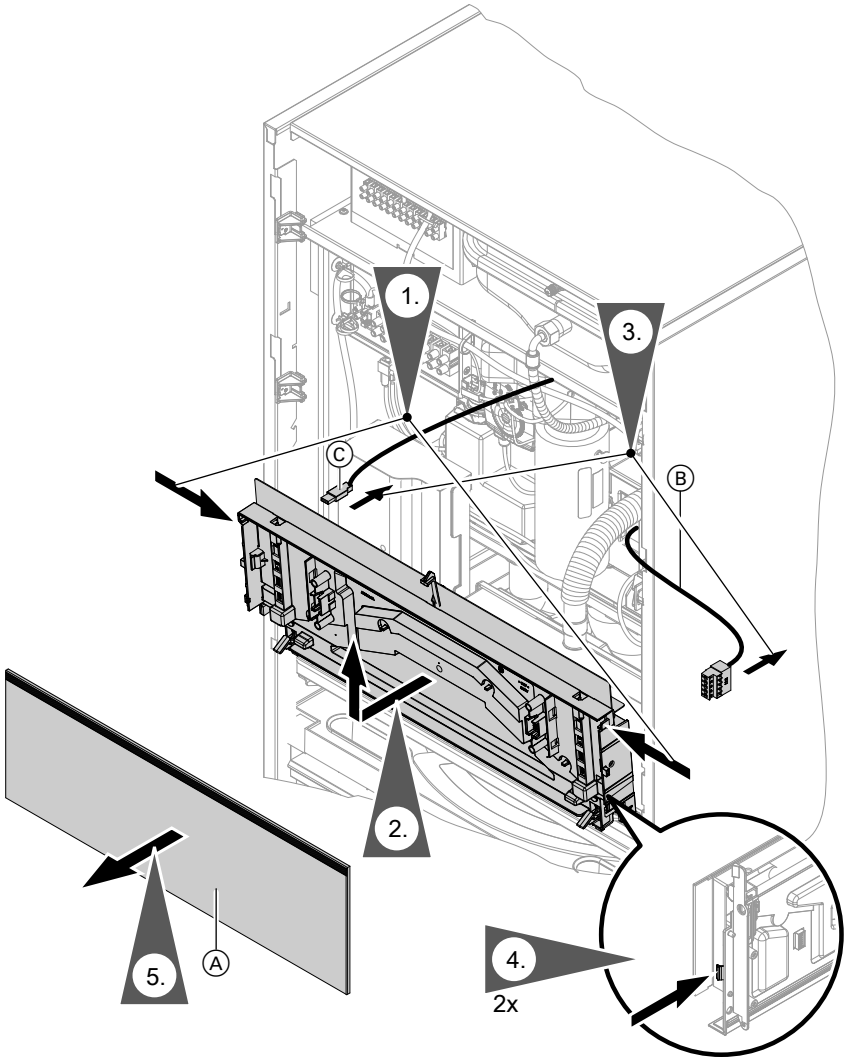


Fig. 87

Ⓐ HMI programming unit
Ⓑ HMI connecting cable
Ⓒ Connecting cable for LAN extension module (accessories)

! **Please note**
Inserting the plug for the HMI programming unit into the slot for the LAN extension module will irreparably damage the TCU communication module.
Insert the plug for the HMI programming unit into the correct slot.

Removing electrical components (cont.)

Removing the HPMU electronics module

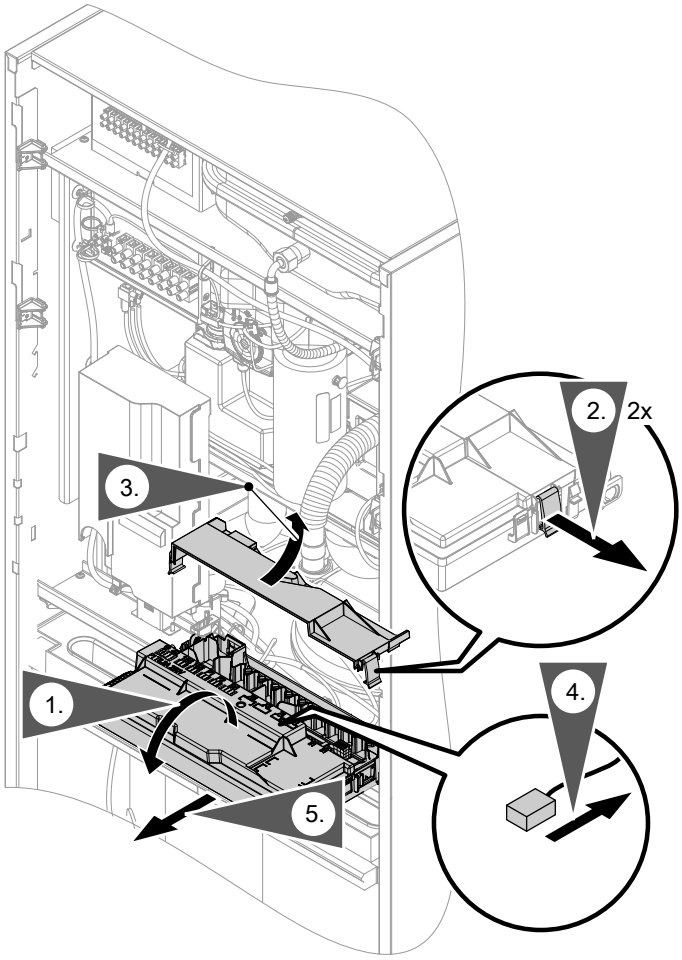


Fig. 88

After replacing the HPMU electronics module, repeat the commissioning procedure: See chapter "Commissioning".

! **Please note**
Filling and venting the system with the transport bracket loose can cause damage to the outdoor unit.
Before filling and venting the system, check whether the transport bracket is secured: See chapter "Checking the transport bracket".

Removing electrical components (cont.)

Removing the EHCU electronics module

Danger
Contact with live components can lead to serious injury from electric current. Some components on PCBs remain live even after the power supply has been switched off.

- **Do not touch** electrical terminal areas.
- When working on the indoor or outdoor unit, isolate the system from the power supply, e.g. at a separate fuse or a main switch.
  Note
  The indoor unit and outdoor unit can be fused separately.
  Check that no voltage is present. Safeguard against unauthorised reconnection.
- Before working on the appliance, wait at least 4 min until the voltage has dropped out.

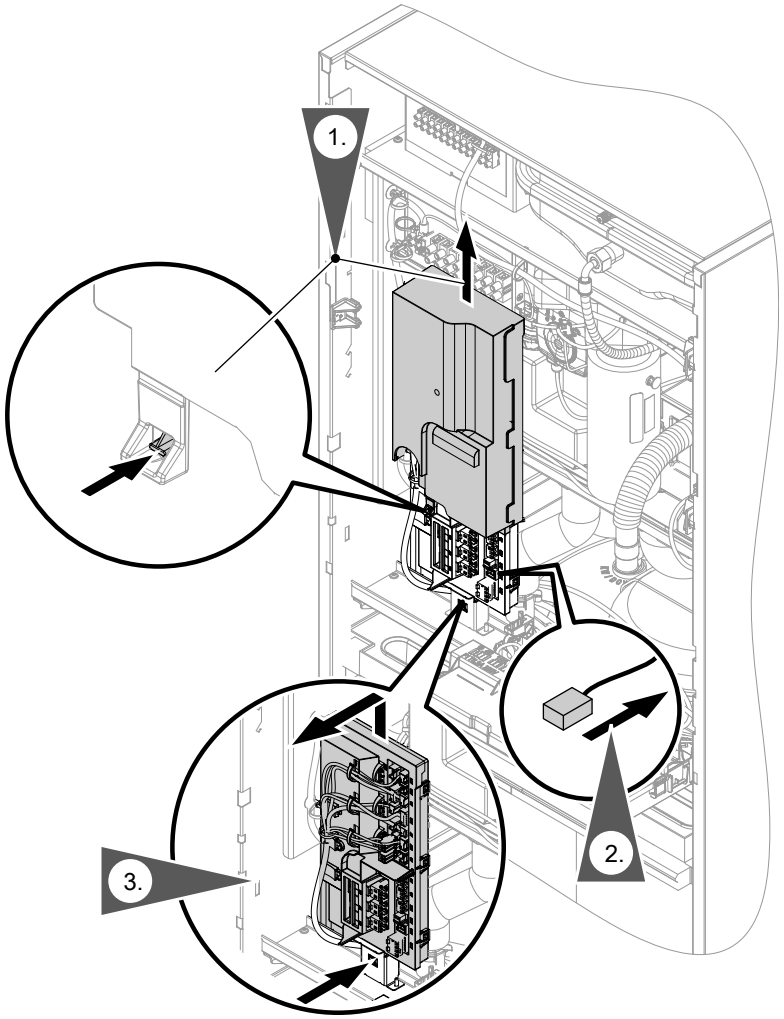
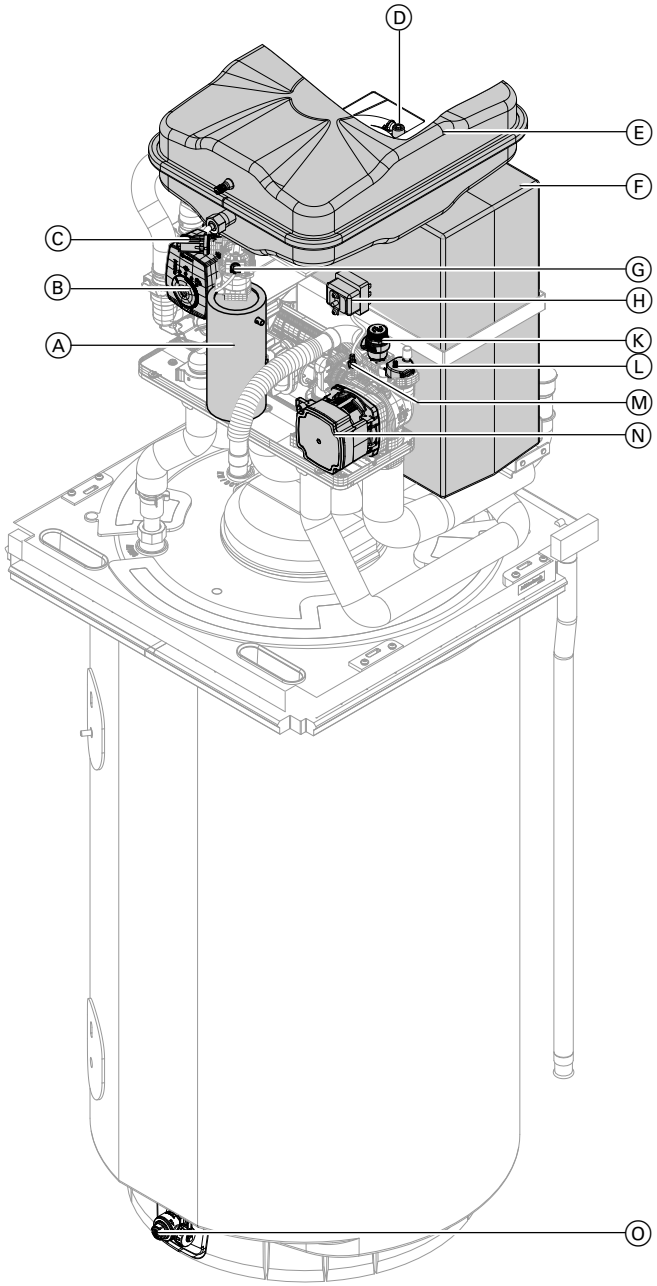


Fig. 89

Note
***No** recommissioning is necessary following replacement of the EHCU electronics module.*

Overview of internal components



Ⓒ Water pressure sensor
Ⓓ Vented integral buffer cylinder
Ⓔ Expansion vessel
Ⓕ Integral buffer cylinder
Ⓖ Secondary circuit flow temperature sensor (T2)
Ⓗ High limit safety cut-out (HLSC), instantaneous heating water heater
Ⓚ Safety valve
Ⓛ Automatic air vent valve
Ⓜ Secondary circuit return temperature sensor (T17)
Ⓝ Secondary pump
Ⓞ Drain valve

Fig. 90

Ⓐ Instantaneous heating water heater
Ⓑ 4/3-way valve

Draining indoor unit on the secondary side

⚠ **Danger**
Heating water escaping uncontrolled may cause scalding.
Allow the heating system to cool down before draining.

1. Connect hoses to all drain valves. Open drain valves.
2. Set the 4/3-way valve in turn to , and until water no longer comes out.

Removing hydraulic components and EPP insulating parts

When replacing hydraulic components and EPP insulating parts, first pivot down or remove electrical components as necessary: See chapter "Removing electrical components".
Separate installation instructions are supplied with some components.

Danger
Residual water will escape when the indoor unit or hydraulic components are fitted or removed. Contact of live components with water can lead to serious injury due to electric shock.
- Isolate the heat pump from the power supply. Safeguard against unauthorised reconnection.
- Protect electrical components, e.g. electronics modules, plug-in connections, electrical cables, from the ingress of water.

Danger
Residual water will escape when the indoor unit or hydraulic components are fitted or removed. Escaping heating water and hot steam can cause serious injury and damage the heating system.
Only carry out work on the system when it has cooled down and is depressurised.

Please note
Leaking hydraulic connections lead to appliance damage.
- **Always** use new gaskets for assembly.
- Renew damaged fasteners, e.g. clips, screws, etc.
- After installing the new components, check the internal and on-site hydraulic connections for leaks.
- In the event of leaks, drain off liquid via the drain valve. Check the seating of seal rings. **Always** replace displaced seal rings.

Overview of torque settings for assembly

Union nuts:

G ½	12 ±1 Nm
G 1¼	50 ±2 Nm
G 1½	70 ±2 Nm

Screws:

∅ 4.8 x 9.5	3.5 ±0.5 Nm
50 x 14	2.8 ±0.3 Nm
M 4	1.5 –0.5 Nm

Please note
Filling and venting the system with the transport bracket on the outdoor unit loose can cause damage to the outdoor unit.
Before filling and venting the system, check whether the transport bracket is secured: See chapter "Checking the transport bracket".

Removing hydraulic components and EPP… (cont.)

Removing the expansion vessel

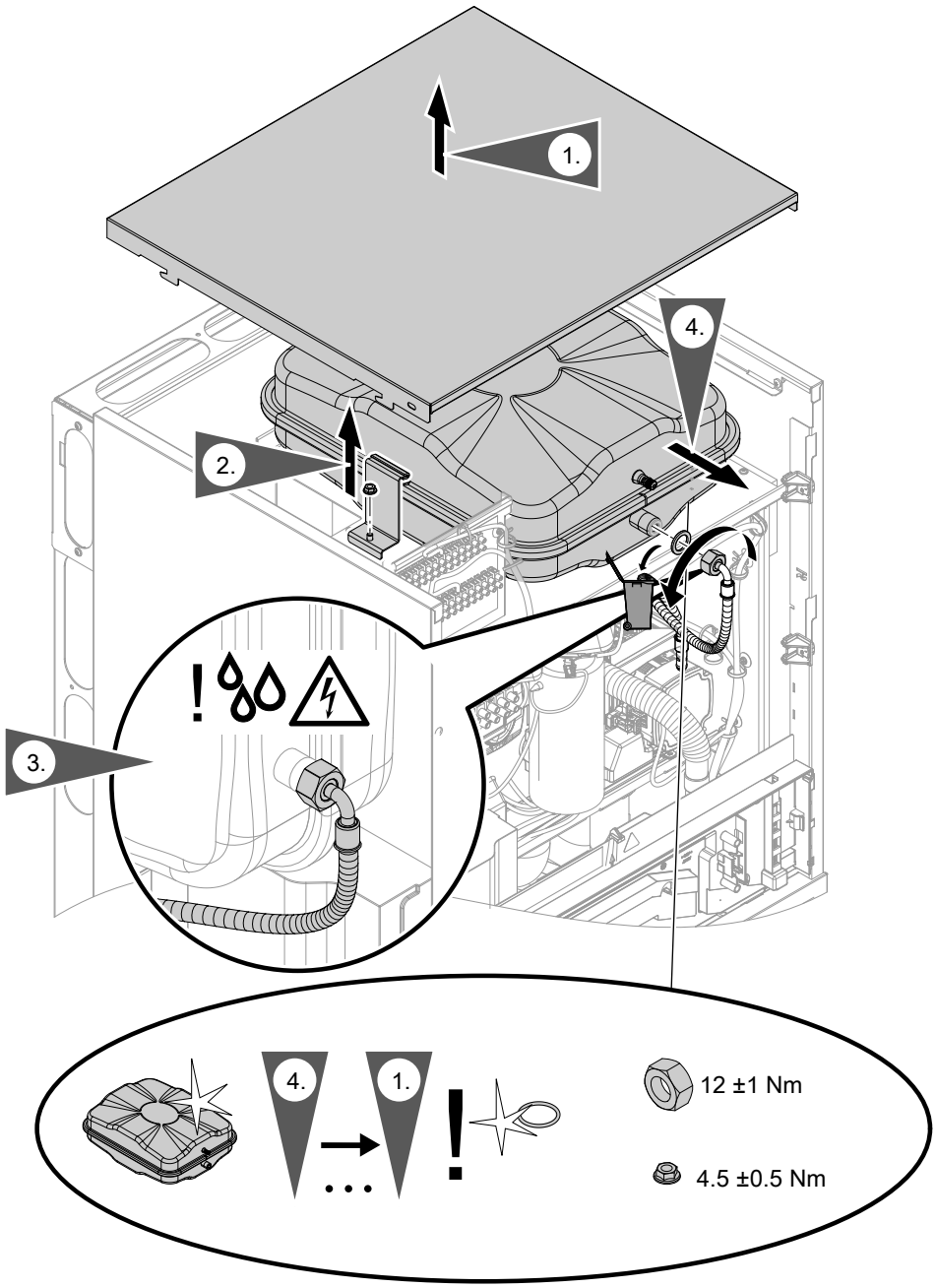


Fig. 91

Removing hydraulic components and EPP… (cont.)

Removing the instantaneous heating water heater

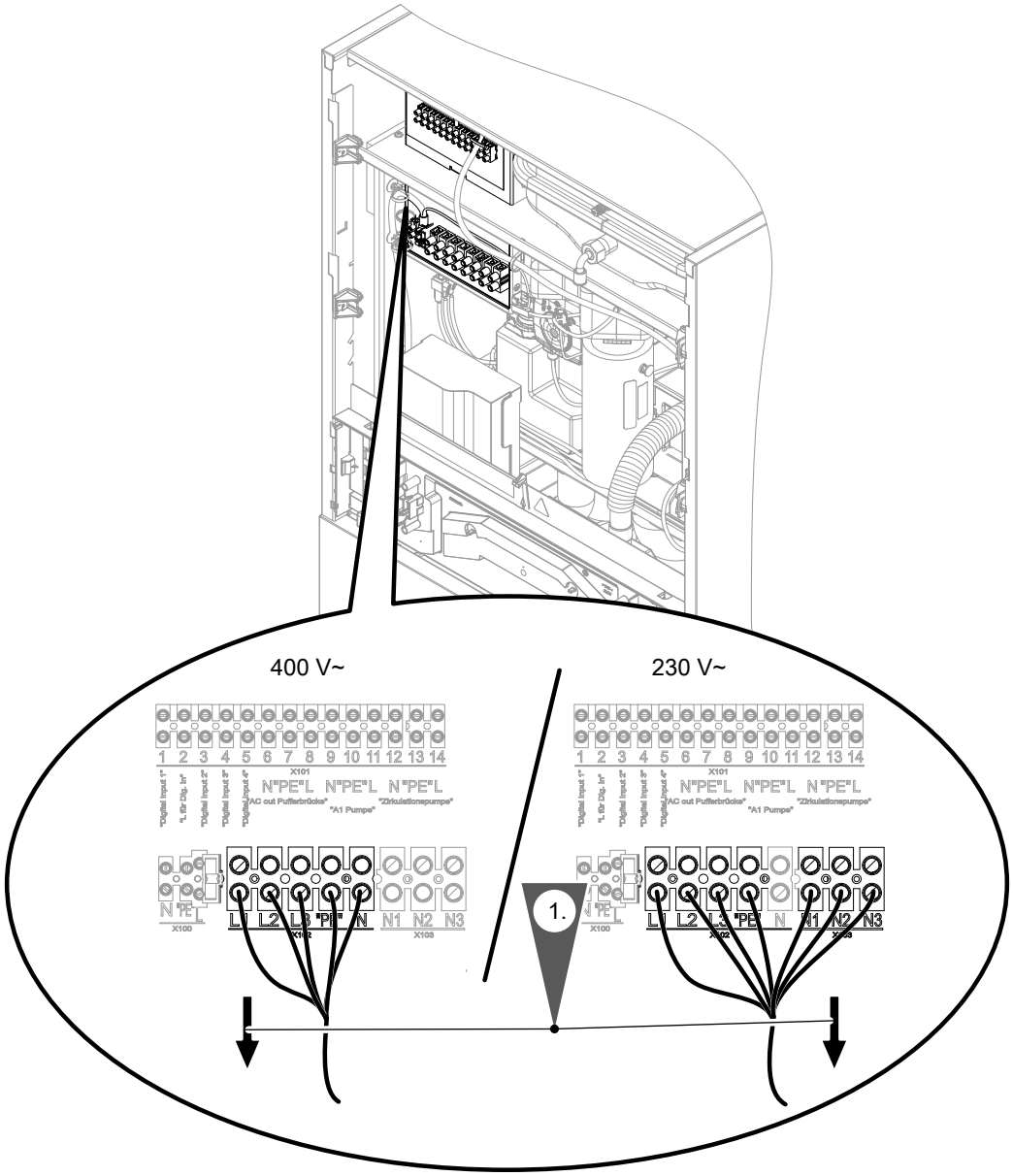


Fig. 92

Removing hydraulic components and EPP… (cont.)

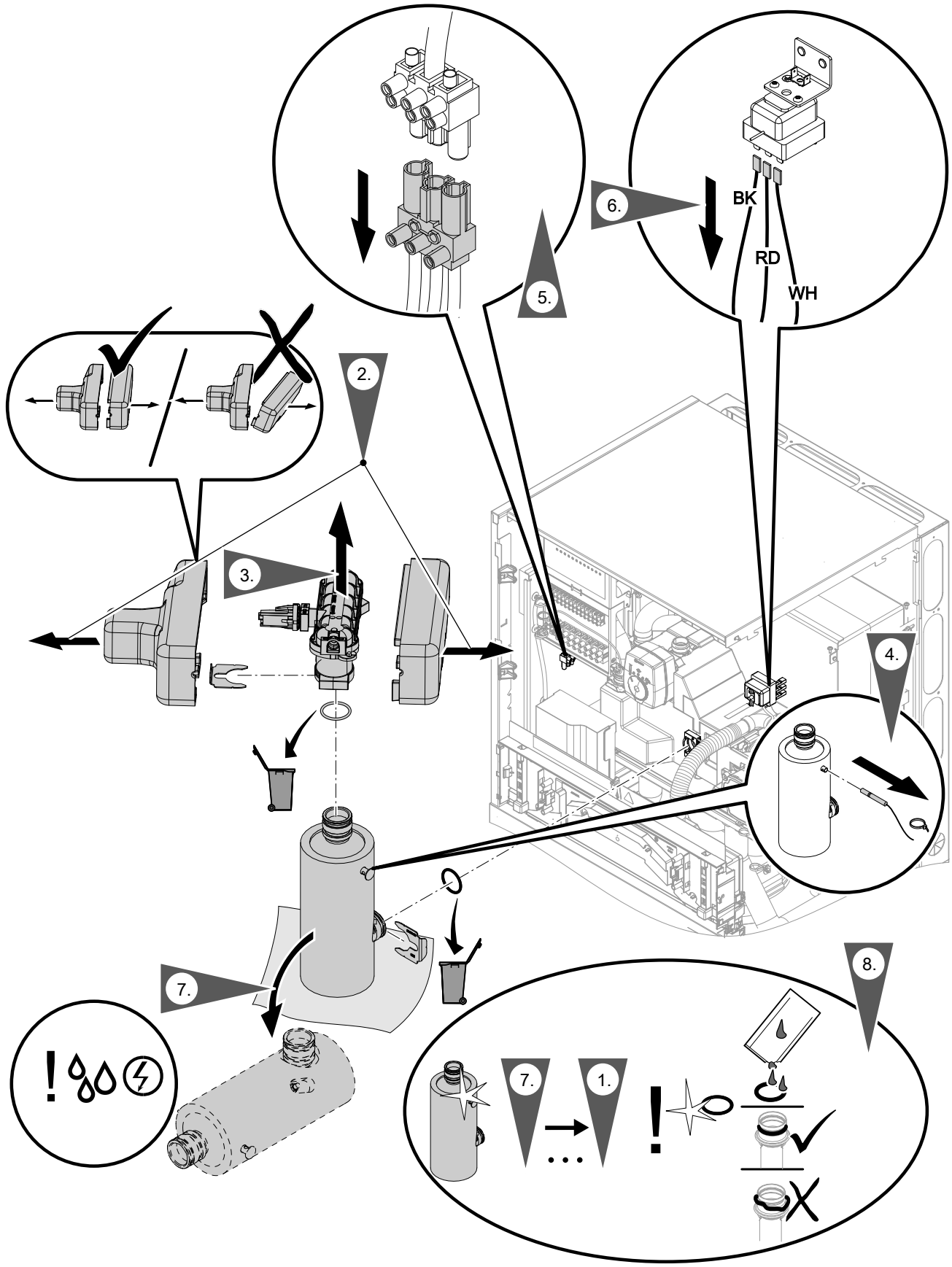


Fig. 93

Removing hydraulic components and EPP… (cont.)

Note
Observe the colour coding of the core wires connected to the high limit safety cut-out (as per IEC 60757):
BK Black
RD Red
WH White

Removing the temperature sensors

Drain the secondary side: See chapter "Draining the indoor unit on the secondary side".

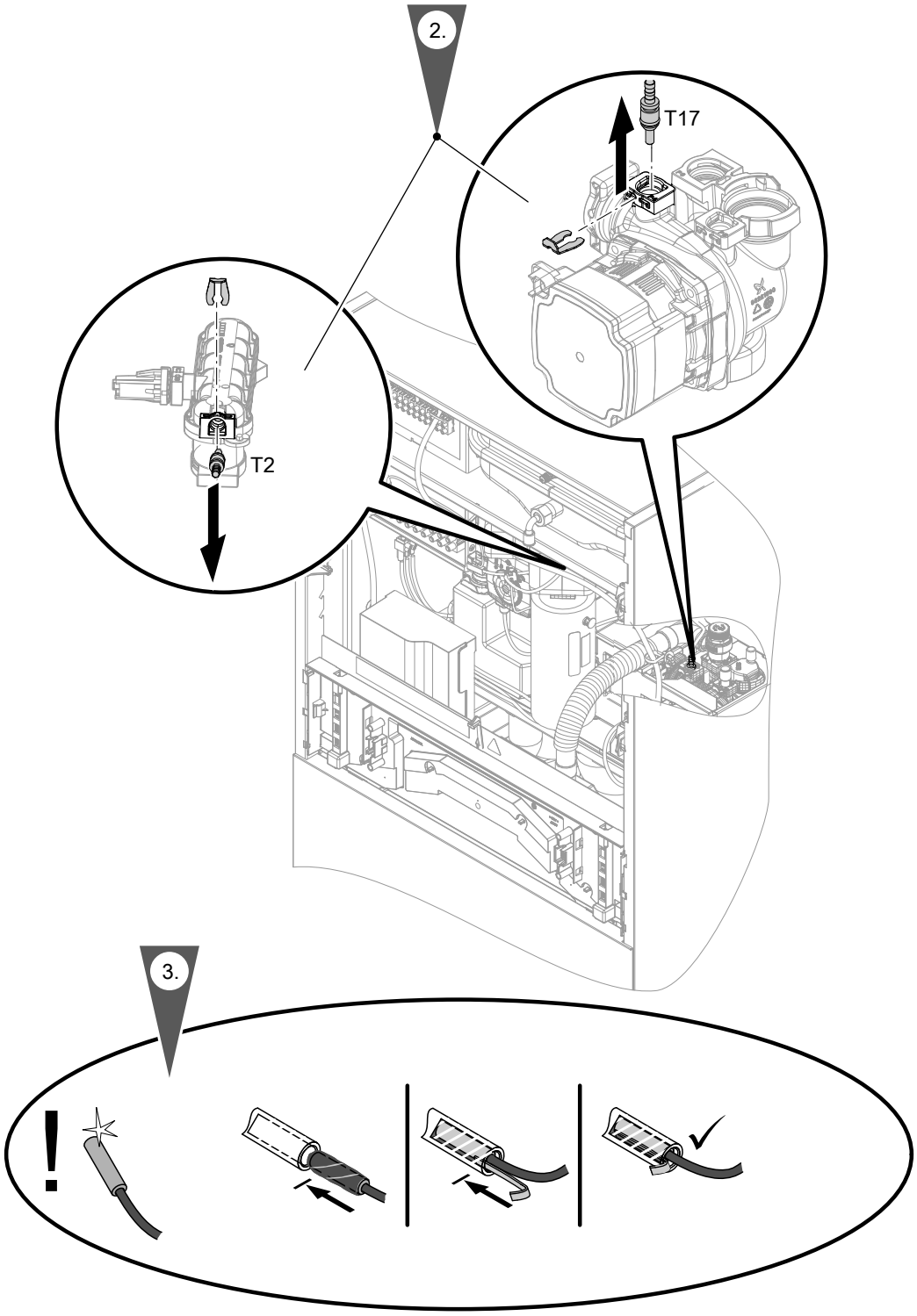


Fig. 94

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Removing hydraulic components and EPP… (cont.)

Removing the water pressure sensor

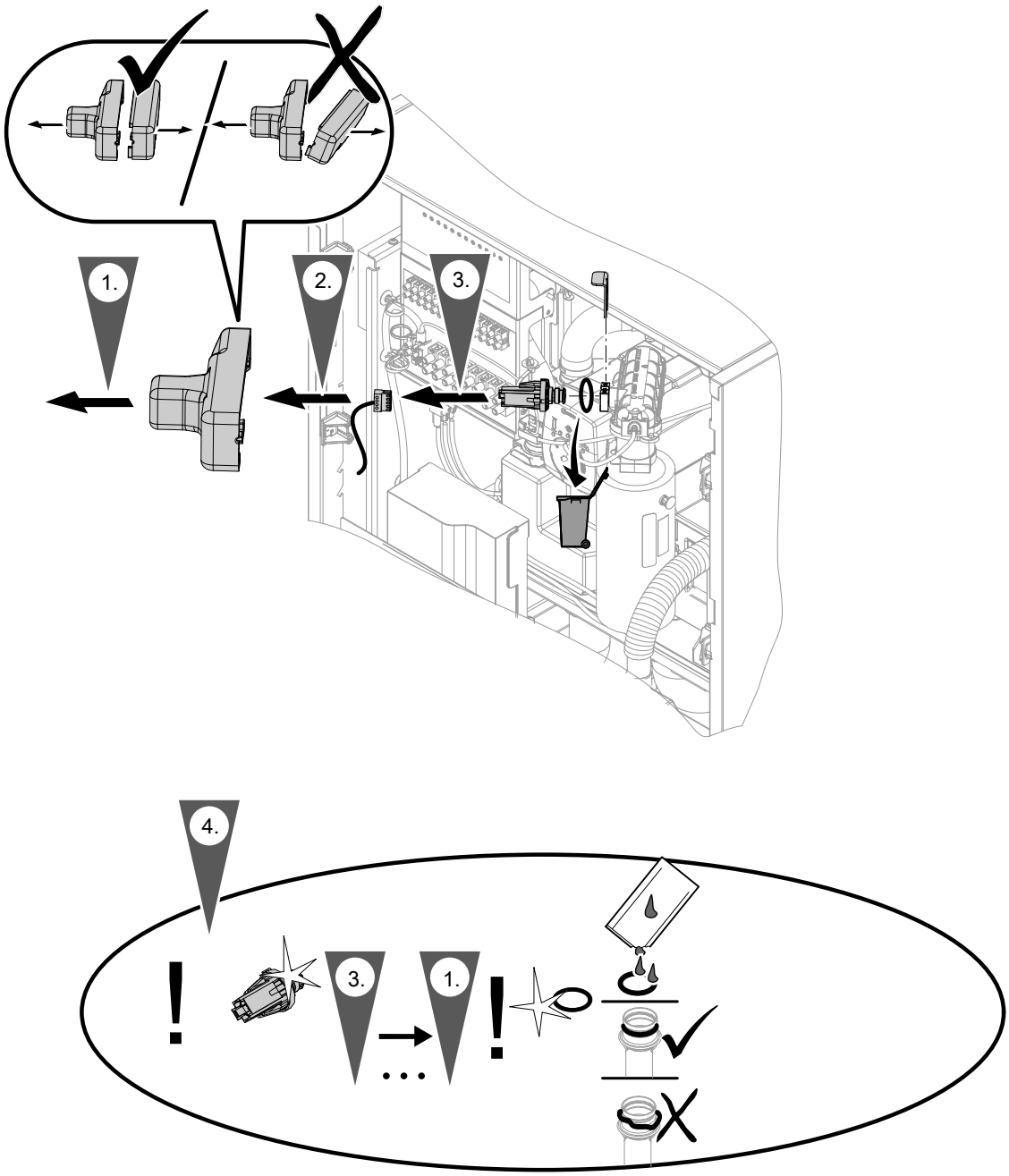


Fig. 95

Removing hydraulic components and EPP… (cont.)

Removing the circulation pump head

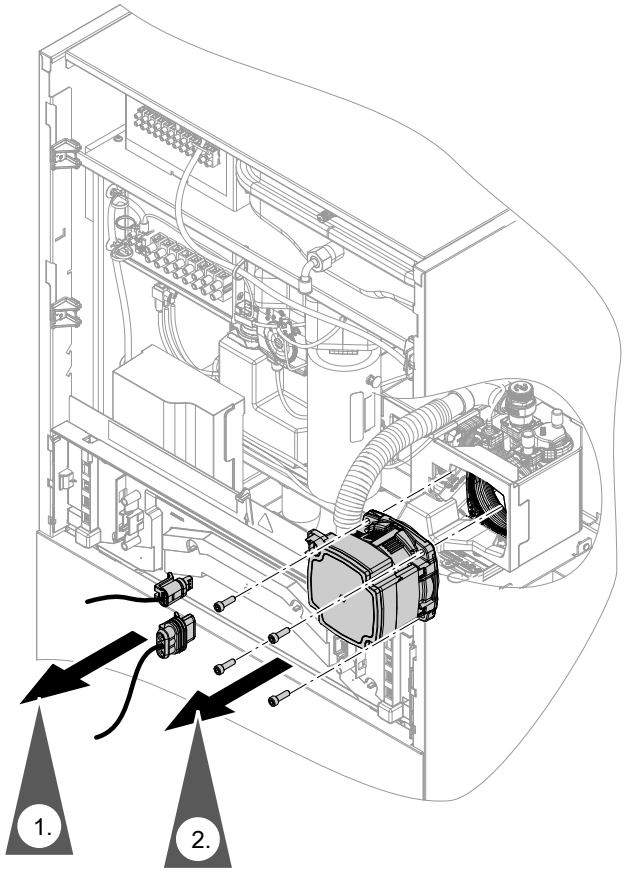


Fig. 96

Torque settings

- *Torque for the circulation pump union nuts: 70 ±2 Nm*
- *Torque for the screws on the pump head: 5 ±1 Nm*

Status display, internal circulation pumps

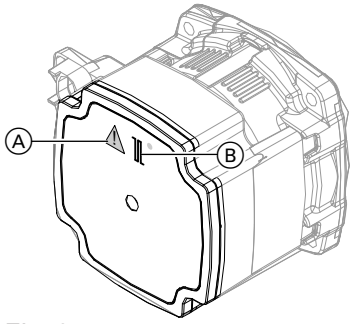


Fig. 97

LED	Meaning
Ⓑ flashes green.	Normal operation, circulation pump runs on demand.
Ⓑ lights up green.	▪ Circulation pump runs continuously with maximum output, e.g. when the PWM signal is interrupted. ▪ No fault message
Ⓐ lights up red.	▪ Fault with fault message ▪ After the indoor unit has been disconnected from the power supply, the LED lights up for approx. 30 to 60 s for the duration of the run-on time. Do not start work on the indoor unit until this run-on time has elapsed.

Checking the temperature sensors

Temperature sensor NTC 10 kΩ	Connection
▪ Outside temperature sensor	▪ Luster terminals for sensors, terminals 5 and 6 ▪ Plug 1 on the HPMU electronics module
▪ Cylinder temperature sensor	Plug 5 on the HPMU electronics module
▪ Secondary circuit flow temperature sensor (T2)	▪ EHCU electronics module ▪ Position of the temperature sensor: See chapter "Indoor unit maintenance: Overview of internal components".
▪ Secondary circuit return temperature sensor (T17)	▪ EHCU electronics module Cable harness in the indoor unit ▪ Position of the temperature sensor: See chapter "Indoor unit maintenance: Overview of internal components".
▪ Temperature sensor in external buffer cylinder	Luster terminals for sensors, terminals 7 and 8

1. Check the lead and plug of the temperature sensor.
2. Disconnect the wires from the plug.
3. Measure the temperature sensor resistance. Compare the resistance with the value for the current temperature from the following table.
4. If the deviation is > 10 %, disconnect the wires on the temperature sensor. Repeat the test directly on the sensor.
   If required, check the on-site cable (2-core cable, max. length 35 m with a cross-section of 1.5 mm^2). Depending on the result, replace the cable or temperature sensor.

Checking the temperature sensors (cont.)

NTC 10 kΩ (blue marking)

ϑ / °C	R / kΩ	ϑ / °C	R / kΩ	ϑ / °C	R / kΩ	ϑ / °C	R / kΩ	ϑ / °C	R / kΩ	ϑ / °C	R / kΩ
–40	336.500	–8	49.647	24	10.449	56	2.878	88	0.976	120	0.389
–39	314.870	–7	47.055	25	10.000	57	2.774	89	0.946	121	0.379
–38	294.780	–6	44.614	26	9.572	58	2.675	90	0.918	122	0.369
–37	276.100	–5	42.315	27	9.165	59	2.579	91	0.890	123	0.360
–36	258.740	–4	40.149	28	8.777	60	2.488	92	0.863	124	0.351
–35	242.590	–3	38.107	29	8.408	61	2.400	93	0.838	125	0.342
–34	227.550	–2	36.181	30	8.057	62	2.316	94	0.813	126	0.333
–33	213.550	–1	34.364	31	7.722	63	2.235	95	0.789	127	0.325
–32	200.510	0	32.650	32	7.402	64	2.158	96	0.765	128	0.317
–31	188.340	1	31.027	33	7.098	65	2.083	97	0.743	129	0.309
–30	177.000	2	29.495	34	6.808	66	2.011	98	0.721	130	0.301
–29	166.350	3	28.048	35	6.531	67	1.943	99	0.700	131	0.293
–28	156.410	4	26.680	36	6.267	68	1.877	100	0.680	132	0.286
–27	147.140	5	25.388	37	6.016	69	1.813	101	0.661	133	0.279
–26	138.470	6	24.165	38	5.775	70	1.752	102	0.642	134	0.272
–25	130.370	7	23.009	39	5.546	71	1.694	103	0.623	135	0.265
–24	122.800	8	21.916	40	5.327	72	1.637	104	0.606	136	0.259
–23	115.720	9	20.880	41	5.117	73	1.583	105	0.589	137	0.253
–22	109.090	10	19.900	42	4.917	74	1.531	106	0.572	138	0.247
–21	102.880	11	18.969	43	4.726	75	1.481	107	0.556	139	0.241
–20	97.070	12	18.087	44	4.543	76	1.433	108	0.541	140	0.235
–19	91.600	13	17.251	45	4.369	77	1.387	109	0.526	141	0.229
–18	86.474	14	16.459	46	4.202	78	1.342	110	0.511	142	0.224
–17	81.668	15	15.708	47	4.042	79	1.299	111	0.497	143	0.219
–16	77.160	16	14.995	48	3.889	80	1.258	112	0.484	144	0.213
–15	72.929	17	14.319	49	3.743	81	1.218	113	0.471	145	0.208
–14	68.958	18	13.678	50	3.603	82	1.180	114	0.458	146	0.204
–13	65.227	19	13.069	51	3.469	83	1.143	115	0.445	147	0.199
–12	61.722	20	12.490	52	3.340	84	1.107	116	0.434	148	0.194
–11	58.428	21	11.940	53	3.217	85	1.072	117	0.422	149	0.190
–10	55.330	22	11.418	54	3.099	86	1.039	118	0.411	150	0.185
–9	52.402	23	10.921	55	2.986	87	1.007	119	0.400		

Checking the water pressure sensor

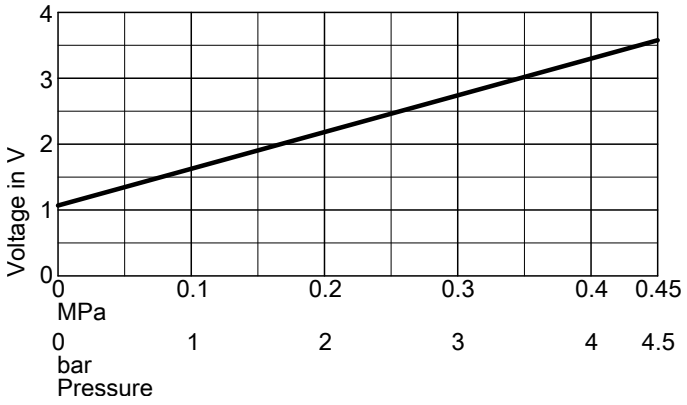


Fig. 98

Checking the fuse

- Fuse F1 is located in the HPMU electronics module: See page 78.
- Fuse F2 is located on the luster terminal for the heat pump control unit power supply: See page 93.

