

Vitocal 151-A

Type AWOT(-M)-E-AC/AWOT(-M)-E-AC-AF 151.A


Air source heat pump, monoblock version for heating and cooling operation, with 1 integrated heating/cooling circuit




VITOCAL 151-A




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.

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 materials and ignition sources.
- 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 CO₂ 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.

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. There is a risk of asphyxiation if it is breathed in.

- 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. There is a risk of asphyxiation if it is breathed in.

- Prevent direct contact with liquid and gaseous refrigerant.
- 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 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: $-25\text{ }^{\circ}\text{C}$ to $70\text{ }^{\circ}\text{C}$
- Only store the outdoor unit in its ex-factory protective packaging.
- Protect the outdoor unit against damage.
- The maximum number of outdoor units that may be stored in one place is determined by local conditions.

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Disposal of packaging







Please dispose of packaging waste in line with statutory regulations.

Symbols





Symbols in these instructions

Symbol	Meaning
	Reference to other document containing further information
	Step in a diagram: The numbers correspond to the order in which the steps are carried out.
	Warning of material losses and environmental pollution
	Live electrical area
	Pay particular attention.
	<ul style="list-style-type: none"> Component must audibly click into place. or Acoustic signal
	<ul style="list-style-type: none"> 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.

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 151-A is a monoblock air source heat pump, comprising 1 indoor unit with integral DHW cylinder and 1 outdoor unit.

Refrigerant circuit

The refrigerant circuit works with refrigerant R290 (propane).

All components of the refrigerant circuit are located in the outdoor unit, including the refrigerant circuit controller with 2 electronic expansion valves. Subject to operating conditions, compressor output is matched via inverter control.

To provide room cooling, there is an electronically controlled reversal of the refrigerant flow direction within the refrigerant circuit.

Hydraulics

The indoor and outdoor units are connected to each other hydraulically.

The hydraulic components for room heating and cooling are located in the indoor unit. 1 high efficiency circulation pump is installed to supply the heating/cooling circuits.

Switching between room heating, DHW heating and defrosting is done with the integrated 4/3-way valve. The heat required to defrost the evaporator is provided by the integrated buffer cylinder in the indoor unit. The overflow valve function to guarantee the minimum system volume flow rate is also achieved via the 4/3-way valve.

System without heating water buffer cylinder

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

The flow temperature is controlled by modulating the heat pump.

System with external heating water buffer cylinder

The heat pump heats up to 4 heating circuits: 1 heating circuit without mixer and up to 3 heating circuits with mixer

DHW cylinder

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

Instantaneous heating water heater

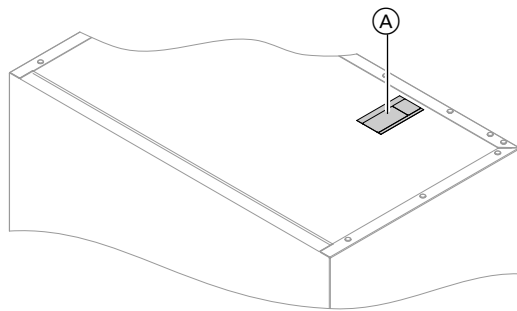
In the indoor unit, an instantaneous heating water heater is built into the heating water flow from the outdoor unit. This instantaneous heating water heater supports the heat pump in room heating and/or DHW heating if the heating output of the heat pump is insufficient under certain conditions. In power-OFF 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.

Product information (cont.)

Type plate









The QR code with designation "i" contains the access data for the registration and product information portal. This allows e.g. the 16-digit serial number to be read out via the QR-Code.

Fig. 1

Ⓐ Type plate and QR code for appliance registration

Type overview

Type	Heating/cooling circuits		Rated voltage			Central indoor unit power supply	Condensate pan heating
	Internal hydraulics	External buffer cylinder					
AWOT-E-AC 151.A	1	1 to 4	230 V~	400 V~/ 230 V~	400 V~	—	—
AWOT-M-E-AC 151.A	1	1 to 4	230 V~	400 V~/ 230 V~	230 V~	—	—
AWOT-M-E-AC 151.A SP	1	1 to 4	230 V~	230 V~	230 V~	X	—
AWOT-E-AC-AF 151.A	1	1 to 4	230 V~	400 V~/ 230 V~	400 V~	—	X
AWOT-M-E-AC-AF 151.A	1	1 to 4	230 V~	400 V~/ 230 V~	230 V~	—	X
AWOT-M-E-AC-AF 151.A SP	1	1 to 4	230 V~	230 V~	230 V~	X	X

-  Control unit/PCB, indoor unit
-  Outdoor unit
-  Instantaneous heating water heater

System examples

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

Spare parts lists

Information about spare parts can be found at www.viessmann.com/etapp or in the Viessmann spare part app.



Requirements for on-site connections

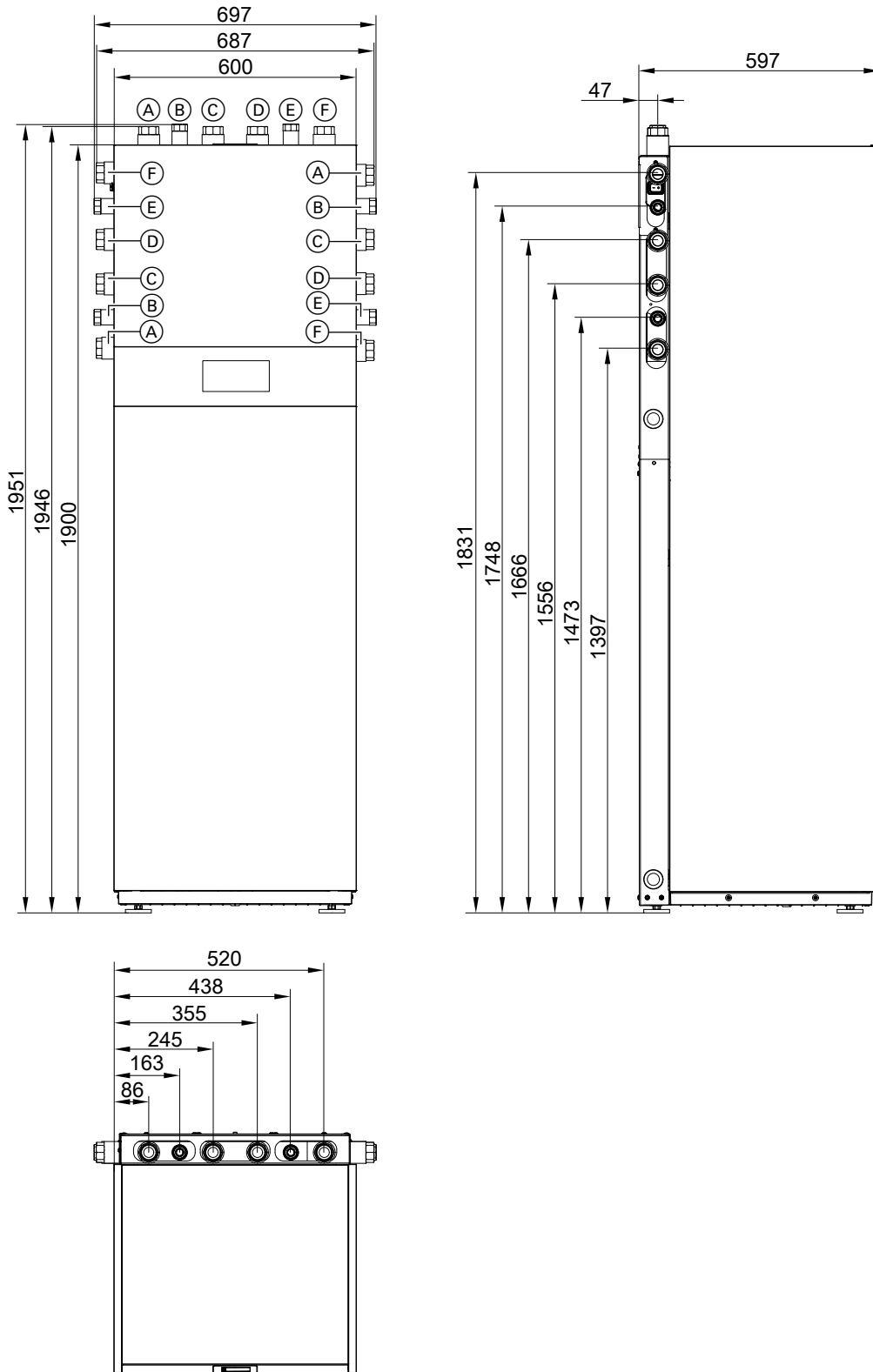


Fig. 2

- (A) Secondary circuit flow (heating/cooling circuit 1 / heating water buffer cylinder), connection Cu 28 x 1.0 mm
- (B) Cold water, connection Cu 22 x 1.0 mm
- (C) Outdoor unit flow (indoor unit heating water inlet), connection Cu 28 x 1.0 mm
- (D) Outdoor unit return (indoor unit heating water outlet), connection Cu 28 x 1.0 mm
- (E) DHW, connection Cu 22 x 1.0 mm
- (F) Secondary circuit return (heating/cooling circuit 1/ heating water buffer cylinder), connection Cu 28 x 1.0 mm

Outdoor unit

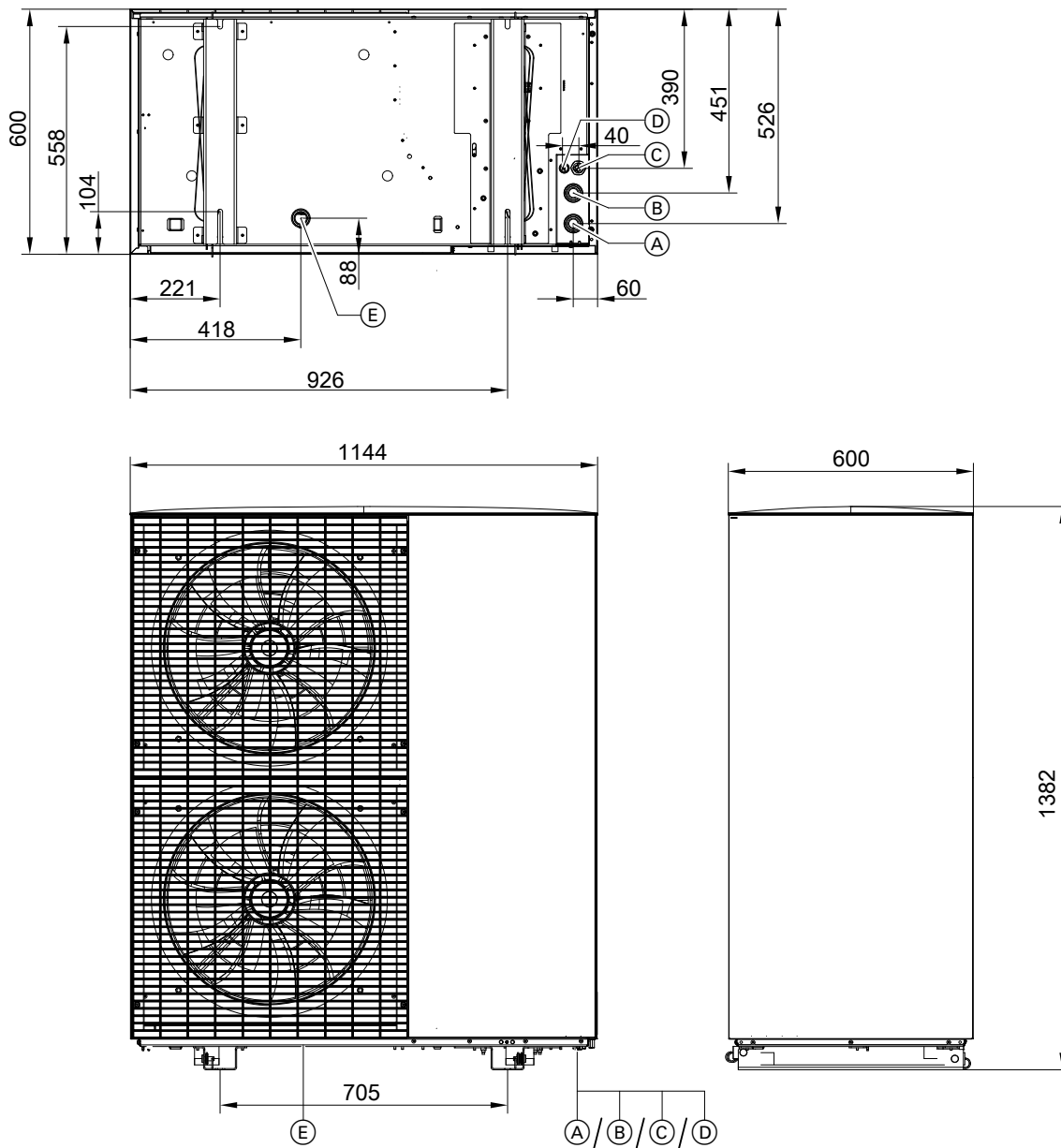


Fig. 3

- (A) Outdoor unit flow (heating water outlet): Plug-in connection for Cu 28 x 1.0 mm
- (B) Outdoor unit return (heating water inlet): Plug-in connection for Cu 28 x 1.0 mm
- (C) Power cable plug
- (D) CAN bus communication cable plug (accessories)
- (E) 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.
- 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.
- In order to avoid damage to the air outlet grill, always fit the sack truck to the rear side of the outdoor unit.
Do not damage the evaporator when doing so.



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. 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 protective gloves.

The transport aids are each found in the mounting rail under the outdoor unit. Because of the uneven weight distribution, there are 4 transport aids on the right-hand mounting rail.

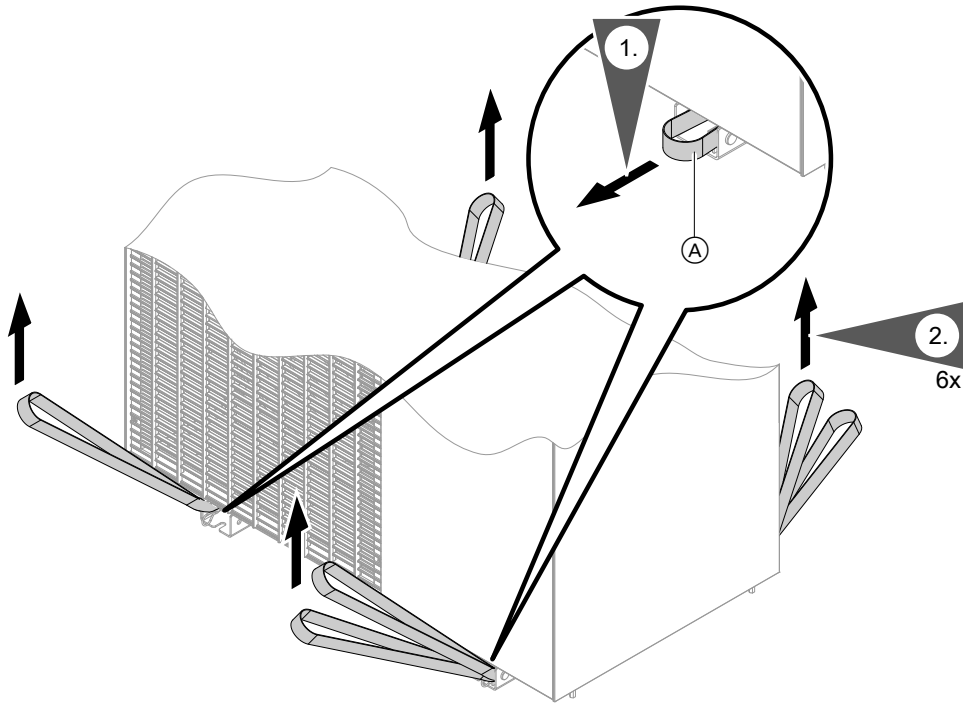


Fig. 4

Ⓐ Transport aid

Installing the outdoor unit (cont.)

Removing the transport aids

After handling, remove all transport aids.

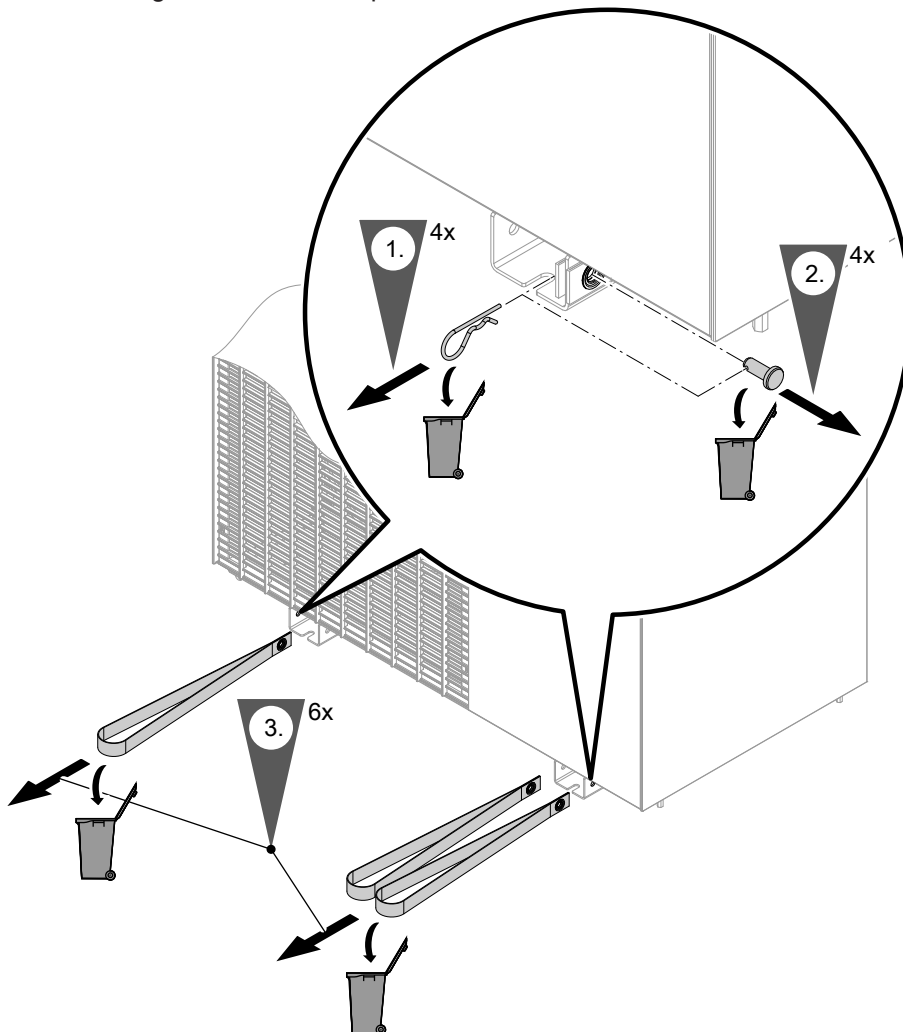


Fig. 5

Installation information

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 ≥ 250 mm high using anti-vibration feet (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".

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.

Flat roof installation

Note

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

Installing the outdoor unit (cont.)

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

- 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.
Install suitable protection equipment, e.g. anchorage points.
- We recommend installing the heat pump on a steel-reinforced concrete ceiling.
- 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.

Siting

- In accordance with EN 378-3:2016, the outdoor unit should only be installed in the open air.
- The refrigerant circuit in the outdoor unit contains easily flammable refrigerant in 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.

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 GaStellIV, GaStpIVO, BetrVO).
- Provide systems with refrigerants in safety group A3 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 \varnothing	Min. thickness of thermal insulation layer with $\lambda = 0.035 \text{ W/(m}\cdot\text{K)}$
$\leq 22 \text{ mm}$	40 mm
$> 22 \text{ mm}$	60 mm

λ Thermal conductivity

Installing the outdoor unit (cont.)

- 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 24 and 25.



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 24.

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.



Technical guide

Weight of outdoor units

Outdoor unit	Weight in kg
Outdoor unit 230 V~	191
Outdoor unit 400 V~	197

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.

Installing the outdoor unit (cont.)

- 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.
- Because of the increased wind loads, keep a distance of 5 m from building edges.

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, etc.
- 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

Note

The particular safety zone is dependent on the surroundings of the outdoor unit.

