Installation and service instructions

for contractors

Vitocal 250-A
Type AWO(-M)-E-AC/AWO(-M)-E-AC-AF 251.A
Air source heat pump, monoblock version for heating and cooling operation, with 1 integrated heating/cooling circuit
Type AWO(-M)-E-AC/AWO(-M)-E-AC-AF 251.A 2C
Air source heat pump, monoblock version for heating and cooling operation, with 2 integrated heating/cooling circuits

VITOCAL 250-A

6202074 GB 2/2023

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 heating contractors. These heating 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.
- 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. Soldering/brazing 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.
- Before initial commissioning, all safety-relevant points must be checked by the particular certified heating contractors. The system must be commissioned by the system installer or a qualified person authorised by the installer.

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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, 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 groups A2L and 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.
- Do not use flammable materials, e.g. sprays or other flammable gases.
- Discharge static: Before beginning work, touch earthed objects, such as heating or water pipes.

Safety instructions (cont.)

- 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.
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.
- Replace faulty components only with genuine Viessmann spare parts.
- Do not undertake any repairs on the inverter. Replace the inverter if there is a defect.

Auxiliary components, spare and wearing parts

Please note
Spare 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 replacements, use only original spare parts supplied or approved by Viessmann.

Safety instructions (cont.)

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.
- 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.
- 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.
- Only recommission the system after it has been repaired.

⚠ **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 fan ring heating (accessories) that is suitable for refrigerant R290 and/or an electric ribbon heater in the condensate pan (accessories or factory-fitted).

Safety instructions (cont.)

Safety instructions for storage of the outdoor unit

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

⚠ **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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Index (cont.)

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 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)

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

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

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Intended use (cont.)

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 is a monoblock air source heat pump, comprising 1 indoor unit 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. Depending on the appliance version, 1 or 2 high efficiency circulation pumps are installed for supplying 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.

System without external buffer cylinder

Type AWO(-M)-E-AC 251.A/AWO(-M)-E-AC-AF 251.A

The heat pump heats or cools 1 heating/cooling circuit without mixer.

The flow temperature is controlled by modulating the heat pump.

Type AWO(-M)-E-AC 251.A 2C/ AWO(-M)-E-AC-AF 251.A 2C

The heat pump heats or cools 1 or 2 heating/cooling circuits without mixer.

- Heating/cooling circuit 1:
  The flow temperature is controlled by modulating the heat pump.
- Heating/cooling circuit 2:
  The flow temperature is controlled by the mixing function of the 4/3-way valve and the speed of the built in heating circuit pump dependent upon the flow temperature in heating/cooling circuit 1.
  Therefore, in room heating mode, the maximum flow temperature of heating/cooling circuit 2 cannot be higher than the current flow temperature of heating/cooling circuit 1.
  In room cooling mode, the flow temperature in heating/cooling circuit 2 cannot lie below that of heating/cooling circuit 1.
  Note
  Only connect heating/cooling circuit 2 if heating/cooling circuit 1 is also connected.

Product information (cont.)

System with external buffer cylinder

- **Type AWO(-M)-E-AC 251.A/ AWO(-M)-E-AC-AF 251.A**
  The heat pump heats or cools up to 4 heating/cooling circuits:
  1 heating/cooling circuit without mixer and up to 3 heating/cooling circuits with mixer
  A cooling water buffer cylinder or heating/cooling water buffer cylinder is required to use the cooling function.
- **Type AWO(-M)-E-AC 251.A 2C/ AWO(-M)-E-AC-AF 251.A 2C**
  An external buffer cylinder cannot be connected.

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.

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.

Type plate

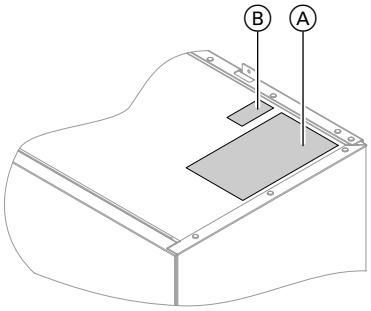

Fig. 1

Ⓐ Type plate
Ⓑ QR code for appliance registration

The **QR code with designation "i"** contains the access data for the registration and product information portal.
Using this QR code, the 16-digit serial number, for example, can be read out.

Product information (cont.)

Type overview

Type	integral	with buffer cylinder	Rated voltage			Central indoor unit power supply	Condensate pan heating
AWO-E-AC 251.A	1	1 to 4	230 V~	400 V~	400 V~	—	□
AWO-M-E-AC 251.A	1	1 to 4	230 V~	400 V~	230 V~	—	□
AWO-M-E-AC 251.A SP	1	1 to 4	230 V~	230 V~	230 V~	X	□
AWO-E-AC-AF 251.A	1	1 to 4	230 V~	400 V~	400 V~	—	■
AWO-M-E-AC-AF 251.A	1	1 to 4	230 V~	400 V~	230 V~	—	■
AWO-M-E-AC-AF 251.A SP	1	1 to 4	230 V~	230 V~	230 V~	X	■
AWO-E-AC 251.A 2C	2	—	230 V~	400 V~	400 V~	—	□
AWO-M-E-AC 251.A 2C	2	—	230 V~	400 V~	230 V~	—	□
AWO-M-E-AC 251.A 2C SP	2	—	230 V~	230 V~	230 V~	X	□
AWO-E-AC-AF 251.A 2C	2	—	230 V~	400 V~	400 V~	—	■
AWO-M-E-AC-AF 251.A 2C	2	—	230 V~	400 V~	230 V~	—	■
AWO-M-E-AC-AF 251.A 2C SP	2	—	230 V~	230 V~	230 V~	X	■

Heating/cooling circuits
Control unit/PCB, indoor unit
Outdoor unit
Instantaneous heating water heater

X Available
□ Accessories
■ Integral

System examples

Available system examples: See **www.viessmann-schemes.com**.

Maintenance parts and spare parts

Maintenance parts and spare parts can be identified and ordered directly online.

Viessmann Partnershop

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https://shop.viessmann.com/

Viessmann spare part app

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Requirements for on-site connections

Indoor unit with 1 integrated heating/cooling circuit

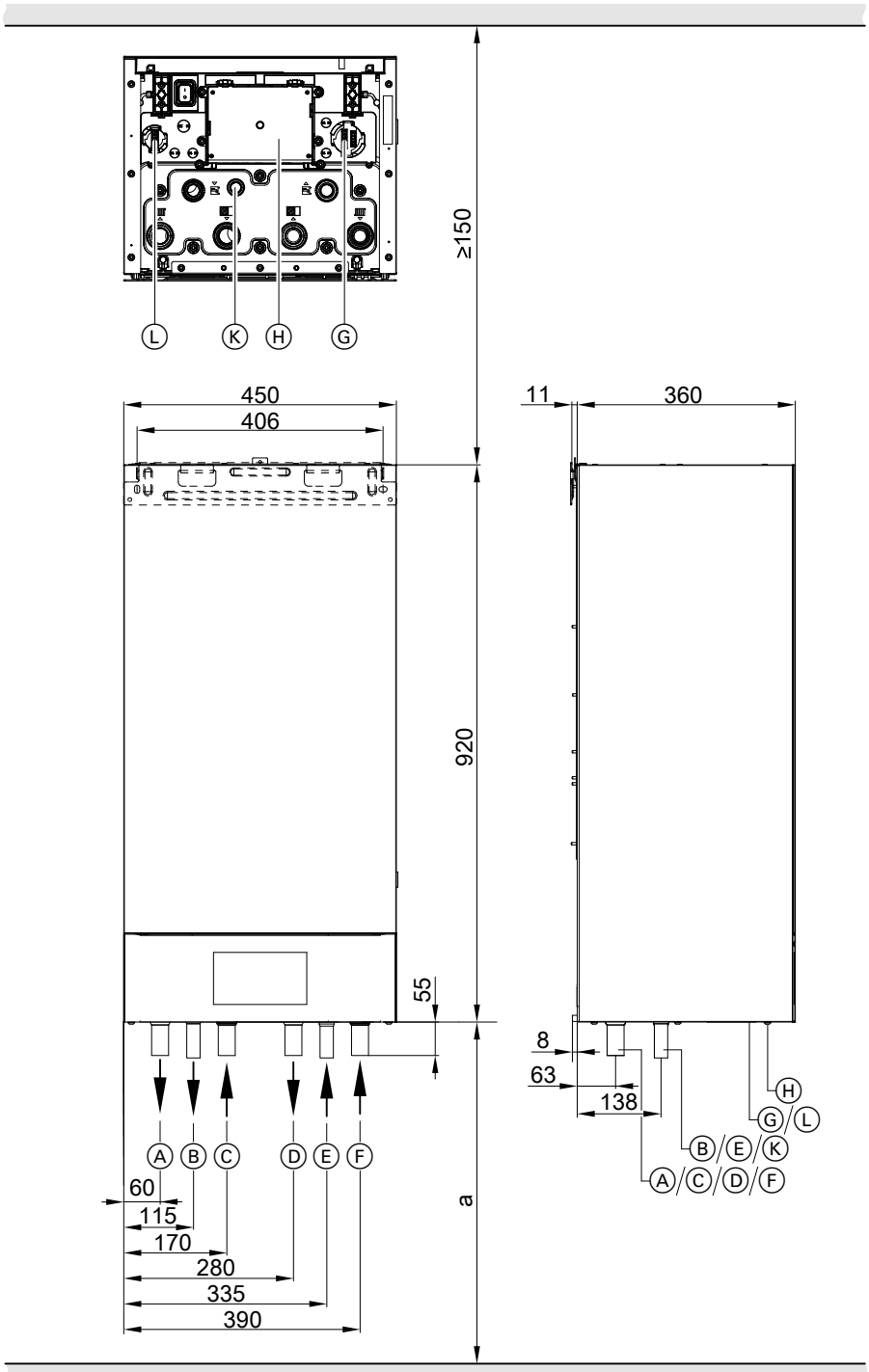

Fig. 2

a Min. installation height:
Depending on the installation position of programming unit

Ⓐ Secondary circuit flow (heating/cooling circuit 1/ external buffer cylinder), connection Cu 28 x 1.0 mm

Ⓑ DHW cylinder flow (on the heating water side), connection Cu 22 x 1.0 mm

Ⓒ Heating water **from** outdoor unit, connection Cu 28 x 1.0 mm

Ⓓ Heating water **to** outdoor unit, connection Cu 28 x 1.0 mm

Ⓔ DHW cylinder return (on the heating water side), connection Cu 22 x 1.0 mm

Ⓕ Secondary circuit return (heating/cooling circuit 1/ external buffer cylinder), connection Cu 28 x 1.0 mm

Ⓖ Extra low voltage (ELV) connection sockets < 42 V

Ⓗ Junction box 230 V~

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Requirements for on-site connections (cont.)

Ⓚ Drain hose safety valve
Ⓛ Extra low voltage (ELV) connection socket < 42 V

Note
Min. installation height: See chapters "Installing the indoor unit", "Minimum installation heights" on page 40.

Requirements for on-site connections (cont.)

Indoor unit with 2 integrated heating/cooling circuits

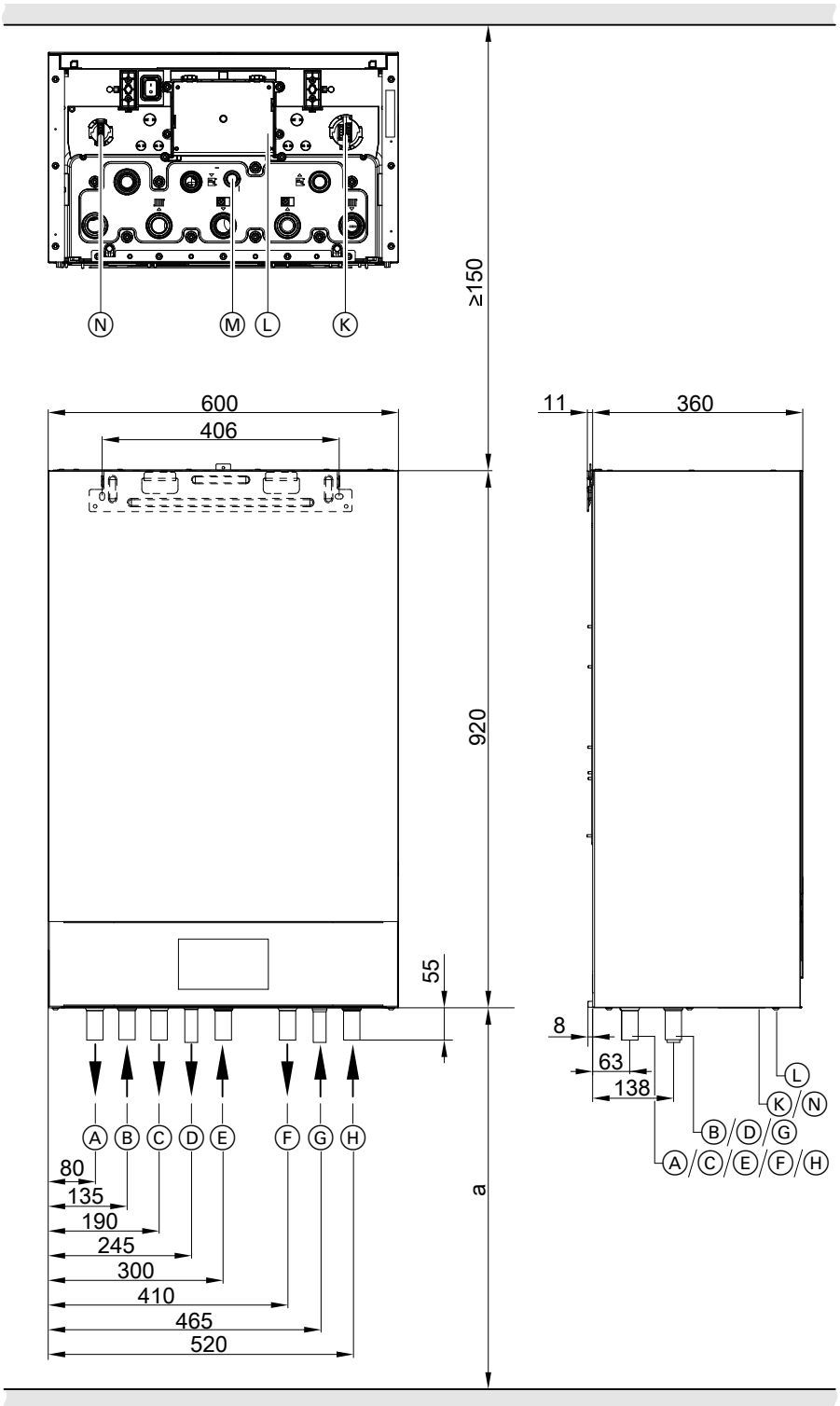

Fig. 3

a Min. installation height:
Depending on the installation position of programming unit

Ⓐ Heating/cooling circuit 2 flow, connection Cu 28 x 1.0 mm

Ⓑ Heating/cooling circuit 2 return, connection Cu 28 x 1.0 mm

Ⓒ Heating/cooling circuit 1 flow, connection Cu 28 x 1.0 mm

Ⓓ DHW cylinder flow (on the heating water side), connection Cu 22 x 1.0 mm

Ⓔ Heating water **from** outdoor unit, connection Cu 28 x 1.0 mm

Ⓕ Heating water **to** outdoor unit, connection Cu 28 x 1.0 mm

Ⓖ DHW cylinder return (on the heating water side), connection Cu 22 x 1.0 mm

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Requirements for on-site connections (cont.)

Ⓗ Heating/cooling circuit 1 return, connection Cu 28 x 1.0 mm
Ⓚ Extra low voltage (ELV) connection sockets < 42 V
Ⓛ Junction box 230 V~
Ⓜ Drain hose safety valve
Ⓝ Extra low voltage (ELV) connection socket < 42 V

Note
Min. installation height: See chapters "Installing the indoor unit", "Minimum installation heights" on page 40.

Outdoor unit with 1 fan

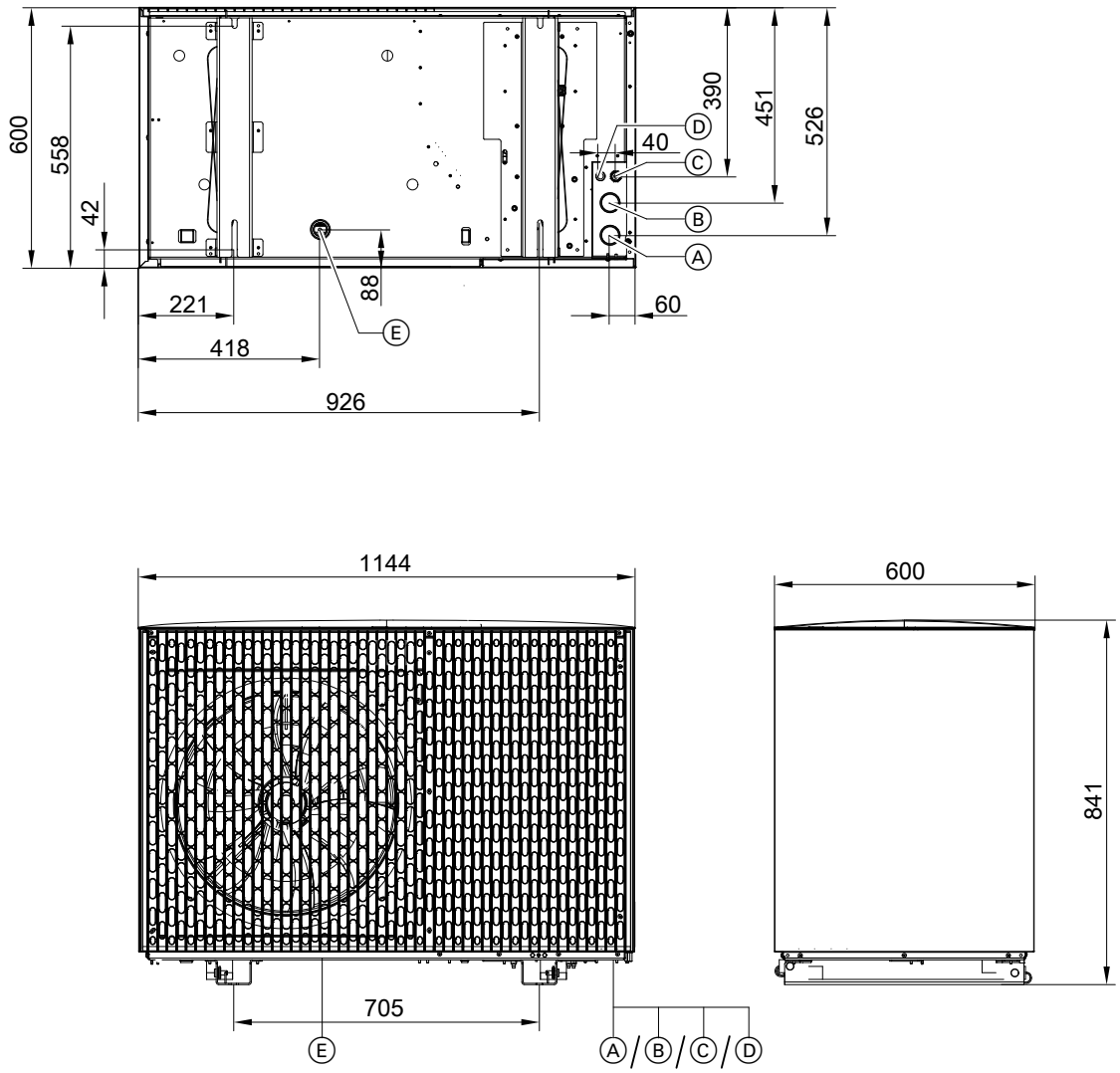

Fig. 4

Ⓐ 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

Requirements for on-site connections (cont.)

Outdoor unit with 2 fans

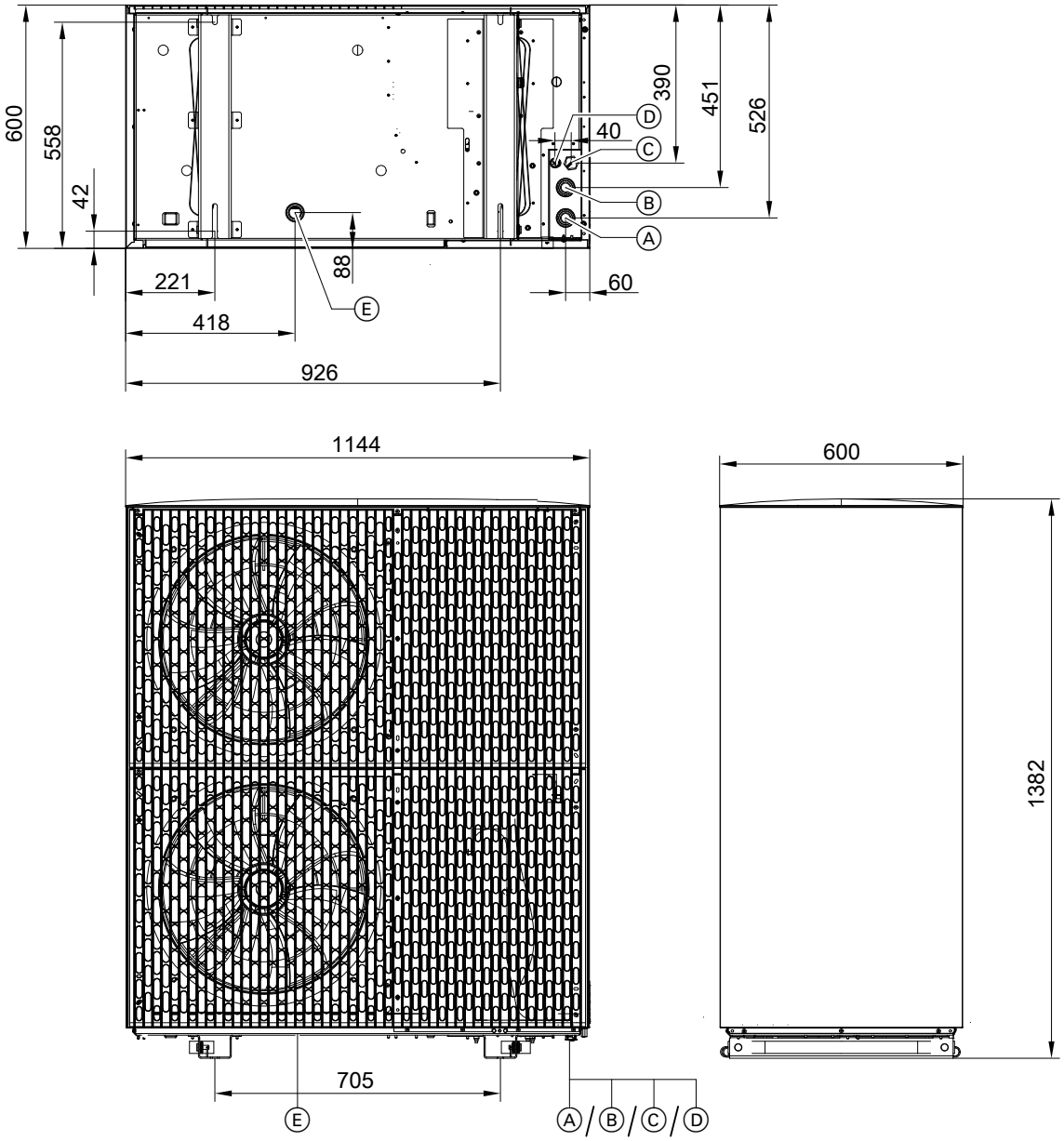

Fig. 5

Ⓐ 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

Installing the outdoor unit

Transport

Danger
The outdoor unit is filled with refrigerant R290 (propane): Mechanical loading can lead to leaks in the refrigerant circuit. Where leaks of refrigerant occur, there is the risk of explosion or asphyxiation.
- Prevent vibration during transport.
- Position the outdoor unit 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.
- Only handle/transport the outdoor unit using transport aids or a crane.

Please note
Scratches on the surface coating will lead to corrosion.
- 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.

Handling using transport aids

Danger
If the transport aids are damaged, the outdoor unit may fall. This can lead to refrigerant circuit damage. Should damage to the refrigerant circuit occur, there is the risk of explosion or asphyxiation.
- Check transport aids for damage **before** handling.
- Note the weight of the outdoor unit: See chapter "Weight of outdoor units".

Use the transport aids to lift and transport the outdoor unit. Wear personal protective equipment, e.g. protective gloves and safety shoes.
The transport aids are each found in the mounting rail under the outdoor unit. Due to the uneven weight distribution, there are 4 transport aids attached to the right-hand mounting rail for outdoor units with 2 fans: See Fig. 6.
The outdoor unit with 1 fan has only 1 transport aid on the right-hand mounting rail.

Installing the outdoor unit (cont.)

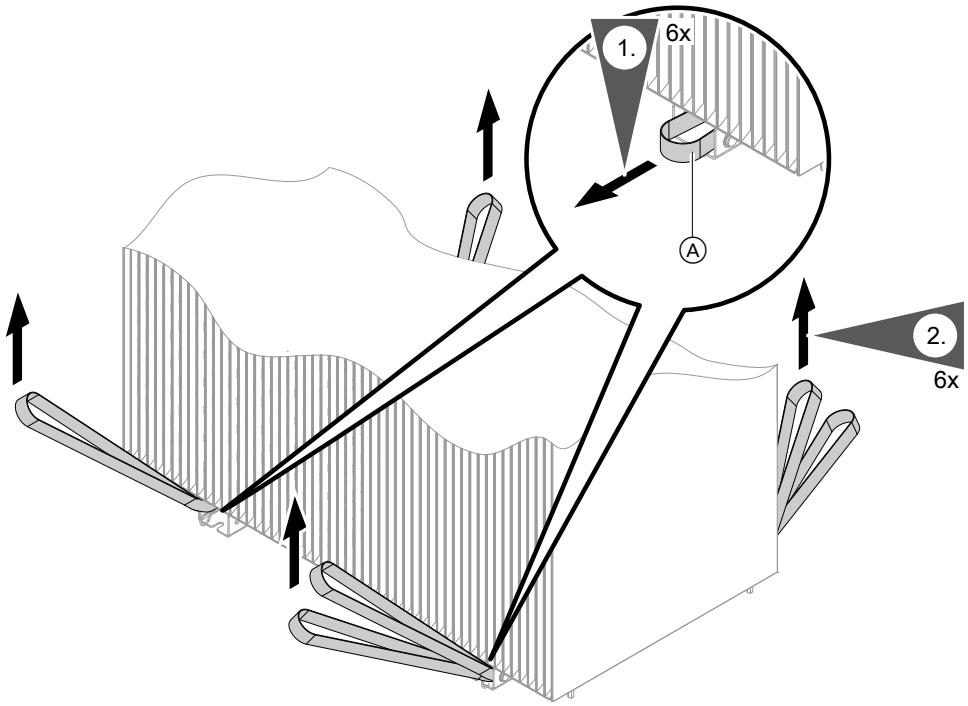

Fig. 6

Ⓐ Transport aid

Installing the outdoor unit (cont.)

Removing the transport aids

After handling, remove all transport aids.

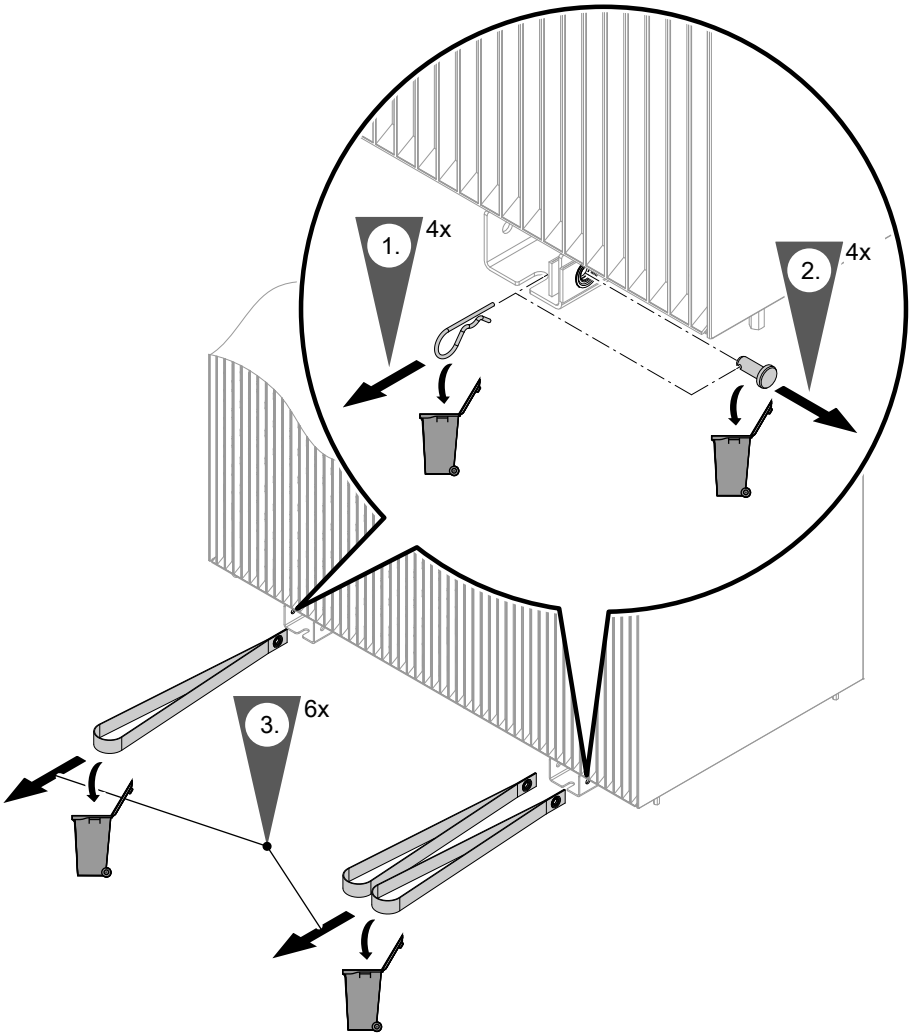

Fig. 7

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.
- **Before** transport, check on-site aids, e.g. slings and boards, for damage.
- Note the weight of the outdoor unit: See chapter "Weight of outdoor units".
- 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. Store edge protectors.
2. Protect the evaporator on the rear side of the outdoor unit against damage:
   - Position a board on site in the lower area.
   - Protect the entire evaporator, e.g. with cardboard or bubble wrap.
3. Position the edge protection profiles of the packaging at the front and rear upper edges of the outdoor unit. Place slings properly around the outdoor unit: See Fig. 8.
4. After transportation, set the outdoor unit down carefully. Remove the remaining packaging from the outdoor unit.

Installing the outdoor unit (cont.)

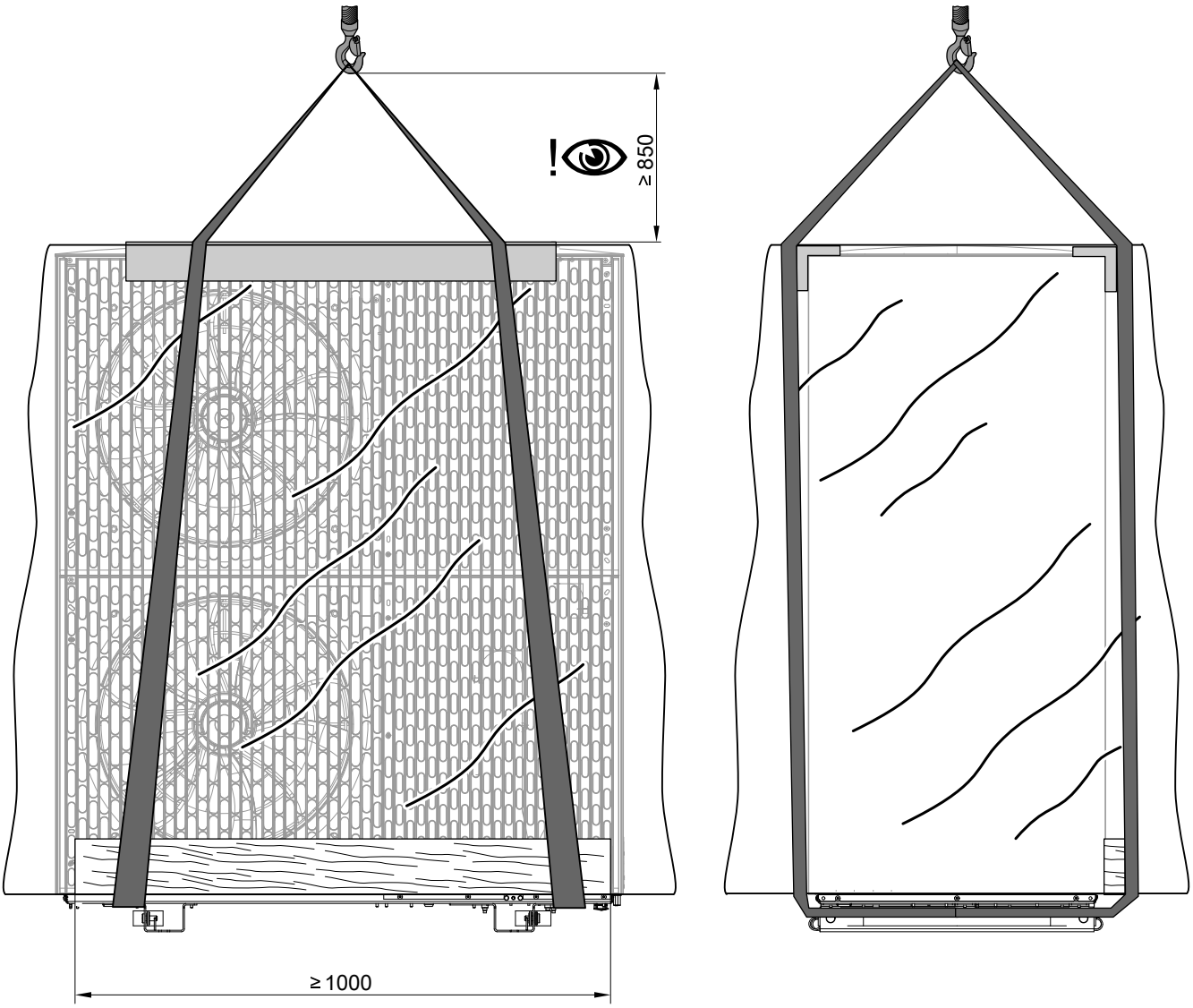

Fig. 8 Transport by crane using the example of the outdoor unit with 2 fans

Installation information

The difference in height between the hydraulic connections of the outdoor unit and the indoor unit must not exceed 6 m.

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) onto 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 supports cannot be used, site the outdoor unit on a concrete foundation ≥ 150 mm high using 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 into account the weight of the outdoor unit: See chapter "Weight of outdoor units".

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Installing the outdoor unit (cont.)

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.

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.

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.
  All wall outlets must be made **gas-tight**. This also includes wall outlets that **lie below ground level in the safety zone**.
- 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.

Installing the outdoor unit (cont.)

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 required, provide a wind break on site. Observe the minimum clearances to the heat pump: See the following chapter.

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

- 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 types ...-AF an electric ribbon heater is factory-fitted.

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 29 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 29.

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 required, 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/m²); 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

Installing the outdoor unit (cont.)

Weight of outdoor units

Outdoor unit	Weight in kg
Outdoor unit with **1 fan**	162
Outdoor unit with **2 fans**	
▪ Outdoor unit 230 V~	215
▪ Outdoor unit 400 V~	221

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".
- 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.
- Select the installation location giving due consideration to the physical laws concerning the propagation and reflection of sound.
  Technical guide
- Do not install above cellar shafts or floor troughs.
- Do not install near windows or bedrooms.
- 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 "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 statics, distances from building edges and sound concepts.

Safety zone

The refrigerant circuit in the outdoor unit contains easily flammable refrigerant in safety group A3 according to 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:
- Building openings, e.g. windows, doors, light wells, flat roof windows
- Outdoor air and exhaust air apertures from ventilation and air conditioning systems
- Property boundaries, neighbouring properties, footpaths and driveways
- Pump shafts, inlets to waste water systems, downpipes and waste water shafts, etc.
- Other slopes, troughs, depressions, shafts
- Electrical house supply connections
- Electrical systems, sockets, lamps, light switches
- Snowfall from roofs

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

Installing the outdoor unit (cont.)

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 the outdoor unit with 1 fan.*
  - *These safety zones also apply to other types of installation.*
- *In the case of wall installation, the requirements listed above also apply to the area **below** the outdoor unit, down to the ground.*

Freestanding positioning of the outdoor unit

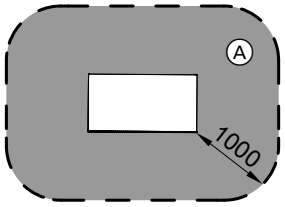

Fig. 9

Ⓐ Safety zone

Siting the outdoor unit in front of an external wall

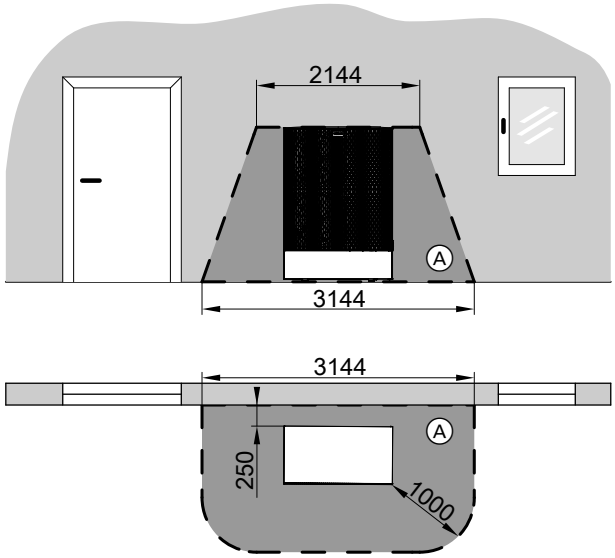

Fig. 10

Ⓐ Safety zone

Corner positioning of the outdoor unit, right

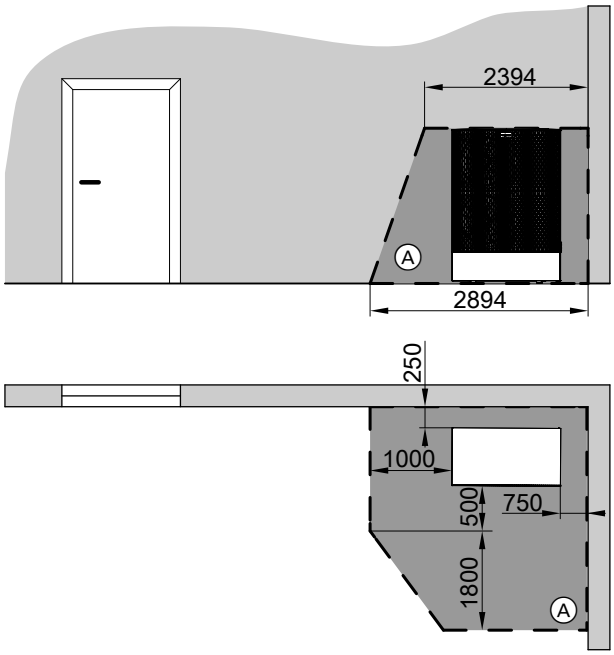

Fig. 11

Ⓐ Safety zone

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.*

Corner positioning of the outdoor unit, left

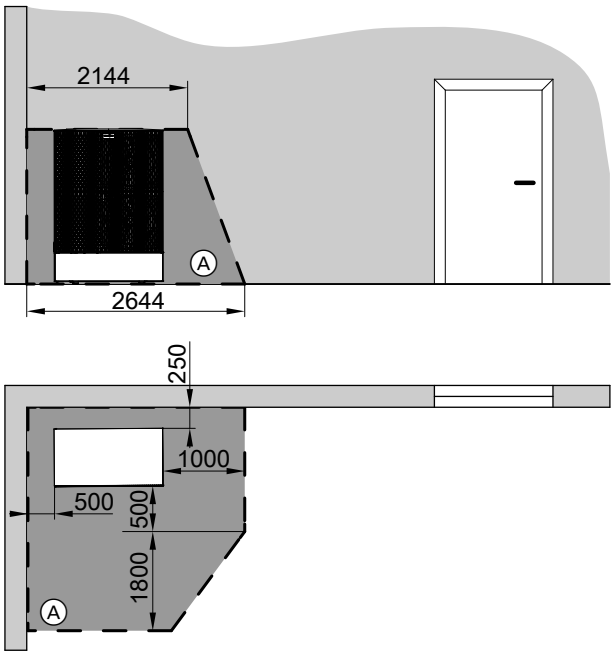

Fig. 12

Ⓐ Safety zone

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Installing the outdoor unit (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.*

Minimum clearances

Note
The minimum distances shown in the following are identical for outdoor units with 1 and 2 fans.

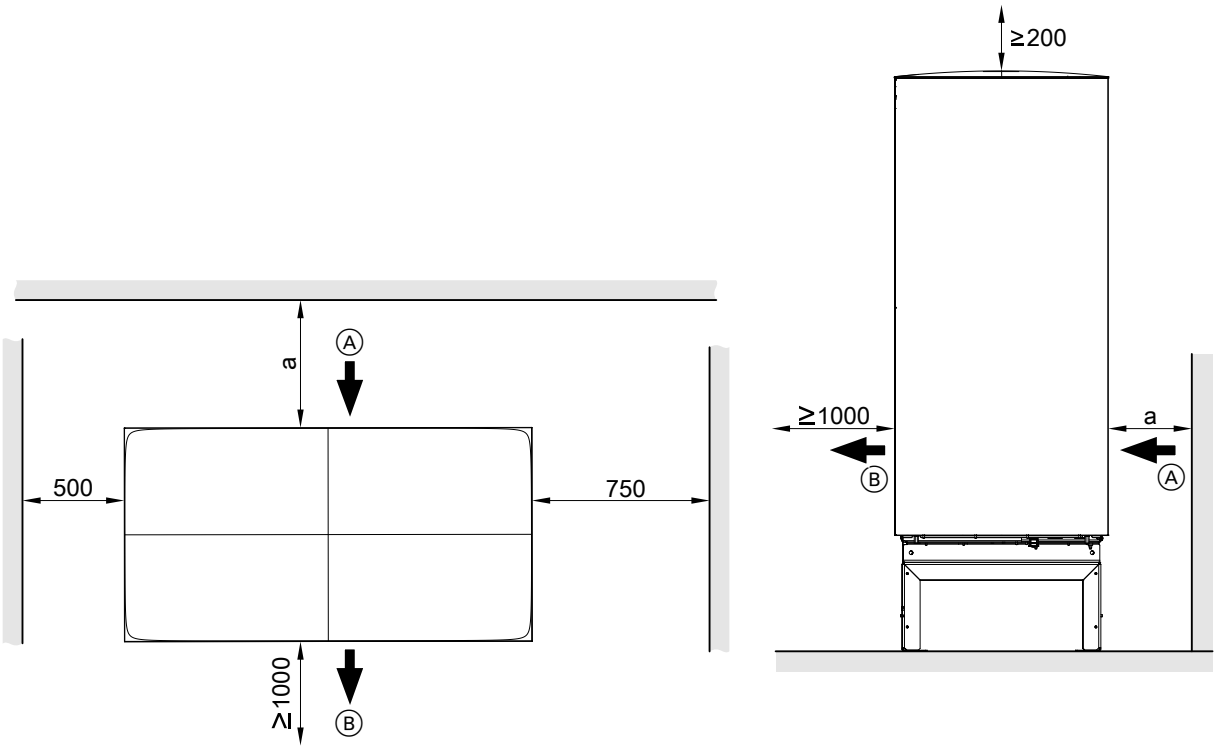

Fig. 13

Ⓐ Air intake
Ⓑ Air discharge
a
- Line entry above ground level: ≥ 250 mm
- Line entry below ground level: ≥ 450 mm

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.

Draining condensate 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).

Installing the outdoor unit (cont.)

Draining condensate via drain pipe in seepage layer

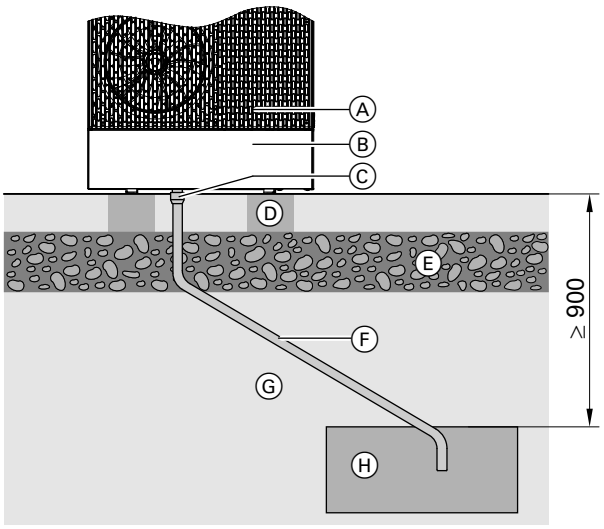

Fig. 14

Ⓐ 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

Draining condensate via waste water system

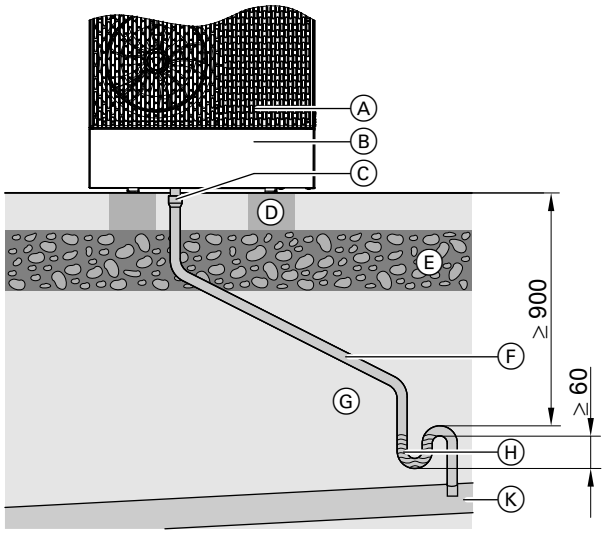

Fig. 15

Ⓐ 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.

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.

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Installing the outdoor unit (cont.)

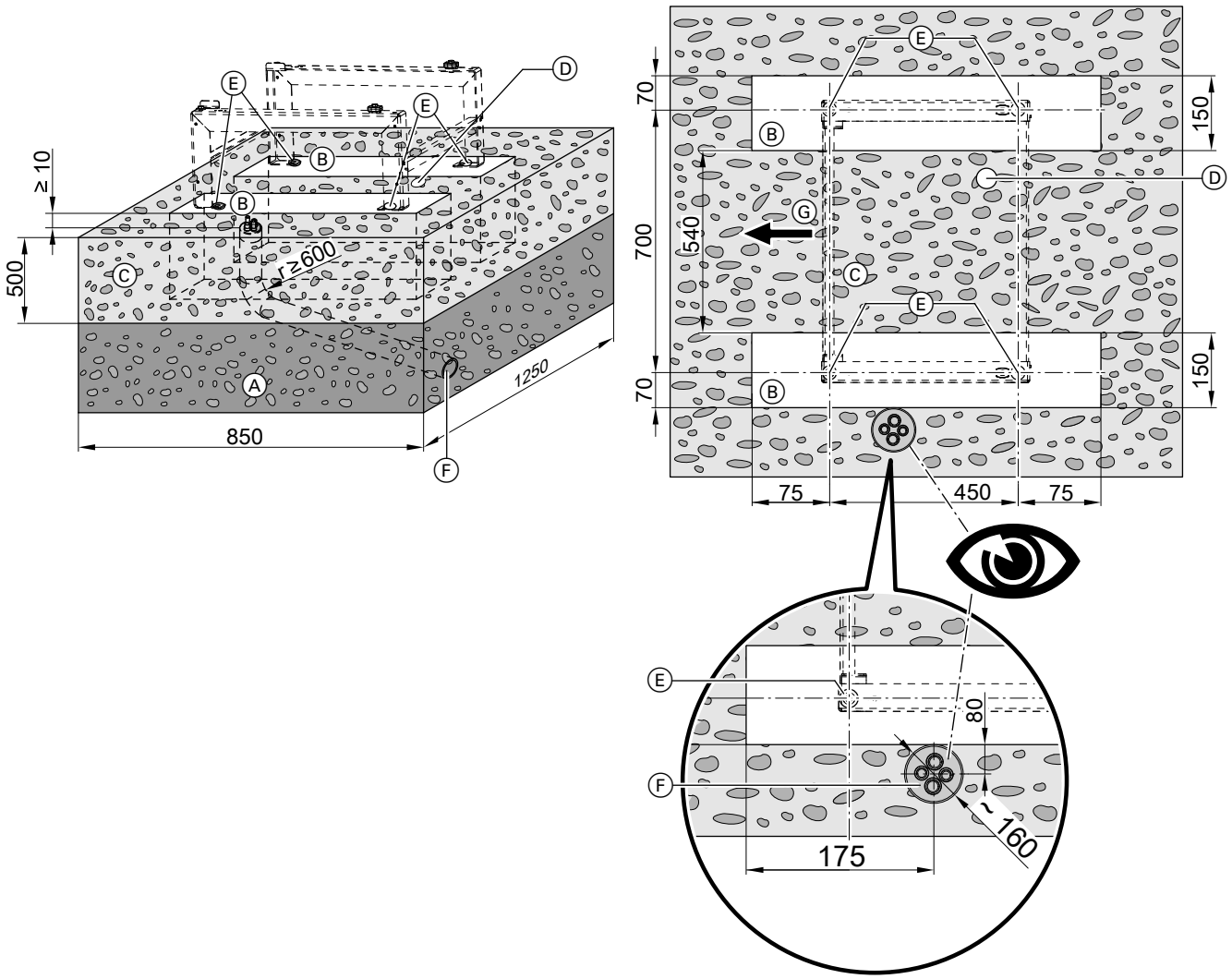

Fig. 16

Ⓐ 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 drainage of condensate: Gravel bed as soakaway
Ⓓ Conduit (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.
Ⓕ Hydraulic connection set (accessories) for line entry below ground level:
So that the floorstanding installation connection set (accessories) can be used, align both lines of the hydraulic connection set flush with and parallel to the edge of the foundation.
Ⓖ Air discharge
r Bending radius

Foundation for installation with anti-vibration feet (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.

Installing the outdoor unit (cont.)

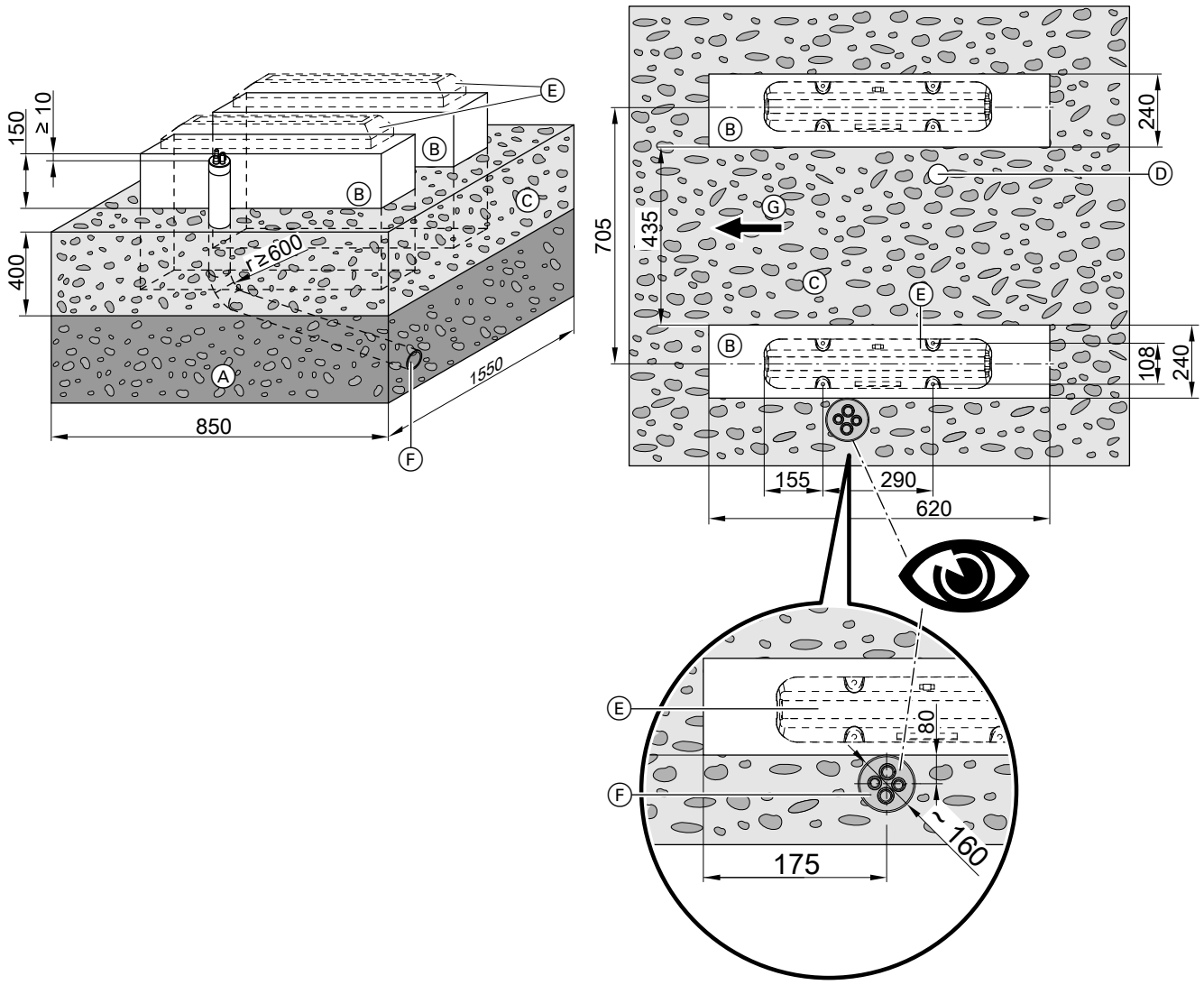

Fig. 17

Ⓐ 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 drainage of condensate: Gravel bed as soakaway
Ⓓ Conduit (min. DN 40) for draining condensate via waste water system or seepage layer
Ⓔ Anti-vibration feet (accessories):
Observe installation instructions.
Ⓕ Hydraulic connection set (accessories) for line entry below ground level:
So that the floorstanding installation connection set (accessories) can be used, align both lines of the hydraulic connection set flush with and parallel to the edge of the foundation.
Ⓖ Air discharge
r Bending radius

Installation instructions for anti-vibration base

- *Align the anti-vibration base on the foundation using the supplied spirit levels.*
- *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.*

Floorstanding installation with support: Line entry above ground level

Note

The following information for floorstanding installation applies to outdoor units with 1 and 2 fans. The outdoor unit with 2 fans is shown as an example.