Fuse type:
- 6.3 A H (slow), 250 V~
- Max. power loss ≤ 2.5 W

Danger
Removing fuses does **not switch the power circuit to zero volt**. Contact with live components can lead to serious injury from electric current.
Before working on the equipment, always ensure that **the power circuit is also at zero volt.**

1. Switch off the power supply.
2. Open the HPMU electronics module.
3. Check the fuse. Replace if required.

Danger
Incorrect or improperly fitted fuses can lead to an increased risk of fire.
- Insert fuses without using any force. Position fuses correctly.
- Only use structurally identical types with the same response characteristics.

Indoor unit with central mains connection:
- Additionally check the fuse in the "230 V~ mains connection kit" (accessories or standard delivery).
  Separate instructions

Checklist for maintenance work

- Every person working on the refrigerant circuit must be able to produce a certificate of competence issued by an organisation with industry accreditation. This certificate confirms their competence in the safe handling of refrigerants by means of a standard industry procedure.
- Servicing work may only carried out in accordance with the manufacturer's specifications. If maintenance and repair work requires assistance from additional individuals, the person trained in the handling of flammable refrigerants must constantly supervise the work.
- Only AG145 and CuP 281a solders specified by the manufacturer in accordance with ISO 17672 may be used for soldering work on the refrigerant circuit.
- In order to minimise the risk of ignition, safety checks must be carried out **before** any work on appliances with flammable refrigerants can commence. Take the following measures **before** interfering with the refrigerant circuit:

Measure		Completed	Comments
1	**General working environment** ▪ Inform the following persons of the type of work to be carried out: – All maintenance personnel – All persons in the vicinity of the system. ▪ Shut off the area surrounding the outdoor unit. ▪ Survey the immediate surroundings of the outdoor unit for flammable materials and ignition sources: Remove all flammable, movable materials and all ignition sources.		
2	**Checking for the presence of refrigerant** ▪ In order to recognise a flammable atmosphere in time: Before, during and after the work, check the surrounding area for any escaping refrigerant, using an explosion-proof refrigerant detector suitable for R290. This refrigerant detector must not generate any sparks and must be suitably sealed.		
3	**Fire extinguisher** A CO_2 or powder extinguisher must be to hand in the following cases: ▪ Refrigerant is being extracted. ▪ Refrigerant is being topped up. ▪ Welding or brazing/soldering work is being carried out.		
4	**Sources of ignition** ▪ When carrying out work on a refrigerant circuit that contains or previously contained flammable refrigerant, never use ignition sources that could ignite the refrigerant. Remove all possible ignition sources, including cigarettes, from the area where installation, repair, dismantling or disposal work is taking place that may result in refrigerant escaping. ▪ Before starting work, survey the immediate surroundings of the appliance for flammable materials and ignition sources: Remove all flammable, movable materials and all ignition sources. ▪ Display no smoking signs.		
5	**Ventilating the work location** ▪ Carry out repairs outdoors, or provide adequate ventilation for the work location before interfering with the refrigerant circuit or commencing any welding or brazing/soldering work. ▪ Ventilation must be maintained for the entire duration of the work. Ventilating should dilute any refrigerant that may escape and should ideally discharge it into the surrounding atmosphere.		

Checklist for maintenance work (cont.)

Measure		Completed	Comments
6	**Checking the refrigeration system** ▪ Any replacement electrical components must be suitable for the application and must correspond to the manufacturer's specification. Only replace faulty components with original spare parts from the manufacturer. ▪ Carry out all component replacements in accordance with the manufacturer's instructions. If required, consult the manufacturer's technical support. Perform the following checks: ▪ The refrigerant charge must not be greater than specified in the technical data. ▪ If a hydraulically separated system is used, check the secondary circuit for the presence of any refrigerant. ▪ Labels and symbols must always be clearly visible and legible. Replace any illegible information. ▪ Refrigerant lines and components must be installed in such a manner that they do not come into contact with substances that can cause corrosion. Exception: The refrigerant lines are made from corrosion-resistant materials or are reliably protected against corrosion.		
7	**Checks on electrical components** ▪ Safety checks must be carried out for maintenance and repair work on electrical components: See below. ▪ In the event of a safety-related fault, do not connect the system until the fault has been remedied. If it is not possible to remove the fault immediately, it may be necessary to provide a suitable interim solution for operating the system. Inform the system operator. Carry out the following safety checks: ▪ Discharge the capacitors: Ensure no sparks are created when discharging. ▪ Do not position any live electrical components or cables in the immediate vicinity of the outdoor unit when filling or extracting refrigerant or when flushing the refrigerant circuit. ▪ Check the earth connection.		
8	**Reparaturen an abgedichteten Gehäusen** Abgedichtete elektrische Komponenten dürfen **nicht** repariert werden.		
9	**Repairs on components that are suitable for flammable atmospheres** ▪ Do not connect any continuous capacitive or inductive loads to the appliance unless it has been ensured that the permissible voltages and currents are not exceeded. ▪ In areas where flammable atmospheres exist, only apply voltage to components which are suitable for flammable atmospheres. ▪ Only use original parts from the manufacturer or components approved by the manufacturer. Other parts may result in refrigerant becoming ignited in the event of a leak.		
10	**Wiring** ▪ Check whether the wiring is subject to wear, corrosion, tension, vibration, sharp edges or other unfavourable environmental influences. ▪ When checking, also take into account the effects of ageing and continuous vibration on the compressor and fans.		

Checklist for maintenance work (cont.)

Measure		Completed	Comments
11	**Refrigerant detectors** ▪ On no account use possible ignition sources for refrigerant detection or leak detection. ▪ Flame leak detectors or other detectors with open flames must not be used.		
12	**Leak detection** The following leak detection processes are suitable for appliances with flammable refrigerant: Leak detection with electronic refrigerant detectors: ▪ Electronic refrigerant detectors may not have the required sensitivity or may need to be calibrated to the relevant range. Carry out the calibration in refrigerant-free surroundings. ▪ The refrigerant detector must be suitable for the R290 refrigerant to be detected. ▪ The refrigerant detector must not contain any potential ignition sources. ▪ Calibrate the refrigerant detector to the refrigerant used. Set the response threshold to < 3 g/a, suitable for propane. Leak detection with liquid leak detectors: ▪ Liquid leak detectors are suitable for use with most refrigerants. ! **Please note** Liquid leak detectors containing chlorine may react with the refrigerant. This could result in corrosion. Do not use liquid leak detectors that contain chlorine. Measures to take if a leak in the refrigerant circuit occurs or is suspected: ▪ Immediately extinguish all open flames in the vicinity of the heat pump. ▪ If brazing/soldering work needs to be undertaken to remedy the leak, always extract all the refrigerant from the refrigerant circuit. Purge the site to be brazed/soldered before and during the brazing/soldering work with oxygen-free nitrogen.		
13	**Extracting refrigerant** Carry out the work in accordance with chapter "Extracting refrigerant".		
14	**Testing pressure resistance** Carry out the work according to chapter "Testing pressure resistance".		
15	**Filling the refrigerant circuit** Carry out the work in accordance with chapter "Filling the refrigerant circuit".		

Checklist for maintenance work (cont.)

Measure		Completed	Comments
16	**Shutdown** Carry out the work in accordance with chapter "Final decommissioning and disposal".		
17	**Identification** (labelling the heat pump) If the heat pump has been taken out of use, affix a label to the outdoor unit in a clearly visible position containing the following information with date and signature: ▪ Outdoor unit works with flammable refrigerant R290 (propane). ▪ System has been taken out of use. ▪ Refrigerant has been extracted. ▪ Outdoor unit contains nitrogen. ▪ Outdoor unit may contain residual flammable refrigerant.		

Removing the outer casing

The steps are shown using the example of the outdoor unit with 2 fans.

- The procedure for the outdoor unit with 1 fan is identical.
- Fitting the outer casing: Carry out the steps in reverse order.
- Torque settings for assembly:
  Right-hand side panel nuts: 1.5 +1.0 Nm
  Screws TX 25: 1.8 ±0.25 Nm

Removing the outer casing (cont.)

Removing the right-hand side casing

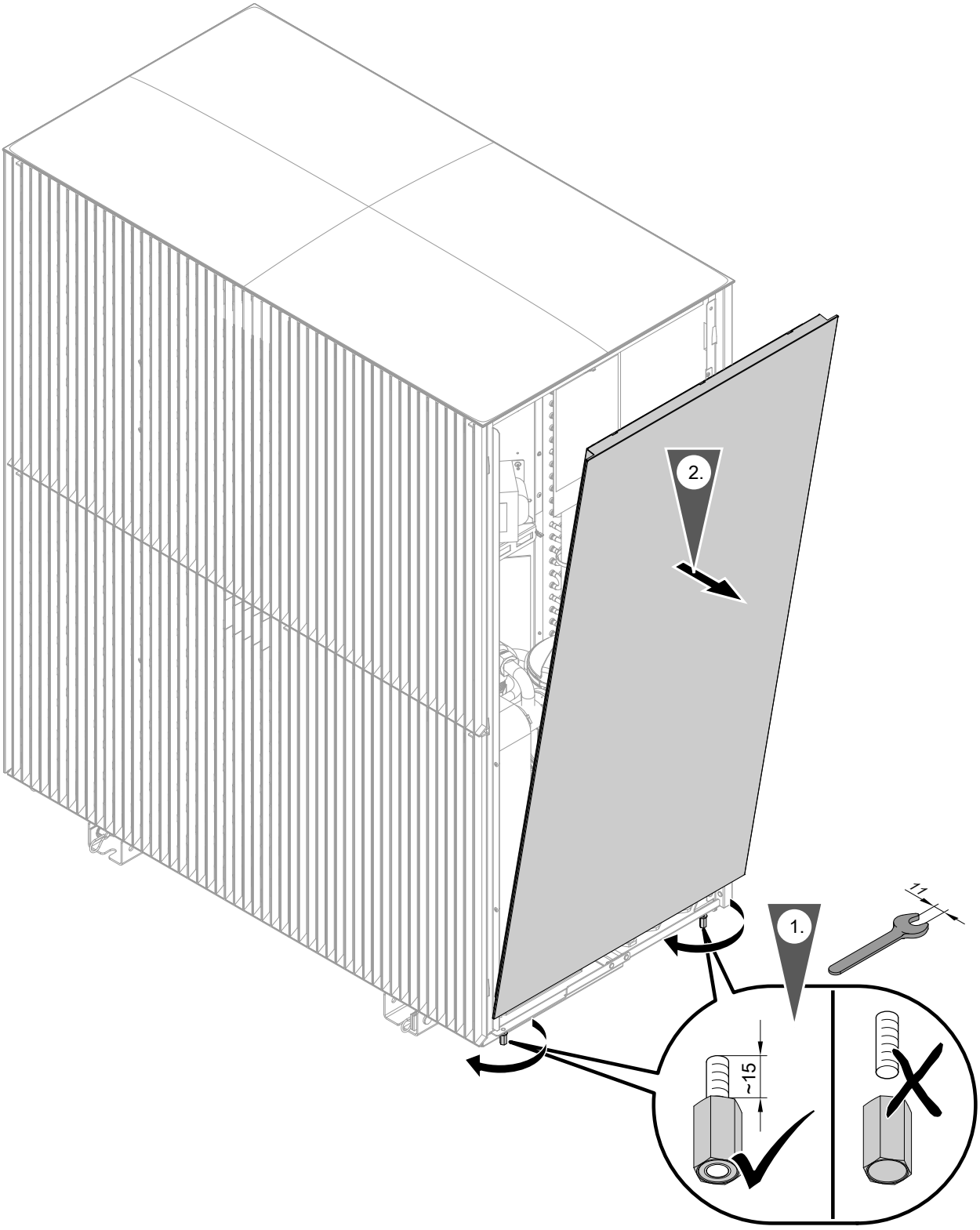


Fig. 99

Removing the outer casing (cont.)

When fitting the right-hand side casing, make sure it is positioned correctly:

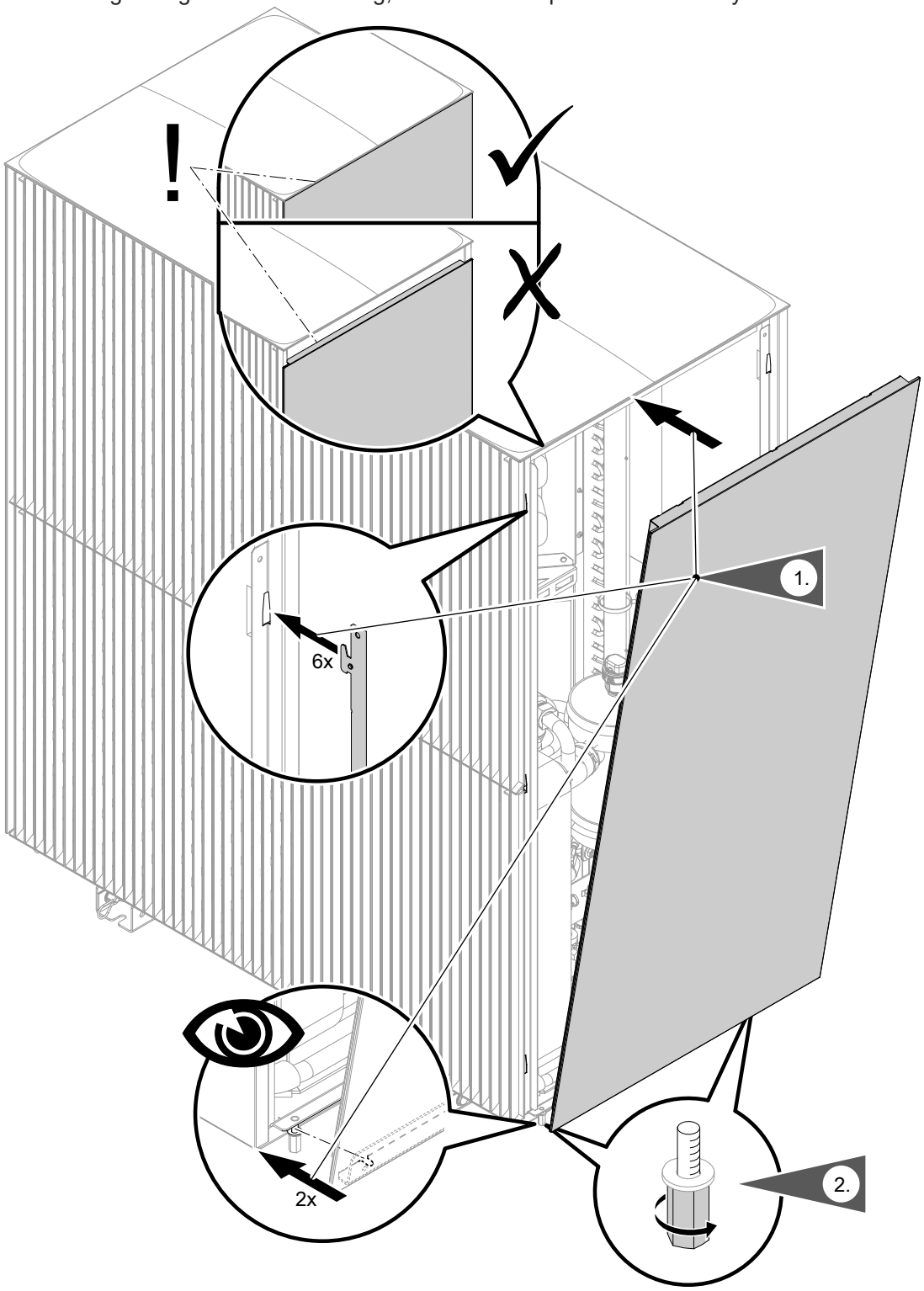


Fig. 100

Note
Torque for the nuts: 1.5 +1.0 Nm

Removing the top casing

1. Remove right-hand side casing: See Fig. 35.

Removing the outer casing (cont.)

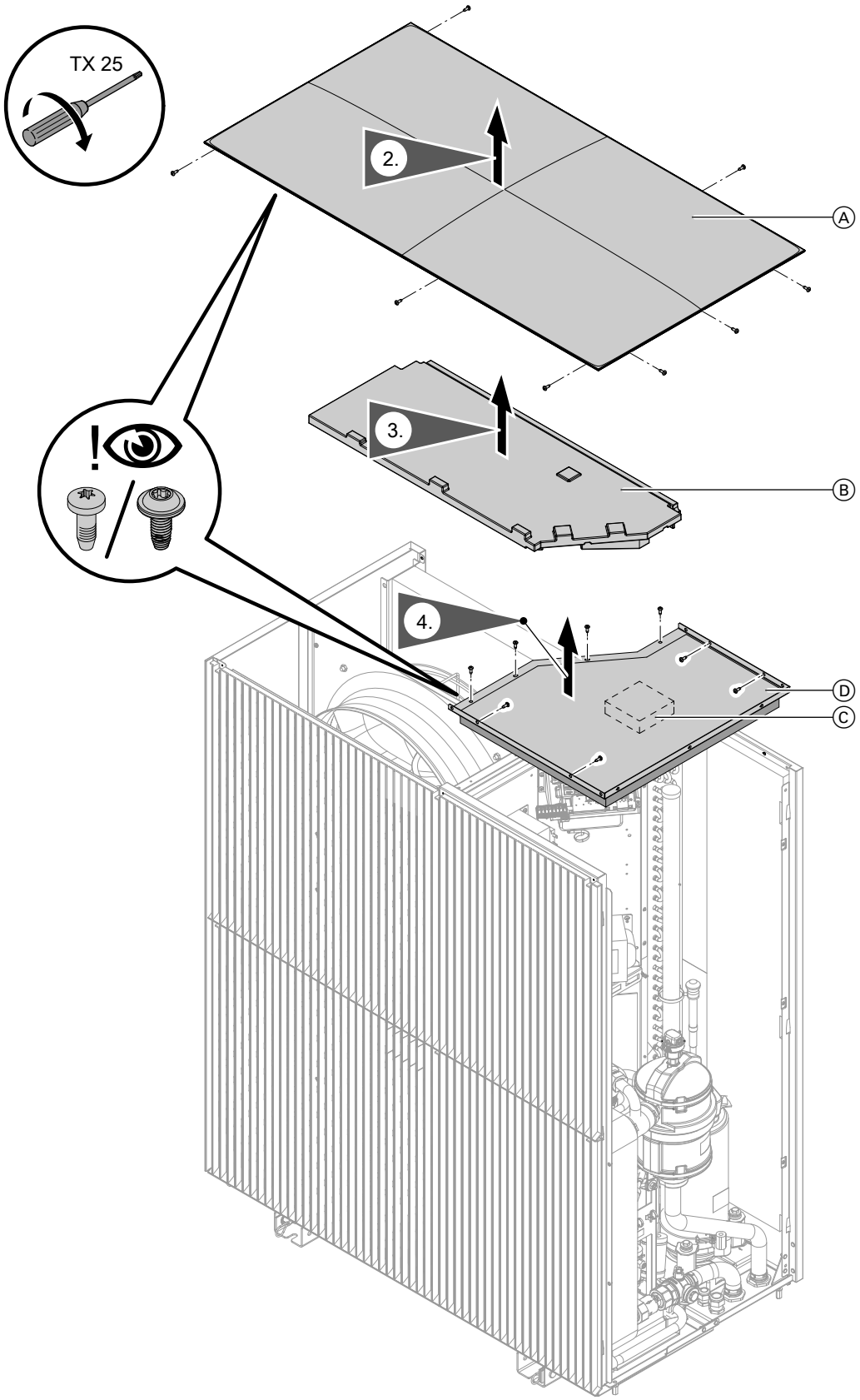


Fig. 101

Note
Torque for both screws: 1.8 ±0.25 Nm

Ⓐ Top cover
Ⓑ Air space cover
Ⓒ EPP support
Ⓓ Cover with gasket and sound insulation

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Removing the outer casing (cont.)

Removing the front casing

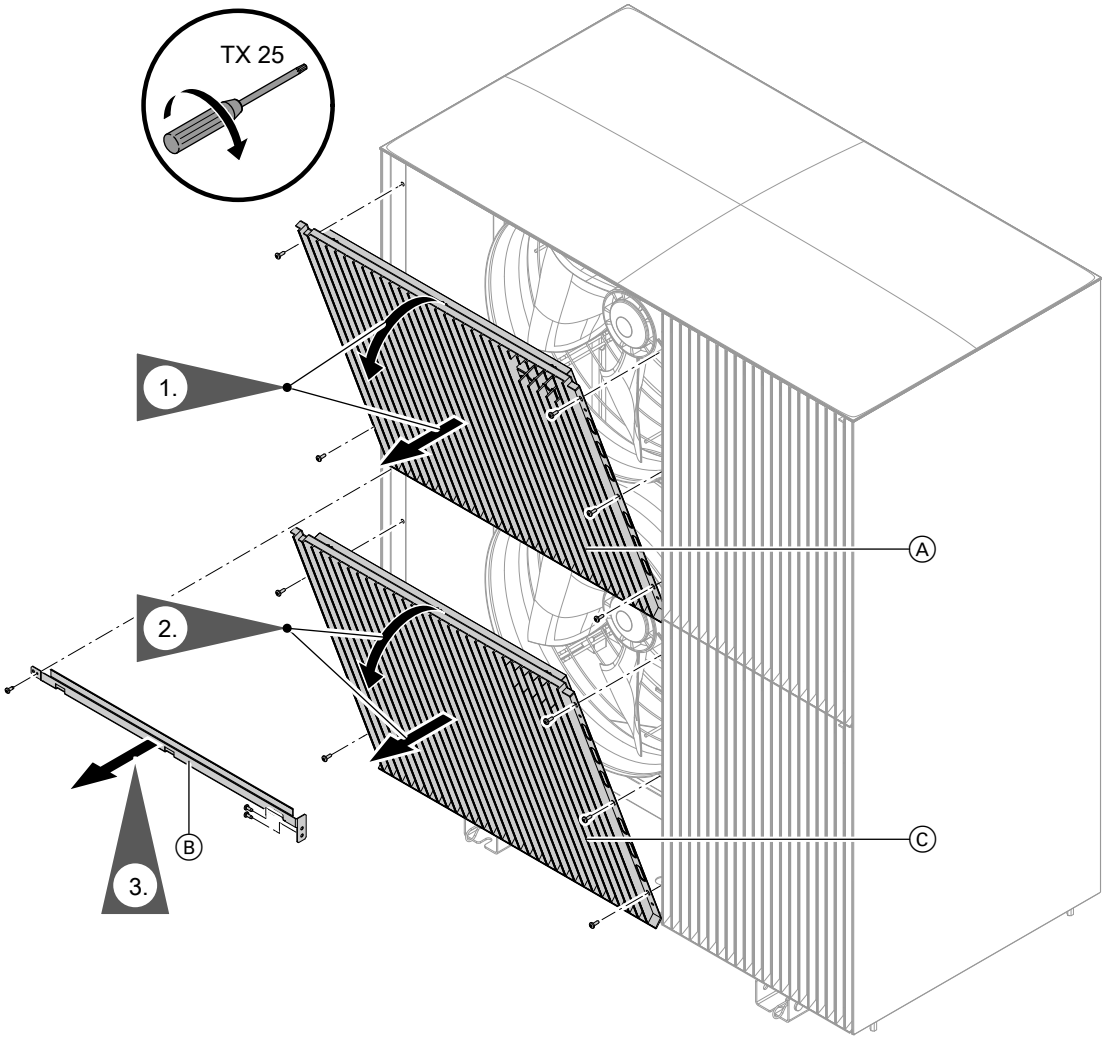


Fig. 102

Note
Torque for the screws: 1.8 ±0.25 Nm

Ⓐ Only for outdoor unit with 2 fans:
Grille of upper fan
Ⓑ Reinforcing strut
Ⓒ Grille of lower fan

Removing the outer casing (cont.)

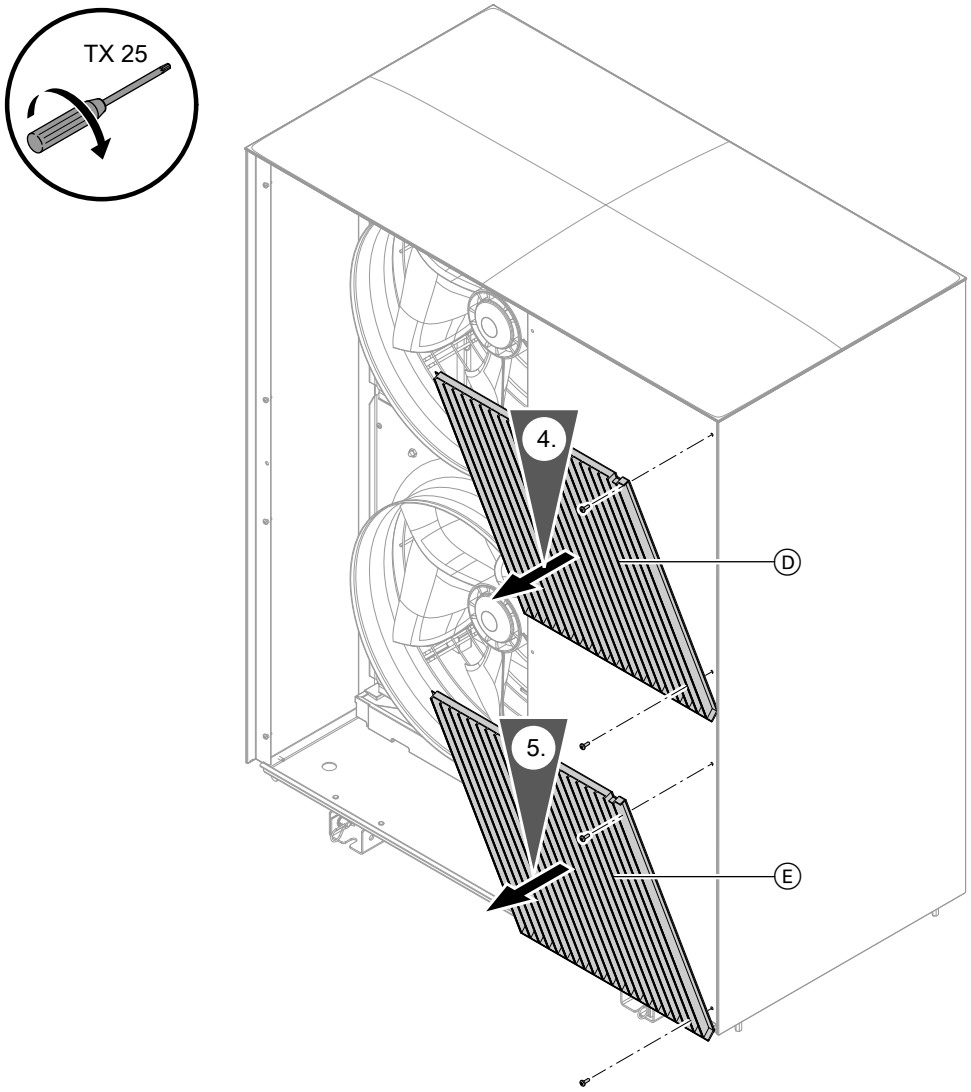


Fig. 103

Note
Torque for the screws: 1.8 ±0.25 Nm

Ⓓ Only for outdoor unit with 2 fans:
Design grille, top
Ⓔ Design grille, bottom

6. Remove right-hand side casing: See Fig. 35.

7. Remove cover: See Fig. 101.

Removing the outer casing (cont.)

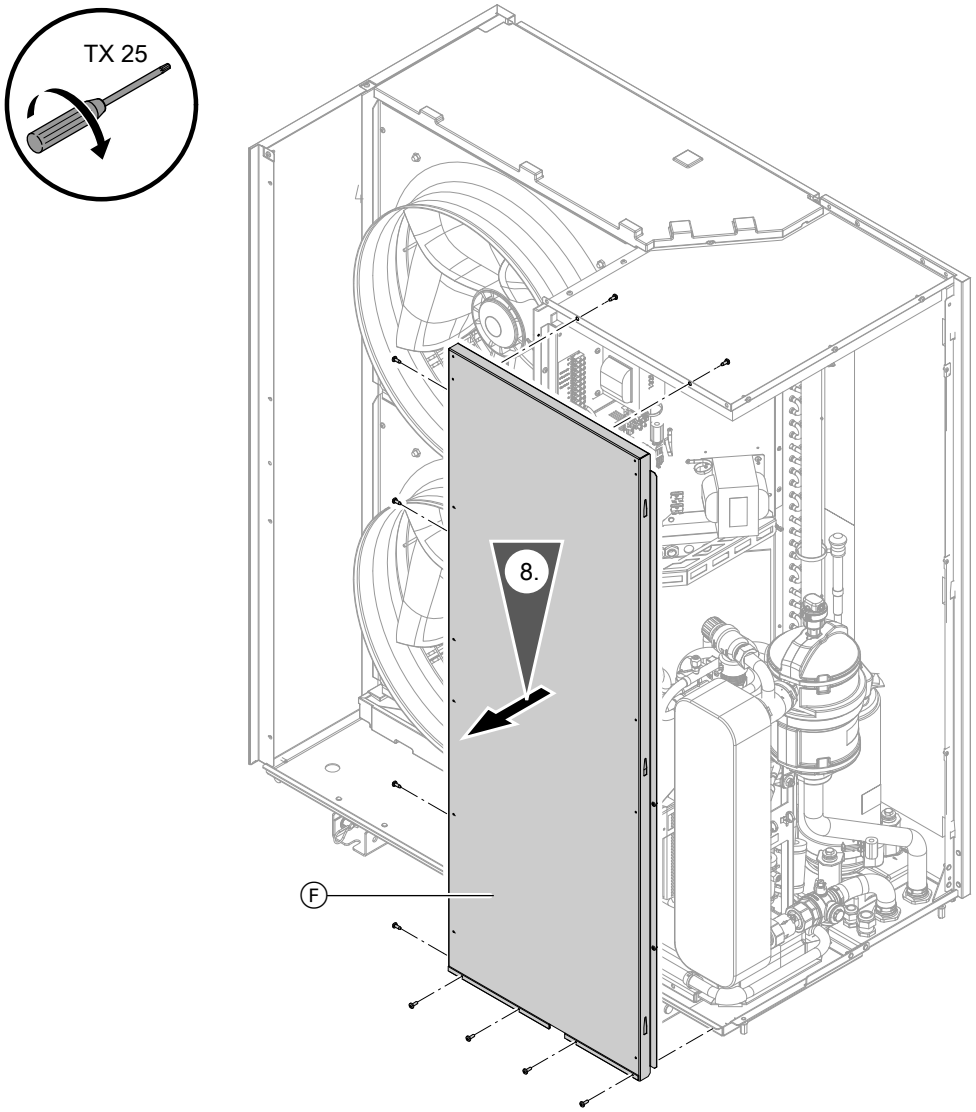


Fig. 104

Note
Torque for the screws: 1.8 ±0.25 Nm

Ⓕ Front panel

Removing the left-hand side casing

1. Remove right-hand side casing: See Fig. 35.

2. Remove cover: See Fig. 101.

3. Remove fan grilles and reinforcing strut: See Fig. 102.

Removing the outer casing (cont.)

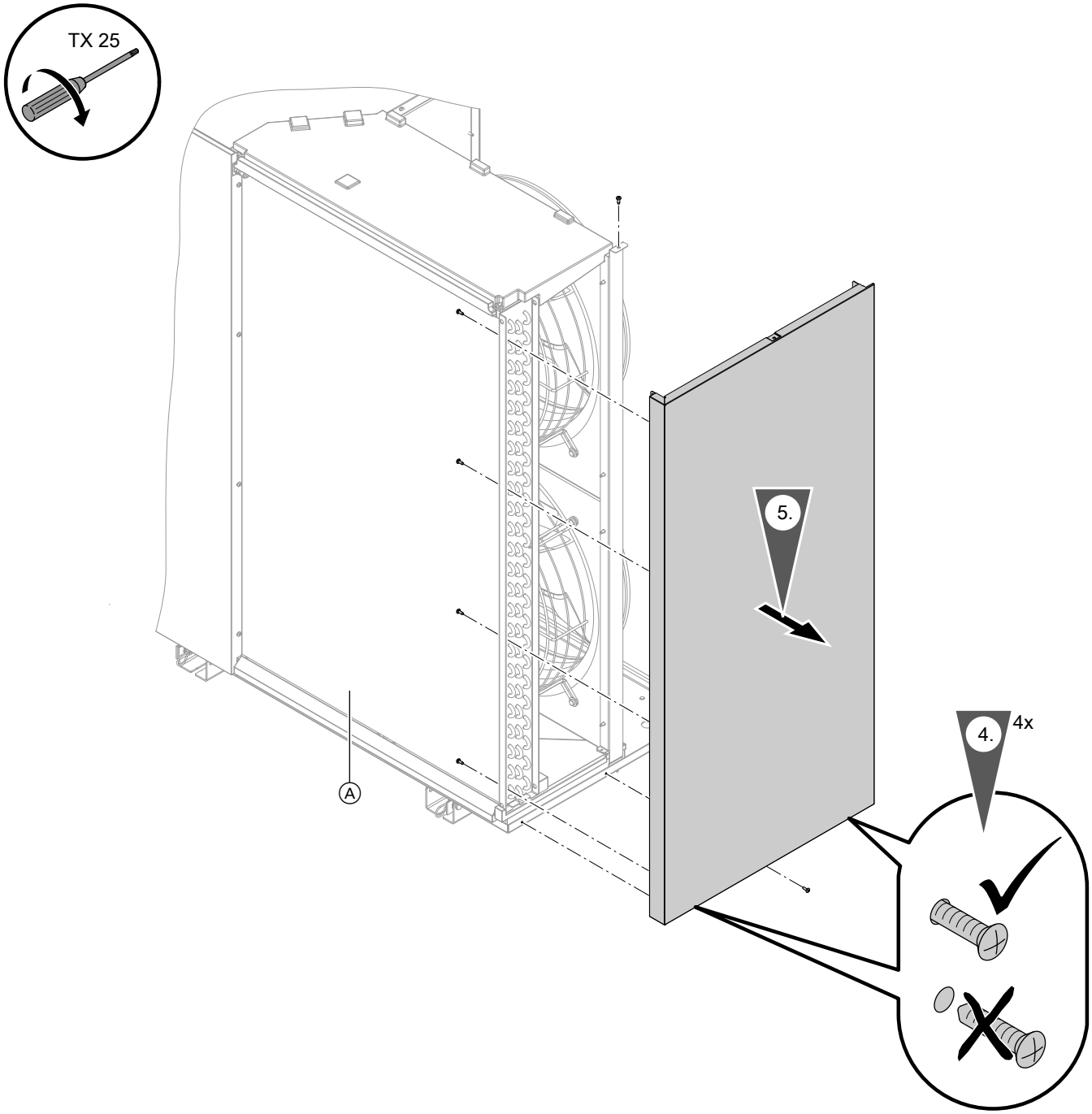


Fig. 105

Note
Torque for the screws: 1.8 ±0.25 Nm

Ⓐ Evaporator

Removing the rear casing

1. Remove right-hand side casing: See Fig. 35.

2. Remove cover: See Fig. 101.

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Removing the outer casing (cont.)

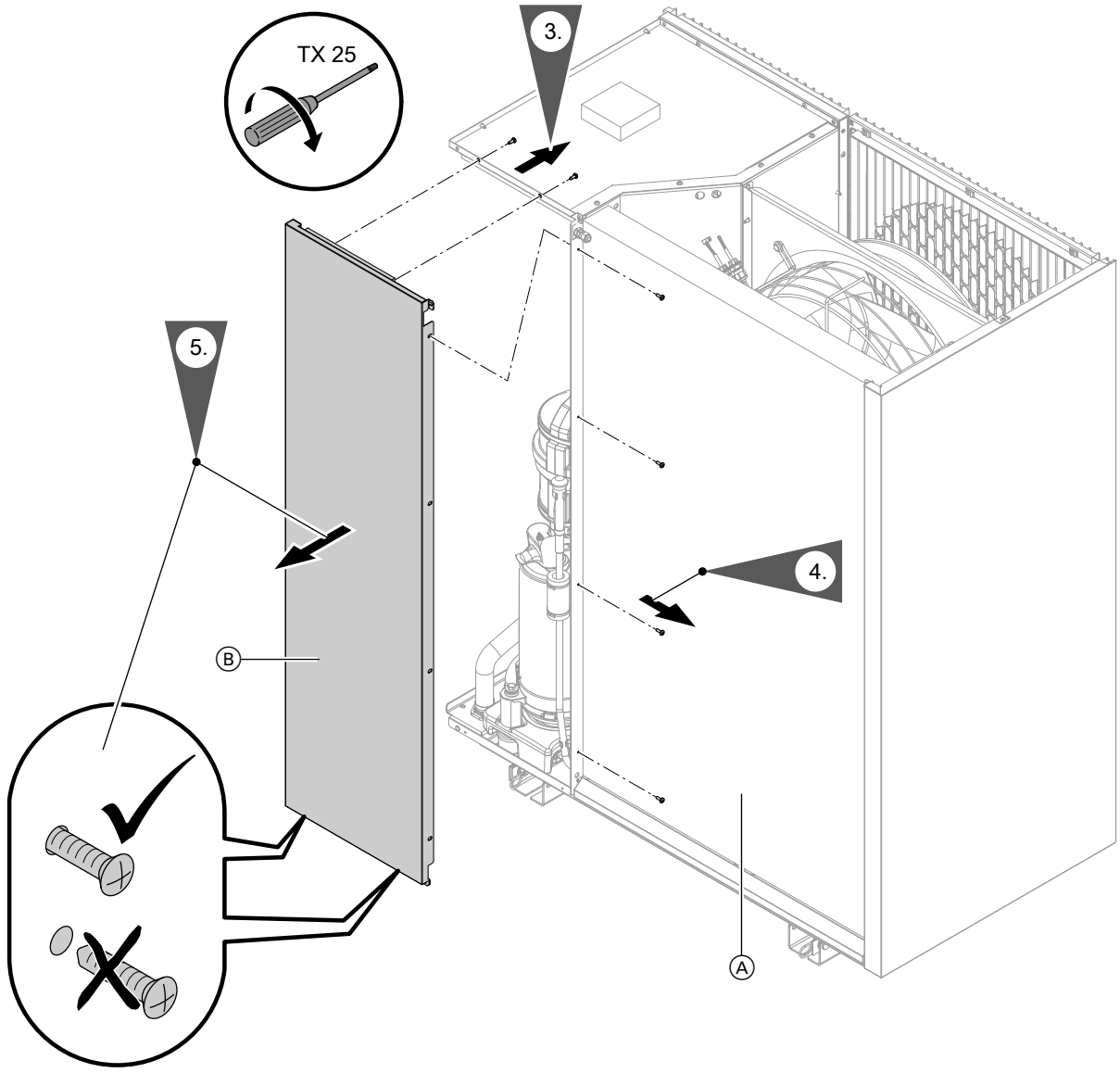


Fig. 106

Note
Torque for the screws: 1.8 ±0.25 Nm

Ⓐ Evaporator
Ⓑ Back panel

Overview of electrical components

Danger
Contact with live components can lead to serious injury from electric current. Some components on PCBs remain live even after the power supply has been switched off.
- **Do not touch** electrical terminal areas.
- When working on the indoor or outdoor unit, isolate the system from the power supply, e.g. at a separate fuse or a main switch. Check that no voltage is present. Safeguard against unauthorised reconnection.
- Before working on the appliance, wait at least 4 min until the voltage has dropped out.

Danger
The absence of system component earthing can lead to serious injury from electrical current and component damage in the event of an electrical fault.
All earth conductor connections **must** be reconnected.
The appliance and pipework must be connected to the equipotential bonding of the building.