- The safety zones below are shown with floorstanding installation. 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

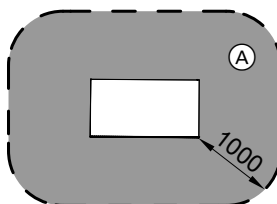


Fig. 6

Ⓐ Safety zone

Installing the outdoor unit (cont.)

Siting the outdoor unit in front of an external wall

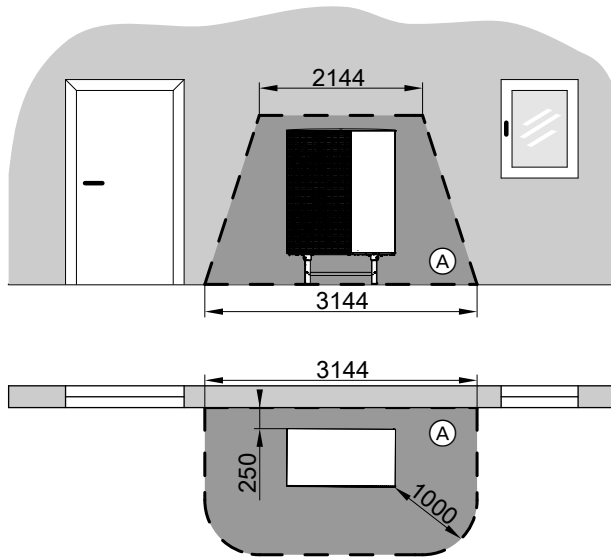


Fig. 7

Ⓐ Safety zone

Corner positioning of the outdoor unit, left

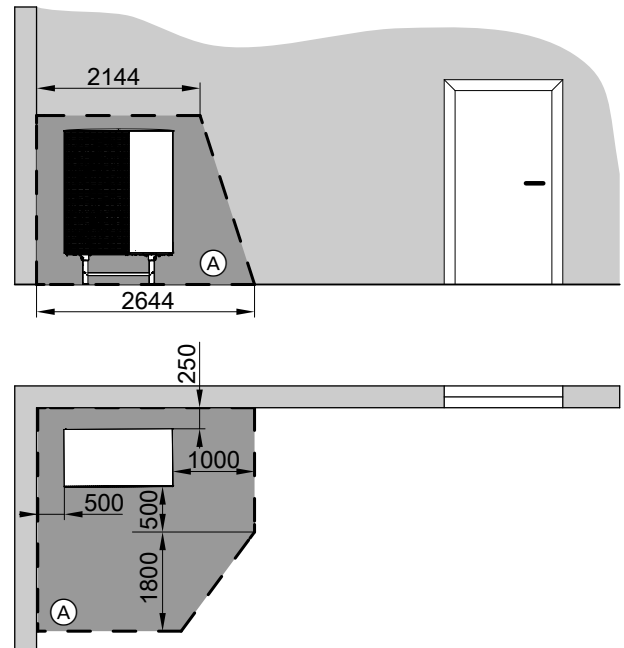


Fig. 9

Ⓐ Safety zone

Corner positioning of the outdoor unit, right

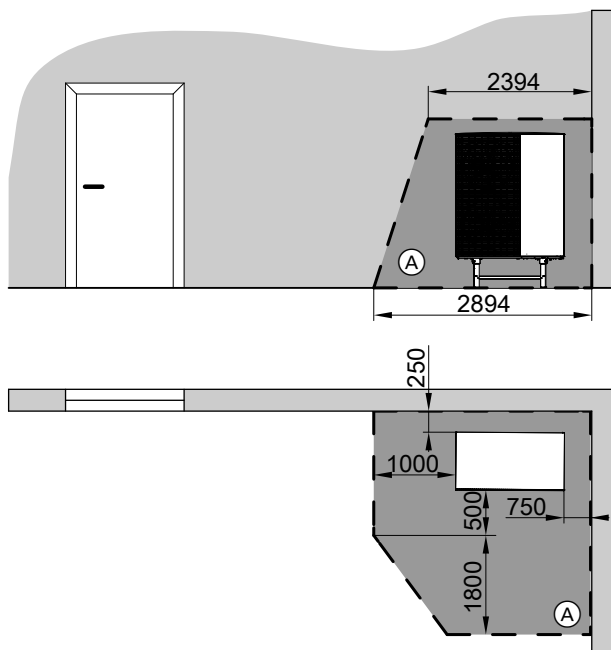


Fig. 8

Ⓐ Safety zone

Minimum clearances

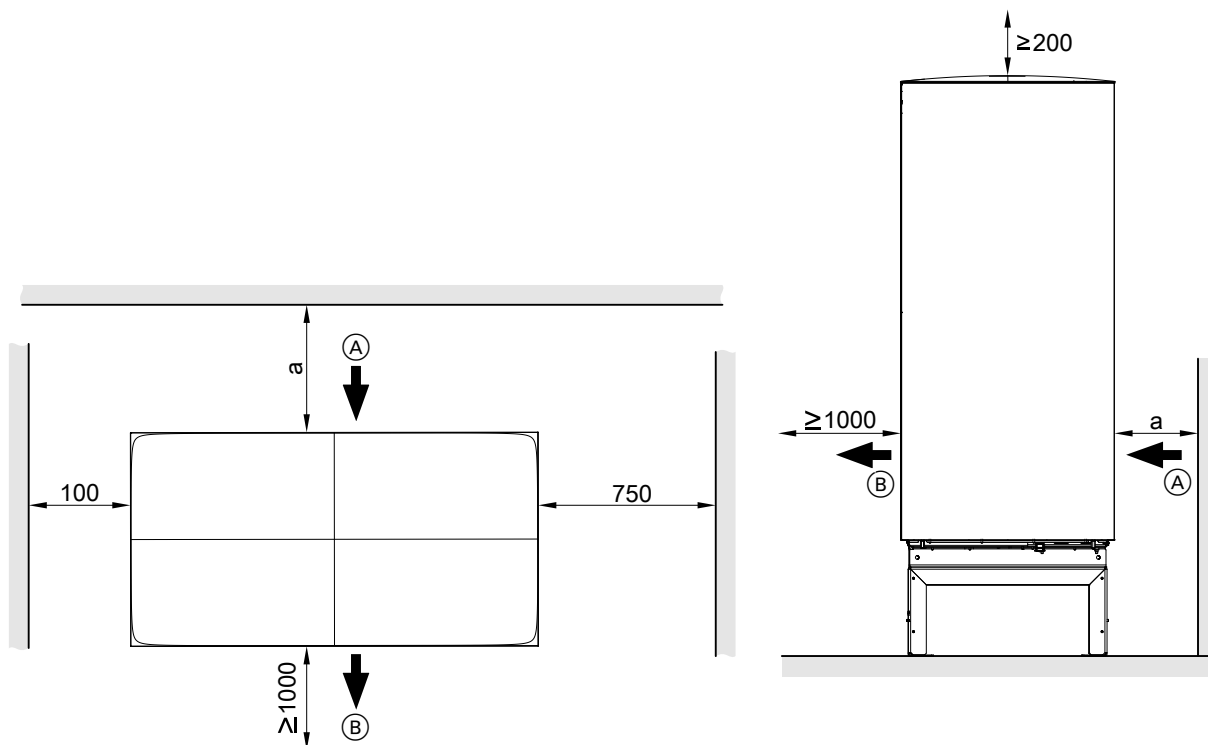


Fig. 10

(A) Air intake

(B) Air discharge

- a ■ Line entry above ground level: ≥ 250 mm
- Line entry below ground level: ≥ 450 mm

Draining condensate via a soakaway

- Allow the condensate to drain away freely **without** a drain pipe into a gravel bed beneath the outdoor unit. Or
- Allow the condensate to drain away via a **drain pipe** into a seepage layer (only for floorstanding installation): See following diagram.

Note

To ensure correct function of the condensate drain even at low temperatures, provide a ribbon heater in the drain pipe (accessories).

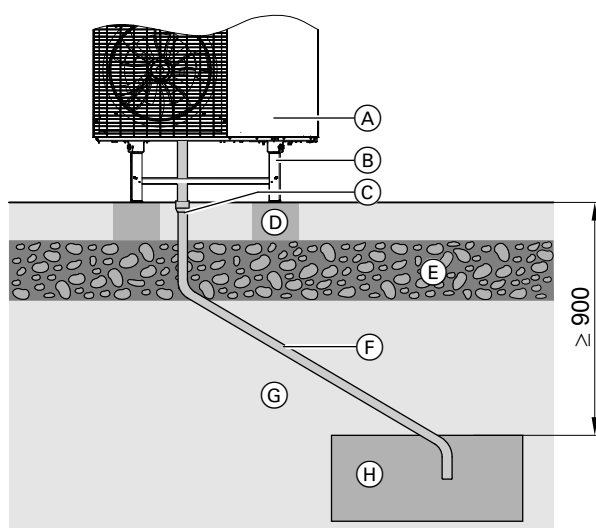


Fig. 11

(A) Outdoor unit

(B) Support for floorstanding installation (accessories)

Installing the outdoor unit (cont.)

- Ⓒ Condensate drain connector
- Ⓓ Foundation
- Ⓔ Frost protection (compacted crushed stone)
- Ⓕ Drain pipe with ribbon heater (at least DN 40)
- Ⓖ Ground
- Ⓗ Seepage layer for removal of condensate

Draining condensate via waste water system

Note

To ensure correct function of the condensate drain even at low temperatures, provide a ribbon heater in the drain pipe (accessories).

- Ⓒ Condensate drain connector
- Ⓓ Foundation
- Ⓔ Frost protection (compacted crushed stone)
- Ⓕ Drain pipe with ribbon heater (at least DN 40)
- Ⓖ Ground
- Ⓗ Stench trap in an area free from the risk of frost
- Ⓙ Drain

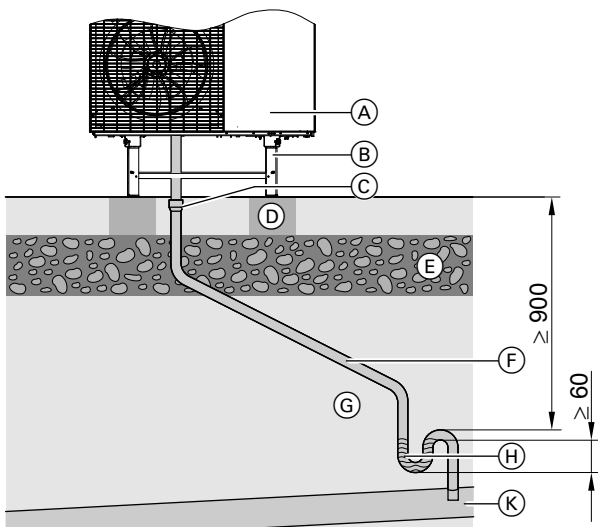


Fig. 12

- Ⓐ Outdoor unit
- Ⓑ Support for floorstanding installation (accessories)

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. tilting angle: $\pm 2^\circ$

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

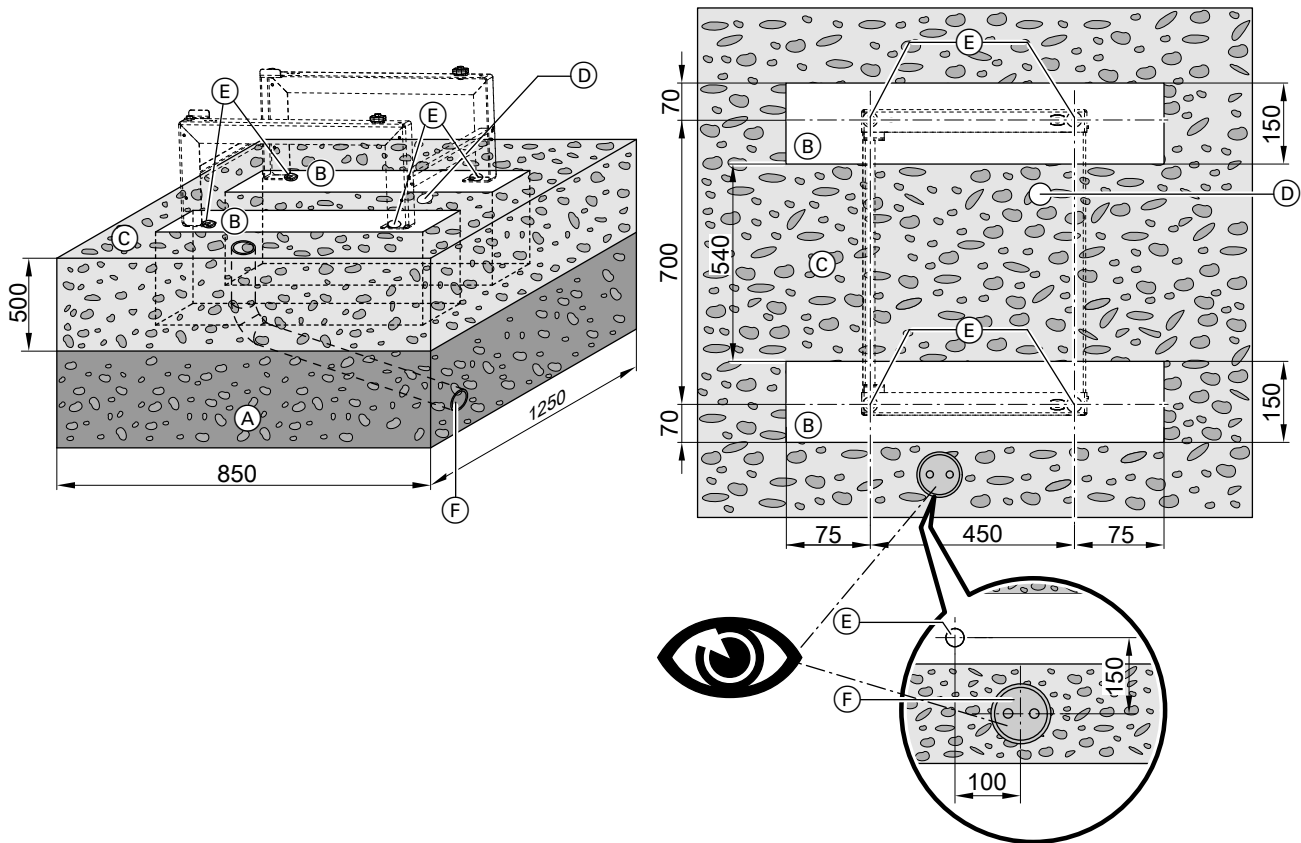


Fig. 13

- Ⓐ 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
- Ⓒ 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.
- Ⓕ Only for line entry below ground level: Hydraulic connection set (accessories)

Note

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: See previous illustration.

Foundation for installation with anti-vibration feet (accessories)

- Provide 2 horizontal foundation strips.
- Max. tilting angle: $\pm 2^\circ$

We recommend the construction of 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.)

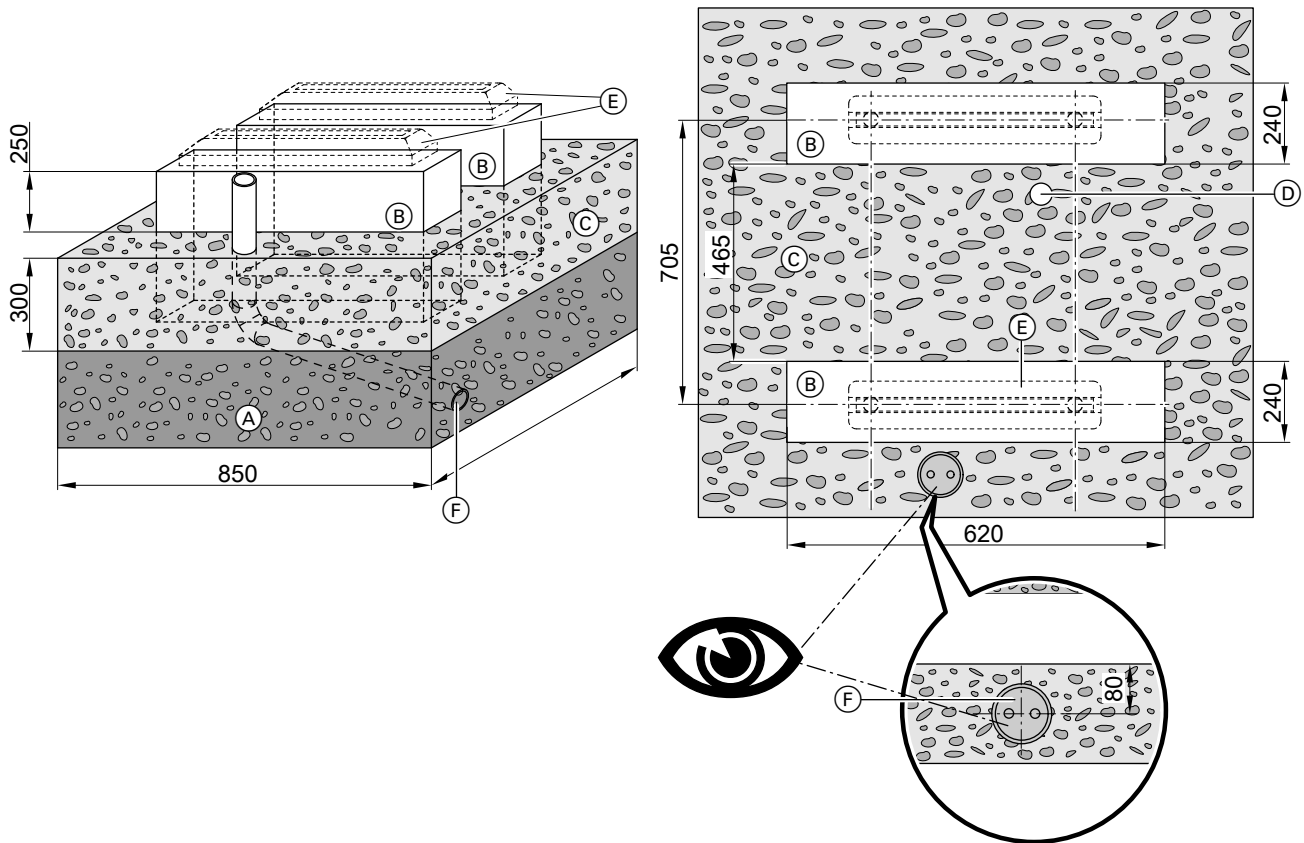


Fig. 14

- (A) Frost protection for foundations (compacted crushed stone, e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations
- (B) Foundation strip
- (C) For free drainage of condensate: Gravel bed as soakaway
- (D) Conduit (min. DN 40) for draining condensate via waste water system or seepage layer
- (E) Anti-vibration feet (accessories): Align the anti-vibration feet centrally on the foundation.
- (F) Only for line entry below ground level: Hydraulic connection set (accessories)

Note

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: See previous illustration.