Installing the outdoor unit (cont.)

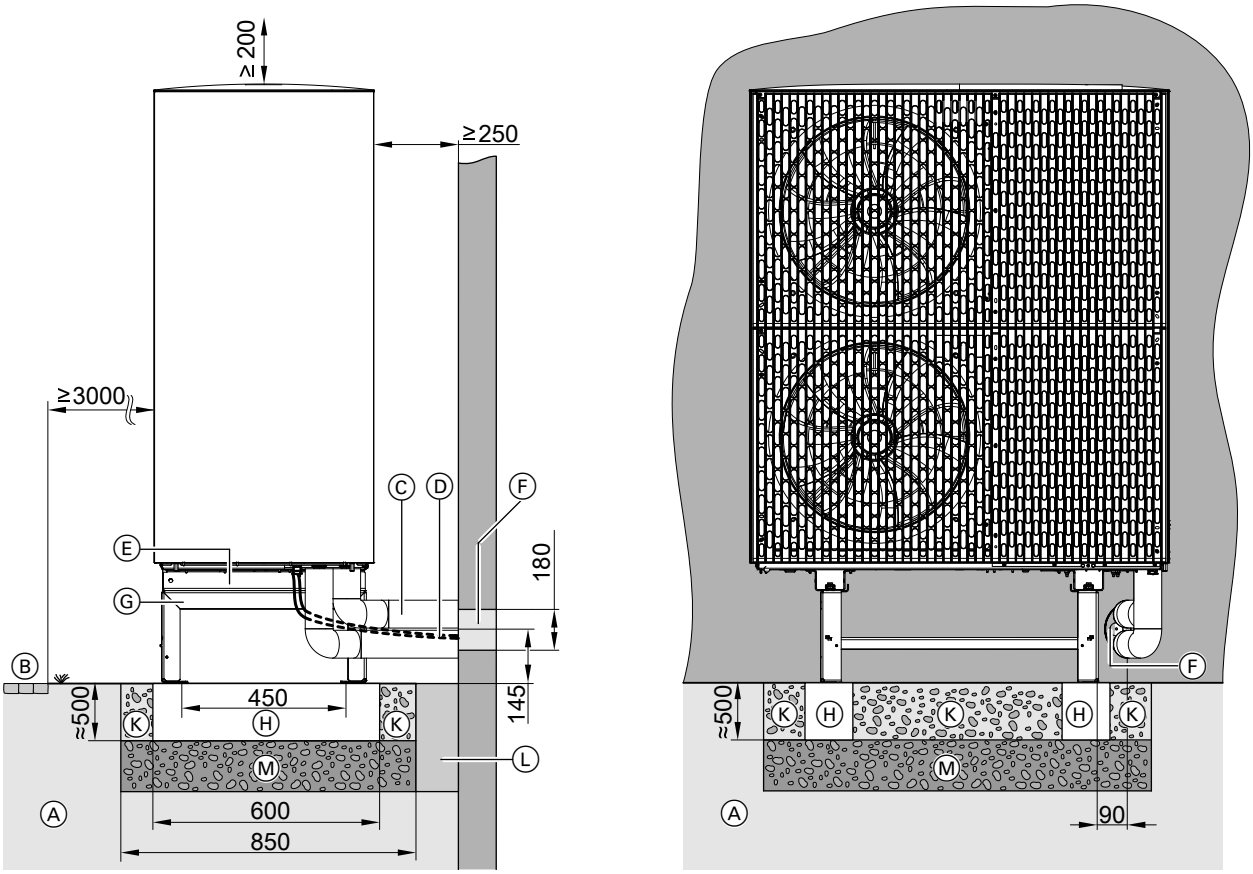

Fig. 18 Max. wall separation with design casing (accessories): 300 mm

Ⓐ 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 stress.
Ⓔ Condensate drain in the base plate:
Do not connect anything if the condensate can drain freely.
Ⓕ Gas-tight wall outlet (accessories) for electrical cables and hydraulic lines
Ⓖ Support for floorstanding installation (accessories), illustration without design casing (accessories)
Ⓗ Foundation strip
Ⓚ 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

Note

- *Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See table on page 26.*
- *Protect the pipework against damage. Avoid trip hazards.*

Floorstanding installation with support: Line entry below ground level

Note

The following information for floorstanding installation applies to outdoor units with 1 and 2 fans. The outdoor unit with 2 fans is shown as an example.

Installing the outdoor unit (cont.)

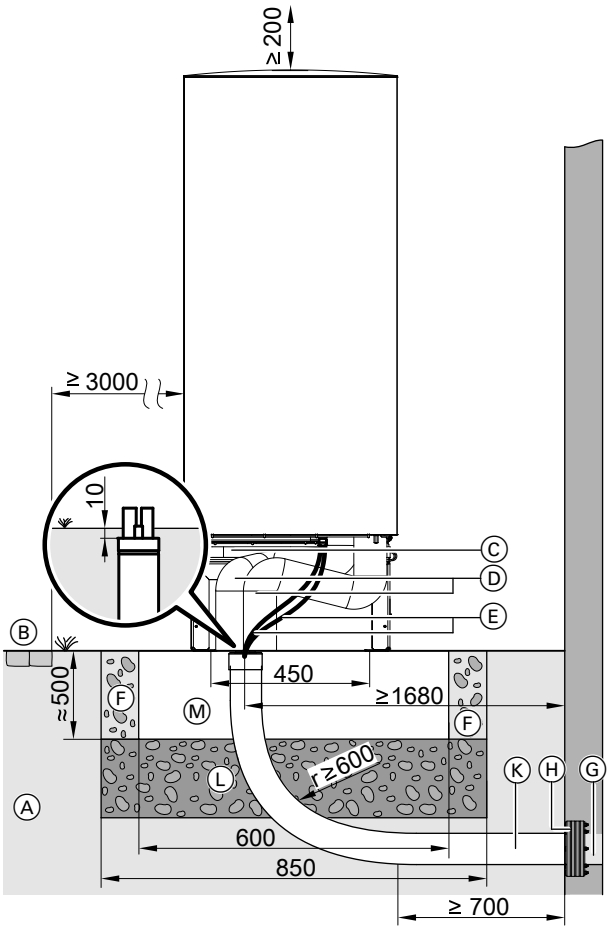

Fig. 19

Ⓐ 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
Ⓖ Gas-tight wall outlet (on site) for Quattro connection line laid underground (accessories)
Ⓗ Ring seal (accessories)
Ⓚ Quattro connection line laid underground (accessories)
Ⓛ Foundation strips
Ⓜ Frost protection for foundations (compacted crushed stone, e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations

Note

- *Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See table on page 26.*
- *Protect the pipework against damage. Avoid trip hazards.*

Installing an outdoor unit on foundations

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.

Installation with anti-vibration base (accessories)

See chapter "Foundations for installation with anti-vibration base (accessories)".

Wall mounting

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

Separate installation instructions for mounting bracket set for wall-mounting

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Installing the outdoor unit (cont.)

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.

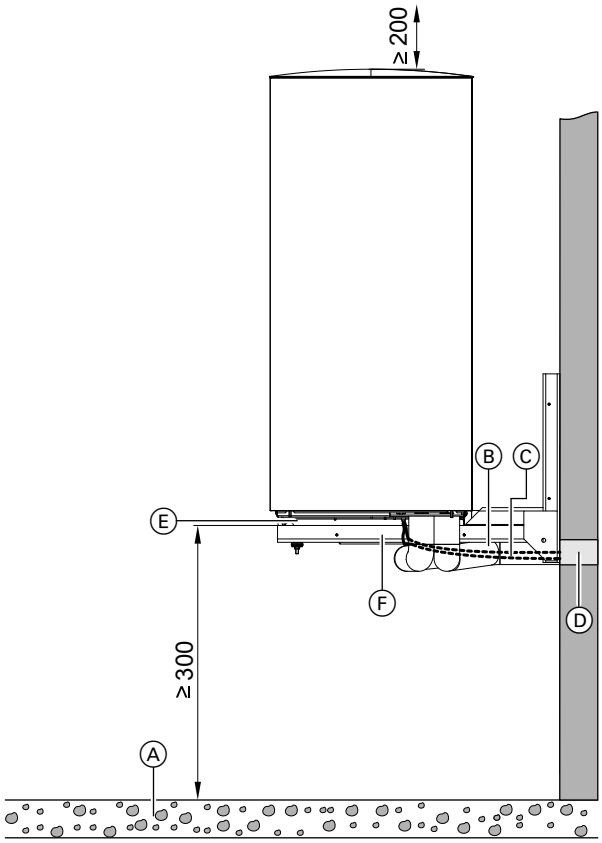


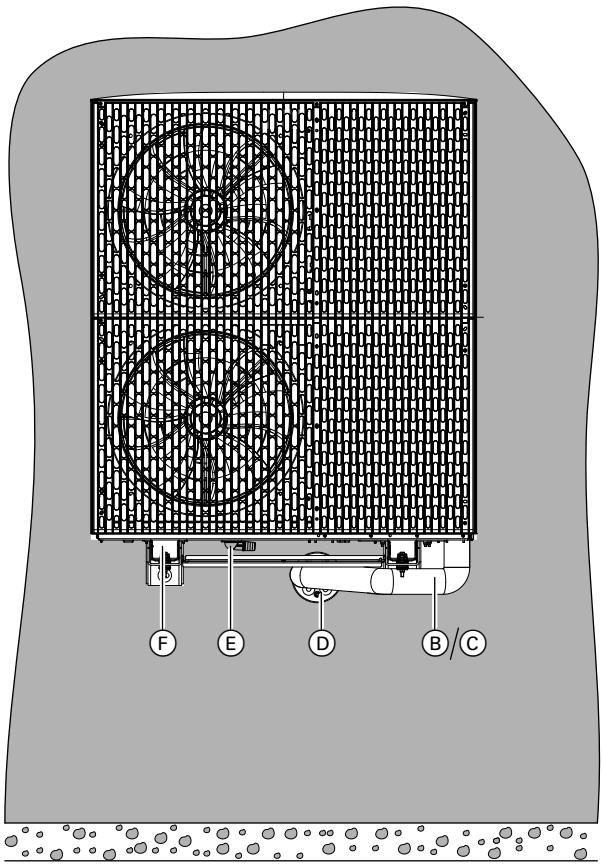
Fig. 20

Ⓐ 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 stress.
Ⓓ Gas-tight wall outlets (accessories) for electrical cables and hydraulic lines
Ⓔ 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 26.*

Wall mounting with bracket set for wall mounting

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



Opening the outdoor unit

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

Installing the outdoor unit (cont.)

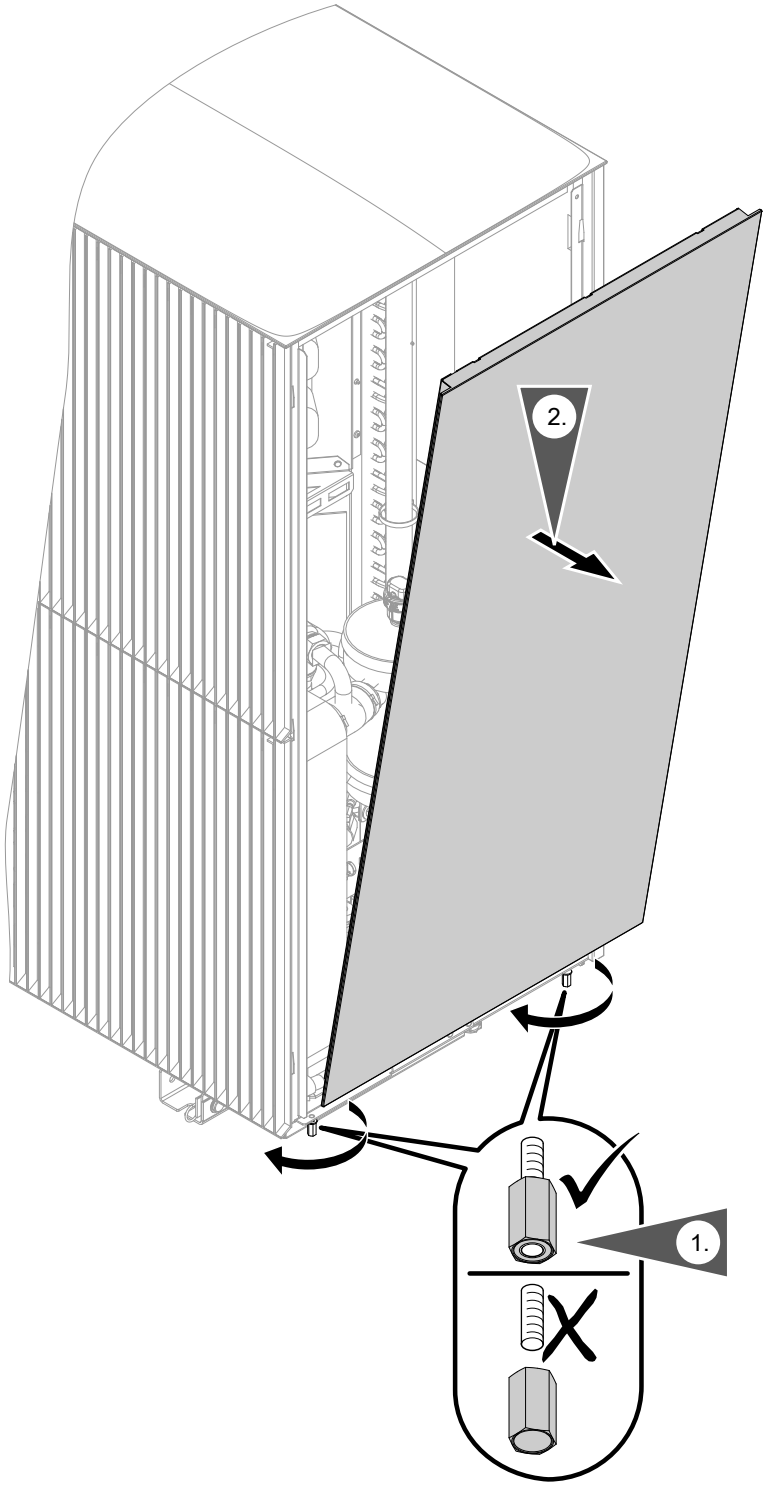


Fig. 21

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

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.

Installing the outdoor unit (cont.)

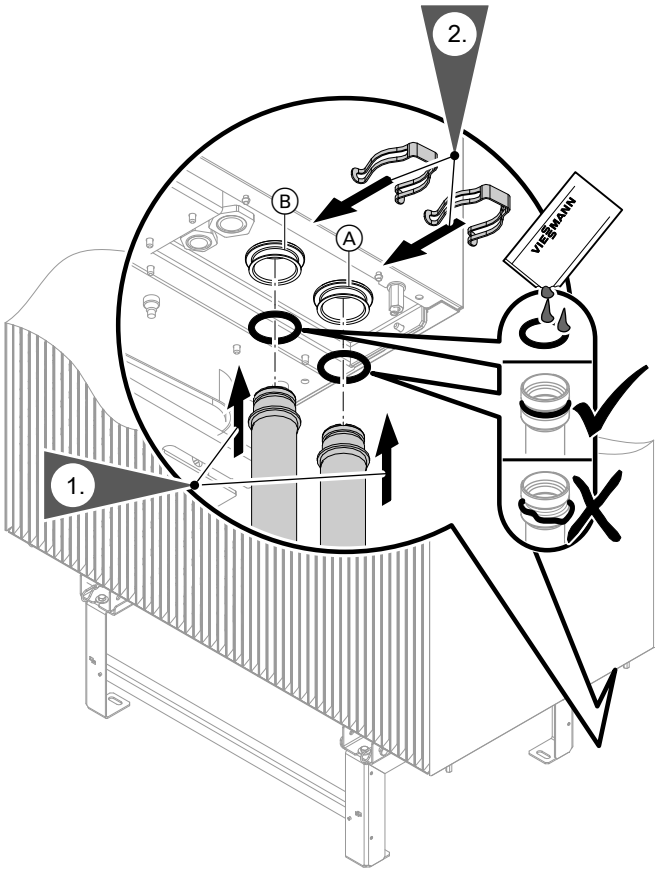


Fig. 22

Ⓐ 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.

Installing the outdoor unit (cont.)

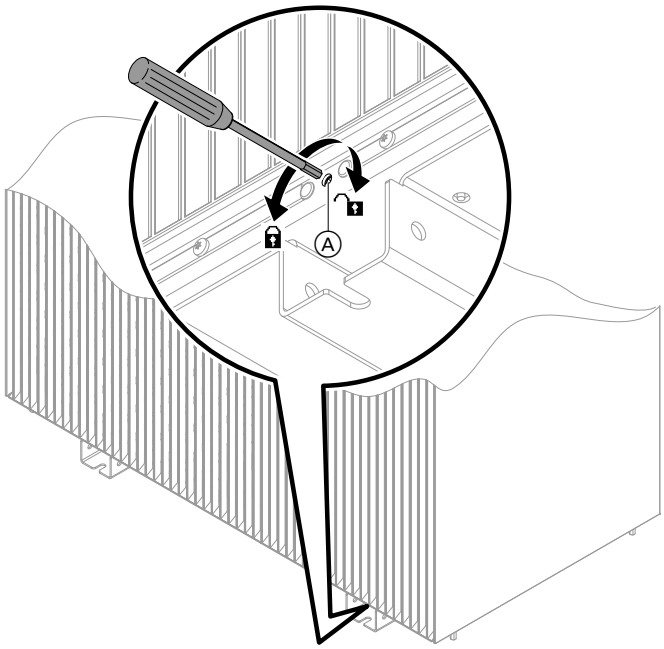


Fig. 23

Ⓐ 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

Installing the indoor unit

Transport

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.

Requirements for 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)

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

Installing the indoor unit (cont.)

WiFi operational reliability and system requirements

WiFi router system requirement
- WiFi router with activated WiFi:
  The WiFi router must be protected by a sufficiently secure WPA2 password.
  The WiFi router must always have the latest firmware update.
  Do not use unencrypted connections between the heat generator and the WiFi router.
- Internet connection with high availability:
  Flat rate (flat rate tariff **without** restriction on time or data volume)
- Dynamic IP addressing (DHCP, delivered condition) in the network (WiFi):
  Have this checked on site by an IT expert **prior** to commissioning. Arrange for set up if required.
- Set routing and security parameters in the IP network (LAN).
  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. Set up enabling if required.

Wireless signal range of WiFi connection

The range of wireless signals may be reduced by walls, ceilings and interior fixtures. These weaken the wireless signal, causing poor reception due to the following circumstances.
- 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, metal foil of 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. Maintain a distance of **at least 2 m** from these devices:
  - Computers
  - Audio and video systems
  - Devices with active WiFi connection
  - Electronic transformers
  - Pre-ballasts

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 commercially available WiFi repeaters.

Angle of penetration

The reception quality remains best if radio 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.

Flat (unfavourable) angle of penetration

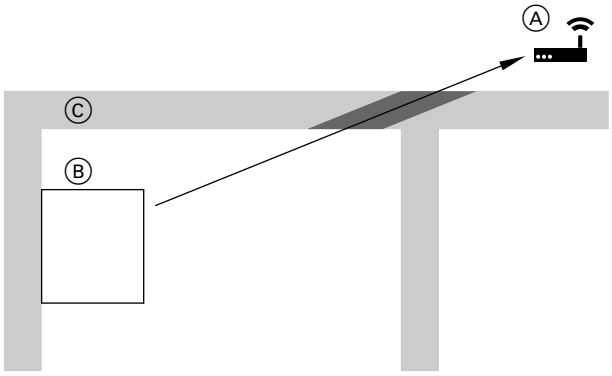


Fig. 24

Ⓐ WiFi router
Ⓑ Heat generator
Ⓒ Wall

Ideal angle of penetration

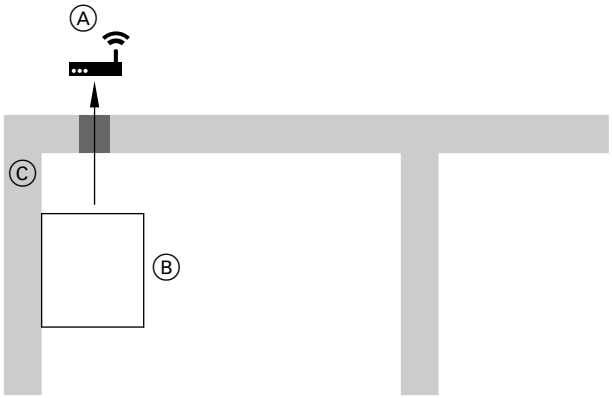


Fig. 25

Ⓐ WiFi router
Ⓑ Heat generator
Ⓒ Wall

Installing the indoor unit (cont.)

Minimum clearances

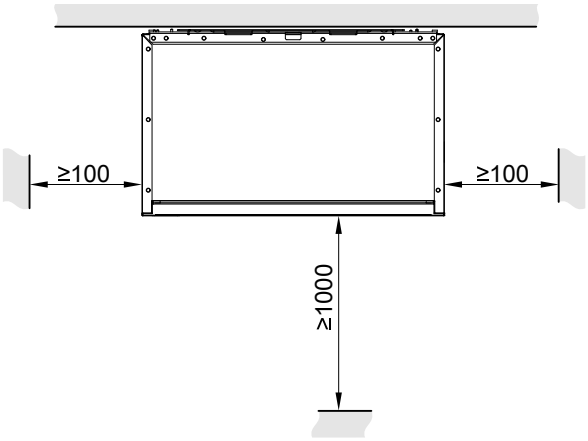


Fig. 26

Do not install the indoor unit in a cupboard.

Minimum installation heights

In the delivered condition, the programming unit is located at the bottom. For easier access, the programming unit can be fitted at the top, e.g. for lower installation heights.

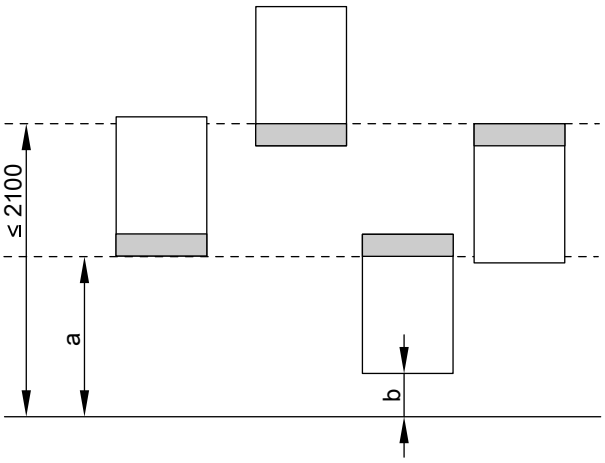


Fig. 27

Recommended dimensions

		a	b
Without pre-plumbing jig for surface mounting	mm	≥ 600	≥ 500
With pre-plumbing jig for surface mounting (accessories)	mm	≥ 680	≥ 680

Fitting the indoor unit to the wall

- Take into account the weight and centre of gravity of the indoor unit. Weight: See "Specification".
- The wall must meet the structural requirements. Use suitable fixing materials, depending on the wall structure.
- Wall installation in conjunction with a pre-plumbing jig (accessories):
  Pre-plumbing jig installation instructions

Please note
An incorrectly mounted indoor unit can become detached from the wall and fall down.
Make sure the fixing is secure.

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Installing the indoor unit (cont.)

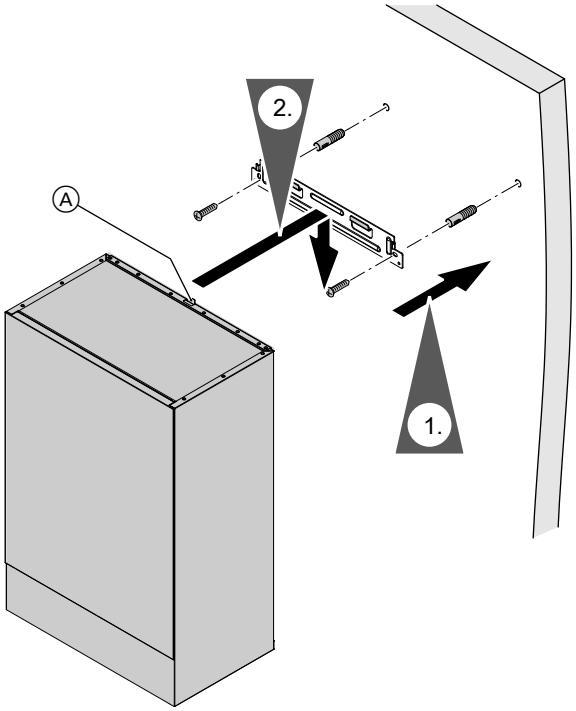


Fig. 28

Ⓐ Bracket for additional fixing screw, e.g. in earthquake regions

Connecting the secondary circuit

The following requirements must be met on site:
- Components reflect current technology.
- Components are approved in sealed unvented heating systems with operating pressures up to 3 bar.
- Manufacturer's instructions for installation

- If the indoor unit was installed on the wall using a pre-plumbing jig (recommended), connect the on-site pipes to the pre-plumbing jig.
  Pre-plumbing jig installation instructions
- If no pre-plumbing jig was used, connect the on-site pipes to the connection pieces of the indoor unit.
  Note
  So that the system can be filled and flushed via the commissioning assistant, fit a ***three-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*

  Connection on the DHW side:
  - *If required, install 1 shut-off valve in each flow and return DHW cylinder.*

Connecting the secondary circuit (cont.)

Fitting the connection pieces supplied

Indoor unit with 1 integrated heating/cooling circuit

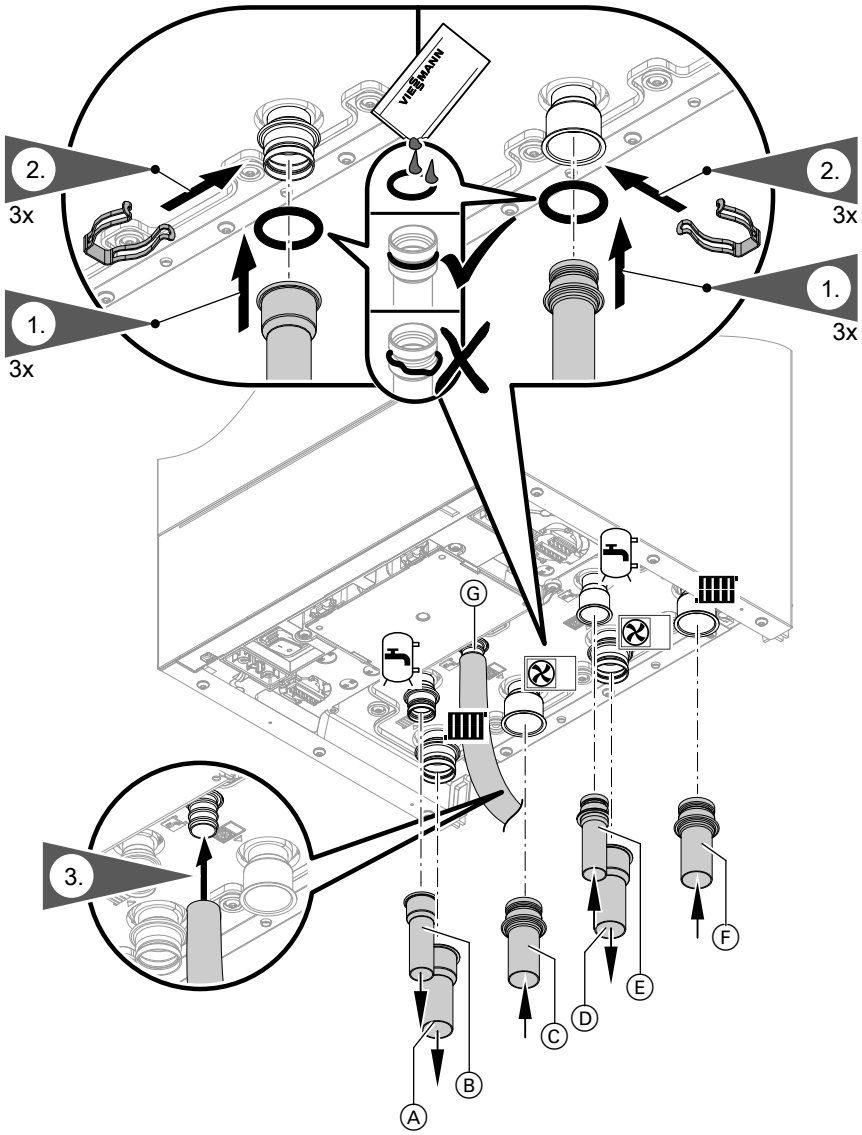


Fig. 29

Ⓐ Secondary circuit flow (heating/cooling circuit 1/ external buffer cylinder), connection Cu 28 x 1.0 mm
Ⓑ DHW cylinder flow (on the heating water side), connection Cu 22 x 1.0 mm
Ⓒ Heating water **from** outdoor unit (indoor unit heating water inlet), connection Cu 28 x 1.0 mm
Ⓓ Heating water **to** outdoor unit (indoor unit heating water outlet), connection Cu 28 x 1.0 mm
Ⓔ DHW cylinder return (on the heating water side), connection Cu 22 x 1.0 mm
Ⓕ Secondary circuit return (heating/cooling circuit 1/ external buffer cylinder), connection Cu 28 x 1.0 mm
Ⓖ Safety valve drain hose: Use the same inner cross-section.

Connecting the secondary circuit (cont.)

Indoor unit with 2 integrated heating/cooling circuits

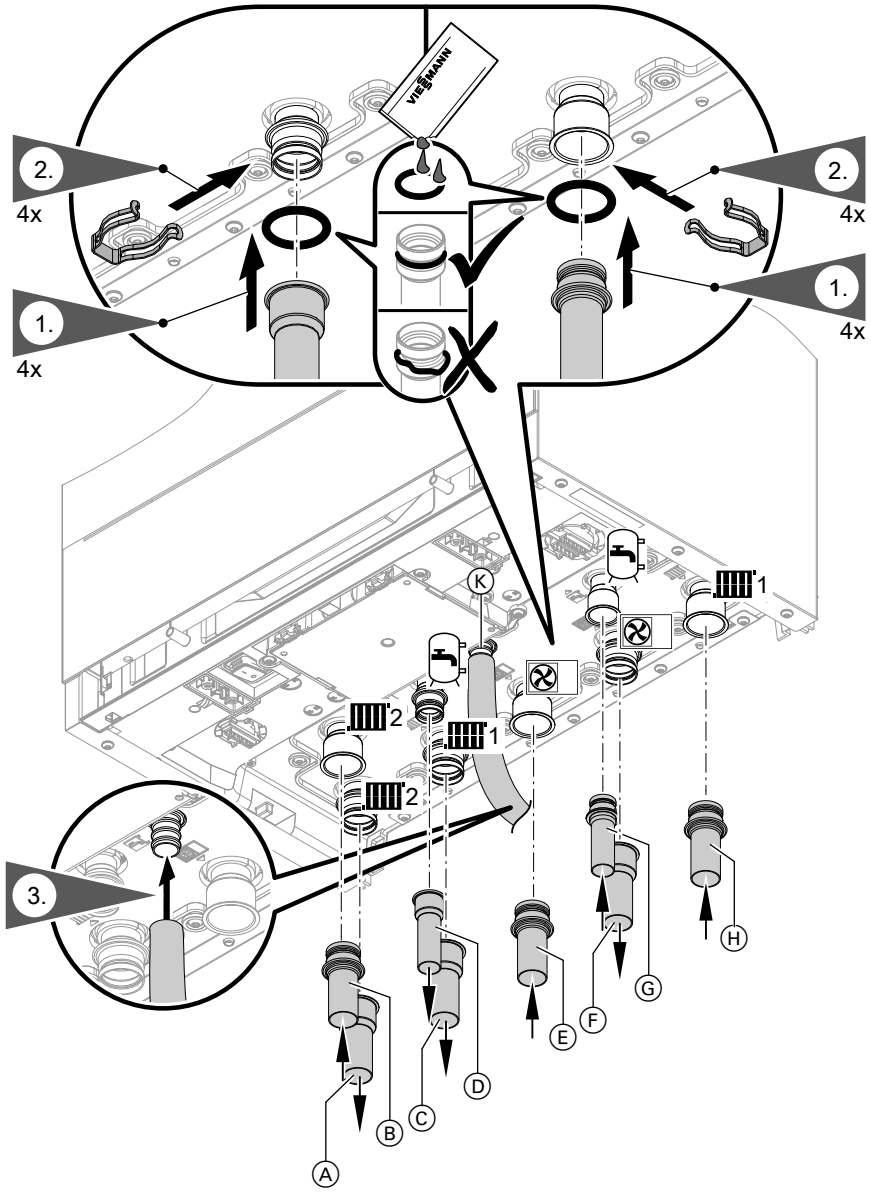


Fig. 30

Ⓐ Heating/cooling circuit 2 flow, connection Cu 28 x 1.0 mm
Ⓑ Heating/cooling circuit 2 return, connection Cu 28 x 1.0 mm
Ⓒ Heating/cooling circuit 1 flow, connection Cu 28 x 1.0 mm
Ⓓ DHW cylinder flow (on the heating water side), connection Cu 22 x 1.0 mm
Ⓔ Heating water **from** outdoor unit (indoor unit heating water inlet), connection Cu 28 x 1.0 mm
Ⓕ Heating water **to** outdoor unit (indoor unit heating water outlet), connection Cu 28 x 1.0 mm
Ⓖ DHW cylinder return (on the heating water side), connection Cu 22 x 1.0 mm
Ⓗ Heating/cooling circuit 1 return, connection Cu 28 x 1.0 mm
Ⓚ Safety valve drain hose: Use the same inner cross-section.

Making the hydraulic connections

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

Connecting the secondary circuit (cont.)

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 to remove magnetic and non-magnetic dirt particles, e.g. the heating filter with magnetite separation (accessories).

   Please note
   Contamination in the secondary circuit will lead to blockage of the hot 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 e.g. hydraulic connection set (accessory).

4. Recommendation: Check for leaks with nitrogen.

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 "Building system pressure".

   Thermally insulate pipework inside the building. 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

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.

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 at 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

Heating/cooling circuits 1 and 2:

- Use 24 V⎓ contact humidistat.
- Electrical connection
  - Heating/cooling circuit 1: Connection on the underside of the appliance to 6-pole connection socket on the right, terminals 7 and 8
  - Heating/cooling circuit 2 (only for types ... 2C): Connection X22 on EHCU electronics module

Connecting the secondary circuit (cont.)

Systems with external buffer cylinder

Heating/cooling circuits 1, 2, 3 and 4:

- Use 230 V~ contact humidistat.
- Connect to respective mixer extension kit of the heating/cooling circuit (ADIO electronics module).

Connection 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.

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.

Operation without outdoor unit

The indoor unit can be operated without the outdoor unit, e.g. for screed drying. In this instance, central heating runs via the integrated instantaneous heating water heater.

Connecting the secondary circuit (cont.)

Both 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 Fig. 31.

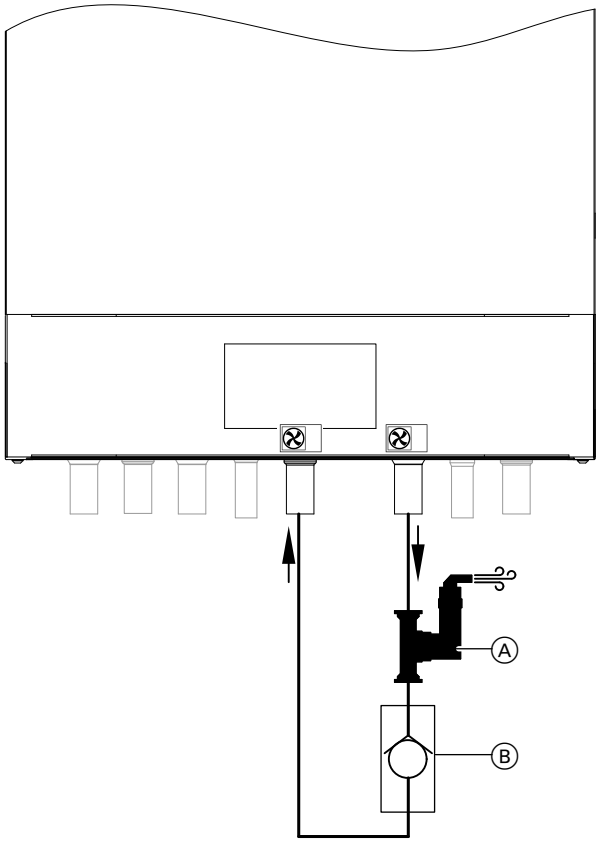


Fig. 31

Ⓐ Air vent valve
Ⓑ Non-return valve

Indoor unit: Removing the front panel

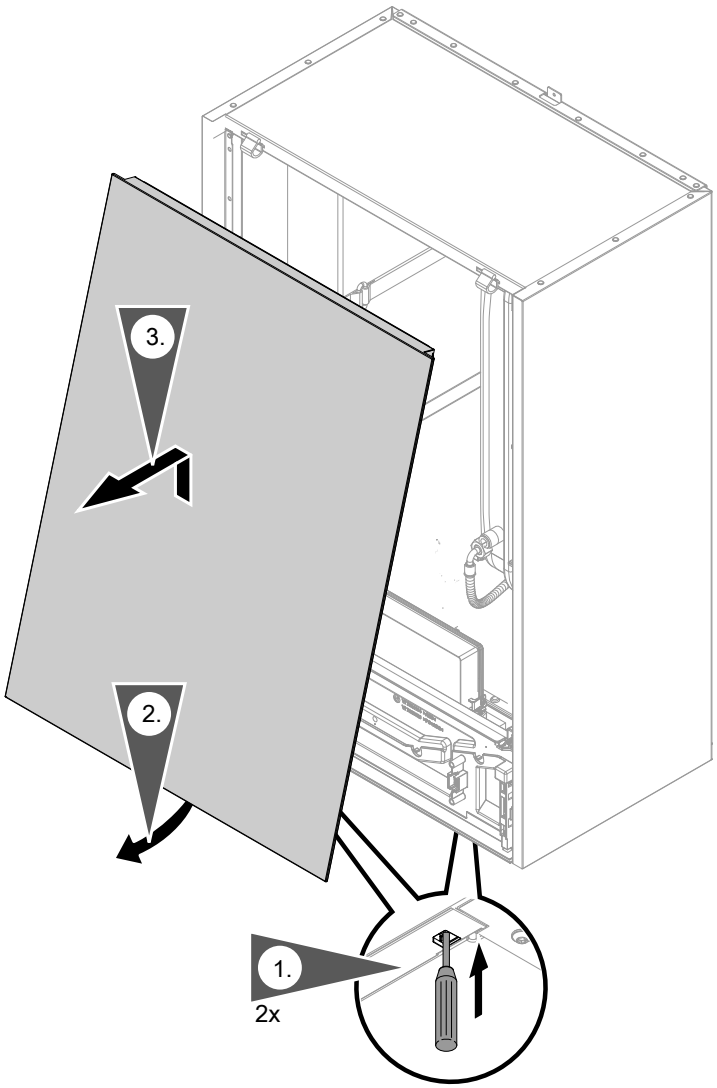


Fig. 32

Electrical connection

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

Some connection areas, e.g. for power supply and the CAN bus communication cable, are located outside the indoor unit on the underside of the appliance.

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.*	0.5 m
▪ < 42 V, e.g. for sensors	0.7 m

Electrical connection (cont.)

Recommended power cables

Indoor unit

Power supply		Cable	Max. cable length
Control unit/PCB 230 V~			
	▪ Without power-OFF	3 x 1.5 mm^2	50 m
	▪ With power-OFF	5 x 1.5 mm^2	50 m
Instantaneous heating water heater			
400 V~		5 x 2.5 mm^2	25 m
230 V~	▪ 1-phase	3 x 2.5 mm^2	25 m
	▪ 2-phase in the 3-phase network	5 x 2.5 mm^2	25 m
	▪ 2-phase in the 1-phase network	7 x 2.5 mm^2	25 m
	▪ 3-phase	7 x 2.5 mm^2	25 m

Heat pumps with central power supply (types ... SP)

Power supply	Cable	Max. cable length
Indoor unit 230 V~	3 x 6.0 mm^2	30 m

Outdoor units

Power supply	Cable	Max. cable length
Outdoor unit 230 V~	3 x 2.5 mm^2	20 m
	Or	
	3 x 4.0 mm^2	32 m
Outdoor unit 400 V~	5 x 2.5 mm^2	30 m

Electrical connection (cont.)

Overview of electrical terminal areas

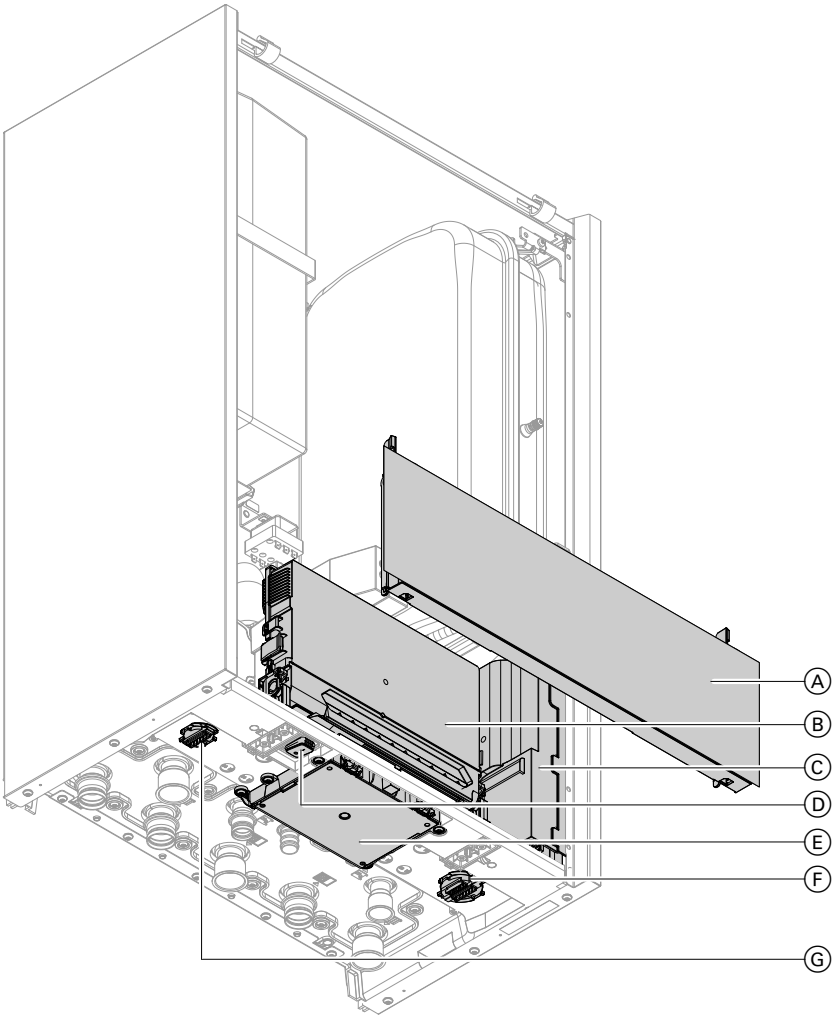


Fig. 33

Ⓐ HMI programming unit
Ⓑ HPMU electronics module
Ⓒ EHCU electronics module
Ⓓ ON/OFF switch
Ⓔ Junction box 230 V~
Ⓕ Extra low voltage (ELV) connection sockets ≤ 42 V
Ⓖ Extra low voltage (ELV) connection socket ≤ 42 V

Opening the 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 (cont.)

Removing the programming unit mounting bracket

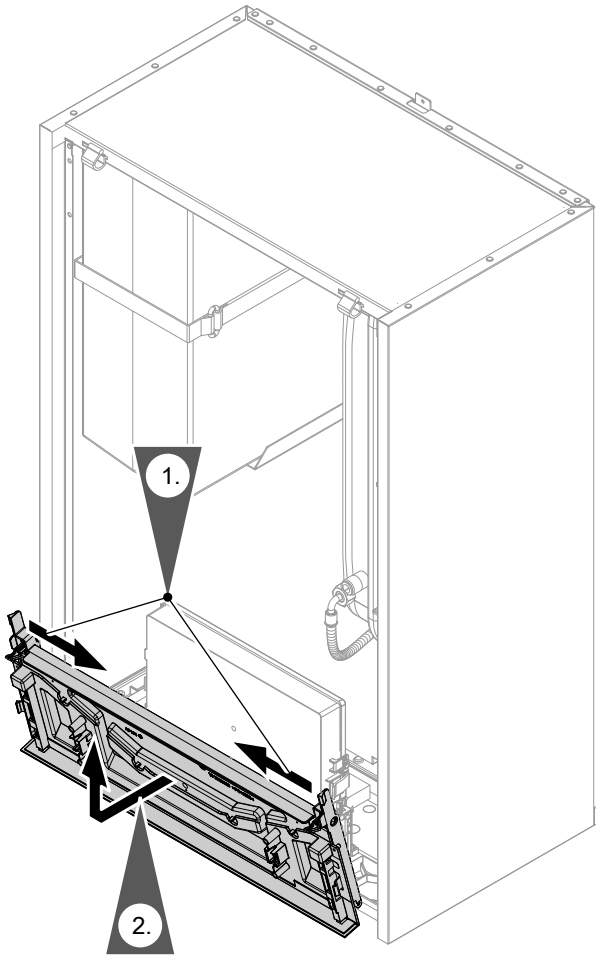


Fig. 34

Opening the HPMU electronics module

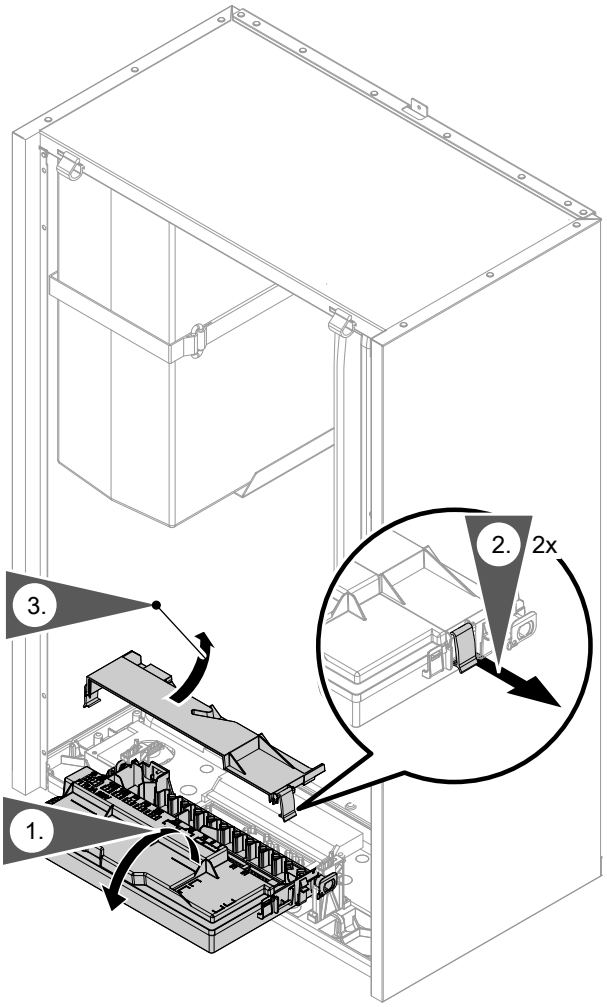


Fig. 35

Electrical connection (cont.)

Opening the EHCU electronics module

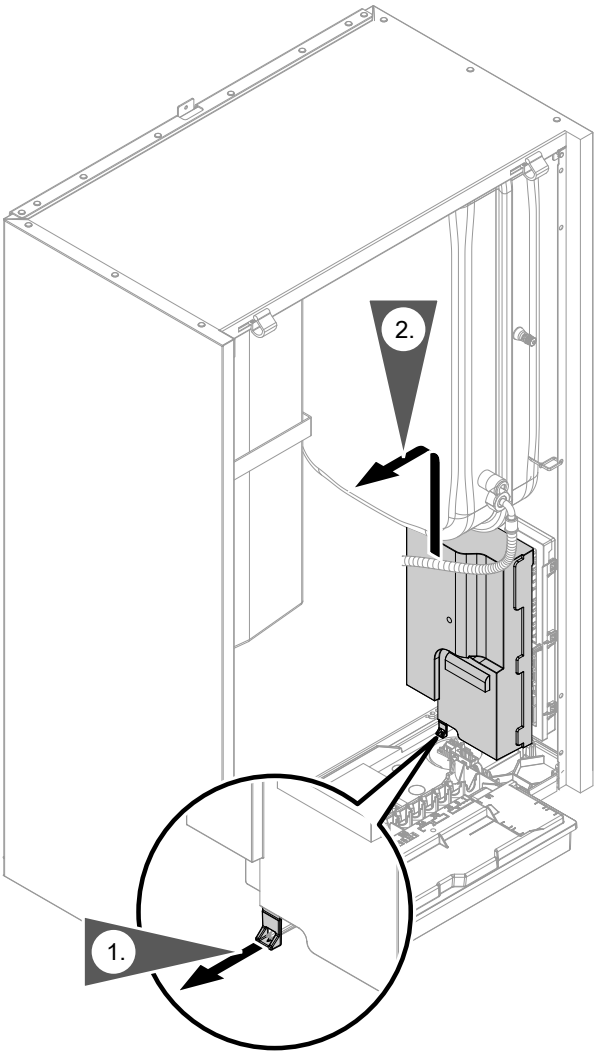


Fig. 36

Opening the 230 V~ junction box

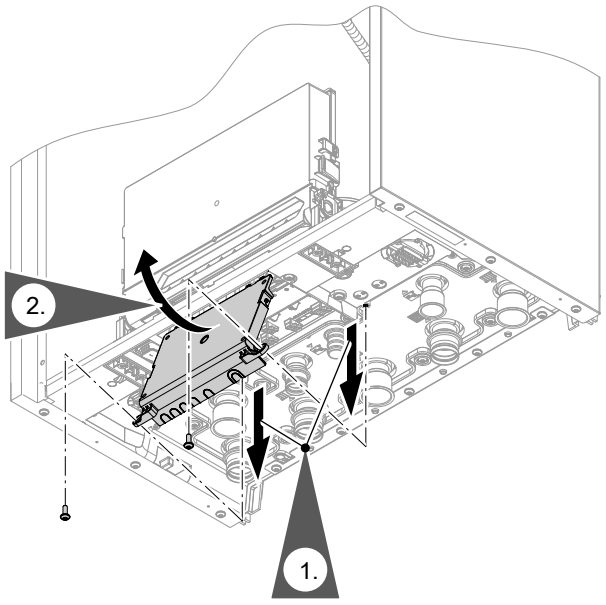


Fig. 37

Closing the junction box

- After completing all electrical connections, seal the junction box tightly.
- Torque for the screws: 2.8 Nm

Indoor unit: Routing cables to the wiring chamber

⚠ **Danger**
Damaged wiring insulation can lead to serious injury from electrical current 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.

Electrical connection (cont.)

Please note
If apertures are not securely sealed this can lead to damage from condensation, vibrations and excessive noise.

- Only break out as many terminal area openings as are needed for cable entries.
- Use suitable strain relief or cable fittings for all cable entries.
- Seal all cable entries so they are soundproof and impermeable.

Electrical connection (cont.)