Outdoor unit with 1 fan

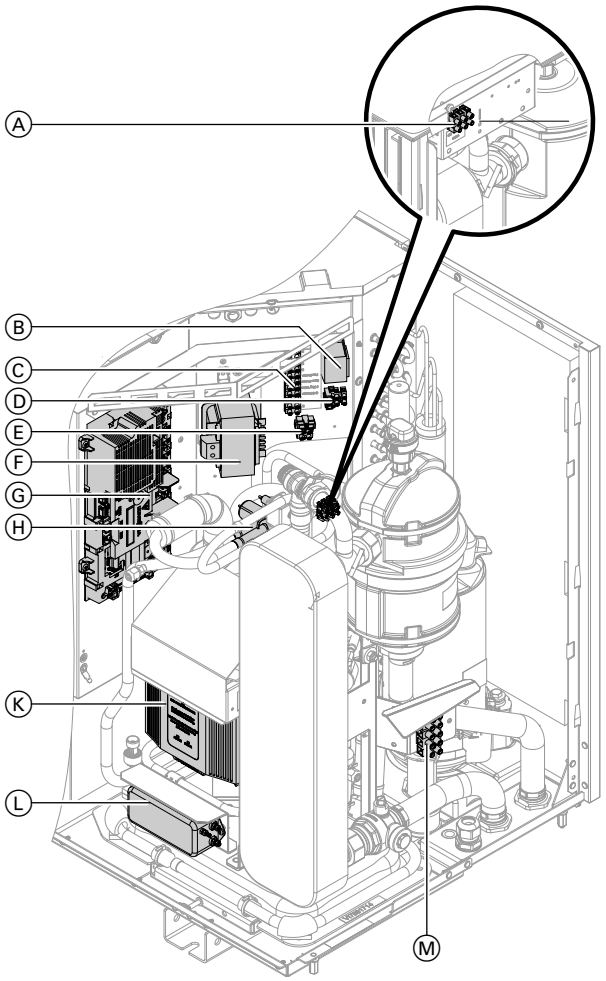


Fig. 107

Ⓐ Terminals for CAN bus communication cable
Ⓑ Choke coil
Ⓒ Terminal strip, 230 V~ function components
Ⓓ Fan terminals with fuse 6.3 A H (slow), 250 V~
Ⓔ Electronics terminals with fuse 6.3 A H (slow), 250 V~
Ⓕ Chokes
Ⓖ VCMU refrigerant circuit controller
Ⓗ Solenoid coil, 4-way diverter valve
Ⓚ Inverter
Ⓛ Interference suppression filter
Ⓜ Mains terminals 230 V~

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Overview of electrical components (cont.)

Outdoor unit with 2 fans, 230 V~, sizes 10 to 13

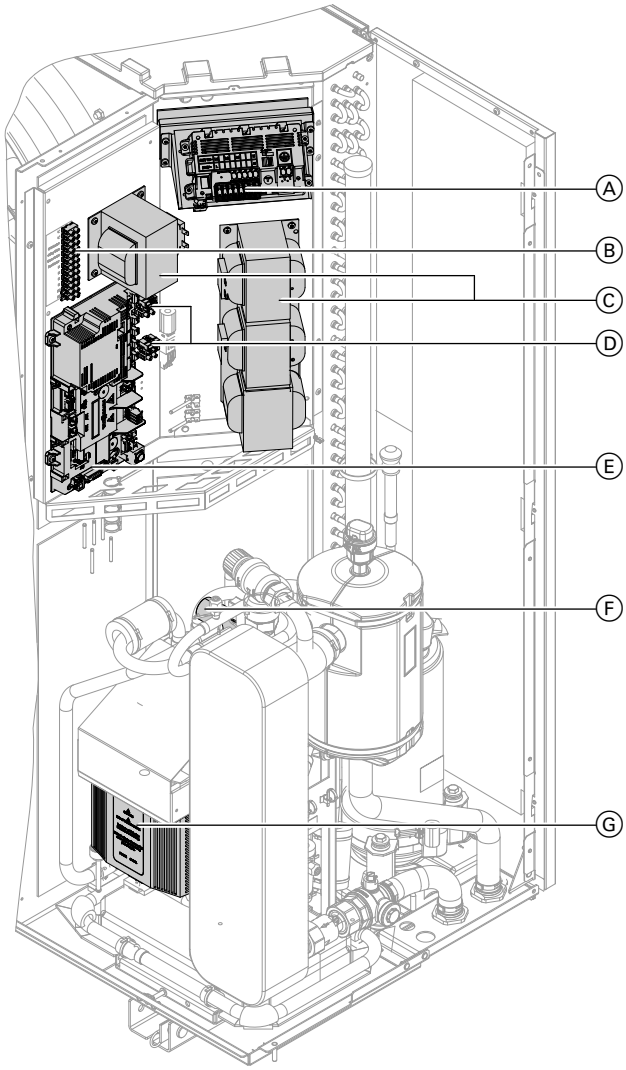


Fig. 108

Ⓐ EMCF PCB with 230 V~ mains terminals
Ⓑ Terminal strip, 230 V~ function components
Ⓒ Chokes
Ⓓ Fuses for PCB and fans
6.3 A H (slow), 250 V~
Ⓔ VCMU refrigerant circuit controller
Ⓕ Coil, 4-way diverter valve
Ⓖ Inverter

Overview of electrical components (cont.)

Outdoor unit with 2 fans, 400 V~, sizes 10 to 13

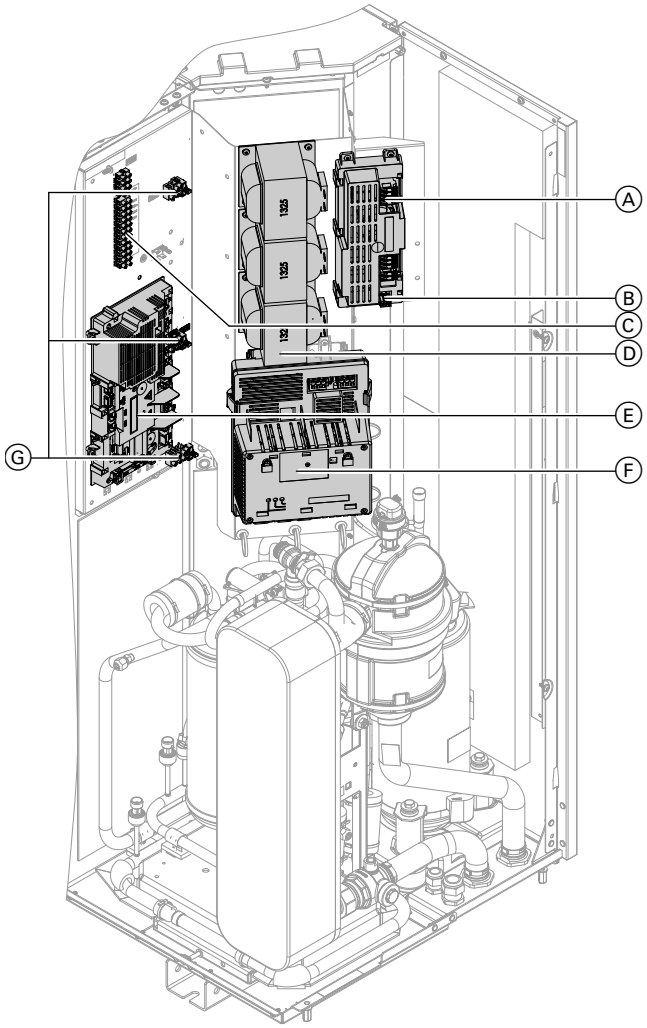


Fig. 109

Ⓐ EMCF PCB with 400 V~ mains terminals
Ⓑ Terminals for CAN bus communication cable
Ⓒ Terminal strip, 230 V~ function components
Ⓓ Chokes
Ⓔ VCMU refrigerant circuit controller
Ⓕ Inverter
Ⓖ Fuses for PCB and fans
6.3 A H (slow), 250 V~

Overview of electrical components (cont.)

Outdoor unit with 2 fans, 400 V~, sizes 16 to 19

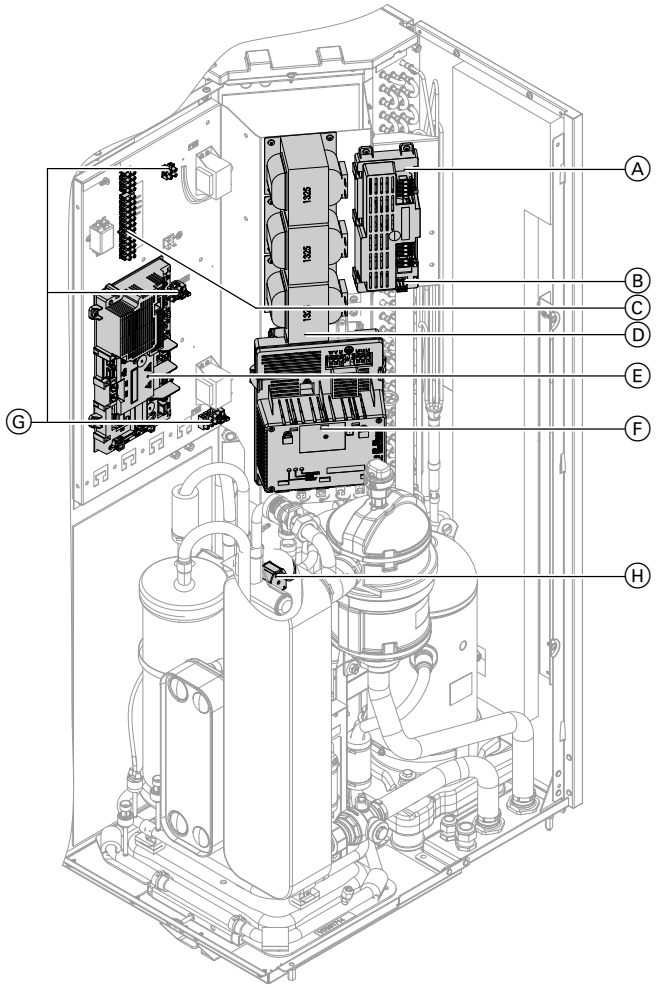


Fig. 110

Ⓐ EMCF PCB with 400 V~ mains terminals
Ⓑ Terminals for CAN bus communication cable
Ⓒ Terminal strip, 230 V~ function components
Ⓓ Chokes
Ⓔ VCMU refrigerant circuit controller
Ⓕ Inverter
Ⓖ Fuses for PCB and fans
6.3 A H (slow), 250 V~
Ⓗ Coil, 4-way diverter valve

Overview of internal components

Danger
Contact with live components can lead to serious injury from electric current. Some components on PCBs remain live even after the power supply has been switched off.

- When working on the outdoor unit, isolate the system from the power supply, e.g. at a separate MCB/fuse or a mains isolator. Check the system is no longer live and safeguard against reconnection.
- Prior to working on the appliance, wait at least 4 min until the voltage on the charged capacitors has completely dropped out.

Overview of internal components (cont.)

Outdoor unit with 1 fan

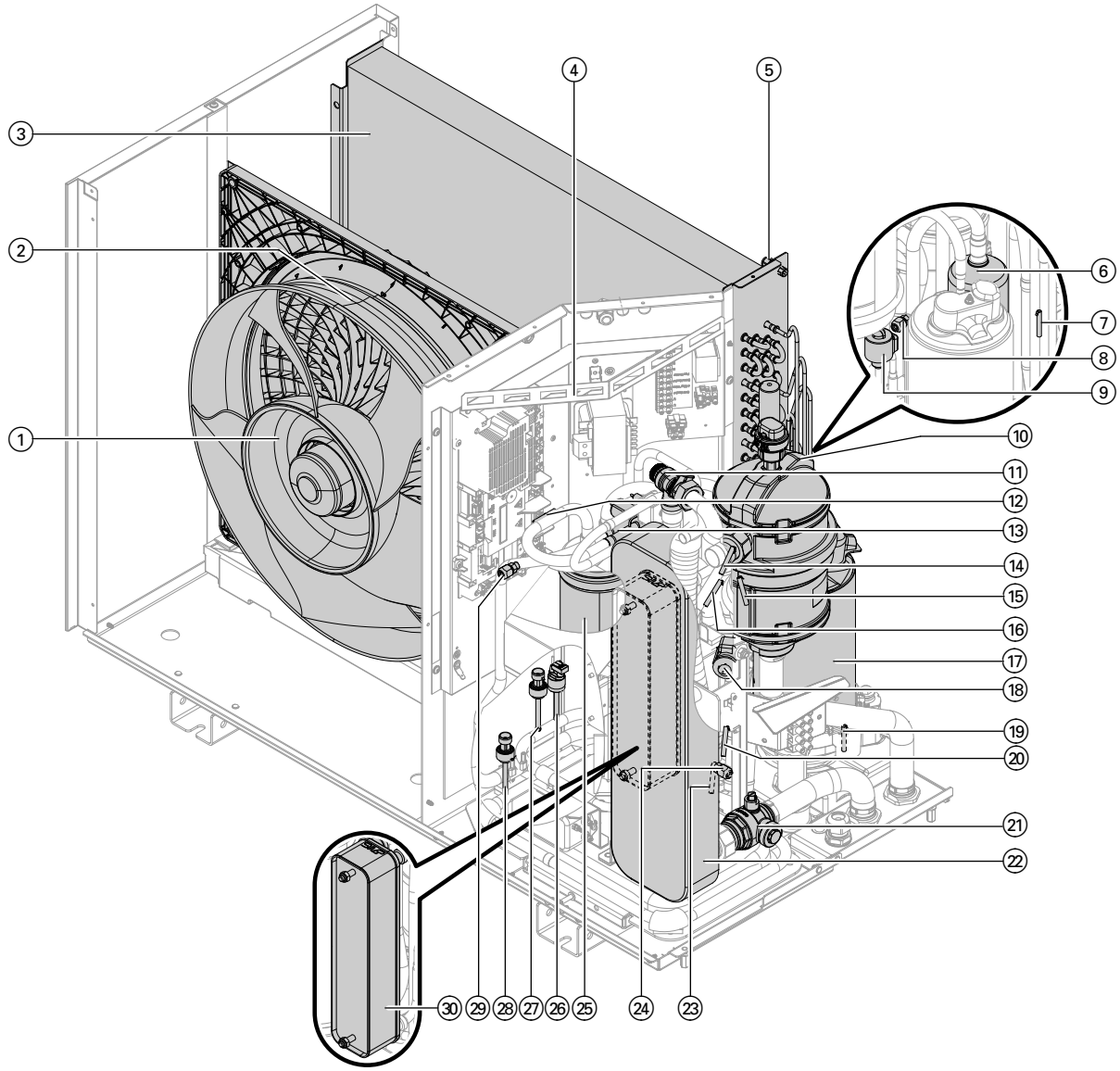


Fig. 111

① Fan
② Version V002 only: Fan ring heater
③ Evaporator
④ Inverter temperature sensor (BT10)
⑤ Air inlet temperature sensor (BT7)
⑥ Compressor accumulator (refrigerant receiver)
⑦ Liquid gas temperature sensor – cooling (BT6)
⑧ Schrader valve, low pressure side
⑨ Electronic expansion valve 2
⑩ Float air vent valve with quick-action air vent valve
⑪ 3 bar safety valve
⑫ Suction gas temperature sensor – evaporator (BT3)
⑬ 4-way diverter valve
⑭ Secondary circuit flow temperature sensor downstream of condenser (BT1)
⑮ Liquid gas temperature sensor – heating (BT9)
⑯ Hot gas temperature sensor (BT4)
⑰ Compressor
⑱ Electronic expansion valve 1
⑲ Oil sump temperature sensor (BT8)
⑳ Suction gas temperature sensor – compressor (BT5)
㉑ Ball valve with non-return valve and filter
㉒ Condenser
㉓ Liquid gas temperature sensor – condenser (BT2)
㉔ Schrader valve, high pressure side 2
㉕ Accumulator (refrigerant receiver)
㉖ High pressure switch PSH
㉗ High pressure sensor (BP1, black)
㉘ Low pressure sensor (BP2, green)
㉙ Schrader valve, high pressure side 1
㉚ Internal heat exchanger

Overview of internal components (cont.)

Outdoor unit with 2 fans, 230 V~, sizes 10 to 13

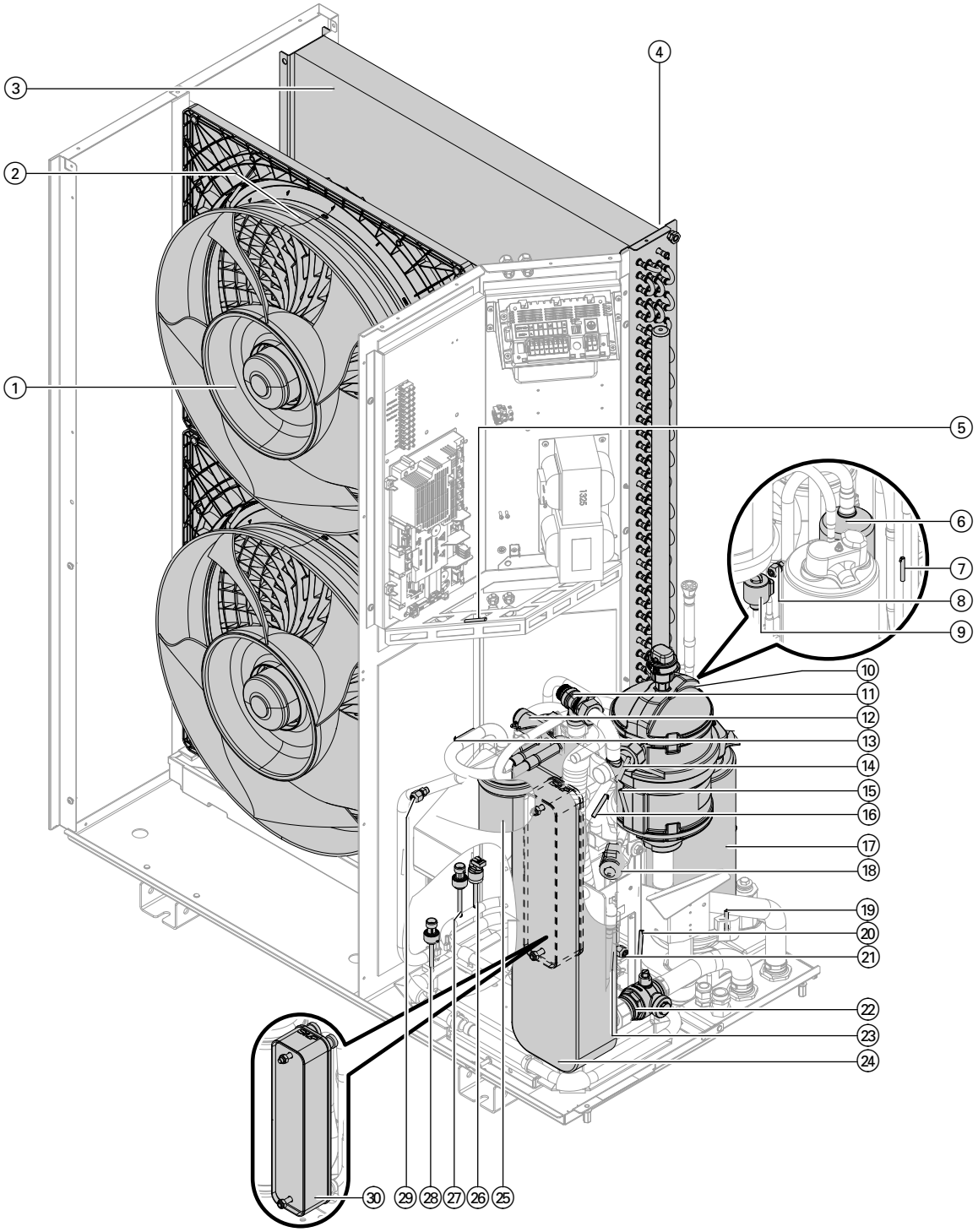


Fig. 112

① Fan
② Version V002 only: Fan ring heater
③ Evaporator
④ Air inlet temperature sensor (BT7)
⑤ Inverter temperature sensor (BT10)
⑥ Compressor accumulator (refrigerant receiver)
⑦ Liquid gas temperature sensor – cooling (BT6)
⑧ Schrader valve, low pressure side
⑨ Electronic expansion valve 2
⑩ Float air vent valve with quick-action air vent valve
⑪ 3 bar safety valve
⑫ 4-way diverter valve
⑬ Suction gas temperature sensor – evaporator (BT3)
⑭ Secondary circuit flow temperature sensor downstream of condenser (BT1)
⑮ Liquid gas temperature sensor – condenser (BT2)
⑯ Hot gas temperature sensor (BT4)
⑰ Compressor

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Overview of internal components (cont.)

⑱ Electronic expansion valve 1
⑲ Oil sump temperature sensor (BT8)
⑳ Suction gas temperature sensor – compressor (BT5)
㉑ Schrader valve, high pressure side 2
㉒ Ball valve with non-return valve, filter
㉓ Liquid gas temperature sensor – heating (BT9)
㉔ Condenser
㉕ Accumulator (refrigerant receiver)
㉖ High pressure switch PSH
㉗ High pressure sensor (BP1, black)
㉘ Low pressure sensor (BP2, green)
㉙ Schrader valve, high pressure side 1
㉚ Internal heat exchanger

Overview of internal components (cont.)

Outdoor unit with 2 fans, 400 V~, sizes 10 to 13

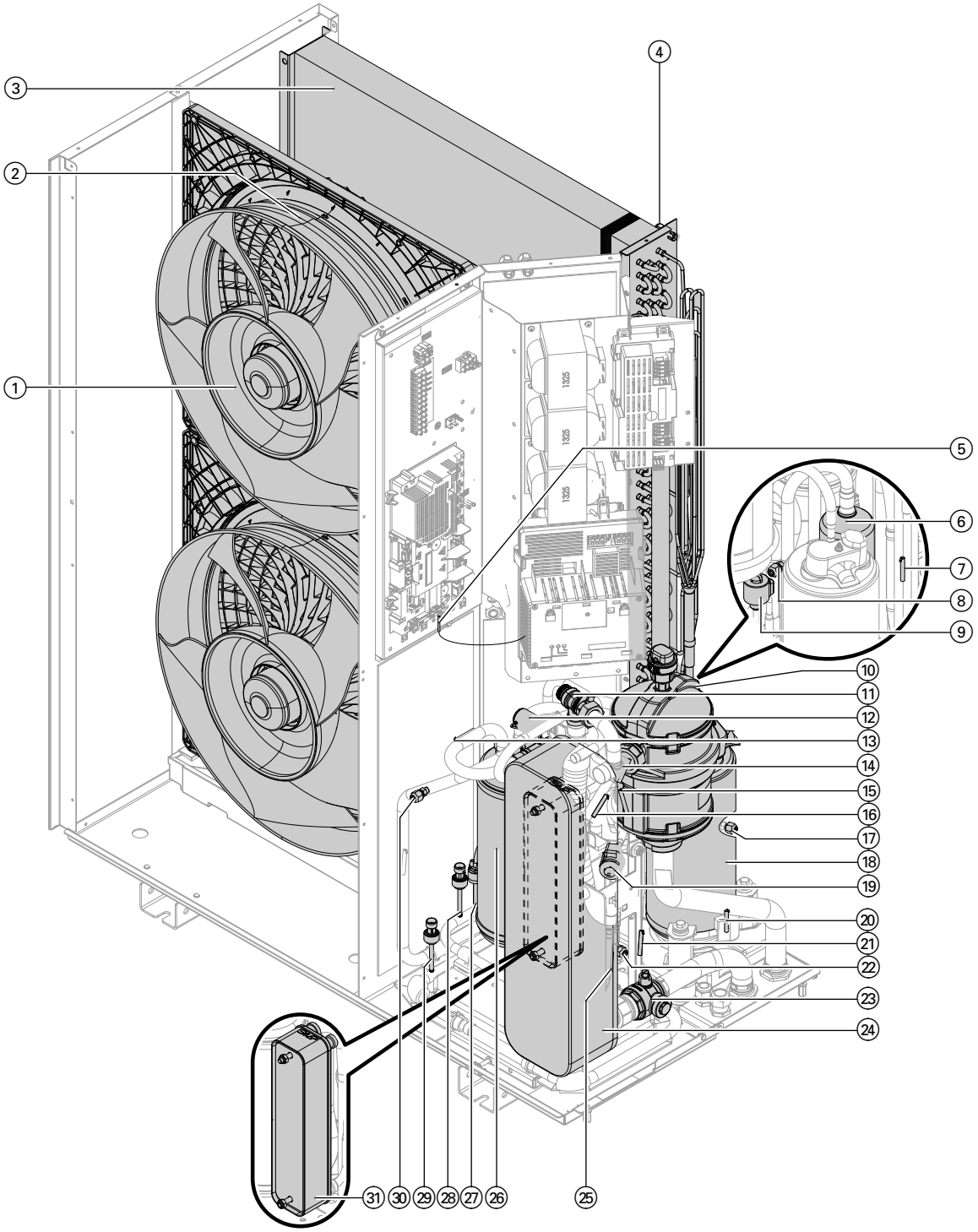


Fig. 113

① Fan
② Version V002 only:
Fan ring heater
③ Evaporator
④ Air inlet temperature sensor (BT7)
⑤ Inverter temperature sensor (BT10)
⑥ Compressor accumulator (refrigerant receiver)
⑦ Liquid gas temperature sensor – cooling (BT6)
⑧ Schrader valve, low pressure side
⑨ Electronic expansion valve 2
⑩ Float air vent valve with quick-action air vent valve
⑪ 3 bar safety valve
⑫ 4-way diverter valve
⑬ Suction gas temperature sensor – evaporator (BT3)
⑭ Secondary circuit flow temperature sensor downstream of condenser (BT1)
⑮ Liquid gas temperature sensor – heating (BT9)
⑯ Hot gas temperature sensor (BT4)
⑰ Schrader valve, evaporator

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Overview of internal components (cont.)

⑱ Compressor
⑲ Electronic expansion valve 1
⑳ Oil sump temperature sensor (BT8)
㉑ Suction gas temperature sensor – compressor (BT5)
㉒ Schrader valve, high pressure side 2
㉓ Ball valve with non-return valve, filter
㉔ Condenser
㉕ Liquid gas temperature sensor – condenser (BT2)
㉖ Accumulator (refrigerant receiver)
㉗ High pressure switch PSH
㉘ High pressure sensor (BP1, black)
㉙ Low pressure sensor (BP2, green)
㉚ Schrader valve, high pressure side 1
㉛ Internal heat exchanger

Outdoor unit with 2 fans, 400 V~, sizes 16 to 19

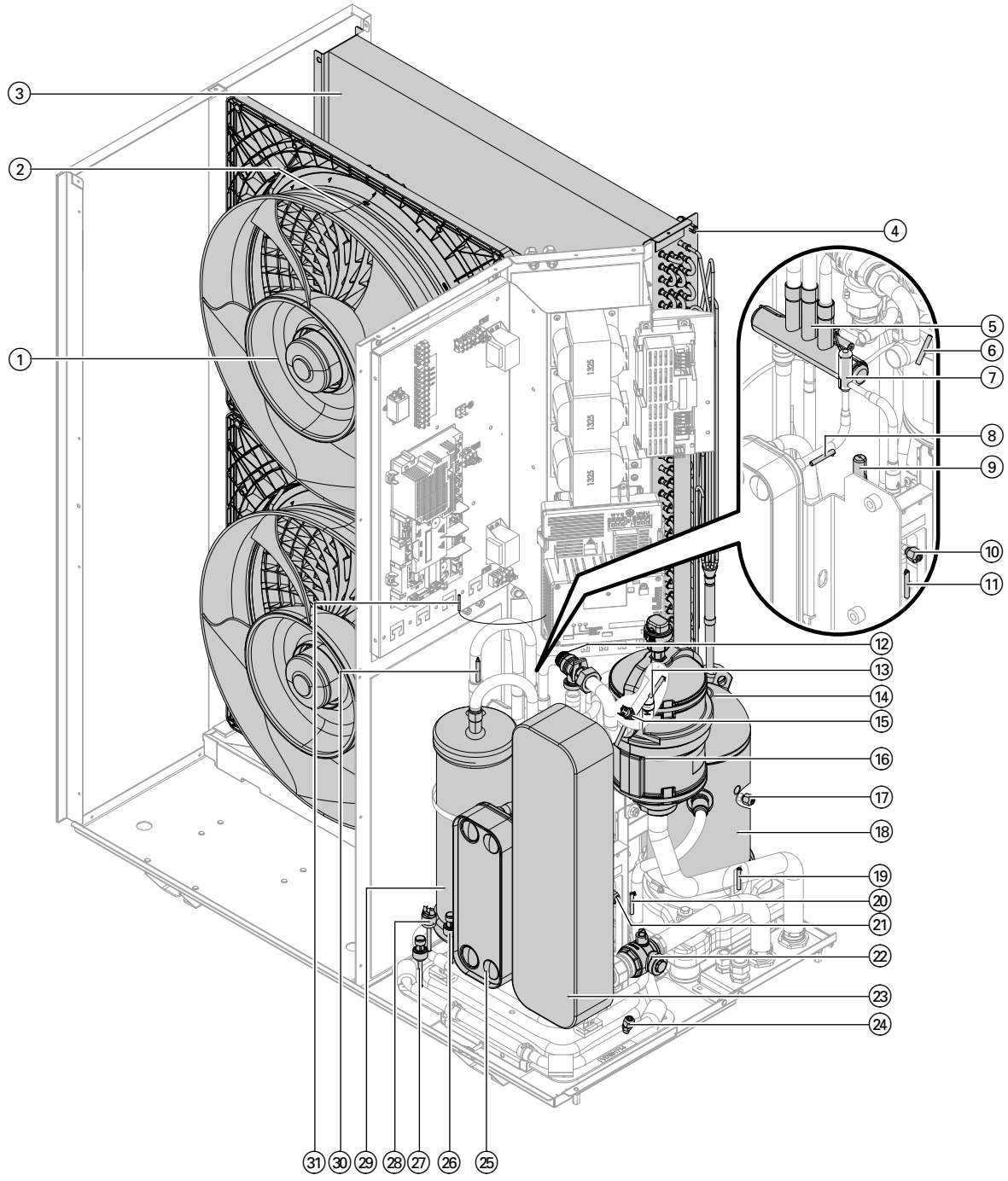


Fig. 114

① Fan
② Version V002 only: Fan ring heater
③ Evaporator
④ Air inlet temperature sensor (BT7)
⑤ 4-way diverter valve

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Overview of internal components (cont.)

⑥ Secondary circuit flow temperature sensor downstream of condenser (BT1)
⑦ Electronic expansion valve 1
⑧ Liquid gas temperature sensor – heating (BT9)
⑨ Electronic expansion valve 2
⑩ Schrader valve, high pressure side 1
⑪ Liquid gas temperature sensor – condenser (BT2)
⑫ 3 bar safety valve
⑬ Hot gas temperature sensor (BT4)
⑭ Liquid gas temperature sensor – cooling (BT6)
⑮ High limit safety cut-out
⑯ Float air vent valve with quick-action air vent valve
⑰ Schrader valve, evaporator
⑱ Compressor including oil sump heater
⑲ Oil sump temperature sensor (BT8)
⑳ Suction gas temperature sensor – compressor (BT5)
㉑ Schrader valve, high pressure side 2
㉒ Ball valve with non-return valve and filter
㉓ Condenser
㉔ Schrader valve, low pressure side
㉕ Internal heat exchanger
㉖ High pressure sensor (BP1, black)
㉗ Low pressure sensor (BP2, green)
㉘ High pressure switch PSH
㉙ Accumulator (refrigerant receiver)
㉚ Suction gas temperature sensor – evaporator (BT3)
㉛ Inverter temperature sensor (BT10)

Draining the outdoor unit on the secondary side

If only the outdoor unit is to be drained, shut off the hydraulic lines to the indoor unit.

All sizes except 10 to 13, 230 V~

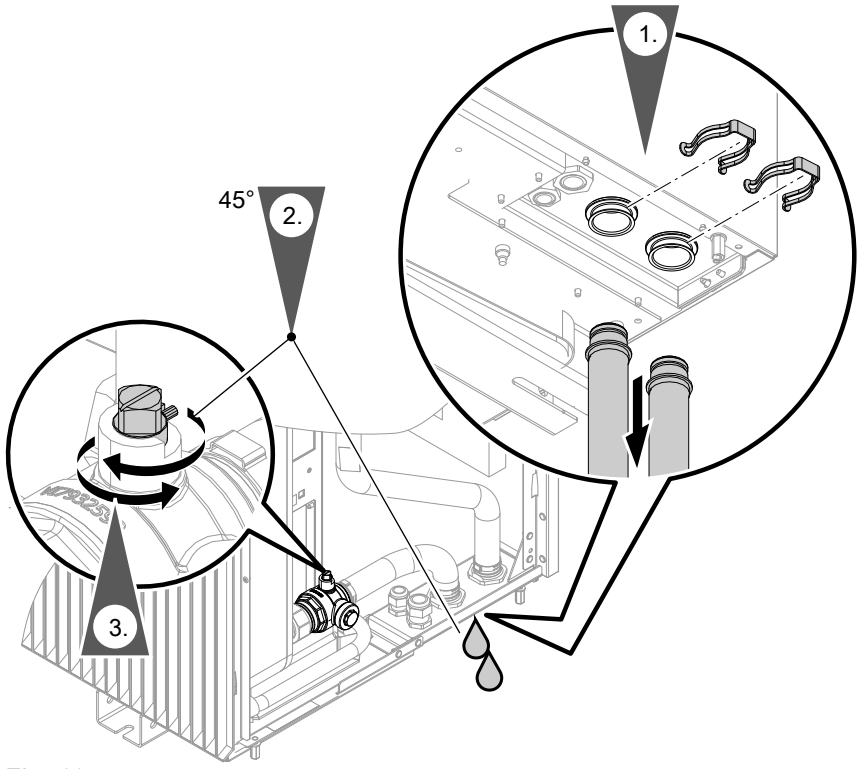


Fig. 115

2. Turn the setting screw slot by 45° in the direction of flow.
The check valve is open. Heating water flows out in the opposite direction to the arrow.
Fully drain the outdoor unit.

3. Turn the setting screw slot back by 45° perpendicular to the direction of flow.
The check valve is closed.

Draining the outdoor unit on the secondary side (cont.)

Sizes 10 to 13, 230 V~

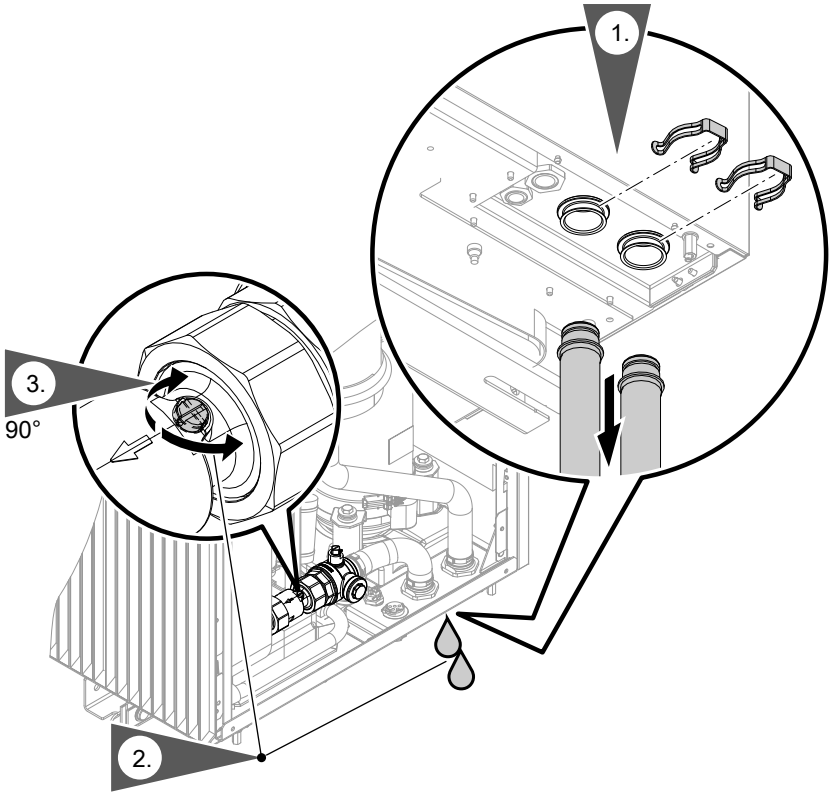


Fig. 116

2. Turn the setting screw slot by 90° in the direction of flow.
The check valve is open. Heating water flows out in the opposite direction to the arrow.
Fully drain the outdoor unit.

3. Turn the setting screw slot back by 90° perpendicular to the direction of flow.
The check valve is closed.

Removing hydraulic components

Before dismantling hydraulic components from the outdoor unit, drain the hydraulic connection line to the indoor unit: See chapter "Draining the indoor unit on the secondary side".

Note
Removal of components not shown: See separate installation instructions for the individual part.

Removing hydraulic components (cont.)

Removing the float air vent valve with quick-action air vent valve

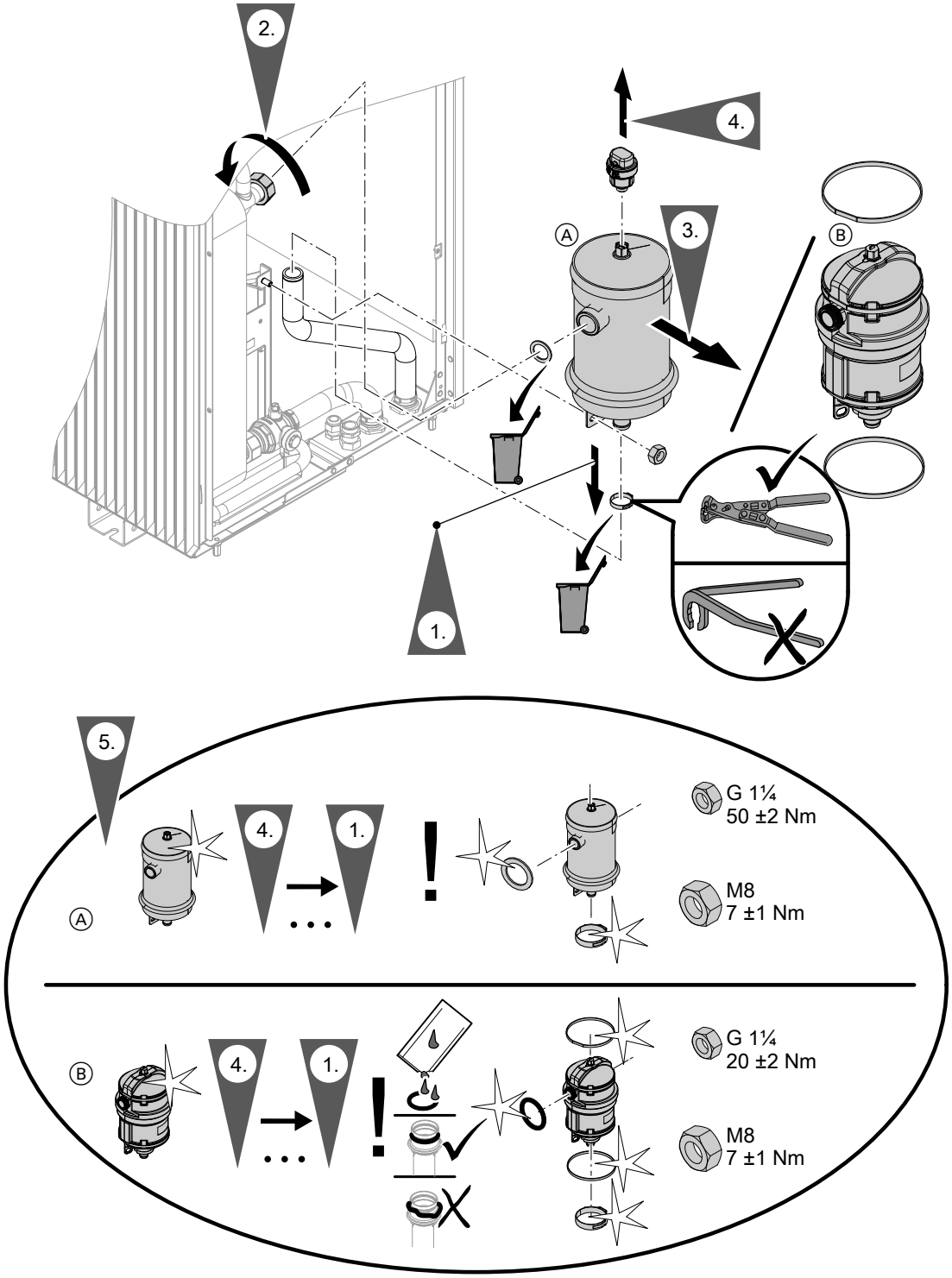


Fig. 117

Ⓐ Stainless steel float air vent valve
Ⓑ Plastic float air vent valve

Removing hydraulic components (cont.)