Floorstanding installation with support: Line entry above ground level

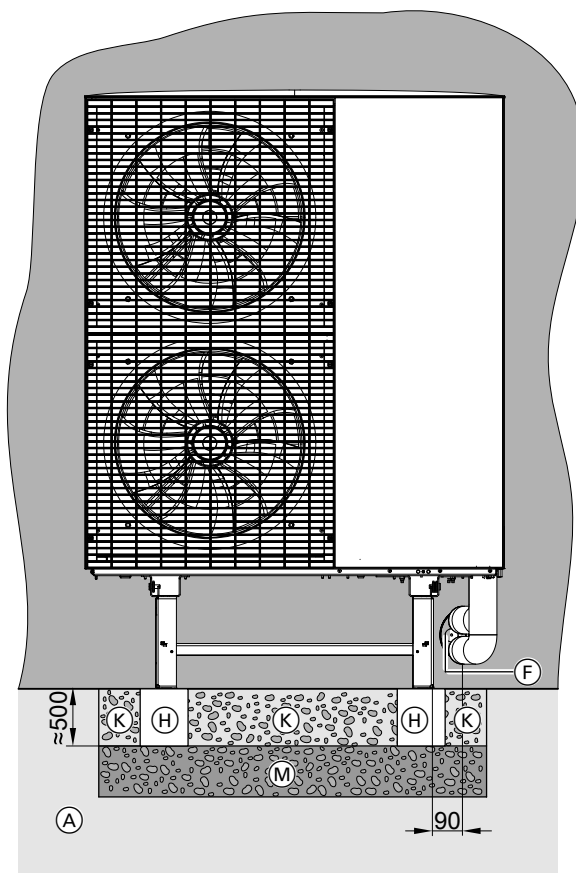
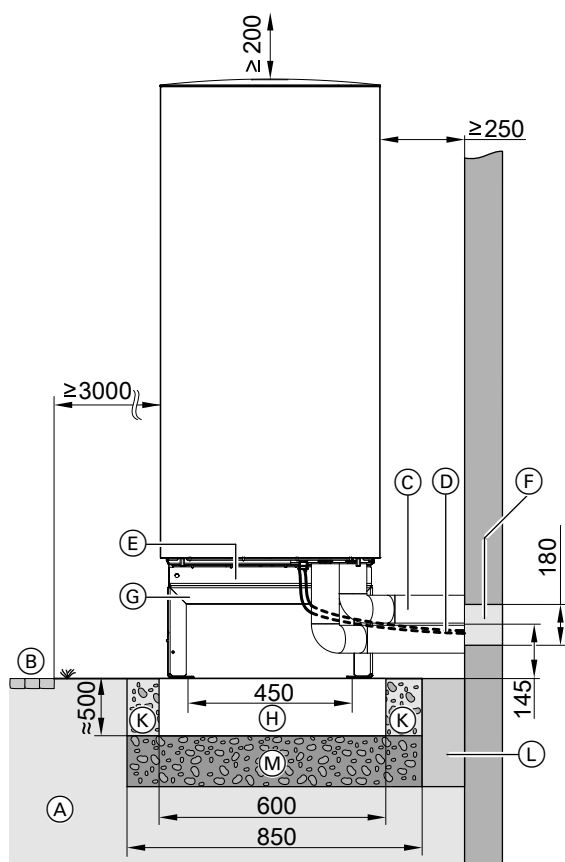


Fig. 15

- (A) Ground
- (B) Pathway, patio
- (C) Hydraulic connection lines, indoor/outdoor unit
- (D) Indoor/outdoor unit CAN bus communication cable and outdoor unit power cable:
Route the cables free of stress.
- (E) Condensate drain in the base plate:
Do not connect anything if the condensate can drain freely.
- (F) Gas-tight wall outlet (accessories) for electrical cables and hydraulic lines
- (G) Support for floorstanding installation (accessories), illustration without design casing (accessories)
- (H) Foundation strip
- (K) For free drainage of condensate: Gravel bed as soakaway
- (L) Flexible separating layer between the foundations and the building
- (M) 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 20.
- Protect the pipework against damage. Avoid trip hazards.

Installing the outdoor unit (cont.)

Floorstanding installation with support: Line entry below ground level

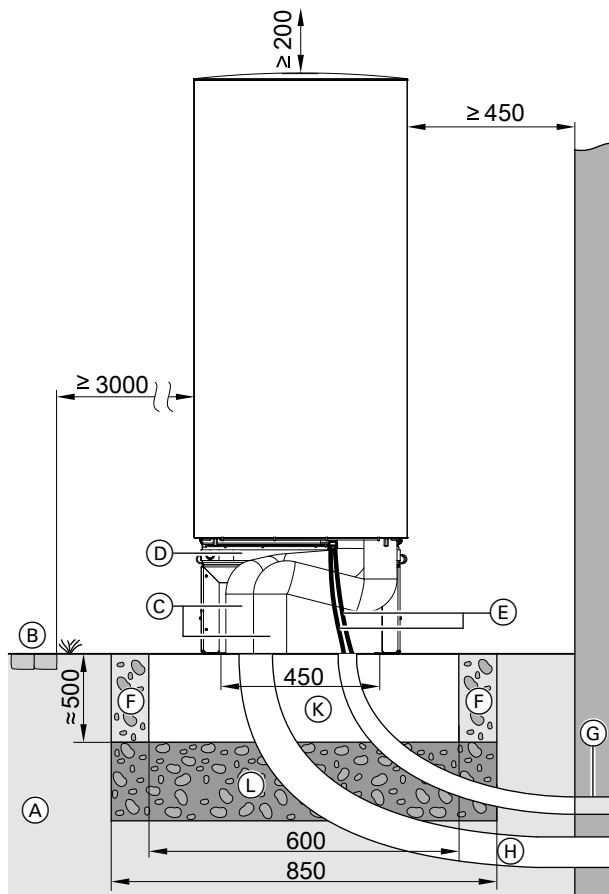


Fig. 16


- (A) Ground
- (B) Pathway, patio
- (C) Connection set, floorstanding installation (accessories)
- (D) Support for floorstanding installation (accessories)
- (E) Indoor/outdoor unit CAN bus communication cable and outdoor unit power cable:
Route the cables free of stress.
- (F) For free drainage of condensate: Gravel bed as soakaway
- (G) Gas-tight wall outlet for CAN bus communication cable, indoor/outdoor unit and outdoor unit power cable (accessories)
- (H) Hydraulic connection set (accessories):
Make the wall outlet into the building gas-tight.
- (K) Foundation strip
- (L) 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 20.
- 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 feet (accessories)

-  Installation instructions for "anti-vibration feet"

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

Installation sequence

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.

Wall mounting with bracket set for wall mounting

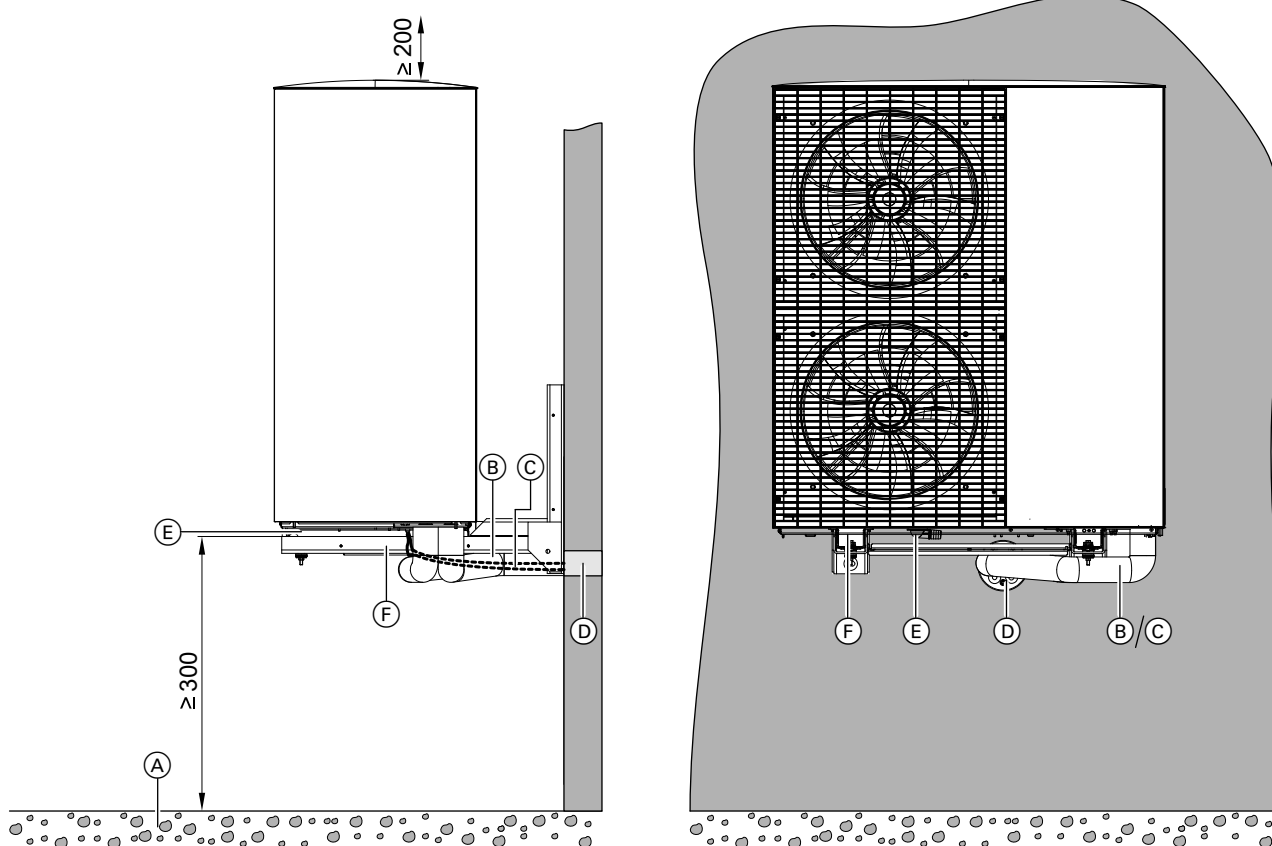


Fig. 17

- (A) Gravel bed as condensate soakaway
- (B) Connection set for wall mounting bracket (accessories)
- (C) Indoor/outdoor unit CAN bus communication cable and outdoor unit power cable:
Route the cables free of stress.

- (D) Gas-tight wall outlet (accessories) for electrical cables and hydraulic lines
- (E) Condensate drain in the base plate:
Do not seal the opening.
- (F) Bracket for wall mounting (accessories)

Note

- For the exact location of the drill holes for the wall mounting bracket: 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 20.

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.

Note

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

Installing the outdoor unit (cont.)

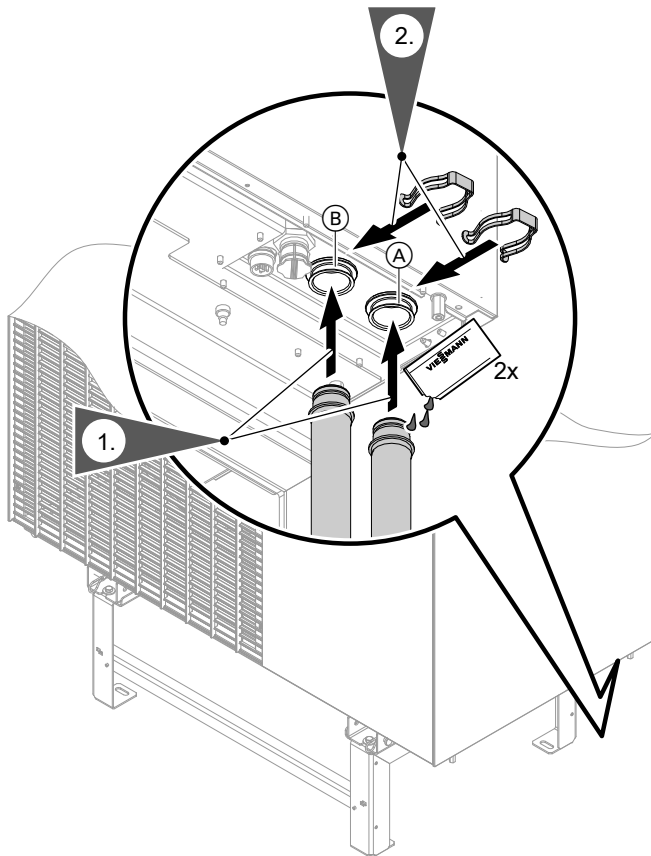


Fig. 18

- Ⓐ Outdoor unit flow (heating water outlet)
- Ⓑ Outdoor unit return (heating water inlet)

Checking the transport bracket

- ! **Please note**
Releasing the transport lock prematurely will affect the function of the safety valve during the filling process. This can cause damage to the outdoor unit.
Do not release the transport bracket until after the filling and venting process.

Installing the outdoor unit (cont.)

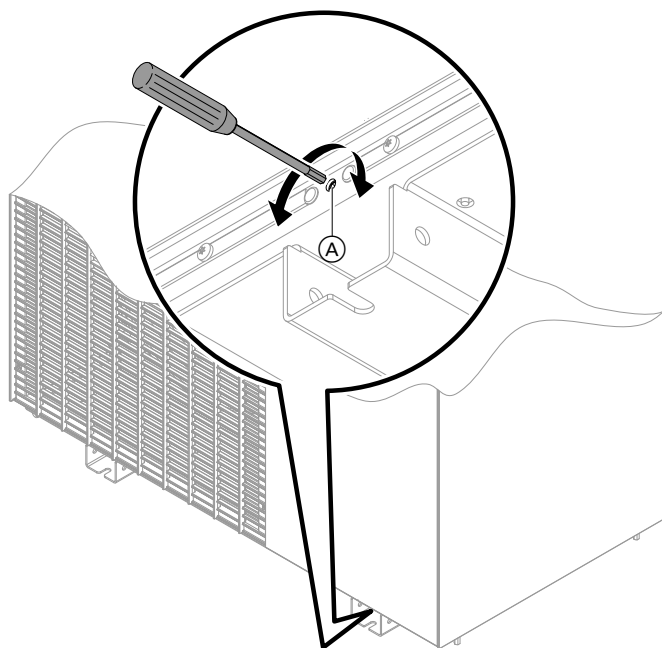


Fig. 19

After positioning of the outdoor unit, check whether the transport bracket is completely secured with an Allen key (size 5).

Securing screw (A), must be turned as far as it will go to the **left**.

Positioning 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.

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)

Positioning the indoor unit (cont.)

- 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 metalised 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

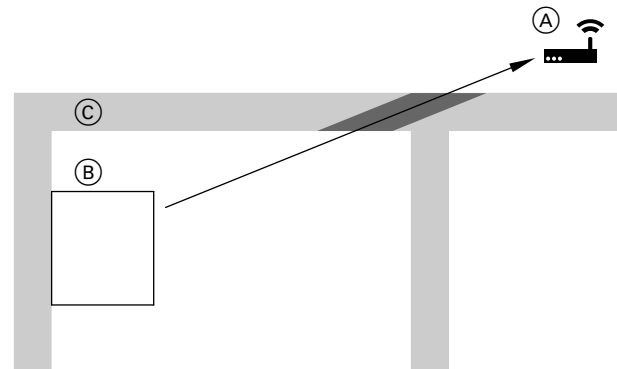


Fig. 20

- Ⓐ WiFi router
- Ⓑ Heat generator
- Ⓒ Wall

Ideal angle of penetration

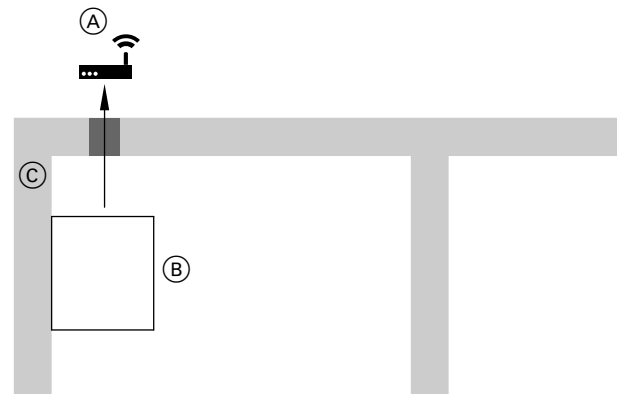


Fig. 21

- Ⓐ WiFi router
- Ⓑ Heat generator
- Ⓒ Wall

Positioning the indoor unit (cont.)

Minimum clearances

Secondary circuit connections, left/top

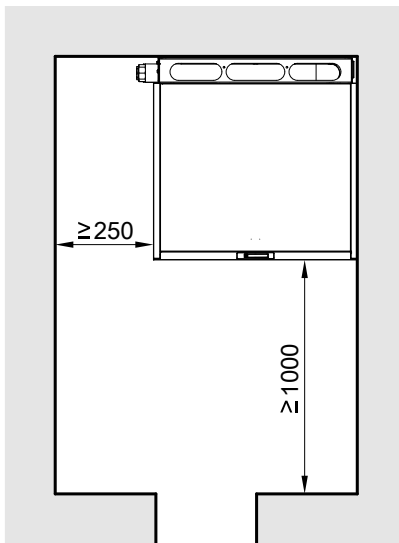


Fig. 22

Secondary circuit connections, right/top

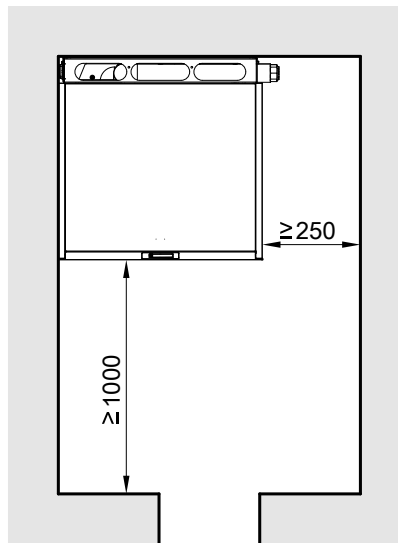


Fig. 23

Minimum room height

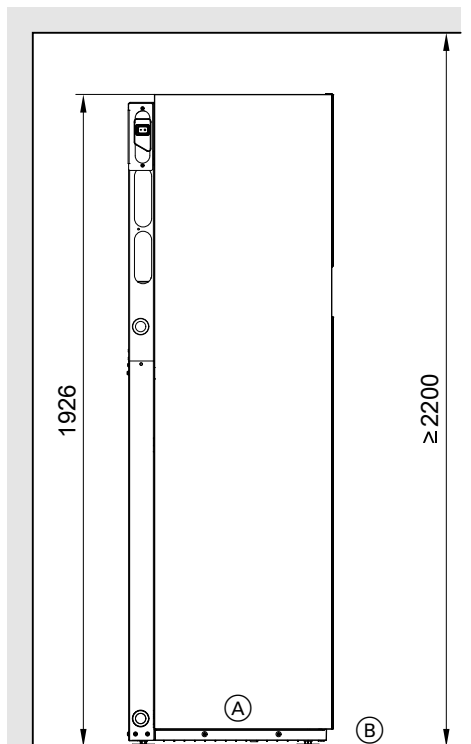


Fig. 24

Note

Remove the packaging upwards before positioning.

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

Positioning the indoor unit (cont.)

Pressure points

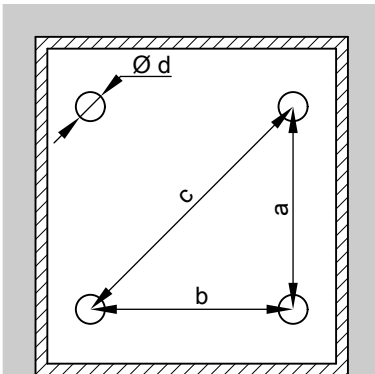


Fig. 25

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

Note

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

The total weight of the indoor unit with filled DHW cylinder and 1 heating/cooling circuit is 386 kg. Each pressure point (each with an area of 3217 mm²) is subject to a load of up to 96.5 kg.

Relocating the ON/OFF switch

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

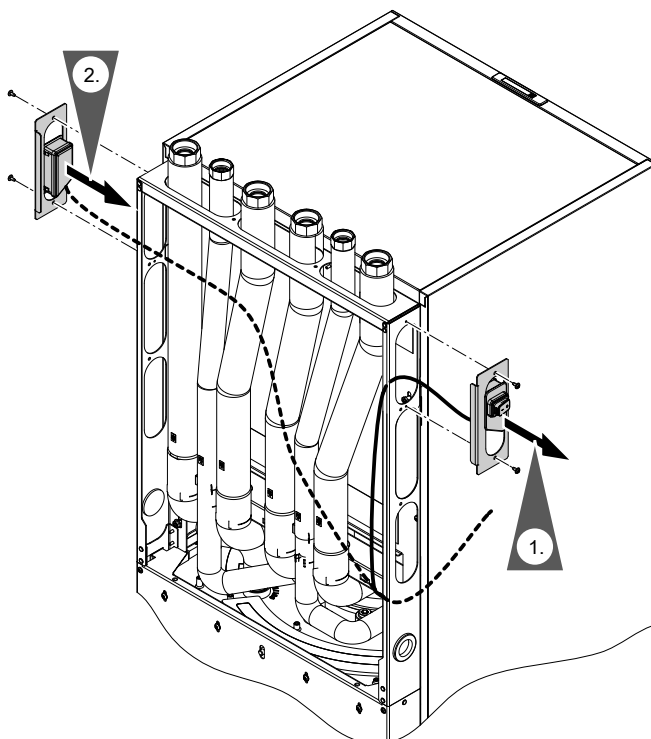


Fig. 26

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

1. Remove the retainer with the ON/OFF switch. Pull out the ON/OFF switch with its cable.
2. Insert and fit the retainer with the ON/OFF switch into the required opening. Reconnect the cable in the HPMU wiring chamber and relieve strain.