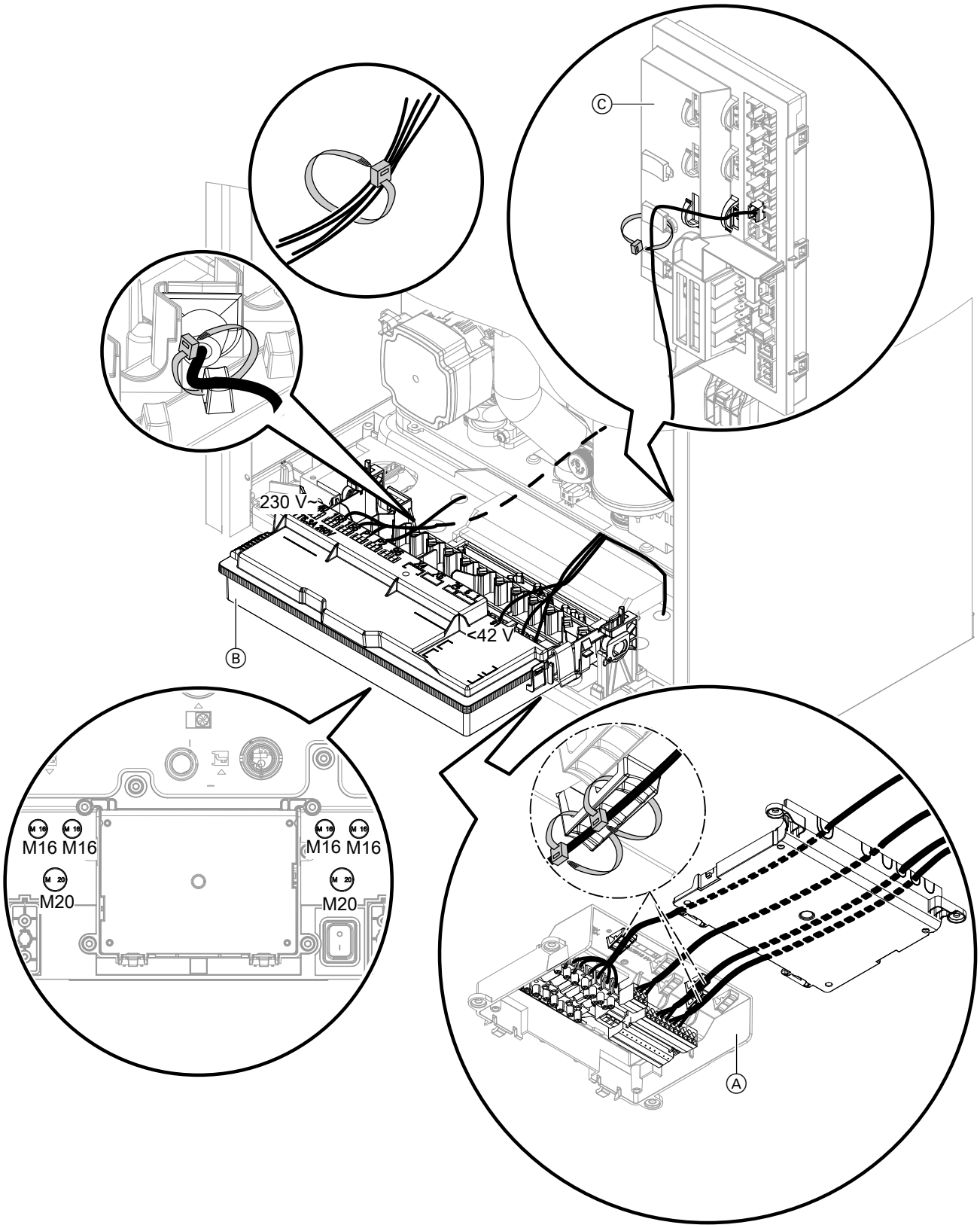


Fig. 38

Ⓐ Junction box 230 V~
Ⓑ HPMU electronics module
Ⓒ EHCU electronics module

Electrical connection (cont.)

Route the leads to the 230 V~ junction box

- Only break out as many openings in the cover as needed.
- Provide strain relief on all cables/leads in the 230 V~ junction box with 2 cable ties: See Fig. 38.

Routing cables to the HPMU electronics module

- Route **only** flexible cables to the HPMU electronics module.
- Only break out as many M16, M20 cable entry openings in the floor of the indoor unit as needed. For strain relief, insert suitable metric cable fittings or click-in cable fittings into the openings.
- Route the cables through the cable fittings. Firmly secure cables.
- Also, apply strain relief to the terminal area cables.

Route the cables to the EHCU electronics module

- Only break out as many M16, M20 cable entry openings in the floor of the indoor unit as needed. For strain relief, insert suitable metric cable fittings or click-in cable fittings into the openings.
- Route the cables through the cable fittings. Firmly secure cables.

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.

Electrical connection (cont.)

Connection sockets: Sensors and BUS connections

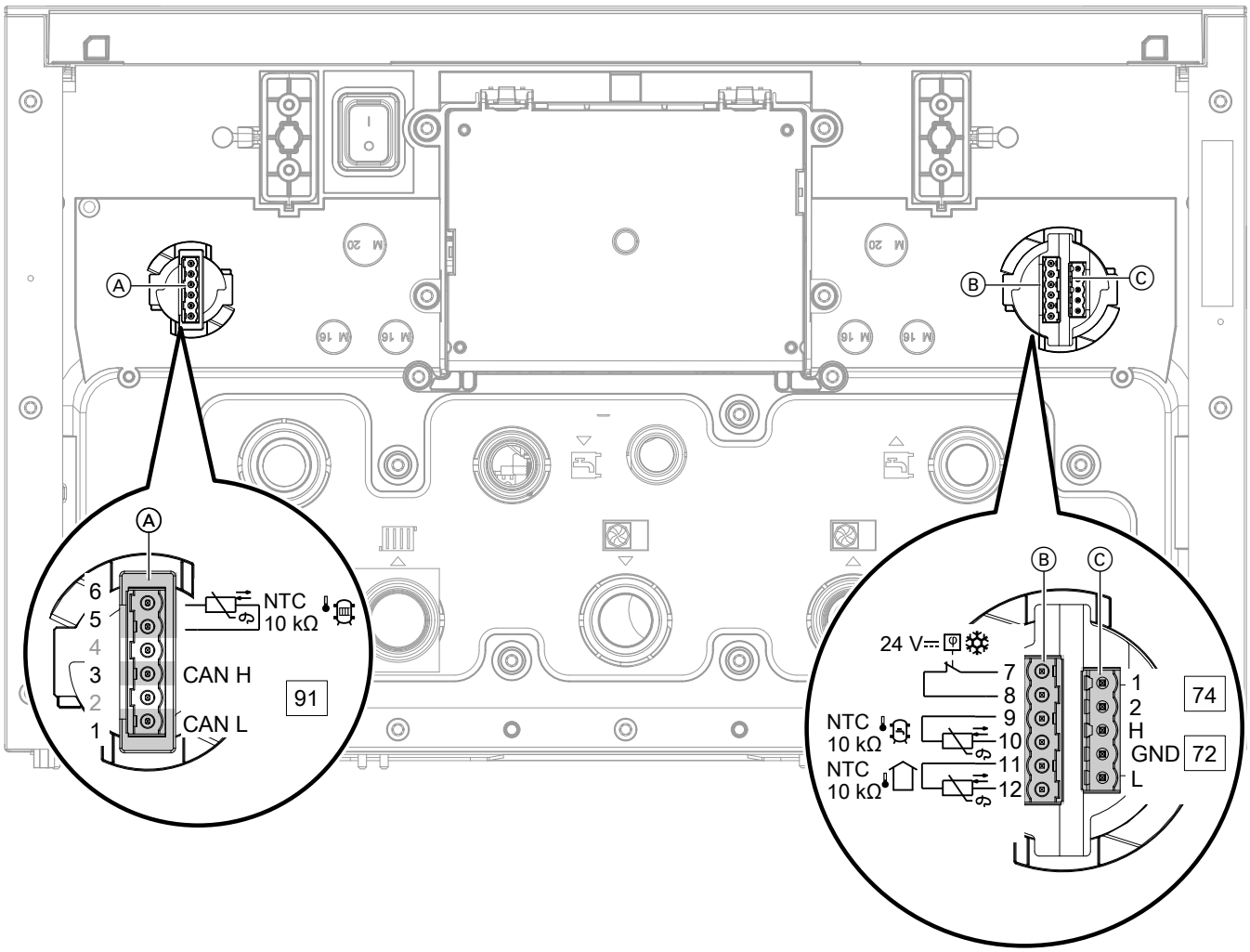


Fig. 39

Ⓐ 6-pole connection socket on the left
Ⓑ 6-pole connection socket on the right
Ⓒ 5-pole connection socket on the right

Electrical connection (cont.)

6-pole connection socket Ⓐ

Clamps	Component	Explanation
1 CAN L 3 CAN H	Connection of an additional CAN bus subscriber (Viessmann appliance), 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 with other Viessmann appliances via the 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 5-pole connection socket Ⓒ.*
4	Do not connect anything here!	
5 and 6	Only for indoor unit with 1 integrated heating/cooling circuit: Temperature sensor, external buffer cylinder	Sensor type: NTC 10 kΩ Cores are interchangeable Recommended connecting cable: ▪ 2 x 1.5 mm² ▪ Max. cable length: 35 m

6-pole connection socket Ⓑ

Clamps	Component	Explanation
7 GND 8 24 V	Contact humidistat, 24 V⎓ for heating/cooling circuit 1 ***Note*** *Use only 230 V~ contact humidistat in conjunction with external buffer cylinder. In this case, the contact humidistat is connected to the mixer extension kit of the respective heating/cooling circuit (ADIO electronics module).*	Recommended connecting cable: ▪ 2 x 0.75 mm² Max. cable length: 25 m Or ▪ 2 x 1.5 mm² Max. cable length: 50 m
9 and 10	Top cylinder temperature sensor	Sensor type: NTC 10 kΩ Cores are interchangeable Recommended connecting cable: ▪ 2 x 1.5 mm² ▪ Max. cable length: 35 m
11 and 12	Outside temperature sensor	Sensor type: NTC 10 kΩ Cores are interchangeable Recommended connecting cable: ▪ 2 x 1.5 mm² ▪ Max. cable length: 35 m

Electrical connection (cont.)

5-pole connection socket Ⓒ

Terminals	Component	Explanation
74.1 74.2	Connection of additional PlusBus subscribers via plug 74, e.g. mixer extension kit	Cores are interchangeable Recommended connecting cable: ▪ Unshielded data cable: 2 x 0.34 mm² ▪ Max. cable length: 50 m
72.L 72.GND 72.H	Connection of indoor/outdoor unit CAN bus communication cable via plug 72	Connection for integration into the **internal** CAN bus system If plug 72 is wired up on site: ▪ Connect additional shielding to 72.GND. ▪ If the indoor unit is operated without the outdoor unit (e.g. for screed drying), connect 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 CAN bus communication cable of the indoor/outdoor unit".

230 V~ junction box: 230 V~ components and switching contacts

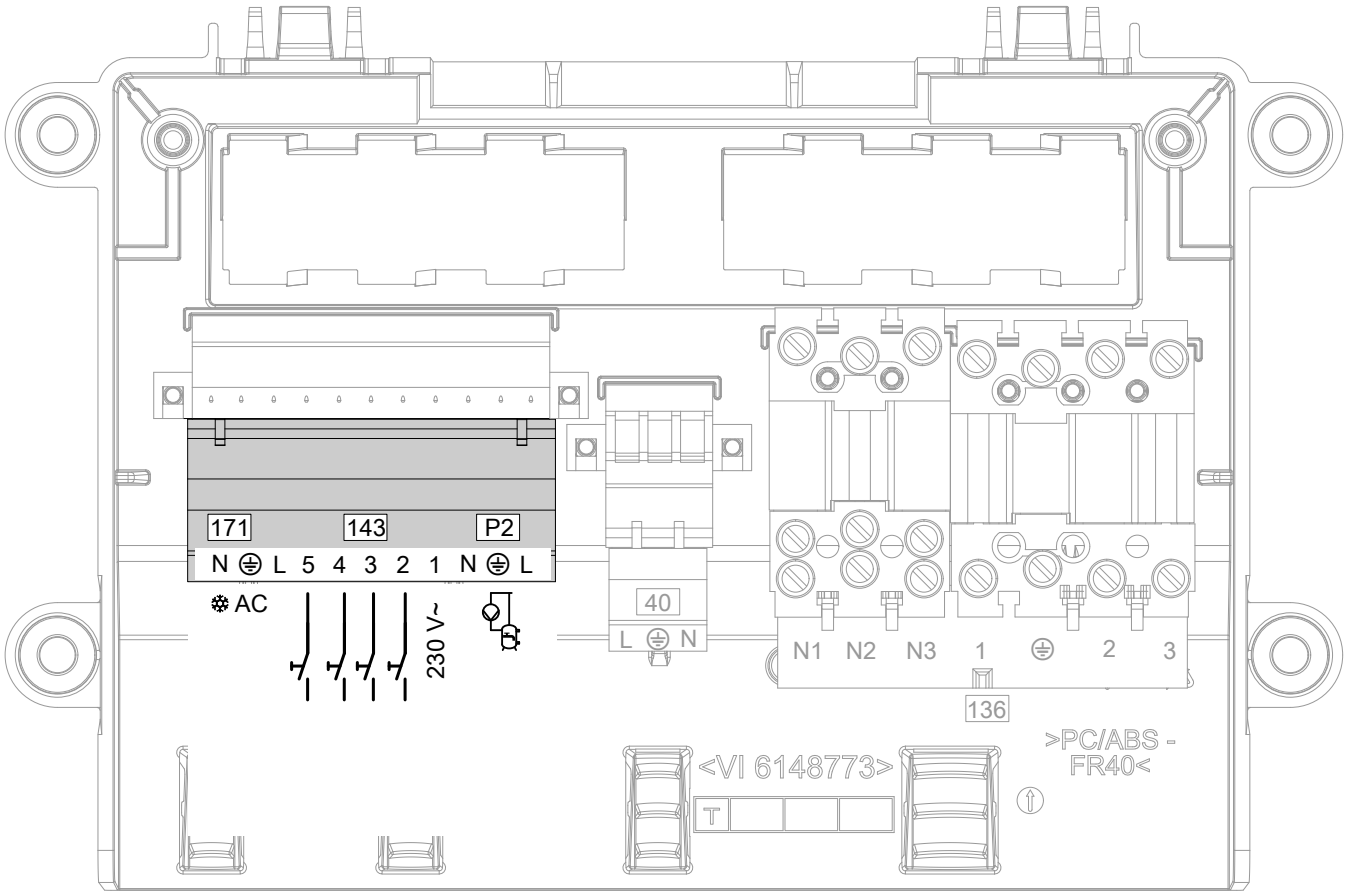


Fig. 40

Electrical connection (cont.)

11-pin plug

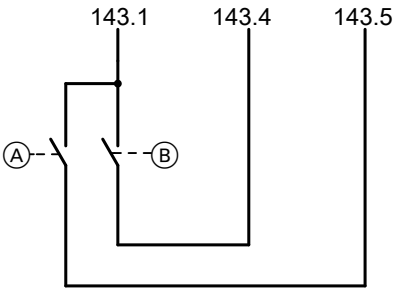
Clamps	Component/function	Explanation
P2.N P2.⏚ P2.L 	DHW circulation pump	▪ Output: 230 W ▪ Voltage: 230 V~ ▪ Max. switching current: 1 A Recommended connecting cable: ▪ 3 x 1.5 mm² ▪ Max. cable length: 50 m
143.1	Power supply for configurable digital inputs 143.2 to 143.5	Voltage: 230 V~
143.2 143.3 143.4 143.5	Configurable digital inputs 143.2 to 143.5 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
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

Digital input functions

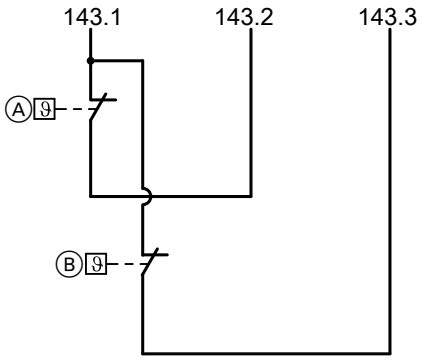
- The simultaneous connection of several functions to 1 digital input is **not** possible.
- With on site power supply, ensure phase matching with the control unit voltage input: See chapter "Indoor unit: Power supply for heat pump control unit".
- Set the required parameters during commissioning: See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

Electrical connection (cont.)

The following functions are available via the 4 digital inputs:

Functions	Digital inputs				Explanation
	143.2	143.3	143.4	143.5	
Power-OFF 	—	—	X	—	Requires floating **N/C** contact: ▪ Closed: Heat pump operational ▪ Open: Heat pump shut down ▪ For the instantaneous heating water heater, the stages to be switched off can be selected. ▪ The power supply for the heat pump control unit (3 x 1.5 mm²) and the cable for the power-OFF signal can be combined in a single 5-core cable. ▪ For further information regarding power-OFF: See chapter "Power supply". ***In connection with Smart Grid:*** *Do **not** connect the power-OFF signal.*  Ⓐ Floating contact (on site)
Smart Grid	—	—	X	X	The power-OFF function is integral to Smart Grid. The power-OFF signal must therefore **not** be connected.  Ⓐ Floating contact (on site) Ⓑ Floating contact (on site)
DHW circulation pump demand 	X	—	—	—	External demand, DHW circulation pump  Ⓐ Floating contact (on site)

Electrical connection (cont.)

Functions	Digital inputs				Explanation
	143.2	143.3	143.4	143.5	
External blocking	X	—	—	—	External blocking of refrigerant circuit and instantaneous heating water heater  Ⓐ Floating contact (on site)
Heating/cooling circuits temperature limiter 1	X	—	—	—	Temperature limiter to restrict the maximum temperature of underfloor heating circuits  Ⓐ Temperature limiter heating/cooling circuit 1 Ⓑ Temperature limiter heating/cooling circuit 2
Temperature limiter heating/cooling circuit 2	—	X	—	—	

Electrical connection (cont.)

HPMU electronics module: Accessory 230 V~ and BUS connection

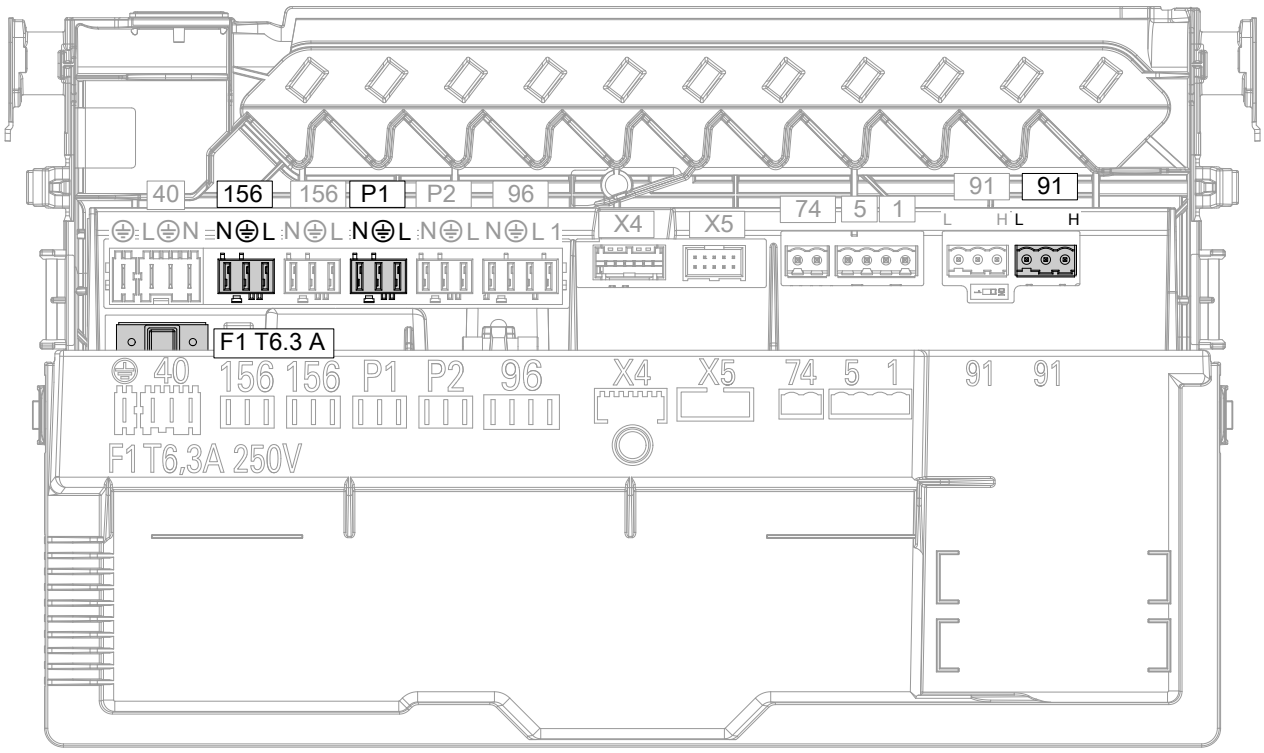


Fig. 41

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 mm² ▪ Max. cable length: 50 m
P1.N P1.⏚ P1.L	Only for indoor unit with 1 integrated heating/cooling circuit: E.g. 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

Electrical connection (cont.)

Extra low voltage (ELV) connections < 42 V

Terminals	Component	Explanation
91.L 91.H	Connection of an additional CAN bus subscriber (Viessmann appliance), 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) For further information: See chapter "Connecting with other Viessmann 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 a 5-pole connection socket on the underside of the appliance.*

Power supply accessories 230 V ~

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

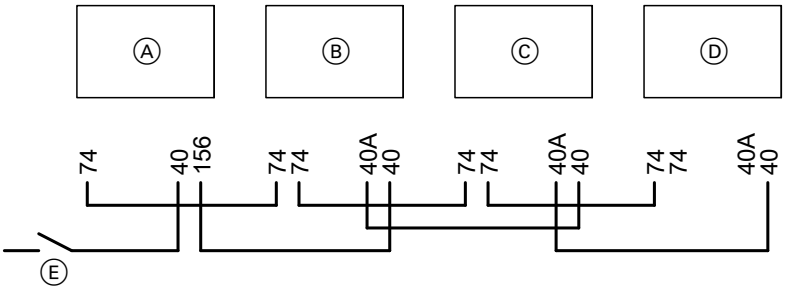


Fig. 42

Ⓐ Indoor unit terminal areas
- 40 Control unit/PCB power supply in the 230 V~ junction box
- 74 PlusBus connection to connection socket
- 156 Power supply for PlusBus subscribers in the HPMU electronics module

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

Electrical connection (cont.)

Some accessories with direct power supply

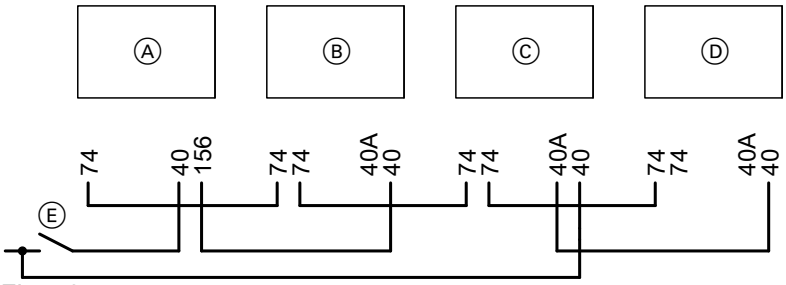


Fig. 43

Ⓐ Indoor unit terminal areas
- 40 Control unit/PCB power supply in the 230 V~ junction box
- 74 PlusBus connection to connection socket
- 156 Power supply for PlusBus subscribers in the HPMU electronics module

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

Connecting with other Viessmann appliances via the CAN bus

The heat pump can be connected with other compatible appliances via the external CAN bus. Depending on what other compatible appliances it is combined with, this may bring benefits such as shared use of a connectivity module or even joint commissioning and operation via an app.

- The Viessmann CAN bus is designed for "line" bus topology with a terminator at both ends: See Fig. 44.
- 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
When commissioning any CAN bus subscriber, always observe the start sequence: See chapter "Commissioning the system".

Recommended cable

- Recommended cable for integration into an external CAN bus system:
  Fully wired 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	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)	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

Electrical connection (cont.)

Terminator

When integrating into an external CAN bus system, a distinction is made as to whether the heat pump is the first, last or central subscriber. Any terminators connected at the factory may need to be removed: See following chapter.

The heat pump is the first or last subscriber

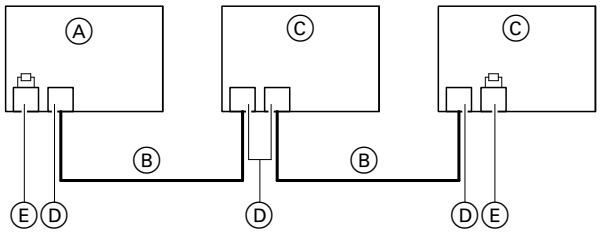


Fig. 44

Ⓐ Heat pump connected as first or last CAN bus subscriber

In this case, 1 connection is required on the heat pump:
- 1 connection to 6-pole connection socket on the underside of the appliance, 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

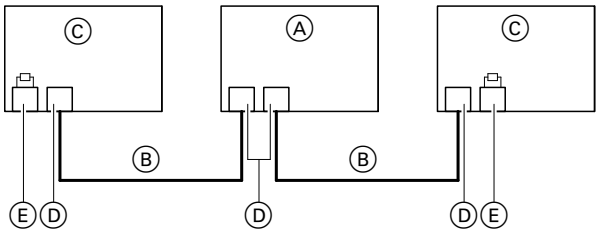


Fig. 45

Ⓐ Heat pump as central CAN bus subscriber

In this case, 2 connections are required on the heat pump:
- 1 connection to 6-pole connection socket on the underside of the appliance, 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 plug 91 inserted on site 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

Electrical connection (cont.)

EHCU electronics module: Additional contact humidistat

Only for indoor unit with 2 integral heating/cooling circuits.

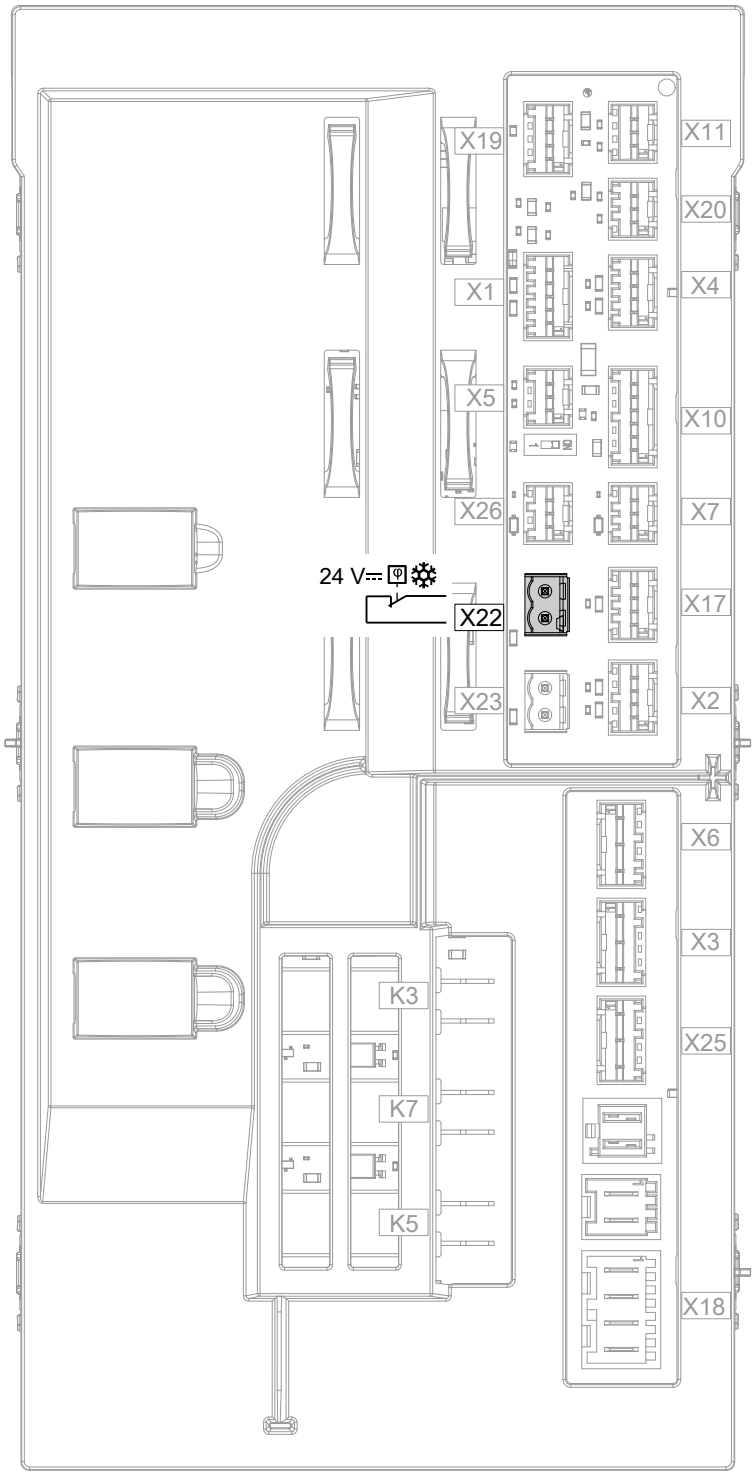


Fig. 46

Electrical connection (cont.)

X22

Clamps	Component	Explanation
X22.1 GND X22.2 24 V	Contact humidistat, 24 V⎓ for heating/cooling circuit 2 ***Note*** *Use only 230 V~ contact humidistat in conjunction with external buffer cylinder. In this case, the contact humidistat is connected to the mixer extension kit of the respective heating/cooling circuit (ADIO electronics module).*	Recommended connecting cable: ▪ 2 x 0.75 mm² Max. cable length: 25 m Or ▪ 2 x 1.5 mm² Max. cable length: 50 m

Fitting the programming unit

In the delivered condition, the programming unit is located at the bottom. For easier access, the programming unit can be fitted at the top, e.g. for lower installation heights.
In this case, fit the programming unit bracket at the top.

Electrical connection (cont.)

Fitting the programming unit bracket at the top

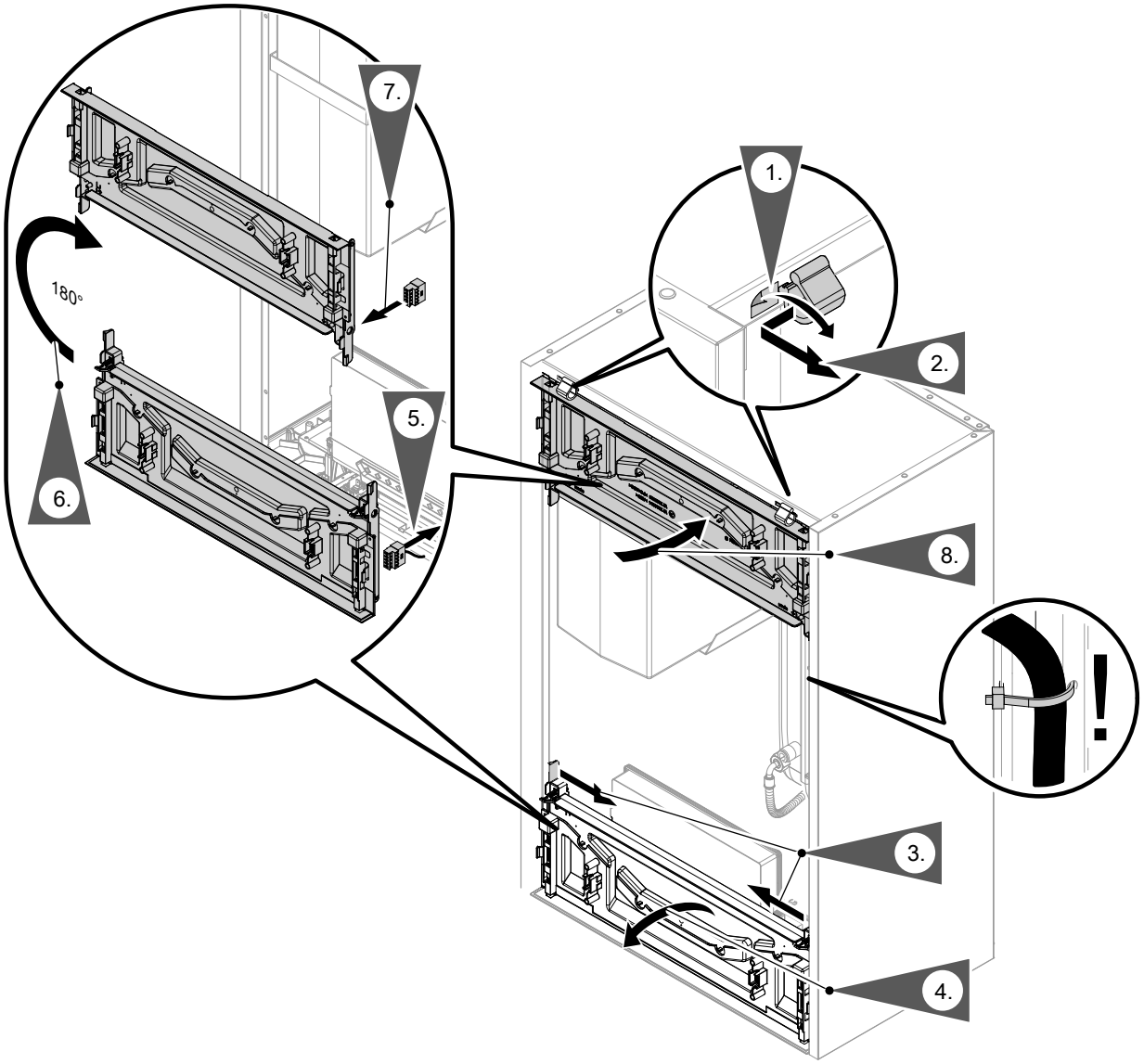


Fig. 47

Electrical connection (cont.)

Installing the programming unit

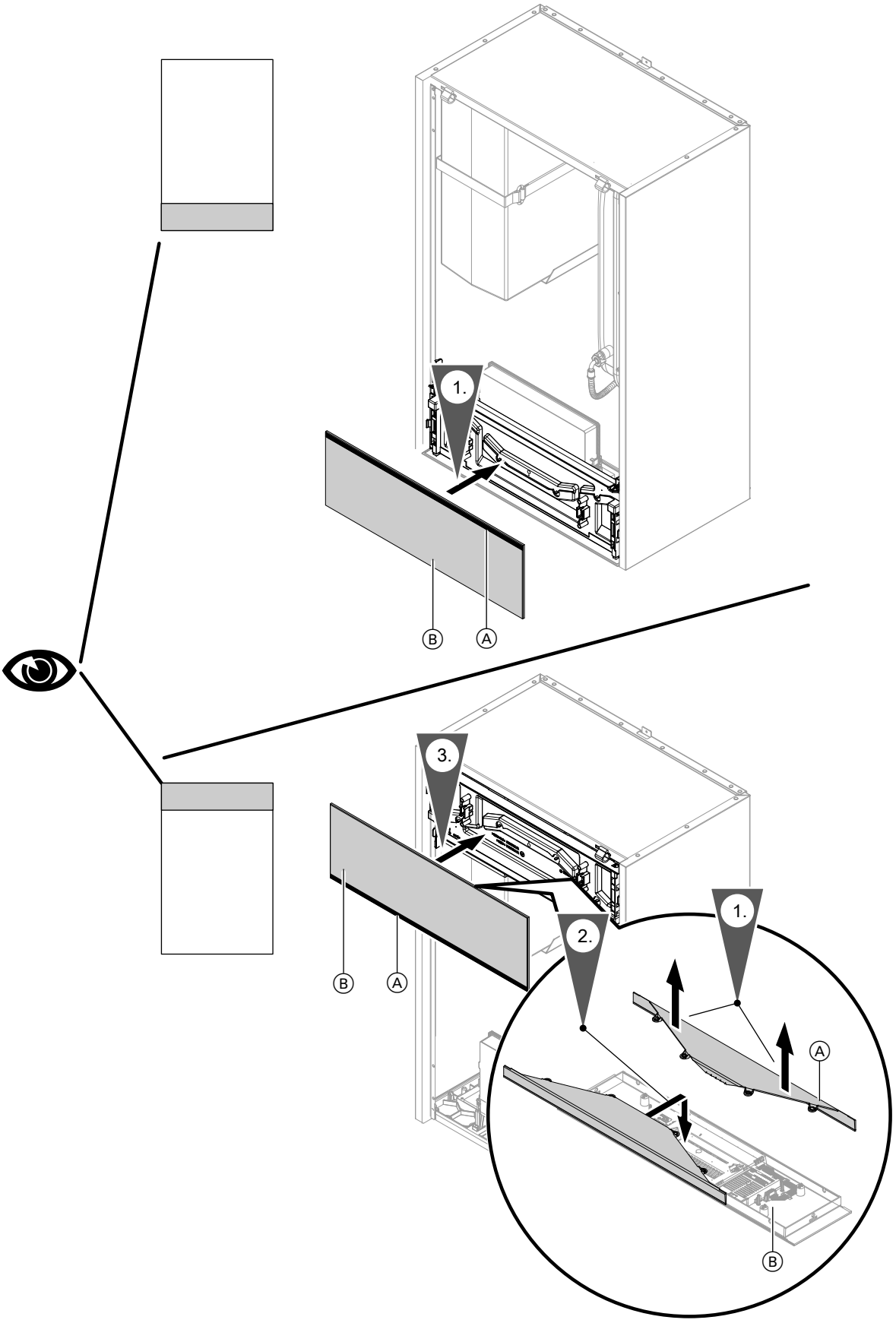


Fig. 48

Ⓐ Lightguide
Ⓑ Programming unit

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Electrical connection (cont.)

Checking the outdoor unit connection version

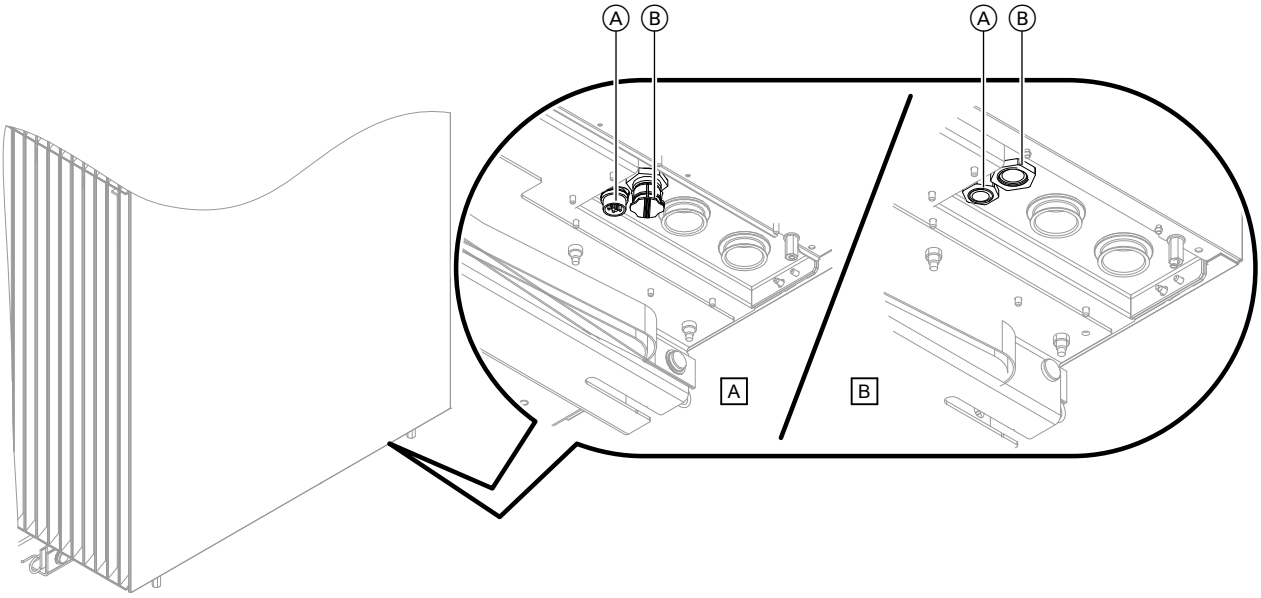

Fig. 49

Connection version A: With plug

Only for outdoor unit with 2 fans
Ⓐ Plug for CAN bus communication cable
Ⓑ Plug for power cable

Connection version B: With cable entry

For outdoor unit with 1 or 2 fans
Ⓐ Cable entry for CAN bus communication cable
Ⓑ Cable entry for power cable

Electrical connection (cont.)

Preparing the electrical connection on the outdoor unit

Connection version [A]: With plug

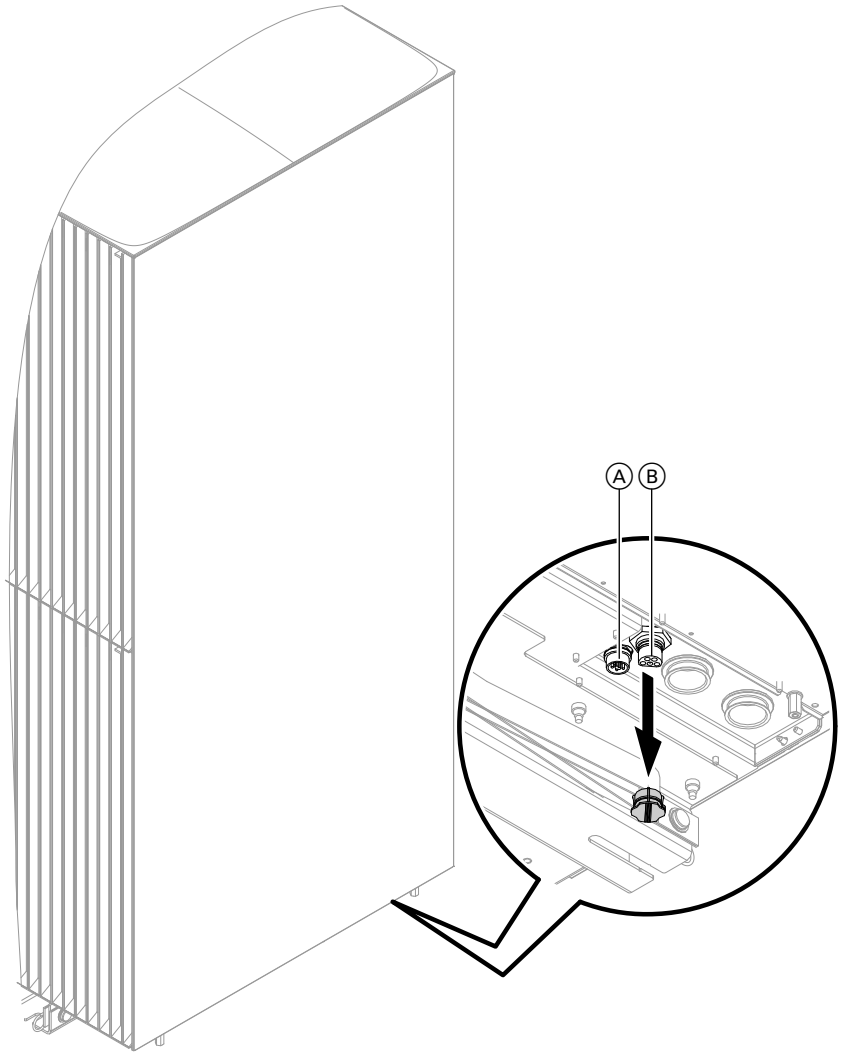

Fig. 50

Ⓐ Plug for CAN bus communication cable
Ⓑ Plug for power cable

Remove cap on power supply.

Electrical connection (cont.)

Connection version B: With cable entry

Outdoor unit with 1 fan: Cable routing to the terminal area

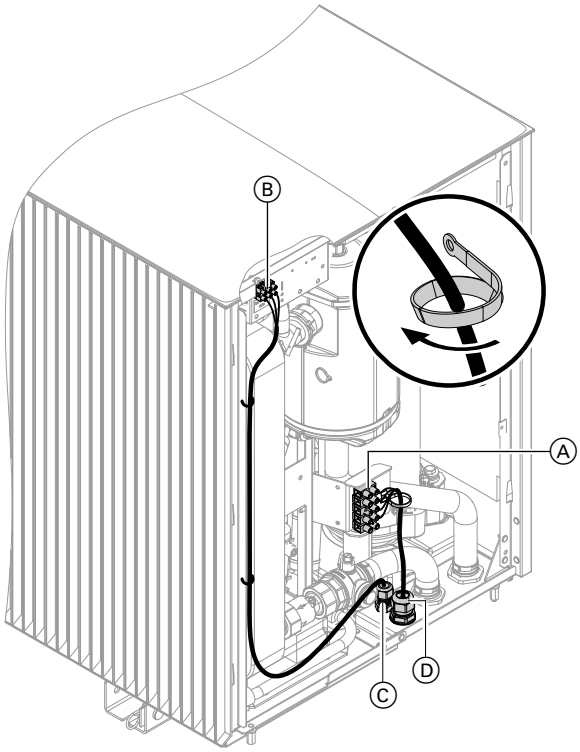

Fig. 51

Ⓐ Compressor power supply 230 V~
Ⓑ 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

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

Electrical connection (cont.)

Outdoor unit with 2 fans: Cable routing to the terminal area

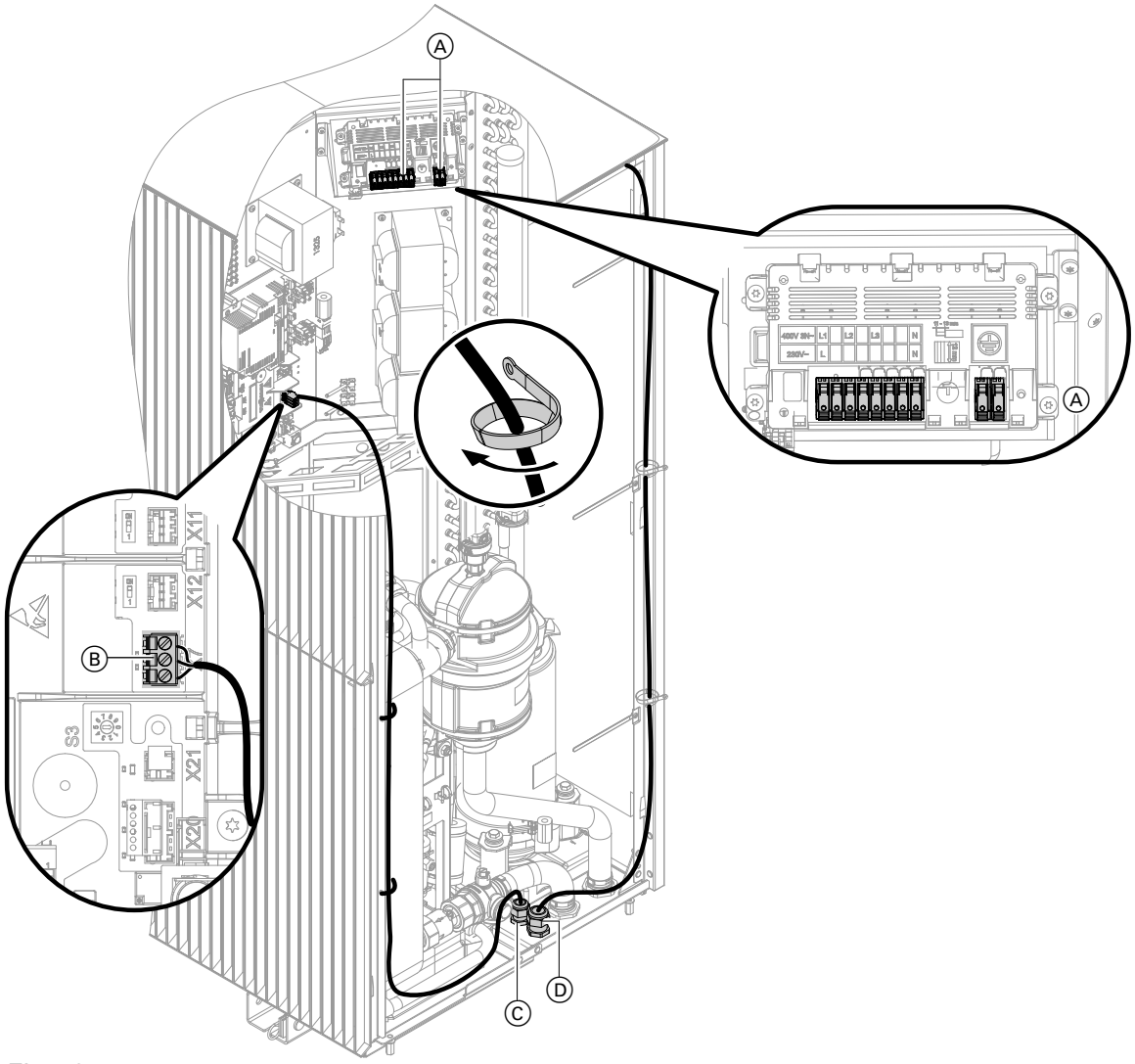

Fig. 52

Ⓐ Compressor power supply 230 V~/400 V~
Ⓑ 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

Length of cable in appliance:
- Compressor power cable 230 V~/400 V~: 1900 mm
- CAN bus communication cable: 1000 mm

Indoor/outdoor unit CAN bus communication cable (accessories)

Please note
Incorrectly carried out electrical installation can cause damage to the appliance.
Protect the CAN bus communication cable from damage.

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

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Electrical connection (cont.)

Recommended cable

- Recommended cable:
  Indoor/outdoor unit bus communication cable (accessories), fully wired, in 5, 15 or 30 m lengths
- For wiring on site:
  Only use the cable types listed in the following two tables.
  Also connect shielding to the "GND" connection of each of the following:
  - On connection of outdoor unit
  - In the terminal area on the underside of the appliance: Connection 72

  If required, remove the terminator from terminal 72.

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 for termination are connected at the factory.

Electrical connection (cont.)

Connection version A: With plug

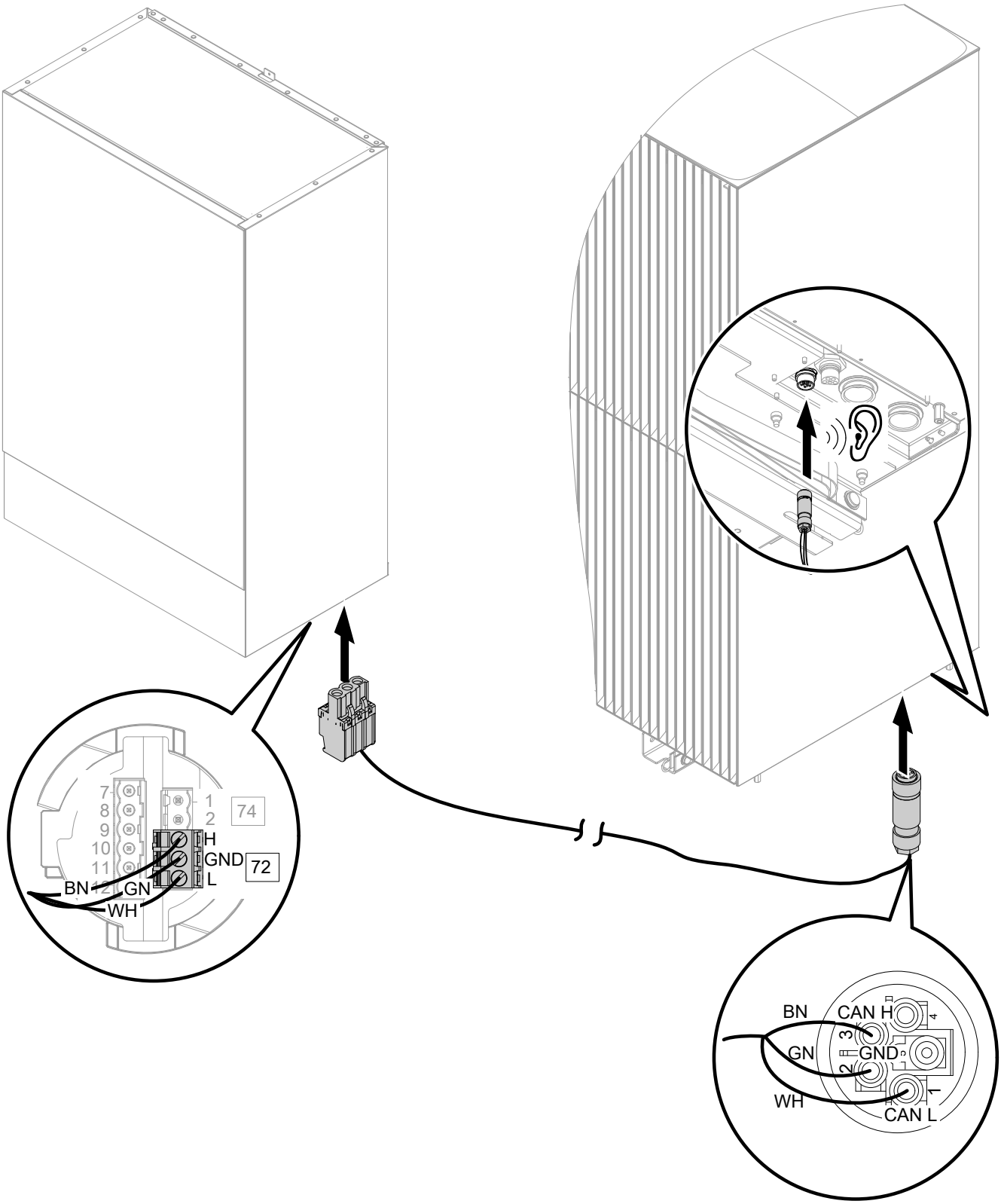

Fig. 53

Note
Only use cables with shielding:
Connect the shielding on both sides of the connecting cable to the "GND" connection.