Removing the ball valve with filter and check valve

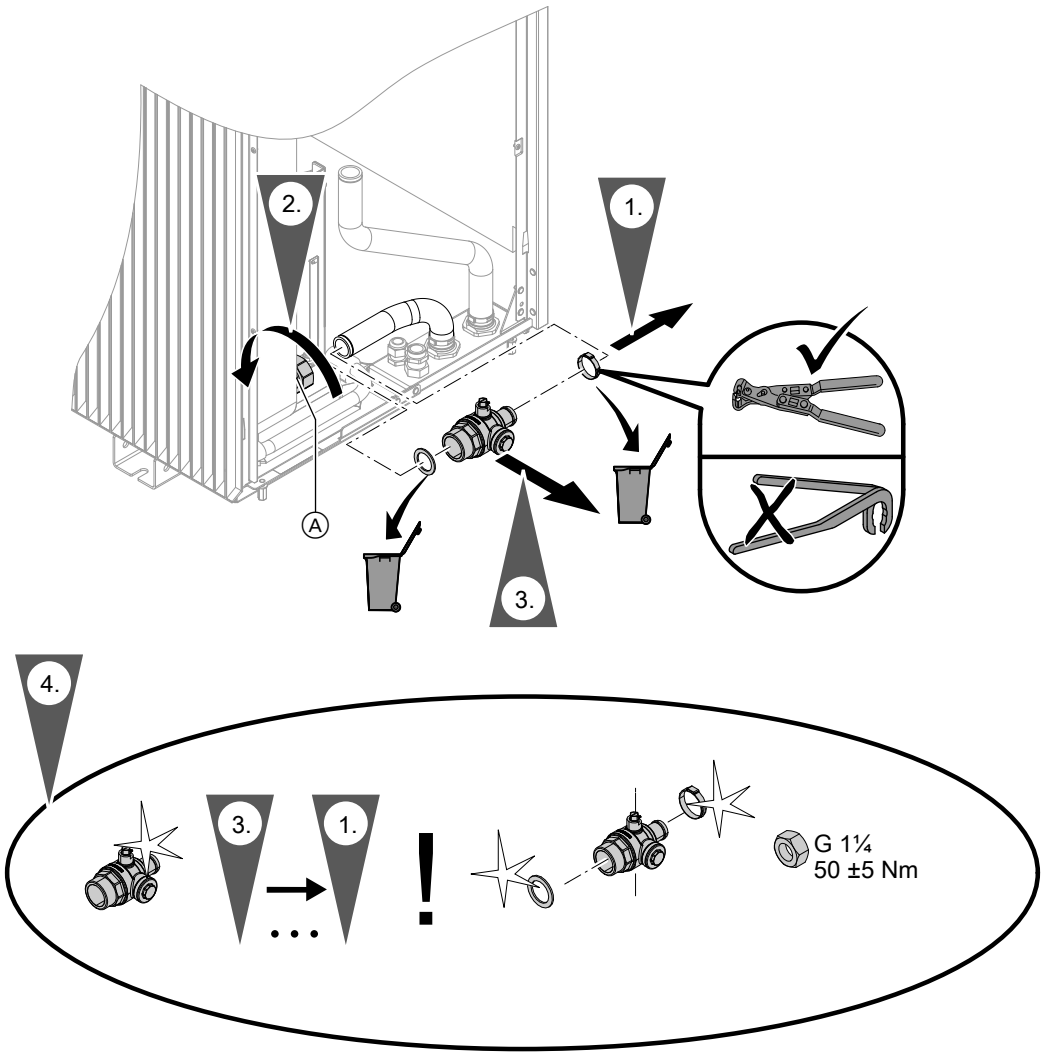


Fig. 118

Refrigerant circuit flow diagrams

Labelling of the sensors in acc. with EN 1861:

- PT H 1 — High pressure sensor
- PT 2 L — Low pressure sensor
- TT 3 — Temperature sensor
- PS H 4 — High pressure switch PSH
- TS H 5 — High limit safety cut-out

Note

The following two flowcharts for heating operation and cooling operation apply to outdoor units with 1 and 2 fans. The outdoor unit with 2 fans is shown as an example.

Refrigerant circuit flow diagrams (cont.)

Flow rates

Outdoor unit for size	Up to 08	From 10
Secondary-side flow rates (heating water)		
▪ Minimum flow rate	0.350 m^3/h (350 l/h)	0.350 m^3/h (350 l/h)
▪ Max. flow rate	1.900 m^3/h (1900 l/h)	2.100 m^3/h (2100 l/h)
Primary side flow rates (air)		
▪ Minimum flow rate	2900 m^3/h	3432 m^3/h
▪ Max. flow rate	5300 m^3/h	5400 m^3/h

Heating mode

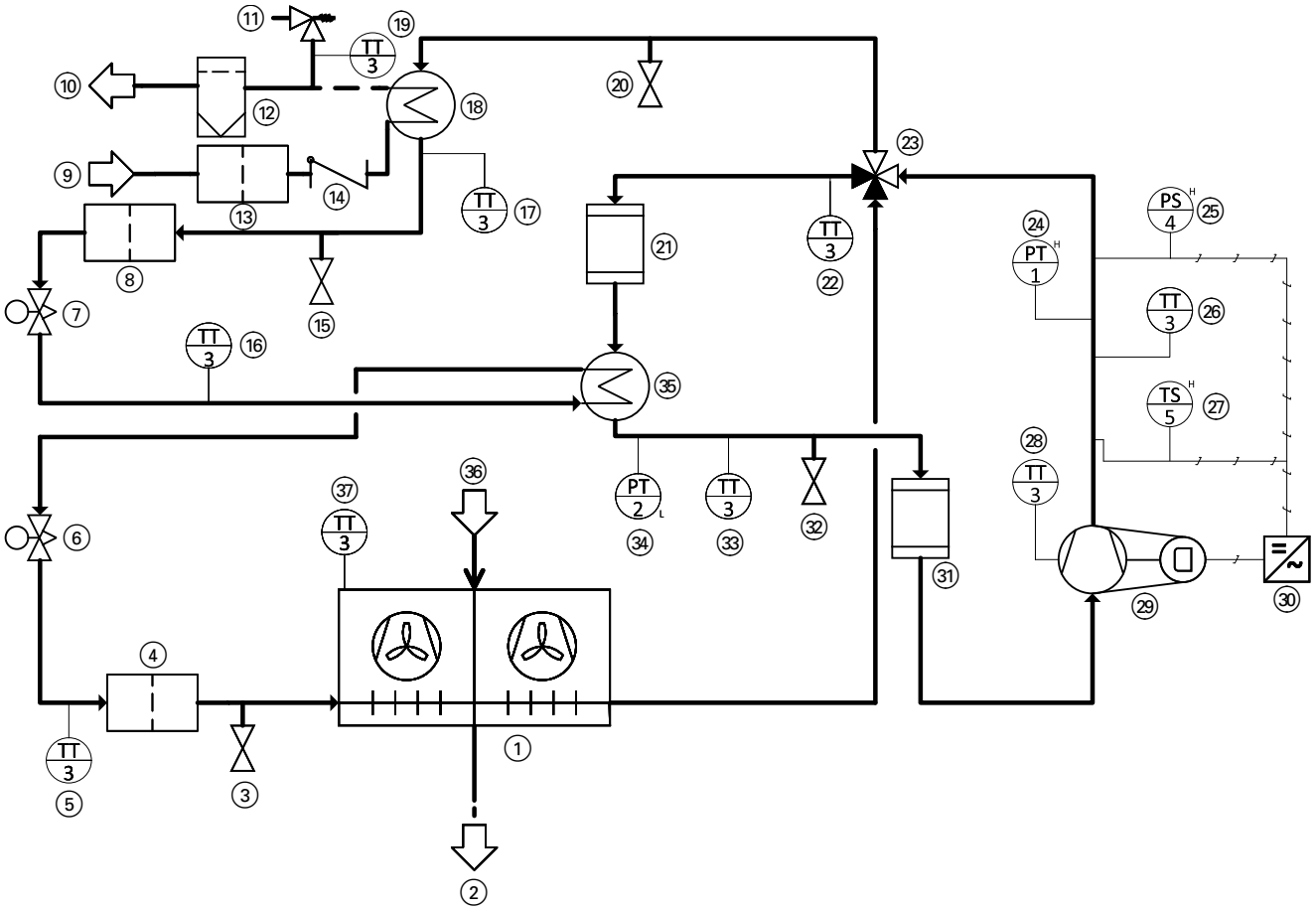


Fig. 119

① Evaporator
② Air discharge
③ May be installed (depending on factory filling variant)
Schrader valve, evaporator
④ Filter, electronic expansion valve 2
⑤ Liquid gas temperature sensor – cooling (BT6)
⑥ Electronic expansion valve 2
⑦ Electronic expansion valve 1
⑧ Filter, electronic expansion valve 1
⑨ Secondary circuit return
⑩ Secondary circuit flow
⑪ Safety valve 3 bar
⑫ Float air vent valve with quick-action air vent valve
⑬ Filter, non-return valve
⑭ Non-return valve
⑮ Schrader valve, high pressure side 2
⑯ Liquid gas temperature sensor – heating (BT9)
⑰ Liquid gas temperature sensor – condenser (BT2)
⑱ Condenser
⑲ Secondary circuit flow temperature sensor downstream of condenser (BT1)
⑳ Only for sizes 04 to 13
Schrader valve, high pressure side 1
㉑ Accumulator (refrigerant receiver)
㉒ Suction gas temperature sensor – evaporator (BT3)
㉓ 4-way diverter valve
㉔ High pressure sensor (BP1, black)
㉕ High pressure switch PSH
㉖ Hot gas temperature sensor (BT4)
㉗ High limit safety cut-out

Refrigerant circuit flow diagrams (cont.)

㉘ Oil sump temperature sensor (BT8)
㉙ Compressor, including oil sump heater
㉚ Inverter
Position in the refrigerant circuit depends on size: See "Overview of electrical components".
㉛ Only for sizes 04 to 13
Accumulator (refrigerant receiver)
㉜ Schrader valve, low pressure side
㉝ Suction gas temperature sensor – compressor (BT5)
㉞ Low pressure sensor (BP2, green)
㉟ Internal heat exchanger
㊱ Air intake
㊲ Air inlet temperature sensor (BT7)

Cooling mode

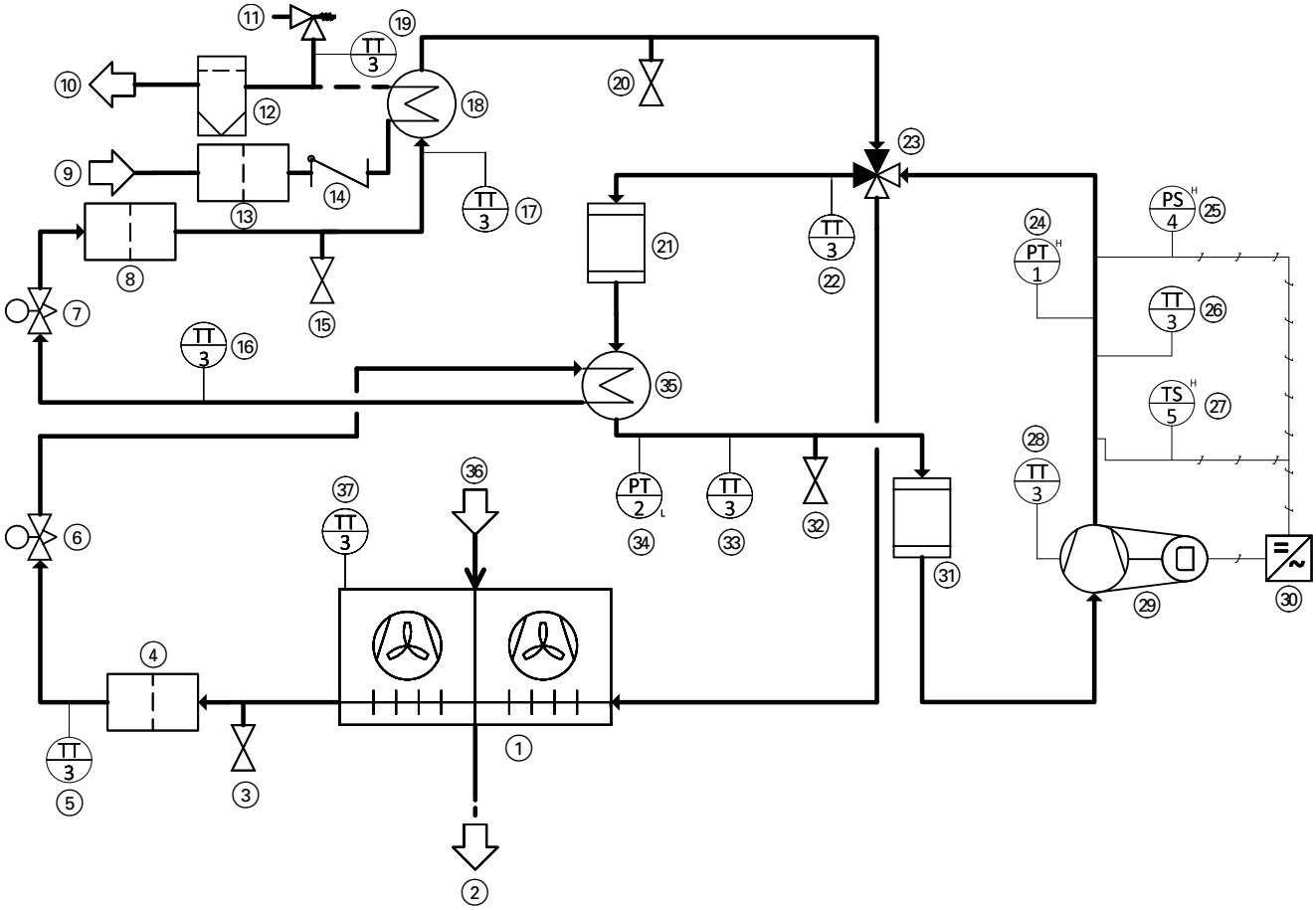


Fig. 120

① Evaporator
② Air discharge
③ May be installed (depending on factory filling variant)
Schrader valve, evaporator
④ Filter, electronic expansion valve 2
⑤ Liquid gas temperature sensor – cooling (BT6)
⑥ Electronic expansion valve 2
⑦ Electronic expansion valve 1
⑧ Filter, electronic expansion valve 1
⑨ Secondary circuit return
⑩ Secondary circuit flow
⑪ Safety valve 3 bar
⑫ Float air vent valve with quick-action air vent valve
⑬ Filter, non-return valve
⑭ Non-return valve
⑮ Schrader valve, high pressure side 2
⑯ Liquid gas temperature sensor – heating (BT9)
⑰ Liquid gas temperature sensor – condenser (BT2)
⑱ Condenser
⑲ Secondary circuit flow temperature sensor downstream of condenser (BT1)
⑳ Only for sizes 04 to 13
Schrader valve, high pressure side 1
㉑ Accumulator (refrigerant receiver)
㉒ Suction gas temperature sensor – evaporator (BT3)
㉓ 4-way diverter valve
㉔ High pressure sensor (BP1, black)
㉕ High pressure switch PSH
㉖ Hot gas temperature sensor (BT4)
㉗ High limit safety cut-out
㉘ Oil sump temperature sensor (BT8)
㉙ Compressor, including oil sump heater
㉚ Inverter
Position in the refrigerant circuit depends on size: See "Overview of electrical components".

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Refrigerant circuit flow diagrams (cont.)

㉛ Only for sizes 04 to 13
Accumulator (refrigerant receiver)
㉜ Schrader valve, low pressure side
㉝ Suction gas temperature sensor – compressor (BT5)
㉞ Low pressure sensor (BP2, green)
㉟ Internal heat exchanger
㊱ Air intake
㊲ Air inlet temperature sensor (BT7)

Extracting the refrigerant

Before commencing work, note the "Checklist for maintenance work" on page 136 164 onwards.

Also take into account the following points:
- Only extraction equipment authorised for R290 (propane) that has been regularly inspected may be used.
  Check the condition of the extraction equipment, including the service record.
- Only use refrigerant bottles suitable for R290, e.g. special recycling bottles. The refrigerant bottles must be correspondingly labelled.
  The refrigerant bottles must be equipped with a safety valve and permanently attached shut-off valves.
- Check whether a sufficient number of recycling bottles is available.
- Do not mix together different refrigerants in a single recovery bottle.
- Have suitable transport equipment ready for the refrigerant bottles (if required).
- Check the availability of personal protective equipment and its proper use.
- Ensure the refrigerant circuit and all connections used are free from leaks.
- Provide calibrated scales to determine the amount of extracted refrigerant.

1. Test the earth conductor. Check earth conductor for correct connection.

2. **Open expansion valves via actuator test:**
   Note
   *If not all actuator tests and function checks are displayed, **first** update the software of the programming unit and all electronics modules via ViGuide.*

   ☰
   > 🔧 **"Service"**
   > Enter password **"serviceaccess"**.
   > **"Actuator test and function check"**
   > ✓ to confirm the security prompt.
   > ∧/∨ for the **"Refrigerant circuit"** group
   > Use › to select the following actuators one after the other. Use ∧/∨ to set the values:
   - **"Expansion valve 1"** to 100 %
   - **"Expansion valve 2"** to 100 %

   Confirmation is not required.
   As soon as the actuator test is active, it is marked with ✳.

3. **Isolate the outdoor unit from the power supply:**
   Isolate the outdoor unit from the power supply, e.g. at separate fuses. Check that no voltage is present. Safeguard against unauthorised reconnection.

   ⚠ **Danger**
   Contact with live components can result in severe injuries. Some components on PCBs remain live even after the power supply has been switched off.
   Before removing any covers, wait at least 4 min for the voltage to drop out.

4. **Disconnecting the CAN bus connection**
   Disconnect the CAN bus communication cable for the indoor/outdoor unit from the outdoor unit.

Extracting the refrigerant (cont.)

5. **Prepare the outdoor unit on the secondary side:**
   Note
   Hot heating water in the outdoor unit makes it easier to extract the refrigerant.

   Either set heating mode via the actuator test:
   ☰
   > 🔧 **"Service"**
   > Enter password **"serviceaccess"**.
   > **"Actuator test and function check"**
   > ✓ to confirm the security prompt.
   > ∧/∨ for the **"Heating"** group
   > Use › to set the **"4/3-way valve position"** to 50 %.
   > Use › to set the **"Primary circuit pump, set speed"** to 100 %.
   Confirmation is not required.
   As soon as the actuator test is active, it is marked with ✳.

6. **Or**: Drain the outdoor unit on the secondary side.

7. **Prepare to extract the refrigerant:**
   Check that the safety instructions for working on the refrigerant circuit are being adhered to: See "Safety instructions".

   ⚠ **Danger**
   Pressure fluctuations occur when the refrigerant circuit is drained. These pressure fluctuations can cause the heating water in the condenser to freeze and the condenser to burst.
   Ensure frost protection on the heating water side: See steps 5 and 6.

   ⚠ **Danger**
   Escaping refrigerant can lead to explosions that result in very serious injuries.
   Do not introduce any power sources or ignition sources into the safety zone.

8. Place the refrigerant bottle on the scales.
   Only use explosion-proof scales within the safety zone.

9. **Connect the refrigerant bottle:**
   Earth the refrigerant bottle to prevent sparks.
   Connect the refrigerant bottle to the extraction equipment. Connect the extraction equipment to the Schrader valves on the high pressure and low pressure side of the refrigerant circuit via the manifold.

10. **Extract the refrigerant:**
    Extract the refrigerant from all parts of the refrigerant circuit using the extraction equipment.

    Note
    - *Refrigerant extraction must be continuously monitored or carried out by a contractor authorised and certified to handle the refrigerant R290.*
    - *Do not overfill the refrigerant bottle; max. 80 % of the permissible charge weight.*
    - *Do not exceed the permissible design pressure of the refrigerant bottle.*
    - *Do not mix the refrigerant with other refrigerants.*
    - *Observe the following technical rules on operational reliability and hazardous materials: TRGS 510, TRBS 3145, TRGS 745*

11. Separate the refrigerant bottle from the refrigerant circuit. Close the refrigerant bottle connections securely. Label the refrigerant bottle according to the statutory requirements. Dispose of the refrigerant bottle in a suitable disposal/recycling facility.

12. **Purge the refrigerant circuit:**
    Purge the refrigerant circuit with dry nitrogen for at least 5 min. Note the direction of flow through the compressor: See chapter "Refrigerant circuit flow diagrams".
    Nitrogen purge pressure: < 1 bar (< 100 kPa)
    Recommendation: After purging, check the concentration of refrigerant R290 in the nitrogen. Use an explosion-proof refrigerant detector suitable for R290 for this purpose.

    Explosion limits for R290:
    - Lower explosion limit (LEL): 1.7 % by vol. ≙ 17,000 ppm
    - Upper explosion limit (UEL): 10.8 % by vol. ≙ 108,000 ppm

13. **Evacuate the refrigerant circuit:**
    Evacuate the refrigerant circuit.
    Absolute pressure for vacuum according to EN 378: < 2.7 mbar (< 270 Pa)

    ⚠ **Danger**
    Escaping refrigerant can lead to explosions that result in very serious injuries.
    Ensure the vacuum pump outlet is outside the safety zone.

14. Carry out a static vacuum test.

Extracting the refrigerant (cont.)

15. Repeat steps 10 to 14 until there is no more refrigerant in the refrigerant circuit.

Note
- *At low outside temperatures, evacuation of the refrigerant circuit takes longer.*
- *For the final purging process, release the positive pressure down to atmospheric pressure. Do not evacuate further.*
  This is especially important if brazing/soldering work is to be carried out on the refrigerant circuit.

If the work is interrupted:
*If the work steps described here are interrupted, the refrigerant circuit **must** be sealed to prevent refrigerant leakage (gas-tight).*

16. Mark the outdoor unit:
Affix a label to the outdoor unit in a clearly visible position, containing the following information, with date and signature:
- Outdoor unit uses flammable refrigerant R290 (propane).
- System has been taken out of use.
- Refrigerant has been extracted.
- Outdoor unit contains nitrogen.
- Outdoor unit may contain residual flammable refrigerant.

Procedure for replacing components in the refrigerant circuit

Observe the following when working on the refrigerant circuit:
- When replacing components in the refrigerant circuit, comply with the applicable national regulations.
  If these national regulations require a pressure resistance test, the limits specified in chapter "Testing pressure resistance" must be complied with.
- Wear suitable personal protective equipment when carrying out any work.
- Work on the refrigerant circuit with flammable refrigerant in safety group A3 may only be carried out by authorised contractors.
  These contractors must be trained in accordance with EN 378 Part 4 or IEC 60335-2-40, Section HH.
  The certificate of competence from an industry-accredited body is required.
- Brazing/soldering work on the refrigerant circuit may only be carried out by contractors certified in accordance with ISO 13585 and AD 2000, datasheet HP 100R. And only by contractors qualified and certified for the processes to be carried out.
  The work must fall within the range of applications purchased and be carried out in accordance with the prescribed procedures.
- Brazing/soldering work on accumulator connections requires certification of personnel and processes by a notified body according to the Pressure Equipment Directive (2014/68/EU).

⚠ **Danger**
Explosion hazard: Brazing/soldering work on the refrigerant circuit can cause scale to form on the soldered seam. Scale reduces the pressure resistance of the soldered seam.

Nitrogen prevents the formation of scale. Continuously purge the refrigerant circuit with dry nitrogen during brazing/soldering work:
- Nitrogen purge pressure: < 1 bar (< 100 kPa)
- Both electronic expansion valves must remain fully open for the duration of the purging process.
- Flow direction for the nitrogen via the Schrader valves on the low pressure and high pressure side: See chapter "Refrigerant circuit flow diagrams".
  Position of the Schrader valves: See chapter "Overview of internal components".

1. Observe the safety information for work on the refrigerant circuit: See "Safety information".

⚠ **Danger**
Escaping refrigerant can lead to explosions that result in very serious injuries.
- Do not introduce any power sources or ignition sources into the safety zone.
- Ensure that the system is de-energised.

2. Prepare to work on the refrigerant circuit: See chapter "Checklist for maintenance work".

3. Drain the refrigerant circuit completely: See chapter "Extracting the refrigerant".

Procedure for replacing components in the… (cont.)

4. Disconnect the electrical connections: See chapter "Electrical connection of the outdoor unit" and "Overview of electrical components".

5. Open the outdoor unit: See chapter "Removing the outer casing".

6. If components on the secondary side are removed, first drain the outdoor unit on the secondary side: See chapter "Draining the outdoor unit on the secondary side".

7. Remove the following components on the secondary side if necessary:
   - Float air vent valve with quick-action air vent valve
   - Ball valve with filter and integral check valve

   See chapter "Removing hydraulic components".

8. Remove the required component from the refrigerant circuit: See the relevant chapter below.
   Open the refrigerant circuit at the corresponding solder joints of the component to be replaced using a soldering tool or pipe cutter.

   Please note
   The heat of the soldering flame can damage refrigerant circuit components, electrical cables and electrical components.
   - Protect refrigerant circuit components that are not being replaced from the heat of the soldering flame.
   - Position electrical cables such that they are not damaged by the soldering flame. Undo cable ties if necessary.
   - Protect electrical components from the soldering flame. Remove if necessary.

   Danger
   Explosion hazard due to outgassing of oxygen from compressor oil residues in components of the refrigerant circuit.
   Ensure good ventilation when transporting components removed from the refrigerant circuit.
   Store components in well ventilated areas. This applies in particular to compressors and accumulators.

9. Install the spare part **and** filter dryer.

   Please note
   Residual moisture in the refrigerant circuit greatly reduces the service life of the outdoor unit.
   After opening the refrigerant circuit, **always** install the filter dryer:
   "Filter dryer spare parts kit"

   Please note
   The heat of the soldering flame can damage refrigerant circuit components.
   Observe the max. permissible temperature of the spare part. Observe the manufacturer's instructions. Cool the spare part during installation.

   Installation is carried out in reverse order to removal.
   - Use the new gaskets provided.
   - Insulate the sensors and secure with cable ties (included in standard delivery of spare part).
   - Secure electrical cables with cable ties if necessary.
   - Install electrical components if necessary.

Components in the refrigerant circuit: Sizes 04 to 08

Removing the evaporator

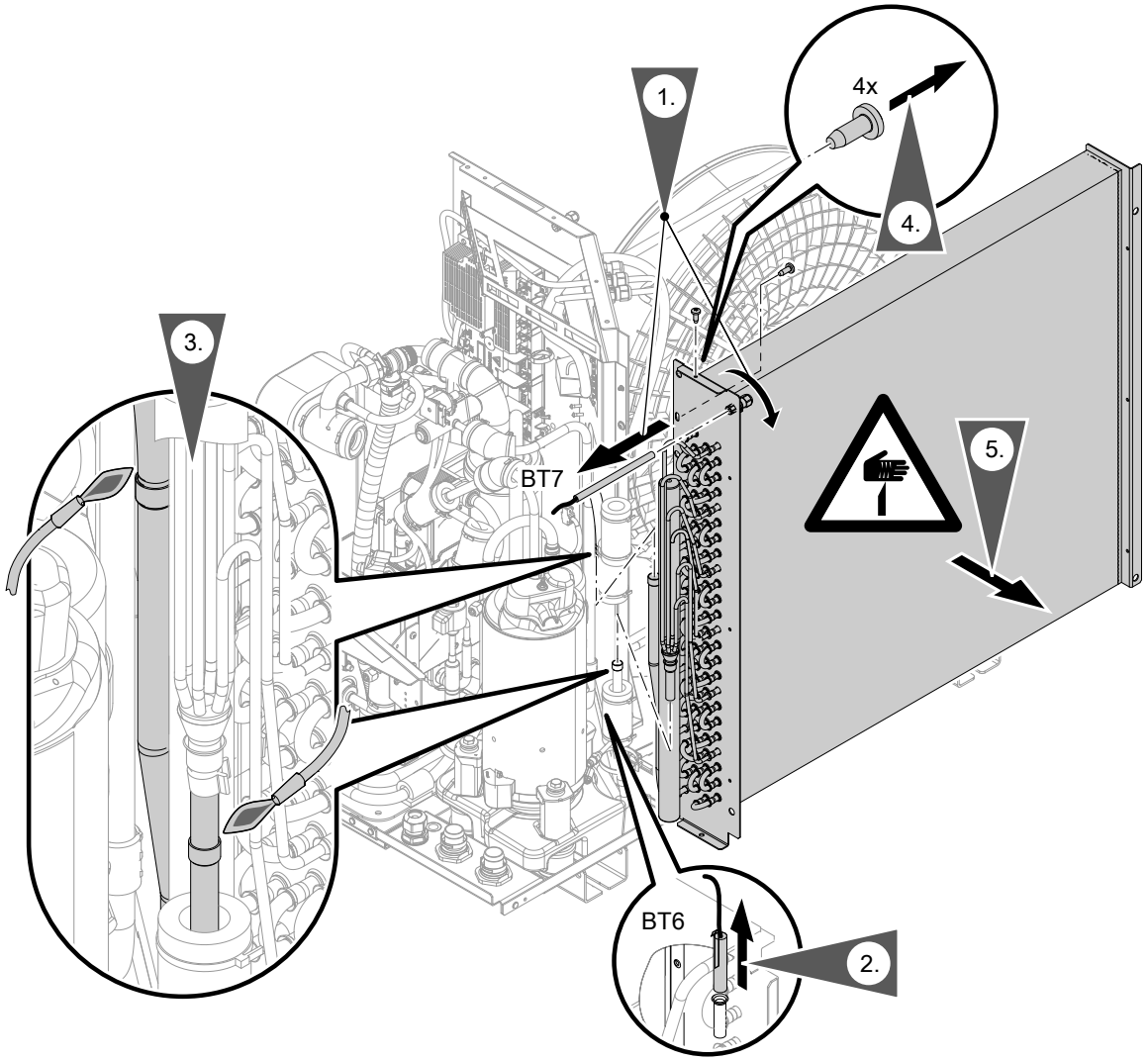


Fig. 121

BT6 Liquid gas temperature sensor, cooling
BT7 Air inlet temperature sensor

Note on assembly:
Torque for the screws: 1.8 ±0.25 Nm

Removing the compressor and accumulators (refrigerant receivers)

When replacing the compressor, both accumulators (refrigerant receivers) must also be replaced. This ensures that the refrigerant circuit contains the correct amount of oil.

! **Please note**
Tilting the compressor sharply leads to damage in the refrigerant circuit during commissioning.
- Max. tilting angle: 45°
- Wait at least 30 min after transportation.

! **Please note**
Acidic compressor oil damages the refrigerant circuit.
Before installing the new compressor and new accumulators, check the condition of the compressor oil in the removed compressor.
If the compressor oil is acidic, the old compressor oil must be completely removed from the entire refrigerant circuit.
In this case, inform the technical support of the heat pump manufacturer.

Components in the refrigerant circuit: Sizes 04… (cont.)

Removing the compressor

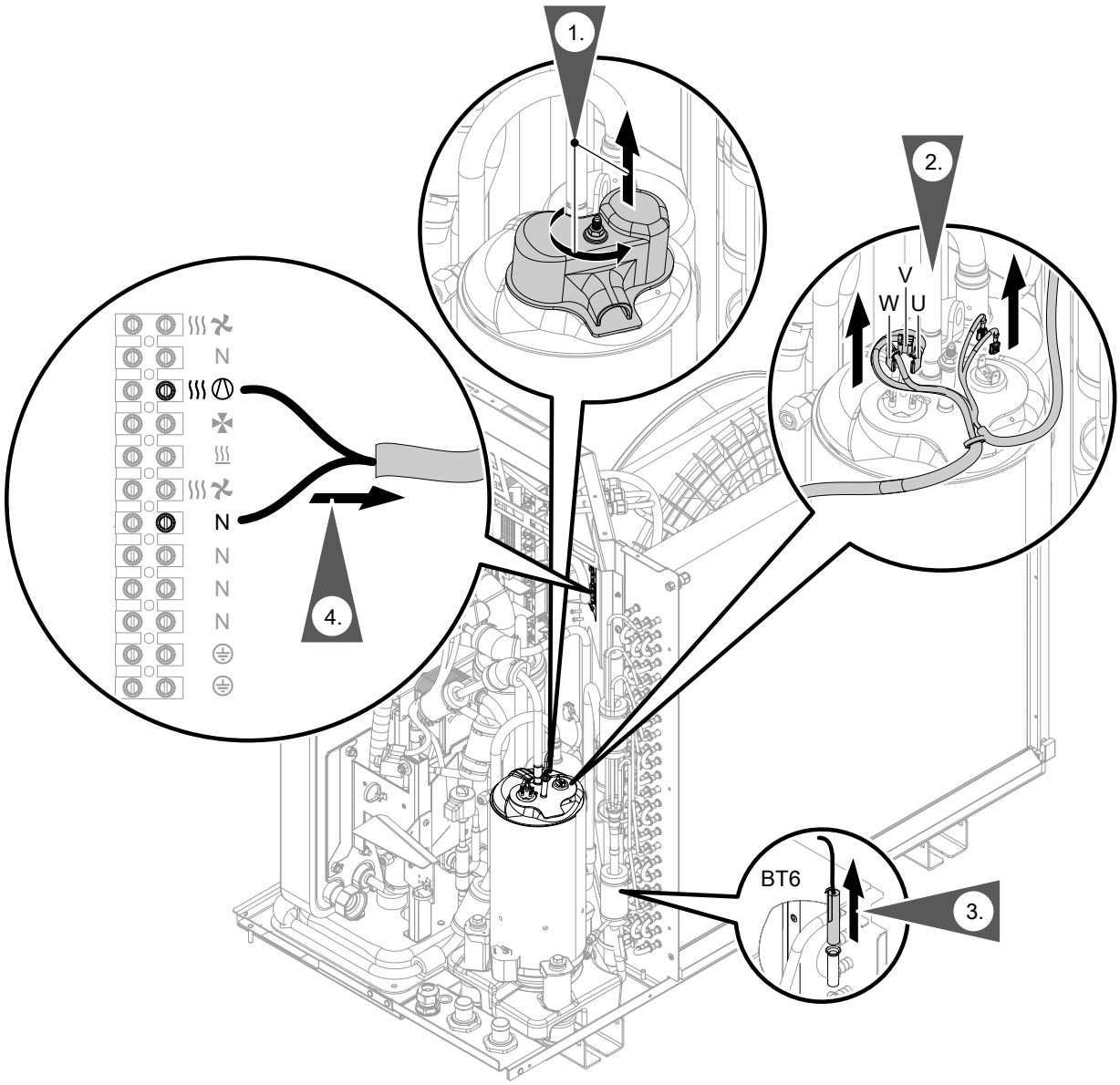


Fig. 122

BT6 Liquid gas temperature sensor, cooling

Components in the refrigerant circuit: Sizes 04… (cont.)

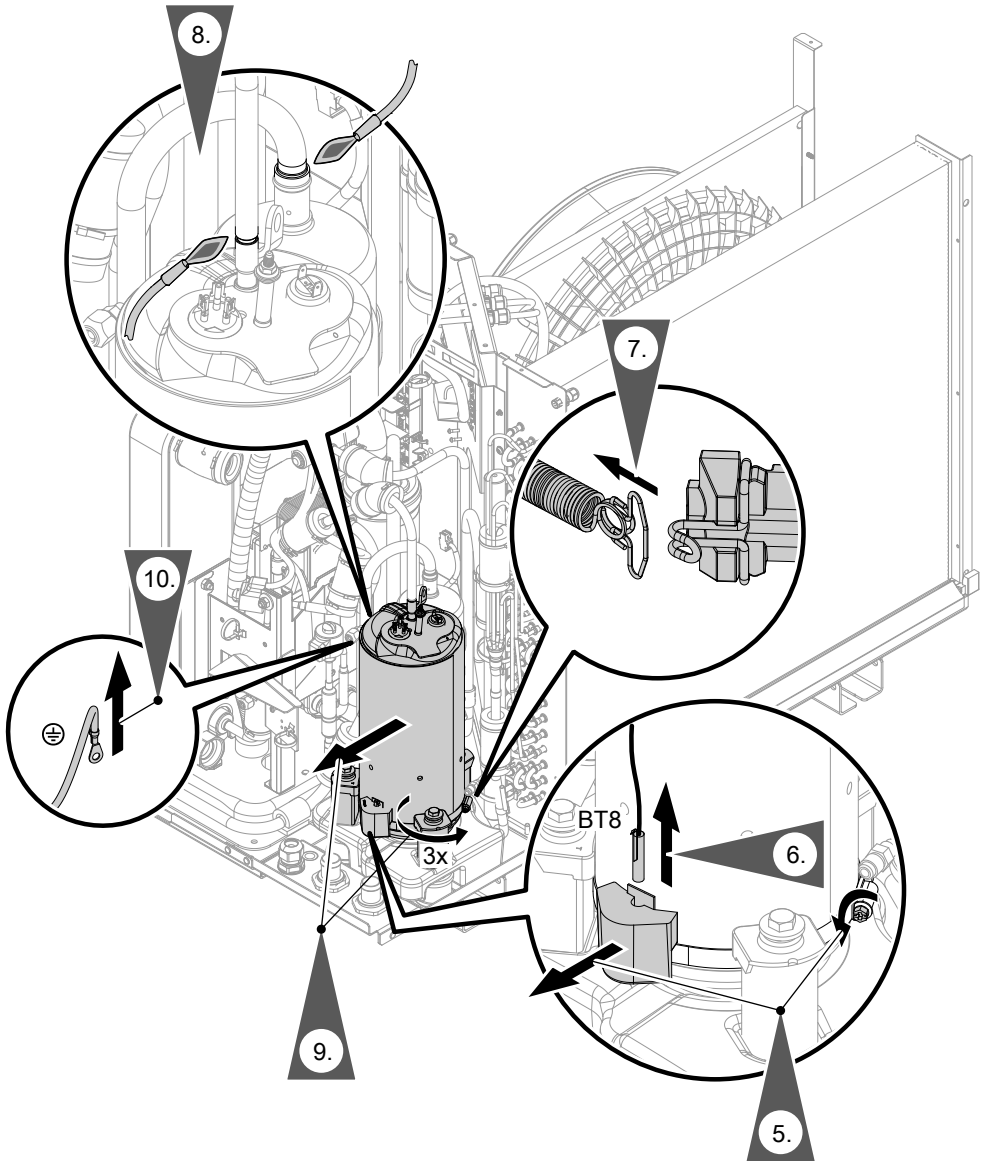


Fig. 123

BT8 Oil sump temperature sensor

Notes on assembly:

- *Colour coding of electrical connection on the compressor:*
  U Brown
  V Black
  W Grey
- *Torque for the screws: 7 ±0.5 Nm*
- *To avoid increased noise, secure all cables again with cable ties.*

Components in the refrigerant circuit: Sizes 04… (cont.)

Removing the separate accumulator

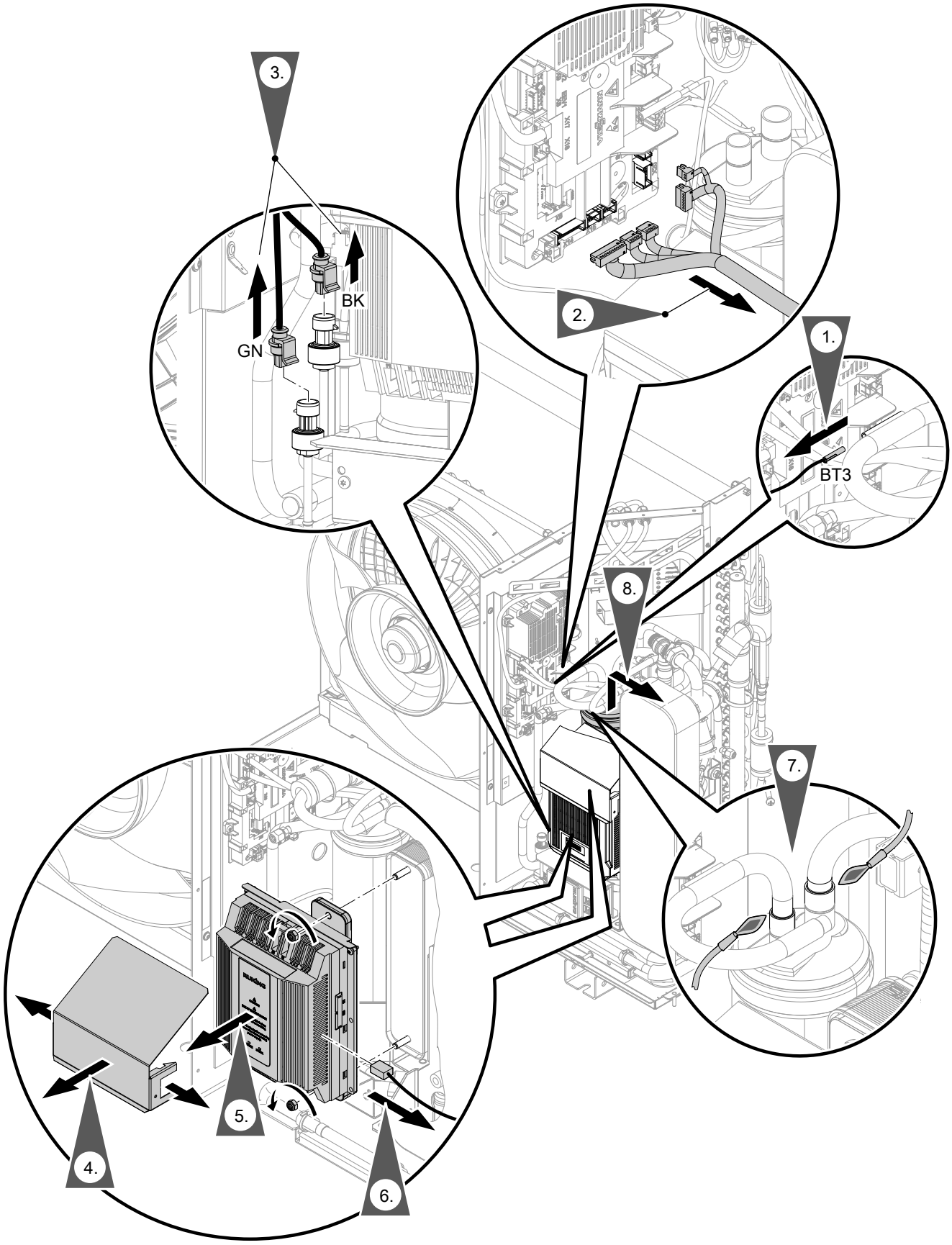


Fig. 124

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Components in the refrigerant circuit: Sizes 04… (cont.)