Connecting the secondary circuit

Preparing connections on the heating water side

Equip the heating system on site with an expansion vessel in the heating return. The expansion vessel must be approved to EN 13831.

Note

- With underfloor heating circuits, install a temperature limiter to restrict the maximum temperature of underfloor heating systems.
- Ensure the minimum flow rate, e.g. by means of an overflow valve: See "Specification".

Preparing the connections on the DHW side

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

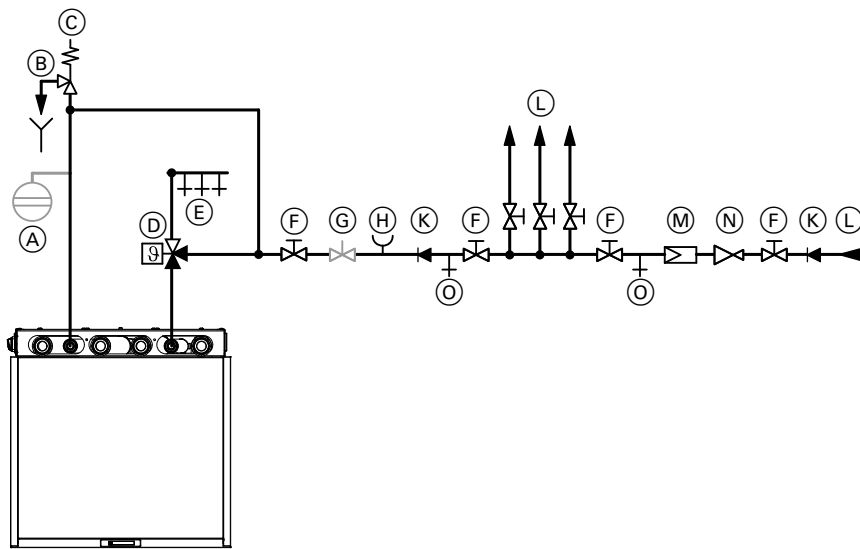


Fig. 27

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

Safety valve

The DHW cylinder **must** have a safety valve to protect against unduly high pressure.

Recommendation: Install safety valve above top edge of cylinder. This means the DHW cylinder will not need to be drained when working on the safety valve.

CH: According to W3 "Principles for creating potable water installations", safety valves must be drained directly via a visible unrestricted drain or via a short outlet line to the drain network.

Drinking water filter

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

Automatic thermostatic mixing valve

With appliances that heat DHW to temperatures above 60 °C, an automatic thermostatic mixing valve must be installed in the DHW line as protection against scalding.

Connecting the secondary circuit (cont.)

This also particularly applies when connecting solar thermal systems.

Connecting the secondary side

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/ heating water buffer cylinder
- Flow and return lines to the outdoor unit

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

Installing the hydraulic connection set (accessories)



"Hydraulic connection set" installation instructions

Note

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

Indoor unit with 1 integrated heating/cooling circuit

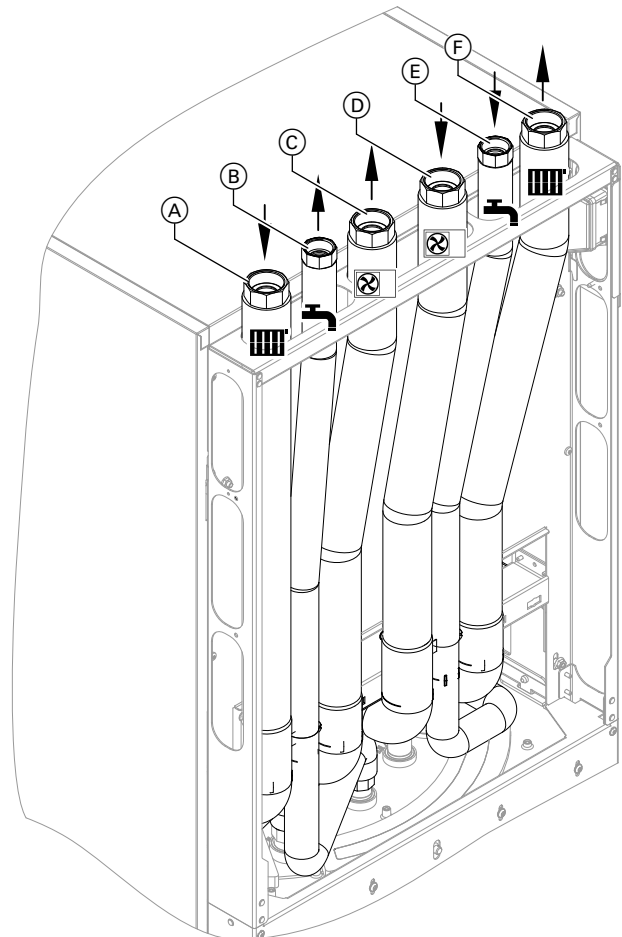


Fig. 28

- Ⓐ Heating water return, heating/cooling circuit 1: G 1¼ (female thread)
- Ⓑ DHW: G ¾ (female thread)
- Ⓒ Outdoor unit return (heating water outlet): G 1¼ (female thread)
- Ⓓ Outdoor unit flow (heating water inlet): G 1¼ (female thread)
- Ⓔ Cold water: G ¾ (female thread)
- Ⓕ Heating water flow, heating/cooling circuit 1: G 1¼ (female thread)

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
In order to remove magnetic and non-magnetic dirt particles, we recommend the installation of a suitable dirt separator with magnet in the secondary circuit: See the Vitoset pricelist.

! 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. Thermally insulate lines inside the building. If room cooling is planned for the building, use thermal and vapour diffusion-proof insulation.

Pipework internal \varnothing	Min. thickness of thermal insulation layer with $\lambda = 0.035 \text{ W/(m}\cdot\text{K)}$
$\leq 22 \text{ mm}$	20 mm
$> 22 \text{ mm}$	30 mm

λ Thermal conductivity

! Please note
Leaking hydraulic lines will cause damage to the system or to the building.
If required, only apply thermal insulation to pipes after the system has been filled.

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

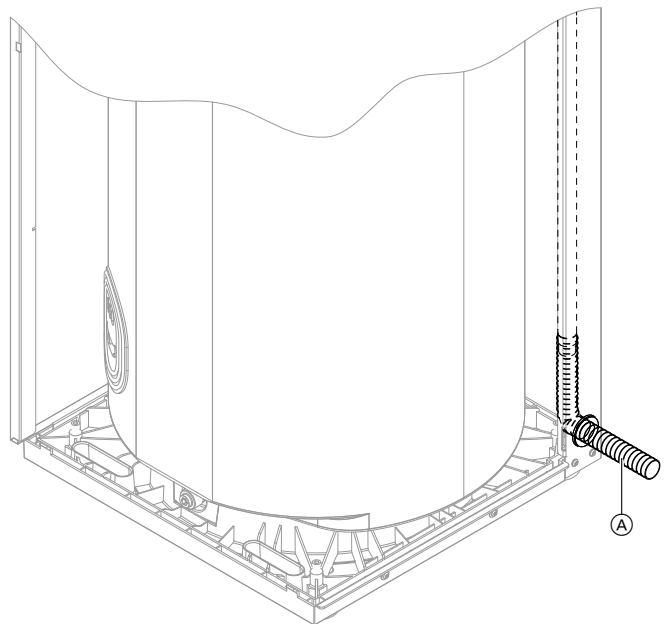


Fig. 29

Ⓐ Drain hose

Connecting the secondary circuit (cont.)

Aligning the indoor unit

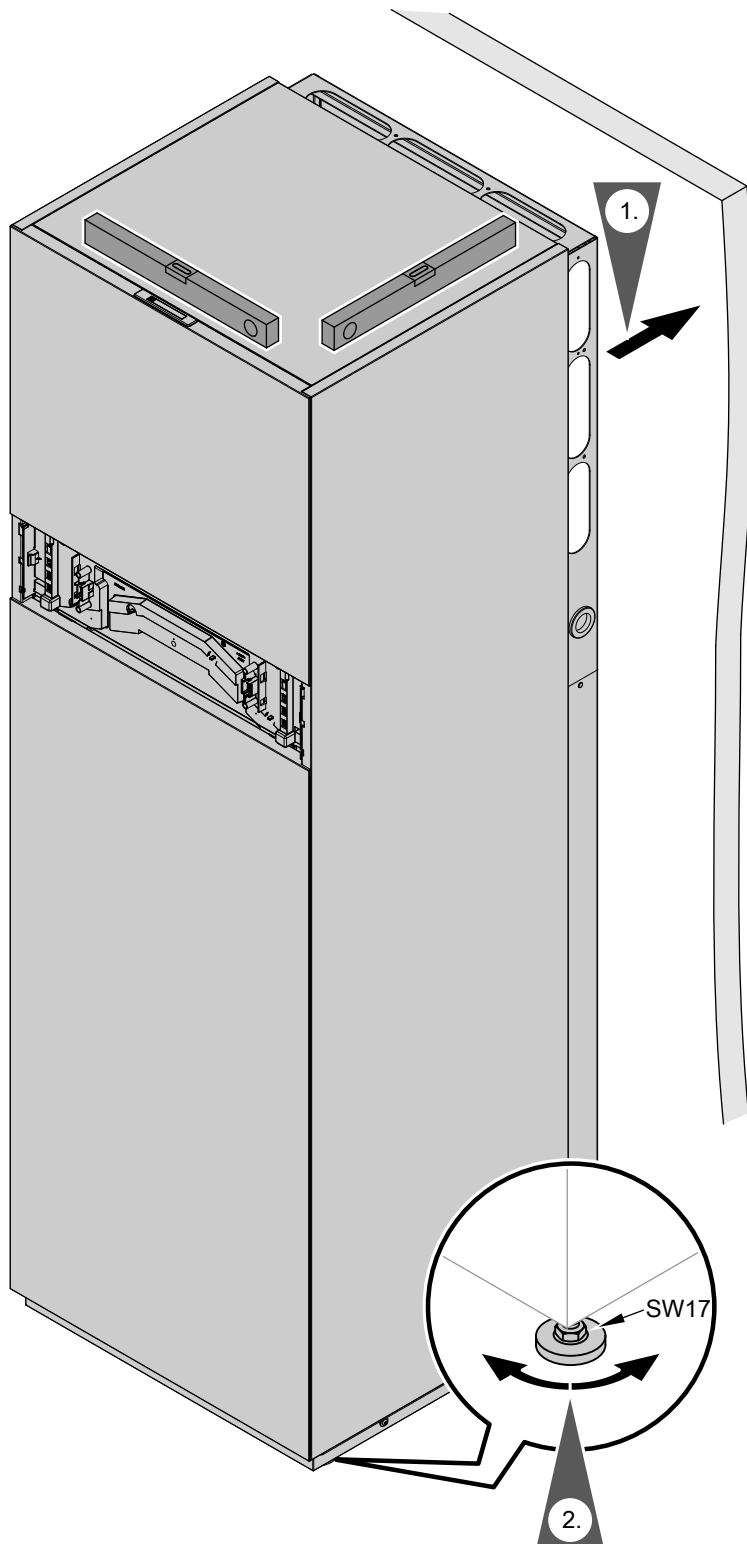


Fig. 30

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.

Connecting the secondary circuit (cont.)

Contact humidistat

For area cooling systems (e.g. underfloor heating circuit, chilled ceiling), a 24 V $\overline{=}$ contact humidistat (accessories) is required.

- Installation in the coolant flow of the room to be cooled. If required, remove thermal insulation.
- Electrical connection
 - Integrated heating/cooling circuit 1: Connection to 12-pole terminal at the bottom of the upper PCB and upper luster terminal, terminals 1 and 2
- If several rooms with different relative humidity levels are part of the heating/cooling circuit, fit and connect several contact humidistats in series: Design the switching contacts as N/C contacts.

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.

For this, the outdoor unit flow and return are hydraulically connected.

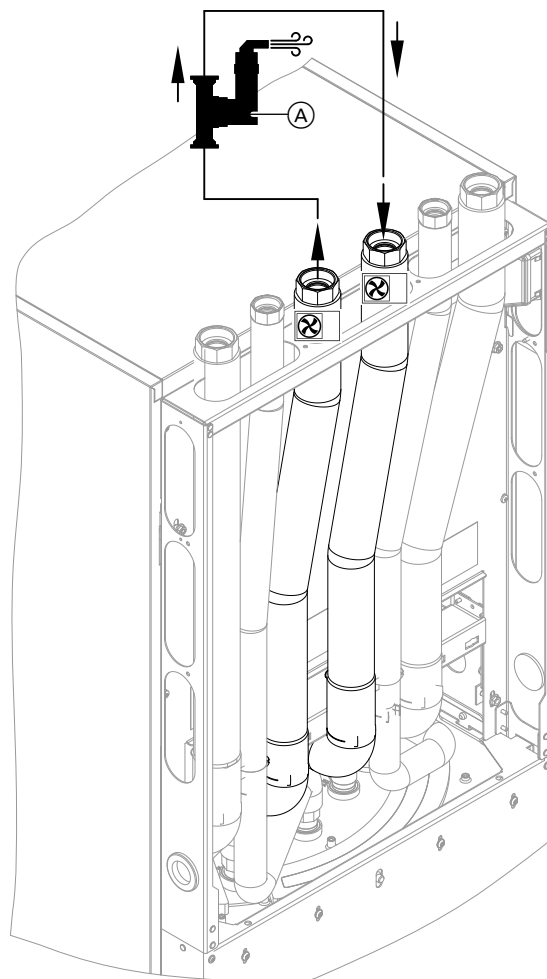


Fig. 31

Ⓐ Air vent valve

Indoor unit: Removing the front panels

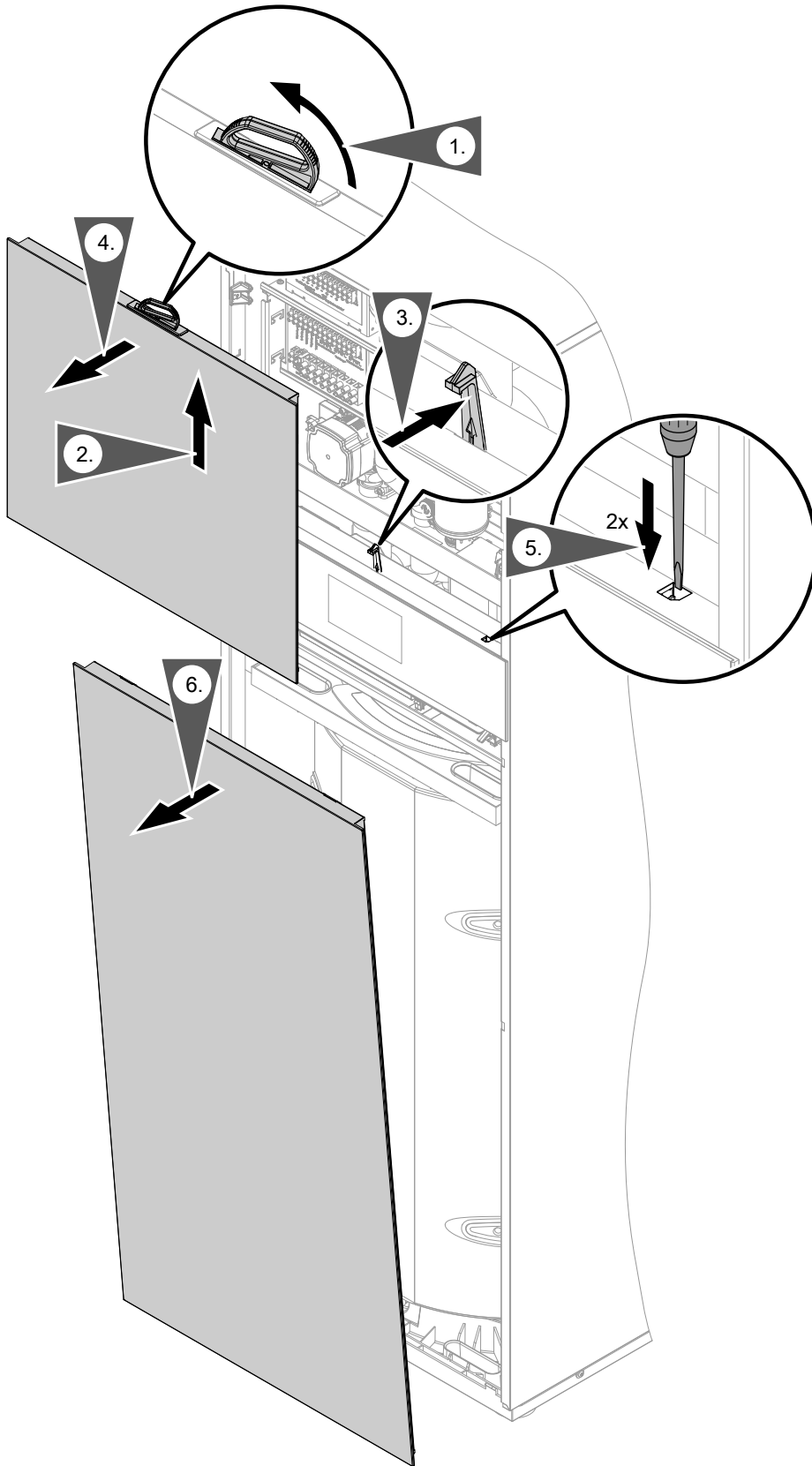


Fig. 32

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

Connection cables	Cable lengths in the indoor unit
<ul style="list-style-type: none"> ▪ 230 V~, e.g. for circulation pumps 	1.3 m
Note	
<i>Route the cables to the HPMU electronics module so they are flexible.</i>	
<ul style="list-style-type: none"> ▪ < 42 V, e.g. for sensors 	1.3 m

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~	7 x 2.5 mm ² 25 m

For central power supply on 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

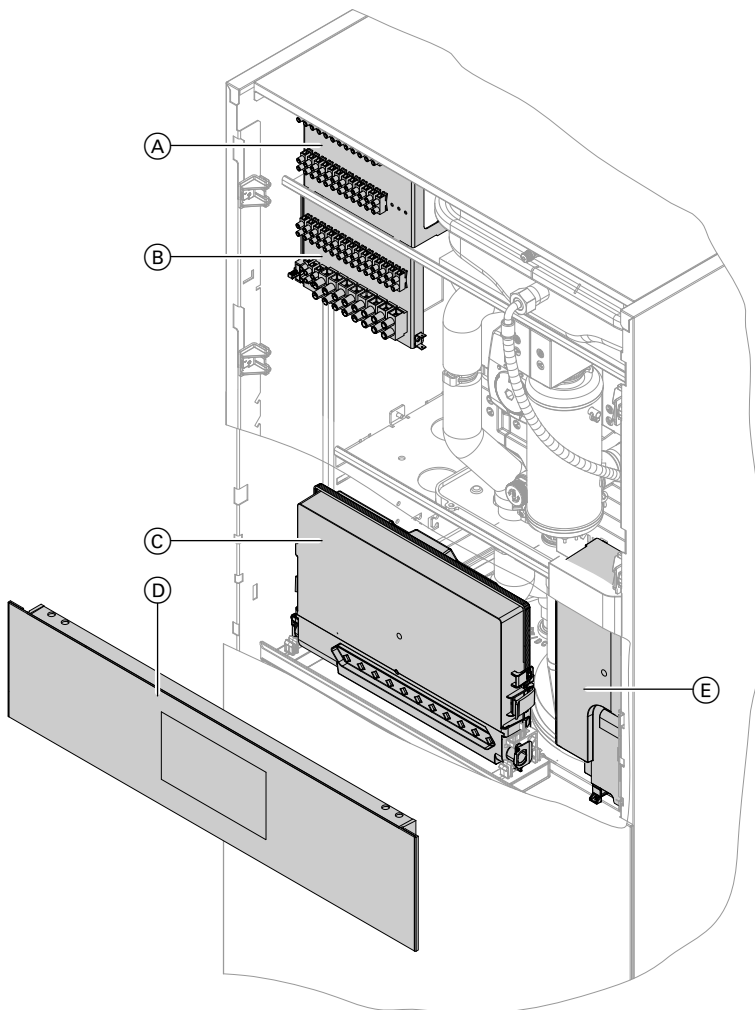


Fig. 33

- | | |
|---|---|
| <p>(A) Upper PCB</p> <ul style="list-style-type: none"> ▪ Upper luster terminal: BUS connections ▪ Bottom luster terminal: Sensors <p>(B) Bottom PCB</p> <ul style="list-style-type: none"> ▪ Upper luster terminal: 230 V~ components and digital inputs ▪ Bottom luster terminal: Mains terminals for control unit and instantaneous heating water heater | <p>(C) HPMU electronics module</p> <p>(D) HMI programming unit</p> <p>(E) EHCU electronics module</p> |
|---|---|