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Electrical connection (cont.)

Connection version B: With cable entry

Note
Only use cables with shielding:
Connect the shielding on both sides of the connecting cable to the "GND" connection.

Observe the following for on-site cables:
- Cable length:
  Min. 3 m
  Max. 30 m

Outdoor unit with 1 fan

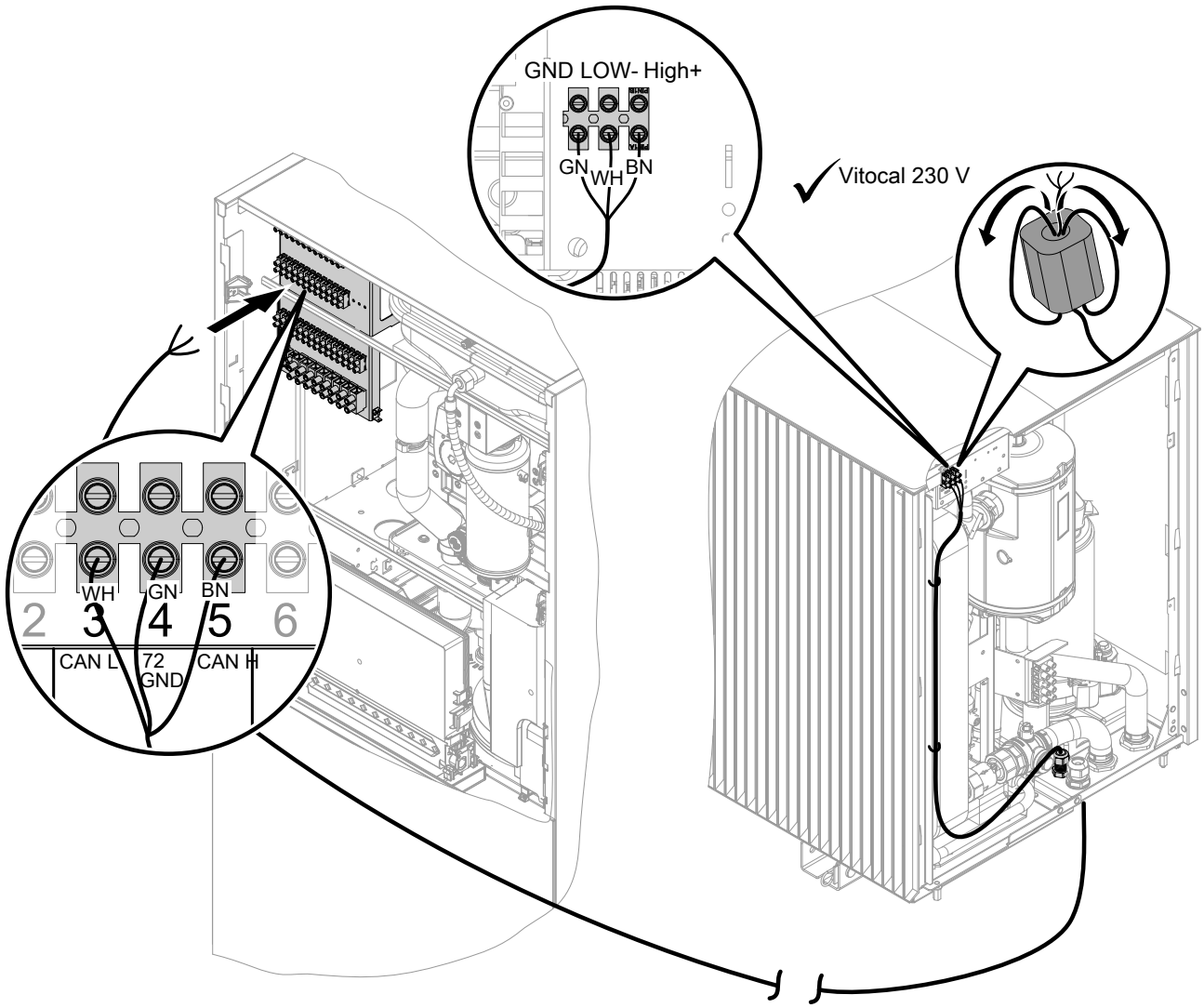

Fig. 54

Electrical connection (cont.)

Outdoor unit with 2 fans

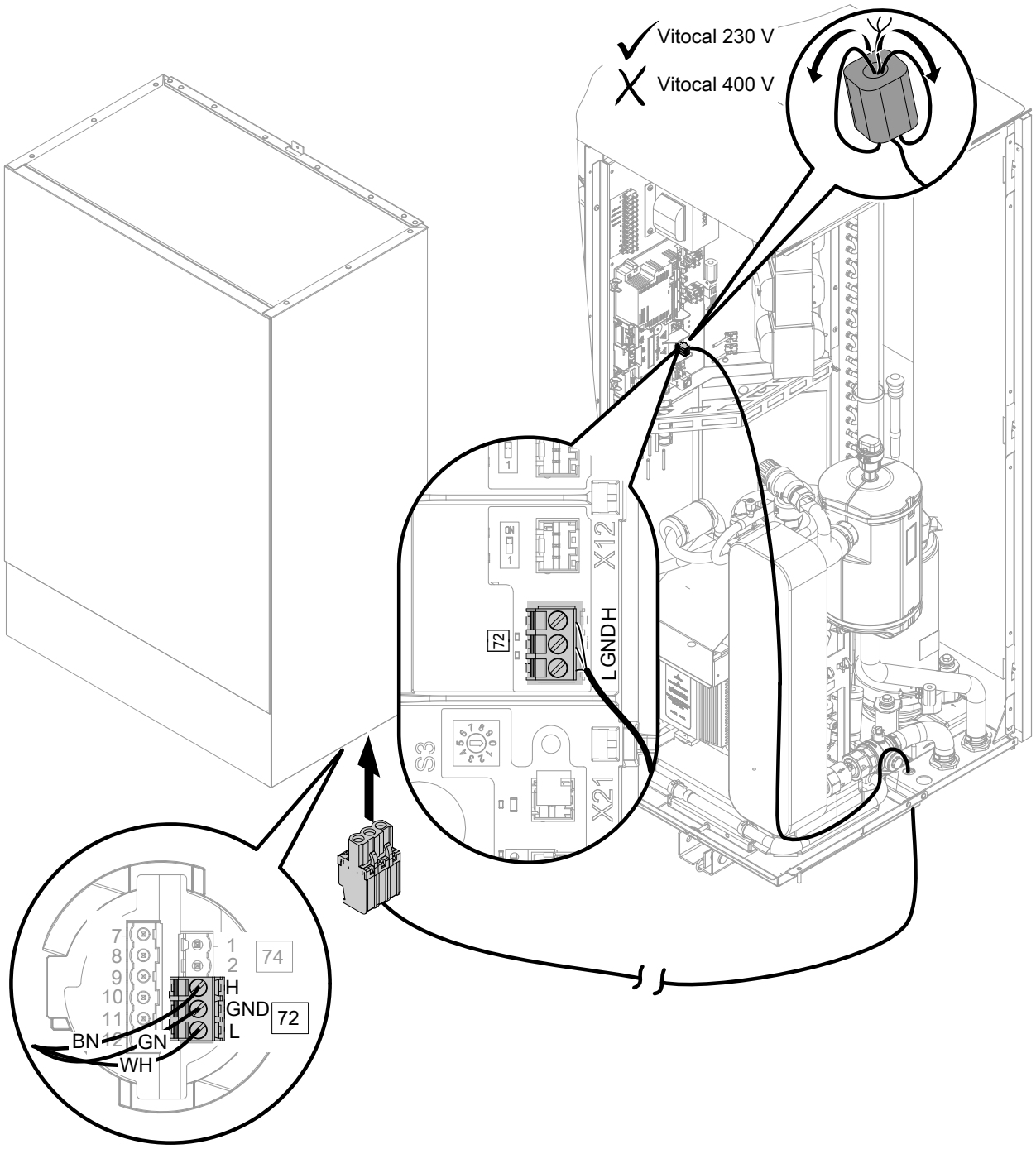

Fig. 55

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

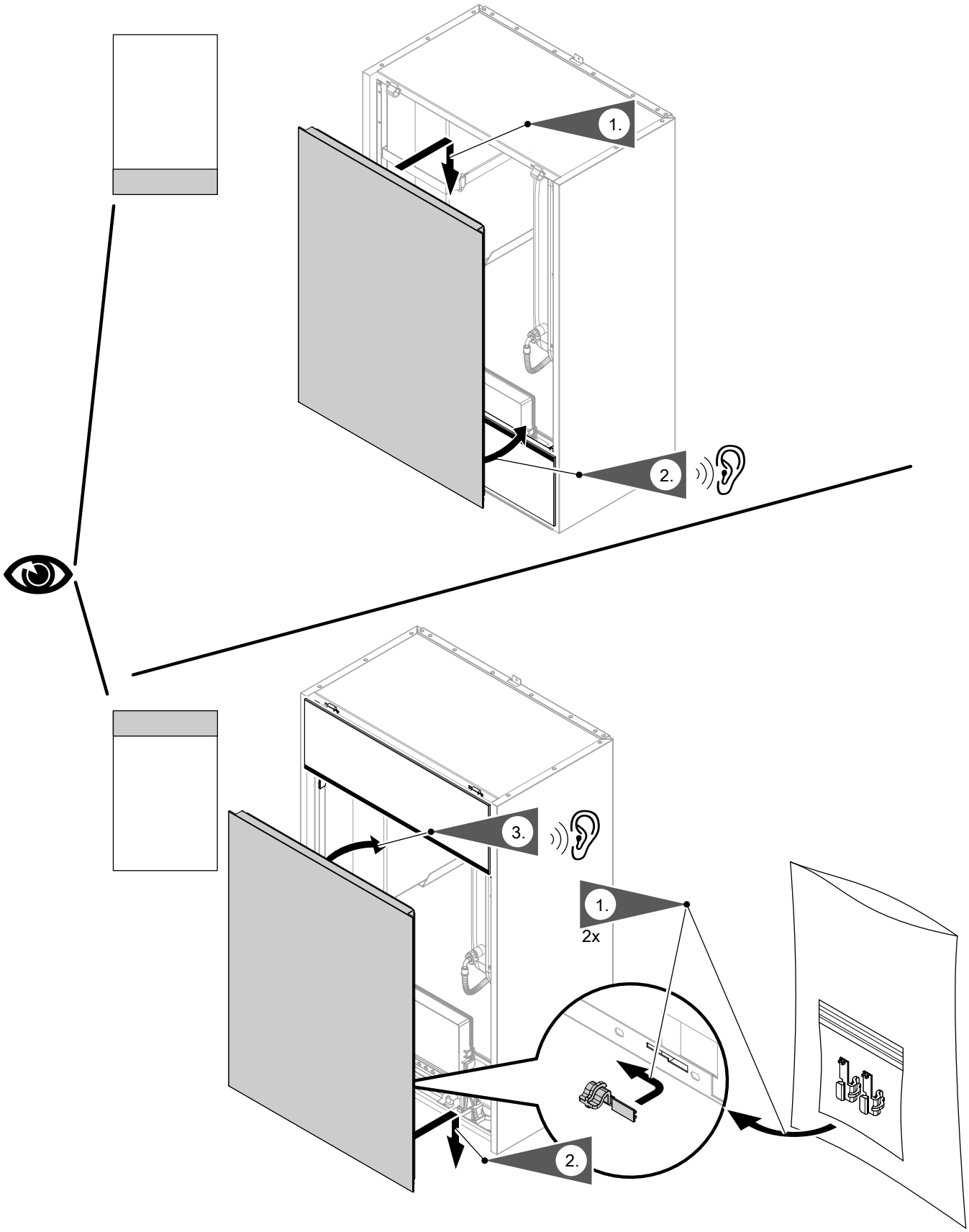

Fig. 56

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Power supply

Isolators for non-earthed conductors

- Install an isolator in the power cable to provide omnipolar separation from the mains for all active conductors, corresponding to overvoltage category III (3 mm) for full isolation. This isolator must be fitted in the permanent electrical installation in line with installation requirements, e.g. mains isolator or upstream circuit breaker.
- We additionally recommend installing an AC/DC-sensitive RCD (RCD class B) for DC (fault) currents that can occur with energy efficient equipment.
- Select and size residual current devices 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 ID 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".

- 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.
  Or
  Combine the cables for the power-OFF signal and for the heat pump control unit power supply (3 x 1.5 mm^2) in a 5-core cable.
- 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 cut for a maximum of 3 x 2 hours per day (24 h).
- The **heat pump control unit/PCB** must be supplied **without** power-OFF. Tariffs subject to possible shutdown must not be used here.
- Using self-consumption (use of power generated by the photovoltaic system for own use):
  During the power-OFF period, it is **not** possible to operate the compressor with power generated on site.
- 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 MCB/fuse, or at least on the same phase, as the heat pump control unit.
  Connection to the same MCB/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 types ... SP: 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 fuse protection of the appliance only

- 1/N/PE 230 V/50 Hz
- Recommended power cable: 3 x 6.0 mm²
- 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~ junction box.

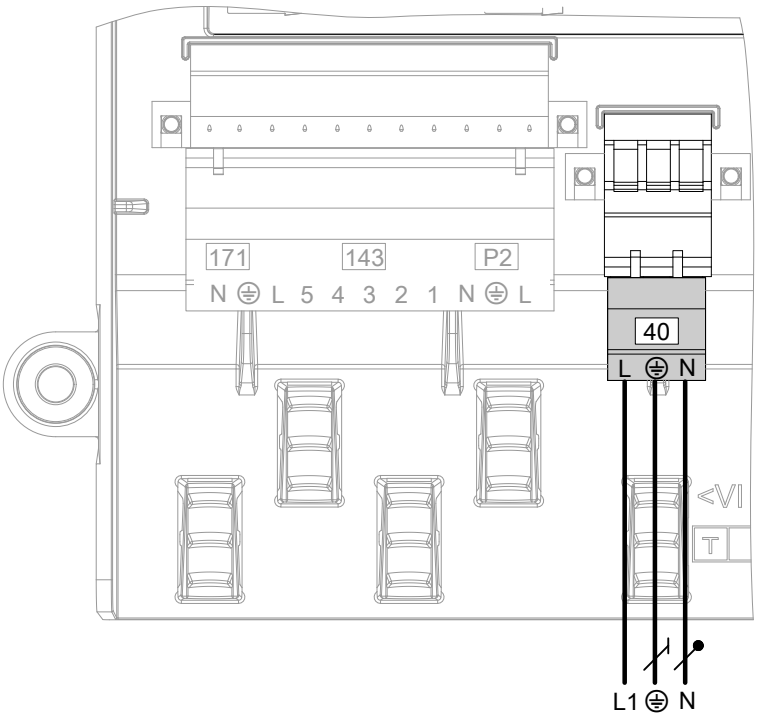

Fig. 57

"40" Mains terminal for heat pump control unit power supply

Heat pump control unit	
Power supply	1/N/PE 230 V/50 Hz
Recommended power cable	
▪ Without power-OFF	3 x 1.5 mm²
▪ With power-OFF	5 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.

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Power supply (cont.)

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

- The mains connection is made in the 230 V~ junction box.
- The 230 V~ power supply can be 1-phase, 2-phase or 3-phase.
- The 400 V~ power supply can be 2-phase or 3-phase.

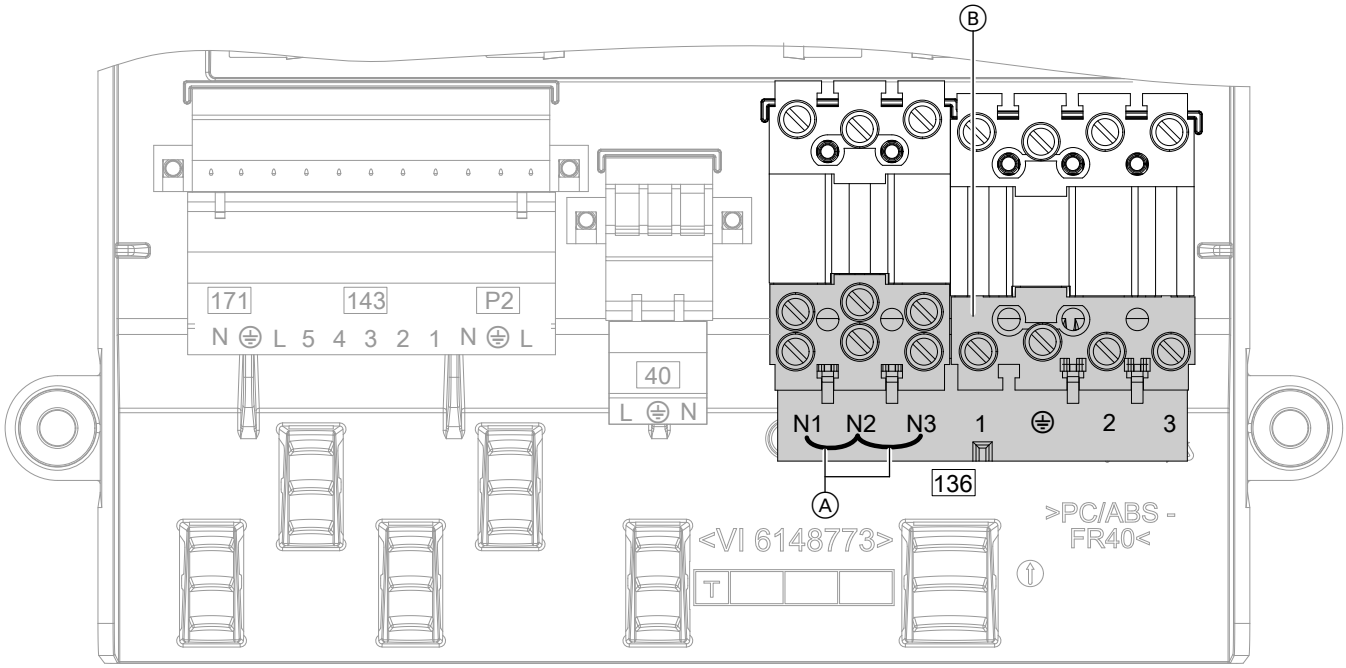


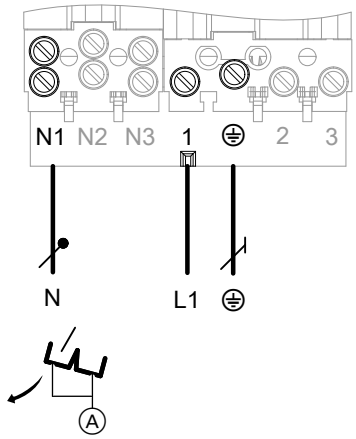
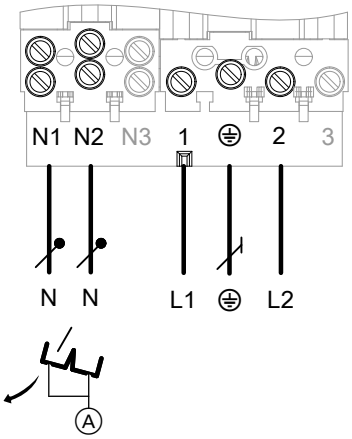
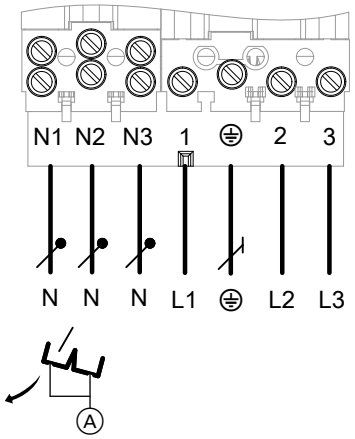
Fig. 58

Ⓐ Jumpers
Ⓑ Mains terminal for Instantaneous heating water heater power supply

Power supply (cont.)

Instantaneous heating water heater power supply 230 V~

Power supply

	1-phase	2-phase	3-phase
	 1x 1/N/PE 230 V/50 Hz	 2x 1/N/PE 230 V/50 Hz	 3x 1/N/PE 230 V/50 Hz
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	5 kW	Not required

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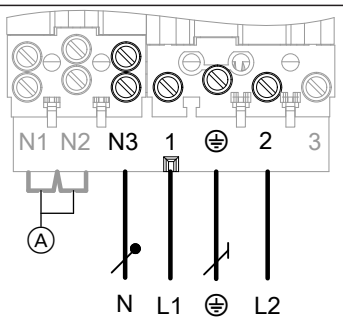
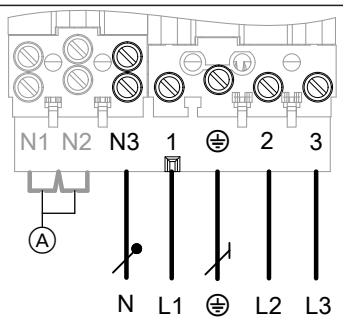
Power supply (cont.)

Instantaneous heating water heater power supply 400 V~

Power supply	2-phase	3-phase
	 2/N/PE 400 V/50 Hz	 3/N/PE 400 V/50 Hz
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	5 kW	Not required

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 MCB/fuse or mains isolator. 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.

Power supply (cont.)

Connection version [A]: With plug

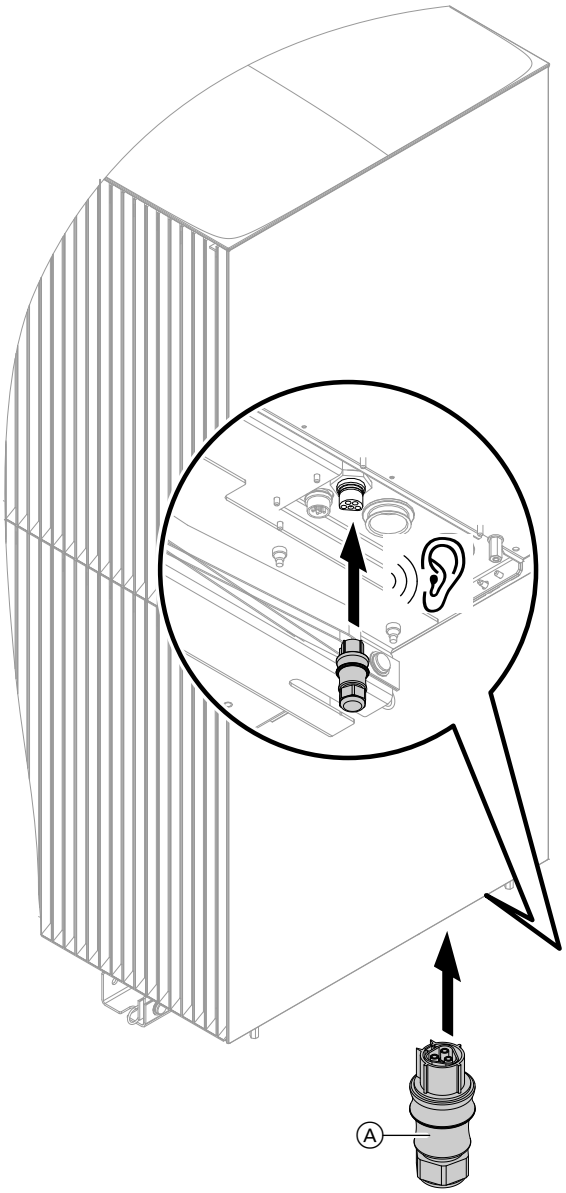


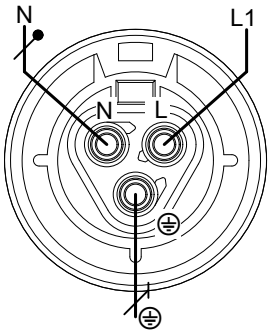
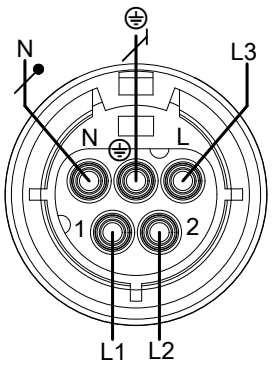
Fig. 59

Ⓐ Power supply plug

- Do not use wire ferrules.
- Shield the power cable from direct sunlight.

Power supply (cont.)

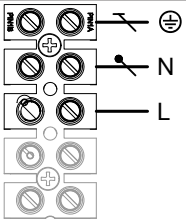
Only for outdoor unit with 2 fans

Compressor power supply	**230 V~**	**400 V~**
	 1/N/PE 230 V/50 Hz	 3/N/PE 400 V/50 Hz
Recommended power cable		
▪ Cable type	H07RN-F The use of PVC cable is **not** permissible.	H07RN-F The use of PVC cable is **not** permissible.
▪ Cross-section	3 x 2.5 mm² **Or** 3 x 4.0 mm²	5 x 2.5 mm²
Max. cable length		
▪ For 3 x 2.5 mm²	20 m	—
▪ For 3 x 4.0 mm²	32 m	—
▪ For 5 x 2.5 mm²	—	30 m
Max. fuse rating	B25A	16 A

Connection version B: With cable entry

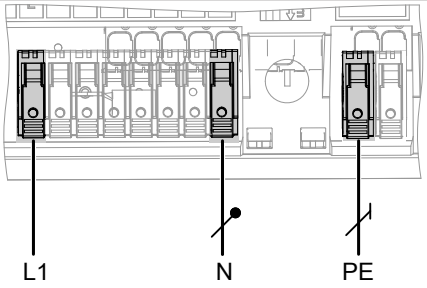
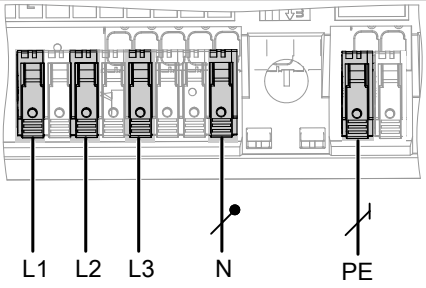
- For terminal area of outdoor unit: See chapter "Preparing the electrical connection on the outdoor unit".
- Shield the power cable from direct sunlight.

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 into the 230 V~ junction box of the indoor unit; with heat pump cascades the connection is only made at the lead heat pump.

Electrical connections of the power supply:

- Indoor unit:
  See following chapter:
  - "230 V~ junction box: 230 V~ components and switching contacts"
  - "Indoor unit: Heat pump control unit power supply"
  - "Indoor unit: Power supply for instantaneous heating water heater"
- Outdoor unit:
  See chapter "Compressor power supply".

Note

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

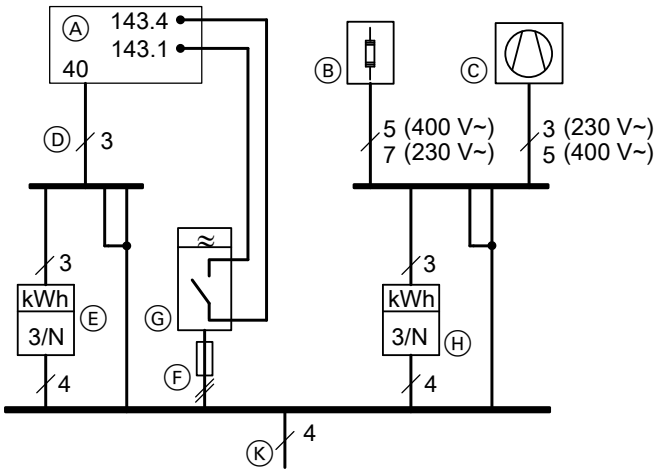


Fig. 60 Diagram excluding fuses and RCD

Ⓐ 230 V~ junction box
Ⓑ 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 enabled); 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 via the integrated energy management system as well as further information: See **link.viessmann.com/energymanagement**.

Fig. 61

Indoor unit: Close the 230 V~ junction box

After completing all electrical connections, seal the 230 V~ junction box tightly.

Torque for the screws: 2.8 Nm

Closing the outdoor unit

Note

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

Closing the outdoor unit (cont.)

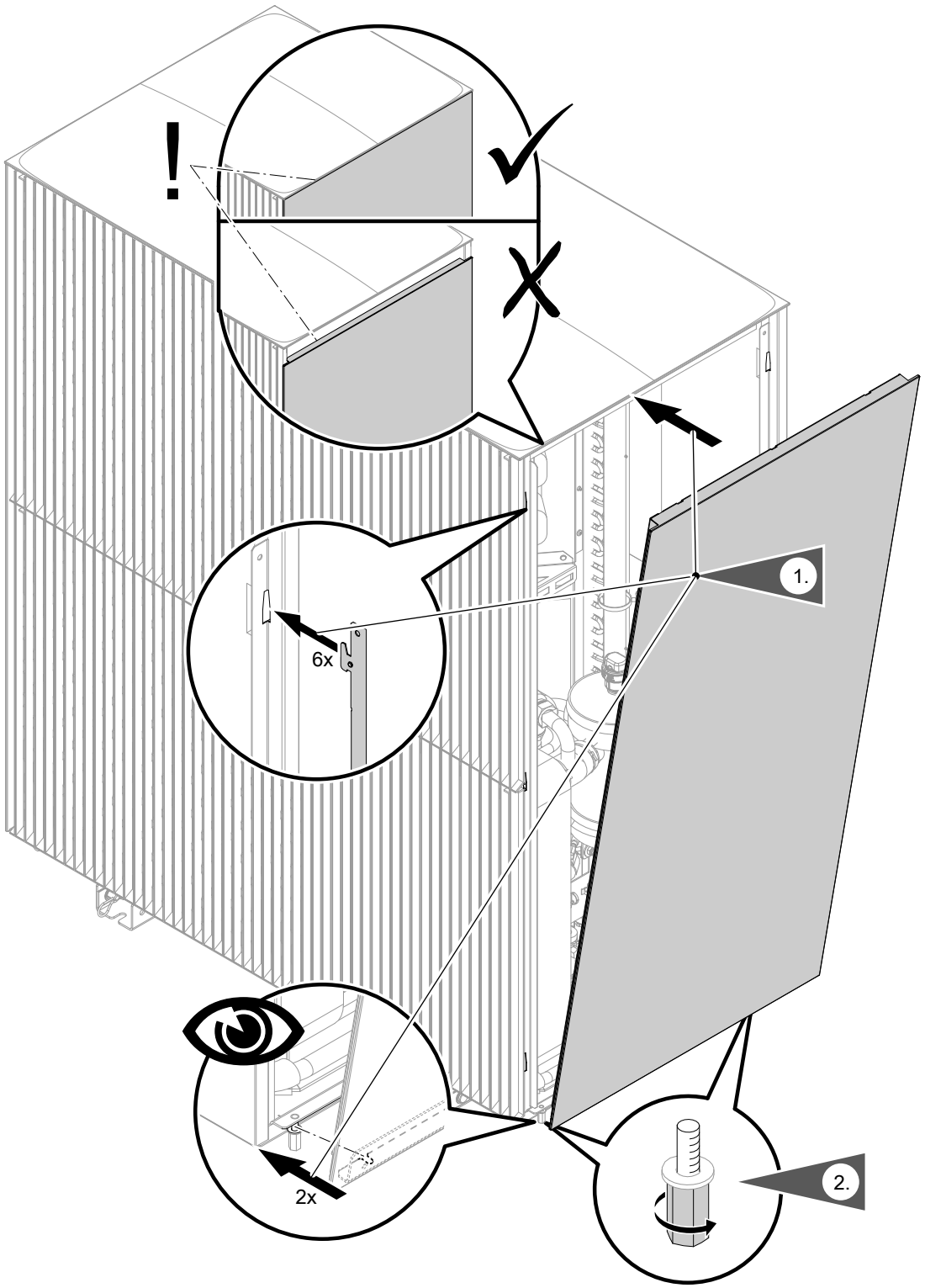
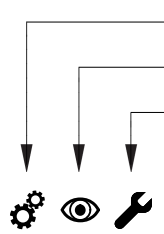


Fig. 62

2. Torque 5.0 +1.0 Nm

Steps - commissioning, inspection and maintenance



Compiling reports

Enter the readings taken during commissioning in the reports on page 177 onwards and the operator's log (if available).

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:
  - System is cleaned.
  - 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.
- The indoor unit, the instantaneous heating water heater and the and the outdoor unit are connected to the mains supply.
- If the heat pump is integrated into an external CAN bus system with other Viessmann appliances:
  All CAN bus subscribers are connected but not yet commissioned.
- Observe start sequence of heat pump and external CAN bus subscribers.

Commissioning the heat pump as a single appliance

Commissioning of the heat pump as a single appliance is carried out using the commissioning assistant on the heat pump display, or via the ViGuide App.

Commissioning the heat pump in the system network with other Viessmann appliances (CAN bus subscribers)

All CAN bus subscribers are commissioned via the ViGuide app. To do so, start commissioning on the main appliance (heat pump) using the commissioning assistant and select "Commissioning with software tool". The connected Viessmann appliances detect connection to the main appliance (heat pump) and display this on the control device.

Note
If an external CAN bus subscriber (Viessmann appliance) has already been commissioned beforehand, reset this appliance to its pre-commissioned status.

Installation and service instructions for CAN bus subscribers (Viessmann appliance)

Start sequence

The start sequence must always be observed:

1. Switch on the power supply at the main MCB/fuse.
2. Switch on power to the outdoor unit.
3. Switch on power to the indoor unit.
4. Start indoor unit at the ON/OFF switch.

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.)

5. If other CAN bus subscribers are being commissioned at the same time:
   Start all other CAN bus subscribers.
6. Perform commissioning using the commissioning assistant or the ViGuide app:
   See chapter "Commissioning requirements".

Commissioning steps

1. If the appliance has not been switched on yet: Turn on the ON/OFF switch. The commissioning assistant starts automatically.
   If the appliance has already been switched on: See chapter "Calling up the commissioning assistant at a later point".
2. Further steps: See "Commissioning assistant" in the following overview.

   Note
   Depending on the heat generator type, the accessories connected and other settings, not all menu points will be displayed.
3. Further settings: See "ViCare app"
   Or

   Operating instructions

Commissioning assistant

Note
Further settings are possible via the ViGuide app.

Procedure	Explanations and references
Commissioning	
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 appliance automatically switches on the WiFi access point. Carry out further commissioning steps in accordance with the software tools instructions or the app.
Demo operation	In demo operation, sensor values and hydraulic settings are simulated. The activated demo mode can be terminated from the Service menu. Upon return to normal operation, a restart is carried out.
Information	Confirm the information displayed on the "service link" and the data protection information.
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.

Commissioning the system (cont.)

Procedure	Explanations and references
Installation conditions of outdoor unit	Installation conditions of outdoor unit: See installation information on page 24.
▪ Yes, installation conditions are met	Continue commissioning with the outdoor unit.
▪ No, continue with instantaneous heating water heater only	Start up the system without the outdoor unit: Operation with the instantaneous heating water heater, e.g. screed drying
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. Room heating only starts with instantaneous heating water heater.	Outdoor unit not ready for operation: Operation with instantaneous heating water heater, no room cooling

System scheme	
Low loss header/buffer cylinder	Only for indoor units with 1 integral heating/cooling circuit: 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 water/coolant buffer cylinder with 1 buffer temperature sensor
Heating/cooling circuit 1 to Heating/cooling circuit 4	Configuring the heating/cooling circuits ***Note*** *For types "... 2C", only 2 heating/cooling circuits can be configured.*
▪ 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 heating water/coolant buffer cylinder (if installed) must be configured for "Heating and cooling". ▪ Heating and cooling An external heating water/coolant buffer cylinder (if installed) must be configured for "Heating and cooling".
▪ Type	Type of energy distribution, e.g. radiators, underfloor heating system
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

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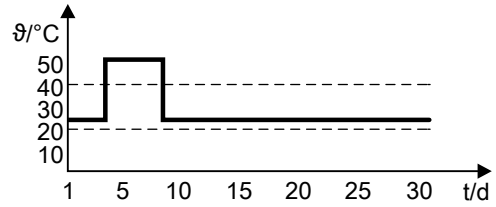
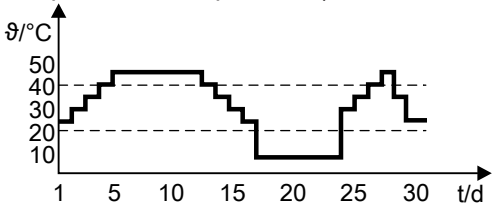
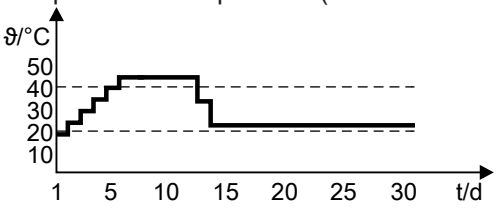
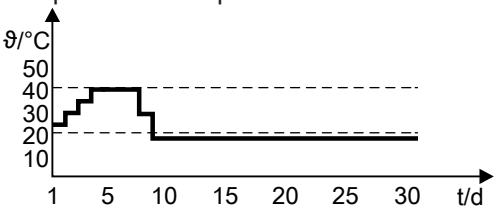
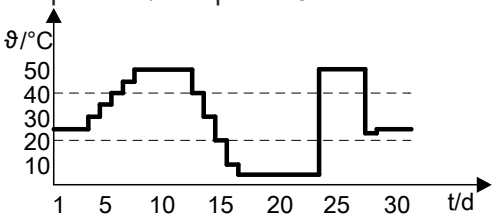
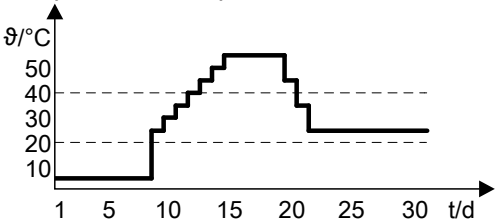
Commissioning the system (cont.)

Procedure	Explanations and references
Filling assistant	
System pressure ▪ Set value ▪ Range	Select the system pressure values. Set value of the heating water side system pressure in bar 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 appears.
Filling ▪ Filling heating/cooling circuit 2 ▪ Filling DHW ▪ Filling defrost buffer ▪ Filling heating/cooling circuit 1 ▪ Building up the system pressure	Fill the system with heating water. See chapter "Filling heating/cooling circuit 2" on page 97. See chapter "Filling the remaining consumer circuits" on page 98. See chapter "Building up the system pressure" on page 100.
Venting	The system is vented via the quick-action air vent valve in the outdoor unit: See chapter "Venting the system" on page 101. ***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. Fit an air vent valve into this hydraulic connection and use it to vent the system: See page 45.* ***Note*** *The venting process can take up to 20 min.*

Commissioning the system (cont.)

Procedure	Explanations and references
Extensions	
Power-OFF and Smart Grid	Activation of power-OFF or Smart Grid: Connection of floating contacts of the power supply utility (connections 143.4 and 143.5 in the 230 V~ junction box): See page 57.
▪ Not available	Neither power-OFF nor Smart Grid is connected.
▪ Power-OFF	The floating contact for power-OFF is connected (connection 143.4): See page 57.
▪ Smart Grid	Floating contacts for Smart Grid are connected (connections 143.4 and 143.5): See page 57.
Electric booster heater	Enabling the built in instantaneous heating water heater
▪ Function 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.
▪ Only DHW	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.
Digital input 1	Function of the floating contact connected to connection 143.2 in the 230 V~ junction box
▪ No function	No floating contact connected
▪ External demand, DHW circulation pump	If the connected button is pressed, the DHW circulation pump runs for 5 minutes.
▪ External blocking	Refrigerant circuit and instantaneous heating water heater are blocked.
▪ Blocking heating/cooling circuit 1	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.
Digital input 2	Function of the floating contact connected to connection 143.3 in the 230 V~ junction box
▪ No function	No floating contact connected
▪ Fault message input	External appliance fault message, e.g. external heat generator
▪ Blocking heating/cooling circuit 2	If the temperature limiter to restrict the maximum temperature for underfloor heating circuit 2 responds, the room heating for this heating/cooling circuit is switched off.
System configuration	
Quieter operation	Quieter operation of the outdoor unit: During quieter operation, the compressor and fan are operated at reduced speed.
▪ Function	Enable/disable quieter operation.
▪ Time program	Set the time program for quieter operation: See operating instructions.
▪ Adjustable by system user	Enable whether the time program for quieter operation can be set 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.

Commissioning the system (cont.)

Procedure	Explanations and references
▪ Profile A	Temperature/time profile 1 (in acc. with EN 1264-4) 
▪ Profile B	Temperature/time profile 2 (in acc. with ZV parquet and flooring technology) 
▪ Profile C	Temperature/time profile 3 (in acc. with Austrian Standards) 
▪ Profile D	Temperature/time profile 4 
▪ Profile E	Temperature/time profile 5 
▪ Profile F	Temperature/time profile 6 

Switching WiFi on/off

The appliance is equipped with an integrated WiFi communication module with extended type plate. This WiFi communication module supports commissioning, maintenance and servicing with "ViGuide"/"ViGuide App" as well as operation via the "ViCare app".

3 labels with the access details required for establishing the connection are attached at the factory to the front of the programming unit. The access code is marked with a "WiFi symbol".

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Commissioning the system (cont.)

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

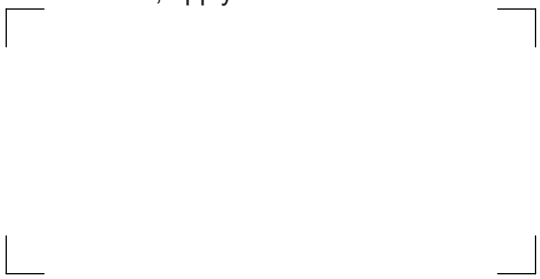

Fig. 63

- Affix label in the field provided for the purpose in the operating instructions.

Switch on the WiFi connection. Establish a connection to the router:
- Information on WiFi: See chapter "WiFi operational reliability and system requirements".
- **Establishing an 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. Confirm with ✓.
5. **"Commissioning"**

Commissioning via ViGuide app

Note
Apps for commissioning and service are available for iOS and Android devices.

Download on the App Store

GET IT ON Google Play

The appliance automatically switches on the WiFi access point.

1. ☰
2. **"Service"**
3. Enter password **"viservice"**.
4. Confirm with ✓.
5. **"Commissioning"**
6. **"Commissioning with software tool"**
7. Confirm with ✓.
8. Follow the instructions in the 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 37.

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Filling the system (cont.)

Fill and top-up water

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

Please note
Unsuitable fill and top-up water increases the level of deposits and corrosion. This can reduce the output of the heat pump or cause damage to the system, in particular to the integral instantaneous heating water heater.
- 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

Note
For indoor units with 2 integrated heating/cooling circuits, heating/cooling circuit 2 is filled in the 1st step. Then the filling of the rest of the system, including the outdoor unit, is menu-guided. For this, the 4/3-way valve switches in turn between each of the lines for the heating/cooling circuit 1, DHW heating, defrosting, etc.

Filling heating/cooling circuit 2

Note
Only for indoor units with 2 integral heating/cooling circuits

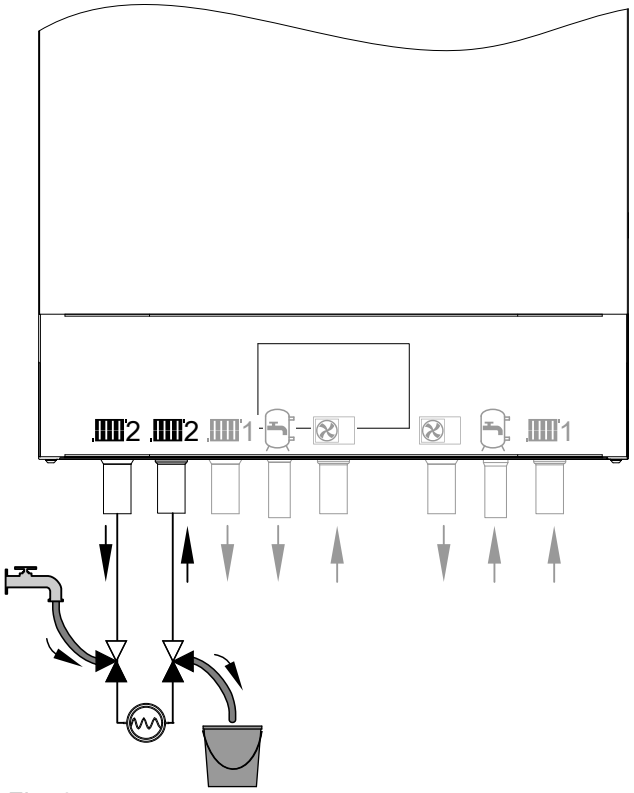

Fig. 64

1. Call up the filling function in the commissioning assistant.
2. Connect the fill hose to the 3-way ball valve, heating/cooling circuit 2 flow.
3. Connect the drain hose to the 3-way ball valve, heating/cooling circuit 2 return. Route the hose into a suitable container or drain outlet.

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Filling the system (cont.)

4. Open the 3-way ball valves in the heating/cooling circuit 2 flow and return as shown in Fig. 64.
   Allow the heating water to flow in via the fill hose.

   Required flow rate for filling with heating water:
   - Min. 600 l/h
   - Max. 1500 l/h

   Filling pressure: 0.3 to 0.5 bar (30 to 50 kPa) higher than diaphragm expansion vessel pre-charge pressure
   Factory-set pre-charge pressure of expansion vessel: 0.75 bar (0.075 MPa) to 0.95 bar (0.095 MPa)

5. Start the filling process in the commissioning assistant.

6. As soon as air bubbles are no longer coming out of the drain hose, end the filling with ✔.
   The commissioning assistant switches to filling the remaining consumer circuits.

7. Close both the 3-way ball valves.

8. Remove the fill and drain hoses.

Filling the remaining consumer circuits

DHW circuit (**"Filling DHW"**, integrated buffer cylinder (**"Filling defrost buffer"**) and heating/cooling circuit 1 (**"Filling heating/cooling circuit 1"**) are filled in turn.

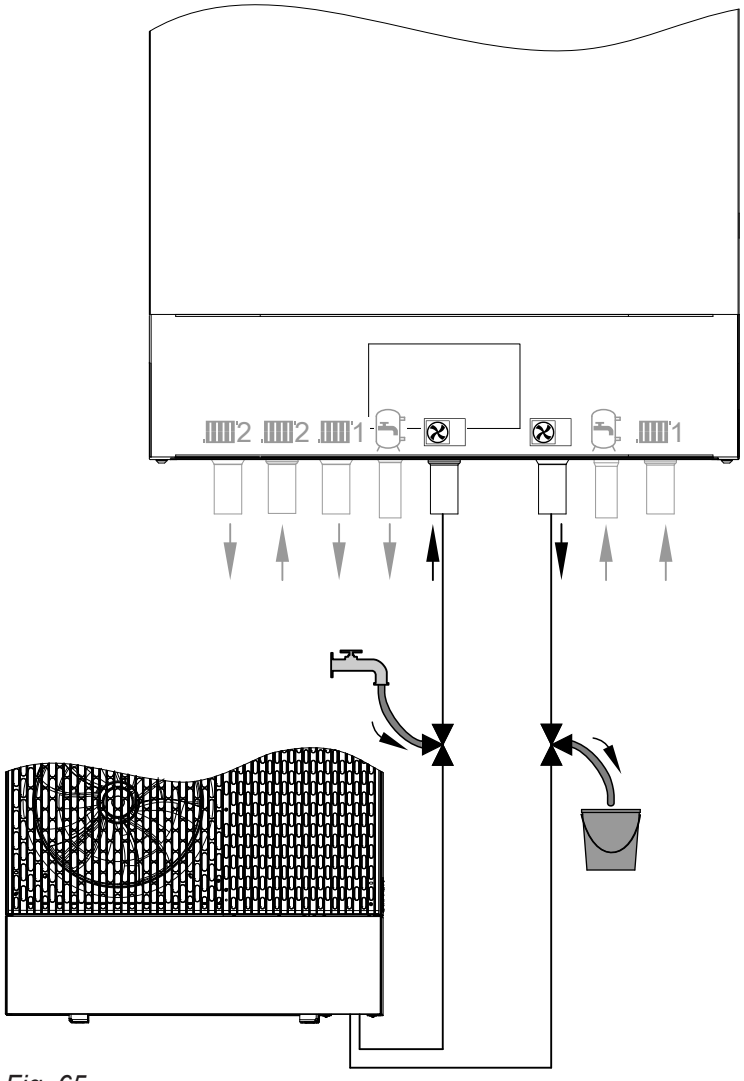

Fig. 65

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Filling the system (cont.)

Start filling the remaining consumer circuits:
- For an indoor unit with 1 integrated heating/cooling circuit, the filling starts automatically after **"Filling"** has been called up in the commissioning assistant.
- For an indoor unit with 2 integrated heating/cooling circuits, filling starts automatically after the filling of integrated heating/cooling circuit 2 has completed.

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

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

3. Open the outdoor unit 3-way flow and return ball valve as shown in Fig. 65: **Open in all directions**
   Allow the heating water to flow in via the fill hose.

   Required flow rate for filling with heating water:
   - Min. 600 l/h
   - Max. 1500 l/h

   Filling pressure: 0.3 to 0.5 bar (30 to 50 kPa) higher than diaphragm expansion vessel pre-charge pressure
   Factory-set pre-charge pressure of 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.

5. As soon as air bubbles are no longer 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 the 3-way ball valves.

8. Remove the fill and drain hoses.

Calling up the filling function

To activate this function, start the commissioning assistant.

See page 96.

Building up the system pressure

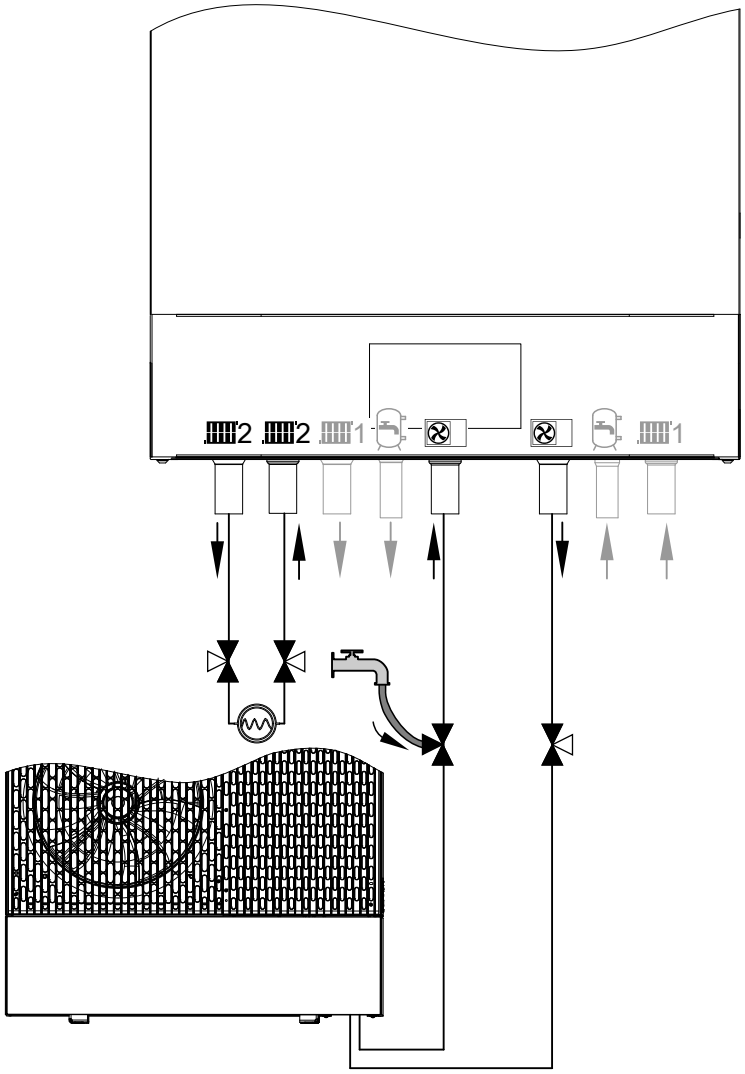

Fig. 66

Filling the system with the filling function is completed. The **"Build up system pressure"** function then starts automatically.

1. Only for indoor units with 2 integrated heating/cooling circuits:
   Open both 3-way ball valves to and from heating/cooling circuit 2: See Fig. 66.