BT3 Suction gas temperature sensor, evaporator
BK High pressure sensor (black)
GN Low pressure sensor (green)

Note on assembly:
Max. permissible temperature of the separate accumulator: 80 °C

Installation of the oil sump heater

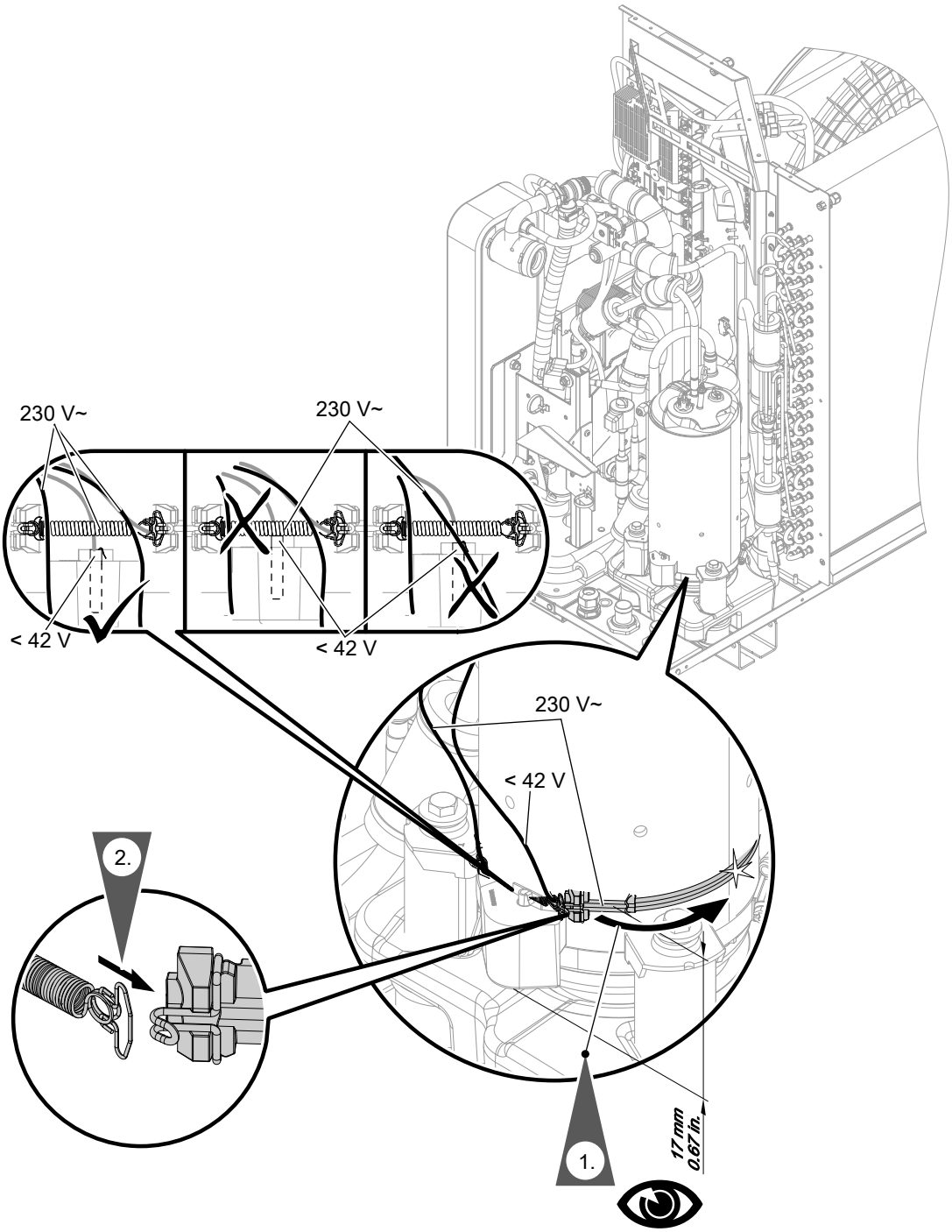


Fig. 125

Removing the condenser

2. Carefully lever the safety valve drain hose out of the base plate. Use pliers if necessary.

Components in the refrigerant circuit: Sizes 04… (cont.)

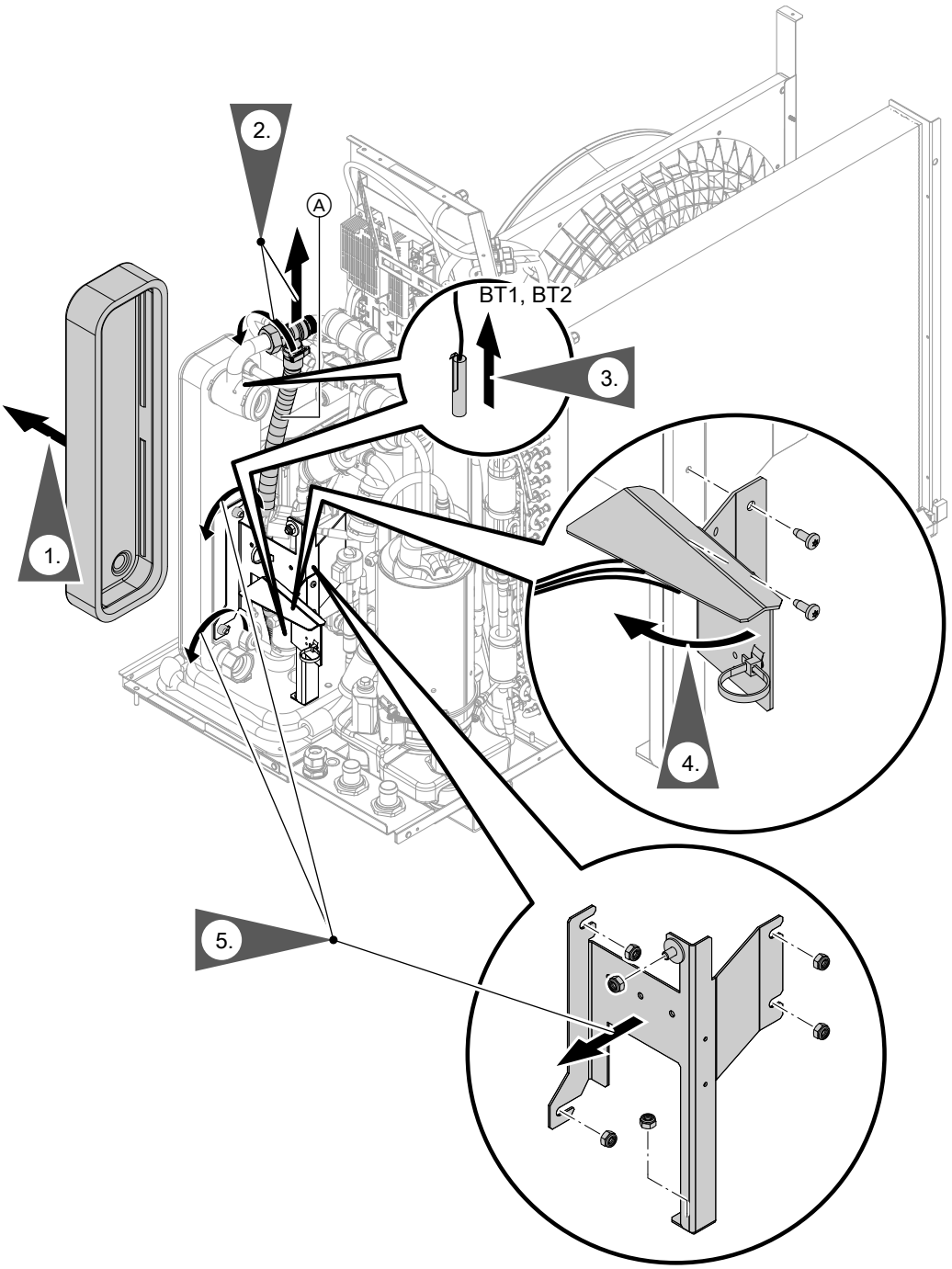


Fig. 126

Ⓐ Drain hose, safety valve
BT1 Flow temperature sensor, secondary circuit downstream of condenser
BT2 Liquid gas temperature sensor, condenser

Components in the refrigerant circuit: Sizes 04… (cont.)

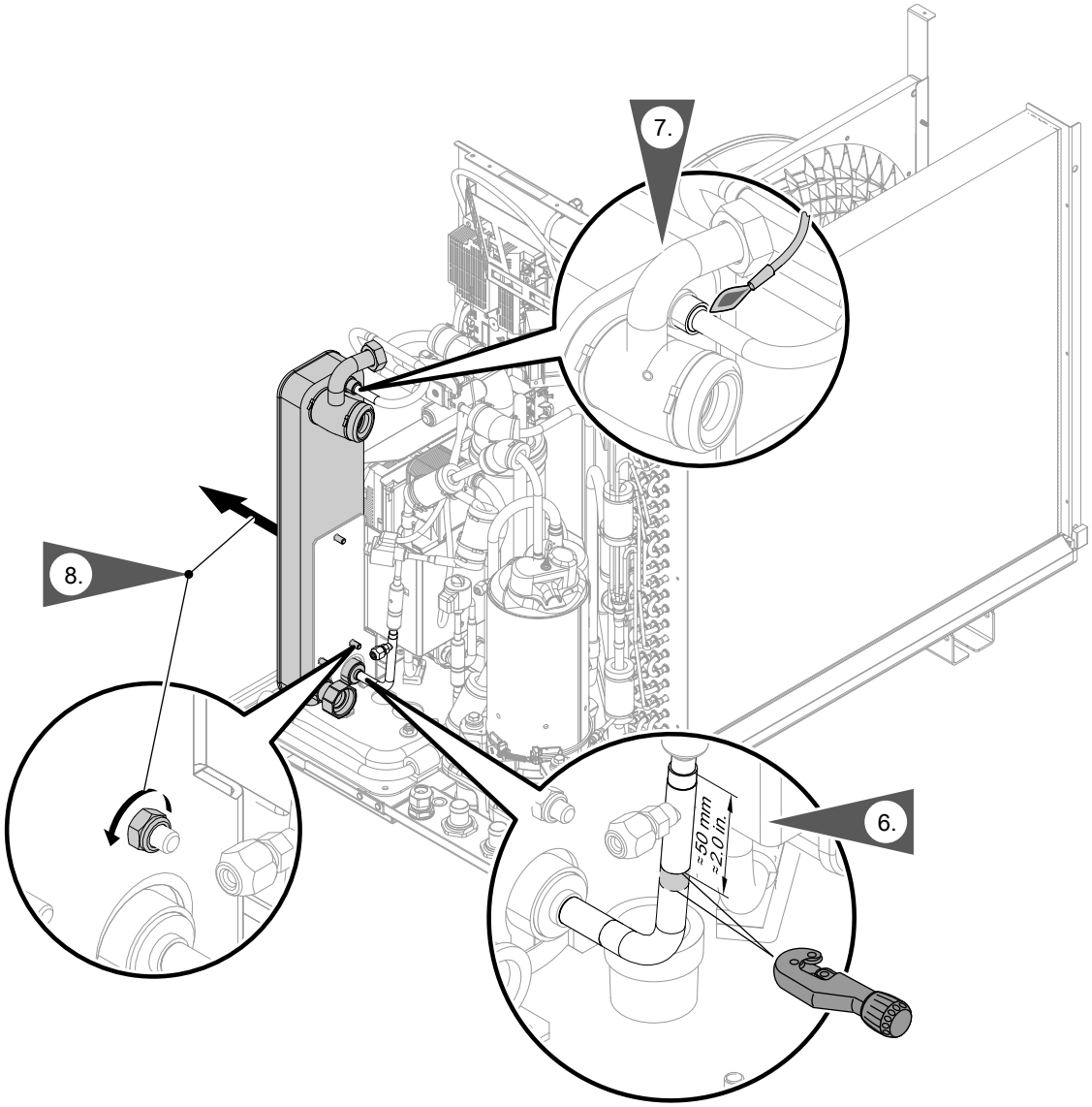


Fig. 127

Note on assembly:

- *Torque for the union nut of the drain hose (spanner size 36): 30 ±1 Nm*
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Components in the refrigerant circuit: Sizes 04… (cont.)

Removing the internal heat exchanger

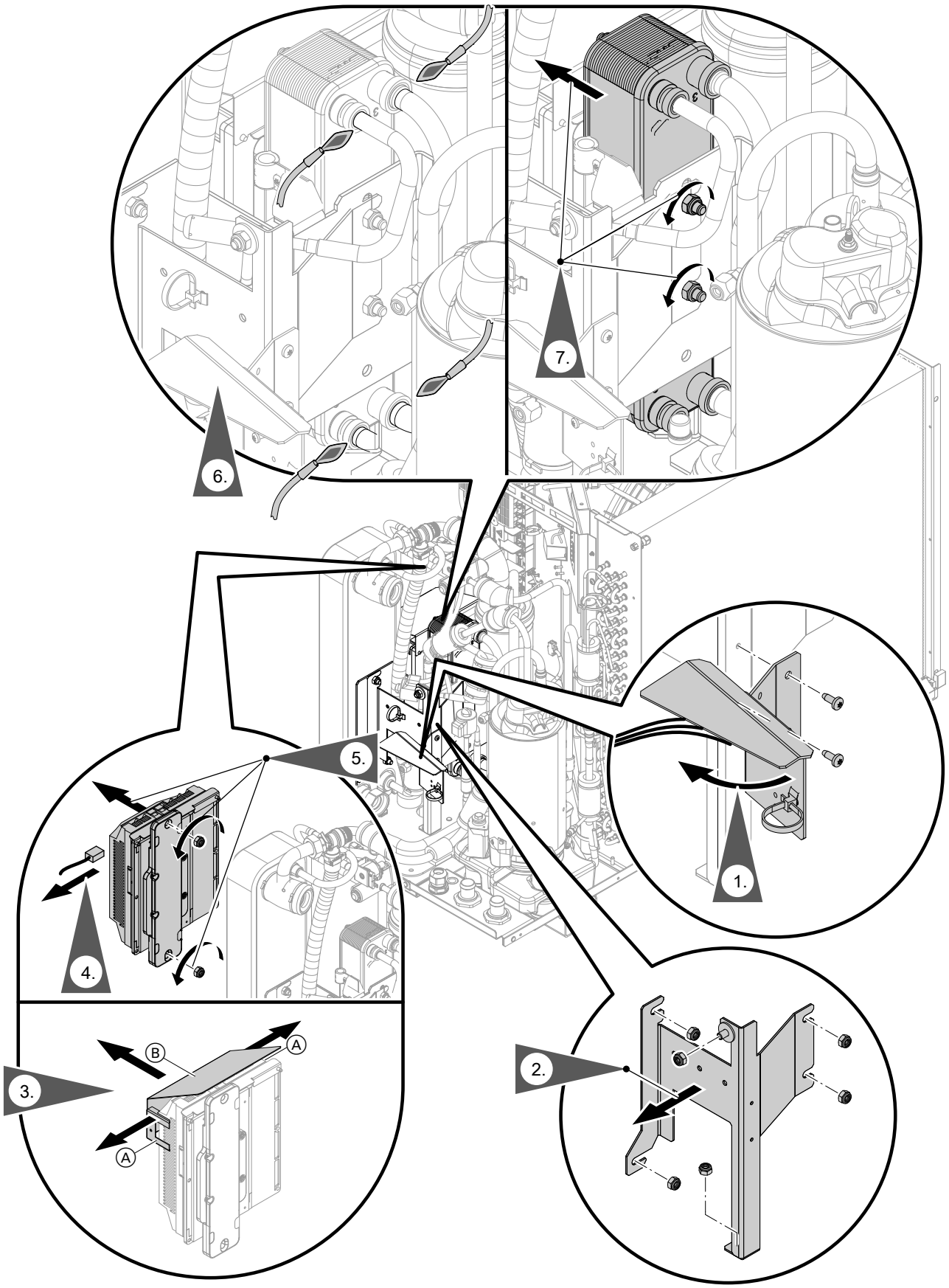


Fig. 128

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Components in the refrigerant circuit: Sizes 04… (cont.)

Ⓐ Clip
Ⓑ Inverter cover

Note on assembly:
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Removing the 4-way diverter valve

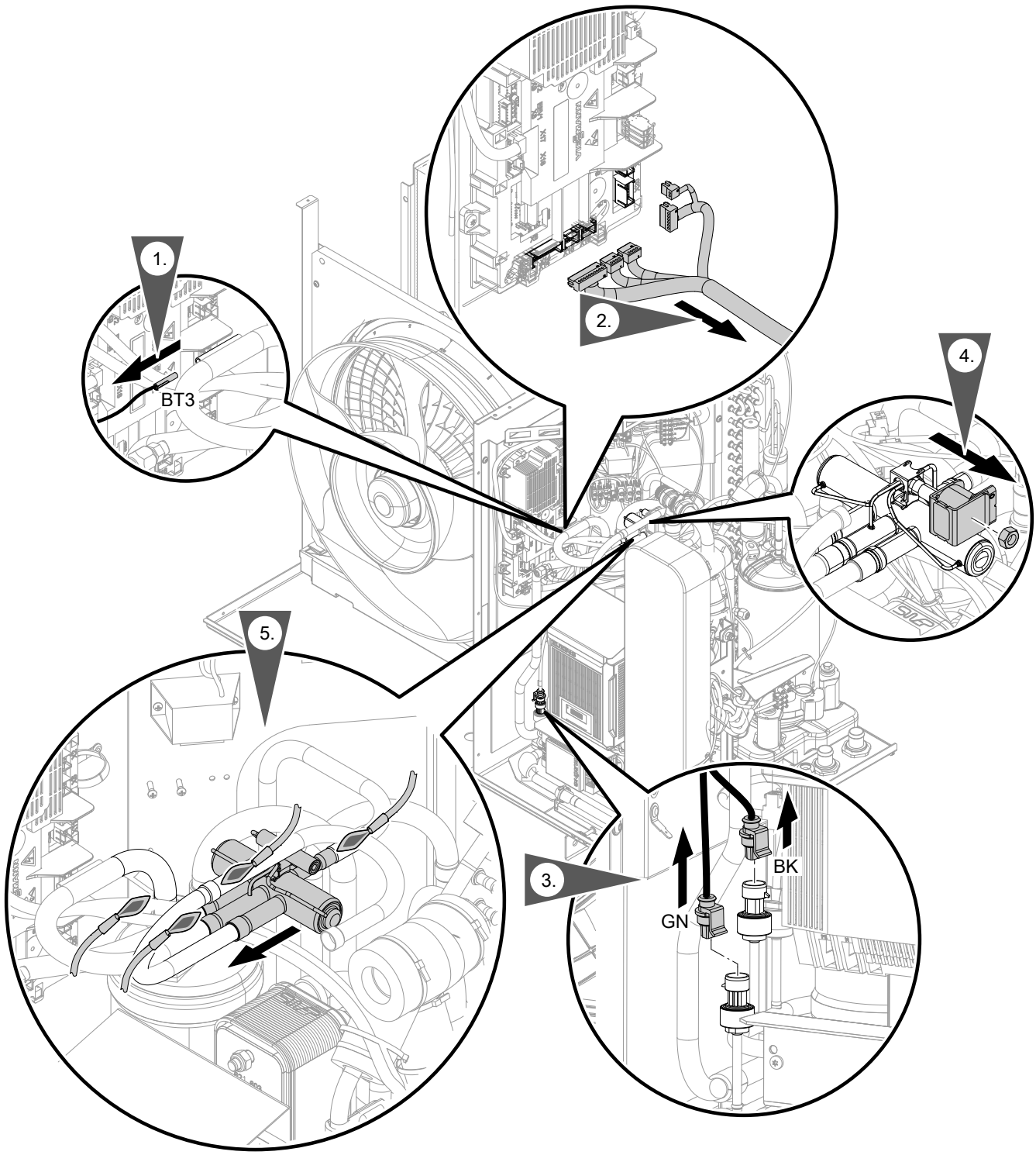


Fig. 129

BT3 Suction gas temperature sensor, evaporator
BK High pressure sensor (black)
GN Low pressure sensor (green)

Note on assembly:
- *Max. permissible temperature of the 4-way diverter valve: 120 °C*
- *Torque for the union nut of the drain hose (spanner size 36): 30 ±1 Nm*

Components in the refrigerant circuit: Sizes 04… (cont.)

Replacing electronic expansion valve 1

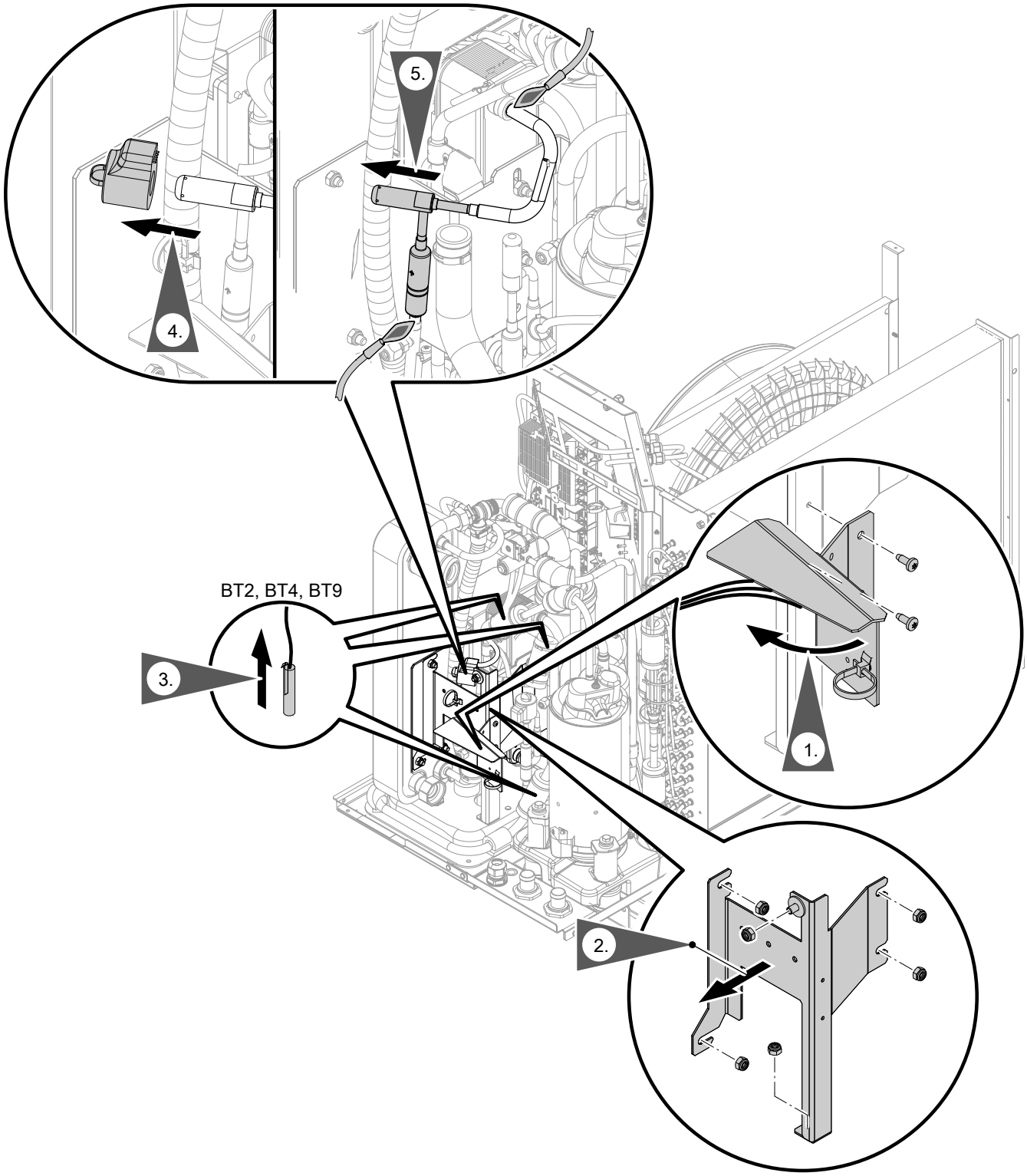


Fig. 130

BT2 Liquid gas temperature sensor, condenser
BT4 Hot gas temperature sensor
BT9 Liquid gas temperature sensor, heating

Components in the refrigerant circuit: Sizes 04… (cont.)

Notes on assembly:

- *Max. permissible temperature of the electronic expansion valve: 70 °C*
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Components in the refrigerant circuit: Sizes 04… (cont.)

Replacing electronic expansion valve 2

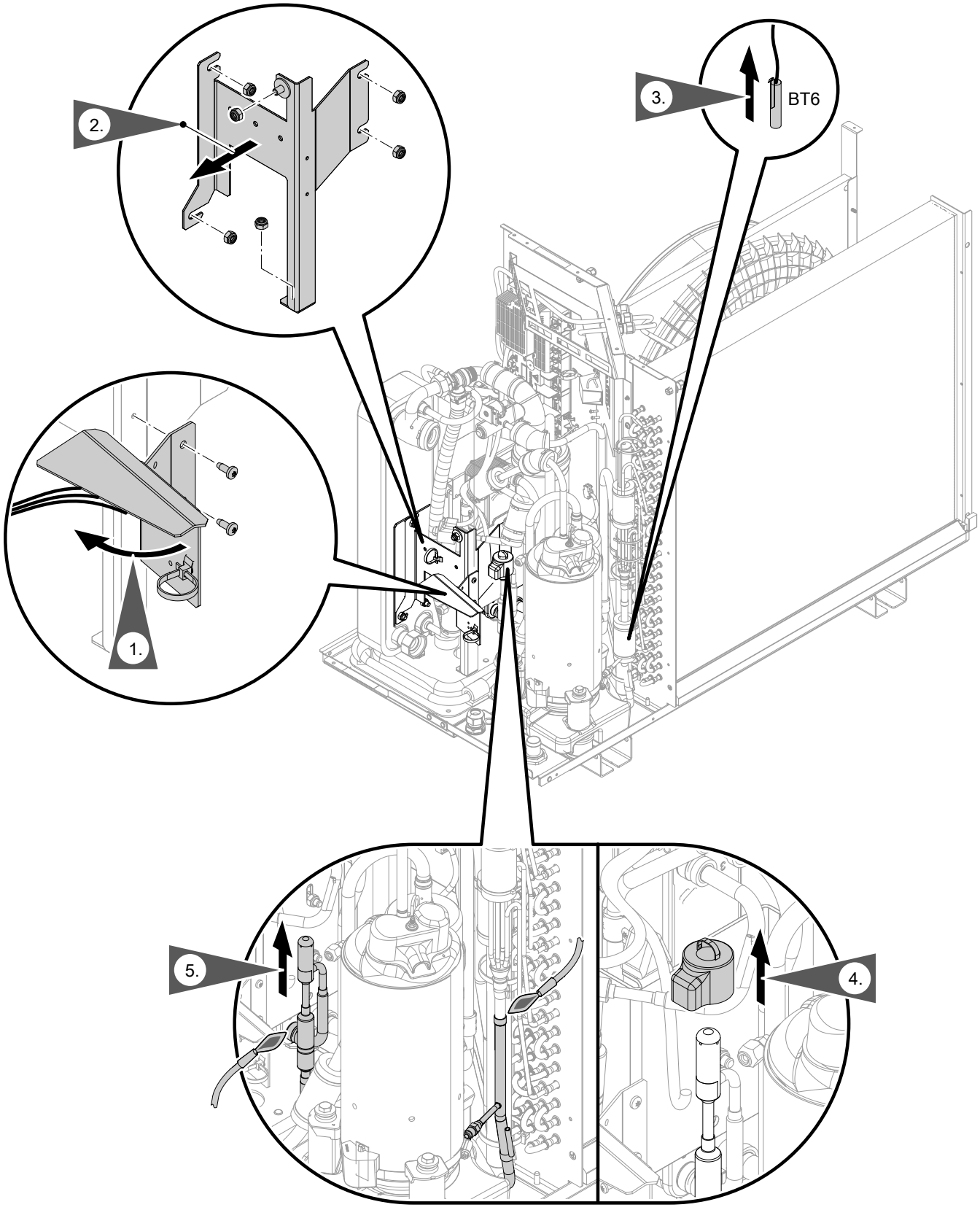


Fig. 131

BT6 Liquid gas temperature sensor, cooling

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Components in the refrigerant circuit: Sizes 04… (cont.)

Note on assembly:
- *Max. permissible temperature of the electronic expansion valve: 70 °C*
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Components in the refrigerant circuit: Sizes 10 to 13

Removing the evaporator

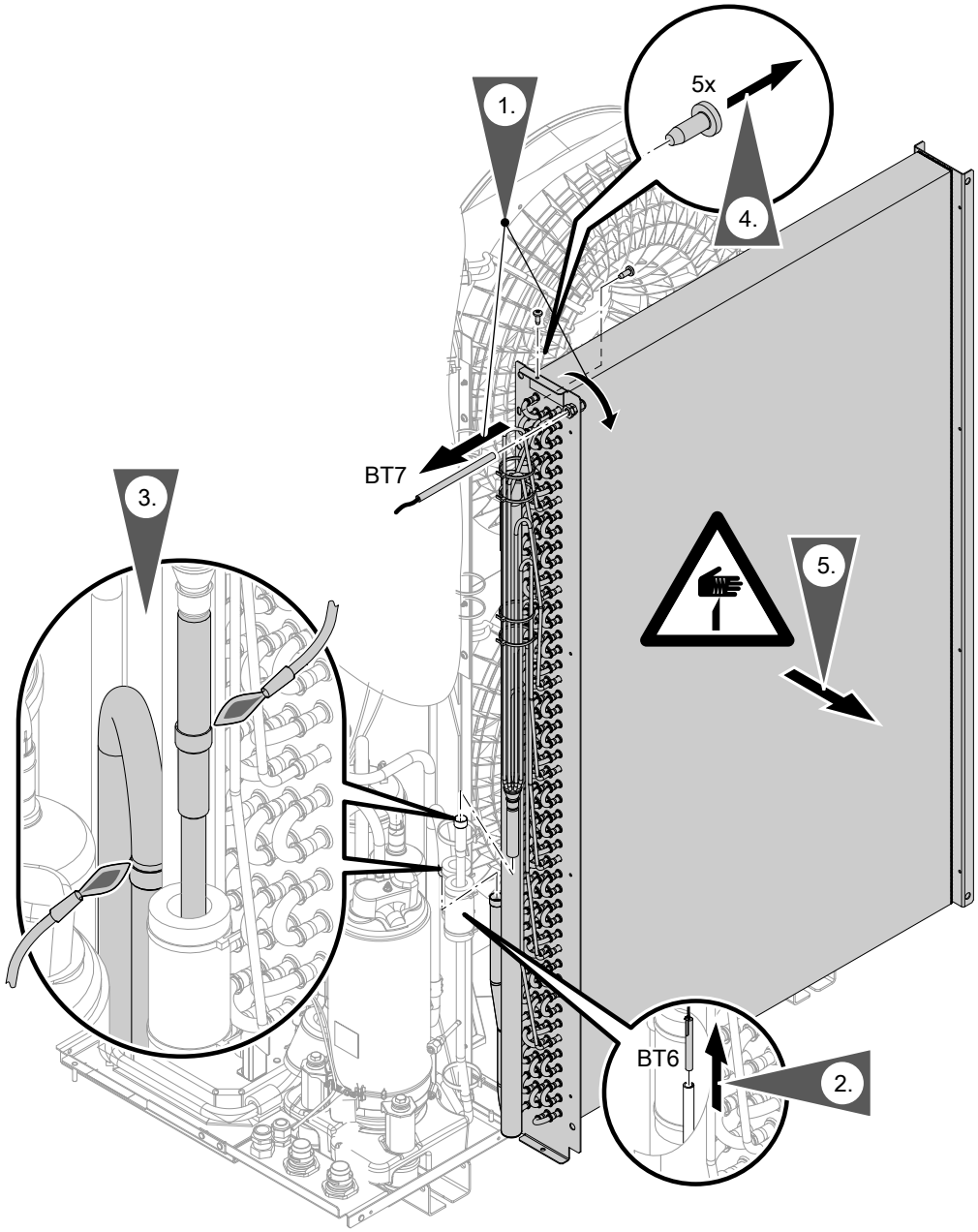


Fig. 132

BT6 Liquid gas temperature sensor, cooling
BT7 Air inlet temperature sensor

Note on assembly:
Torque for the screws: 1.8 ±0.25 Nm

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Components in the refrigerant circuit: Sizes 10… (cont.)

Removing the compressor and accumulators (refrigerant receivers)

When replacing the compressor, both accumulators (refrigerant receivers) must also be replaced. This ensures that the refrigerant circuit contains the correct amount of oil.

! **Please note**
Tilting the compressor sharply leads to damage in the refrigerant circuit during commissioning.
- Max. tilting angle: 45°
- Wait at least 30 min after transportation.

! **Please note**
Acidic compressor oil damages the refrigerant circuit.
Before installing the new compressor and new accumulators, check the condition of the compressor oil in the removed compressor.
If the compressor oil is acidic, the old compressor oil must be completely removed from the entire refrigerant circuit.
In this case, inform the technical support of the heat pump manufacturer.

Removing the compressor

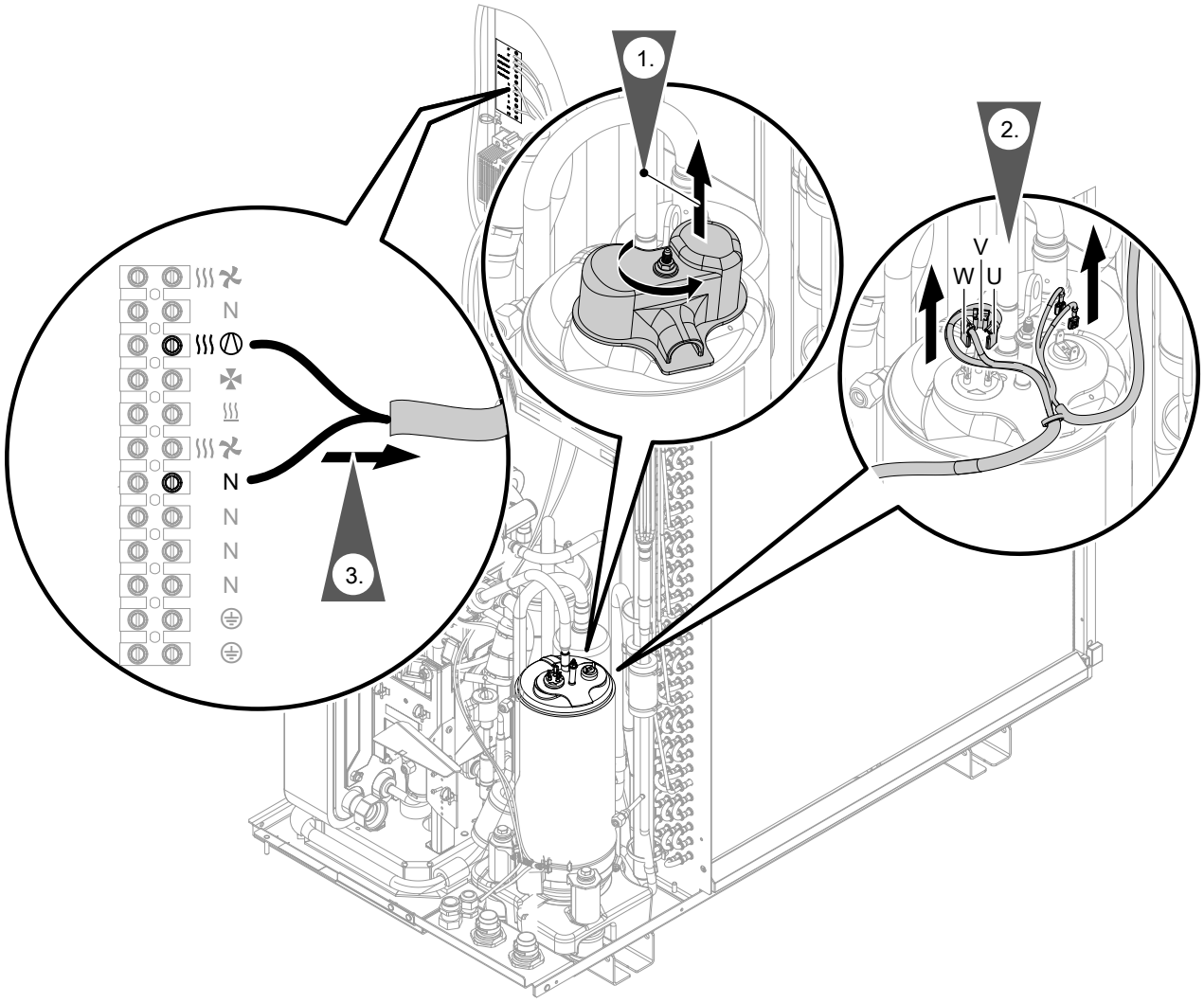


Fig. 133

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Components in the refrigerant circuit: Sizes 10… (cont.)

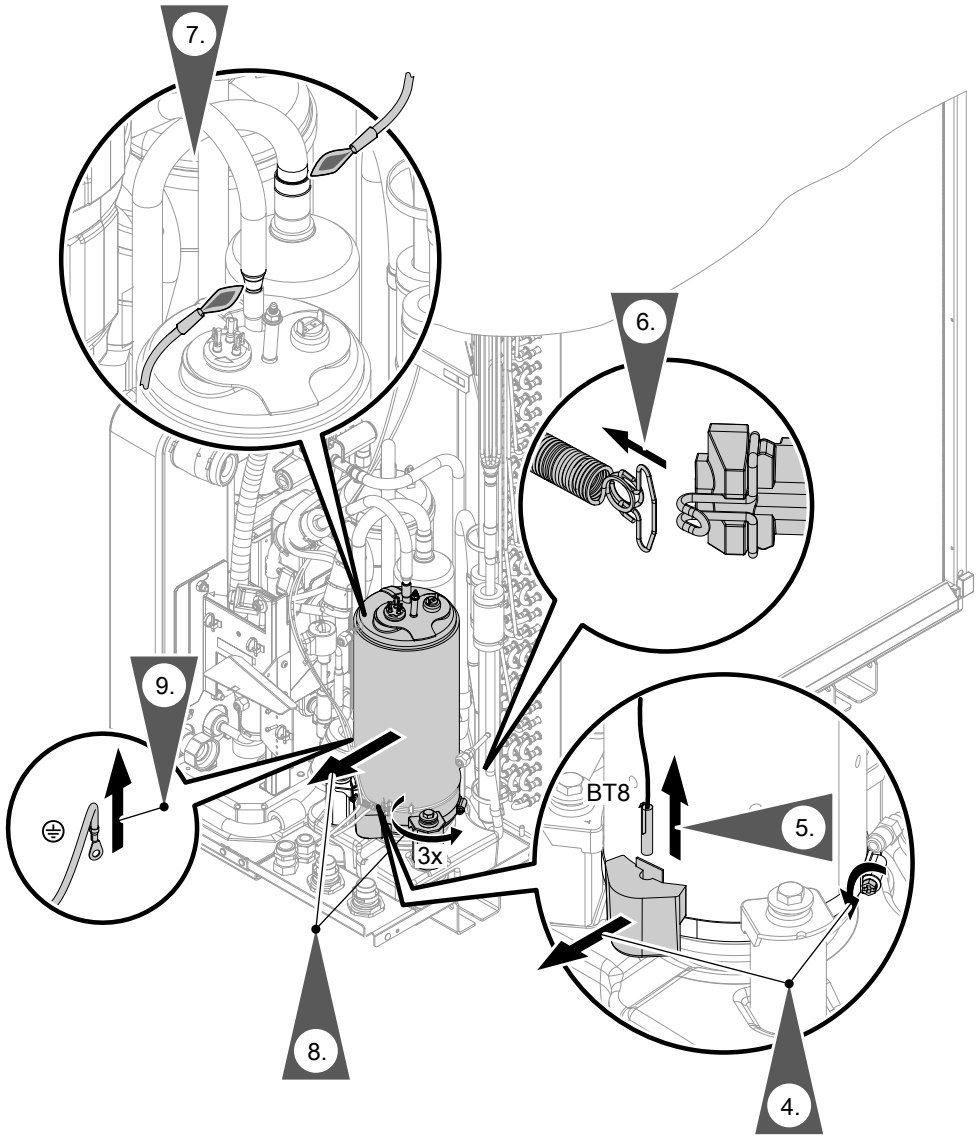


Fig. 134

BT8 Oil sump temperature sensor

Notes on assembly:

- *Max. permissible temperature of the compressor with accumulator: 127 °C*
- *Colour coding of electrical connection on the compressor:*
  U Brown
  V Black
  W Grey
- *Torque for the screws: 7 ±0.5 Nm*
- *To avoid increased noise, secure all cables again with cable ties.*

Components in the refrigerant circuit: Sizes 10… (cont.)