Opening electrical terminal areas

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

Removing the programming unit mounting bracket

Move the bracket to the maintenance position

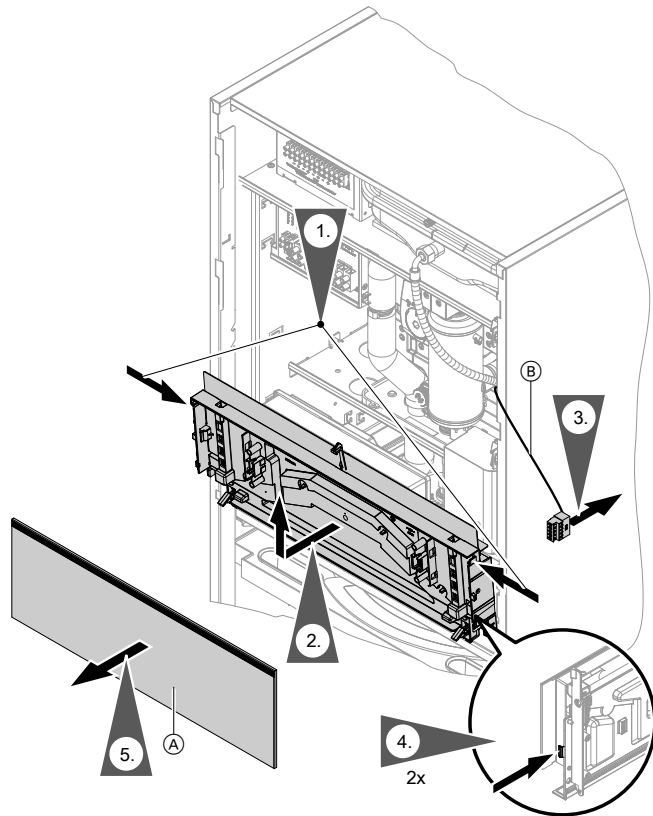


Fig. 34

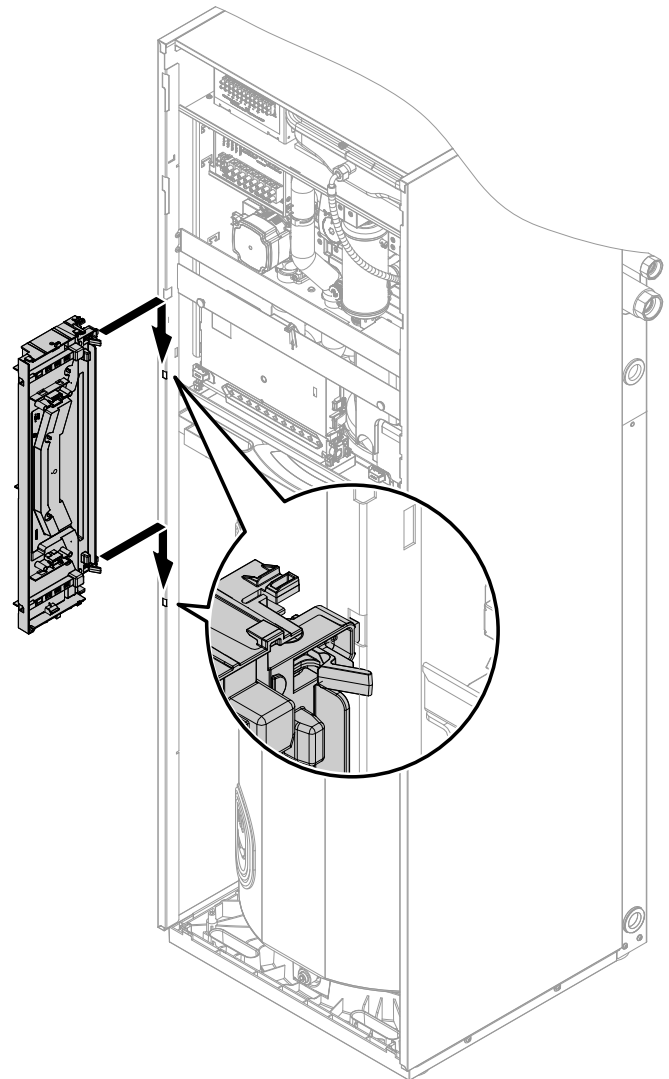


Fig. 35

Electrical connection (cont.)

Opening the HPMU electronics module

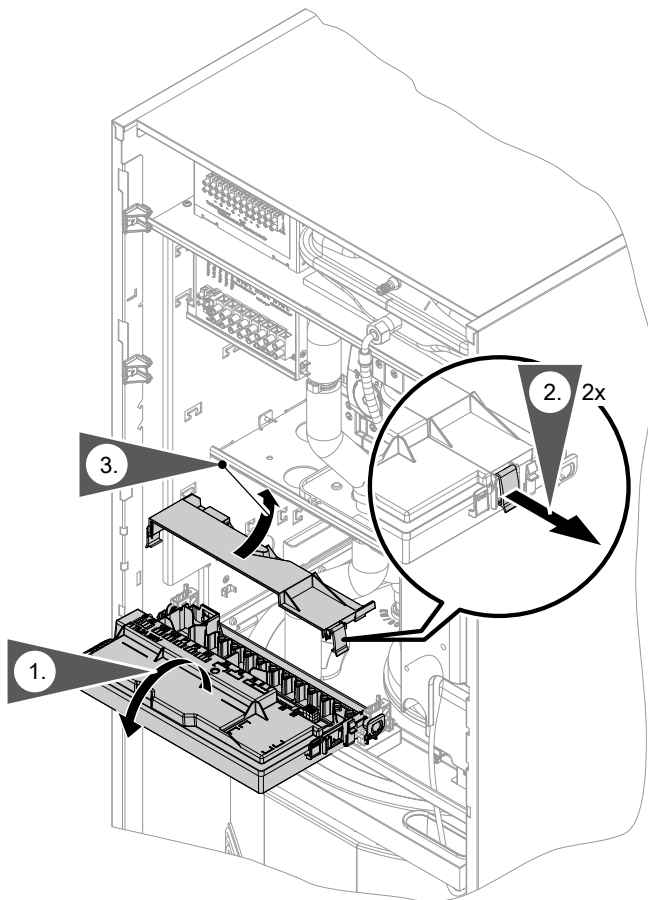


Fig. 36

Opening the EHCU electronics module



Fig. 37

Installation

Indoor unit: Routing cables to the terminal area

! 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.

! Please note
 Openly routed cables can be damaged by vibration.
 Secure all cables inserted into the appliance with at least 2 cable ties.

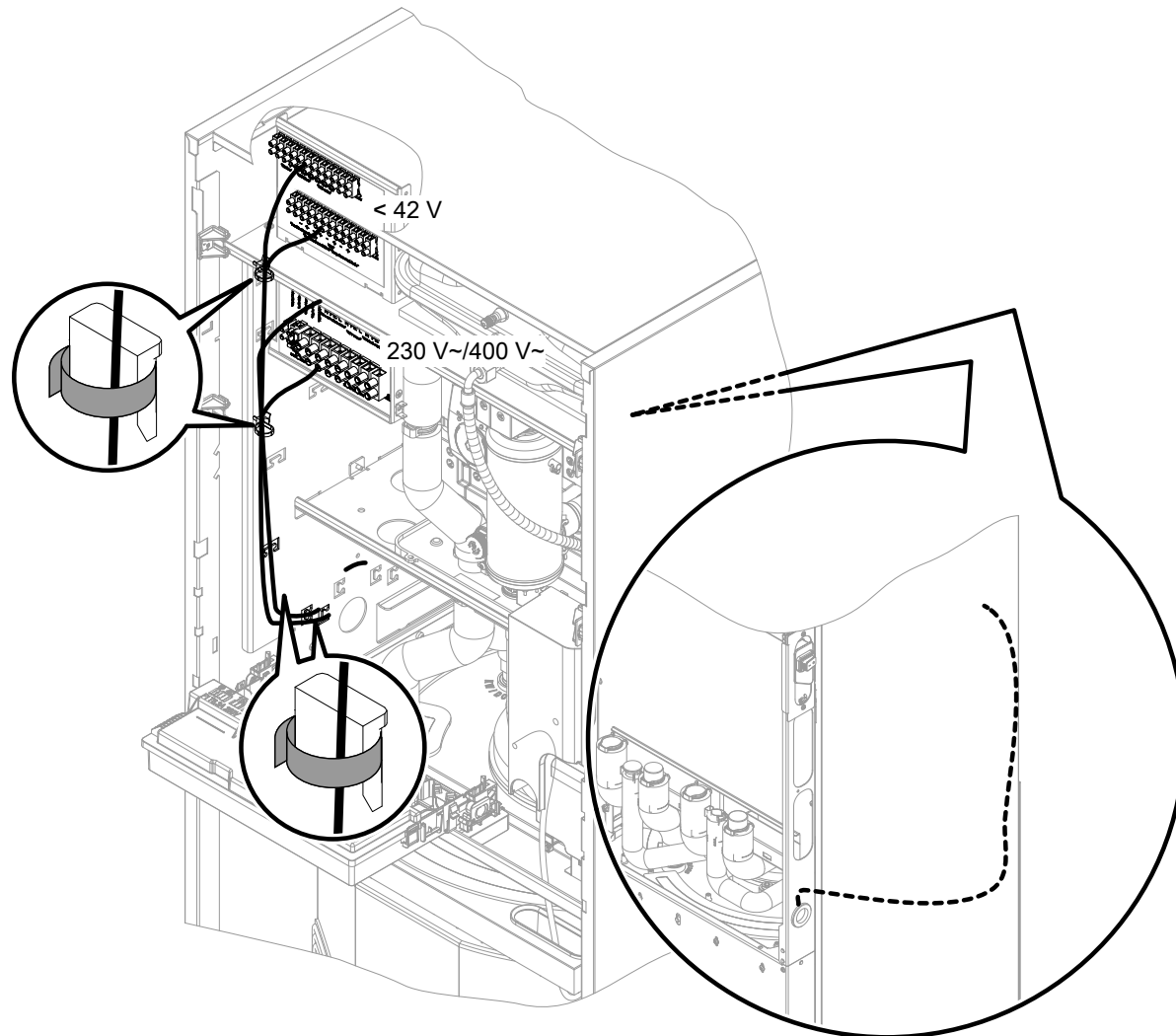


Fig. 38

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.)

Upper PCB: Bus connections and sensors

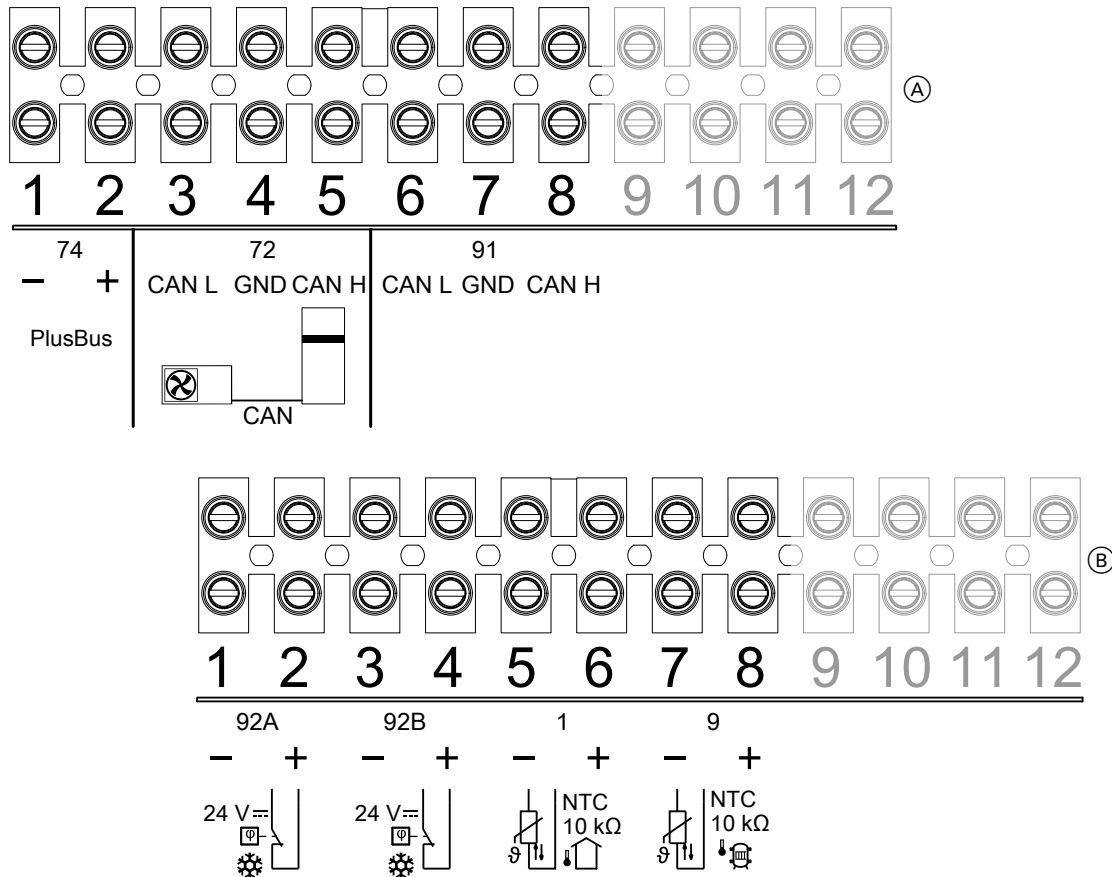


Fig. 39

- (A) BUS connections
- (B) Sensors

Luster terminals, top (A): BUS connections		
Terminals	Component	Explanation
1 and 2 74.1 74.2	Connection of additional PlusBus subscribers, e.g. mixer extension kit	Cores are interchangeable Recommended connecting cable: <ul style="list-style-type: none"> ▪ Unshielded data cable: 2 x 0.34 mm² ▪ Max. cable length: 50 m
3 to 5 72.L 72.GND 72.H	Indoor/outdoor unit CAN bus communication cable connection	Connection for integration into the internal CAN bus system When wiring on site, connect additional shielding to 72.GND. If the indoor unit only (without the outdoor unit) is used for screed drying, plug the terminator into terminal 72 between 72.L and 72.H. Recommended connecting cable: <ul style="list-style-type: none"> ▪ Pre-assembled bus communication cable (accessories) Further information: See chapter "Integrating a heat pump into a CAN bus system".

Electrical connection (cont.)

Luster terminals, top (A): BUS connections

Terminals	Component	Explanation
6 to 8 91.L 91.GND 91.H	Connection of an additional CAN bus subscriber	To connect the heat pump to an external CAN bus system: Recommended connecting cable and further information: See chapter "Integrating a heat pump into a CAN bus system". The connection is routed internally to plug 91 in the HPMU electronics module. Note <i>Plug 72 of the indoor/outdoor unit CAN bus communication cable may only be connected to terminal 72.</i>
9 to 12	Do not connect anything here!	

Luster terminals, bottom (B): Sensors

Terminals	Component	Explanation
1 and 2 92A.1 GND 92A.2 24 V	Contact humidistat, 24 V $\overline{=}$ for heating/cooling circuit 1	Recommended connecting cable: <ul style="list-style-type: none"> ▪ 2 x 0.75 mm² Max. cable length: 25 m Or ▪ 2 x 1.5 mm² Max. cable length: 50 m
5 and 6	Outside temperature sensor	Sensor type: NTC 10 k Ω Cores are interchangeable Recommended connecting cable: <ul style="list-style-type: none"> ▪ 2 x 1.5 mm² Max. cable length: 35 m
7 and 8	External heating water buffer cylinder: Temperature sensor	Sensor type: NTC 10 k Ω Cores are interchangeable Recommended connecting cable: <ul style="list-style-type: none"> ▪ 2 x 1.5 mm² Max. cable length: 35 m
9 to 12	Do not connect anything here!	

Electrical connection (cont.)

Bottom PCB: 230 V~ function components and digital inputs

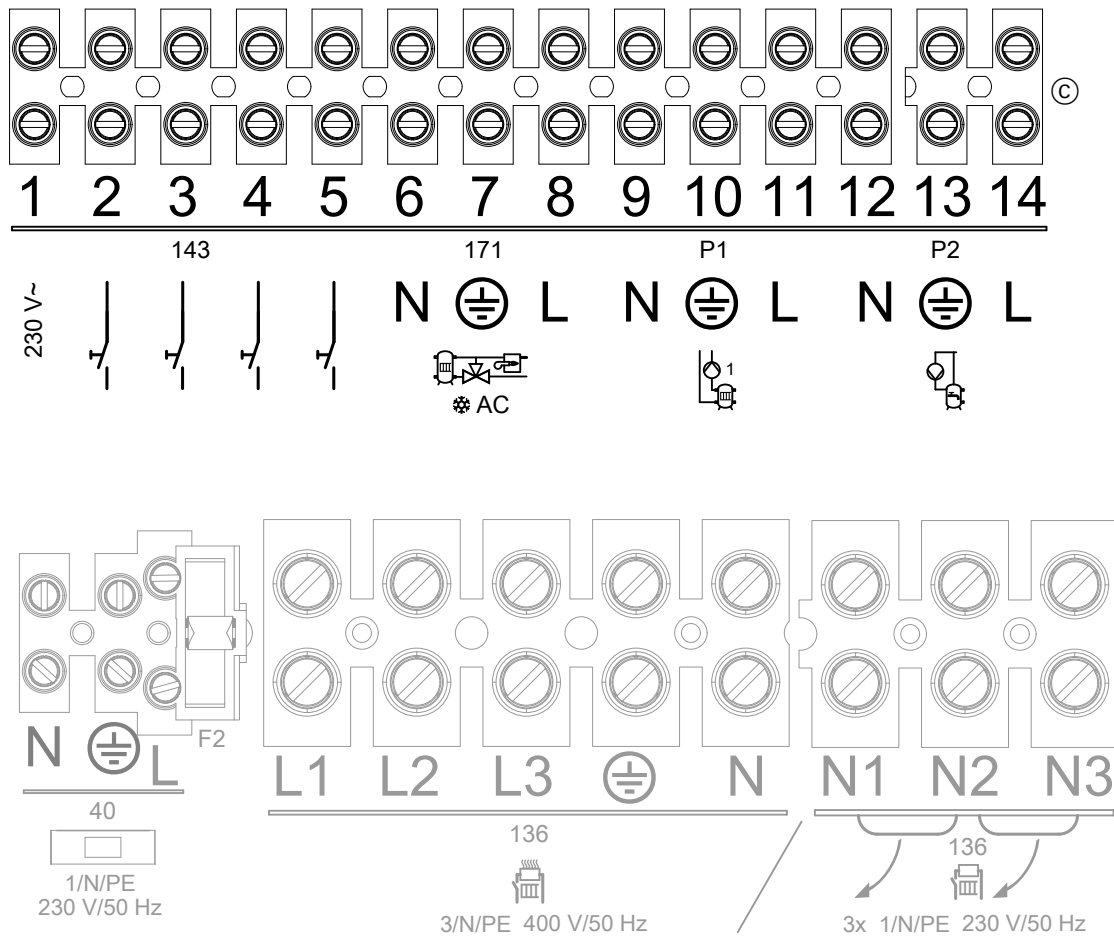
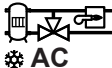


Fig. 40

Luster terminals for 230 V~ components and digital inputs ©

Terminals	Component/function	Explanation
1 to 5		
143.1	Power supply for configurable digital inputs 1 to 4	Voltage: 230 V~
143.2	Configurable digital inputs 1 to 4 Possible functions: See chapter "Digital input functions"	Set the required parameters during commissioning: See chapter "Commissioning assistant" Breaking capacity: 230 V~, 0.15 A Recommended connecting cable: ▪ 2 x 0.75 mm ² ▪ Max. cable length: 50 m
143.3		
143.4		
143.5		
6 to 8		
171.N		
171.⊕		
171.L		
 AC		

Electrical connection (cont.)