2. Connect the fill hose to the 3-way ball valve from the outdoor unit flow (indoor unit heating water inlet).

3. Open the 3-way ball valve of the outdoor unit flow (indoor unit heating water inlet) as shown in Fig. 66: **Open in all directions**

4. Open the 3-way ball valve to the outdoor unit return (indoor unit heating water outlet): See Fig. 66.

5. Allow the heating water to flow in slowly via the fill hose.
   Check the system pressure on the display.

6. As soon as the required system pressure has been reached, end the process in the commissioning assistant.

7. Close the 3-way ball valve from the outdoor unit flow (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.

8. Check the internal and on-site hydraulic connections for leaks.
   Recommended test pressure: 2 to 2.5 bar (0.2 to 0.25 MPa)

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.

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Building up the system pressure (cont.)

9. Thermally insulate the hydraulic connections.

Activate system pressure function

To activate this function, start the commissioning assistant.

See page 96.

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. Once the **"Venting"** function has started, the entire system is automatically vented by means of the quick-action air vent valve in the outdoor unit. The quick-action air vent valve is on the float air vent valve: See "Overview of internal components". 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 case of a large system pressure drop, restore the system pressure: See chapter "Establishing system pressure".

Activating the venting function

To activate this function, start the commissioning assistant.

See page 96.

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 MCB/fuse or a mains isolator. Check that it is no longer 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.
- 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) No 517/2014 and 2015/2067).

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Opening the heat pump (cont.)

Opening the indoor unit

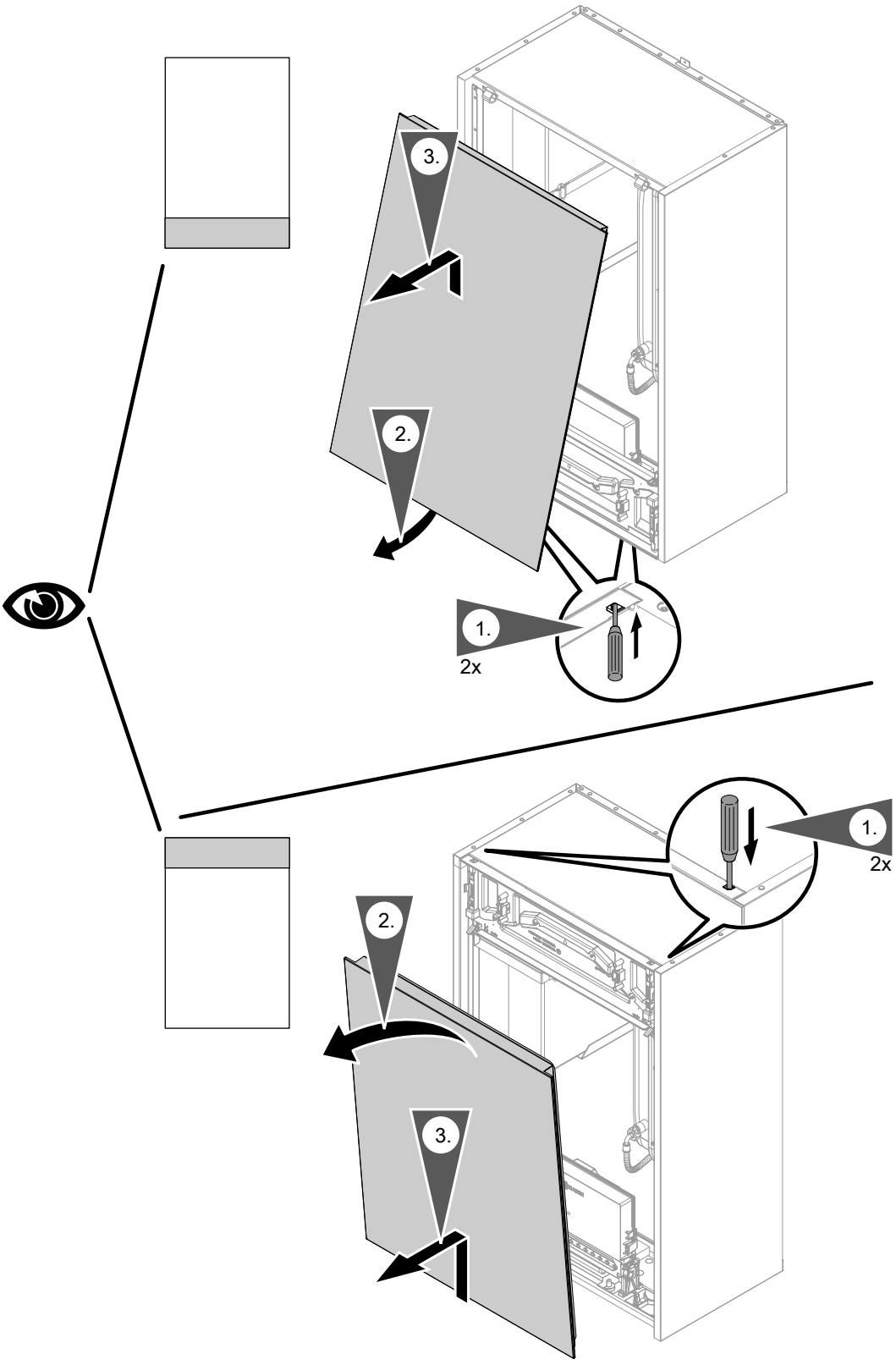

Fig. 67

Opening the heat pump (cont.)

Moving the programming unit to the maintenance position

- To facilitate certain maintenance tasks, move the programming unit up or down, depending where it is located.
- Do not disconnect the plug from the mounting panel. Do not alter where and how the cable is secured (fixing point of the cable tie).

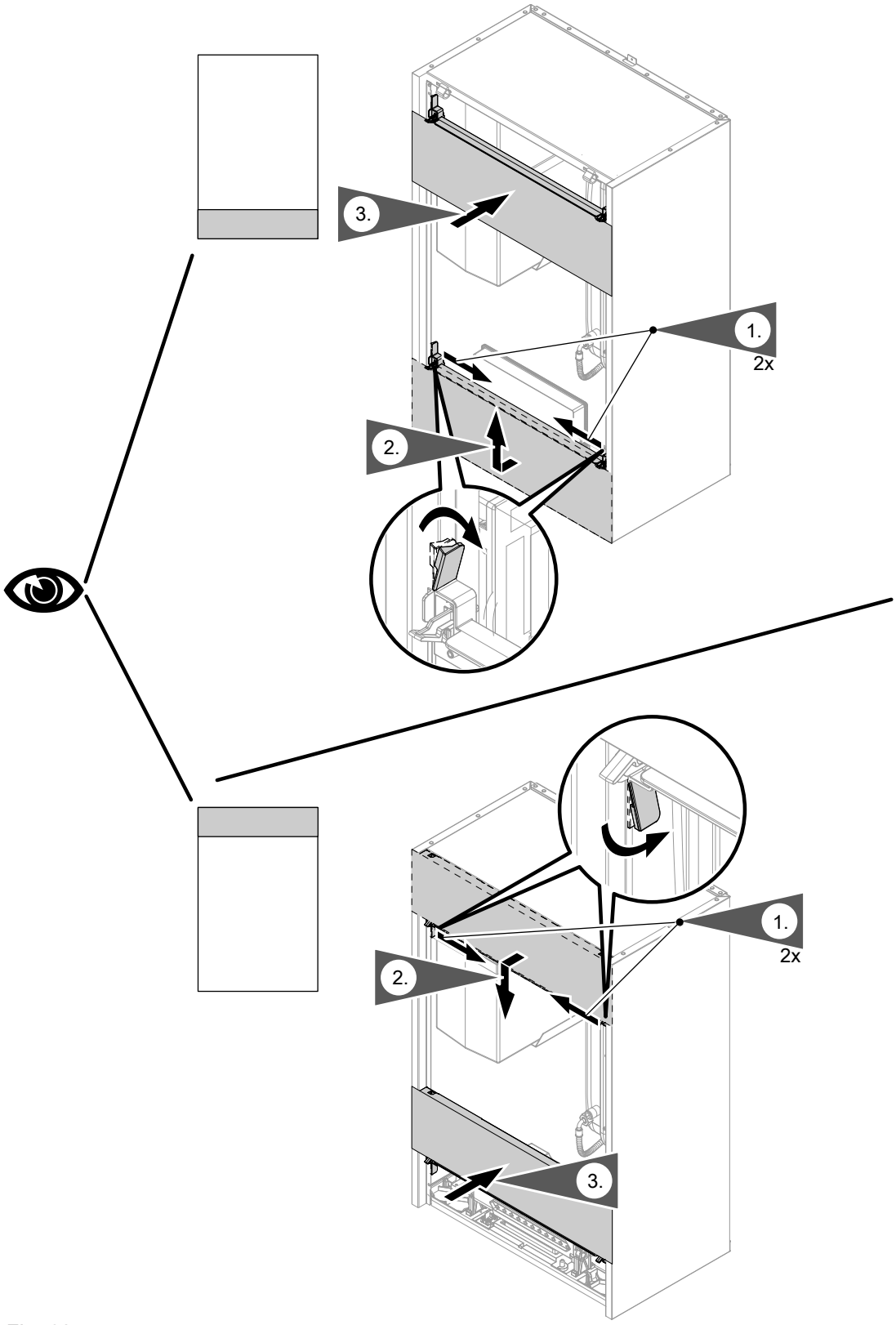

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Fig. 68

Opening the heat pump (cont.)

Opening the outdoor unit

See page 35.

Checking the expansion vessel and system pressure

- Use the calculation to DIN 4807-2 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.

   Calling up 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)

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.

Releasing the outdoor unit transport bracket (cont.)

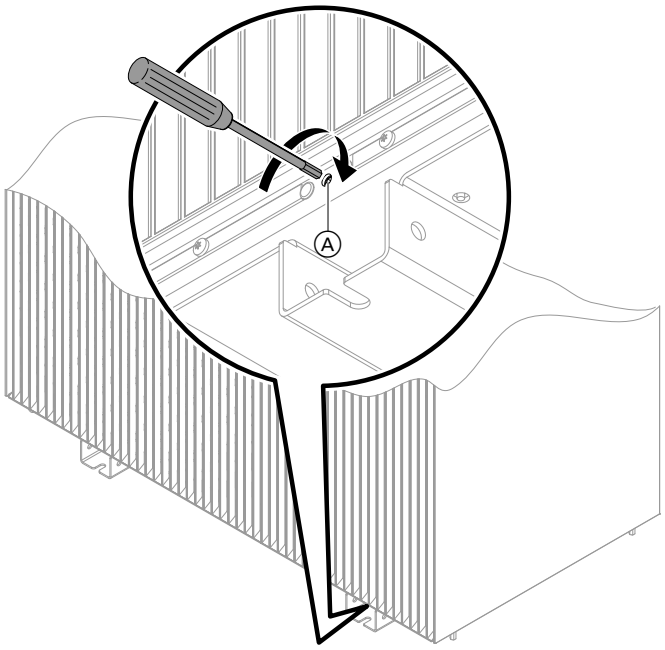

Fig. 69

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

PS Permissible operating pressure: See "Specification".

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

Testing the refrigerant circuit (cont.)

Outdoor unit with 2 fans

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".

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 tightness.
- Check all components containing water for leaks.
- Check all electrical components and connections for damage, ageing and tightness.
- Check all dampers and brackets.
- Check that the safety zone requirements are met.

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 heat exchanger (evaporator) of the outdoor unit".
- Ensure the condensate can drain freely: See chapter "Cleaning the condensate pan and the 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.
If it is suspected to be unsuitable or fails the tests, repair the appliance or dispose of it.
For working on the refrigerant circuit: See also chapter "Checklist for maintenance work".

Note
Use in a commercial environment may be subject to special regulations incorporating the mentioned maintenance work and the Pressure Equipment Directive.

- Test the safety chain **annually**: Request information about the test procedure from Viessmann Technical Service.
- 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.

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Testing the refrigerant circuit (cont.)

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 Regulation (EU) No 517/2014 and 2015/2067).

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

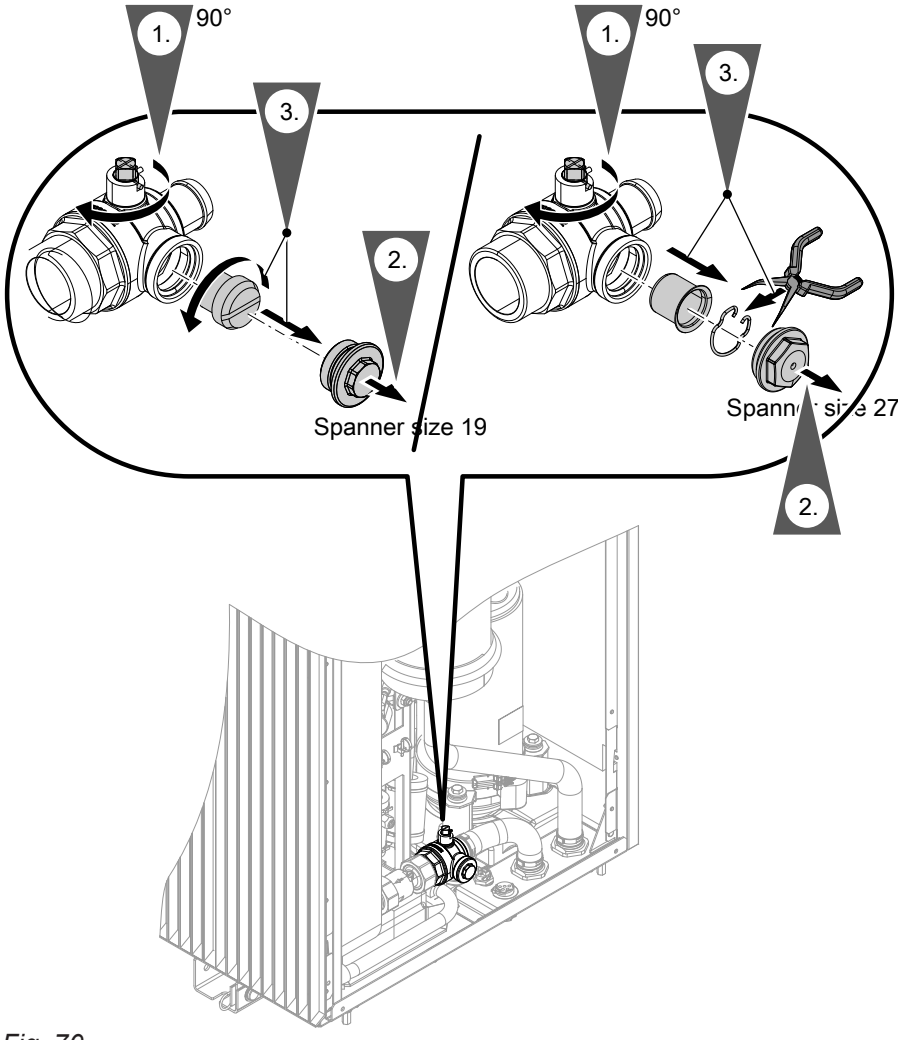

Fig. 70

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

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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.

1. Remove fan grille: See page 154.
2. Turn the fan by hand.

Torque for the screws:
1.8 ±0.5 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
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
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.

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 hand brush with long bristles.
- 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.

Cleaning with compressed air

1. Open the outdoor unit casing.

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

2. Using compressed air, clean the heat exchanger **from the inside out**.

   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. Check the aluminium fins of the heat exchanger for deformation and scratches. If necessary, repair with a suitable tool.
4. Close the outdoor unit casing.

Cleaning 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.
- Do not open the appliance until the fan has come to a stop.

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.

Cleaning the condensate pan and condensate drain (cont.)

Note
The following information applies to outdoor units with 1 and 2 fans. The outdoor unit with 2 fans is shown as an example.

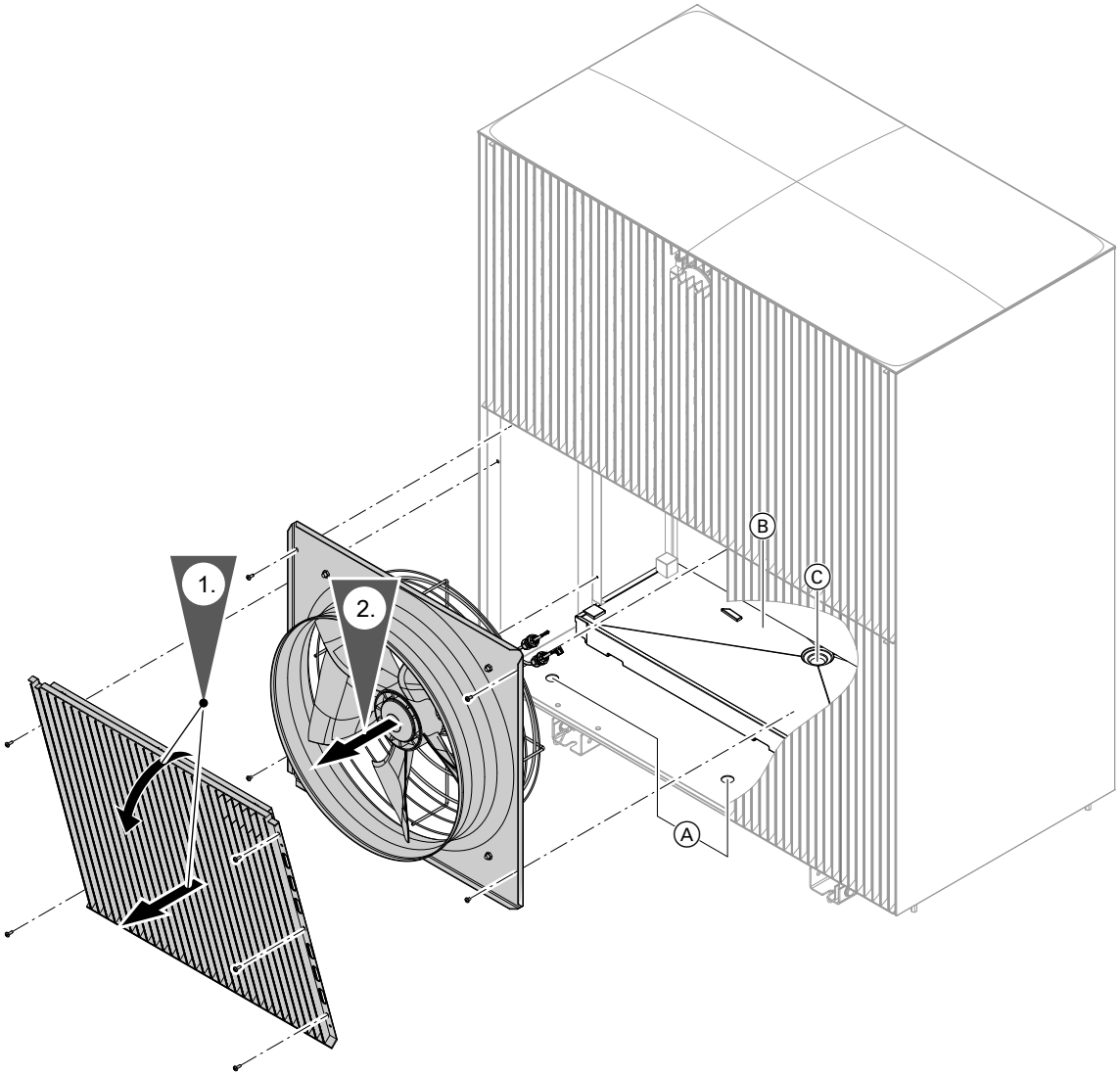

Fig. 71

Ⓐ Apertures in the base plate
Ⓑ Condensate pan
Ⓒ Condensate drain

3. Clean the condensate pan and condensate drain.

Torque for the screws:
1.8 ±0.5 Nm

Checking the indoor unit electrical connections for firm seating

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

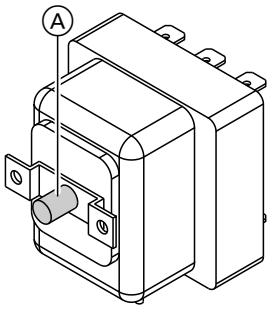

Fig. 72

Ⓐ 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 via the actuator test in the ViGuide app.
- The setting is only possible for systems without an external heating/cooling water buffer cylinder.

1. Call up the "Actuator test" in the ViGuide app.

2. Select the following settings for the "4/3-way valve position":

Indoor unit with 1 integral heating/cooling circuit:
- Select a setting of "0 %".

- Indoor unit with 2 integral heating/cooling circuits: For heating/cooling circuit 1, select the setting "0 %".
- For heating/cooling circuit 2, select the setting "50 %".

3. Set the required flow rate for the two heating/cooling circuits in turn using the speed of the heating/cooling circuit pump.

During the adjustment procedure, the flow rate for heating/cooling circuit 1 can be checked as follows:
- On the control panel in the **"Information"** menu
- In the ViGuide app in the "Operating data" menu

The flow rate for heating/cooling circuit 2 must be determined on site.

4. Terminate the actuator test in the ViGuide app.

5. Set the calculated values in the parameters for the max. speed of the heating/cooling circuit pumps:

Separate service instructions "System configuration and diagnosis for heat pumps with Viessmann One Base"

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.

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. Replace any seal rings that may have become dislodged.

Close the heat pump after completing all work.

Closing the heat pump (cont.)

Closing the indoor unit

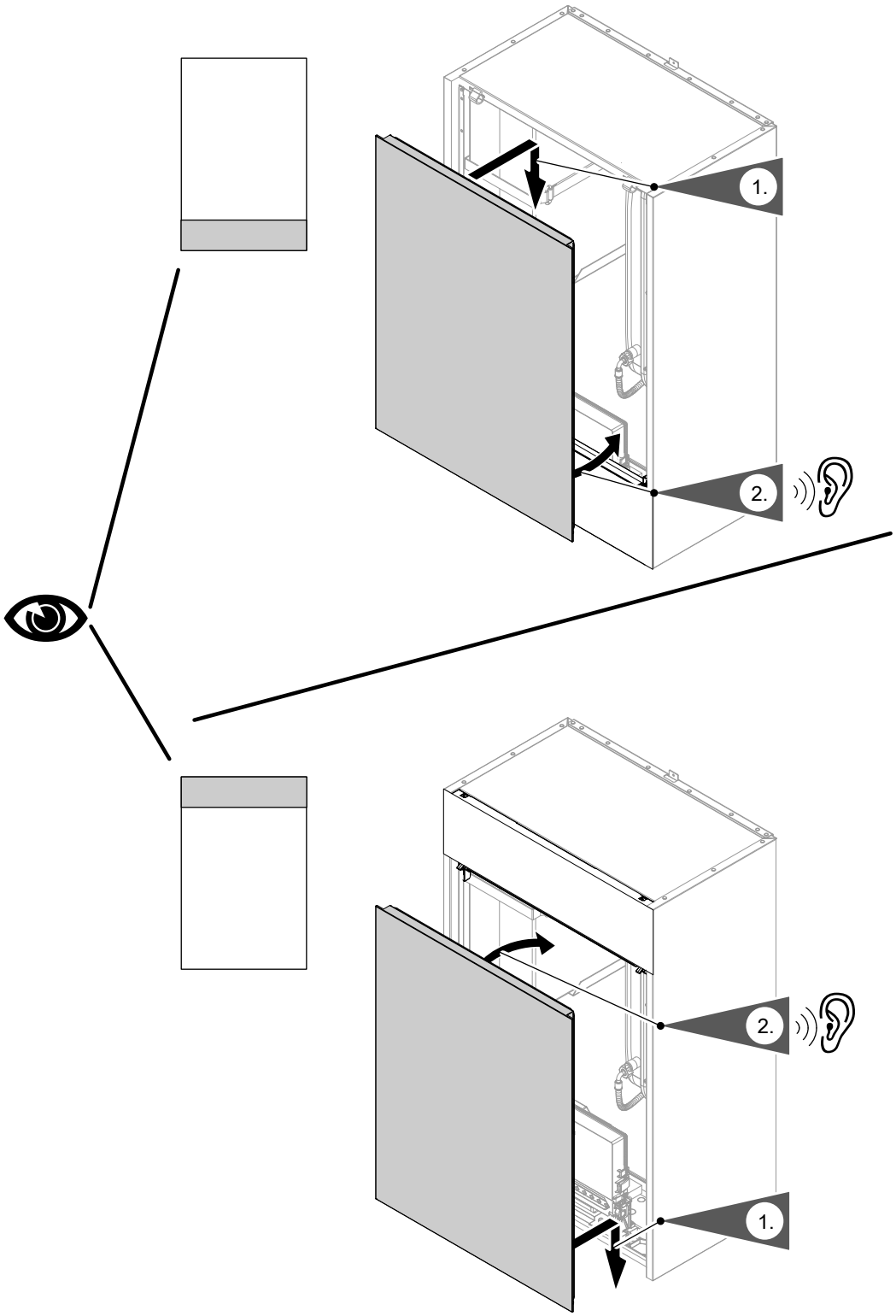

Fig. 73

Closing the outdoor unit

See page 87.

Checking the heat pump for noise

Check indoor and outdoor units for unusual noises.
Vent again if required.

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

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 **"Climate circuit 1"**, **"Climate 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 circuit"**
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

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 instruct the user in operating the system. This also includes all components added as accessories, such as remote controls.

Equipment and functions of the heating system must be entered in the form in the appendix to the operating instructions.
The system installer should also provide information on the required maintenance.

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Service menu

Calling up the service menu

Tap the following buttons:

1. "☰"
2. **"Service"**
3. Enter password **"viservice"**.
4. Confirm with ✓.
5. Select required menu.

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

Service menu overview

Service menu	
Diagnosis	
	Refrigerant circuit
	General
	Heating/cooling circuit 1
	DHW
Change passwords	
Commissioning	
Appliances detected	
Access point ON/OFF	
Exit demo operation	
Exiting the service menu	
Actuator test	

Diagnosis

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 **"viservice"**.
4. Confirm with ✓.
5. **"Diagnosis"**
6. Select the required group, e.g. **"General"**.

Refrigerant circuit

Tap the following buttons:

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

Notes
- *The symbols on the display are animated if the components are operational (e.g. pumps).*
- *The values shown are examples.*

Service menu (cont.)

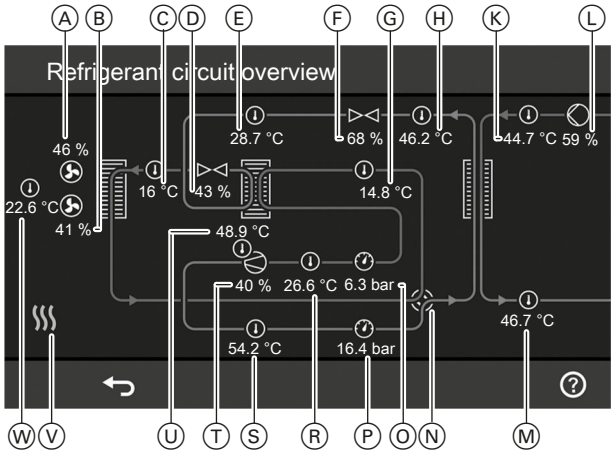

Fig. 74

Pos.	Meaning
	Fan Animated symbol: Fan is running.
Ⓐ	Speed of fan 1 in %
Ⓑ	Speed of fan 2 in %
Ⓒ	Liquid gas temperature – cooling, in °C
Ⓓ	Opening of electronic expansion valve 1 in %
Ⓔ	Liquid gas temperature – heating, in °C
Ⓕ	Opening of electronic expansion valve 2 in %
Ⓖ	Suction gas temperature – evaporator, in °C
Ⓗ	Liquid gas temperature – condenser, in °C
Ⓚ	Secondary circuit return temperature in °C
	Secondary pump Animated symbol: Pump is running.
Ⓛ	Secondary pump speed in %
Ⓜ	Secondary circuit flow temperature in °C
Ⓝ	4-way valve, refrigerant circuit Heating mode Cooling mode
Ⓞ	Suction gas pressure – compressor, in bar
Ⓟ	Condensing pressure – compressor, in bar
	Compressor Animated symbol: Compressor is running.
Ⓡ	Suction gas temperature – compressor, in °C
Ⓢ	Hot gas temperature in °C
Ⓣ	Position of compressor in %
Ⓤ	Compressor temperature in °C
Ⓥ	Heating mode Cooling mode Defrost Power-OFF
Ⓦ	Evaporator air intake temperature in °C

Service menu (cont.)

Changing the service password

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

Tap the following buttons:

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

Resetting all passwords to delivered condition

Tap the following buttons:

1. Request the master password from Viessmann Technical Service.
2. "☰"
3. 🔧**"Service"**
4. Enter password **"viservice"**.
5. Confirm with ✔.
6. **"Change passwords"**
7. **"Reset all passwords"**
8. Enter master password.
9. Confirm twice with ✔.

Checking CAN bus subscribers

The detected CAN bus subscribers are displayed.

Tap the following buttons:

1. "☰"
2. 🔧**"Service"**
3. Enter password **"viservice"**.
4. Confirm with ✔.
5. **"Appliances detected"**

Checking outputs (actuator test)

Note
When the actuator test is started, all actuators are initially disabled.

Tap the following buttons:

1. "☰"
2. 🔧**"Service"**
3. Enter password **"viservice"**.
4. **"Actuator test"**
5. ✔ to confirm the security prompt.

   Note
   If an actuator function is not possible because another process is running, a message is displayed.
6. Use ◀/▶ to select the required group: See the following table.
7. Select required actuator. Several functions can be activated simultaneously.

Checking outputs (actuator test) (cont.)

8. If required, tap ✔ to confirm. The functions are active for 30 s.

Note
If necessary, use ⊡ to switch to ***"Refrigerant circuit overview"****.*

9. Use ↩ to end the actuator test.

The following actuators can be controlled:

Display		Meaning
Heating group		
Primary circuit pump, set speed		Secondary pump speed in %
4/3-way valve position		4/3-way valve position in % For indoor units with 1 integral heating/cooling circuit: 0 % — Secondary circuit (heating/cooling circuit 1 or external heating water/coolant buffer cylinder) between 0 and 50 % — Secondary circuit and integral buffer cylinder 50 % — Integral buffer cylinder 100 % — DHW heating For indoor units with 2 integral heating/cooling circuits: 0 % — Heating/cooling circuit 1 between 0 and 50 % — Heating/cooling circuit 1, heating/cooling circuit 2 and integral buffer cylinder 50 % — Integral buffer cylinder and heating/cooling circuit 2 100 % — DHW heating
Heating circuit 1 pump	On	Start secondary pump/heating circuit pump, heating/cooling circuit 1.
	Off	Switch off secondary pump/heating circuit pump, heating/cooling circuit 1.
Heating circuit 2 pump	On	Start heating circuit pump, heating/cooling circuit 2.
	Off	Switch off heating circuit pump, heating/cooling circuit 2.
Heating circuit 3 pump	On	Start heating circuit pump, heating/cooling circuit 3.
	Off	Switch off heating circuit pump, heating/cooling circuit 3.
Heating circuit 4 pump	On	Start heating circuit pump, heating/cooling circuit 4.
	Off	Switch off heating circuit pump, heating/cooling circuit 4.
Mixer, heating circuit 2	Open	Mixer for heating/cooling circuit 2 opens (mixer extension kit).
	Stop	Current position is maintained
	Close	Mixer for heating/cooling circuit 2 closes.
Mixer, heating circuit 3	Open	Mixer for heating/cooling circuit 3 opens (mixer extension kit).
	Stop	Current position is maintained
	Close	Mixer for heating/cooling circuit 3 closes.
Mixer, heating circuit 4	Open	Mixer for heating/cooling circuit 4 opens (mixer extension kit).
	Stop	Current position is maintained.
	Close	Mixer for heating/cooling circuit 4 closes.
Signal, cooling	On	Cooling mode enabled
	Off	No cooling mode
Heat generator group		
Primary circuit pump, set speed		Secondary pump (internal circulation pump) speed in %

Checking outputs (actuator test) (cont.)

Display		Meaning	
DHW group			
Primary circuit pump, set speed		Secondary pump (internal circulation pump) speed in %	
DHW circulation pump	On	Start DHW circulation pump.	
	Off	Stop DHW circulation pump.	
4/3-way valve position		4/3-way valve position in %	
		0 %	Heating/cooling circuit 1
		between 0 and 50 %	Heating/cooling circuit 1, heating/cooling circuit 2 and integral buffer cylinder
		50 %	Integral buffer cylinder and heating/cooling circuit 2
		100 %	DHW heating
		For indoor units with 2 integral heating/cooling circuits:	
		0 %	Heating/cooling circuit 1
		between 0 and 50 %	Heating/cooling circuit 1, heating/cooling circuit 2 and integral buffer cylinder
		50 %	Integral buffer cylinder and heating/cooling circuit 2
		100 %	DHW heating

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
Service messages	▪ The cause of the message must be remedied. ▪ Limited 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"**, **"Faults"** and **"Service messages"**.
   - 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"**
   - **"Service messages"**

   The messages are displayed in chronological order.

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Message display on the programming unit (cont.)

The following information is displayed:
- Date and time of the occurrence of the fault
- Fault code
- 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 required. The subscriber number of the component depends on the position of rotary switch S1 on the corresponding extension module. The rotary switch was set during installation.
To identify the extension module affected, check the setting of rotary switch S1 on the extension module in question, if required.

Subscriber numbers

PlusBus subscriber:
0 EM-S1 extension (ADIO electronics module)
1 - 15 EM-M1, EM-MX and EM-P1 extensions (ADIO electronics module)
17 - 31 EM-EA1 extension (DIO electronics module)
32 - 47 Cylinder module (M2IO electronics module)
64 SDIO/SM1A electronics module

CAN bus subscriber:
1 HPMU electronics module
45 Inverter
54 VCMU refrigerant circuit controller
58 Communication module (TCU 200/300)
59 HMI programming unit
67 EHCU electronics module
68 Communication module, Service Link (NB-IoT)
90 Gateway

Low power radio subscriber:
49 - 63 Vitotrol 300-E

Reading out messages from the memory (message history)

The 10 most recent faults (including those remedied) and service messages are saved and can be called up.
The messages are sorted by date.

Tap the following buttons:

1. ☰
2. **"Service"**
3. Enter password **"viservice"**.
4. Confirm with ✓.
5. **"Message history"**
6. **"Fault list"** or **"Service messages"** to call up saved fault messages.
7. 🗑 if required, to delete the list.
8. ✓ to confirm

Troubleshooting measures

Descriptions of the messages and the actions required are available online.
- Scan QR code.
  Or
- Enter document number in **www.vibooks.de**.

Document no.: 6199893

Fig. 75

Message display on the programming unit (cont.)

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 information".
- Work on the refrigerant circuit must **only** be carried out by a certified contractor (in accordance with Regulations (EU) No 517/2014 and 2015/2067).
- Specialist personnel working on a refrigerant circuit with flammable refrigerant are required to have specific qualifications and certification: See "Safety information".

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.
- Replace faulty components only with genuine Viessmann spare parts.

Overview of electrical components

See page 49 onwards.

Removing the programming unit and 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.

- **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 MCB/fuse or a mains isolator. Check that it is no longer 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.

Removing the programming unit and electronics… (cont.)

Removing the HMI programming unit

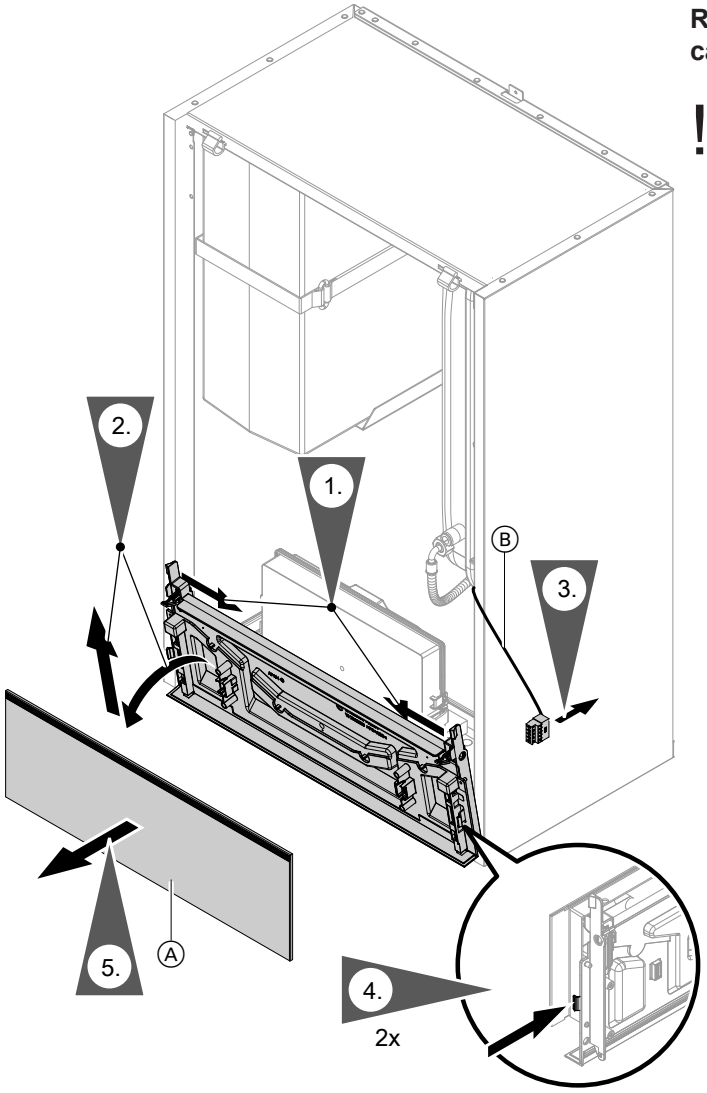

Fig. 76

Ⓐ HMI programming unit
Ⓑ Connection pipe

Replacing the HMI programming unit connecting cable

Please note
Incorrect routing of the connecting cable can lead to heat damage and impairment of the EMC properties.
Position and secure the connecting cable (fixing point of the cable tie) according to the "HMI connecting cable" installation instructions.

Removing the programming unit and electronics… (cont.)

Removing the HPMU electronics module

Remove programming unit: See previous chapter.

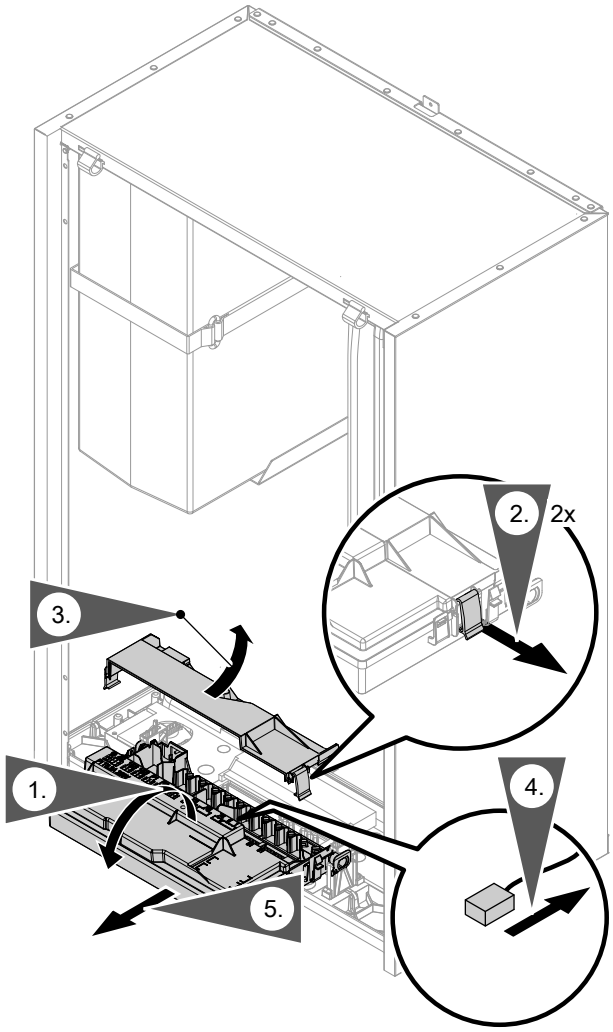

Fig. 77

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

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.

- **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 MCB/fuse or a mains isolator. Check that it is no longer live. Safeguard against unauthorised reconnection.
- Prior to working on the appliance, wait at least 4 min until the voltage has completely dropped out.

Remove programming unit: See chapter "Removing the HMI programming unit".
Fold open the HPMU electronics module if required: See Fig. 77.

Removing the programming unit and electronics… (cont.)

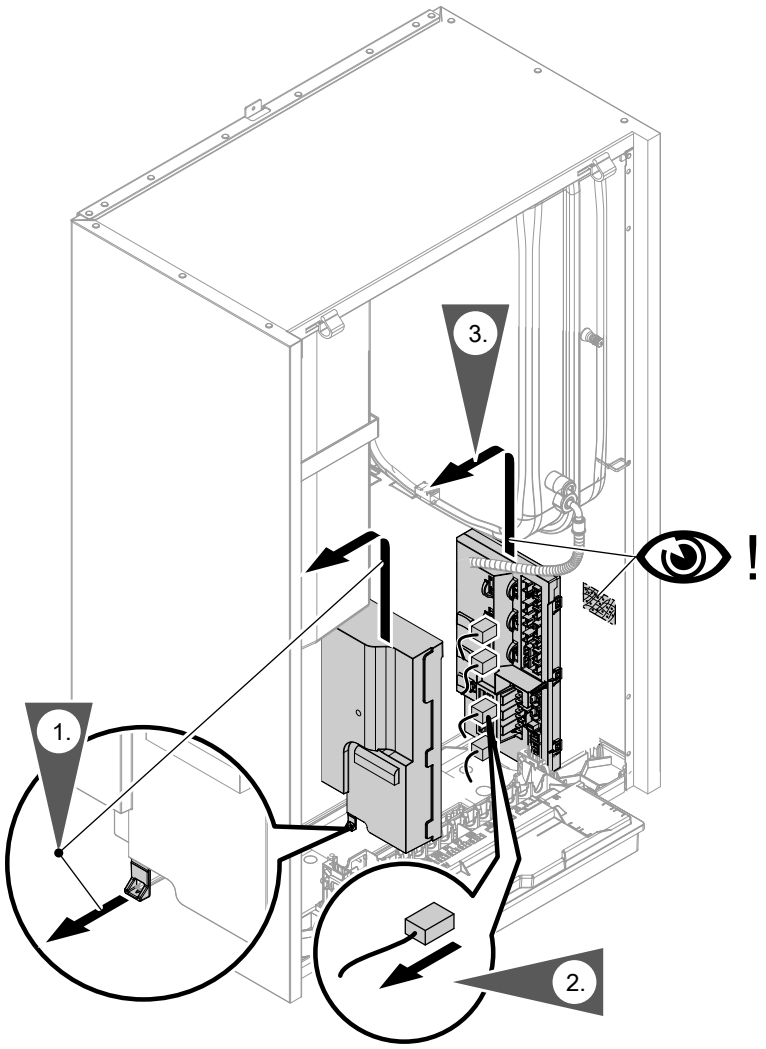

Fig. 78

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

Overview of internal components

Indoor unit with 1 integral heating/cooling circuit

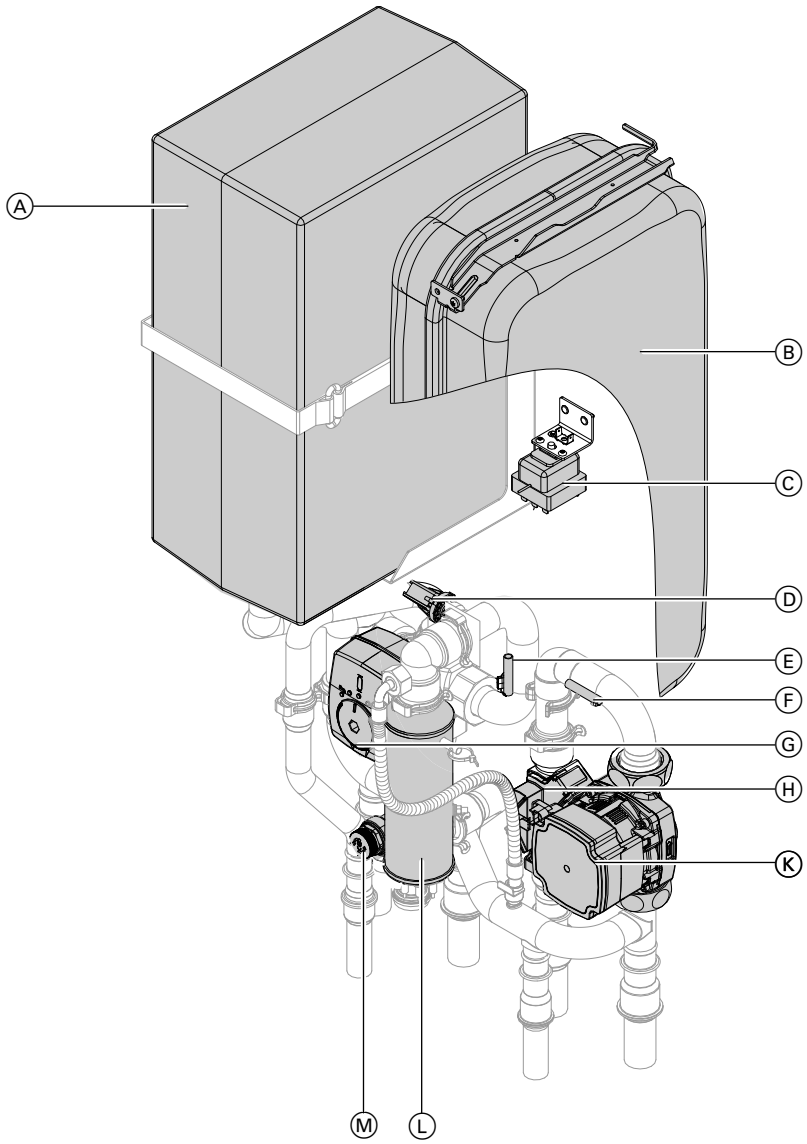

Fig. 79

Ⓐ Integrated buffer cylinder
Ⓑ Expansion vessel
Ⓒ High limit safety cut-out (STB), instantaneous heating water heater
Ⓓ Pressure sensor
Ⓔ Flow temperature sensor
Ⓕ Return temperature sensor
Ⓖ 4/3-way valve
Ⓗ Flow sensor
Ⓚ Secondary pump
Ⓛ Instantaneous heating water heater
Ⓜ Safety valve

Overview of internal components (cont.)

Indoor unit with 2 integral heating/cooling circuits

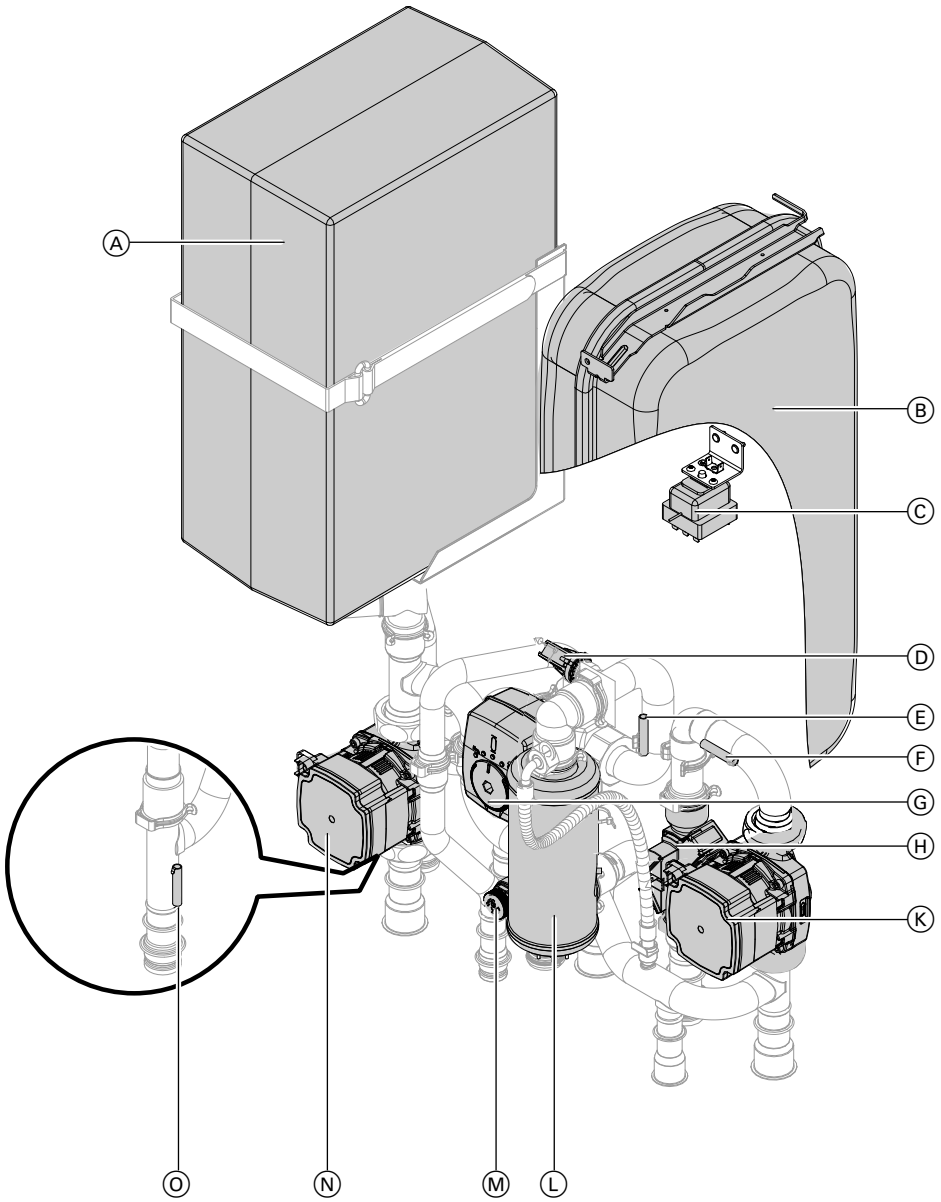

Fig. 80

Ⓐ Integrated buffer cylinder
Ⓑ Expansion vessel
Ⓒ High limit safety cut-out (STB), instantaneous heating water heater
Ⓓ Pressure sensor
Ⓔ Heating/cooling circuit 1 flow temperature sensor
Ⓕ Return temperature sensor
Ⓖ 4/3-way valve
Ⓗ Flow sensor
Ⓚ Heating/cooling circuit 1 heating circuit pump
Ⓛ Instantaneous heating water heater
Ⓜ Safety valve
Ⓝ Heating/cooling circuit 2 heating circuit pump
Ⓞ Heating/cooling circuit 2 flow temperature sensor

Draining the 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.

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

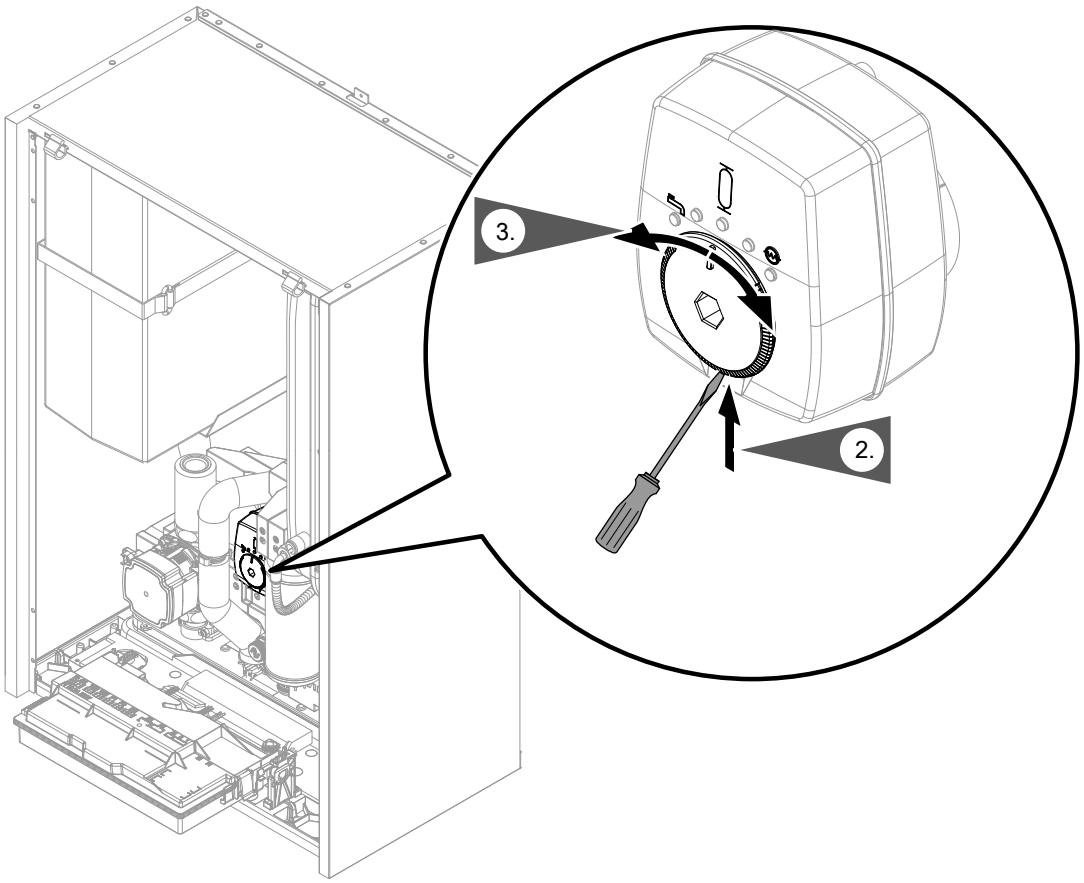

Fig. 81

3. 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 fold out or remove electrical components if required: See chapter "Removing the programming unit and electronics module".
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 severe injury due to electric shock.
- Isolate the heat pump from the power supply. Safeguard against unauthorised reconnection.
- Protect electrical components from the ingress of water, e.g. electronics modules, plug connectors, electrical cables.