Removing the separate accumulator

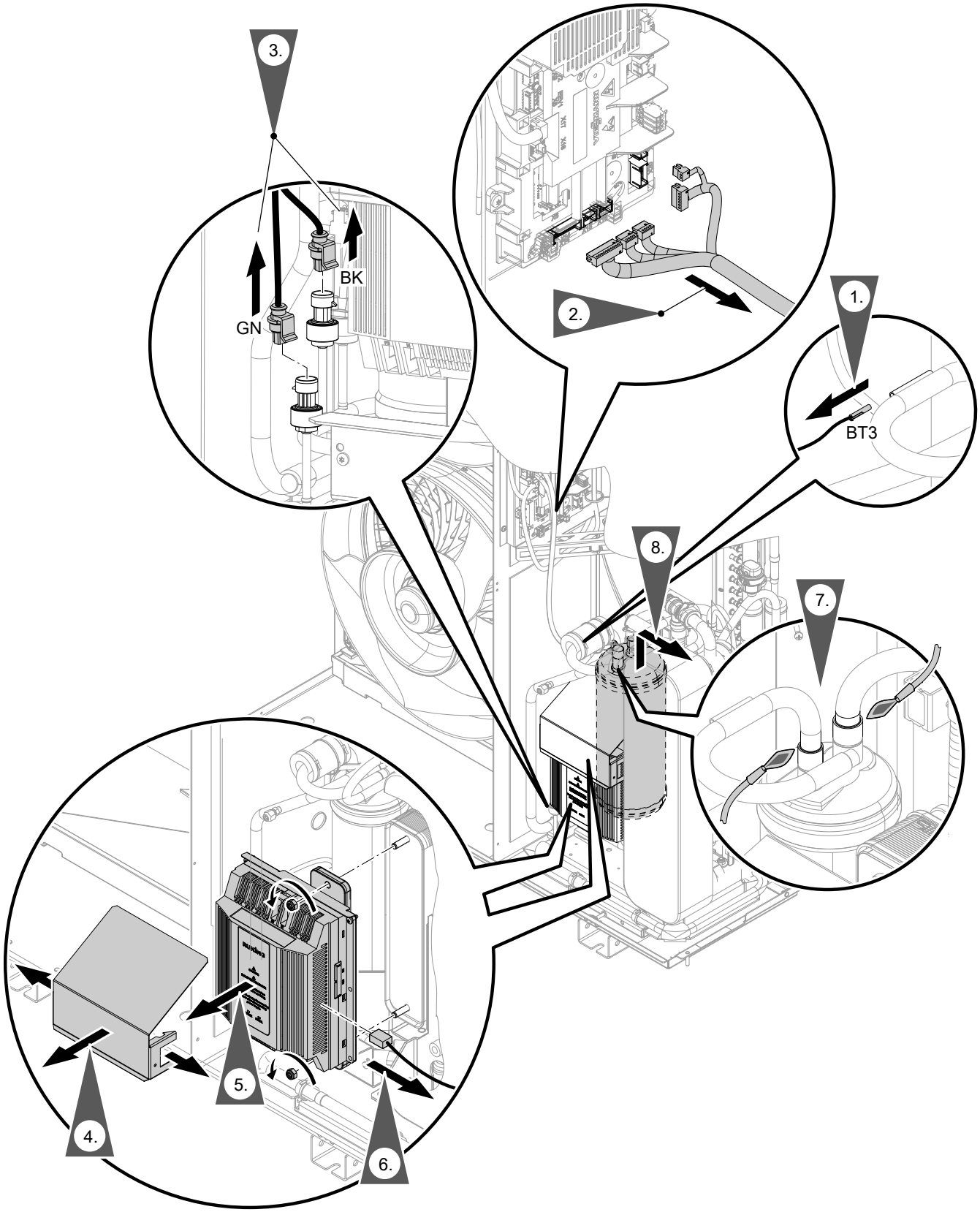


Fig. 135

BT3 Suction gas temperature sensor, evaporator
BK High pressure sensor (black)
GN Low pressure sensor (green)

Note on assembly:
Max. permissible temperature of the separate accumulator: 70 °C

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Components in the refrigerant circuit: Sizes 10… (cont.)

Installation of the oil sump heater

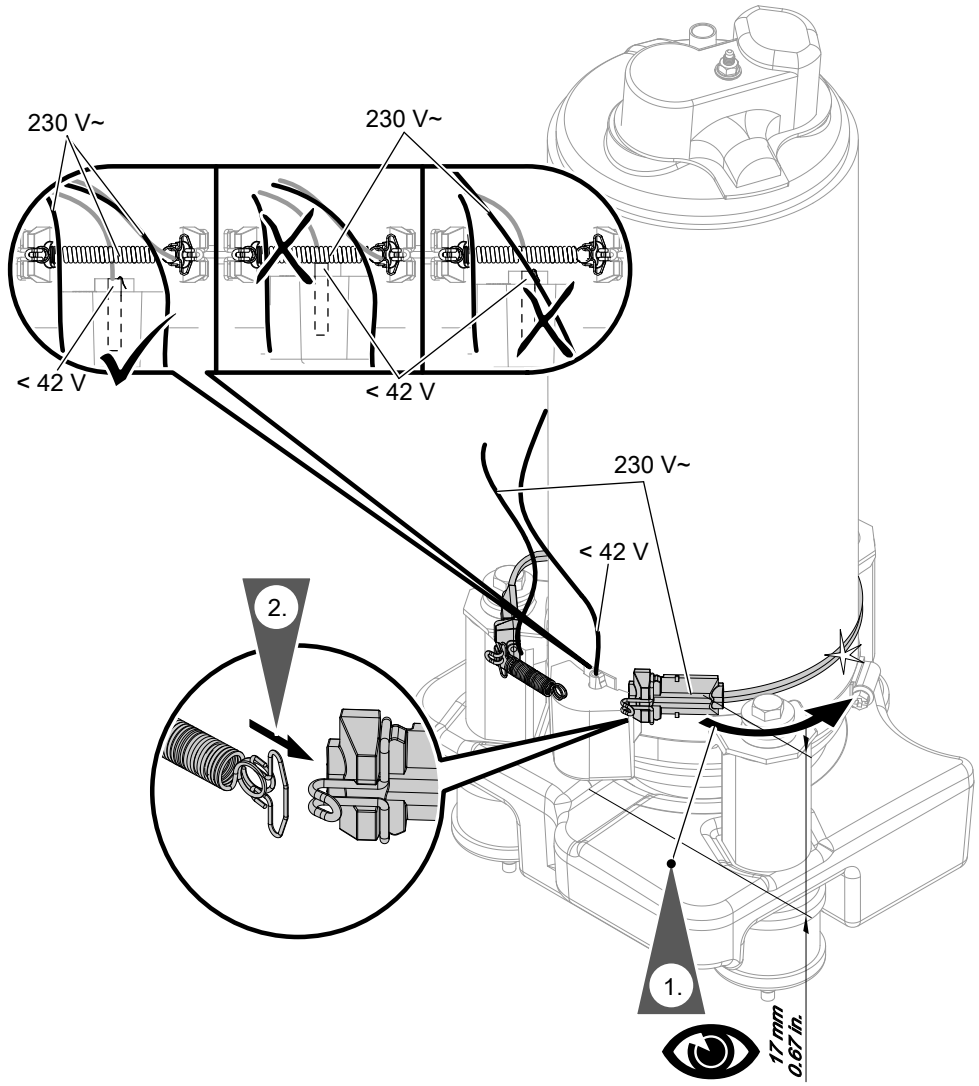


Fig. 136

Removing the condenser

2. Carefully lever the safety valve drain hose out of the base plate. Use pliers if necessary.

Components in the refrigerant circuit: Sizes 10… (cont.)

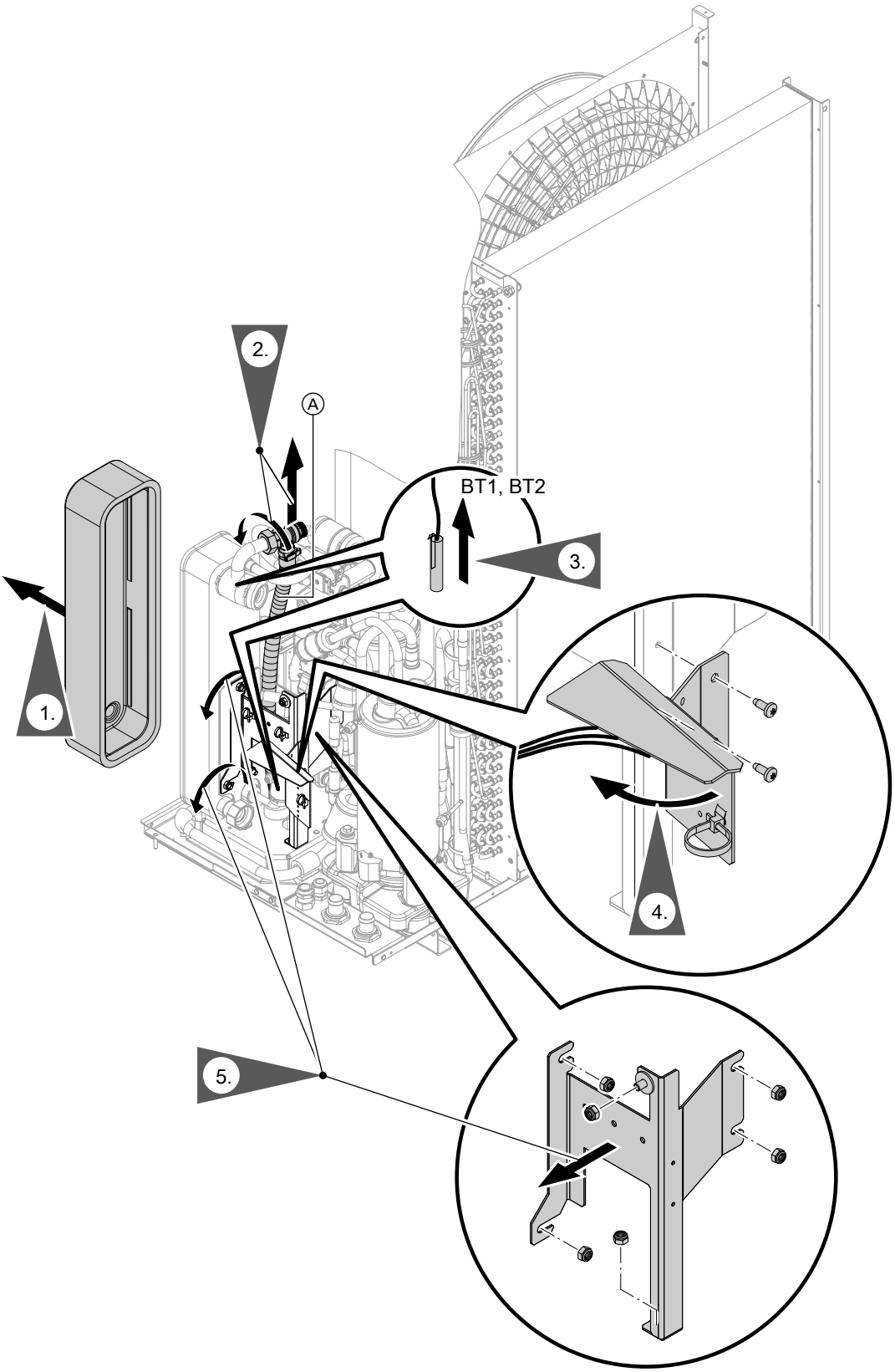


Fig. 137

Ⓐ Drain hose, safety valve
BT1 Flow temperature sensor, secondary circuit downstream of condenser
BT2 Liquid gas temperature sensor, condenser

Components in the refrigerant circuit: Sizes 10… (cont.)

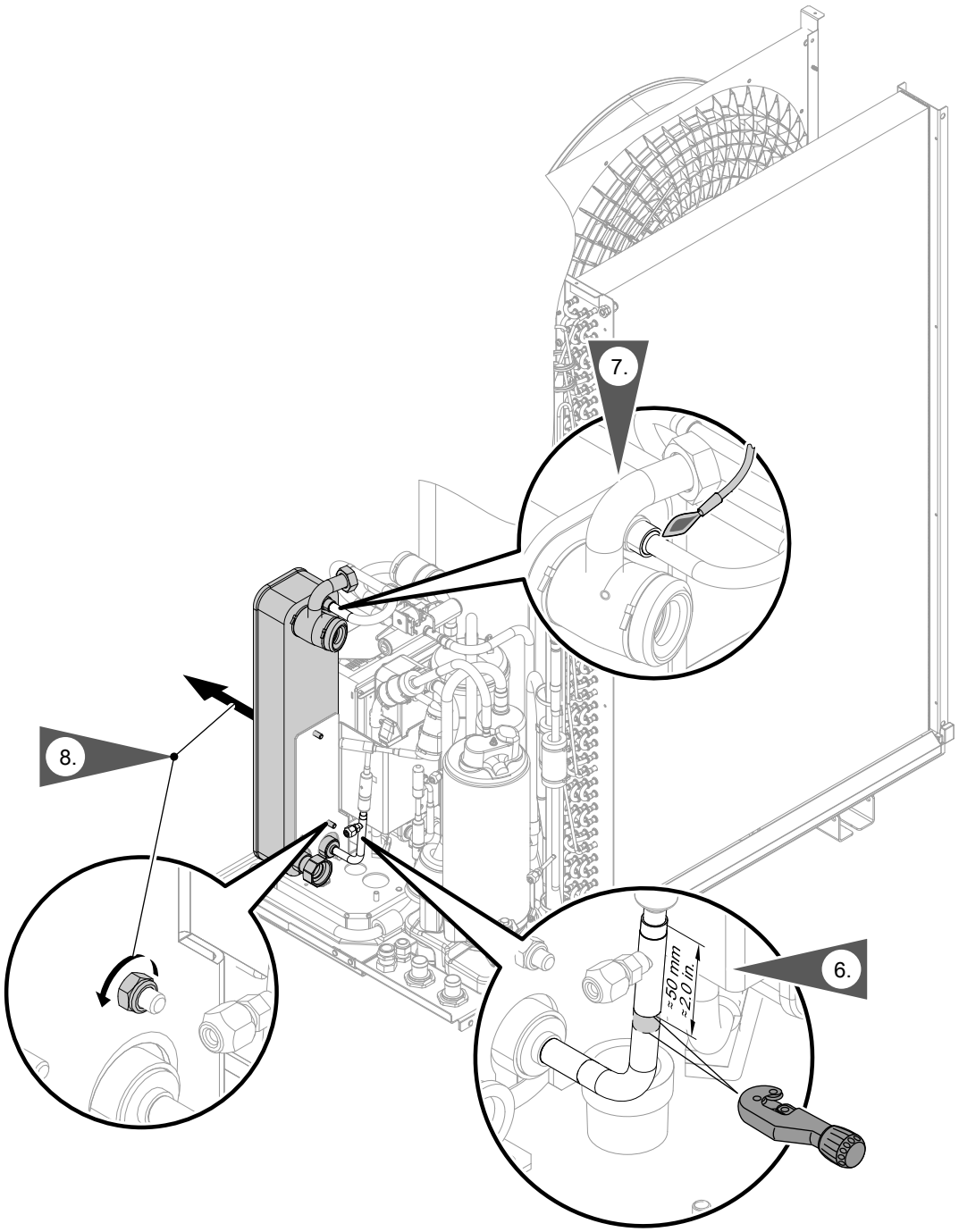


Fig. 138

Note on assembly:

- *Torque for the union nut of the drain hose (spanner size 36): 30 ±1 Nm*
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Components in the refrigerant circuit: Sizes 10… (cont.)

230 V~ outdoor unit: Removing the internal heat exchanger

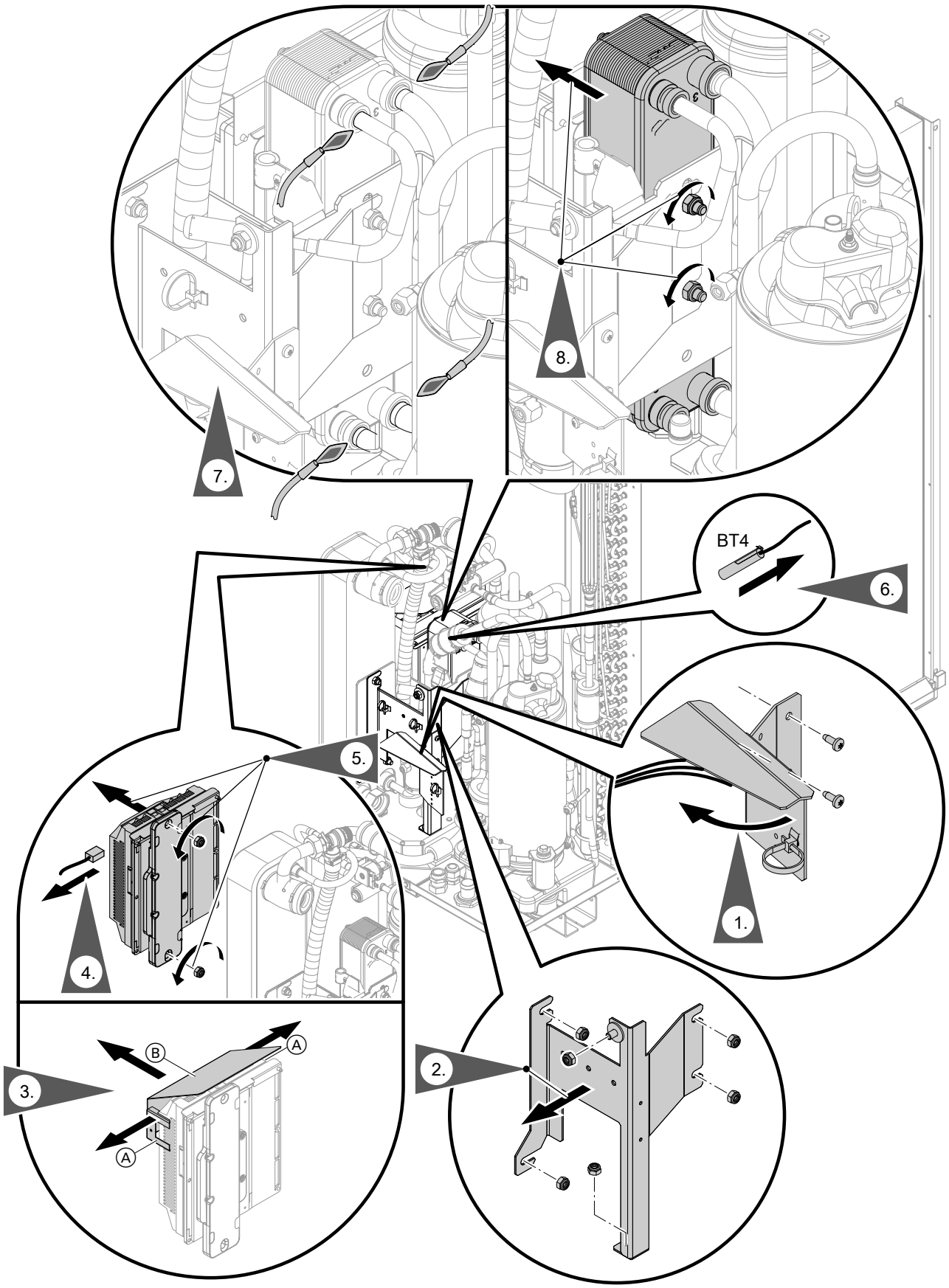


Fig. 139

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Components in the refrigerant circuit: Sizes 10… (cont.)

Ⓐ Clip
Ⓑ Inverter cover
BT4 Hot gas temperature sensor

Note on assembly:

- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Components in the refrigerant circuit: Sizes 10… (cont.)

400 V~ outdoor unit: Removing the internal heat exchanger

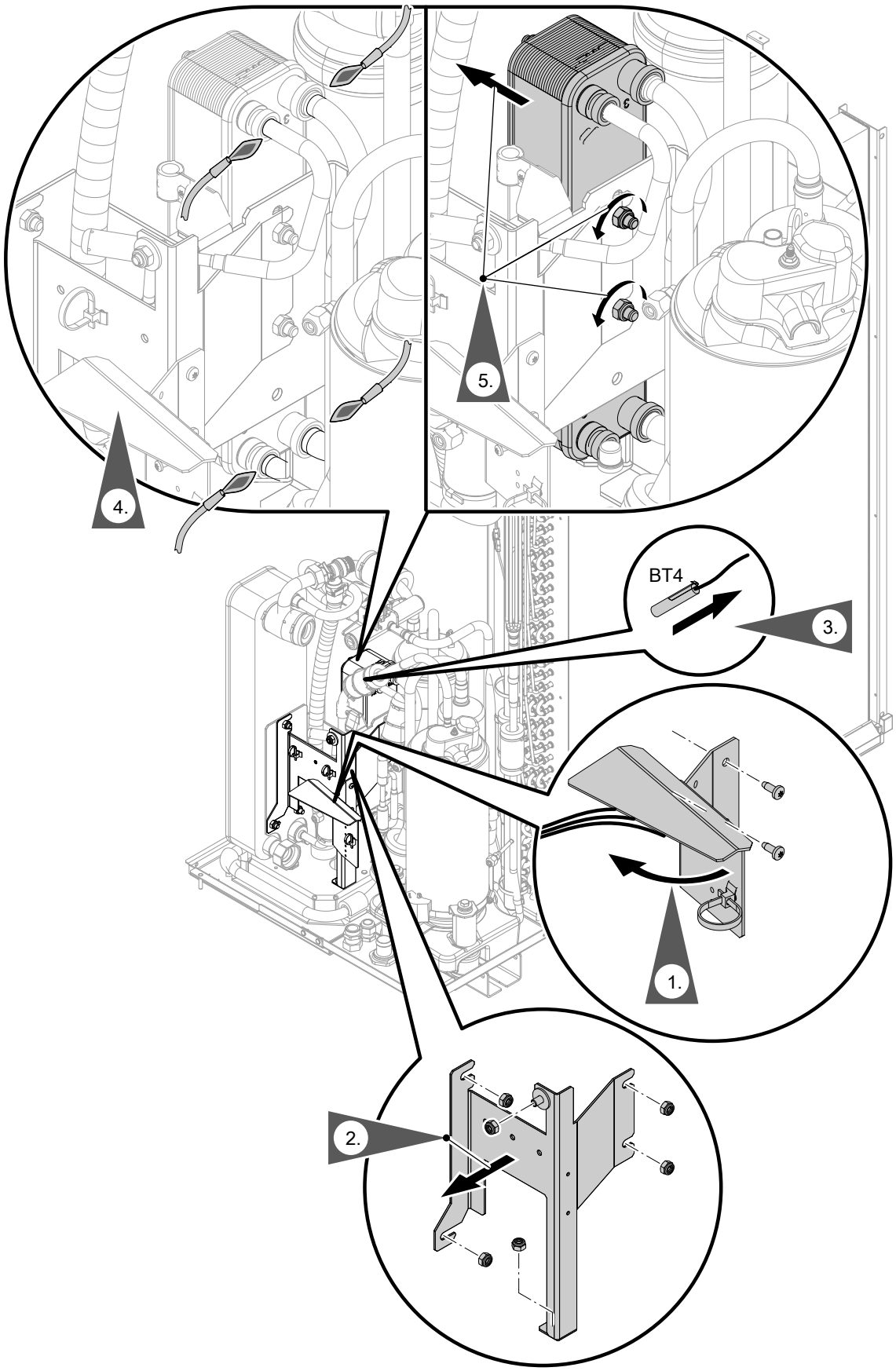


Fig. 140

BT4 Hot gas temperature sensor

Components in the refrigerant circuit: Sizes 10… (cont.)

Note on assembly:

- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Removing the 4-way diverter valve

1. Carefully lever the safety valve drain hose out of the base plate. Use pliers if necessary.

Components in the refrigerant circuit: Sizes 10… (cont.)

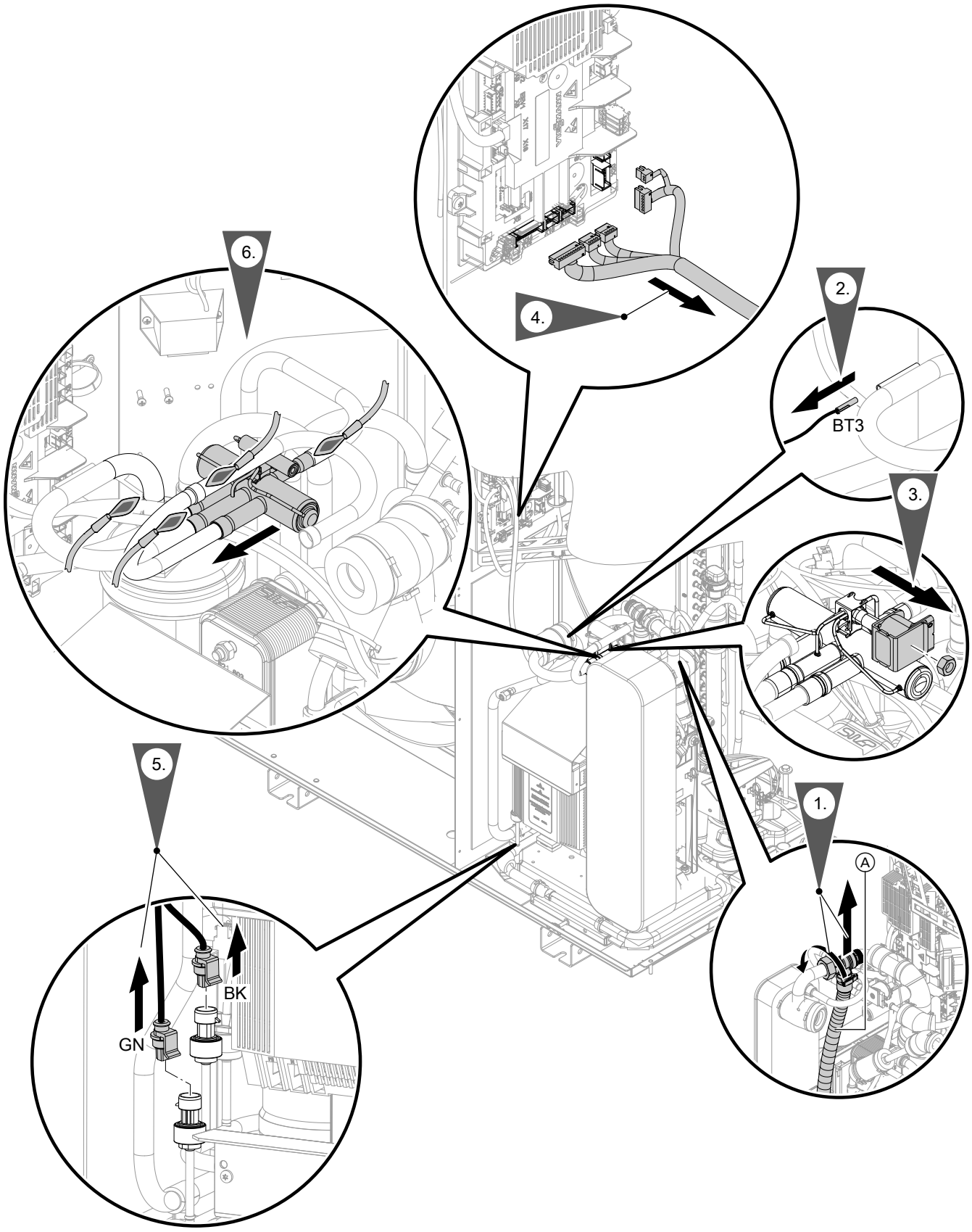


Fig. 141

BT3 Suction gas temperature sensor, evaporator

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Components in the refrigerant circuit: Sizes 10… (cont.)

Note on assembly:

- *Max. permissible temperature of the 4-way diverter valve: 120 °C*
- *Torque for the union nut of the drain hose (spanner size 36): 30 ±1 Nm*

Components in the refrigerant circuit: Sizes 10… (cont.)

Replacing electronic expansion valve 1

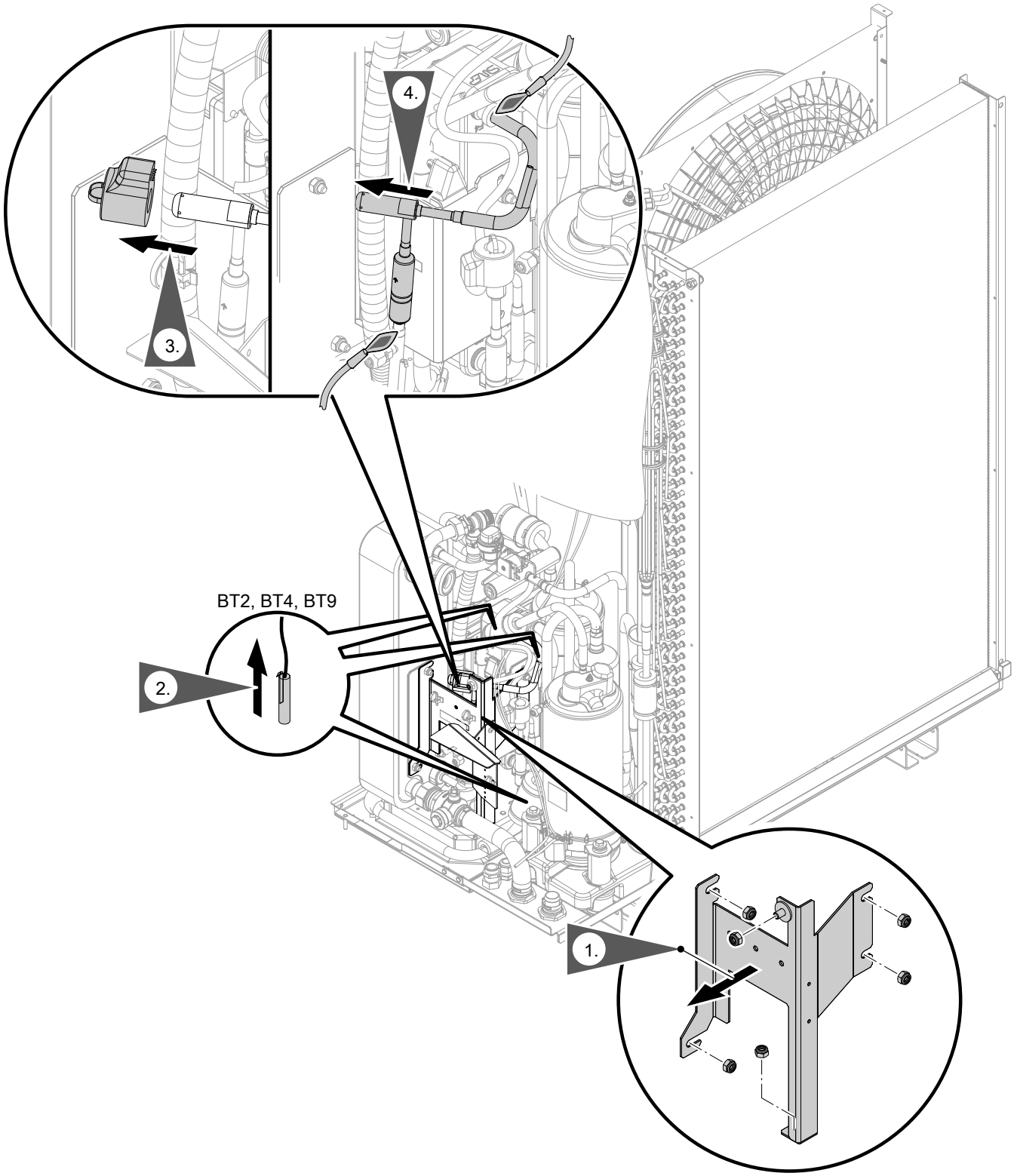


Fig. 142

BT2 Liquid gas temperature sensor, condenser
BT4 Hot gas temperature sensor
BT9 Liquid gas temperature sensor, heating

Components in the refrigerant circuit: Sizes 10… (cont.)

Notes on assembly:

- *Max. permissible temperature of the electronic expansion valve: 70 °C*
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Components in the refrigerant circuit: Sizes 10… (cont.)

Replacing electronic expansion valve 2

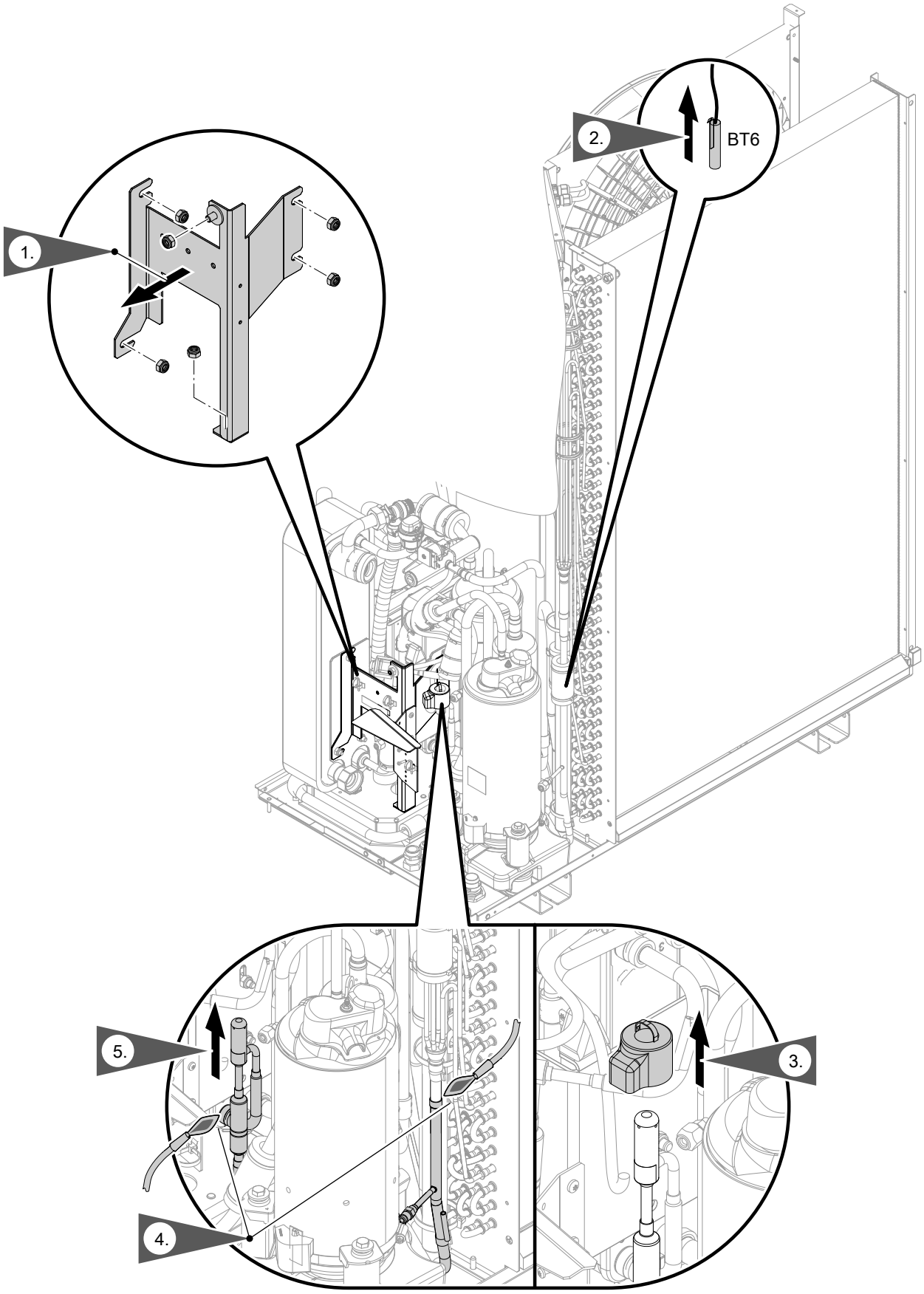


Fig. 143

BT6 Liquid gas temperature sensor, cooling

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Components in the refrigerant circuit: Sizes 10… (cont.)

Note on assembly:

- *Max. permissible temperature of the electronic expansion valve: 70 °C*
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Components in the refrigerant circuit: Sizes 16 to 19

⚠ **Danger**
Incorrect or missing connection of the high limit safety cut-out leads to a fire hazard.
If the high limit safety cut-out is removed for the brazing/soldering work, refit it in the same position and connect it correctly.
Position of the high limit safety cut-out: See Fig. 145.

Components in the refrigerant circuit: Sizes 16… (cont.)

Removing the evaporator

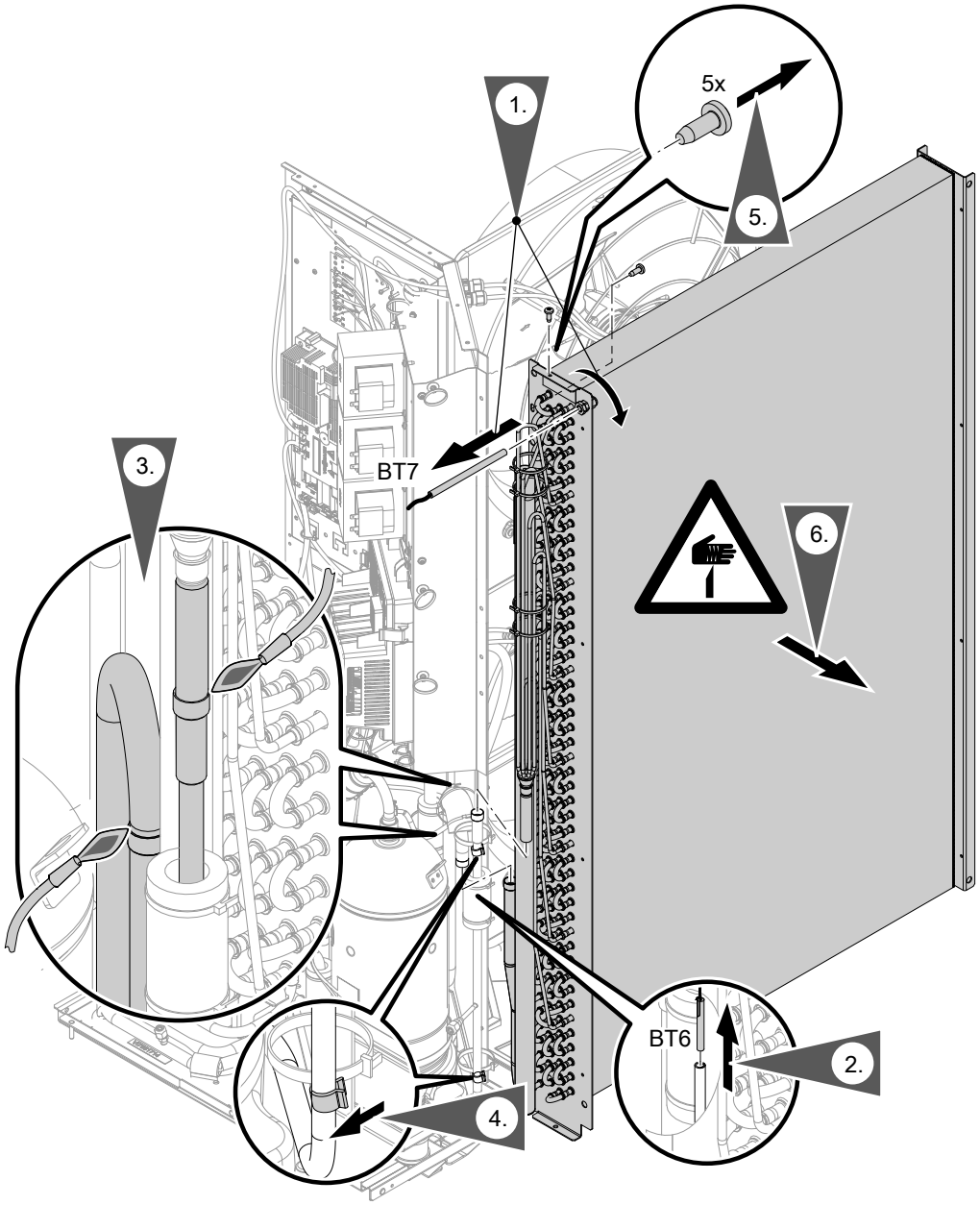


Fig. 144

BT6 Liquid gas temperature sensor, cooling
BT7 Air inlet temperature sensor

Note on assembly:
- *Torque for the screws: 1.8 ±0.25 Nm*
- *Secure all cables again with cable ties. Fit the clips for the pipes in the same place. This prevents increased noise.*

Removing the compressor and accumulators (refrigerant receivers)

When replacing the compressor, both accumulators (refrigerant receivers) must also be replaced. This ensures that the refrigerant circuit contains the correct amount of oil.