Luster terminals for 230 V~ components and digital inputs ©

Terminals	Component/function	Explanation
9 to 11 P1.N P1.⊕ P1.L	Circulation pump for buffer discharge	Configurable connection <ul style="list-style-type: none"> ▪ Output: 230 W ▪ Voltage: 230 V~ ▪ Max. switching current: 1 A Recommended flexible connecting cable: <ul style="list-style-type: none"> ▪ 3 x 1.5 mm² ▪ Max. cable length: 50 m
12 to 14 P2.N P2.⊕ P2.L	DHW circulation pump	<ul style="list-style-type: none"> ▪ Output: 230 W ▪ Voltage: 230 V~ ▪ Max. switching current: 1 A Recommended connecting cable: <ul style="list-style-type: none"> ▪ 3 x 1.5 mm² ▪ Max. cable length: 50 m

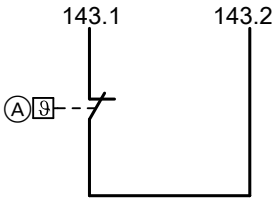
Digital input functions

- 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 "Control unit power supply".
- Set the required parameters during commissioning: See chapter "Commissioning assistant"

The following functions are available via the 4 digital inputs:

Functions	Switching contacts				Explanation
	143.2	143.3	143.4	143.5	
Power-OFF 	—	—	X	—	Requires floating N/C contact: <ul style="list-style-type: none"> ▪ Closed: Heat pump operational ▪ Open: Heat pump shut down <ul style="list-style-type: none"> ▪ 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". <p>In connection with Smart Grid: Do not connect the power-OFF signal.</p>
Smart Grid 	—	—	X	X	The power-OFF function is integral to Smart Grid. The power-OFF signal must therefore not be connected.
DHW circulation pump demand 	X	—	—	—	External demand, DHW circulation pump
External demand	—	X	—	—	External demand from compressor and pumps

Electrical connection (cont.)

Functions	Switching contacts				Explanation
	143.2	143.3	143.4	143.5	
External blocking	X	—	—	—	External blocking of refrigerant circuit and instantaneous heating water heater
Heating/cooling circuits temperature limiter 1	X	—	—	—	Temperature limiter to restrict the maximum temperature of underfloor heating circuits  (A) Temperature limiter heating/cooling circuit 1

HPMU electronics module: Accessory 230 V~ and BUS connection

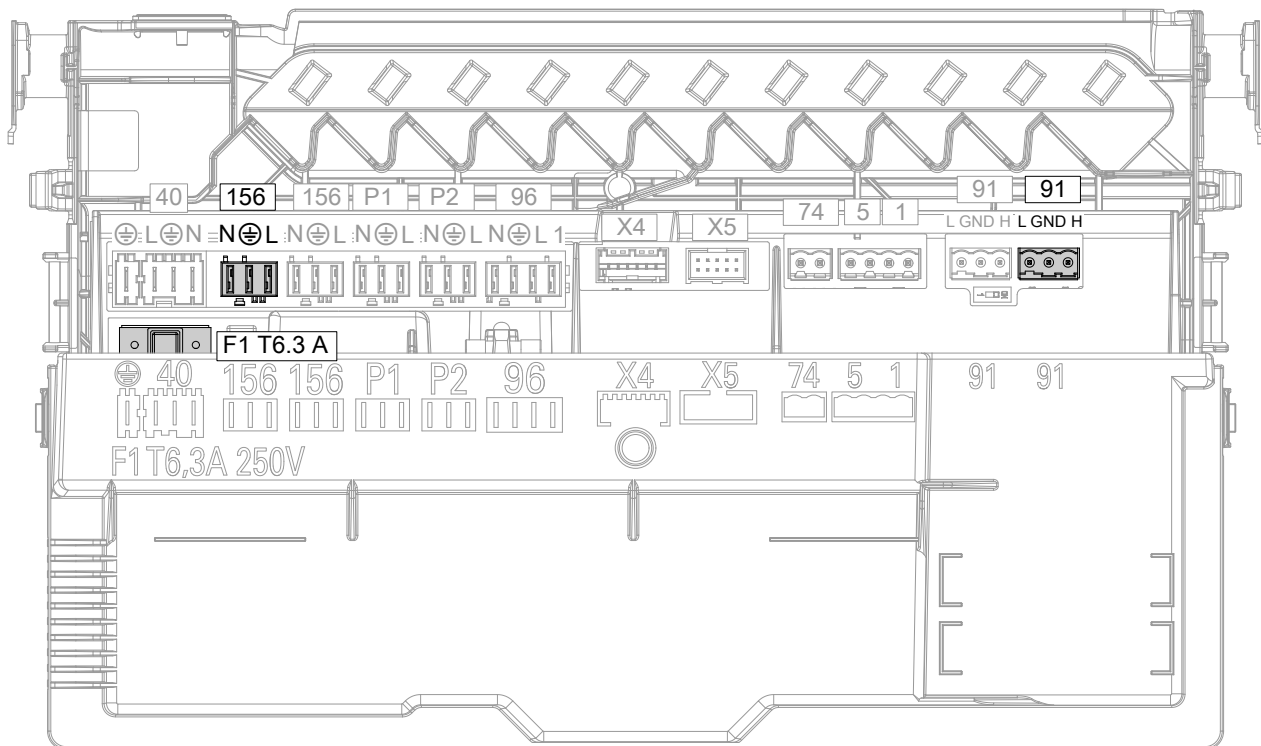


Fig. 41

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	<ul style="list-style-type: none"> Output: 230 W Voltage: 230 V~ Max. switching current: 1 A Recommended flexible connecting cable: <ul style="list-style-type: none"> 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.GND 91.H	Connection of an additional CAN bus subscriber	<p>Connecting the heat pump as central subscriber in an external CAN bus system</p> <p>Recommended connecting cable:</p> <ul style="list-style-type: none"> Pre-assembled bus cable (accessories) <p>Further information: See chapter "Integrating a heat pump into a CAN bus system".</p> <p>Note Plug 72 of the indoor/outdoor unit CAN bus communication cable may only be connected to terminal 72.</p>

Power supply accessories 230 V ~

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

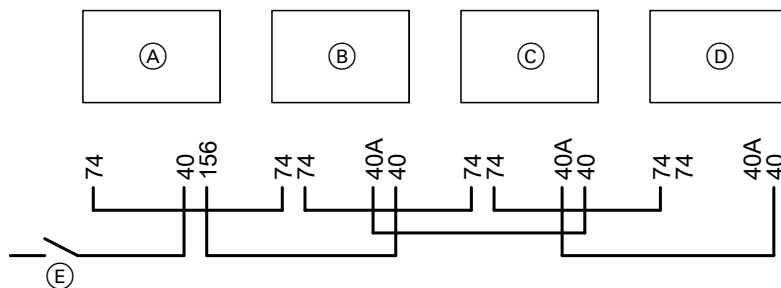


Fig. 42

- (A) Indoor unit terminal areas
 - 40 Control unit/PCB power supply in the 230 V~ terminal area
 - 74 PlusBus connection to connection socket
 - 156 Power supply for PlusBus subscribers in the HPMU electronics module
- (B) Mixer extension kit
- (C) Mixer extension kit
- (D) Mixer extension kit
- (E) ON/OFF switch

Electrical connection (cont.)

Some accessories with direct power supply

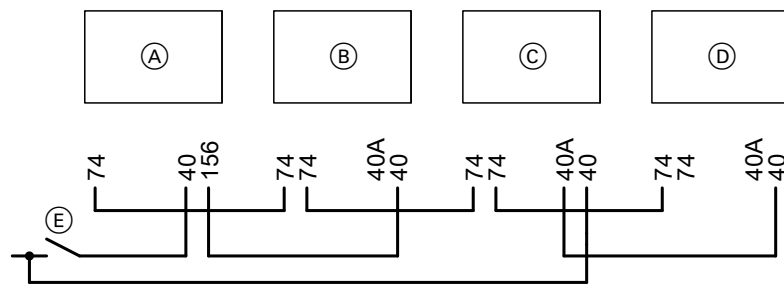


Fig. 43

- (A) Indoor unit terminal areas
 - 40 Control unit/PCB power supply in the 230 V~ terminal area
 - 74 PlusBus connection to terminals
 - 156 Power supply for PlusBus subscribers in the HPMU electronics module
- (B) Mixer extension kit
- (C) Mixer extension kit
- (D) Mixer extension kit
- (E) ON/OFF switch

Integrating a heat pump into a CAN bus system

- The Viessmann CAN bus is designed for "line" bus topology with a terminator at both ends.
- 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.

Integration into the **internal** CAN bus system:

- Recommended cable for connection to the **internal** CAN bus system:
Indoor/outdoor unit bus communication cable (accessories), fully wired, in 5, 15 or 30 m lengths
- For wiring on site:
For both plugs, also connect the shielding to the "GND" connection.
If required, remove the terminator from terminal 72.

Integration into an **external** CAN bus system:

- Recommended cable for connection to an **external** CAN bus system:
Bus cable (accessories), fully wired, in 5, 15 or 30 m lengths
- For wiring on site:
Only use cable types listed in the following table.

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	200 m

Alternative cable types (on site):

CAN bus cable	2-core, CAT5, shielded
▪ Max. length	50 m
CAN bus cable	2-core, CAT7, shielded
▪ Max. length	200 m

Check the terminator when connecting to an external CAN bus system

The heat pump is the first or last subscriber

- Connection of external CAN bus to 12-pole terminal on upper PCB, upper luster terminal, terminals 6, 7, 8
- Do **not** remove the factory-fitted plug 91 in the HPMU electronics module. This plug 91 contains the terminator.

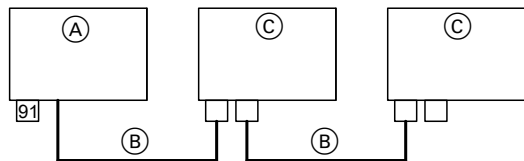


Fig. 44

- Ⓐ Heat pump connected via 12-pole terminal as first or last CAN bus subscriber
- Ⓑ CAN bus cable
- Ⓒ Other CAN bus subscribers

The heat pump is the central subscriber

In this case, 2 connections are required on the heat pump for integration into the external CAN bus:

- 1 Connection to upper PCB, upper luster terminal for bus connections, terminals 6, 7, 8
- 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 to the factory-fitted plug 91 in the HPMU electronics module. Remove the terminator from this plug 91.

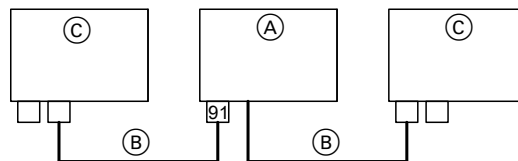


Fig. 45

- Ⓐ Heat pump as central CAN bus subscriber
- Ⓑ CAN bus cable
- Ⓒ Other CAN bus subscribers

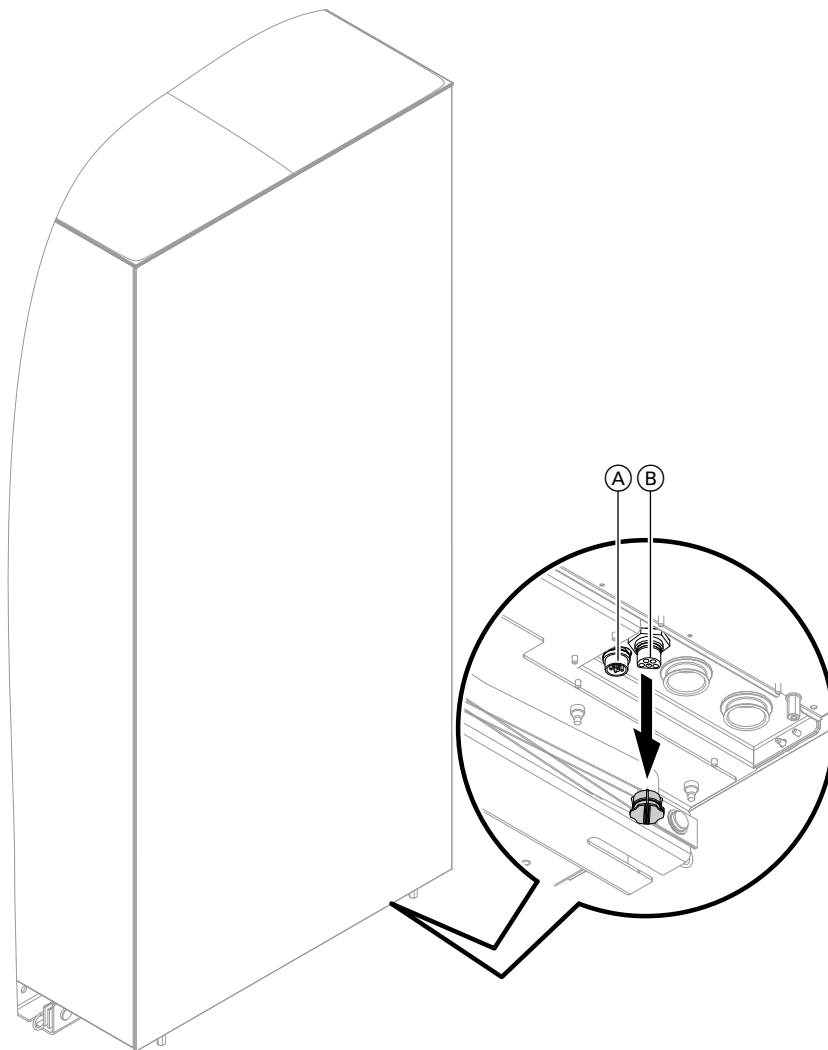
Electrical connection (cont.)**Outdoor unit: Electrical terminal area on the underside of the appliance**

Fig. 46

- Ⓐ Indoor/outdoor unit CAN bus communication cable connection
- Ⓑ Power supply

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.

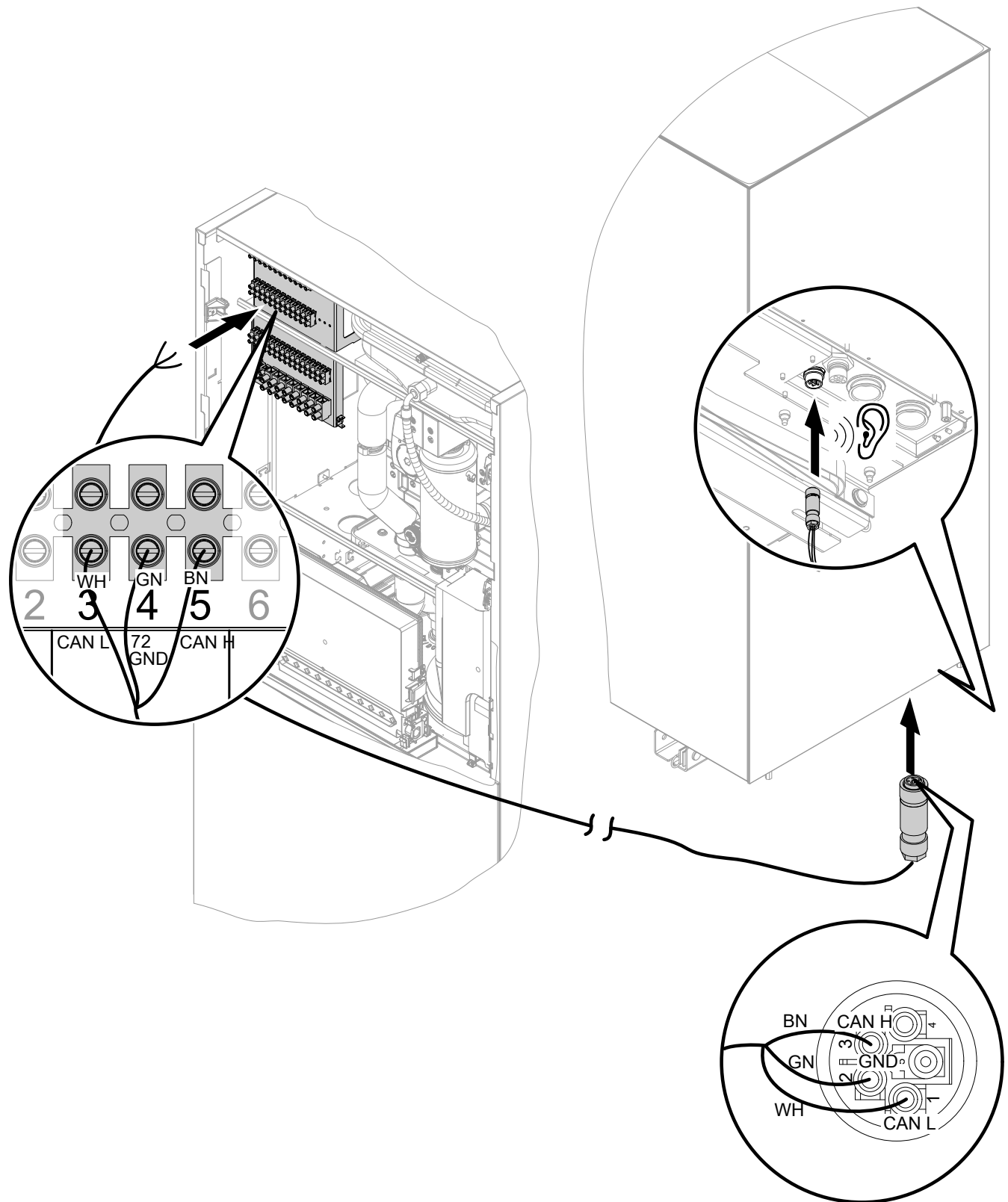


Fig. 47

Note

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

Electrical connection (cont.)

Make sure the following is observed for on-site cable:

- Cable length:
 - Min. 3 m
 - Max. 30 m
- Recommended connecting cable and further information: See chapter "Integrating a heat pump into a CAN bus system".

Fitting the programming unit**Note**

The integrated WiFi communication module supports commissioning, maintenance and servicing via the "Vitoguide app" as well as operation via the "ViCare app".

*The access details required for establishing the connection are available in triplicate as labels on the back of the programming unit. Remove these 3 labels **before** installing the programming unit.*

Apply the labels in the following positions:

- *For commissioning, affix a label to the place marked on the type plate.*
- *Affix a label in the field provided in chapter "Switching WiFi on/off" for subsequent use.*
- *Affix label in the field provided for the purpose in the operating instructions.*

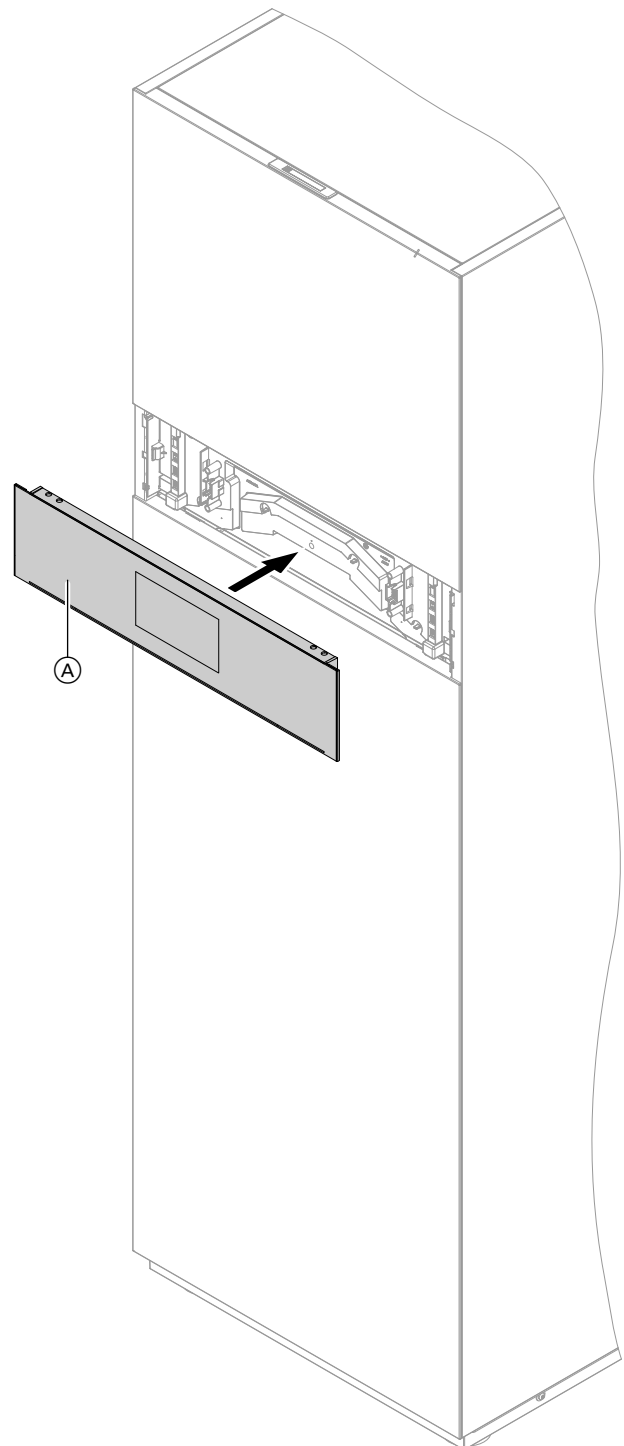



Fig. 48

Ⓐ Programming unit

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 mm²) 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 mm²) 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 shut-down 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.