⚠ **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 to 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 seals 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.

Removing hydraulic components and EPP… (cont.)

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 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 integrated buffer cylinder

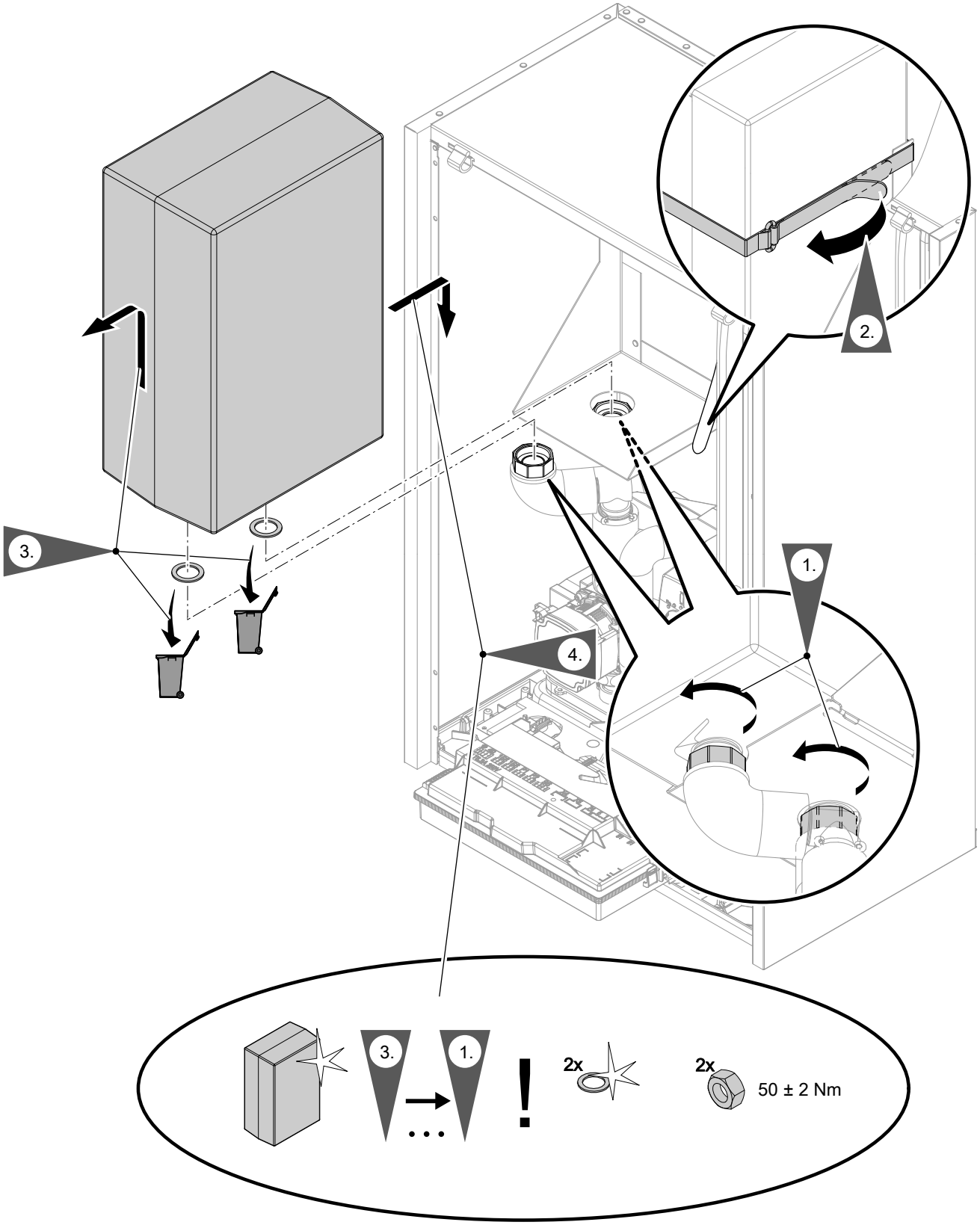

Fig. 82

Removing hydraulic components and EPP… (cont.)

Removing hydraulic lines from the integral buffer cylinder

Indoor unit with 1 integrated heating/cooling circuit

Removing the hydraulic line at the front

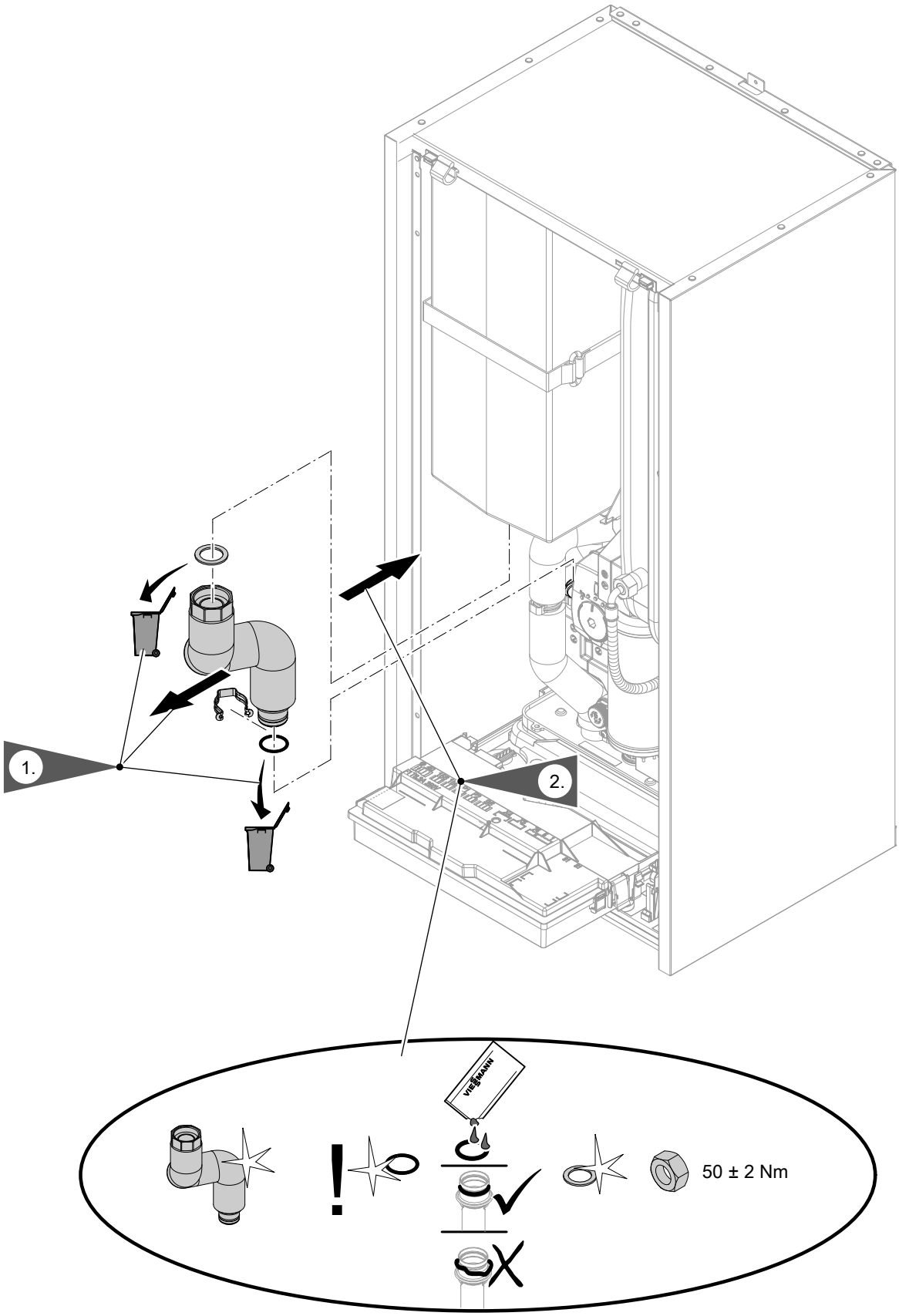

Fig. 83

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Removing hydraulic components and EPP… (cont.)

Removing the hydraulic line at the back

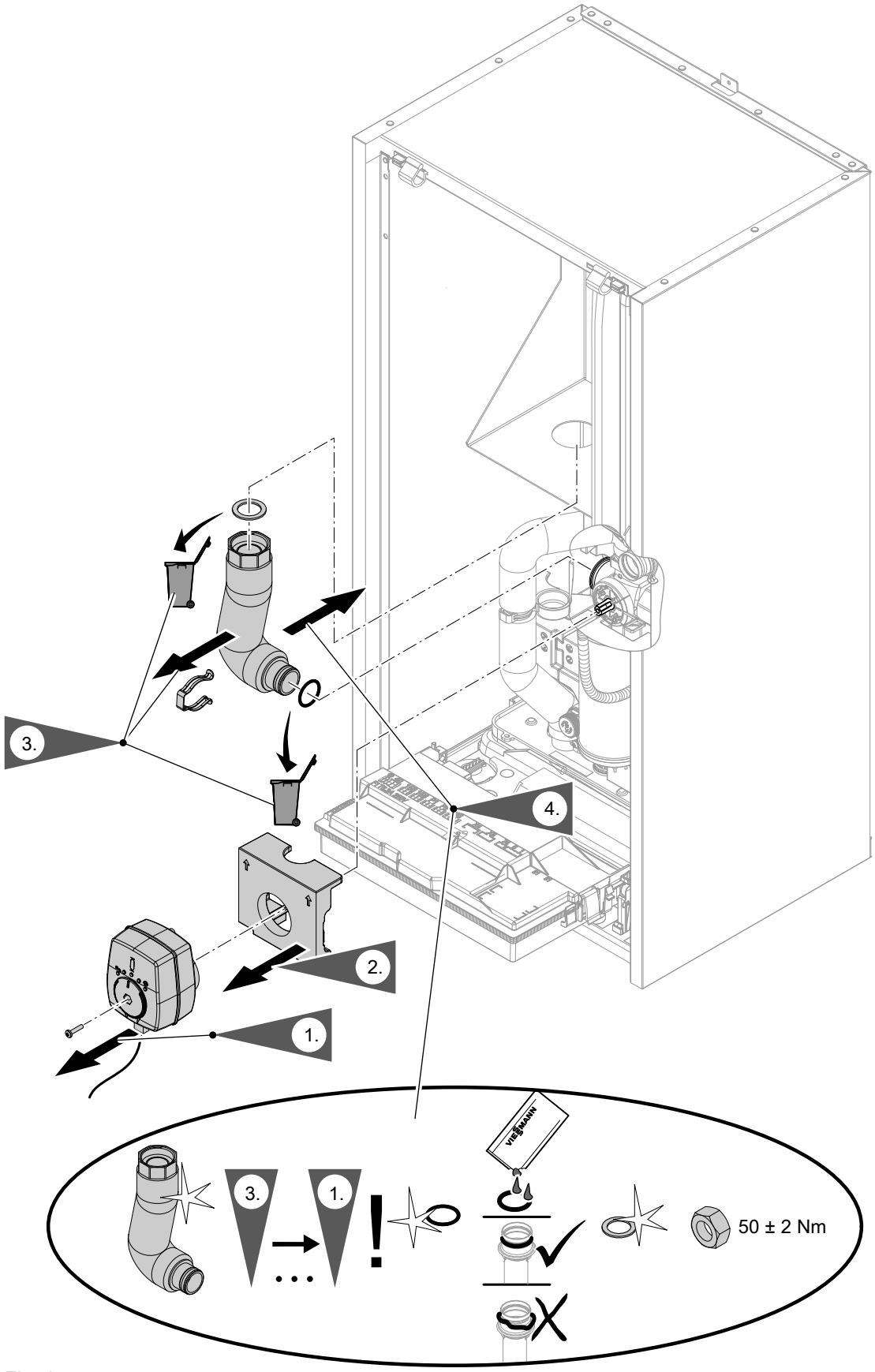

Fig. 84

Removing hydraulic components and EPP… (cont.)

Indoor unit with 2 integrated heating/cooling circuits

Removing the integrated buffer cylinder return line

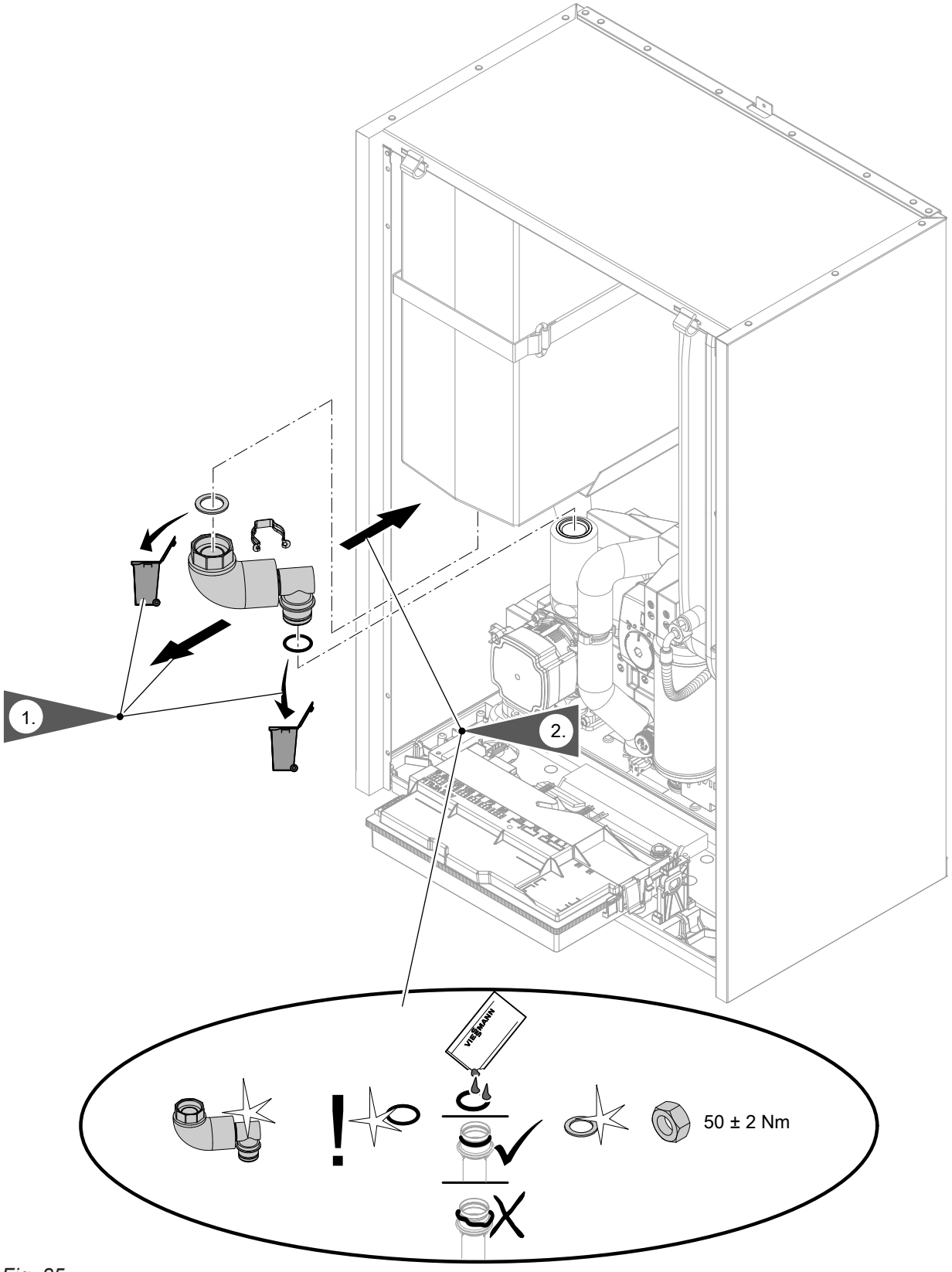

Fig. 85

Removing hydraulic components and EPP… (cont.)

Removing the integrated buffer cylinder flow line

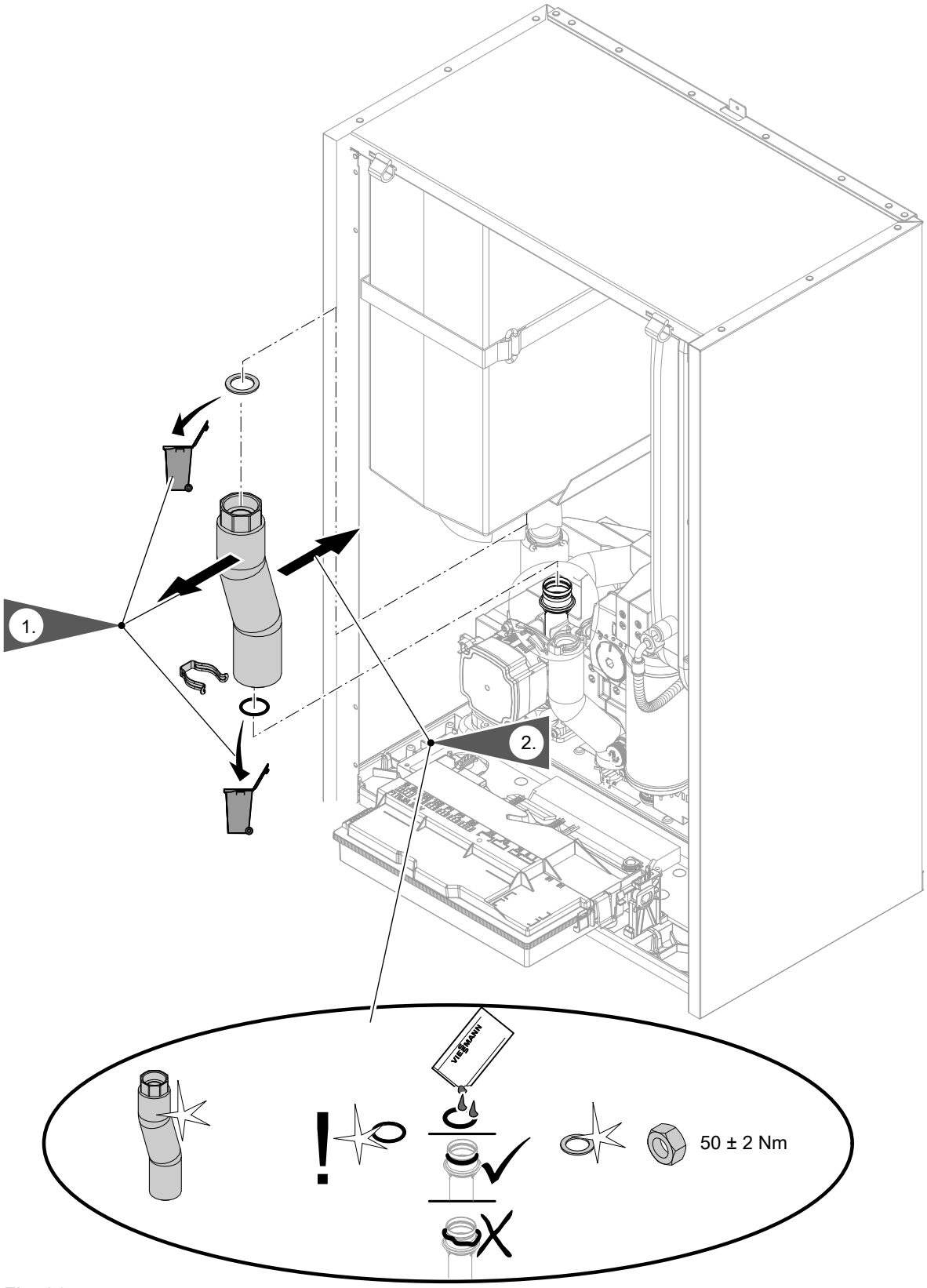

Fig. 86

Removing hydraulic components and EPP… (cont.)

Removing the expansion vessel

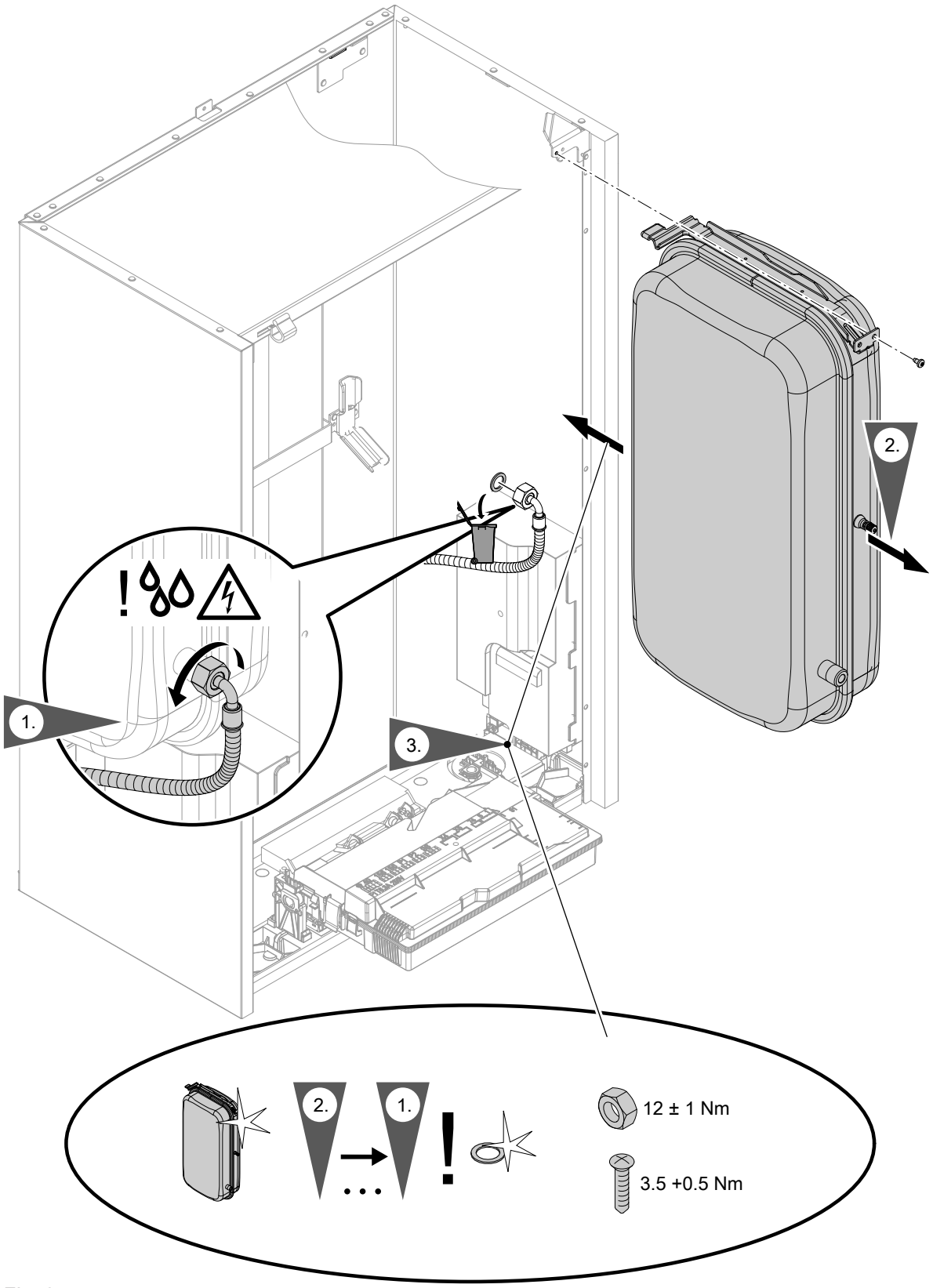

Fig. 87

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Removing hydraulic components and EPP… (cont.)

Additionally for indoor unit with 1 integrated heating/cooling circuit

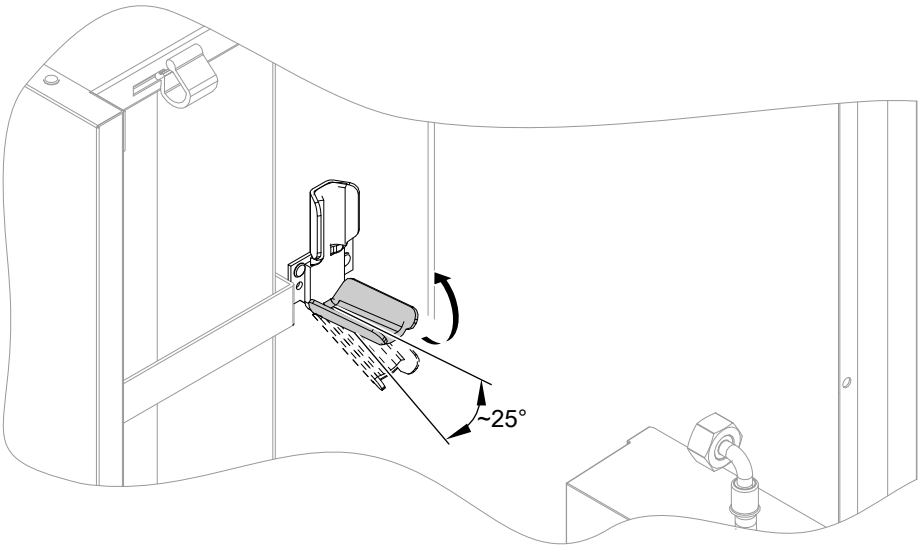

Fig. 88

Note
Only required for the removal of the hydraulic block

Removing hydraulic components and EPP… (cont.)

Removing the instantaneous heating water heater

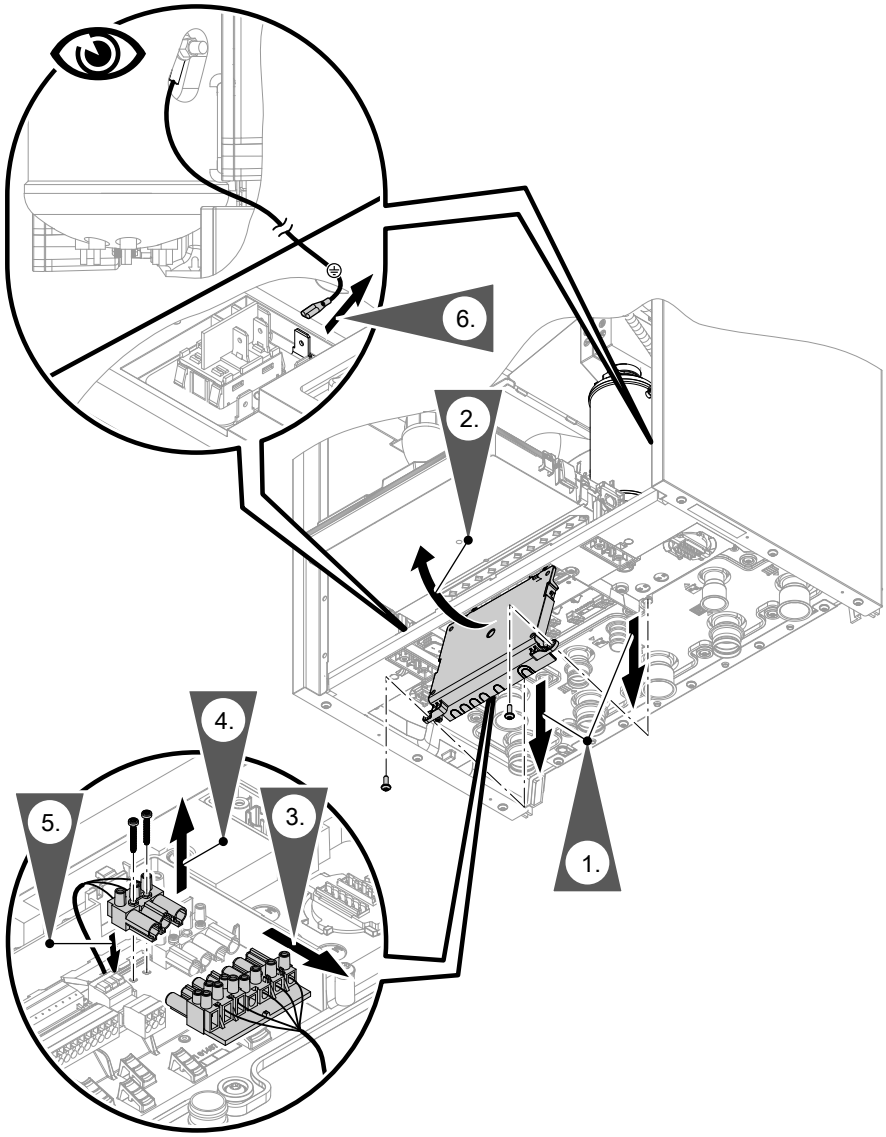

Fig. 89

Torque for the screws on the 230 V~ junction box:
2.8 Nm

Removing hydraulic components and EPP… (cont.)

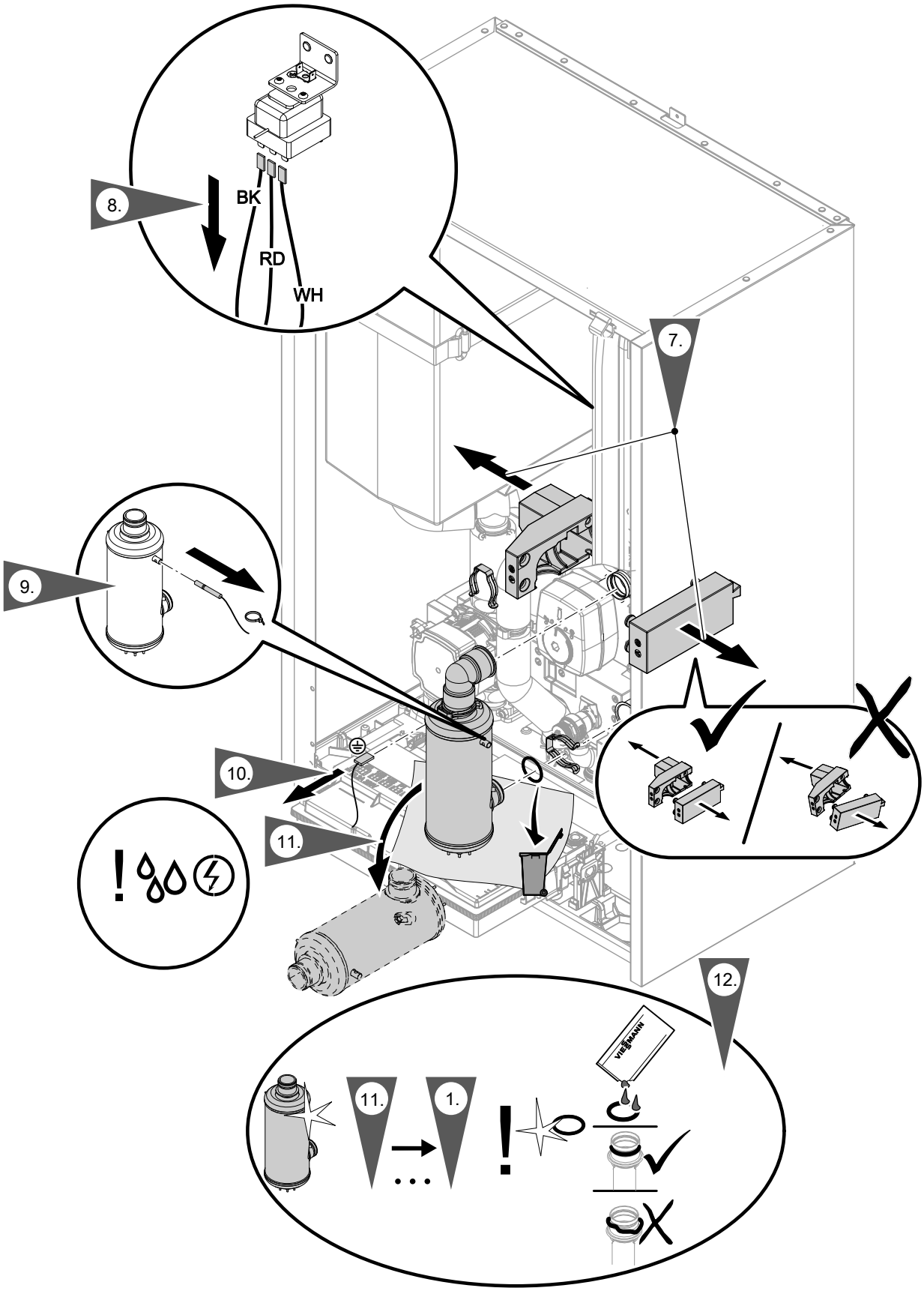

Fig. 90 Observe the colour coding of the core wires connected to the high limit safety cut-out (as per IEC 60757):

BK Black
RD Red
WH White

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Removing hydraulic components and EPP… (cont.)

Removing the sensors

Removing the flow sensor

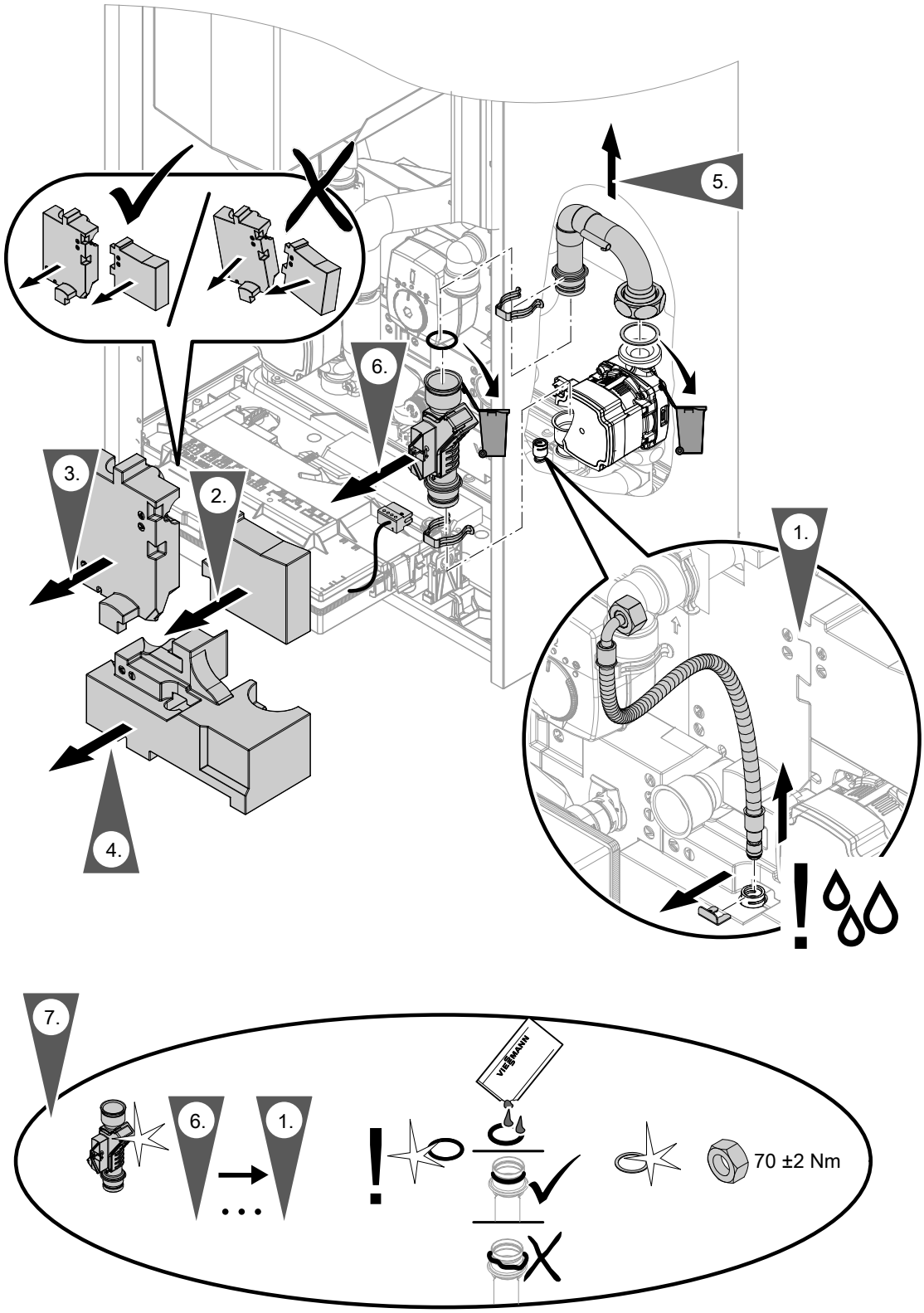

Fig. 91

Removing hydraulic components and EPP… (cont.)

Removing the secondary circuit temperature sensors

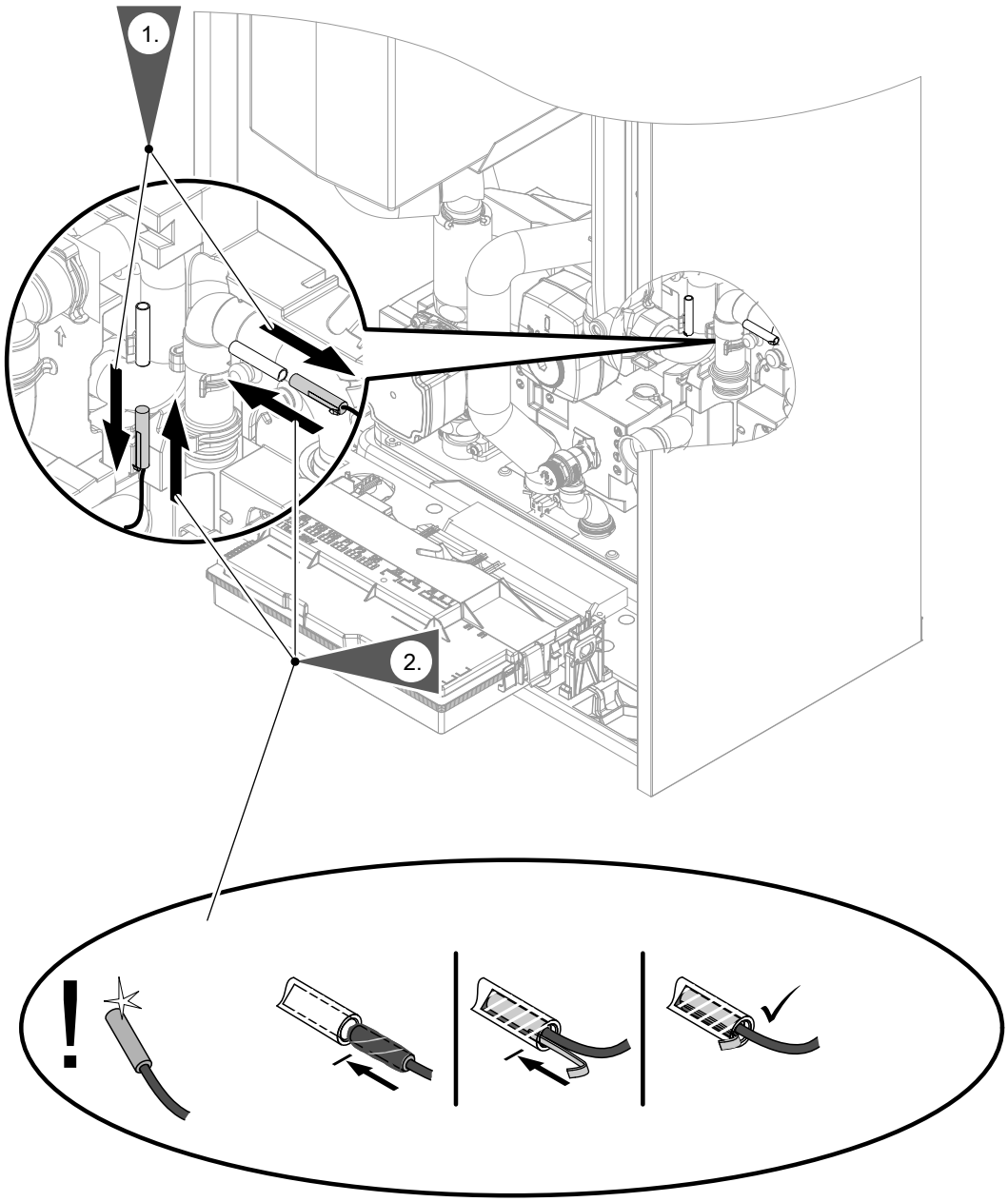

Fig. 92

Removing hydraulic components and EPP… (cont.)

Additionally for indoor unit with 2 integrated heating/cooling circuits

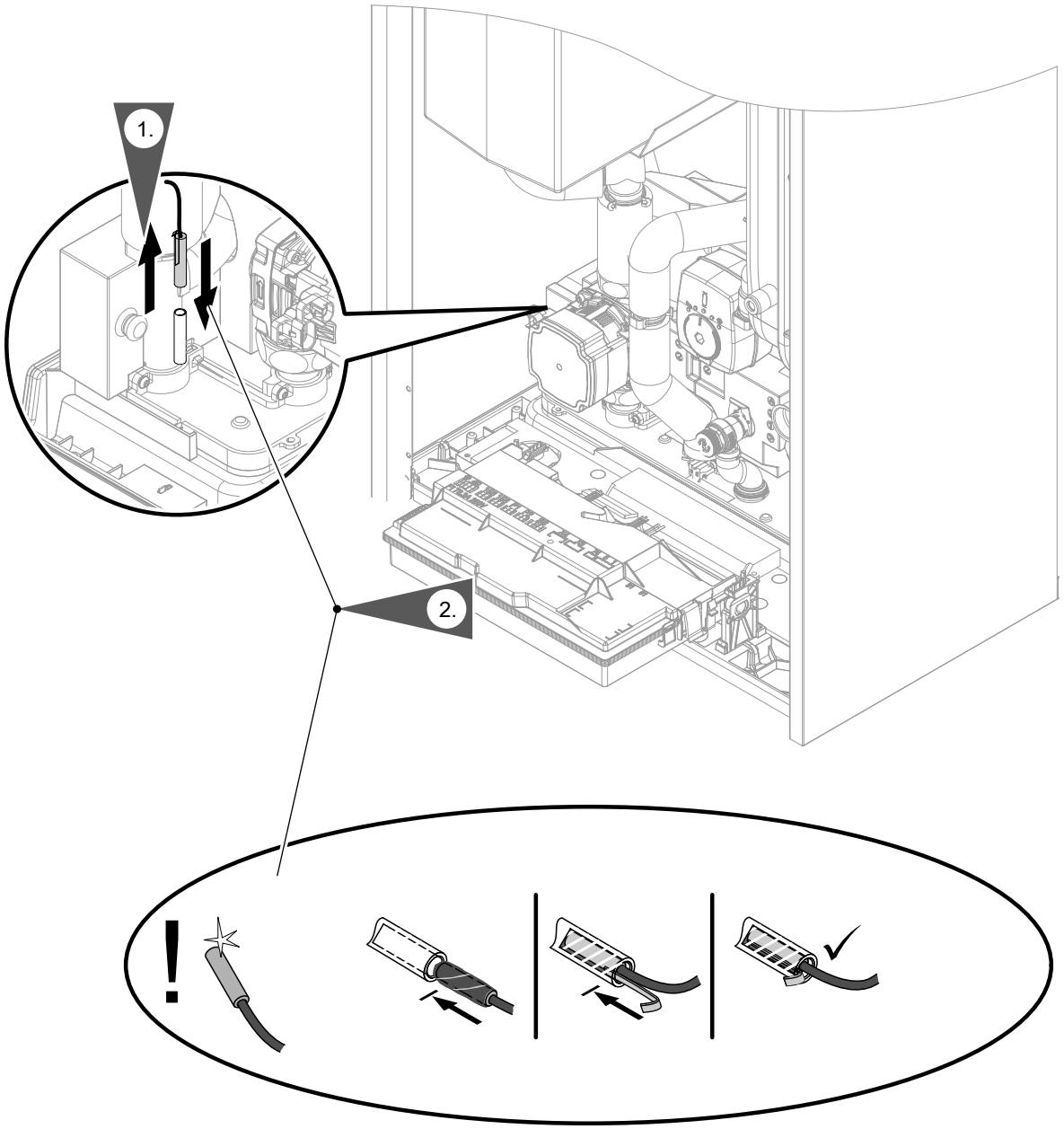

Fig. 93

Removing hydraulic components and EPP… (cont.)

Removing the pressure sensor

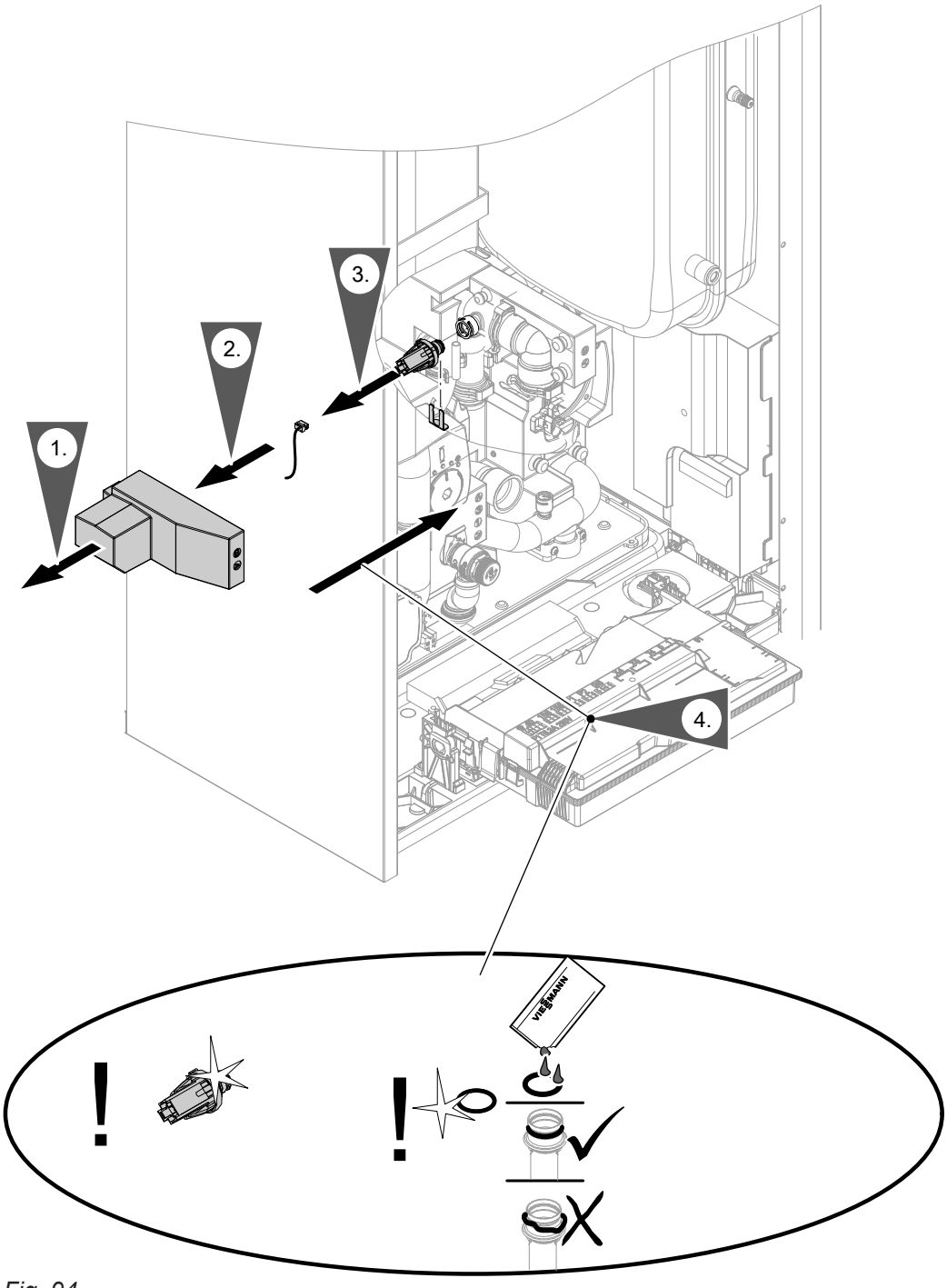

Fig. 94

Removing hydraulic components and EPP… (cont.)

Removing the circulation pump head

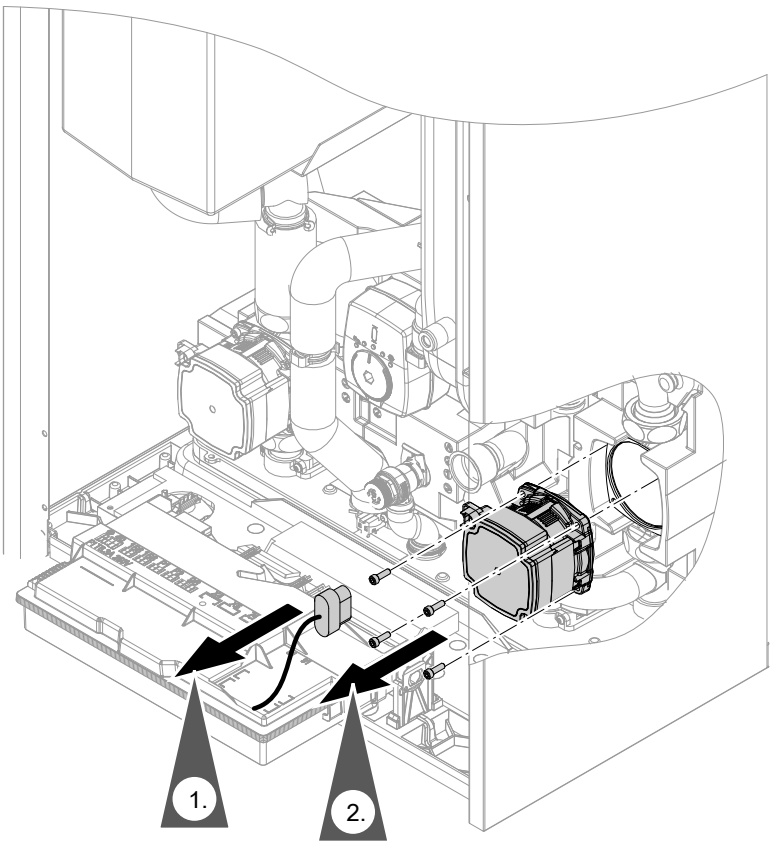

Fig. 95

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

Removing the hydraulic block

Remove the following components first:
- Integrated buffer cylinder: See Fig. 82.
- Hydraulic lines: See Fig. 85 to Fig. 86.
- Expansion vessel: See Fig. 87 and if required Fig. 88.
- Electrical connections:
  - Flow sensor connecting cable: See Fig. 91.
  - Secondary circuit temperature sensors: See Fig. 92 and 93.
  - Pressure sensor: See Fig. 94.
  - Instantaneous heating water heater connections: Power cable plug: See chapter "Instantaneous heating water heater power supply" and Fig. 89. Temperature sensor on the instantaneous heating water heater and electrical leads on the high limit safety cut-out: See Fig. 90.
  - Circulation pump connection plugs: See Fig. 95.

In conjunction with pre-plumbing jig (accessories):
Release hydraulic connections on the underside of the appliance: See separate installation instructions.

Removing hydraulic components and EPP… (cont.)