! **Please note**
Tilting the compressor sharply leads to damage in the refrigerant circuit during commissioning.
- Max. tilting angle: 45°
- Wait at least 30 min after transportation.

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Components in the refrigerant circuit: Sizes 16… (cont.)

! **Please note**
Acidic compressor oil damages the refrigerant circuit.
Before installing the new compressor and new accumulators, check the condition of the compressor oil in the removed compressor.
If the compressor oil is acidic, the old compressor oil must be completely removed from the entire refrigerant circuit.
In this case, inform the technical support of the heat pump manufacturer.

Removing the compressor

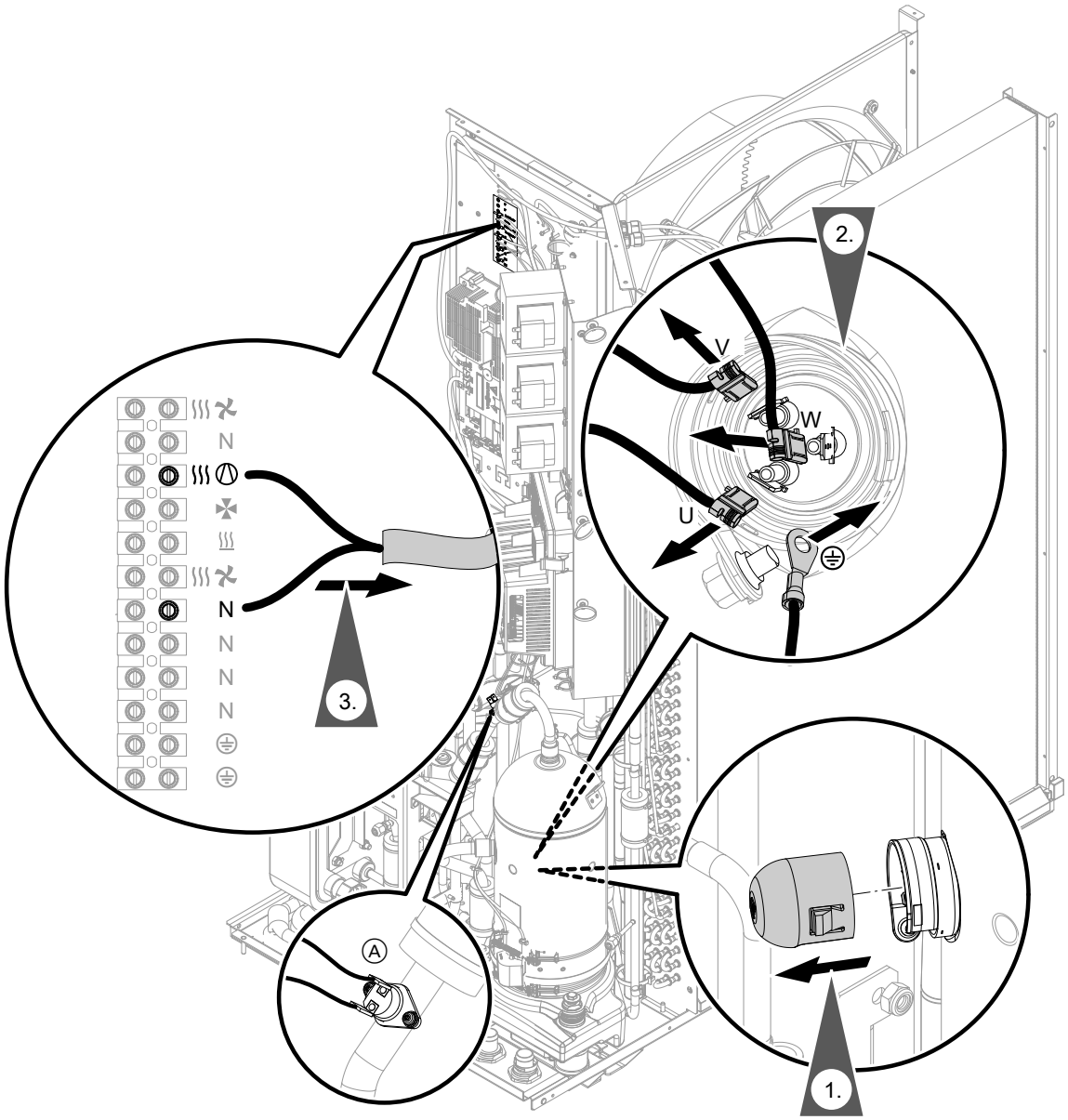


Fig. 145

Ⓐ High limit safety cut-out

Components in the refrigerant circuit: Sizes 16… (cont.)

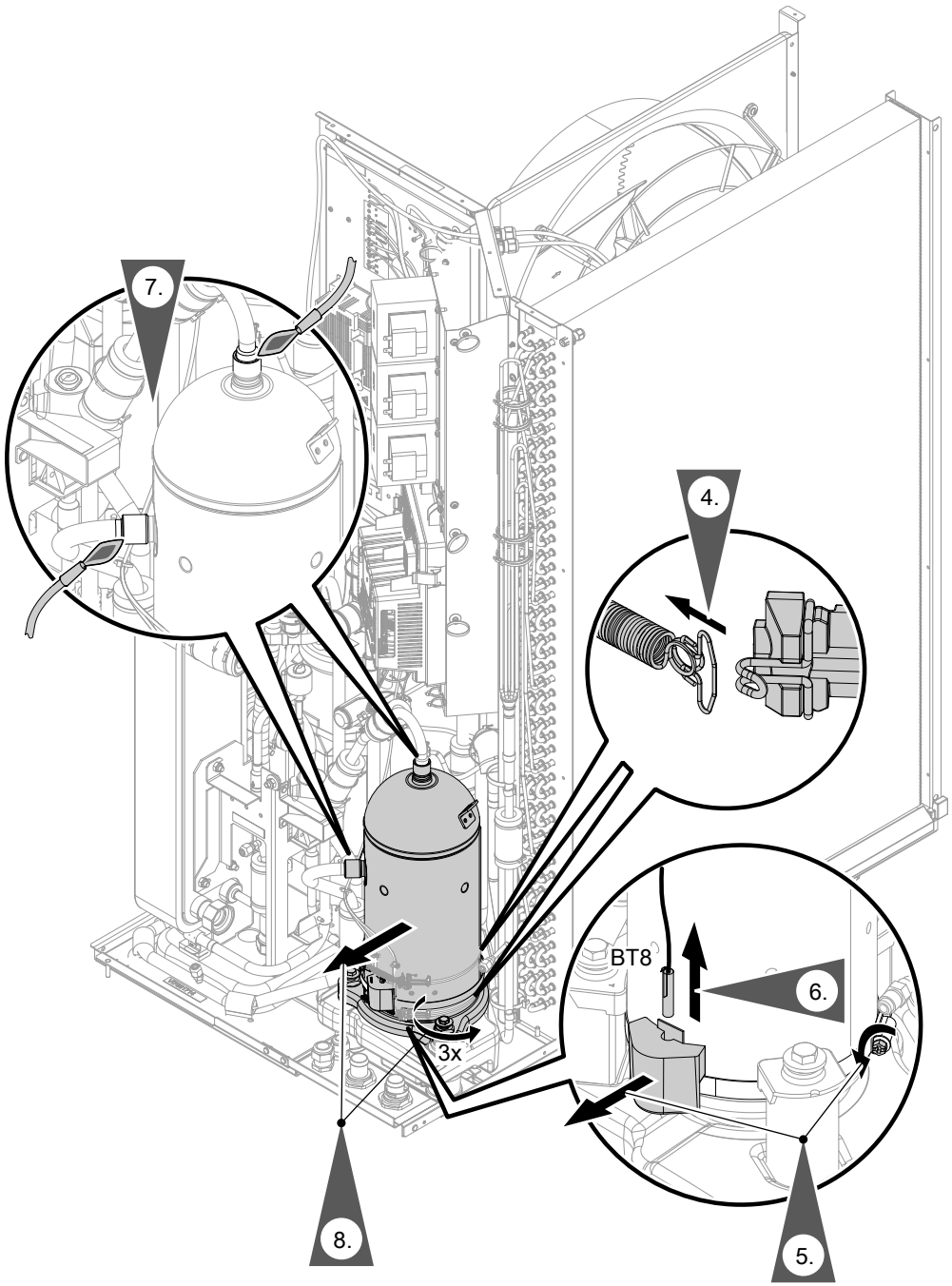


Fig. 146

BT8 Oil sump temperature sensor

Danger
Incorrect or missing connection of the high limit safety cut-out leads to a fire hazard.
If the high limit safety cut-out was removed for the brazing/soldering work, refit it in the same position and connect it correctly.

Notes on assembly:

- *Max. permissible temperature of the compressor with accumulator: 70 °C*
- *Colour coding of electrical connection on the compressor:*
  U Brown
  V Black
  W Grey
- *Torque for the screws: 7 ±0.5 Nm*
- *To avoid increased noise, secure all cables again with cable ties.*

Components in the refrigerant circuit: Sizes 16… (cont.)

Removing the separate accumulator

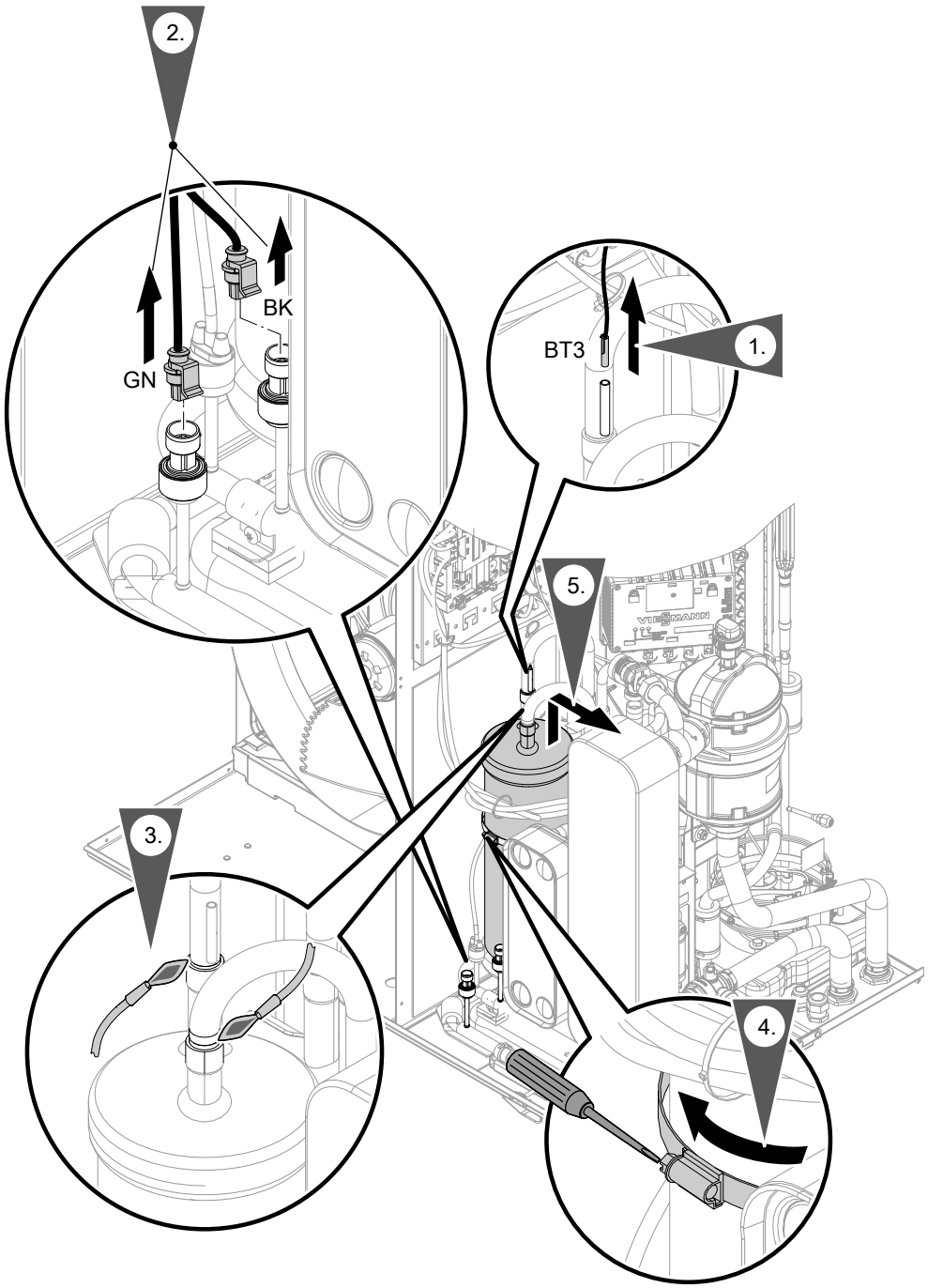


Fig. 147

BT3 Suction gas temperature sensor, evaporator
BK High pressure sensor (black)
GN Low pressure sensor (green)

Note on assembly:
Max. permissible temperature of the separate accumulator: 150 °C

Components in the refrigerant circuit: Sizes 16… (cont.)

Installation of the oil sump heater

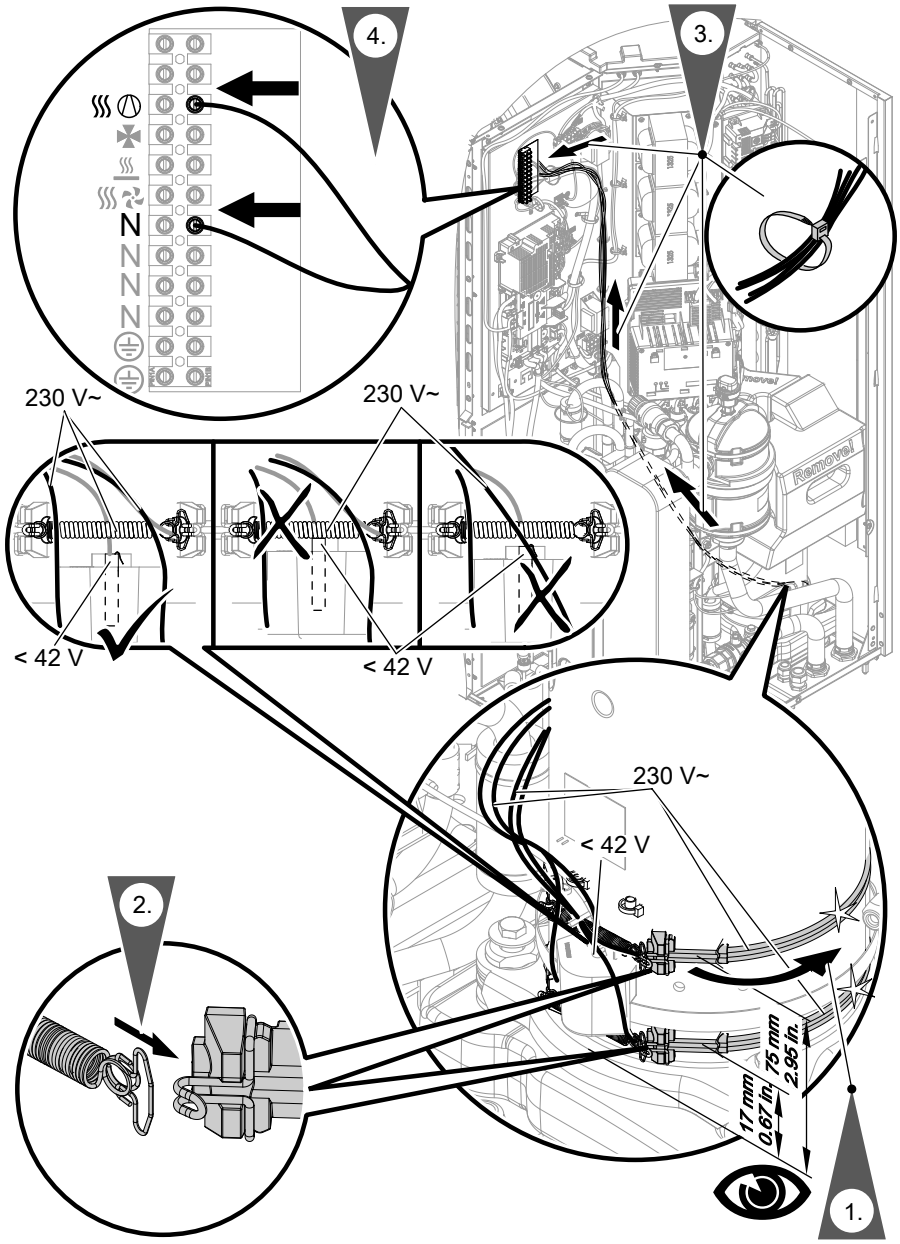


Fig. 148

Removing the condenser

2. Carefully lever the safety valve drain hose out of the base plate. Use pliers if necessary.

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Components in the refrigerant circuit: Sizes 16… (cont.)

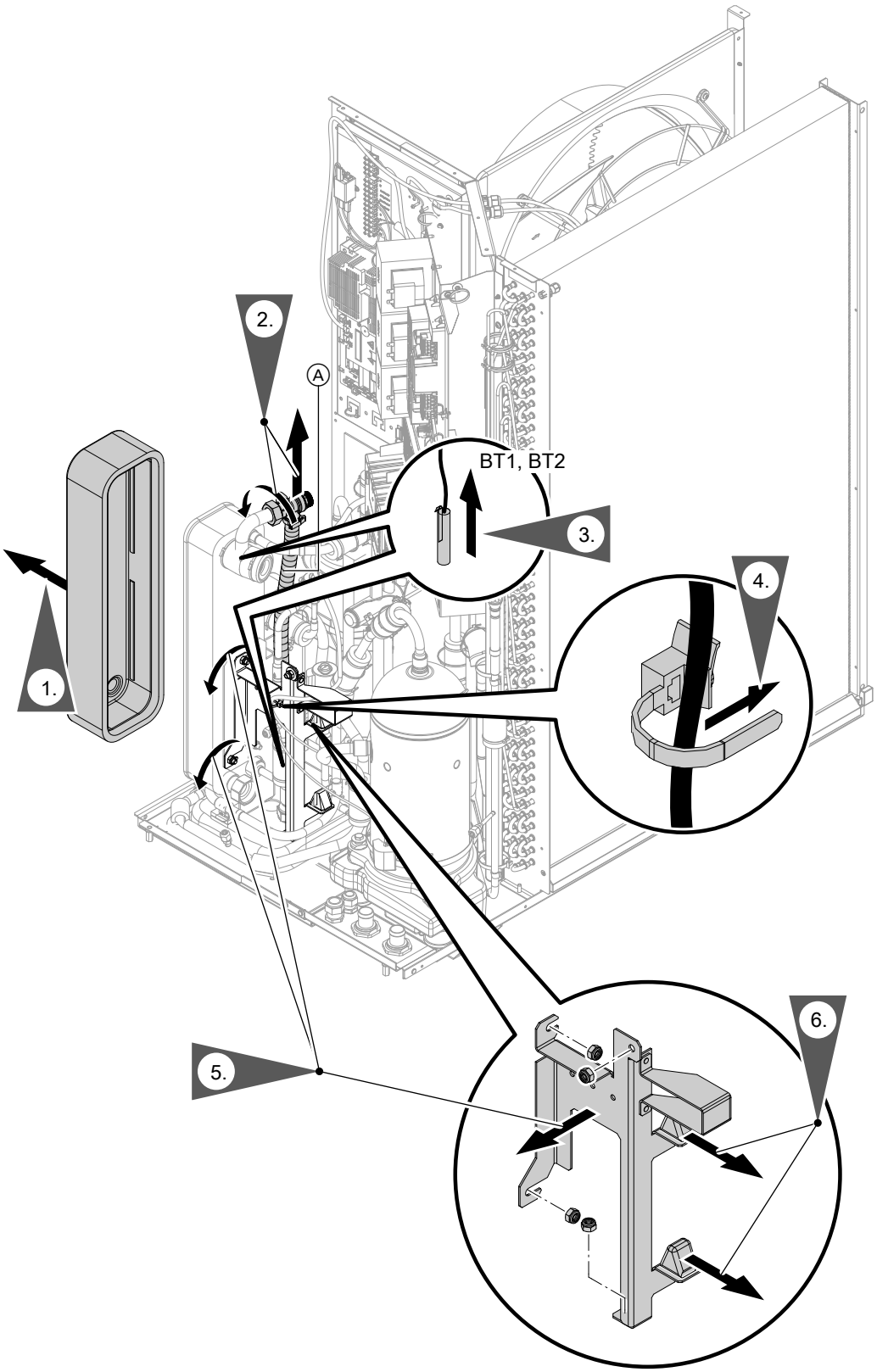


Fig. 149

Ⓐ Drain hose, safety valve
BT1 Flow temperature sensor, secondary circuit downstream of condenser
BT2 Liquid gas temperature sensor, condenser

Components in the refrigerant circuit: Sizes 16… (cont.)

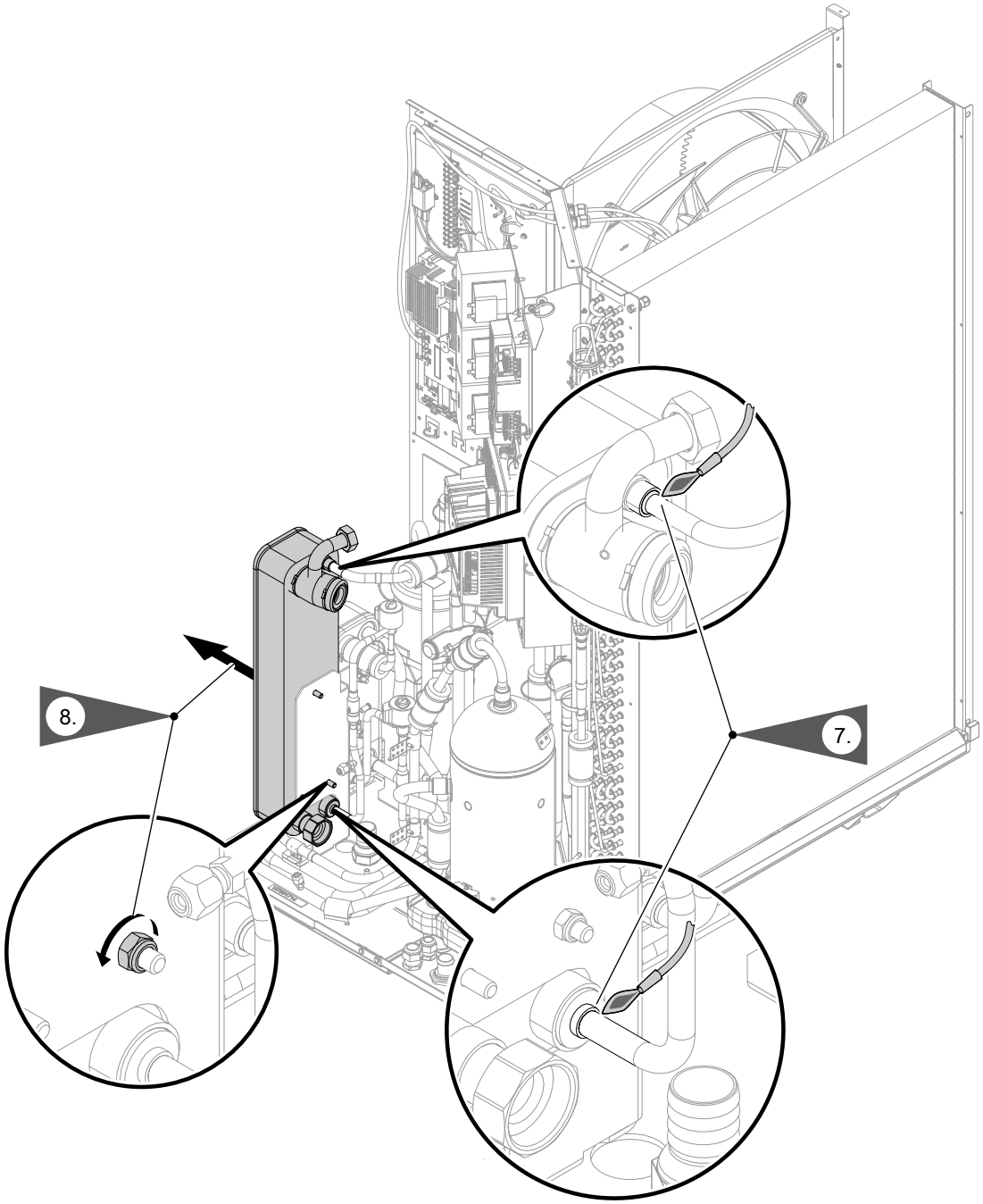


Fig. 150

Note on assembly:

- *Torque for the union nut of the drain hose (spanner size 36): 30 ±1 Nm*
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Components in the refrigerant circuit: Sizes 16… (cont.)

Removing the internal heat exchanger

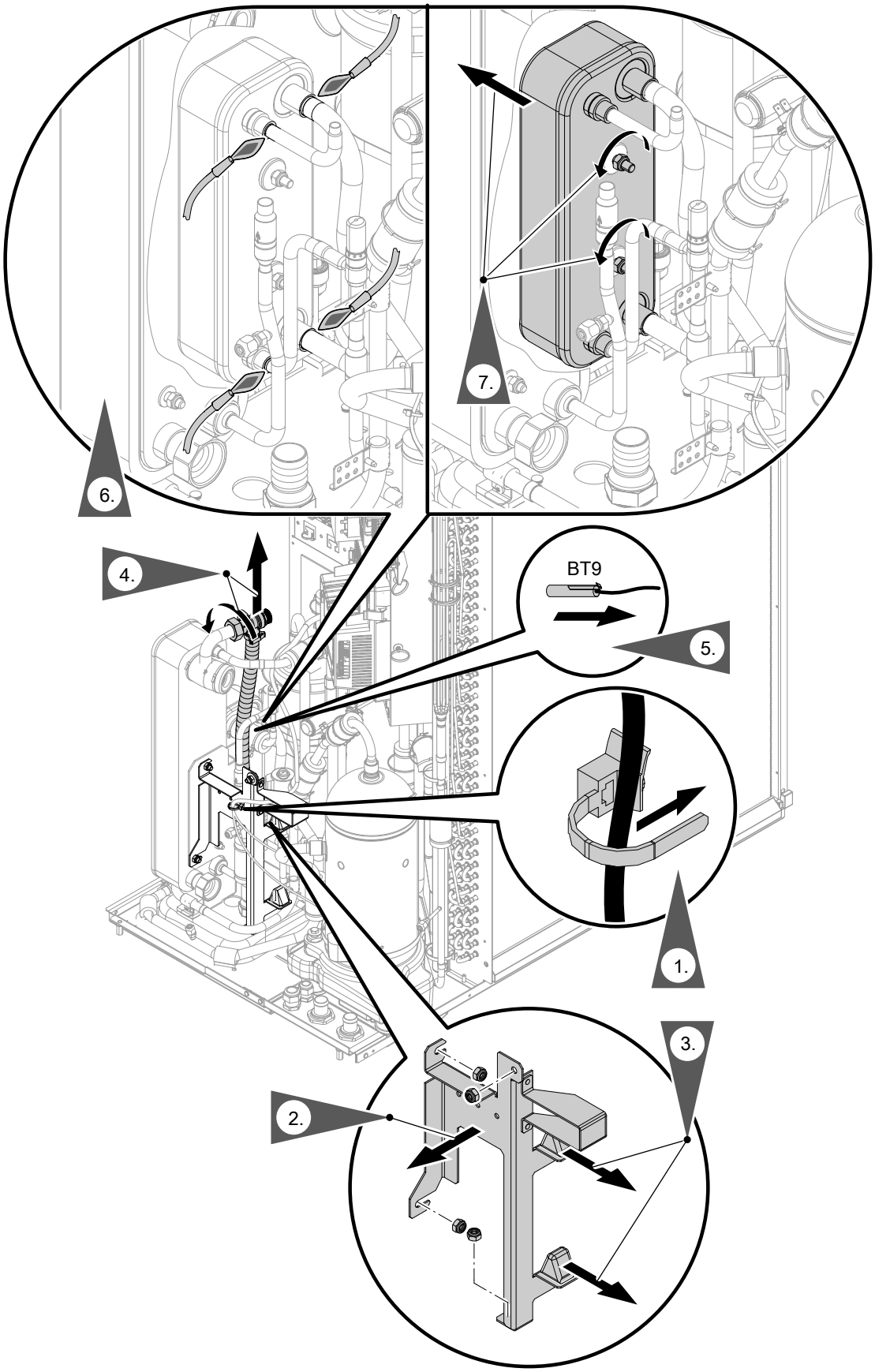


Fig. 151

Ⓐ Drain hose, safety valve
BT9 Liquid gas temperature sensor, heating

4. Carefully lever the safety valve drain hose out of the base plate. Use pliers if necessary.

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Components in the refrigerant circuit: Sizes 16… (cont.)

Danger
Incorrect or missing connection of the high limit safety cut-out leads to a fire hazard.
If the high limit safety cut-out was removed for the brazing/soldering work, refit it in the same position and connect it correctly.

Note on assembly:
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Removing the 4-way diverter valve

1. Carefully lever the safety valve drain hose out of the base plate. Use pliers if necessary.

Components in the refrigerant circuit: Sizes 16… (cont.)

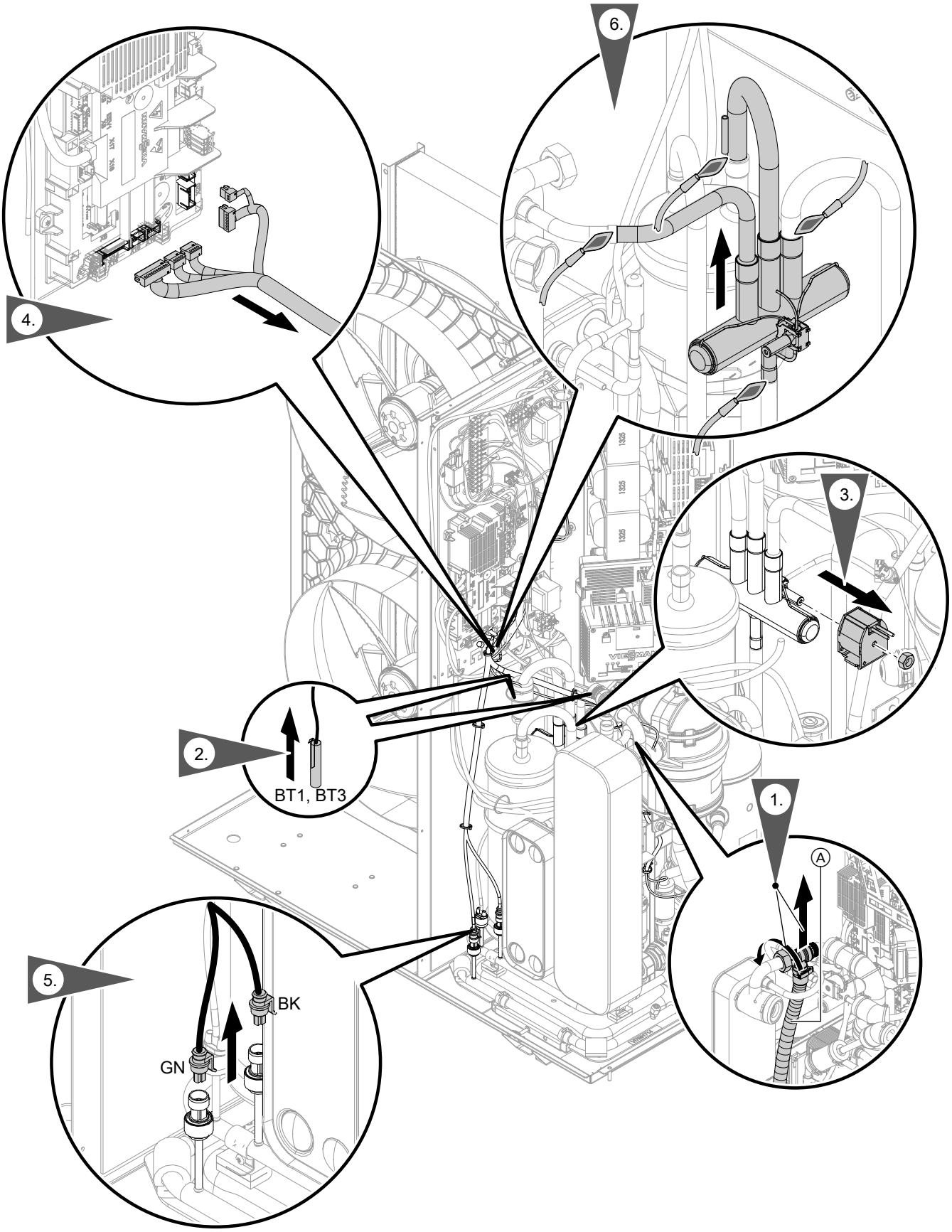


Fig. 152

Ⓐ Drain hose, safety valve
BT1 Flow temperature sensor, secondary circuit downstream of condenser
BT3 Suction gas temperature sensor, evaporator
BK High pressure sensor (black)
GN Low pressure sensor (green)

Components in the refrigerant circuit: Sizes 16… (cont.)

Note on assembly:

- *Max. permissible temperature of the 4-way diverter valve: 130 °C*
- *Torque for the union nut of the drain hose (spanner size 36): 30 ±1 Nm*

Components in the refrigerant circuit: Sizes 16… (cont.)

Replacing electronic expansion valve 1

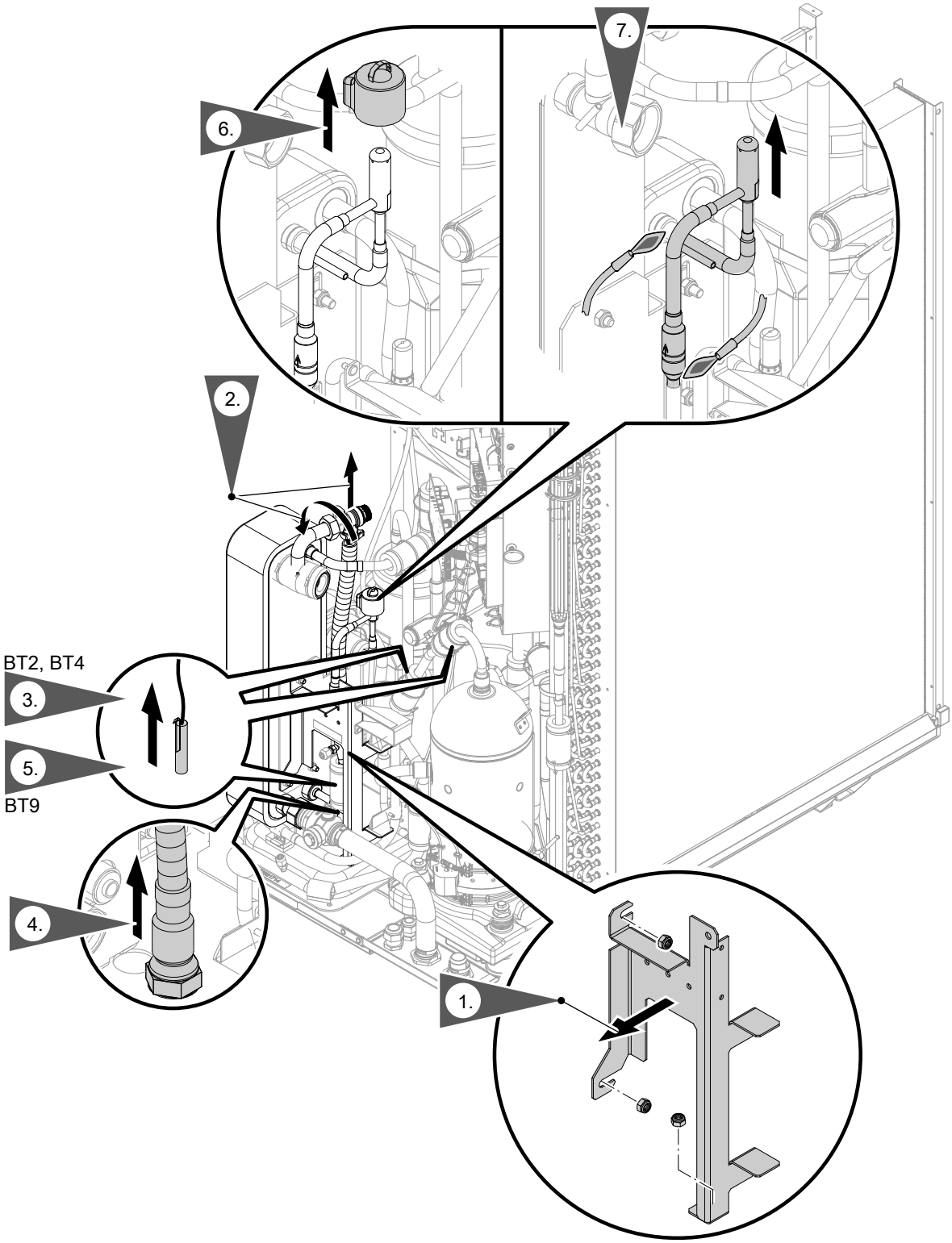


Fig. 153

BT2 Liquid gas temperature sensor, condenser
BT4 Hot gas temperature sensor
BT9 Liquid gas temperature sensor, heating

Components in the refrigerant circuit: Sizes 16… (cont.)

Notes on assembly:

- *Max. permissible temperature of the electronic expansion valve: 70 °C*
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Components in the refrigerant circuit: Sizes 16… (cont.)

Replacing electronic expansion valve 2

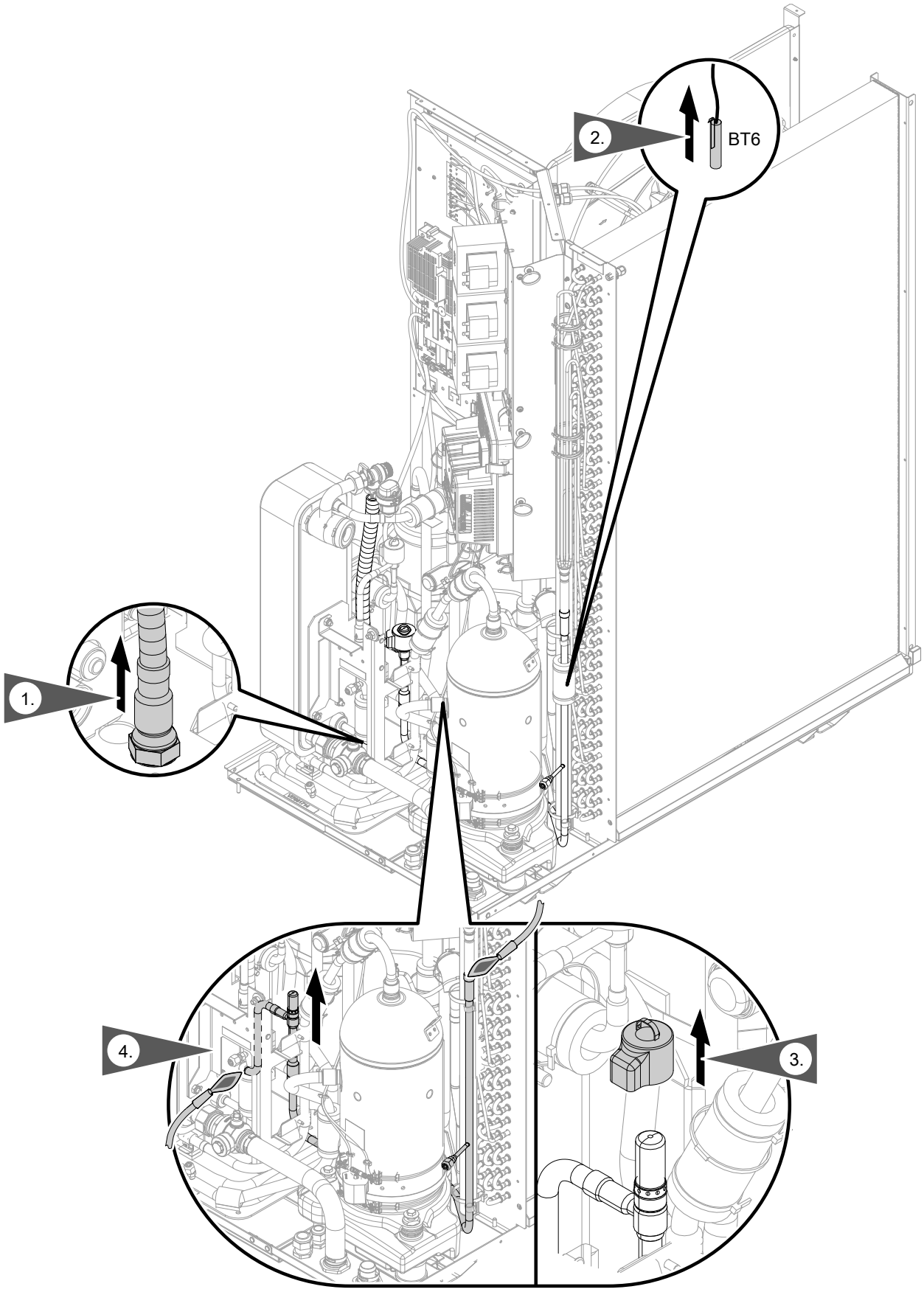


Fig. 154

BT6 Liquid gas temperature sensor, cooling

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Components in the refrigerant circuit: Sizes 16… (cont.)