Central power supply for types ... SP

Shared power supply for heat pump control unit and instantaneous heating water heater:
This requires the 230 V~ mains connection kit (accessories).



Installation instructions "230 V~ mains connection kit"

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

Power supply (cont.)

- Max. cable length: 30 m
- Max. fuse rating 32 A
- Standard tariff: No economy tariff with power-OFF facility possible

Heat pump control unit power supply

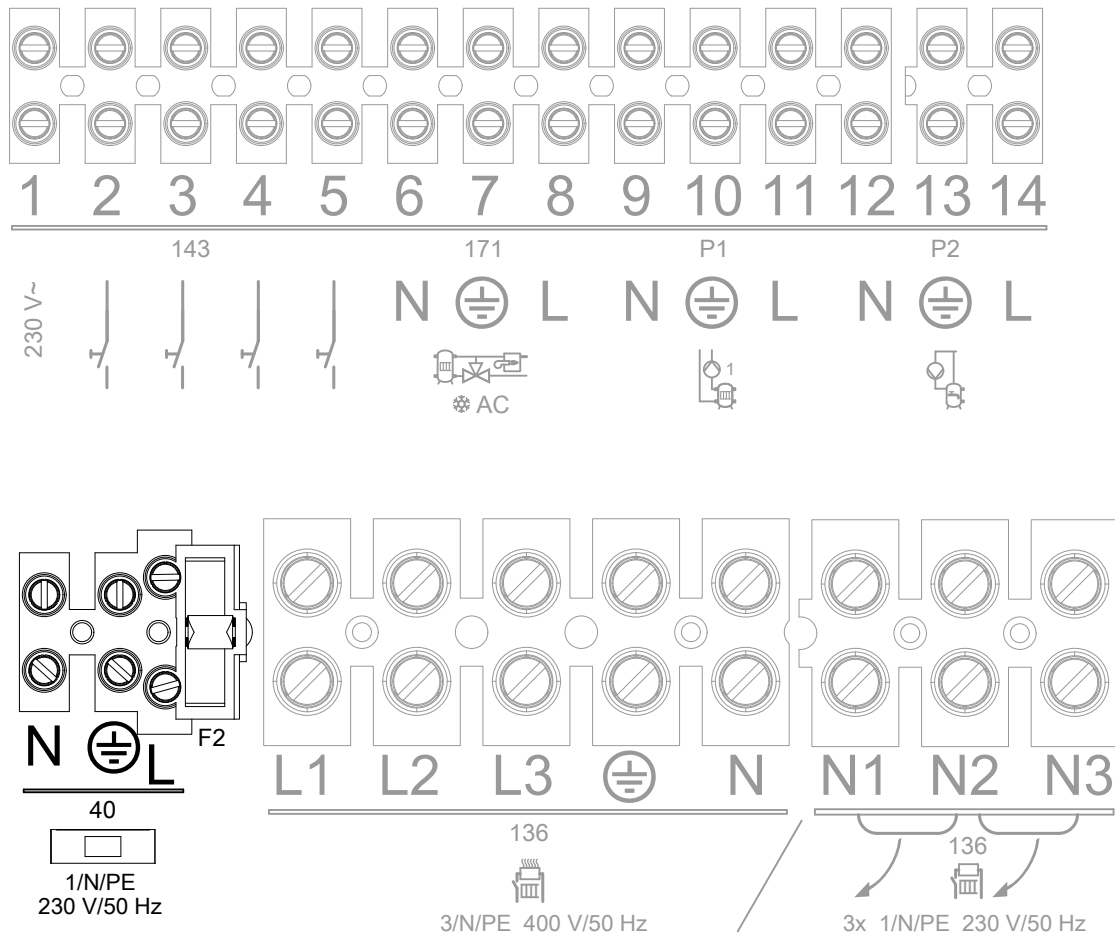


Fig. 49

F2 Fuse 6.3 A H (slow)

- 1/N/PE 230 V/50 Hz
- Recommended power cable:
3 x 1.5 mm²
With power-OFF 5 x 1.5 mm²
- Max. cable length: 50 m

- Max. fuse rating: 16 A
- Standard tariff: No economy tariff with power-OFF facility possible

Note

*This supply must **never** be blocked.*

Installation sequence

Power supply (cont.)

Instantaneous heating water heater power supply

Power supply 400 V~

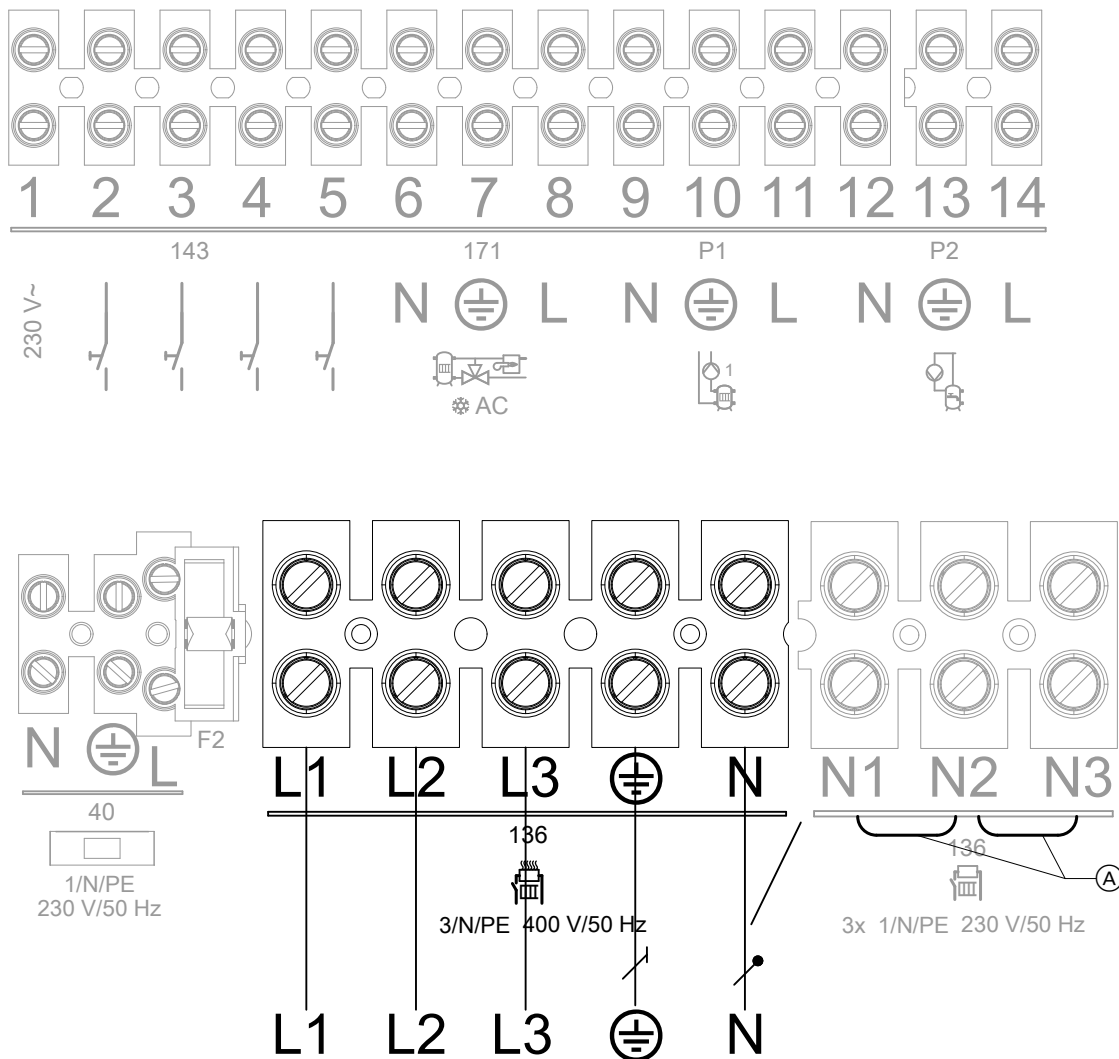


Fig. 50

Ⓐ Jumpers: Do not remove!

- 3/N/PE 400 V/50 Hz
- Recommended power cable:
5 x 2.5 mm²
- Max. cable length: 25 m
- Max. fuse rating: 16 A
- Economy tariff and power-OFF can be applied

Power supply (cont.)

Power supply 230 V~

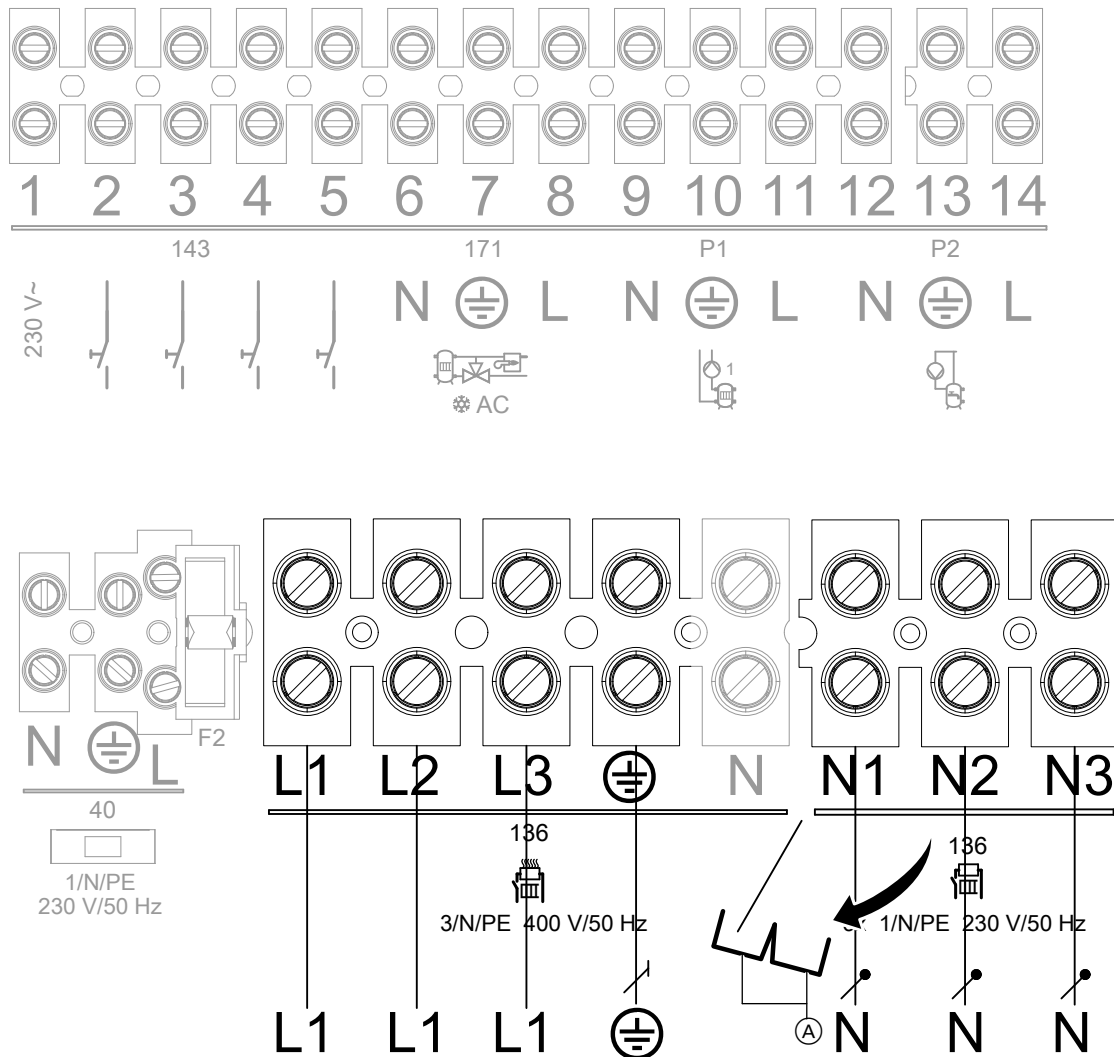


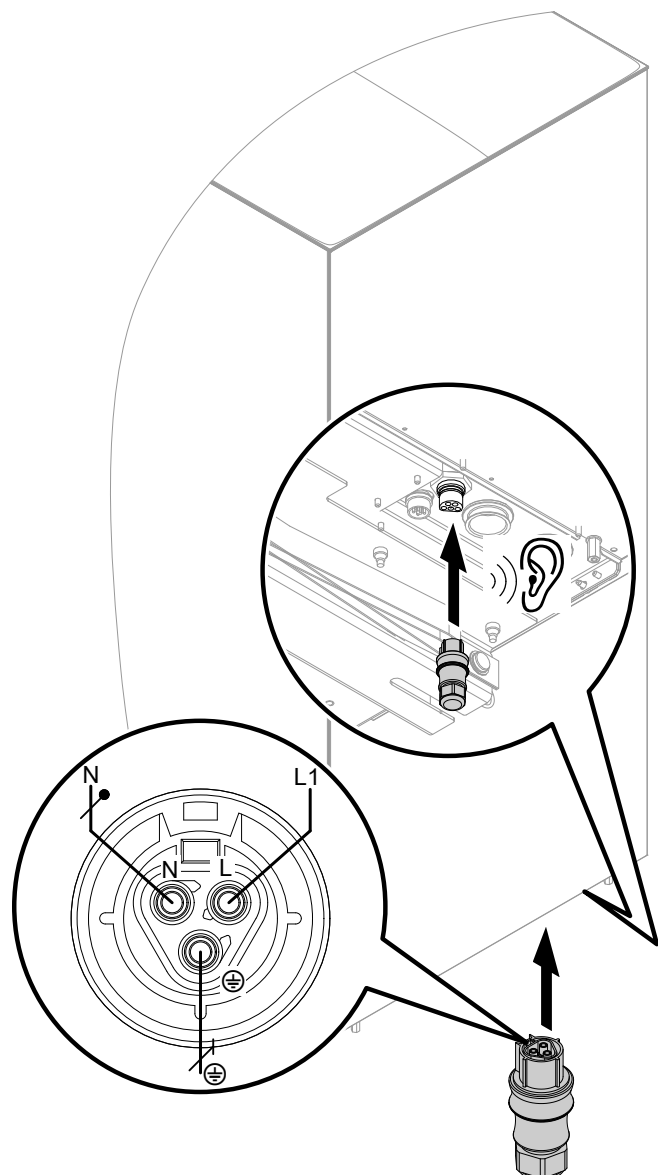
Fig. 51

(A) Jumpers: Remove!

- 3 x 1/N/PE 230 V/50 Hz
- Recommended power cable: 7 x 2.5 mm²
- Max. cable length: 25 m
- Max. fuse rating: 16 A
- Economy tariff and power-OFF can be applied

Compressor power supply: Outdoor unit 230 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.



- Recommended power cable: H07RN-F
The use of PVC cable is **not** permissible.
- Do not use wire ferrules.
Core wire PE must be longer than both the core wires L and N.
- Shield the power cable from direct sunlight.

Fig. 52

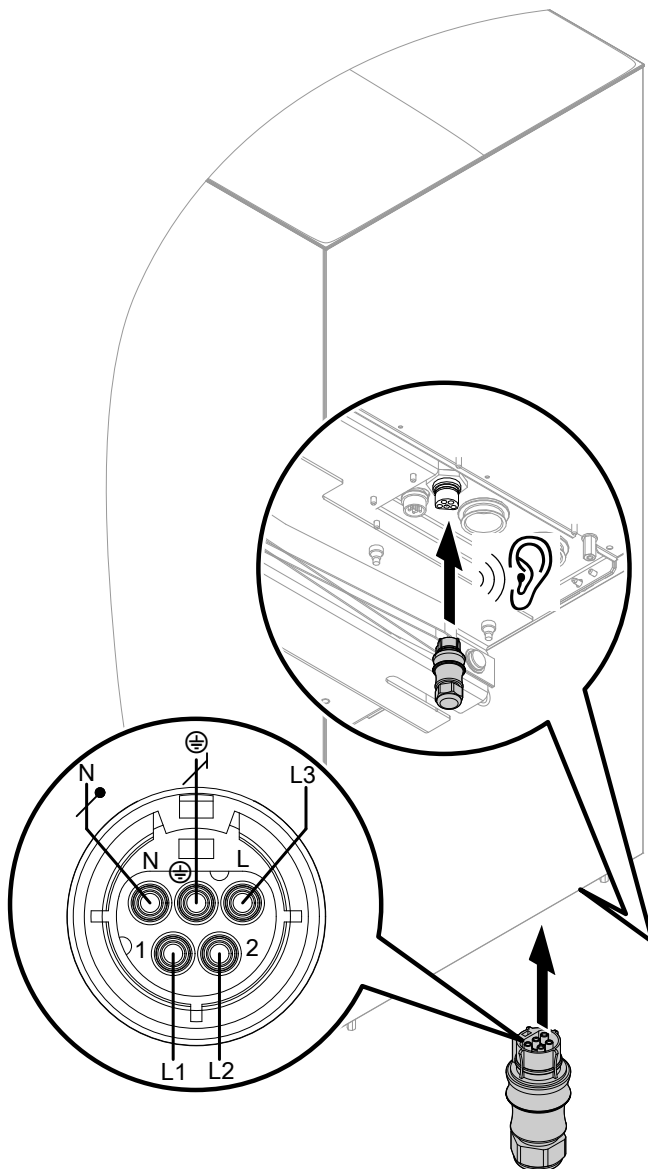
Types	Cable	Max. cable length	Max. fuse rating
All types	3 x 2.5 mm ²	20 m	B25A
	Or		
	3 x 4.0 mm ²	32 m	

Compressor power supply: Outdoor unit 400 V~

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

! **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.

Power supply (cont.)



- Recommended power cable: H07RN-F
The use of PVC cable is **not** permissible.
- Do not use wire ferrules.
The PE wire must be longer than the L1, L2, L3 and N wires.
- Shield the power cable from direct sunlight.

Fig. 53

Types	Cable	Max. cable length	Max. fuse rating
All types	5 x 2.5 mm ²	30 m	B16A

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.

Note

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

Electrical connections of the power supply:

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

Power supply (cont.)

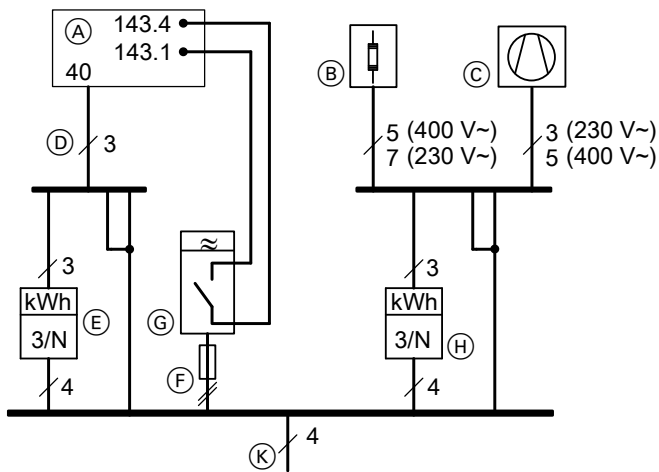


Fig. 54 Diagram excluding fuses and RCD

- (C) Heat pump compressor
- (D) Heat pump control unit power supply
- (E) Premium tariff meter
- (F) Ripple control receiver backup fuse
- (G) Ripple control receiver (contact open: Power-OFF enabled); feed: TNC system
- (H) Economy tariff meter
- (K) Feed: TNC system

- (A) 230 V~ junction box
- (B) Instantaneous heating water heater

Power supply with power-OFF: With on-site load disconnect

The power-OFF signal is connected to the on-site contactor for economy tariff power supply and in the indoor unit 230 V~ junction box.