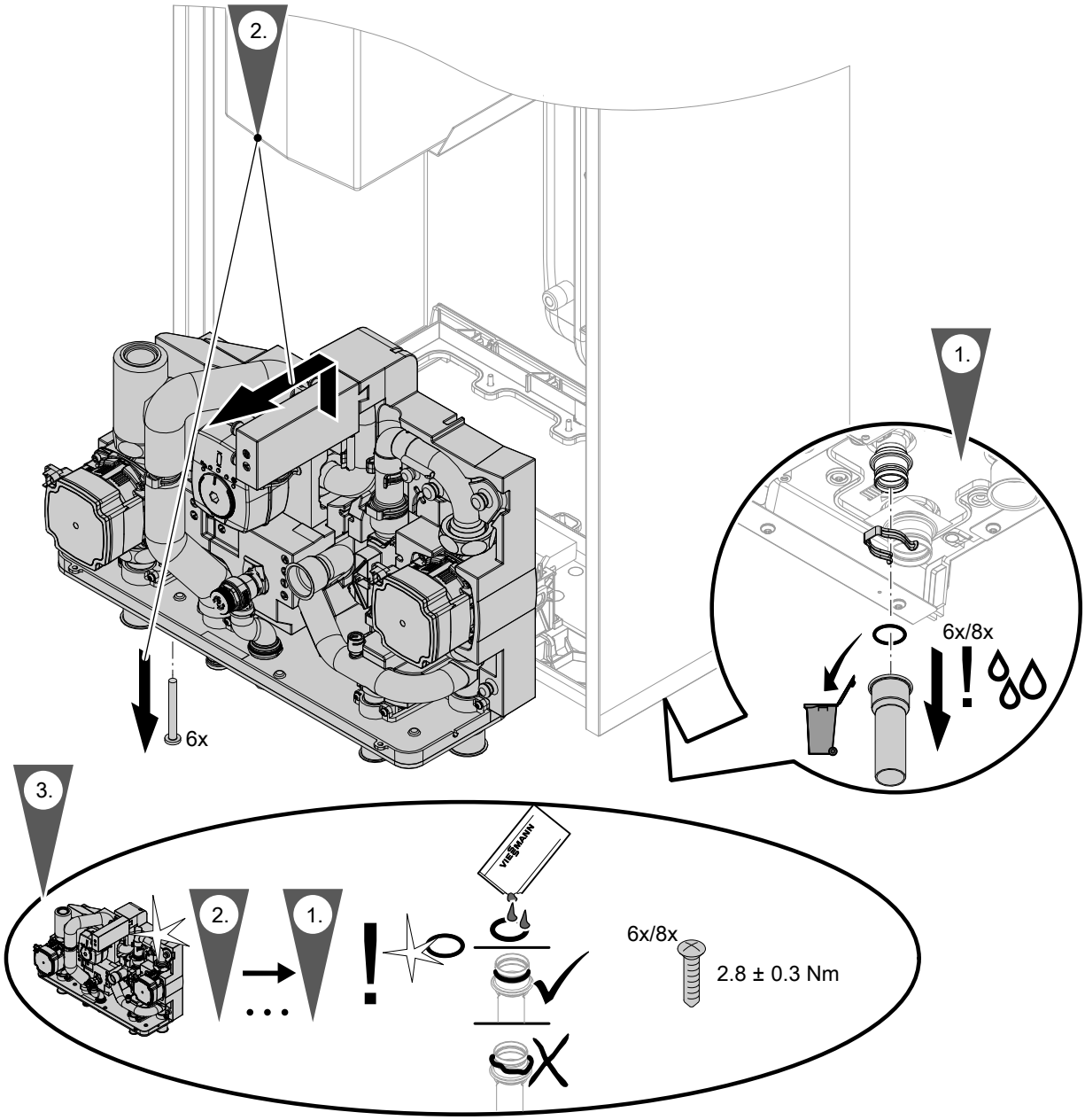

Fig. 96

Removing the additional EPP insulation pieces

After removal of the hydraulic block, all other EPP installation pieces can be replaced.

Removing hydraulic components and EPP… (cont.)

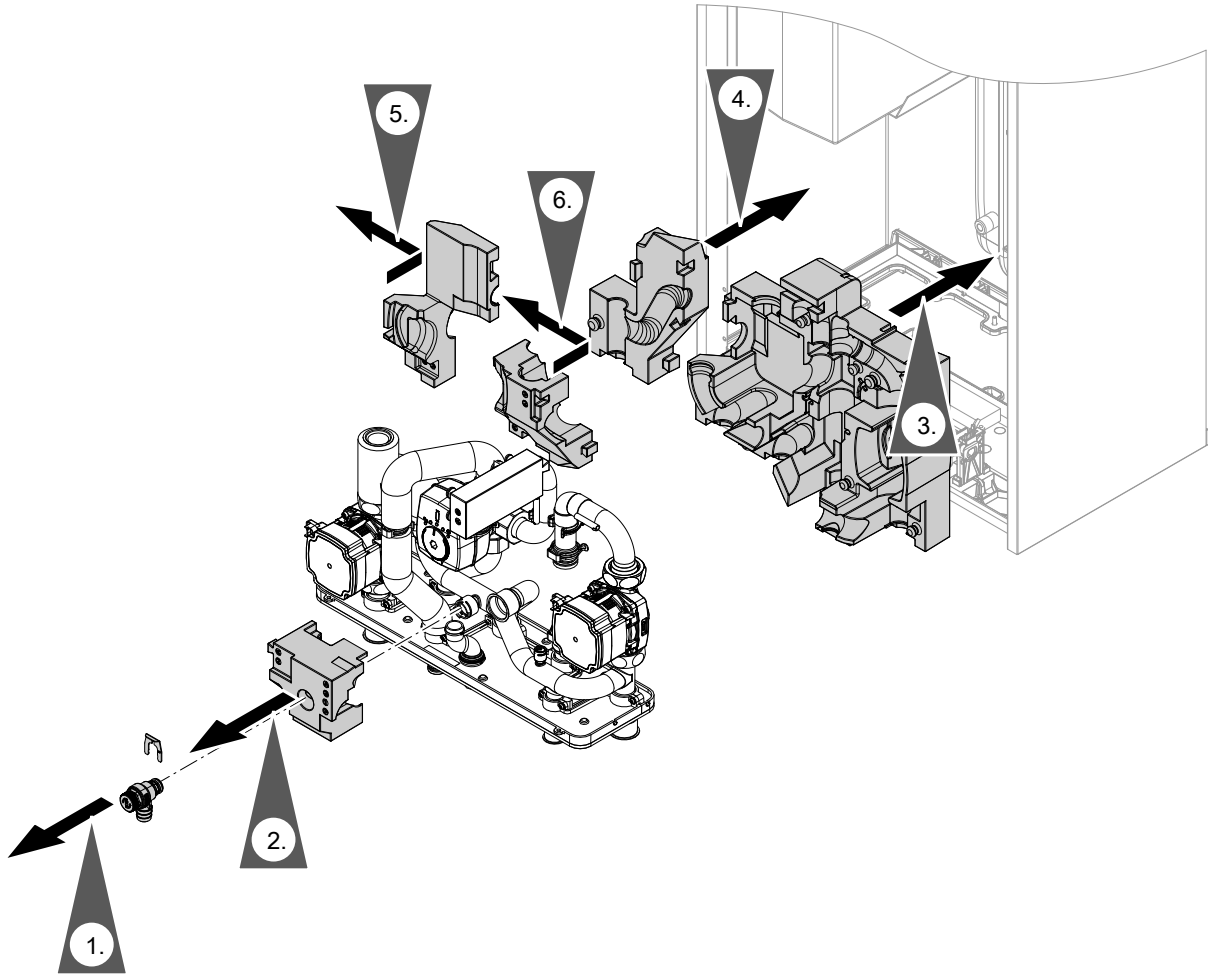

Fig. 97

Status display, internal circulation pumps

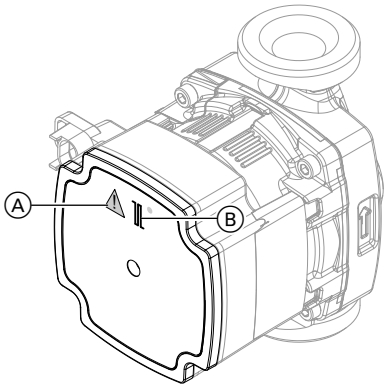

Fig. 98

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 ▪ When isolating the indoor unit from the power supply, the LED illuminates for the duration of the run-on time of approx. 30 to 60 s. When carrying out repair work, wait until the run-on time has elapsed.

Checking the temperature sensors

Temperature sensor NTC 10 kΩ	Connection
▪ Outside temperature sensor	▪ 6-pole connection socket on the underside of the appliance, terminals 11 and 12 ▪ Plug 1 on the HPMU electronics module
▪ Top cylinder temperature sensor	▪ 6-pole connection socket on the underside of the appliance, terminals 9 and 10 ▪ Plug 5 on the HPMU electronics module
▪ Secondary circuit flow temperature sensor Or Flow temperature sensor, heating/cooling circuit 1	▪ EHCU electronics module ▪ Position of the temperature sensor: See chapter "Indoor unit maintenance: Overview of internal components".
▪ Return temperature sensor	▪ EHCU electronics module ▪ Position of the temperature sensor: See chapter "Indoor unit maintenance: Overview of internal components".
▪ Heating/cooling circuit 2 flow temperature sensor Only for indoor unit with 2 integrated heating/cooling circuits	▪ EHCU electronics module ▪ Position of the temperature sensor: See chapter "Indoor unit maintenance: Overview of internal components".
▪ Temperature sensor, external buffer cylinder Only for indoor unit with 1 integrated heating/cooling circuit	6-pole connection socket on the underside of the appliance, terminals 5 and 6

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 test result, replace the lead or the outside temperature sensor.

Checking the temperature sensors (cont.)

Viessmann 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 pressure sensors

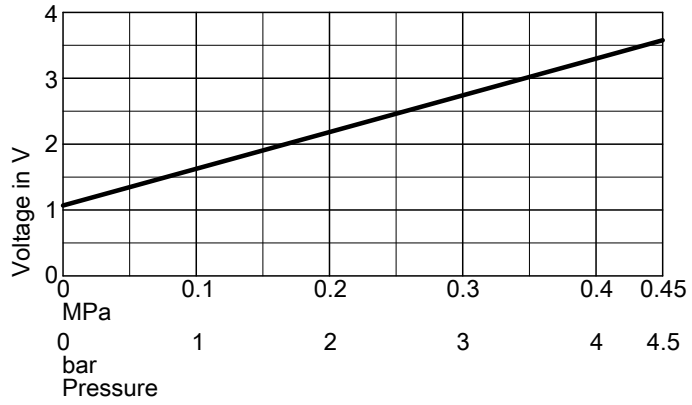

Fig. 99

Checking the fuse

Fuse F1 is located in the HPMU electronics module: See page 61.

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.

Heat pumps with central power supply (types ... SP):
- In addition, check the fuse in the "230 V~ mains connection kit" (accessories). To do so, remove the cover of the mains connection kit.

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 the reverse order.
- Torques for assembly:
  Right side panel nuts: 5.0 +1.0 Nm
  Screws TX 25: 1.8 +0.5 Nm

Removing the outer casing (cont.)

Removing the right-hand side casing

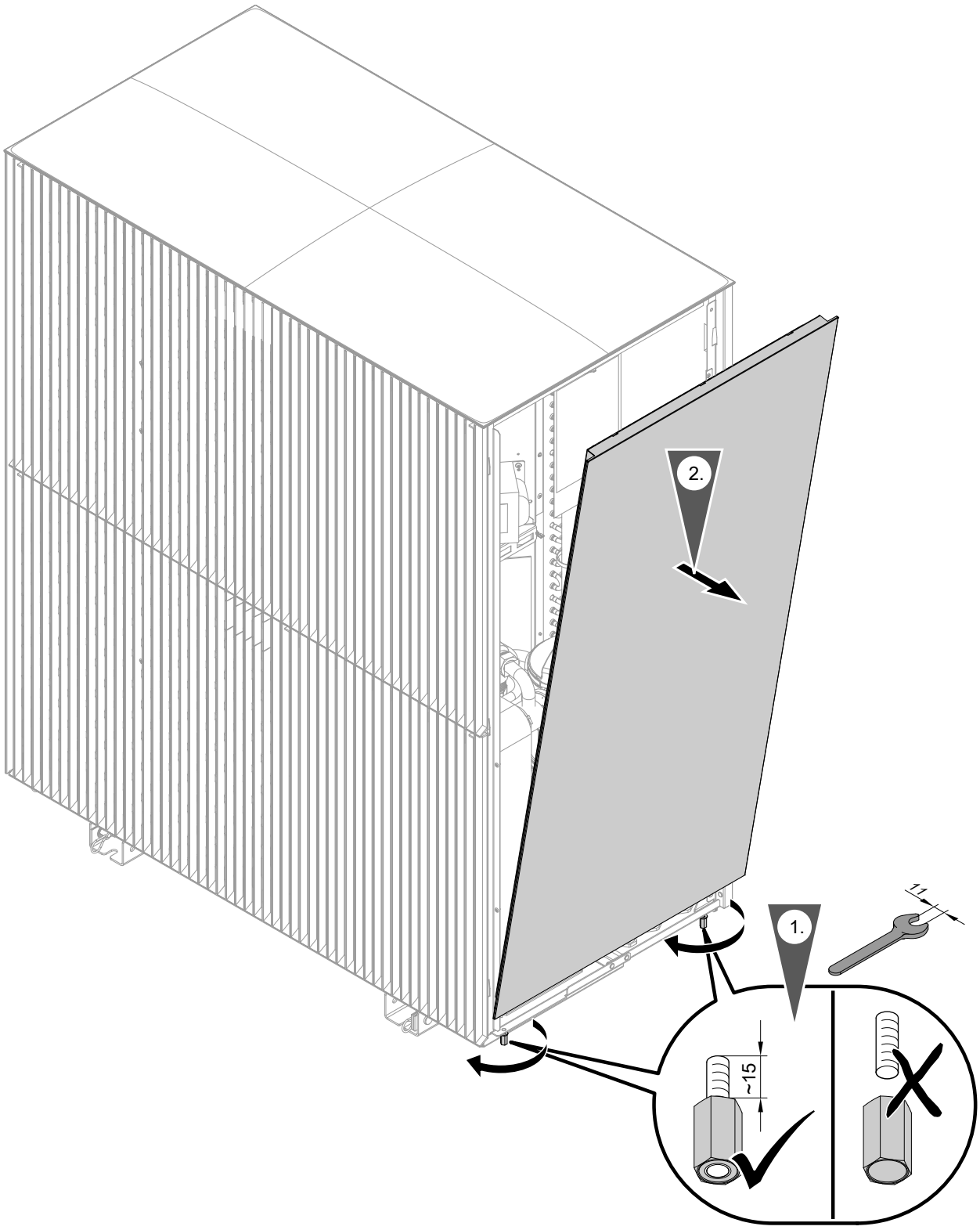

Fig. 100

Removing the outer casing (cont.)

When fitting the right side panel, make sure it is positioned correctly:

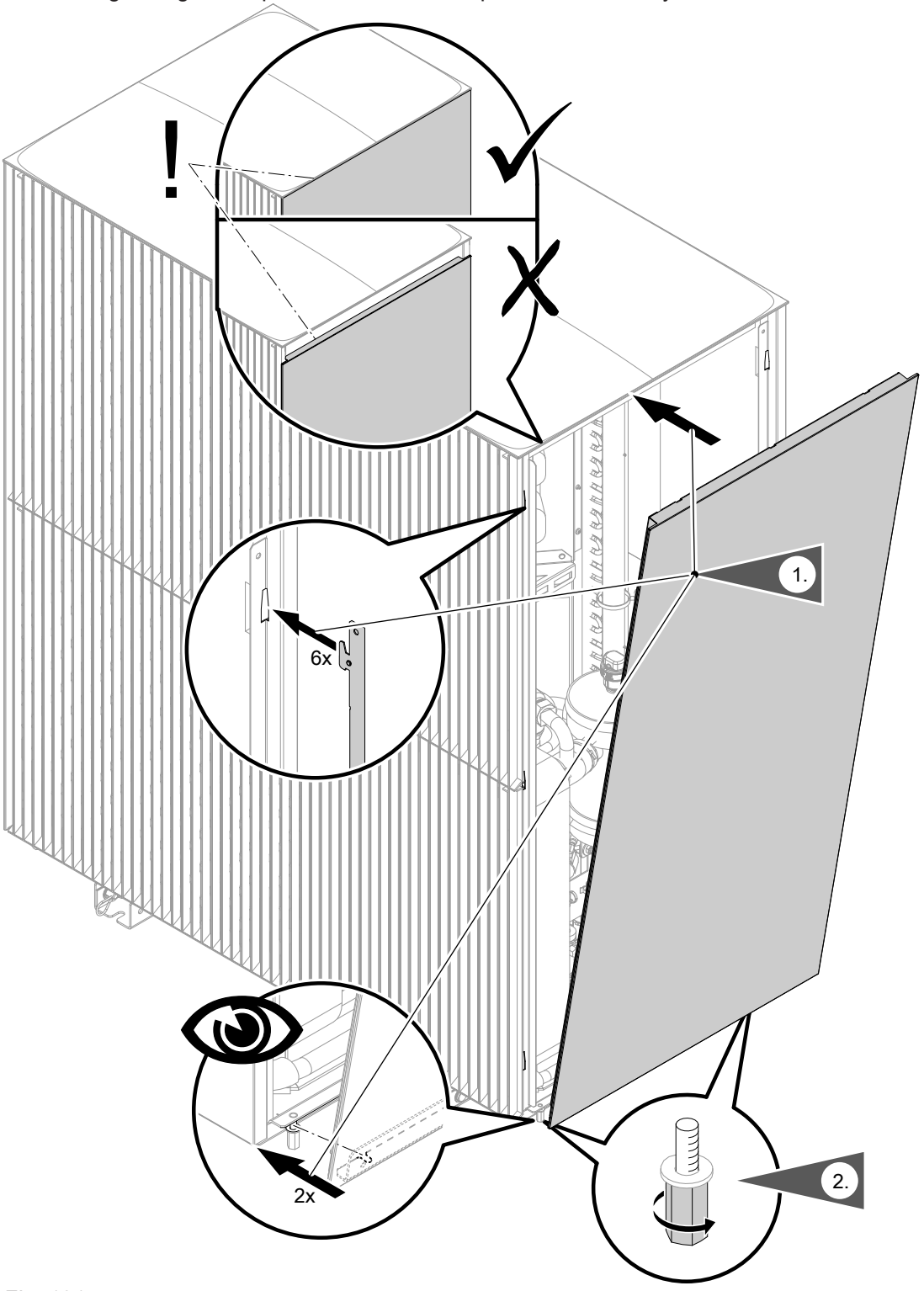

Fig. 101

Removing the top casing

1. Remove side casing, right: See Fig. 100.

Removing the outer casing (cont.)

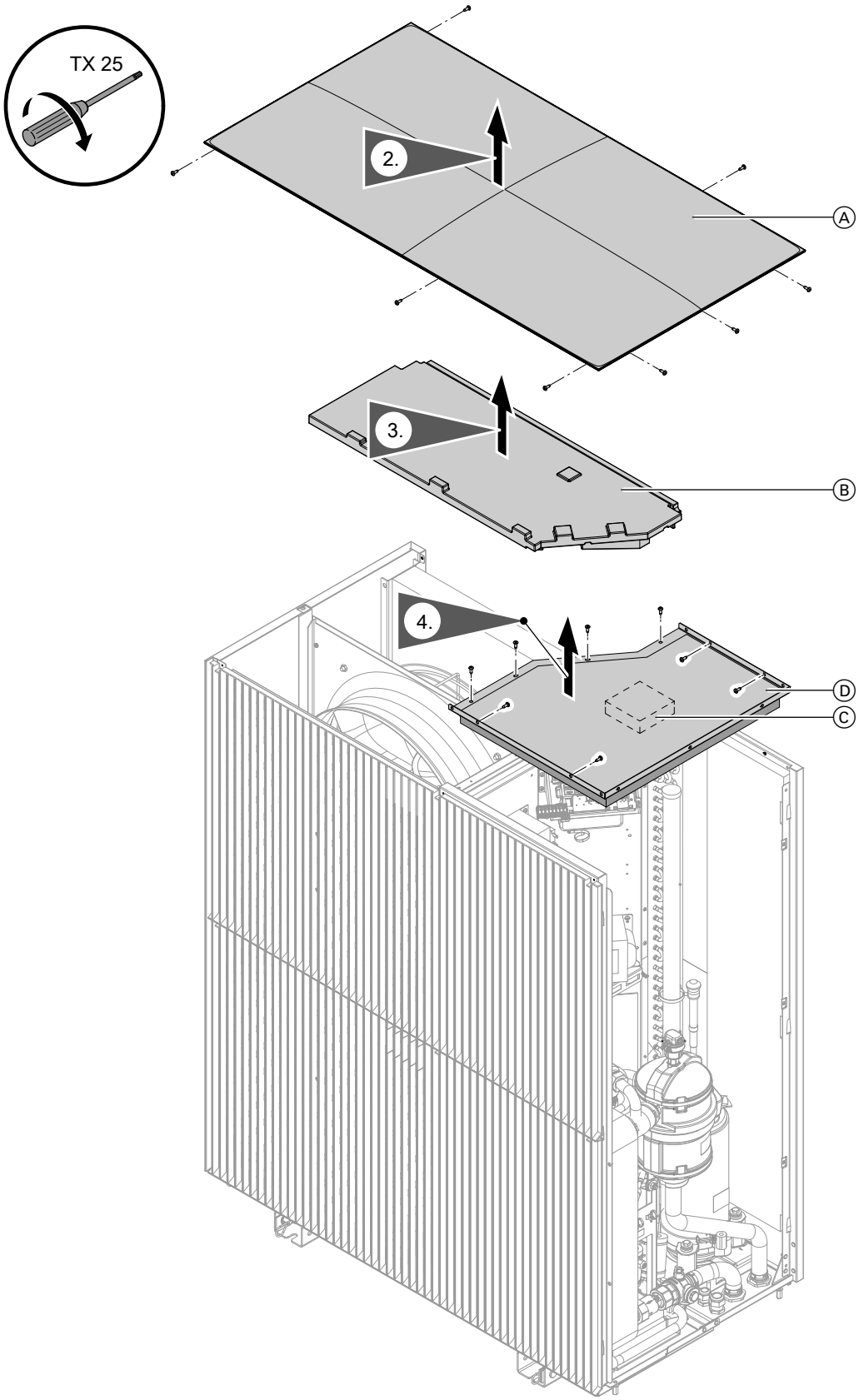

Fig. 102

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

Removing the outer casing (cont.)

Removing the front casing

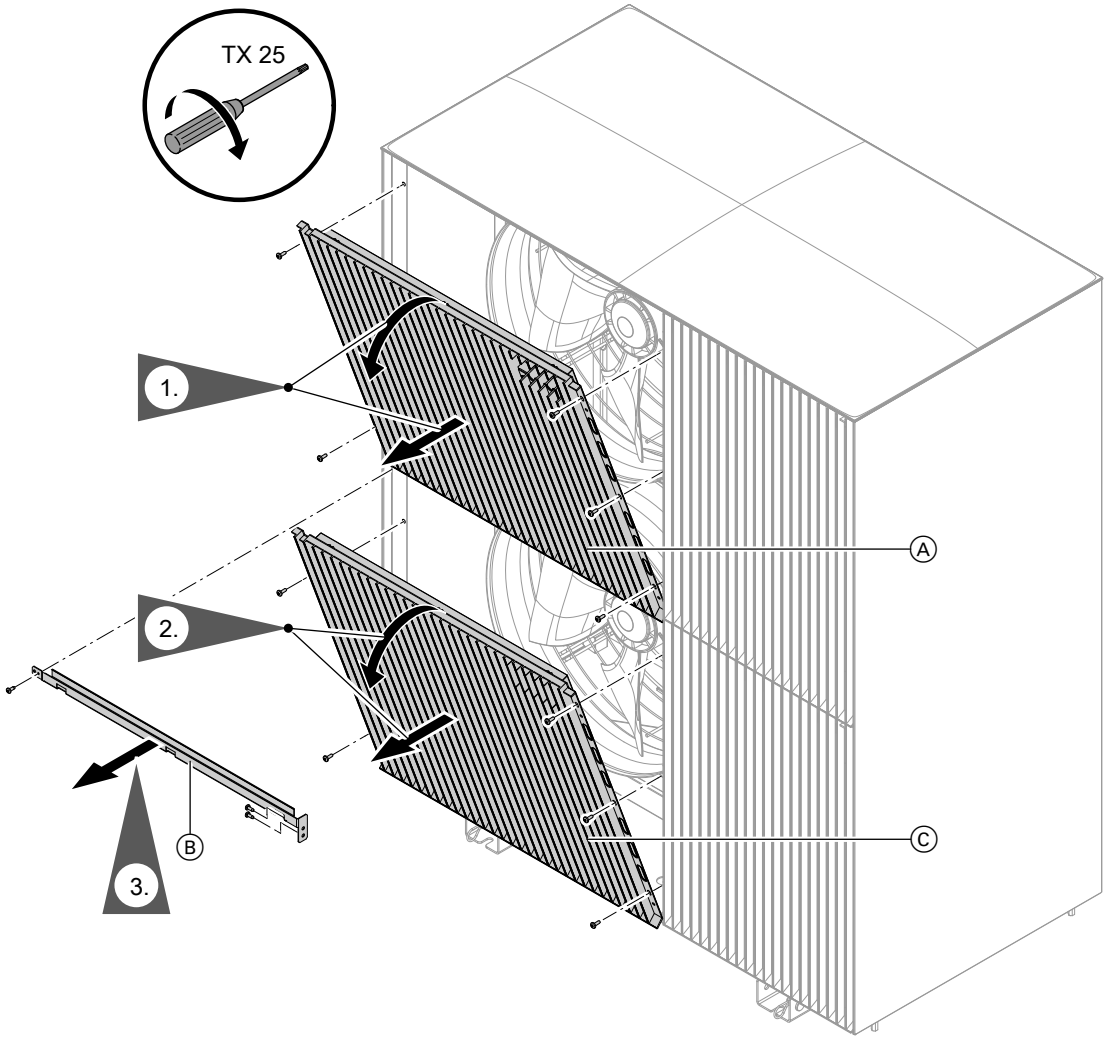

Fig. 103

Ⓐ Only for outdoor unit with 2 fans:
Upper fan grille
Ⓑ Reinforcing strut
Ⓒ Lower fan grille

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Removing the outer casing (cont.)

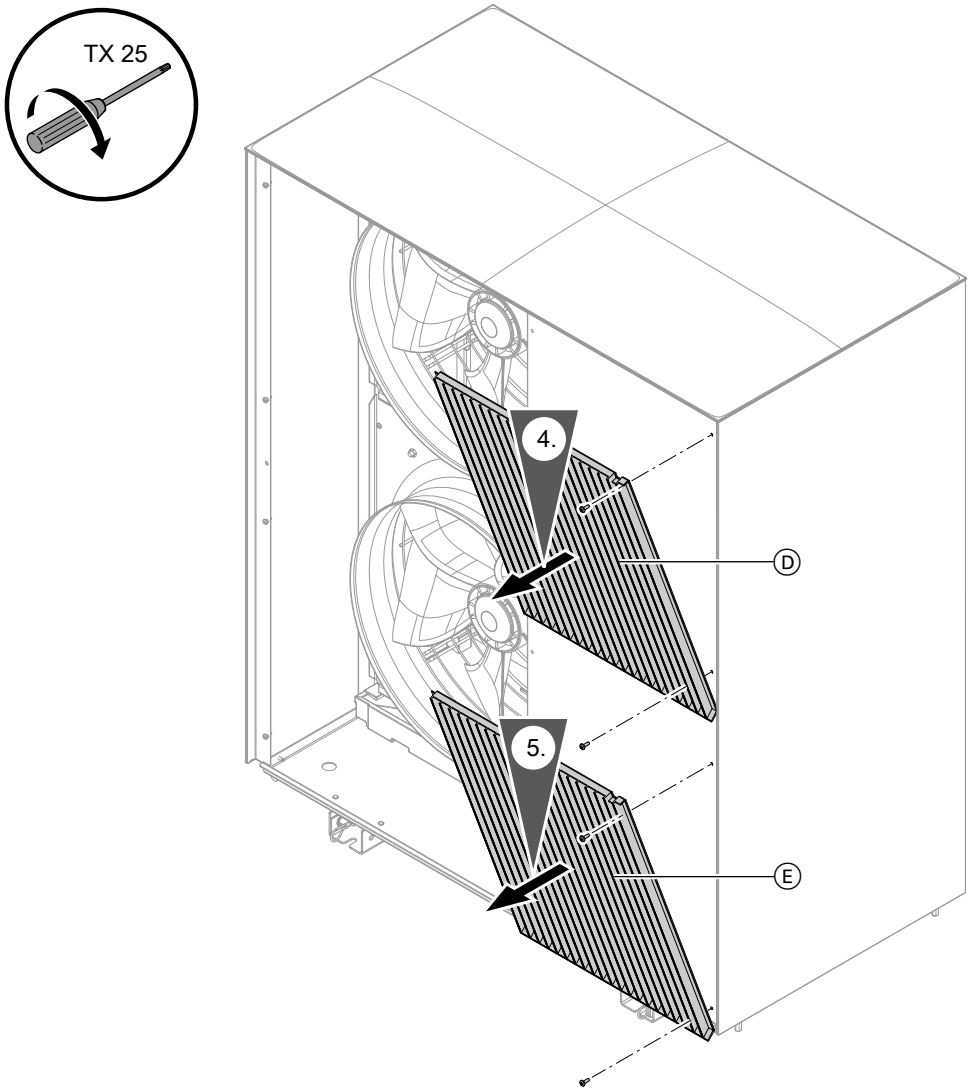

Fig. 104

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

For removal of the front panel:

6. Remove side casing, right: See Fig. 100.

7. Remove top cover: See Fig. 102.

Removing the outer casing (cont.)

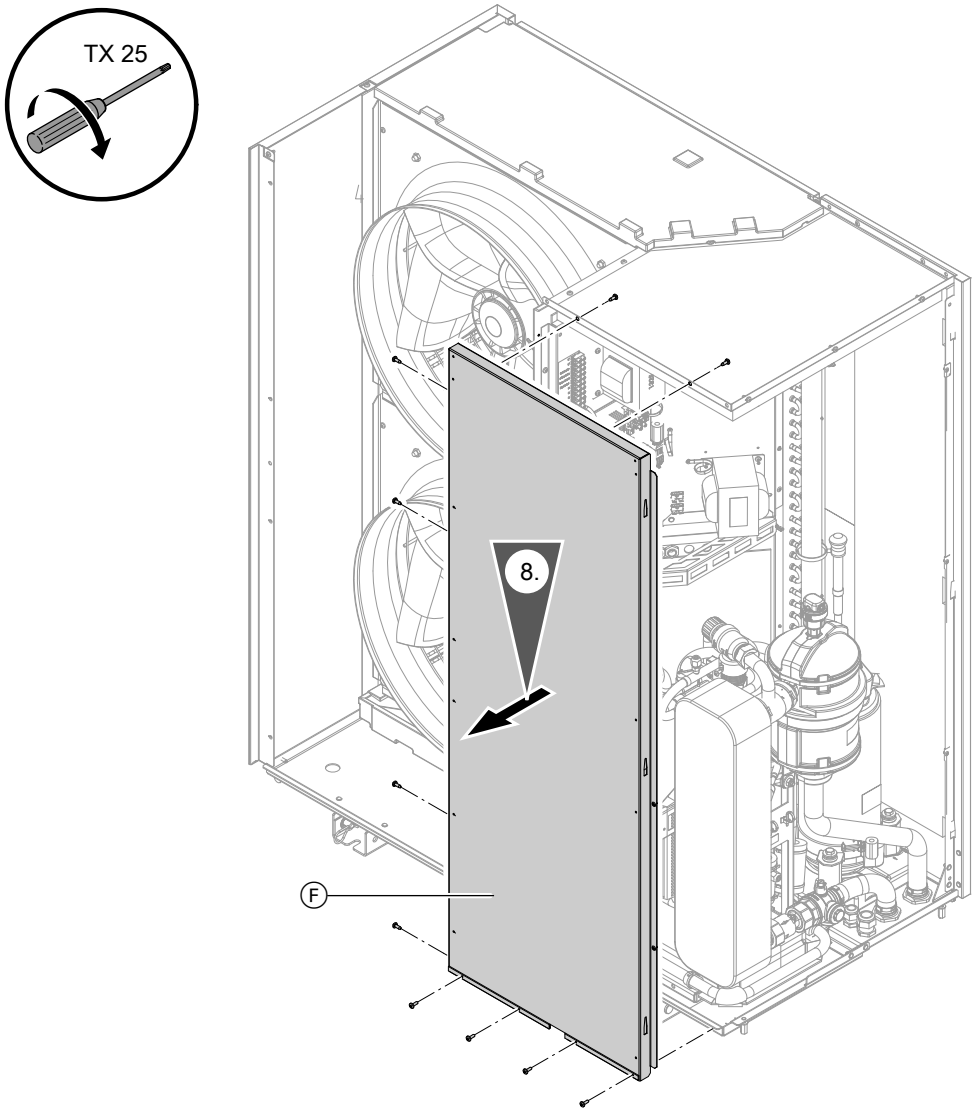

Fig. 105

Ⓕ Front panel

Removing the left-hand side casing

1. Remove side casing, right: See Fig. 100.
2. Remove top cover: See Fig. 102.
3. Remove fan grilles and reinforcing strut: See Fig. 103.

Removing the outer casing (cont.)

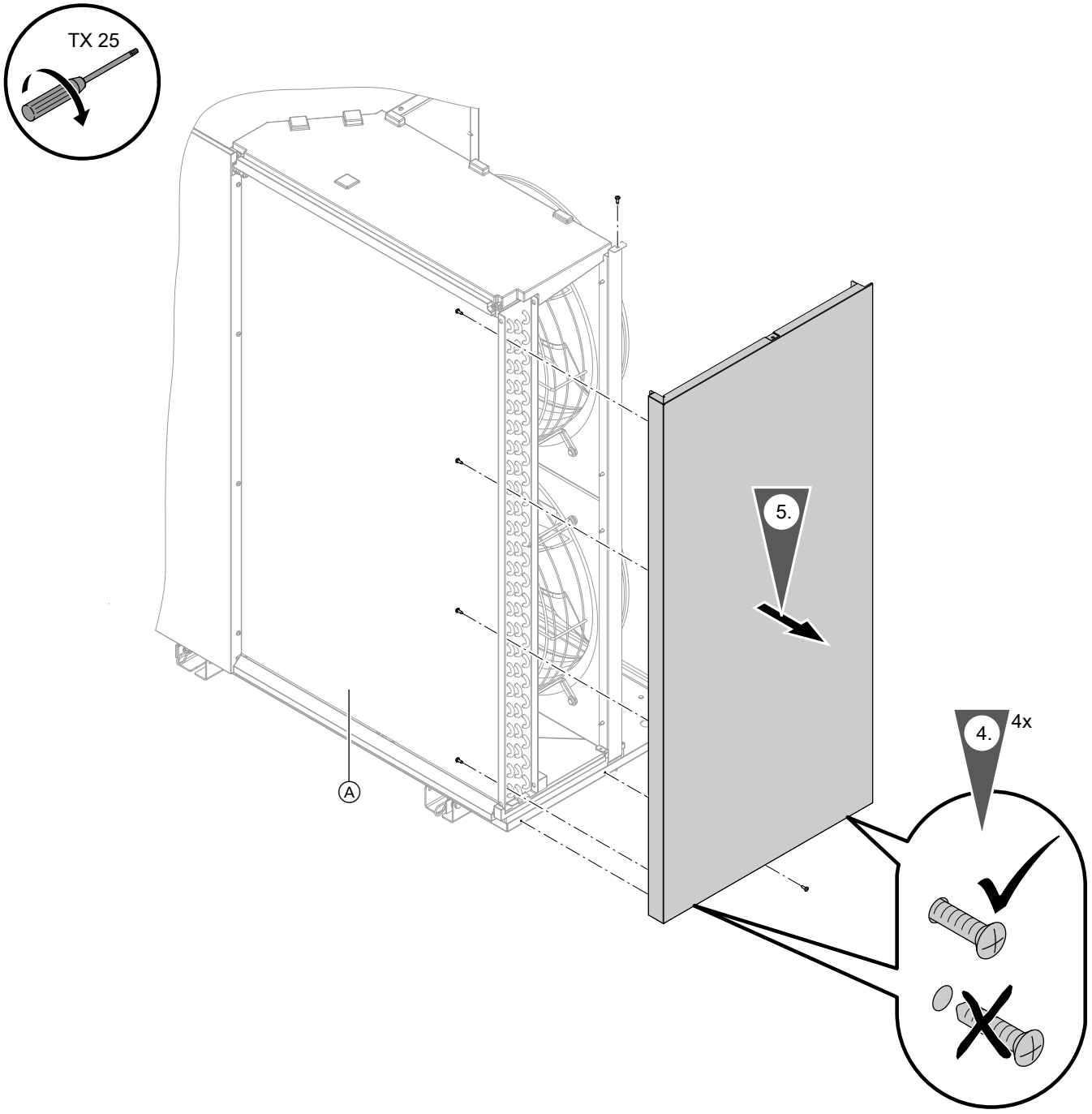

Fig. 106

Ⓐ Evaporator

Removing the rear casing

1. Remove side casing, right: See Fig. 100.

2. Remove top cover: See Fig. 102.

Removing the outer casing (cont.)

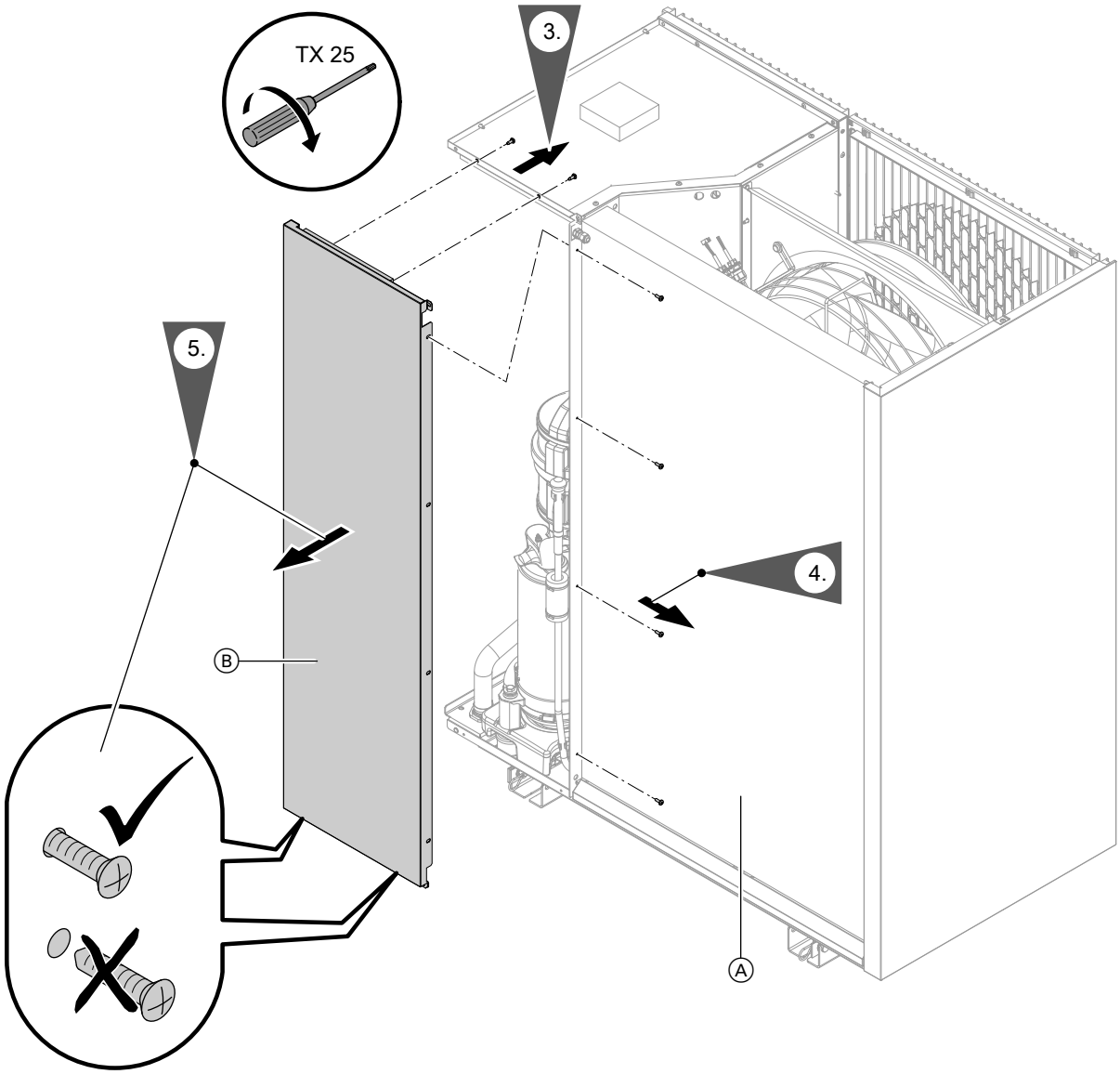

Fig. 107

Ⓐ 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.
- **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 MCB/fuse or a mains isolator. Check that it is no longer 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.

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Overview of electrical components (cont.)

Outdoor unit with 1 fan

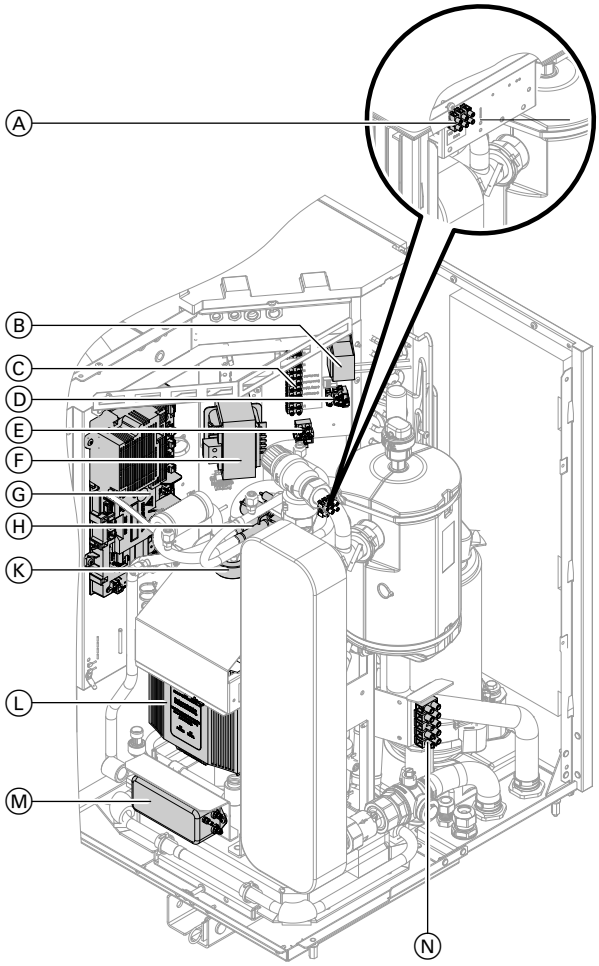

Fig. 108

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

Overview of electrical components (cont.)

Outdoor unit with 2 fans

Connection version A: With plug

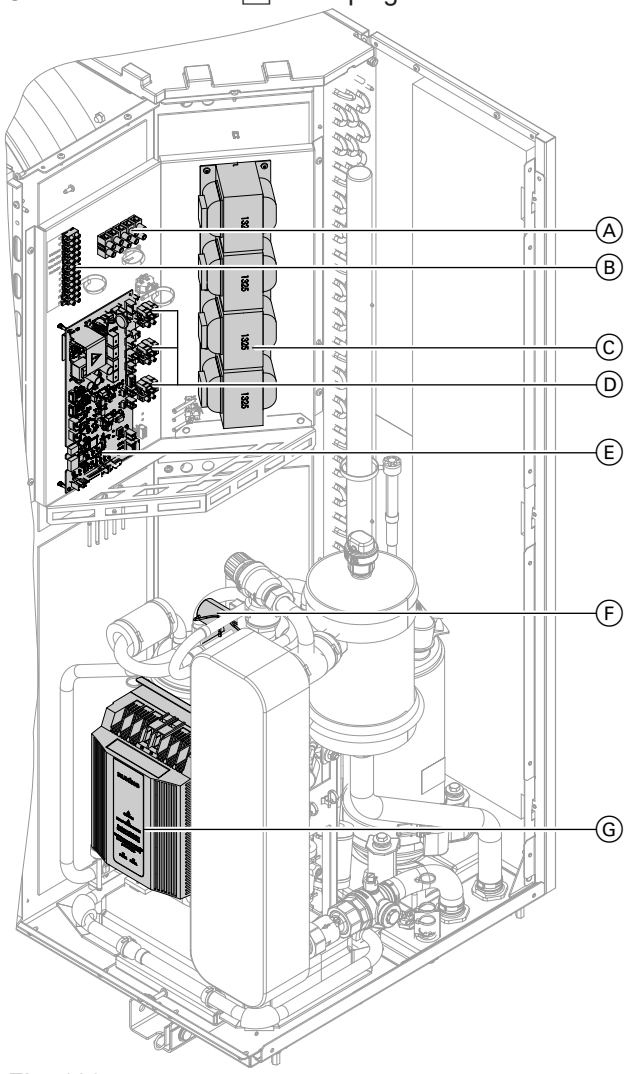

Fig. 109

Ⓐ Terminal strip, 400 V~ power supply
Ⓑ Terminal strip, 230 V~ power supply
Ⓒ Chokes
Ⓓ Fuses for PCB and fans
6.3 A H (slow), 250 V~
Ⓔ VCMU refrigerant circuit controller
Ⓕ Coil, 4-way diverter valve
Ⓖ Inverter

Connection version B: With cable entry

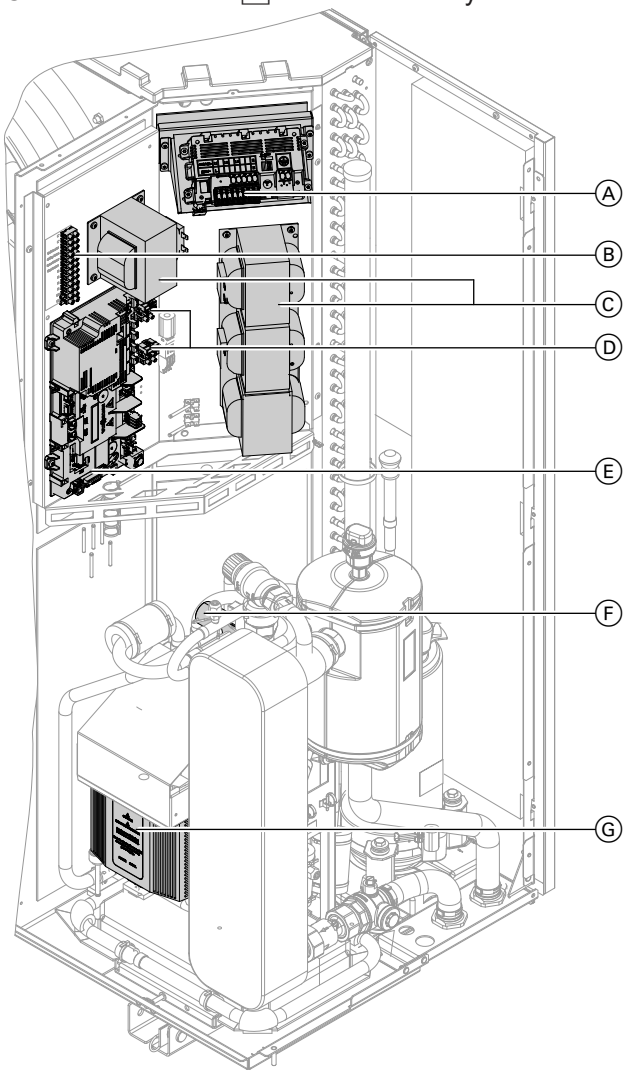

Fig. 110

Ⓐ EMCF PCB with 400 V~/230 V~ power supply
Ⓑ 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

Checklist for maintenance work

Note
Work on the refrigerant circuit must only be carried out by Viessmann Technical Services employees.

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Checklist for maintenance work (cont.)

- 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.
- For soldering work on the refrigerant circuit, only solders AG145 and CuP 281a may be used. These are used by Viessmann and comply with ISO 17672.
- 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 drained. ▪ 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. ▪ The ventilation must be maintained for the entire duration of the work. The ventilation 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 genuine Viessmann spare parts. ▪ Carry out all component replacements in accordance with Viessmann guidelines. If required, consult Viessmann Technical Service. 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, provide a suitable interim solution for the system's operation if required. 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.		

Checklist for maintenance work (cont.)

Measure		Completed	Comments
8	**Repairs on sealed enclosures** ▪ When carrying out work on sealed components, fully isolate the appliance from the power supply, also before removing sealed covers. ▪ If a power supply is absolutely necessary during the work: Position a continuously operating refrigerant detector in the most critical locations, to provide warning of any potentially dangerous situation. ▪ Pay special attention to ensuring that any work on electrical components does not lead to any changes to the enclosures that would affect their protective properties. This includes damage to leads, too many connections on a single terminal, connections that do not correspond to the manufacturer's specification, damage to seals, as well as incorrect installation of cable entries. ▪ Ensure the appliance is correctly installed. ▪ Check that the seals have settled. Ensure by checking that the seals reliably prevent the ingress of a flammable atmosphere. Replace defective seals. ! **Please note** Silicone as a sealant can affect the function of leak detection devices. Do not use silicone as a sealant. ▪ Spare parts must correspond to the manufacturer's specifications. ▪ Work on components which are suitable for flammable atmospheres: It is not imperative that these components are isolated from the power supply.		
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 Viessmann original parts or parts approved by Viessmann. 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.		
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.		

Checklist for maintenance work (cont.)

Measure		Completed	Comments
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 the refrigerant** Carry out the work in accordance with chapter "Extracting the 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".		
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.		

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.

Outdoor unit with 1 fan

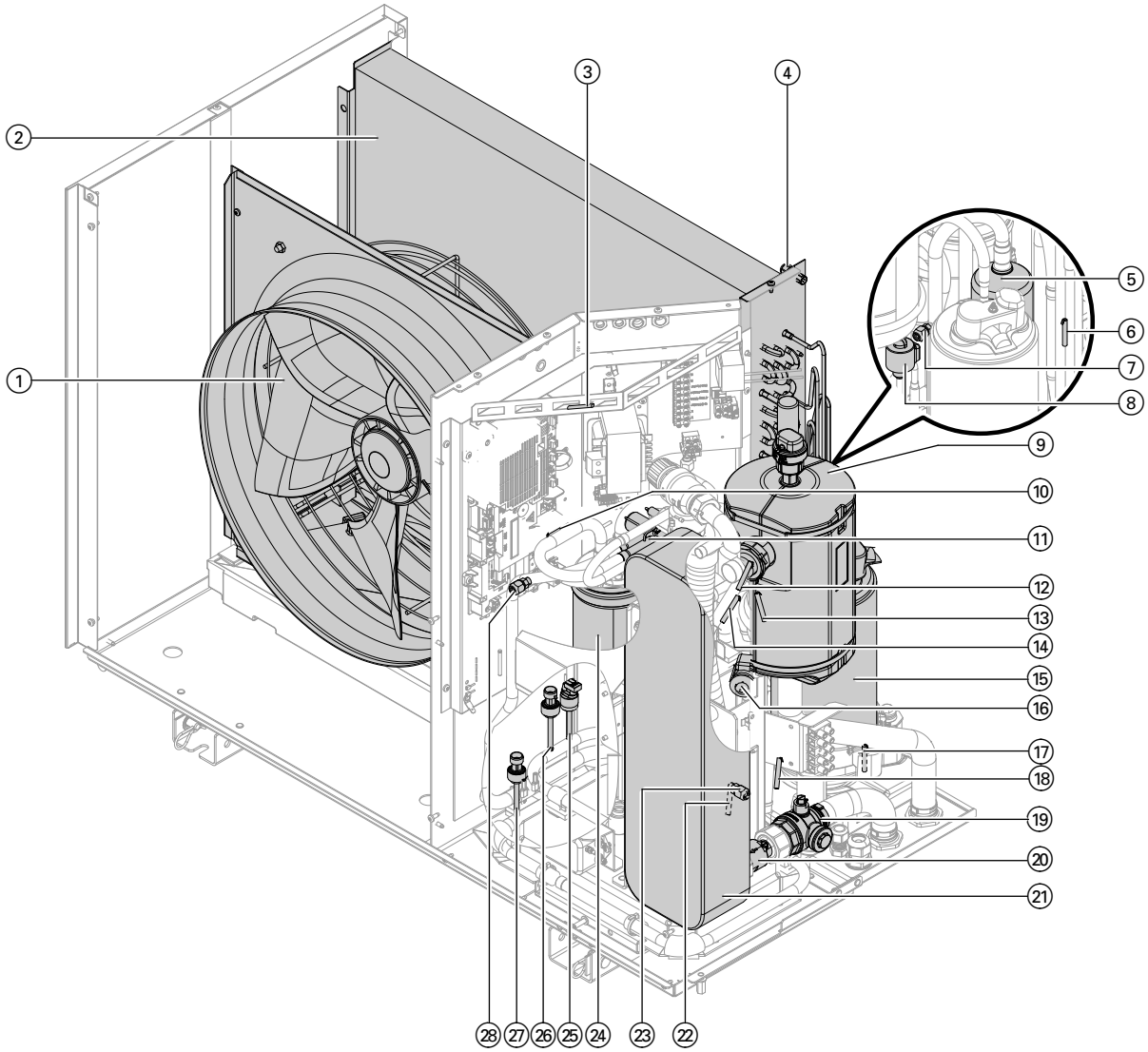

Fig. 111

① Fan
② Evaporator
③ Interior temperature sensor
④ Air intake temperature sensor
⑤ Compressor accumulator
⑥ Liquid gas temperature sensor, cooling
⑦ Schrader valve, low pressure side
⑧ Electronic expansion valve 2
⑨ Float air vent valve with quick-action air vent valve
⑩ Suction gas temperature sensor, evaporator
⑪ 4-way diverter valve
⑫ Secondary circuit flow temperature sensor
⑬ Liquid gas temperature sensor, condenser
⑭ Hot gas temperature sensor

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Overview of internal components (cont.)