Note on assembly:
- *Max. permissible temperature of the electronic expansion valve: 70 °C*
- *Torque for the nuts (spanner size 13): 7 ±0.5 Nm*
- *Torque for the screws: 1.8 ±0.25 Nm*

Testing pressure resistance

If national regulations require a pressure resistance test, the limits specified below must be complied with.

Danger
Excessive pressure can cause damage to the system and hazards due to high pressure and escaping refrigerant.
Observe the permissible test pressure.

1. Connect the test device on the low pressure side and high pressure side 1.
   or
   Connect the test device on the low pressure side and high pressure side 2.
2. Carry out a pressure test with nitrogen:

   Test pressure:
   - Up to size 13:
     1.43 x permissible operating pressure
   - From size 16:
     1.1 x permissible operating pressure
     Max. test pressure: 35 barg
     Min. permissible outside temperature: +10 °C

   Permissible operating pressure: See chapter "Specification".

Filling the refrigerant circuit

In comparison to non-flammable refrigerants, the following points must **additionally** be observed when topping up flammable refrigerants:
- Do not use the same fill valve for different refrigerants.
- Position refrigerant bottles vertically.

Before commencing work, observe chapter "Checklist for maintenance work": See page 164.

1. Check whether the safety instructions for work on the refrigerant circuit are being adhered to: See chapter "Safety instructions".
2. Earth the refrigerant circuit.
3. Perform the leak test with forming gas.
4. Ensure the following conditions for filling are met:
   - Refrigerant circuit has been drained and evacuated: See chapter "Extracting refrigerant".
   - Absolute pressure for vacuum according to EN 378 before filling: < 2.7 mbar (< 270 Pa)
   - If any components were replaced, observe all information in the separate installation instructions.
   - If national regulations require a pressure resistance test after repair work (e.g. soldering work, component replacement), carry out the pressure resistance test first: See chapter "Testing pressure resistance".
5. Fill refrigerant circuit with refrigerant R290 (propane) via the Schrader valve of high pressure side 2 (liquid line): See chapter "Overview of internal components".
   Refrigerant charge: See chapter "Specification".

   Danger
   An excessive refrigerant charge leads to a risk of explosion.
   Do not overfill the refrigerant circuit:
   - Weigh the refrigerant bottle before filling.
   - The refrigerant charge is equal to the weight reduction of the refrigerant bottle.

   Danger
   Oxygen in the refrigerant circuit can cause a fire or explosion during operation.
   When filling the refrigerant circuit ensure that neither air nor oxygen gets into the refrigerant circuit.
6. Close the Schrader valve so it is gas-tight. Fit the sealing cap. To achieve this, counterhold the valve body.
   - Torque for sealing cap union nut: 11 Nm
   - Torque for valve body: 0.25 Nm
7. Affix a label to the heat pump in a clearly visible position, with the following content, with date and signature:
   - Type of topped up refrigerant
   - Amount of topped up refrigerant

Filling the refrigerant circuit (cont.)

8. If required by law, enter the measured values, data and components determined in the operating manual.
9. Seal the sealing caps of the low pressure and high pressure Schrader valves: See chapter "Outdoor unit maintenance: Overview of internal components".

Checking the temperature sensors

Temperature sensors are connected to the VCMU refrigerant circuit controller in the outdoor unit.

Temperature sensor NTC 10 kΩ	Connection
▪ Air inlet temperature sensor (BT7) ▪ Inverter temperature sensor (BT10) ▪ Flow temperature sensor, secondary circuit downstream of condenser (BT1) ▪ Suction gas temperature sensor – compressor (BT5) ▪ Evaporator suction gas temperature sensor (BT3) ▪ Hot gas temperature sensor (BT4) ▪ Liquid gas temperature sensor – condenser (BT2) ▪ Liquid gas temperature sensor – heating (BT9) ▪ Liquid gas temperature sensor – cooling (BT6)	Position of the temperature sensor: See chapter "Outdoor unit maintenance: Overview of internal components"

Checking the temperature sensors (cont.)

NTC 10 kΩ (no marking)

ϑ / °C	R / kΩ	ϑ / °C	R / kΩ	ϑ / °C	R / kΩ	ϑ / °C	R / kΩ	ϑ / °C	R / kΩ	ϑ / °C	R / kΩ
–40	325.700	–8	49.530	24	10.450	56	2.874	88	0.975	120	0.391
–39	305.400	–7	46.960	25	10.000	57	2.770	89	0.946	121	0.381
–38	286.500	–6	44.540	26	9.572	58	2.671	90	0.917	122	0.371
–37	268.800	–5	42.250	27	9.164	59	2.576	91	0.889	123	0.362
–36	252.300	–4	40.100	28	8.776	60	2.484	92	0.863	124	0.352
–35	236.900	–3	38.070	29	8.406	61	2.397	93	0.837	125	0.343
–34	222.600	–2	36.150	30	8.054	62	2.313	94	0.812	126	0.335
–33	209.100	–1	34.340	31	7.719	63	2.232	95	0.788	127	0.326
–32	196.600	0	32.630	32	7.399	64	2.155	96	0.765	128	0.318
–31	184.900	1	31.020	33	7.095	65	2.080	97	0.743	129	0.310
–30	173.900	2	29.490	34	6.804	66	2.009	98	0.721	130	0.302
–29	163.700	3	28.050	35	6.527	67	1.940	99	0.700	131	0.295
–28	154.100	4	26.680	36	6.263	68	1.874	100	0.680	132	0.288
–27	145.100	5	25.390	37	6.011	69	1.811	101	0.661	133	0.281
–26	136.700	6	24.170	38	5.770	70	1.750	102	0.642	134	0.274
–25	128.800	7	23.020	39	5.541	71	1.692	103	0.624	135	0.267
–24	121.400	8	21.920	40	5.321	72	1.636	104	0.606	136	0.261
–23	114.500	9	20.890	41	5.112	73	1.581	105	0.589	137	0.254
–22	108.000	10	19.910	42	4.912	74	1.529	106	0.573	138	0.248
–21	102.000	11	18.980	43	4.720	75	1.479	107	0.557	139	0.242
–20	96.260	12	18.100	44	4.538	76	1.431	108	0.541	140	0.237
–19	90.910	13	17.260	45	4.363	77	1.385	109	0.527	141	0.231
–18	85.880	14	16.470	46	4.196	78	1.340	110	0.512	142	0.226
–17	81.160	15	15.720	47	4.036	79	1.297	111	0.498	143	0.220
–16	76.720	16	15.000	48	3.884	80	1.256	112	0.485	144	0.215
–15	72.560	17	14.330	49	3.737	81	1.216	113	0.472	145	0.210
–14	68.640	18	13.690	50	3.597	82	1.178	114	0.459	146	0.206
–13	64.950	19	13.080	51	3.463	83	1.141	115	0.447	147	0.201
–12	61.480	20	12.500	52	3.335	84	1.105	116	0.435	148	0.196
–11	58.220	21	11.940	53	3.212	85	1.071	117	0.423	149	0.192
–10	55.150	22	11.420	54	3.095	86	1.038	118	0.412	150	0.187
–9	52.250	23	10.920	55	2.982	87	1.006	119	0.401		

Checking the pressure sensors

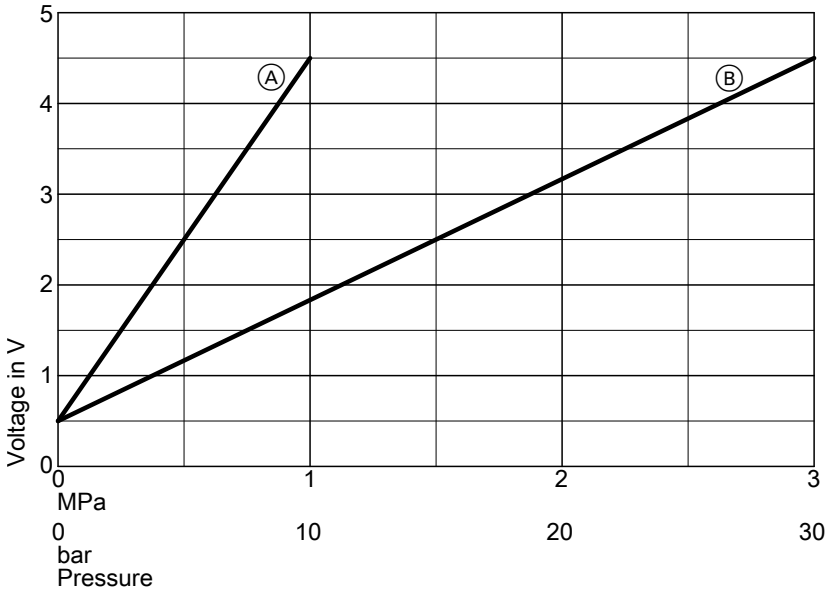


Fig. 155

Ⓐ Low pressure sensor
Ⓑ High pressure sensor

Checking the fuses

The fuses are located next to the VCMU refrigerant circuit controller: See chapter "Overview of electrical components".

Fuse type:
- 6.3 A H (slow), 250 V~
- Max. power loss ≤ 2.5 W

Danger
Removing fuses does **not switch the power circuit to zero volt**. Contact with live components can lead to serious injury from electric current.
Before working on the equipment, always ensure that **the power circuit is also at zero volt.**

1. Switch off the power supply.
2. Remove right-hand side panel of the outdoor unit.
3. Check the fuse. Replace if required.

Danger
Incorrect or improperly fitted fuses can lead to an increased risk of fire.
- Insert fuses without using any force. Position fuses correctly.
- Only use structurally identical types with the same response characteristics.

Commissioning/service reports

Hydraulic parameter report

Settings and test values		Set value	Commissioning	Maintenance/service
Check external heating/cooling circuit pumps				
Circulation pump type				
Circulation pump stage				
Primary circuit commissioning				
Air intake temperature	°C			
Air discharge temperature	°C			
Temperature differential (air intake/discharge) ΔT:				
▪ At secondary circuit flow temperature = 35 °C and air intake temperature ≤ 15 °C	K	4 to 8		
▪ At secondary circuit flow temperature = 35 °C and air intake temperature > 15 °C	K	4 to 13		
Check of mixers, heat pump and cylinder heating Checked under the following conditions:				
Room temperature	°C			
Outside temperature	°C			
Cylinder temperature constant?		Yes (±1 K)		
Secondary circuit flow temperature	°C	Rising	From To	From To
Temperature differential ΔT (Secondary circuit temperature spread)	K	6 to 8		

Specification

Heat pumps with 400 V~ outdoor unit

Types:
- Indoor unit type:
  AWMIT.A1.19-V053
- Outdoor unit type:
  AWMOF-251.A1.**10**-400-V001/V002
  to
  AWMOF-251.A1.**19**-400-V001/V002
  Note
  The highlighted number is the size of the heat pump. The size of the heat pump is determined by the size of the outdoor unit.

Heat pump size		**10**	**13**	**16**	**19**
Heating performance data to EN 14511 (A2/W35)					
Rated heating output	kW	5.8	6.7	7.6	8.6
Fan speed	rpm	425	440	483	520
Power consumption	kW	1.31	1.68	1.76	2.13
Coefficient of performance ε in heating mode (COP)		4.46	3.98	4.30	4.06
Output control	kW	2.2 to 11.0	2.6 to 12.3	6.28 to 12.80	6.28 to 13.20
Heating performance data to EN 14511 (A7/W35, 5 K spread)					
Rated heating output	kW	7.4	8.1	8.5	9.0
Fan speed	rpm	430	440	422	432
Air flow rate	m^3/h	4045	4188	3608	3693
Power consumption	kW	1.34	1.51	1.60	1.71
Coefficient of performance ε in heating mode (COP)		5.50	5.39	5.31	5.27
Output control	kW	2.6 to 12.0	3.0 to 13.4	7.4 to 17.1[*1]	7.4 to 18.5[*1]
Heating performance data to EN 14511 (A–7/W35)					
Rated heating output	kW	10.0	11.1	11.7	12.3
Power consumption	kW	3.07	3.75	4.0	4.24
Coefficient of performance ε in heating mode (COP)		3.16	2.97	2.95	2.87
Heating performance data to EN 14511 (A–7/W55)					
Rated heating output	kW	9.18	10.6	11.8	12.5
Power consumption	kW	4.31	4.60	5.13	5.6
Coefficient of performance ε in heating mode (COP)		2.13	2.30	2.3	2.2

[*1] *Output control not in accordance with EN 14511*

Specification (cont.)

Heat pump size		10	13	16	19
Heating performance data to Commission Regulation (EU) No 813/2013 (average climatic conditions)					
Low temperature application (W35)					
▪ Energy efficiency η_S	%	208	201	190	191
▪ Rated heating output P_{rated}	kW	10.0	12.5	13.3	13.6
▪ Seasonal coefficient of performance (SCOP)		5.22	5.09	4.85	4.86
Medium temperature application (W55)					
▪ Energy efficiency η_S	%	164	162	153	152
▪ Rated heating output P_{rated}	kW	9.6	12.2	12.1	13.2
▪ Seasonal coefficient of performance (SCOP)		4.15	4.12	3.92	3.89
▪ DHW heating energy efficiency η_{wh} with reference to EN 16147:2017+A1:2022	%	115	115	115	116
Energy efficiency class to Commission Regulation (EU) No 813/2013					
Heating, average climatic conditions					
▪ Low temperature application (W35) (D→A^{+++})		A^{+++}	A^{+++}	A^{+++}	A^{+++}
▪ Medium temperature application (W55) (D→A^{+++})		A^{+++}	A^{+++}	A^{+++}	A^{+++}
DHW heating, draw-off profile (XL) (F→A^{+})		A	A	A	A
Cooling performance data to EN 14511 (A35/W7)					
Rated cooling capacity	kW	3.90	5.15	6.58	7.38
Fan speed	rpm	550	550	—	—
Power consumption	kW	1.18	1.21	1.72	1.96
Coefficient of performance in cooling mode (EER)		3.30	4.25	3.83	3.78
Output control	kW	3.9 to 6.4	4.2 to 7.7	6.41 to 11.80	7.19 to 13.30
Cooling performance data, average climatic conditions (A35/W7)					
Rated cooling capacity P_{rated}	kW	6.53	8.00	11.90	13.30
Seasonal cooling energy efficiency ratio (SEER)		4.59	5.68	4.38	4.48
Cooling performance data to EN 14511 (A35/W18)					
Rated cooling capacity	kW	6.50	8.08	9.49	10.54
Fan speed	rpm	550	550	—	—
Power consumption	kW	1.23	1.31	1.77	2.03
Coefficient of performance in cooling mode (EER)		5.30	6.15	5.37	5.20
Output control	kW	6.5 to 13.0	6.8 to 15.1	9.49 to 16.80	10.5 to 18.7
Cooling performance data, average climatic conditions (A35/W18)					
Rated cooling capacity P_{rated}	kW	9.05	11.00	16.80	18.70
Seasonal cooling energy efficiency ratio (SEER)		6.65	6.50	5.73	5.68

Specification (cont.)

Heat pump size		10	13	16	19
Air inlet temperature					
Cooling mode					
▪ Min.	°C	15	15	20	20
▪ Max.	°C	45	45	45	45
Heating mode					
▪ Min.	°C	–20	–20	–20	–20
▪ Max.	°C	40	40	40	40
Heating water (secondary circuit)					
Capacity excl. expansion vessel	l	18	18	18	18
Heat pump circuit minimum flow rate (defrosting)	l/h	1000	1000	1000	1000
Max. flow temperature	°C	70	70	70	70
Outdoor unit electrical values					
Rated voltage, compressor			3/N/PE 400 V~/50 Hz		
Max. operating current, compressor	A	12	12	14	14
Cos φ		0.96	0.96	0.85	0.85
Compressor starting current, inverter controlled	A	< 10	< 10	< 10	< 10
Compressor starting current with stalled armature	A	< 10	< 10	< 10	< 10
Fuse protection		B16A	B16A	B16A	B16A
IP rating		IPX4	IPX4	IPX4	IPX4
Indoor unit electrical values					
PCB					
▪ Rated voltage			1/N/PE 230 V~/50 Hz		
▪ Power supply fuse protection			1 x B16A		
▪ Internal fuse protection			6.3 A H (slow)/250 V~		
Instantaneous heating water heater					
▪ Rated voltage			3/N/PE 400 V~/50 Hz		
▪ Heating output					
Max.	kW	8	8	8	8
Stage 1	kW	2.4	2.4	2.4	2.4
Stage 2	kW	2.4	2.4	2.4	2.4
Stage 3	kW	3.2	3.2	3.2	3.2
▪ Power supply fuse protection		3 x B16A	3 x B16A	3 x B16A	3 x B16A
Max. power consumption					
Outdoor unit					
▪ Fan	W	2 x 140	2 x 140	2 x 170	2 x 170
▪ Total	kW	4.8	5.4	7.2	7.2
Indoor unit					
▪ Integral secondary pump/heating circuit pump, heating/cooling circuit 1 (PWM)	W	63	63	63	63
▪ Energy efficiency index EEI of the circulation pump		≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.20
▪ Control unit/PCB	W	5	5	5	5
▪ Max. connected load, function components 230 V~	W	1000	1000	1000	1000

Specification (cont.)

Heat pump size		10	13	16	19
Mobile data transfer					
WiFi					
▪ Transmission standard		IEEE 802.11 b/g/n			
▪ Frequency band	MHz	2400 to 2483.5			
▪ Max. transmission power	dBm	+15			
Low power radio					
▪ Transmission standard		IEEE 802.15.4			
▪ Frequency band	MHz	2400 to 2483.5			
▪ Max. transmission power	dBm	+6			
Refrigerant circuit					
Refrigerant		R290	R290	R290	R290
▪ Safety group		A3	A3	A3	A3
▪ Charge weight	kg	2	2	2	2
▪ Global warming potential (GWP)[*2]		0.02	0.02	0.02	0.02
▪ CO_2 equivalent	t	0.00004	0.00004	0.00004	0.00004
Compressor (hermetically sealed)	Type	Twin rotary	Twin rotary	Scroll	Scroll
▪ Oil in compressor	Type	HAF68	HAF68	PAG	PAG
▪ Oil volume in compressor	l	1.150 ±0.020	1.150 ±0.020	1.380 ±0.030	1.380 ±0.030
Permissible operating pressure					
▪ High pressure side	bar	30.3	30.3	30.3	30.3
	MPa	3.03	3.03	3.03	3.03
▪ Low pressure side, temperature range –10 °C to +150 °C	bar	30.3	30.3	30.0	30.0
	MPa	3.03	3.03	3.00	3.00
▪ Low pressure side, temperature range –50 °C to –10 °C	bar	30.3	30.3	24.0	24.0
	MPa	3.03	3.03	2.40	2.40
Integral DHW cylinder					
Capacity	l	190	190	190	190
Max. draw-off volume at mixed water temperature 40 °C (V40) with specified set cylinder temperature	l (°C)	254 (55)	254 (55)	254 (48)	254 (48)
Max. DHW temperature	°C	68	68	68	68
Outdoor unit dimensions					
Total length	mm	600	600	680	680
Total width	mm	1144	1144	1144	1144
Total height	mm	1382	1382	1382	1382
Indoor unit dimensions					
Total length	mm	597	597	597	597
Total width	mm	600	600	600	600
Total height	mm	1900	1900	1900	1900
Total weight					
Indoor unit					
▪ Empty	kg	170	170	170	170
▪ Filled (max.)	kg	386	386	386	386
Outdoor unit	kg	221	221	257	257

[*2] *Based on the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR6)*

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Specification (cont.)

Heat pump size		10	13	16	19
Permissible operating pressure, secondary side					
Heating water	bar	3	3	3	3
	MPa	0.3	0.3	0.3	0.3
DHW	bar	10	10	10	10
	MPa	1.0	1.0	1.0	1.0
Connections to indoor unit without connection set/installation aid					
Heating water flow/return, heating circuit or buffer cylinder	mm	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0
Hot water/cold water, DHW circulation	mm	Cu 22 x 1.0	Cu 22 x 1.0	Cu 22 x 1.0	Cu 22 x 1.0
Heating water flow/return, outdoor unit	mm	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0
Length of connection line, indoor — outdoor unit (e.g. Quattro connection line)	m	5 to 20	5 to 20	5 to 20	5 to 20
Sound power at rated heating output Total sound power level measurement with reference to DIN EN 12102-1:2023 and DIN EN ISO 3744:2011 in ErP point C to DIN EN 14825 with operating conditions A7/W55					
Indoor unit					
▪ ErP	dB(A)	40	40	40	40
Outdoor unit					
▪ ErP	dB(A)	49	50	48	48
▪ Max.	dB(A)	58	58	56	57
▪ Low-noise mode, stage 2	dB(A)	53	53	49	50

Heat pumps with 230 V~ outdoor unit

Types:
- Indoor unit type:
  AWMIT.A1.19-V053
- Outdoor unit type:
  AWMOF-251.A1.**04**-230-V001/V002
  to
  AWMOF-251.A1.**13**-230-V001/V002
  Note
  The highlighted number is the size of the heat pump. The size of the heat pump is determined by the size of the outdoor unit.

Size		04	06	08	10	13
Heating performance data to EN 14511 (A2/W35)						
Rated heating output	kW	2.5	3.1	4.0	5.8	6.7
Fan speed	rpm	376	401	447	425	440
Power consumption	kW	0.63	0.78	1.08	1.31	1.68
Coefficient of performance ε in heating mode (COP)		4.00	4.00	3.70	4.46	3.98
Output control	kW	1.8 to 4.5	1.8 to 6.0	1.8 to 6.8	2.2 to 11.0	2.6 to 12.3

Specification (cont.)

Size		04	06	08	10	13
Heating performance data to EN 14511 (A7/W35, 5 K spread)						
Rated heating output	kW	4.0	4.8	5.6	7.3	8.1
Fan speed	rpm	412	443	482	430	440
Air flow rate	m^3/h	1813	1954	2125	4045	4188
Power consumption	kW	0.78	0.94	1.14	1.38	1.56
Coefficient of performance ε in heating mode (COP)		5.1	5.1	4.9	5.31	5.21
Output control	kW	2.1 to 4.0	2.1 to 6.0	2.1 to 8.0	2.6 to 12.0	3.0 to 13.4
Heating performance data to EN 14511 (A–7/W35)						
Rated heating output	kW	3.8	5.6	6.5	10.0	11.1
Power consumption	kW	1.19	1.87	2.41	3.07	3.75
Coefficient of performance ε in heating mode (COP)		3.2	3.0	2.7	3.16	2.97
Heating performance data to EN 14511 (A–7/W55)						
Rated heating output	kW	3.5	5.2	6.2	9.2	10.6
Power consumption	kW	1.58	2.39	2.97	4.31	4.60
Coefficient of performance ε in heating mode (COP)		2.2	2.2	2.1	2.1	2.3
Heating performance data to Commission Regulation (EU) No 813/2013 (average climatic conditions)						
Low temperature application (W35)						
▪ Energy efficiency η_S	%	180	183	176	197	195
▪ Rated heating output P_{rated}	kW	4.1	5.4	6.5	10.0	12.5
▪ Seasonal coefficient of performance (SCOP)		4.6	4.7	4.5	5.01	4.96
Medium temperature application (W55)						
▪ Energy efficiency η_S	%	130	141	143	152	154
▪ Rated heating output P_{rated}	kW	3.8	5.1	6.2	9.6	12.2
▪ Seasonal coefficient of performance (SCOP)		3.3	3.6	3.66	3.87	3.93
▪ DHW heating energy efficiency η_{wh} with reference to EN 16147:2017+A1:2022	%	109	109	109	115	115
Energy efficiency class to Commission Regulation (EU) No 813/2013						
Heating, average climatic conditions						
▪ Low temperature application (W35) (D→A^{+++})		A^{+++}	A^{+++}	A^{+++}	A^{+++}	A^{+++}
▪ Medium temperature application (W55) (D→A^{+++})		A^{++}	A^{++}	A^{++}	A^{+++}	A^{+++}
DHW heating, draw-off profile (XL) (F→A^{+})		A	A	A	A	A

Specification (cont.)

Size		04	06	08	10	13
Cooling performance data to EN 14511 (A35/W7)						
Rated cooling capacity	kW	2.6	3.0	3.4	3.9	5.6
Fan speed	rpm	—	—	—	550	550
Power consumption	kW	0.87	1.00	1.13	1.18	1.65
Coefficient of performance in cooling mode (EER)		3.0	3.0	3.0	3.3	3.4
Output control	kW	1.8 to 4.0	1.8 to 4.8	1.8 to 5.0	3.9 to 6.4	4.2 to 7.7
Cooling performance data, average climatic conditions (A35/W7)						
Rated cooling capacity P_{rated}	kW	2.95	3.6	4.4	6.53	8.0
Seasonal cooling energy efficiency ratio (SEER)		3.8	3.9	4.0	4.59	4.77
Cooling performance data to EN 14511 (A35/W18)						
Rated cooling capacity	kW	4.0	5.0	6.0	6.3	7.9
Fan speed	rpm	—	—	—	550	550
Power consumption	kW	0.85	1.14	1.46	1.19	1.65
Coefficient of performance in cooling mode (EER)		4.7	4.4	4.1	5.3	4.8
Output control	kW	3.2 to 4.0	3.2 to 5.5	3.2 to 6.7	6.3 to 12.9	6.6 to 14.1
Cooling performance data, average climatic conditions (A35/W18)						
Rated cooling capacity P_{rated}	kW	4.6	5.6	6.9	9.05	11.0
Seasonal cooling energy efficiency ratio (SEER)		4.5	4.7	4.9	6.65	6.78
Air inlet temperature						
Cooling mode						
▪ Min.	°C	15	15	15	15	15
▪ Max.	°C	45	45	45	45	45
Heating mode						
▪ Min.	°C	–20	–20	–20	–20	–20
▪ Max.	°C	40	40	40	40	40
Heating water (secondary circuit)						
Capacity excl. expansion vessel	l	18	18	18	18	18
Heat pump circuit minimum flow rate (defrosting)	l/h	1000	1000	1000	1000	1000
Max. flow temperature	°C	70	70	70	70	70
Outdoor unit electrical values						
Rated voltage, compressor		1/N/PE 230 V~/50 Hz				
Max. operating current, compressor	A	15	15.5	16	20	25
Cos φ		0.99	0.99	0.99	0.99	0.99
Compressor starting current, inverter controlled	A	< 10	< 10	< 10	< 10	< 10
Compressor starting current with stalled armature	A	< 10	< 10	< 10	< 10	< 10
Fuse protection	A	B16A	B16A	B16A	B25A	B25A
IP rating		IPX4	IPX4	IPX4	IPX4	IPX4

Specification (cont.)

Size		04	06	08	10	13
Indoor unit electrical values						
PCB						
▪ Rated voltage		1/N/PE 230 V~/50 Hz				
▪ Power supply fuse protection		1 x B16A				
▪ Internal fuse protection		6.3 A H (slow)/250 V~				
Instantaneous heating water heater						
▪ Heating output						
Max.	kW	8				
Stage 1	kW	2.4				
Stage 2	kW	2.4				
Stage 3	kW	3.2				
▪ Rated voltage		230 V~/50 Hz or 400 V~/50 Hz				
▪ Fuse rating, power supply 230 V~		3 x B16A, 1-pole				
▪ Fuse rating, power supply 400 V~		1 x B16A, 3-pole				
Electrical values for indoor unit with central mains connection						
PCB						
▪ Rated voltage		1/N/PE 230 V~/50 Hz				
▪ Internal fuse protection		6.3 A H (slow)/250 V~				
Instantaneous heating water heater						
▪ Heating output	kW	5				
Power supply						
▪ Rated voltage		1/N/PE 230 V~/50 Hz				
▪ Fuse protection		1 x B32A, 1-pole				
Max. power consumption						
Outdoor unit						
▪ Fan	W	140	140	140	2 x 140	2 x 140
▪ Total	kW	2.3	3.6	3.7	4.55	5.4
Indoor unit						
▪ Integral secondary pump/heating circuit pump, heating/cooling circuit 1 (PWM)	W	63	63	63	63	63
▪ Energy efficiency index EEI of the circulation pump		≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
▪ Control unit/PCB	W	5	5	5	5	5
▪ Max. connected load, function components 230 V~	W	1000	1000	1000	1000	1000
Mobile data transfer						
WiFi						
▪ Transmission standard		IEEE 802.11 b/g/n				
▪ Frequency band	MHz	2400 to 2483.5				
▪ Max. transmission power	dBm	+15				
Low power radio						
▪ Transmission standard		IEEE 802.15.4				
▪ Frequency band	MHz	2400 to 2483.5				
▪ Max. transmission power	dBm	+6				

Specification (cont.)

Size		04	06	08	10	13
Refrigerant circuit						
Refrigerant		R290	R290	R290	R290	R290
▪ Safety group		A3	A3	A3	A3	A3
▪ Charge weight	kg	1.2	1.2	1.2	2	2
▪ Global warming potential (GWP)[*3]		0.02	0.02	0.02	0.02	0.02
▪ CO_2 equivalent	t	0.000024	0.000024	0.000024	0.00004	0.00004
Compressor (hermetically sealed)	Type			Twin rotary		
▪ Oil in compressor	Type	HAF68	HAF68	HAF68	HAF68	HAF68
▪ Oil volume in compressor	l	0.840 ±0.020	0.840 ±0.020	0.840 ±0.020	1.150 ±0.020	1.150 ±0.020
Permissible operating pressure						
▪ High pressure side	bar	30.3	30.3	30.3	30.3	30.3
	MPa	3.03	3.03	3.03	3.03	3.03
▪ Low pressure side	bar	30.3	30.3	30.3	30.3	30.3
	MPa	3.03	3.03	3.03	3.03	3.03
Integral DHW cylinder						
Capacity	l	190	190	190	190	190
Max. draw-off volume at mixed water temperature 40 °C (V40) with specified set cylinder temperature	l (°C)	256 (51)	256 (51)	256 (51)	254 (55)	254 (55)
Max. DHW temperature	°C	68	68	68	68	68
Outdoor unit dimensions						
Total length	mm	600	600	600	600	600
Total width	mm	1144	1144	1144	1144	1144
Total height	mm	841	841	841	1382	1382
Indoor unit dimensions						
Total length	mm	597	597	597	597	597
Total width	mm	600	600	600	600	600
Total height	mm	1900	1900	1900	1900	1900
Total weight						
Indoor unit						
▪ Empty	kg	170	170	170	170	170
▪ Filled (max.)	kg	386	386	386	386	386
Outdoor unit	kg	162	162	162	215	215
Permissible operating pressure, secondary side						
Heating water	bar	3	3	3	3	3
	MPa	0.3	0.3	0.3	0.3	0.3
DHW	bar	10	10	10	10	10
	MPa	1.0	1.0	1.0	1.0	1.0
Connections to indoor unit without connection set/installation aid						
Heating water flow/return, heating circuits or heating water buffer cylinder	mm	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0
Hot water/cold water	mm	Cu 22 x 1.0	Cu 22 x 1.0	Cu 22 x 1.0	Cu 22 x 1.0	Cu 22 x 1.0
Heating water flow/return, outdoor unit	mm	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0

[*3] *Based on the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR6)*

Specification (cont.)

Size		04	06	08	10	13
Length of connection line, indoor — outdoor unit (e.g. Quattro connection line)	m	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20
Sound power at rated heating output Total sound power level measurement with reference to DIN EN 12102-1:2023 and DIN EN ISO 3744:2011 in ErP point C to DIN EN 14825 with operating conditions A7/W55						
Indoor unit						
▪ ErP	dB(A)	40	40	40	40	40
Outdoor unit						
▪ ErP	dB(A)	46	47	48	49	50
▪ Max.	dB(A)	54	55	57	58	58
▪ Low-noise mode, stage 2	dB(A)	47	47	49	53	53

Commissioning order

- Email this request form, together with the system scheme, to your local sales office.
  Or
- Complete the order online at partnerportal.viessmann-climatesolutions.com.

A competent employee must be present when the system is commissioned.

System details:

Requester _____

_____

System location _____

_____

_____

Checklist:

- ☐ Hydraulic scheme for heating system included
- ☐ Heating circuits fully installed and filled
- ☐ Electrical installation completed
- ☐ Hydraulic lines fully thermally insulated
- ☐ Installation completed in full up to refrigerant circuit
- ☐ All windows and external doors airtight
- ☐ Components for cooling mode fully installed (optional)
- ☐ Components for ventilation fully installed (optional)
- ☐ Components for photovoltaic system fully installed (optional)

Preferred appointment:

1. Date _____
   Time _____
2. Date _____
   Time _____

The work requested from the manufacturer will be billed to me/us in accordance with the latest pricelist.

Place/date _____

Signature _____

Sound transmission checklist

Sound transmission from the outdoor unit to e.g. the living space can occur even if the sound limit values are observed.

Basic information on noise generation through sound transmission:

- Engineering standards:
  For example TA Lärm [Germany]
- Information on sound propagation, sound pressure, sound power, sound values:


Technical guide for the heat pump

Sound transmission checklist (cont.)

- Information on installing the heat pump: Chapter "Installing the outdoor unit, installation instructions"
- Information on installing the heat pump: Chapter "Installing the outdoor unit, installation location" and "Installing the outdoor unit, minimum clearances"

The perception of sound is subjective. For example, an increase of 10 dB is often perceived to be twice as loud and a decrease of 10 dB half as loud.
Although sound can be measured, smartphones are not suitable for recording noise caused by sound transmission.

In the event of noise problems due to sound transmission, check whether the following requirements are met:

1. Installation location of the outdoor unit, e.g. exposed to wind, other appliances or machines in the immediate vicinity
2. Installation, e.g. minimum clearances
3. Transport brackets removed
4. Floor or wall mounting, e.g. vibration compensation for refrigerant lines, no structure-borne sound bridges through walls, etc.
5. Line routing with sound insulation and vibration isolation, e.g. secure the lines using pipe clips with a soft elastic insulating lining (EPDM); no structure-borne sound bridges through walls, etc.
6. Line lengths and cross-sections
7. Installation location of the indoor unit, e.g. ambient conditions, position in the room, other appliances or machines in the immediate vicinity
8. Professional sound insulation to floors and walls (concrete, brick wall, timber studs, etc.)
9. Oil lift bends if there is a height differential of > 2 m between the indoor and outdoor unit
10. Routing the refrigerant lines below or above ground level

In the event of problems with noise caused by sound transmission, the following information is helpful for a consultation with the manufacturer's technical support:

Description of the noise

Type of sound

☐ Structure-borne noise
☐ Airborne noise

Type of noise

☐ Buzzing
☐ Humming
☐ Rattling
☐ Whistling
☐ Hissing
☐ Beeping
☐ Other

_____

_____

Duration of the noise

☐ Brief
☐ Constant
☐ Other

_____

_____

Description of noise perception

Where is the noise perceived?

Room:

_____

Other

_____

Who perceives the noise?

_____

When is the noise perceived?

Date/time

_____

Individual conditions at the specified time

_____

_____

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Sound transmission checklist (cont.)

Operating status of the heat pump at the time of noise perception

Date/time

Operating program

- ☐ Heating mode
- ☐ Cooling mode
- ☐ DHW heating
- ☐ Defrost mode

Temperatures

Flow temperatures:

Return temperature:

Other temperatures:

Speeds

Compressor speed:

Fan speed:

Further details

Sound measurements

☐ **Sound measurement carried out**

Date/time:

Sound pressure value at a distance of 1 m from the outdoor unit:

Sound pressure value at a distance of 3 m from the outdoor unit:

Sound pressure value at a distance of 10 m from the outdoor unit:

☐ **Reference measurement carried out with the heat pump switched off**

Date/time:

Sound pressure value at a distance of 1 m from the outdoor unit:

Sound pressure value at a distance of 3 m from the outdoor unit:

Sound pressure value at a distance of 10 m from the outdoor unit:

Sound transmission checklist (cont.)

For further analysis, it is helpful if we are able to visualise the building situation:

- ☐ Floor plan with dimensions
- ☐ Designation of the rooms
- ☐ System components
- ☐ Line routing
- ☐ Type of floors, walls and ceilings
- ☐ Photos of the building and the installation situation
- ☐ Labels showing where greater noise perception occurs

Final decommissioning and disposal

Viessmann products can be recycled. Components and substances from the system are not part of ordinary domestic waste.
Isolate the system from the power supply for decommissioning. Allow any hot components to cool down.
All components must be disposed of correctly.

⚠ **Danger**
Escaping refrigerant can lead to explosions that result in very serious injuries.
Do not introduce any power sources or ignition sources into the safety zone.
- Complete units and compressors are only to be disposed of via qualified disposal specialists.
- In the case of damage to the refrigerant circuit or suspected leakage from the refrigerant circuit, evacuate the refrigerant circuit. Fill with nitrogen or comparable gases.

Observe the following regulations:
- Fluorinated greenhouse gas regulation (EU) 2024/573
- Currently applicable regulations and requirements

Note
***Before** commencing decommissioning, note the "Checklist for maintenance work" on page 164.*

Decommissioning:
- Positioning requirements apply only so long as the outdoor unit is filled with refrigerant: See page 22.
- Decommissioning may only be carried out by a qualified contractor who is familiar with the equipment used for refrigerant disposal.
- For decommissioning and disposal also, work on the refrigerant circuit may only be carried out by qualified and certified personnel: See "Safety information".
- Check that it is possible to transport the outdoor unit safely. If necessary, extract the refrigerant: See chapter "Extracting the refrigerant" on page 191.

Frost protection:
- To avoid frost damage, completely remove heating water from the connection pipes and the condenser (not required with frost-free storage).

Intermediate storage:
- Intermediate storage only above ground level with natural ventilation aperture to the outside
- Ensure adequate air circulation during intermediate storage.
- If the outdoor unit dismantled for disposal is not stored in accordance with the siting requirements, the following steps must be carried out:
- Check that it is possible to transport the outdoor unit safely. If necessary, extract the refrigerant: See chapter "Extracting the refrigerant" on page 191.

Transport:
- Observe transport information: See page 22.
  Observe all applicable regulations and requirements.
  Note
  According to the European regulation on the carriage of dangerous goods by road (ADR), special regulation 291 for transporting complete units with less than 12 kg of flammable refrigerant, no special transport requirements need be followed.
- Transport only in an upright position
- Use suitable transport brackets.
- Ensure adequate air circulation during transport.
- Keep ignition sources away, e.g. flying sparks, smoking, etc.

Ordering individual parts for accessories

Please affix accessory labels with part numbers here.
Please specify the relevant part no. when ordering individual parts.

Declaration of conformity

We, Viessmann Climate Solutions GmbH & Co. KG, Viessmannstrasse 1, 35108 Allendorf (Eder), Germany, declare as sole responsible body that the named product complies with the European directives and supplementary national requirements in terms of its design and operational characteristics.
Viessmann Climate Solutions GmbH & Co. KG, Viessmannstrasse 1, 35108 Allendorf (Eder), Germany, hereby declares that the radio equipment type of the named product is in compliance with Directive 2014/53/EU.

Using the serial number, the full Declaration of Conformity can be found on the following website:
www.viessmann.co.uk/eu-conformity

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