⑮ Compressor
⑯ Electronic expansion valve 1
⑰ Oil sump temperature sensor
⑱ Compressor temperature sensor, compressor
⑲ Ball valve with filter
⑳ Non-return valve
㉑ Condenser
㉒ Liquid gas temperature sensor, heating
㉓ Schrader valve, high pressure side 1
㉔ Accumulator
㉕ High pressure switch PSH
㉖ High pressure sensor
㉗ Low pressure sensor
㉘ Schrader valve, high pressure side 2

Outdoor unit with 2 fans

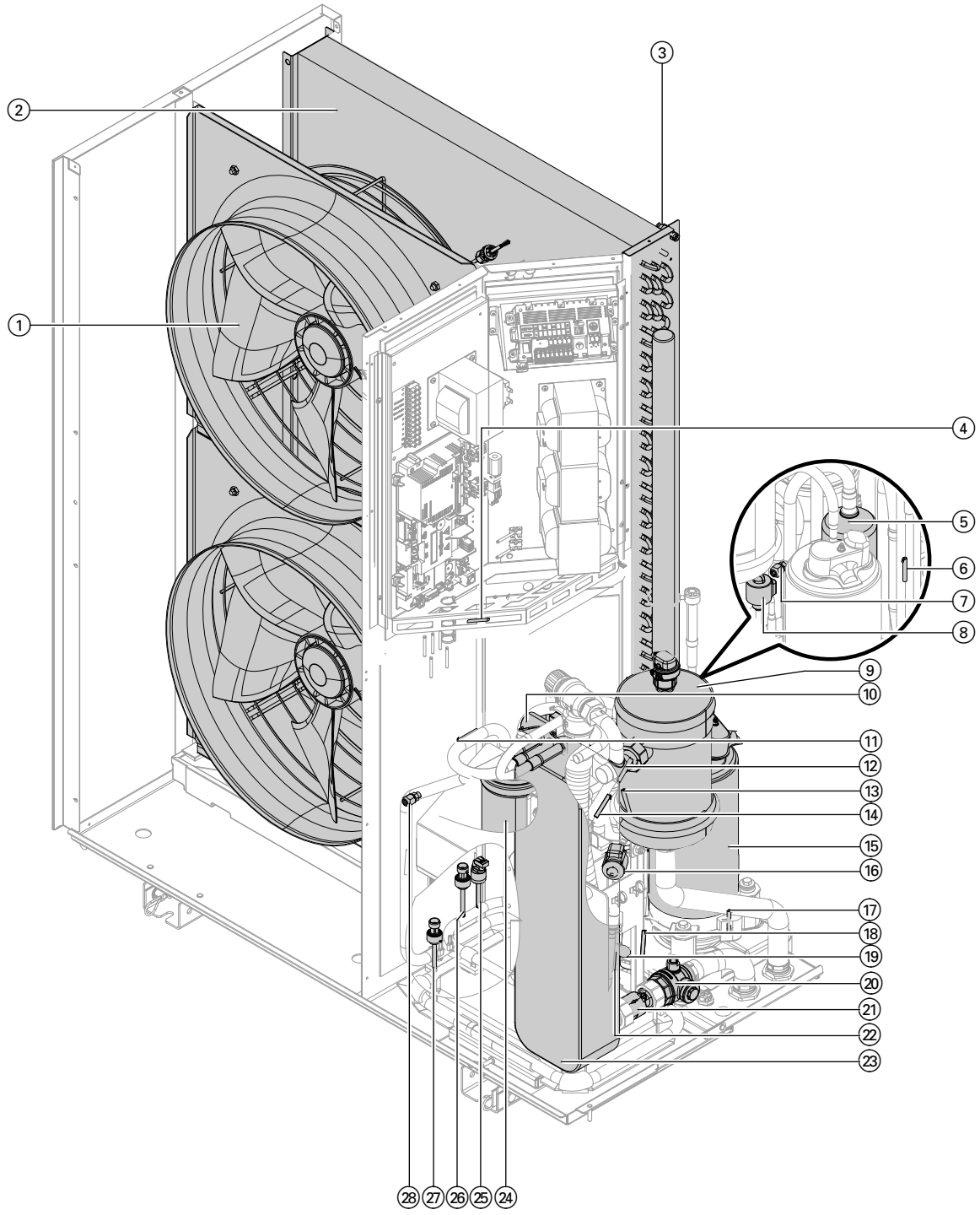

Fig. 112

① Fan
② Evaporator
③ Air intake temperature sensor
④ Interior temperature sensor

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Overview of internal components (cont.)

⑤ Compressor accumulator
⑥ Liquid gas temperature sensor, cooling
⑦ Schrader valve, low pressure side
⑧ Electronic expansion valve 2
⑨ Float air vent valve with quick-action air vent valve
⑩ 4-way diverter valve
⑪ Suction gas temperature sensor, evaporator
⑫ Secondary circuit flow temperature sensor
⑬ Liquid gas temperature sensor, condenser
⑭ Hot gas temperature sensor
⑮ Compressor
⑯ Electronic expansion valve 1
⑰ Oil sump temperature sensor
⑱ Compressor temperature sensor, compressor
⑲ Schrader valve, high pressure side 1
⑳ Ball valve with filter
㉑ Non-return valve
㉒ Liquid gas temperature sensor, heating
㉓ Condenser
㉔ Accumulator
㉕ High pressure switch PSH
㉖ High pressure sensor
㉗ Low pressure sensor
㉘ Schrader valve, high pressure side 2

Refrigerant circuit flowchart

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

Flow rates:

- Secondary side (heating water)
  Min. flow rate: 0.350 m^3/h (350 l/h)
  Max. flow rate: 2.050 m^3/h (2050 l/h)
- Primary side (air)
  Min. air flow rate: 2900 m^3/h
  Max. air flow rate: 5300 m^3/h

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 flowchart (cont.)

Heating mode

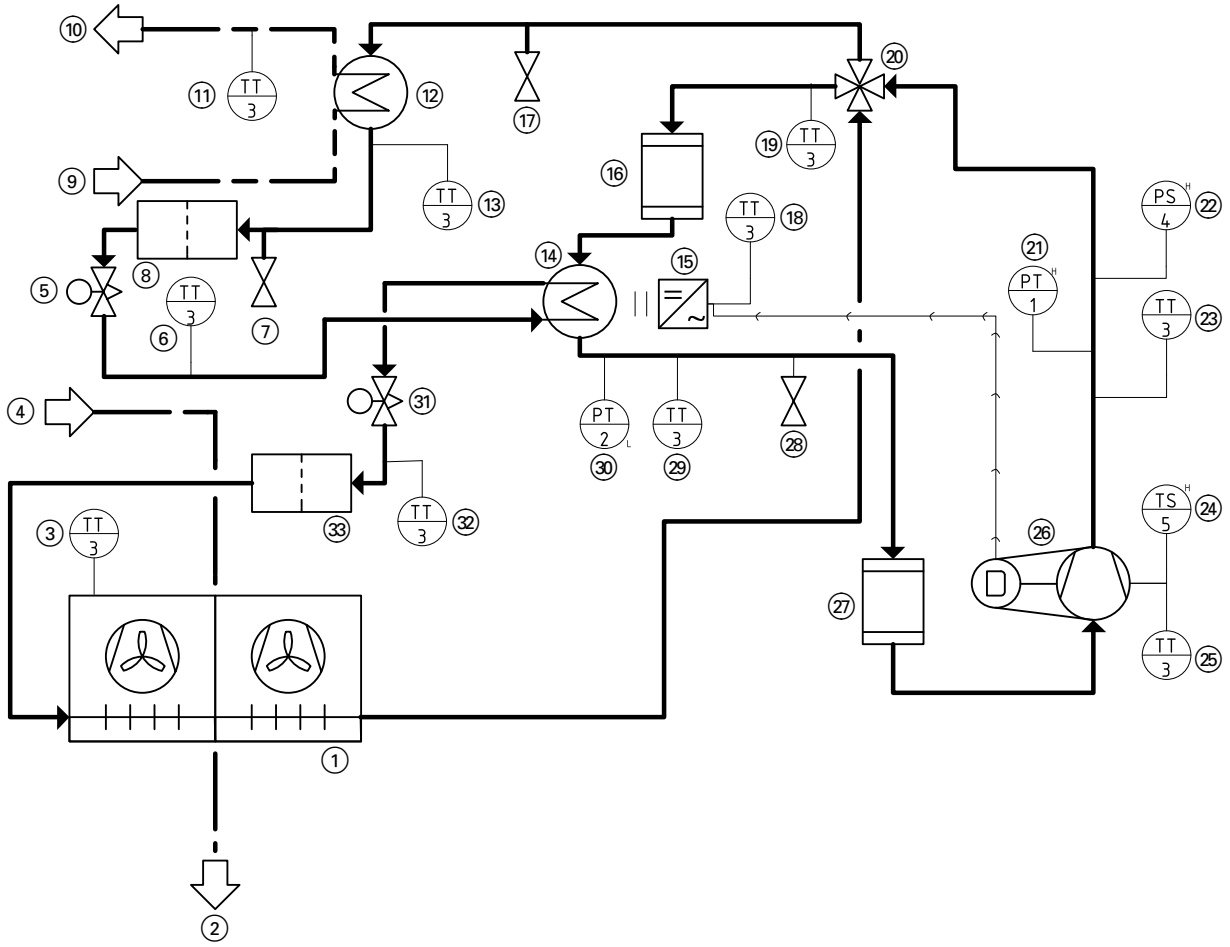

Fig. 113

① Evaporator
② Air discharge
③ Air intake temperature sensor
④ Air intake
⑤ Electronic expansion valve 1
⑥ Liquid gas temperature sensor, heating
⑦ Schrader valve, high pressure side 2
⑧ Filter, electronic expansion valve 1
⑨ Secondary circuit return
⑩ Secondary circuit flow
⑪ Secondary circuit flow temperature sensor
⑫ Condenser
⑬ Liquid gas temperature sensor, condenser
⑭ Heat exchanger
⑮ Inverter
⑯ Refrigerant collector
⑰ Schrader valve, high pressure side 1
⑱ Interior temperature sensor
⑲ Suction gas temperature sensor, evaporator
⑳ 4-way diverter valve
㉑ High pressure sensor
㉒ High pressure switch PSH
㉓ Hot gas temperature sensor
㉔ High limit safety cut-out
㉕ Oil sump temperature sensor
㉖ Compressor
㉗ Accumulator
㉘ Schrader valve, low pressure side
㉙ Suction gas temperature sensor, compressor
㉚ Low pressure sensor
㉛ Electronic expansion valve 2
㉜ Liquid gas temperature sensor, cooling
㉝ Filter, electronic expansion valve 2

Refrigerant circuit flowchart (cont.)

Cooling mode

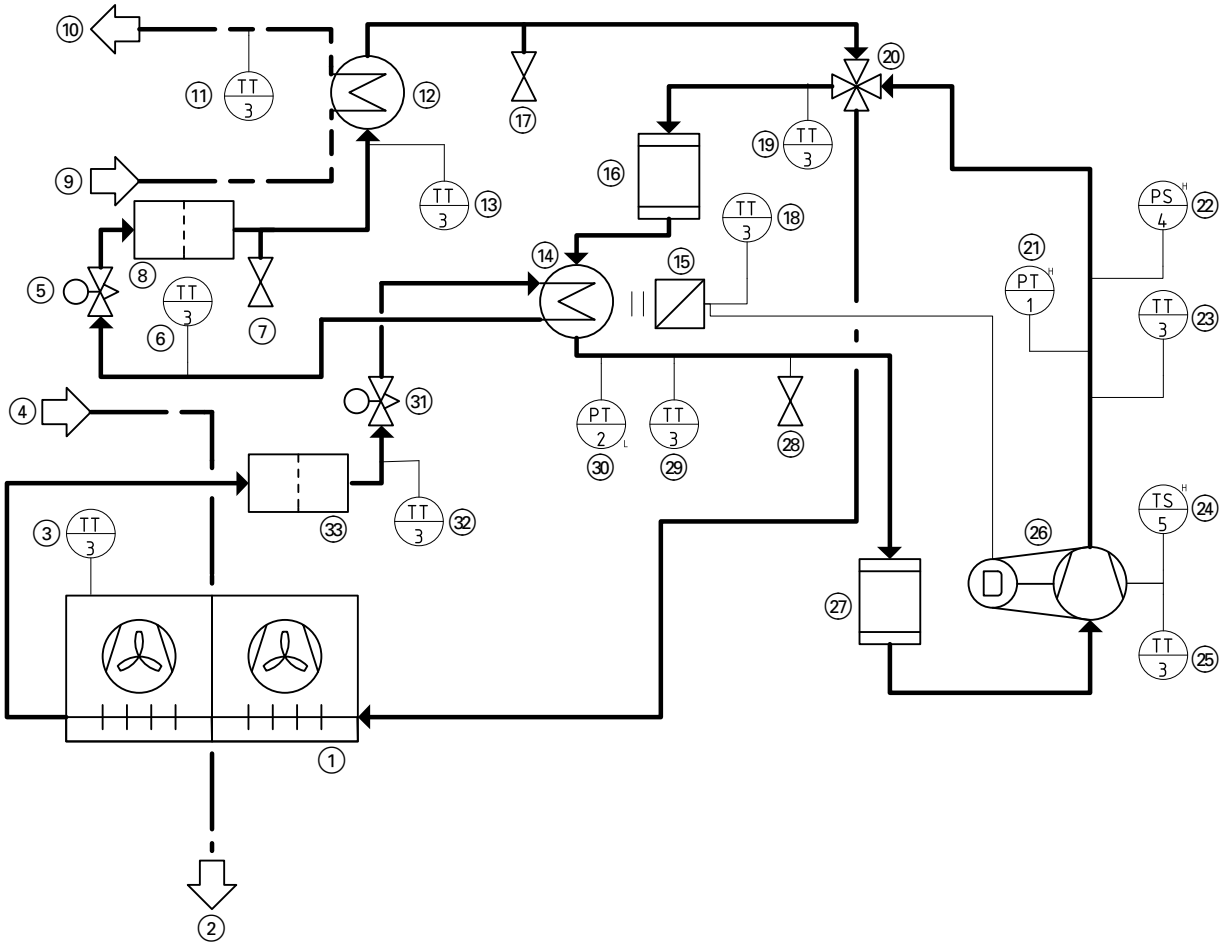

Fig. 114

① Evaporator
② Air discharge
③ Air intake temperature sensor
④ Air intake
⑤ Electronic expansion valve 1
⑥ Liquid gas temperature sensor, heating
⑦ Schrader valve, high pressure side 2
⑧ Filter, electronic expansion valve 1
⑨ Secondary circuit return
⑩ Secondary circuit flow
⑪ Secondary circuit flow temperature sensor
⑫ Condenser
⑬ Liquid gas temperature sensor, condenser
⑭ Heat exchanger
⑮ Inverter
⑯ Accumulator
⑰ Schrader valve, high pressure side 1
⑱ Interior temperature sensor
⑲ Suction gas temperature sensor, evaporator
⑳ 4-way diverter valve
㉑ High pressure sensor
㉒ High pressure switch PSH
㉓ Hot gas temperature sensor
㉔ High limit safety cut-out
㉕ Oil sump temperature sensor
㉖ Compressor
㉗ Refrigerant collector
㉘ Schrader valve, low pressure side
㉙ Suction gas temperature sensor, compressor
㉚ Low pressure sensor
㉛ Electronic expansion valve 2
㉜ Liquid gas temperature sensor, cooling
㉝ Filter, electronic expansion valve 2

Extracting the refrigerant

Before commencing work, note the "Checklist for maintenance work" on page 160 onwards.

Extracting the refrigerant (cont.)

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. Check the condition of the heat pump. Check whether the service intervals have been adhered to.

2. Isolate the system from the power supply. Safeguard against unauthorised reconnection.

   ⚠ **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.

3. Check whether the safety instructions for work on the refrigerant circuit are being adhered to: See "Safety instructions".

4. Place the refrigerant bottle on the scales.
   Battery operated scales may only be used outside the safety zone.

5. 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.

6. Extract the refrigerant from all parts of the refrigerant circuit using the extraction equipment. If necessary, open the electronic expansion valves with the appropriate permanent magnet.

   Note
   - *The refrigerant extraction must be continuously monitored by an authorised contractor.*
   - *Do not overfill the refrigerant bottle, max. 80 % of the permissible capacity.*
   - *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*

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

8. Flush the refrigerant circuit with dry nitrogen for 5 minutes.

9. Fill the refrigerant circuit with dry nitrogen up to a positive pressure of 5 bar (500 kPa).

10. Release the positive pressure.

11. 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.

12. Carry out a static vacuum test:
    Absolute pressure may not exceed 10 mbar (1 kPa) for at least 30 min.
    If the vacuum is not maintained, repeat from step 8.

13. Repeat steps 8 to 10 until there is no more refrigerant in the refrigerant circuit.

    Note
    On 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.

Extracting the refrigerant (cont.)

14. Once the refrigerant has been completely evacuated, close the Schrader valves so they are gas-tight. Fit the sealing cap. To achieve this, counterhold the valve body.
Torque for dust cap union nut: 11 Nm

15. 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.

Testing pressure resistance

⚠ **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: 1.43 x permissible operating pressure
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, note the "Checklist for maintenance work" on page 160 onwards.

1. Check whether the safety instructions for work on the refrigerant circuit are being adhered to: See "Safety instructions".

2. Earth the refrigerant circuit.

3. Ensure the following conditions for filling are met:
- Refrigerant circuit has been drained and evacuated: See chapter "Extracting refrigerant".
- Absolute pressure before filling: < 2.7 mbar (< 270 Pa)
- If any components were replaced, observe all information in the separate installation instructions.
- After performing any repairs (e.g. soldering/brazing, replacing components) first carry out a pressure resistance test: See chapter "Testing pressure resistance".

4. Fill the refrigerant circuit with R290 refrigerant (propane) via the high pressure side 2 Schrader valve (liquid line, see chapter "Overview of internal components").

⚠ **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.

⚠ **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. Max. refrigerant charge: See "Specification".

5. 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

Filling the refrigerant circuit (cont.)

6. Affix a label to the heat pump in a clearly visible position, containing the following information, with date and signature:
   - Type of topped up refrigerant
   - Amount of topped up refrigerant
7. Carry out the leak test using an explosion-proof refrigerant detector suitable for R290 (propane).
8. Seal the sealing caps of the low pressure and high pressure Schrader valves: See "Outdoor unit maintenance: Overview of internal components".

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.

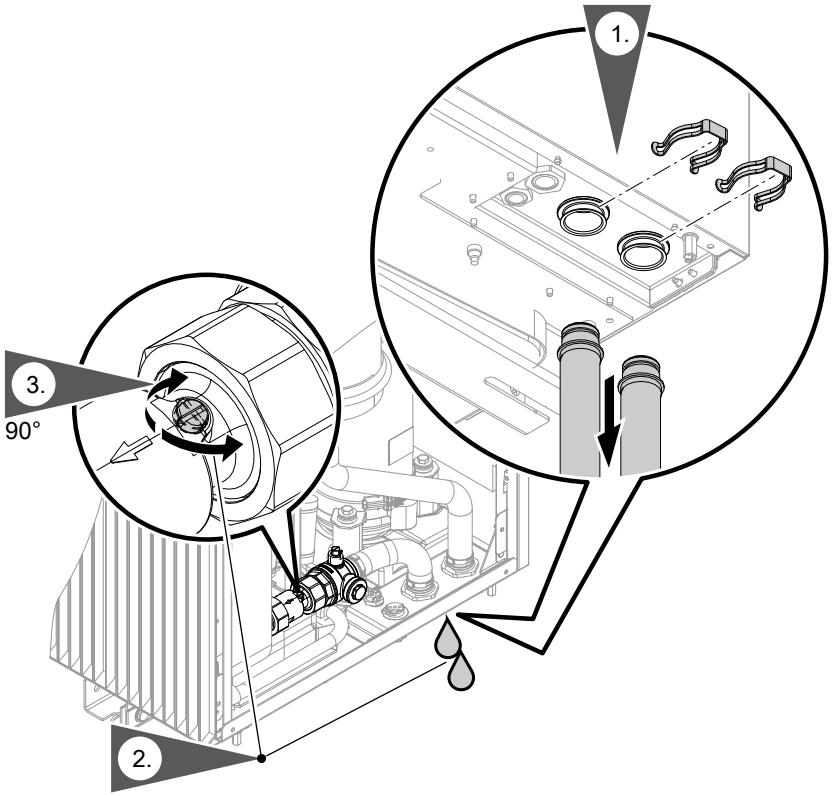

Fig. 115

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

Removing the 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 the hydraulic components (cont.)

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

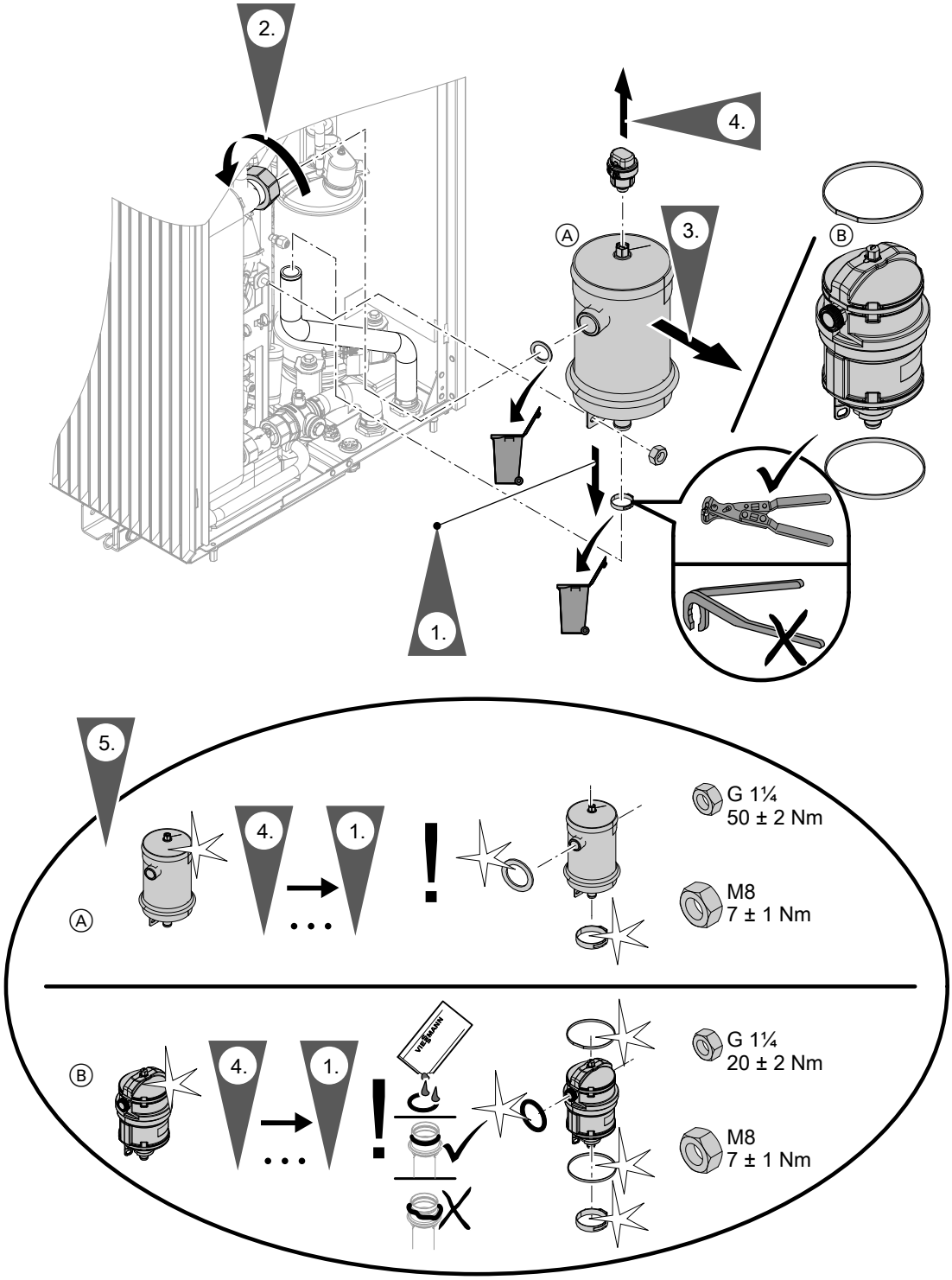

Fig. 116

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

Removing the hydraulic components (cont.)

Removing the ball valve with filter

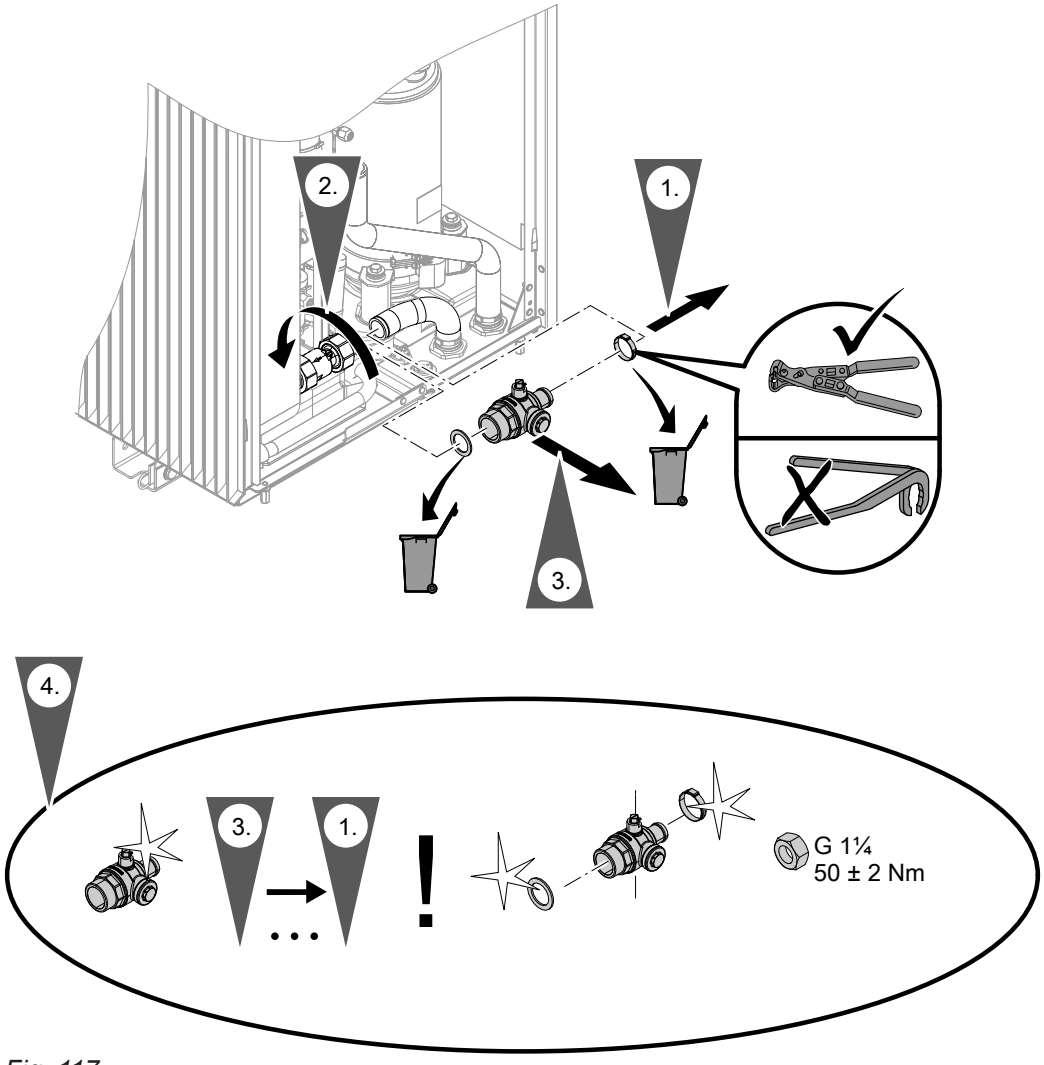

Fig. 117

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 intake temperature sensor ▪ Interior temperature sensor ▪ Compressor suction gas temperature sensor ▪ Suction gas temperature sensor, evaporator ▪ Secondary circuit flow temperature sensor ▪ Condenser liquid gas temperature sensor ▪ Hot gas temperature sensor ▪ Compressor suction gas temperature sensor ▪ Liquid gas temperature sensor, heating ▪ Liquid gas temperature sensor, cooling	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

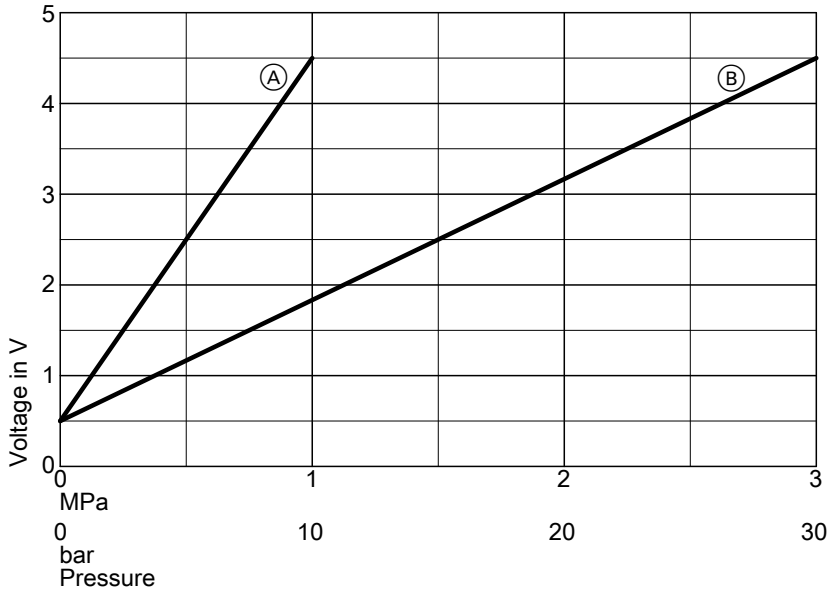

Fig. 118

Ⓐ Low pressure sensor
Ⓑ High pressure sensor

Checking the fuses

The fuses are located next to the VCMU refrigerant circuit controller: See page 158.

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.

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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

Type AWO-E-AC 251.A/AWO-E-AC-AF 251.A		**10** **10 2C**	**13** **13 2C**
Heating performance data to EN 14511 (A2/W35)			
Rated heating output	kW	5.8	6.7
Fan speed	rpm	425	440
Power consumption	kW	1.31	1.68
Coefficient of performance ε (COP) in heating mode		4.46	3.98
Output control	kW	2.2 to 11.0	2.6 to 12.3
Heating performance data to EN 14511 (A7/W35, 5 K spread)			
Rated heating output	kW	7.3	8.1
Fan speed	rpm	430	440
Air flow rate	m^3/h	4045	4188
Power consumption	kW	1.38	1.56
Coefficient of performance ε (COP) in heating mode		5.31	5.21
Output control	kW	2.6 to 12.0	3.0 to 13.4
Heating performance data to EN 14511 (A–7/W35)			
Rated heating output	kW	9.7	11.1
Power consumption	kW	3.07	3.75
Coefficient of performance ε (COP) in heating mode		3.16	2.97
Heating performance data to EN 14511 (A–7/W55)			
Rated heating output	kW	6.75	7.56
Power consumption	kW	2.27	2.33
Coefficient of performance ε (COP) in heating mode		2.97	3.4
Cooling performance data to EN 14511 (A35/W7)			
Rated cooling capacity	kW	3.90	5.60
Fan speed	rpm	550	550
Power consumption	kW	1.18	1.65
Energy efficiency ratio EER in cooling mode		3.30	3.40
Output control	kW	3.9 to 6.4	4.2 to 7.7
Cooling performance data to EN 14511 (A35/W18)			
Rated cooling capacity	kW	6.50	8.20
Fan speed	rpm	550	550
Power consumption	kW	1.23	1.67
Energy efficiency ratio EER in cooling mode		5.30	4.90
Output control	kW	6.5 to 13.0	6.8 to 15.1
Performance data – cooling average climatic conditions (A35/W18)			
Rated cooling capacity P_{rated}	kW	8.96	10.65
Seasonal energy efficiency ratio SEER		7.4	7.1
Performance data – cooling average climatic conditions (A35/W7)			
Rated cooling capacity P_{rated}	kW	6.19	7.56

Specification (cont.)

Type AWO-E-AC 251.A/AWO-E-AC-AF 251.A		10 10 2C	13 13 2C
Seasonal energy efficiency ratio SEER		3.8	4.0
Air intake temperature			
Cooling mode			
▪ Min.	°C	10	10
▪ Max.	°C	45	45
Heating mode			
▪ Min.	°C	–20	–20
▪ Max.	°C	40	40
Heating water (secondary circuit)			
Capacity excl. expansion vessel	l	18	18
Heat pump circuit minimum flow rate (defrosting)	l/h	1000	1000
Max. flow temperature	°C	70	70
Outdoor unit electrical values			
Rated voltage		3/N/PE 400 V/50 Hz	
Max. operating current	A	11.5	11.5
Cos φ		0.92	0.92
Compressor starting current, inverter controlled	A	< 10	< 10
Starting current, compressor with stalled armature	A	< 10	< 10
Fuse protection		B16A	B16A
IP rating		IP X4	IP X4
Indoor unit electrical values			
PCB			
▪ Rated voltage		1/N/PE 230 V/50 Hz	
▪ Power supply fuse protection		1 x B16A	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	kW	8	8
▪ Power supply fuse protection		3 x B16A	3 x B16A
Max. power consumption			
Fan	W	2 x 140	2 x 140
Outdoor unit	kW	4.8	5.4
Integral circulation pumps (PWM)			
▪ 1 heating/cooling circuit	W	63	63
▪ 2 heating/cooling circuits	W	89	89
▪ Energy efficiency index EEI		≤ 0.20	≤ 0.20
Control unit/PCB, indoor unit	W	5	5
Control unit/PCB power, indoor unit	W	1000	1000

Specification (cont.)

Type AWO-E-AC 251.A/AWO-E-AC-AF 251.A		10 10 2C	13 13 2C
Mobile data transfer			
WiFi			
▪ Transfer standard		IEEE 802.11 b/g/n	IEEE 802.11 b/g/n
▪ Frequency range	MHz	2000 to 2483.5	2000 to 2483.5
▪ Max. transmission power	dBm	+15	+15
Low power radio			
▪ Transfer standard		IEEE 802.15.4	IEEE 802.15.4
▪ Frequency range	MHz	2000 to 2483.5	2000 to 2483.5
▪ Max. transmission power	dBm	+6	+6
Service link			
▪ Transfer standard		LTE-CAT-NB1	LTE-CAT-NB1
▪ Frequency range band 3	MHz	1710 to 1785	1710 to 1785
▪ Frequency range band 8	MHz	880 to 915	880 to 915
▪ Frequency range band 20	MHz	832 to 862	832 to 862
▪ Max. transmission power	dBm	+23	+23
Refrigerant circuit			
Refrigerant		R290	R290
▪ Safety group		A3	A3
▪ Refrigerant charge	kg	2	2
▪ Global warming potential (GWP)[*1]		0.02	0.02
▪ CO_2 equivalent	t	0.00004	0.00004
Compressor (hermetically sealed)	Type	Double rotating piston	Double rotating piston
▪ Oil in compressor	Type	HAF68	HAF68
▪ Oil volume in compressor	l	1.150 ±0.020	1.150 ±0.020
Permissible operating pressure			
▪ High pressure side	bar	30.3	30.3
	MPa	3.03	3.03
▪ Low pressure side	bar	30.3	30.3
	MPa	3.03	3.03
Outdoor unit dimensions			
Total length	mm	600	600
Total width	mm	1144	1144
Total height	mm	1382	1382
Indoor unit dimensions			
Total length	mm	360	360
Total width			
▪ With 1 integrated heating/cooling circuit	mm	450	450
▪ With 2 integrated heating/cooling circuits	mm	600	600
Total height	mm	920	920

*[*1] Based on the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*

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Specification (cont.)

Type AWO-E-AC 251.A/AWO-E-AC-AF 251.A		10 10 2C	13 13 2C
Total weight			
Indoor unit with 1 integrated heating/cooling circuit			
▪ Empty	kg	48	48
▪ Filled (max.)	kg	84	84
Indoor unit with 2 integrated heating/cooling circuits			
▪ Empty	kg	55	55
▪ Filled (max.)	kg	91	91
Outdoor unit	kg	221	221
Permissible operating pressure on the secondary side	bar	3	3
	MPa	0.3	0.3
Connections with connection pipes supplied			
Heating water flow/return, heating/cooling circuits or external buffer cylinder	mm	Cu 28 x 1.0	Cu 28 x 1.0
Heating water flow/return, DHW cylinder	mm	Cu 22 x 1.0	Cu 22 x 1.0
Outdoor unit heating water flow/return	mm	Cu 28 x 1.0	Cu 28 x 1.0
Length of connection line indoor unit — outdoor unit (hydraulic connection set)	m	5 to 20	5 to 20
Sound power of the outdoor unit at rated heating output (Measurements with reference to EN 12102/EN ISO 9614-2) Assessed total sound power level at A7/W55			
▪ ErP	dB(A)	54	54
▪ Max.	dB(A)	58	59
▪ Low-noise mode	dB(A)	54	54
Energy efficiency class to Commission Regulation (EU) No 813/2013			
Heating, average climatic conditions			
▪ Low temperature application (W35)		A^{+++}	A^{+++}
▪ Medium temperature application (W55)		A^{+++}	A^{+++}
Heating performance data to Commission Regulation (EU) No. 813/2013 (average climatic conditions)			
Low temperature application (W35)			
▪ Energy efficiency η_S	%	197	195
▪ Rated heating output P_{rated}	kW	10.0	12.5
▪ Seasonal coefficient of performance (SCOP)		5.01	4.96
Medium temperature application (W55)			
▪ Energy efficiency η_S	%	152	154
▪ Rated heating output P_{rated}	kW	9.6	12.2
▪ Seasonal coefficient of performance (SCOP)		3.87	3.93

Specification (cont.)

Heat pumps with 230 V~ outdoor unit

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 04 2C	06 06 2C	08 08 2C	10 10 2C	13 13 2C
Heating performance data to EN 14511 (A2/W35)						
Rated heating output	kW	2.5	3.1	4	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 (COP) in heating mode		4.0	4.0	3.7	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
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 (COP) in heating mode		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	9.7	11.1
Power consumption	kW	1.19	1.87	2.41	3.07	3.75
Coefficient of performance ε (COP) in heating mode		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 (COP) in heating mode		2.2	2.2	2.1	2.1	2.3
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
Energy efficiency ratio EER in cooling mode		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 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
Energy efficiency ratio EER in cooling mode		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

Specification (cont.)

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 04 2C	06 06 2C	08 08 2C	10 10 2C	13 13 2C
Performance data – cooling average climatic conditions (A35/W18)						
Rated cooling capacity P_{rated}	kW	4.6	5.6	6.9	8.96	10.65
Seasonal energy efficiency ratio SEER		4.5	4.7	4.9	7.4	7.1
Performance data – cooling average climatic conditions (A35/W7)						
Rated cooling capacity P_{rated}	kW	2.95	3.6	4.4	6.19	7.56
Seasonal energy efficiency ratio SEER		3.8	3.9	4.0	3.8	4
Air intake temperature						
Cooling mode						
▪ Min.	°C	10	10	10	10	10
▪ 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		1/N/PE 230 V/50 Hz				
Max. operating current	A	15	15.5	16	20	20
Cos φ		0.99	0.99	0.99	0.99	0.99
Compressor starting current, inverter controlled	A	< 10	< 10	< 10	< 10	< 10
Starting current, compressor with stalled armature	A	< 10	< 10	< 10	< 10	< 10
Fuse protection	A	B16A	B16A	B16A	B25A	B25A
IP rating		IP X4	IP X4	IP X4	IP X4	IP X4
Indoor unit electrical values						
PCB						
▪ Rated voltage		230 V/50 Hz or 400 V/50 Hz				
▪ Power supply fuse protection		3 x B16A, 1-pole				
▪ Internal fuse protection		1 x B16A, 3-pole				
Instantaneous heating water heater						
▪ Heating output 230 V~/400 V~	kW	8	8	8	8	8
▪ 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				

Specification (cont.)

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 04 2C	06 06 2C	08 08 2C	10 10 2C	13 13 2C
Max. power consumption						
Fan	W	140	140	140	2 x 140	2 x 140
Outdoor unit	kW	3.5	3.6	3.7	4.8	5.4
Integral circulation pumps (PWM)						
▪ 1 heating/cooling circuit	W	60	60	60	63	63
▪ 2 heating/cooling circuits	W	65	65	65	89	89
▪ Energy efficiency index EEI		≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
Control unit/PCB, indoor unit	W	5	5	5	5	5
Control unit/PCB power, indoor unit	W	1000	1000	1000	1000	1000
Mobile data transfer						
WiFi						
▪ Transfer standard		IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n
▪ Frequency range	MHz	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5
▪ Max. transmission power	dBm	+15	+15	+15	+15	+15
Low power radio						
▪ Transfer standard		IEEE 802.15.4	IEEE 802.15.4	IEEE 802.15.4	IEEE 802.15.4	IEEE 802.15.4
▪ Frequency range	MHz	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5
▪ Max. transmission power	dBm	+6	+6	+6	+6	+6
Service link						
▪ Transfer standard		LTE-CAT-NB1	LTE-CAT-NB1	LTE-CAT-NB1	LTE-CAT-NB1	LTE-CAT-NB1
▪ Frequency range band 3	MHz	1710 to 1785	1710 to 1785	1710 to 1785	1710 to 1785	1710 to 1785
▪ Frequency range band 8	MHz	880 to 915	880 to 915	880 to 915	880 to 915	880 to 915
▪ Frequency range band 20	MHz	832 to 862	832 to 862	832 to 862	832 to 862	832 to 862
▪ Max. transmission power	dBm	+23	+23	+23	+23	+23
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)*2		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	Twin rotary	Twin rotary	Twin rotary	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

*2 *Based on the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*

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Specification (cont.)

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 04 2C	06 06 2C	08 08 2C	10 10 2C	13 13 2C
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	360	360	360	360	360
Total width						
▪ With 1 integrated heating/cooling circuit	mm	450	450	450	450	450
▪ With 2 integrated heating/cooling circuits	mm	600	600	600	600	600
Total height	mm	920	920	920	920	920
Total weight						
Indoor unit with 1 integrated heating/cooling circuit						
▪ Empty	kg	47	47	47	47	47
▪ Filled (max.)	kg	75	75	75	75	75
Indoor unit with 2 integrated heating/cooling circuits						
▪ Empty	kg	54	54	54	54	54
▪ Filled (max.)	kg	82	82	82	82	82
Outdoor unit	kg	162	162	162	215	215
Permissible operating pressure on the secondary side	bar	3	3	3	3	3
	MPa	0.3	0.3	0.3	0.3	0.3
Connections with connection pipes supplied						
Heating water flow/return, heating/cooling circuits or external 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
Heating water flow/return, DHW cylinder	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
Outdoor unit heating water flow/return	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
Length of connection line indoor — outdoor unit (hydraulic connection set)	m	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20
Sound power of the outdoor unit at rated heating output (Measurements with reference to EN 12102/EN ISO 9614-2) Assessed total sound power level at A7/W55						
▪ ErP	dB(A)	49	49	49	54	54
▪ Max.	dB(A)	55	57	58	58	59
▪ Low-noise mode	dB(A)	49	49	49	54	54

Specification (cont.)

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 04 2C	06 06 2C	08 08 2C	10 10 2C	13 13 2C
Energy efficiency class to Commission Regulation (EU) No 813/2013						
Heating, average climatic conditions						
▪ Low temperature application (W35)		A+++	A+++	A+++	A+++	A+++
▪ Medium temperature application (W55)		A+++	A+++	A+++	A+++	A+++
Heating performance data to Commission Regulation (EU) No. 813/2013 (average climatic conditions)						
Low temperature application (W35)						
▪ Energy efficiency η_S	%	189	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)		4.8	4.7	4.5	5.01	4.96
Medium temperature application (W55)						
▪ Energy efficiency η_S	%	143	141	140	152	154
▪ Rated heating output P_{rated}	kW	3.8	5.1	6.2	9.6	12.2
▪ Seasonal coefficient of performance (SCOP)		3.7	3.6	3.6	3.87	3.93

Heat pumps with 230 V~ outdoor unit and indoor unit with central power supply

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 SP 04 2C SP	06 SP 06 2C SP	08 SP 08 2C SP	10 SP 10 2C SP	13 SP 13 2C SP
Heating performance data to EN 14511 (A2/W35)						
Rated heating output	kW	2.5	3.1	4	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 (COP) in heating mode		4.0	4.0	3.7	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
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 (COP) in heating mode		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

Specification (cont.)

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 SP 04 2C SP	06 SP 06 2C SP	08 SP 08 2C SP	10 SP 10 2C SP	13 SP 13 2C SP
Heating performance data to EN 14511 (A–7/W35)						
Rated heating output	kW	3.8	5.6	6.5	9.7	11.1
Power consumption	kW	1.19	1.87	2.41	3.07	3.75
Coefficient of performance ε (COP) in heating mode		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 (COP) in heating mode		2.2	2.2	2.1	2.1	2.3
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
Energy efficiency ratio EER in cooling mode		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 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
Energy efficiency ratio EER in cooling mode		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
Performance data – cooling average climatic conditions (A35/W18)						
Rated cooling capacity P_{rated}	kW	4.6	5.6	6.9	8.96	10.65
Seasonal energy efficiency ratio SEER		4.5	4.7	4.9	7.4	7.1
Performance data – cooling average climatic conditions (A35/W7)						
Rated cooling capacity P_{rated}	kW	2.95	3.6	4.4	6.19	7.56
Seasonal energy efficiency ratio SEER		3.8	3.9	4.0	3.8	4
Air intake temperature						
Cooling mode						
▪ Min.	°C	10	10	10	10	10
▪ Max.	°C	45	45	45	45	45
Heating mode						
▪ Min.	°C	–20	–20	–20	–20	–20
▪ Max.	°C	40	40	40	40	40

Specification (cont.)

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 SP 04 2C SP	06 SP 06 2C SP	08 SP 08 2C SP	10 SP 10 2C SP	13 SP 13 2C SP
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		1/N/PE 230 V/50 Hz				
Max. operating current	A	15	15.5	16	20	20
Cos φ		0.99	0.99	0.99	0.99	0.99
Compressor starting current, inverter controlled	A	< 10	< 10	< 10	< 10	< 10
Starting current, compressor with stalled armature	A	< 10	< 10	< 10	< 10	< 10
Fuse protection	A	B16A	B16A	B16A	B25A	B25A
IP rating		IP X4	IP X4	IP X4	IP X4	IP X4
Indoor unit electrical values						
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 230 V~/400 V~	kW	5	5	5	5	5
Power supply, indoor unit						
▪ Rated voltage		1/N/PE 230 V/50 Hz				
▪ Power supply fuse protection		1 x B32A				
Max. power consumption						
Fan	W	140	140	140	2 x 140	2 x 140
Outdoor unit	kW	3.5	3.6	3.7	4.8	5.4
Integral circulation pumps (PWM)						
▪ 1 heating/cooling circuit	W	60	60	60	63	63
▪ 2 heating/cooling circuits	W	65	65	65	89	89
▪ Energy efficiency index EEI		≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
Control unit/PCB, indoor unit	W	5	5	5	5	5
Control unit/PCB power, indoor unit	W	1000	1000	1000	1000	1000

Specification (cont.)

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 SP 04 2C SP	06 SP 06 2C SP	08 SP 08 2C SP	10 SP 10 2C SP	13 SP 13 2C SP
Mobile data transfer						
WiFi						
▪ Transfer standard		IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n
▪ Frequency range	MHz	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5
▪ Max. transmission power	dBm	+15	+15	+15	+15	+15
Low power radio						
▪ Transfer standard		IEEE 802.15.4	IEEE 802.15.4	IEEE 802.15.4	IEEE 802.15.4	IEEE 802.15.4
▪ Frequency range	MHz	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5
▪ Max. transmission power	dBm	+6	+6	+6	+6	+6
Service link						
▪ Transfer standard		LTE-CAT-NB1	LTE-CAT-NB1	LTE-CAT-NB1	LTE-CAT-NB1	LTE-CAT-NB1
▪ Frequency range band 3	MHz	1710 to 1785	1710 to 1785	1710 to 1785	1710 to 1785	1710 to 1785
▪ Frequency range band 8	MHz	880 to 915	880 to 915	880 to 915	880 to 915	880 to 915
▪ Frequency range band 20	MHz	832 to 862	832 to 862	832 to 862	832 to 862	832 to 862
▪ Max. transmission power	dBm	+23	+23	+23	+23	+23
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)		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	Twin rotary	Twin rotary	Twin rotary	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
Outdoor unit dimensions						
Total length	mm	600	600	600	600	600
Total width	mm	1144	1144	1144	1144	1144
Total height	mm	1382	1382	1382	1382	1382

Specification (cont.)

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 SP 04 2C SP	06 SP 06 2C SP	08 SP 08 2C SP	10 SP 10 2C SP	13 SP 13 2C SP
Indoor unit dimensions						
Total length	mm	360	360	360	360	360
Total width						
▪ With 1 integrated heating/cooling circuit	mm	450	450	450	450	450
▪ With 2 integrated heating/cooling circuits	mm	600	600	600	600	600
Total height	mm	920	920	920	920	920
Total weight						
Indoor unit with 1 integrated heating/cooling circuit						
▪ Empty	kg	47	47	47	47	47
▪ Filled (max.)	kg	75	75	75	75	75
Indoor unit with 2 integrated heating/cooling circuits						
▪ Empty	kg	54	54	54	54	54
▪ Filled (max.)	kg	82	82	82	82	82
Outdoor unit	kg	162	162	162	215	215
Permissible operating pressure on the secondary side	bar	3	3	3	3	3
	MPa	0.3	0.3	0.3	0.3	0.3
Connections with connection pipes supplied						
Heating water flow/return, heating/cooling circuits or external 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
Heating water flow/return, DHW cylinder	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
Outdoor unit heating water flow/return	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
Length of connection line indoor — outdoor unit (hydraulic connection set)	m	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20
Sound power of the outdoor unit at rated heating output (Measurements with reference to EN 12102/ EN ISO 9614-2) Assessed total sound power level at A7/W55						
▪ ErP	dB(A)	49	49	49	54	54
▪ Max.	dB(A)	55	57	58	58	59
▪ Low-noise mode	dB(A)	49	49	49	54	54
Energy efficiency class to Commission Regulation (EU) No 813/2013						
Heating, average climatic conditions						
▪ Low temperature application (W35)		A^{+++}	A^{+++}	A^{+++}	A^{+++}	A^{+++}
▪ Medium temperature application (W55)		A^{+++}	A^{+++}	A^{+++}	A^{+++}	A^{+++}

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Specification (cont.)

Type AWO-M-E-AC 251.A/ AWO-M-E-AC-AF 251.A		04 SP 04 2C SP	06 SP 06 2C SP	08 SP 08 2C SP	10 SP 10 2C SP	13 SP 13 2C SP
Heating performance data to Commission Regulation (EU) No. 813/2013 (average climatic conditions)						
Low temperature application (W35)						
▪ Energy efficiency η_S	%	189	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)		4.8	4.7	4.5	5.01	4.96
Medium temperature application (W55)						
▪ Energy efficiency η_S	%	143	141	140	152	154
▪ Rated heating output P_{rated}	kW	3.8	5.1	6.2	9.6	12.2
▪ Seasonal coefficient of performance (SCOP)		3.7	3.6	3.6	3.87	3.93

Commissioning order

- Email this request form, together with the system scheme, to your local Viessmann sales office.
  Or
- Complete the order online at partnerportal.viessmann.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 Viessmann will be billed to me/us in accordance with the latest Viessmann pricelist.

Place/date _____

Signature _____

Final decommissioning and disposal

Viessmann products can be recycled. Components and substances from the system are not part of ordinary domestic waste.

Complete units and compressors are only to be disposed of via qualified disposal specialists.

Isolate the system from the power supply for decommissioning. Allow any hot components to cool down. All components must be disposed of correctly.

Observe the following regulations:

- Fluorinated greenhouse gas regulation 517/2014/EU
- Currently applicable regulations and requirements

Final decommissioning and disposal (cont.)

Note
***Before** commencing decommissioning, note the "Checklist for maintenance work" on page 160.*

Decommissioning:
- Positioning requirements apply only so long as the outdoor unit is filled with refrigerant: See page 21.
- 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".
- Extract the refrigerant: See chapter "Extracting the refrigerant" on page 169.

Frost protection:
- To avoid frost damage, completely remove heating water from the connection pipes and the condenser (not required for 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 units dismantled for disposal are not stored in accordance with the positioning requirements, the following steps must be carried out:
- Extract the refrigerant: See chapter "Extracting the refrigerant" on page 169.

Transport:
- Observe transport information: See page 21.
  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 the 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 SE, D-35108 Allendorf, 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 SE, D-35108 Allendorf, 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

Keyword index

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Keyword index (cont.)

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6202074 Subject to technical modifications.