With heat pump cascades, the power-OFF signal must be connected to **all** heat pumps in parallel and **in the same phase**. An additional contactor relay is required for this.

The compressor **and** instantaneous heating water heater are "forced" off when power-OFF is enabled.

Electrical connections of the power supply:

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

Note

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

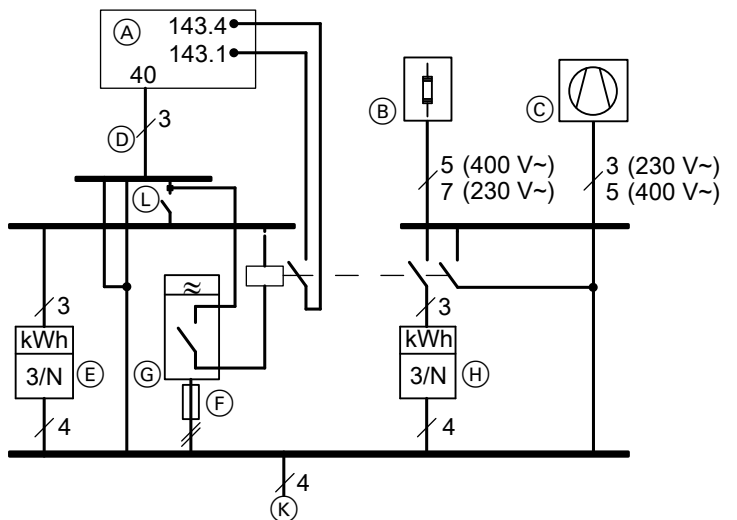


Fig. 55 Diagram excluding fuses and RCD

- (A) 230 V~ junction box
- (B) Instantaneous heating water heater
- (C) Heat pump compressor
- (D) Heat pump control unit power supply
- (E) Premium tariff meter
- (F) Ripple control receiver backup fuse
- (G) Ripple control receiver (contact open: Power-OFF enabled) with backup fuse
- (H) Economy tariff meter
- (K) Feed: TNC system
- (L) Mains isolator

Power supply (cont.)

Mains power supply in conjunction with self-consumption

Without power-OFF

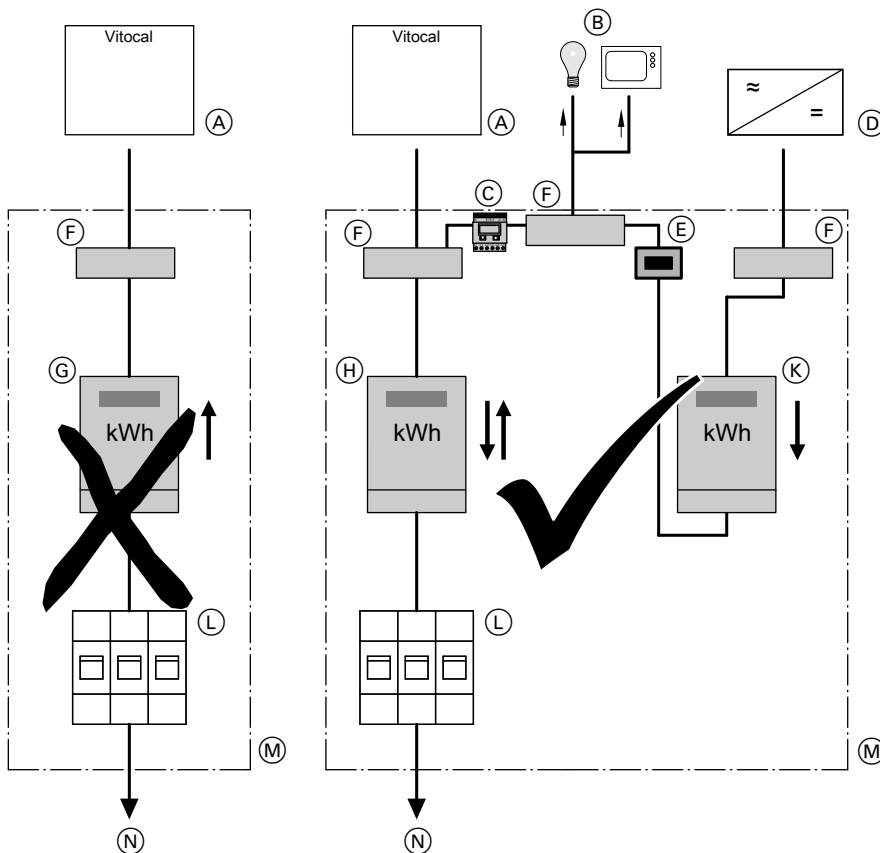


Fig. 56

- (A) Heat pump
- (B) Additional consumers (of self-generated power) in the household
- (C) Energy meter
- (D) Inverter
- (E) Isolator for the photovoltaic system
- (F) Terminal
- (G) Double-tariff meter (for special tariff for heat pumps)
Not permissible in conjunction with photovoltaic systems for self-consumption
- (H) Bidirectional meter (for photovoltaic systems suitable for self-consumption):
Energy drawn from power supply utility and energy exported to power supply utility
- (K) Meter with reversing block:
For energy generated by the photovoltaic system
- (L) Isolator for domestic power supply connection (distribution panel)
- (M) Distribution panel
- (N) Domestic distribution box

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.

Installation sequence

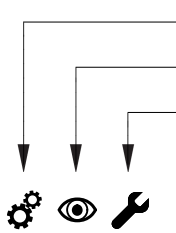
Closing the indoor unit (cont.)

Indoor unit: Fitting the front panel

In reverse order: See page 41.



Steps - commissioning, inspection and maintenance



Commissioning steps
 Inspection steps
 Maintenance steps

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Compiling reports

Enter the readings taken during commissioning in the reports on page 153 onwards and the operator's log (if available).



Switching on the power supply

Switch on the power supply at the main MCB/fuse.



Starting the heat pump

Observe the following sequence:

1. Switch ON outdoor unit voltage.
2. Switch ON indoor unit voltage.
3. Start indoor unit at the ON/OFF switch.



Please note

Freezing can cause damage to the heat pump and to the system.
Leave the power supply and indoor unit 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.



Commissioning the system

Commissioning requirements

- All hydraulic lines are connected to the heat pump and checked for leaks.
- The indoor and outdoor units are connected to each other hydraulically.
- 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 outdoor unit are connected to the mains supply.
- WiFi is available.



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.

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.
3. Further settings: See "ViCare app"
Or



Operating instructions

Note

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



Commissioning the system (cont.)

Commissioning assistant

Procedure	Explanations and references
Commissioning	
Language	Select the required menu language for the programming unit.
Commissioning tool <ul style="list-style-type: none"> ▪ With programming unit (HMI) ▪ Commissioning with software tool 	<p>Commissioning is continued with the programming unit.</p> <p>The appliance automatically switches on the WiFi access point. Carry out further commissioning steps in accordance with the software tools instructions or the app.</p>
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.
Installation conditions of outdoor unit <ul style="list-style-type: none"> ▪ Yes, installation conditions are met ▪ No, continue with instantaneous heating water heater only 	<p>Installation conditions of outdoor unit: See installation information on page 19.</p> <p>Continue commissioning with the outdoor unit.</p> <p>Start up the system without the outdoor unit: Operation with the instantaneous heating water heater, e.g. screed drying</p>
Refrigerant circuit installation <ul style="list-style-type: none"> ▪ Yes, enable outdoor unit ▪ No. Room heating only starts with instantaneous heating water heater. 	<p>The outdoor unit is installed in accordance with these installation and servicing instructions and ready for operation: Continue commissioning.</p> <p>Outdoor unit not ready for operation: Operation with instantaneous heating water heater, no room cooling</p>





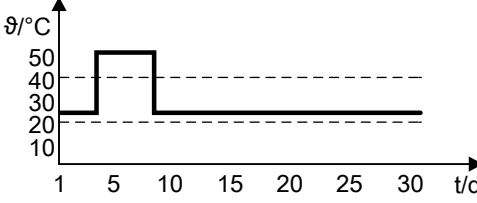
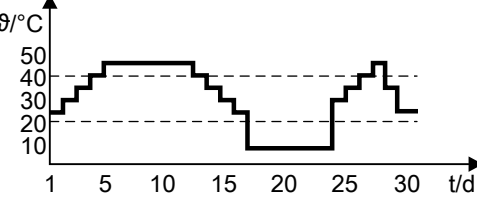
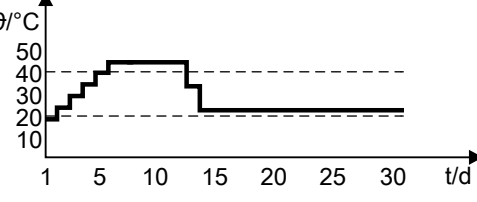
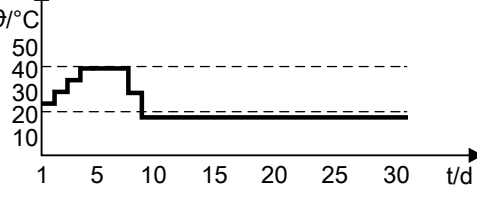
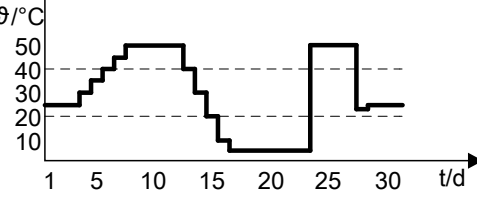
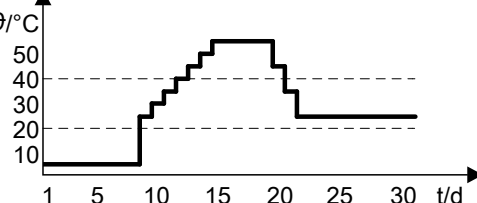
Procedure	Explanations and references
System scheme	
Heating/cooling circuit 1 to Heating/cooling circuit 4 <ul style="list-style-type: none"> ▪ Function ▪ Type ▪ Operating mode 	Configuring the heating/cooling circuits <ul style="list-style-type: none"> ▪ Not available ▪ Heating/cooling circuit without mixer ▪ Heating/cooling circuit with mixer (not for heating/cooling circuit 1) Type of energy distribution, e.g. radiators, underfloor heating system, etc. <ul style="list-style-type: none"> ▪ Heating only ▪ Cooling only ▪ Heating and cooling
DHW <ul style="list-style-type: none"> ▪ No DHW ▪ Cylinder with one sensor ▪ Cylinder with one sensor and DHW circulation pump 	System components for DHW heating System without DHW heating DHW cylinder with 1 cylinder temperature sensor DHW cylinder with 1 cylinder temperature sensor and DHW circulation pump
Low loss header/buffer cylinder <ul style="list-style-type: none"> ▪ Not available ▪ Buffer cylinder, heating only ▪ DHW heating upstream of buffer cylinder 	Settings for the consumer circuits according to the system components System with heating water buffer cylinder with 1 buffer temperature sensor DHW heating with an integrated DHW cylinder
Filling assistant	
System pressure <ul style="list-style-type: none"> ▪ 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 <ul style="list-style-type: none"> ▪ Filling DHW ▪ Filling defrost buffer ▪ Filling heating/cooling circuit 1 ▪ Building up the system pressure 	Fill the system with heating water. See chapter "Filling the consumer circuits" on page 74. See chapter "Building up the system pressure" on page 77.
Venting	The system is vented via the quick-action air vent valve in the outdoor unit: See chapter "Venting the system" on page 78. Note <i>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 40.</i> Note <i>The venting process can take up to 20 min.</i>



Commissioning the system (cont.)

Procedure	Explanations and references
Extensions	
Power-OFF and Smart Grid <ul style="list-style-type: none"> ▪ Not available ▪ Power-OFF ▪ Smart Grid 	Activation of power-OFF and Smart Grid: Connection of floating contacts of the power supply utility (connections 143.4 and 143.5 on the bottom luster terminal in the 230 V~ connection area): See page 49. Neither power-OFF nor Smart Grid is connected. The floating contact for power-OFF is connected (connection 143.4): See page 49. Floating contacts for Smart Grid are connected (connections 143.4 and 143.5): See page 49.
Electric booster heater <ul style="list-style-type: none"> ▪ Not configured ▪ Heating only ▪ Only DHW ▪ Heating and DHW 	Enabling the built in instantaneous heating water heater 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. The instantaneous heating water heater only is switched on for room heating, e.g. if the heat pump output is insufficient. 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. 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 <ul style="list-style-type: none"> ▪ No function ▪ External demand, DHW circulation pump ▪ External blocking ▪ Blocking heating/cooling circuit 1 	Function of the floating contact connected to connection 143.2 on the bottom luster terminal in the 230 V~ connection area No floating contact connected If the connected button is pressed, the DHW circulation pump runs for 5 minutes. Refrigerant circuit and instantaneous heating water heater are blocked. 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 <ul style="list-style-type: none"> ▪ No function ▪ Fault message input ▪ External demand 	Function of the floating contact connected to connection 143.3 on the bottom luster terminal in the 230 V~ connection area No floating contact connected External appliance fault message, e.g. external heat generator Heat pump demand with adjustable set flow temperature (parameter 528.0) and set secondary pump speed (parameter 1100.2)
Remote control units	
Heating/cooling circuit 1 to Heating/cooling circuit 4 <ul style="list-style-type: none"> ▪ No remote control Or ▪ Vitotrol 300-E 	
System configuration	
Quieter operation <ul style="list-style-type: none"> ▪ Function ▪ Time program ▪ Adjustable by system user 	Quieter operation of the outdoor unit: During quieter operation, the compressor and fan are operated at reduced speed. Enable/disable quieter operation. Set the time program for quieter operation: See operating instructions. Enable whether the time program for quieter operation can be set by the system user.



Procedure	Explanations and references
<p>Screed drying</p> <ul style="list-style-type: none"> ▪ Not active ▪ Profile A ▪ Profile B ▪ Profile C ▪ Profile D ▪ Profile E ▪ Profile F 	<p>If a profile is selected, screed drying begins with the respective temperature/time profile, after the commissioning assistant finishes.</p> <p>Screed drying is not switched on.</p> <p>Temperature/time profile 1 (in acc. with EN 1264-4)</p>  <p>Temperature/time profile 2 (in acc. with ZV parquet and flooring technology)</p>  <p>Temperature/time profile 3 (in acc. with Austrian Standards)</p>  <p>Temperature/time profile 4</p>  <p>Temperature/time profile 5</p>  <p>Temperature/time profile 6</p> 

Switching WiFi on/off

The appliance is equipped with an integrated WiFi communication module with extended type plate.



Commissioning the system (cont.)

This WiFi communication module supports commissioning, maintenance and servicing with "Vitoguide" online or the "Vitoguide App" as well as operation via the "ViCare app".

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

Remove these 3 labels **before** installing the programming unit. Apply the labels in the following positions:


- For commissioning, affix a label to the place marked on the type plate.
- For later use, apply a label here:



Fig. 57

- 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 Vitoguide app




Note

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



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 31.

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.
- Only use fill and top-up water with a hardness of < 3 °dH.

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

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

Treat the heating water with one of the following options:

- Direct filling via descaling system while maintaining the minimum flow rate
- Filling with purge pump and treated water
- Filling with circulation process between flow and return

Filling the consumer circuits

Filling of the system, including the outdoor unit, is carried out via the commissioning assistant and is menu-guided.

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

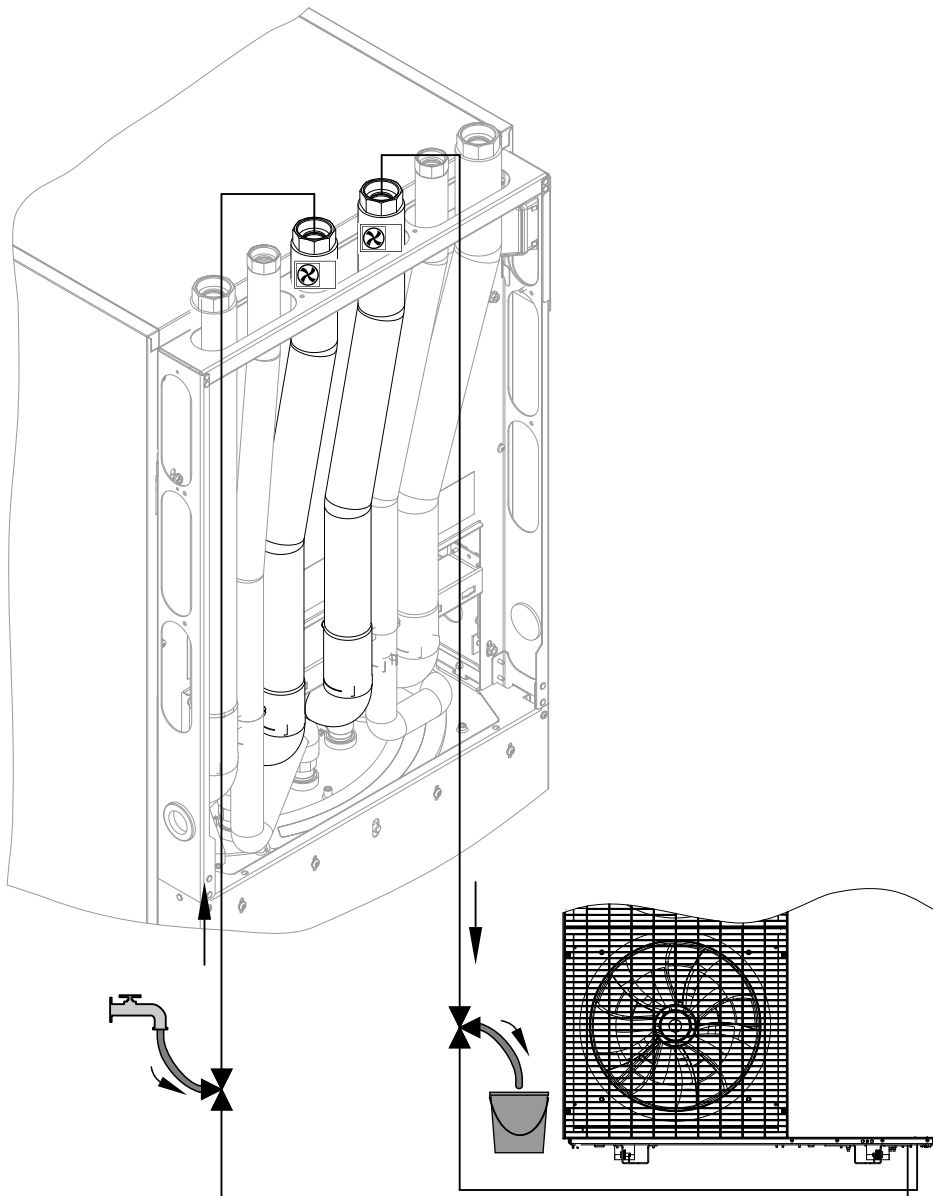
**Filling the system** (cont.)

Fig. 58

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

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 in the outdoor unit return (indoor unit heating water outlet). Route the hose into a suitable container or drain outlet.





Filling the system (cont.)

3. Open the outdoor unit 3-way flow and return ball valve as shown in Fig. 75: **Open in all directions**
Allow the heating water to flow in via the fill hose.



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.
- Only use fill and top-up water with a hardness of < 3 °dH.

Heating water flow rate:

- Min. 600 l/h
- Max. 1500 l/h

Charge pressure: Min. 0.2 bar (0.02 MPa) above the pre-charge pressure of the expansion vessel
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 73.



Building up the system pressure

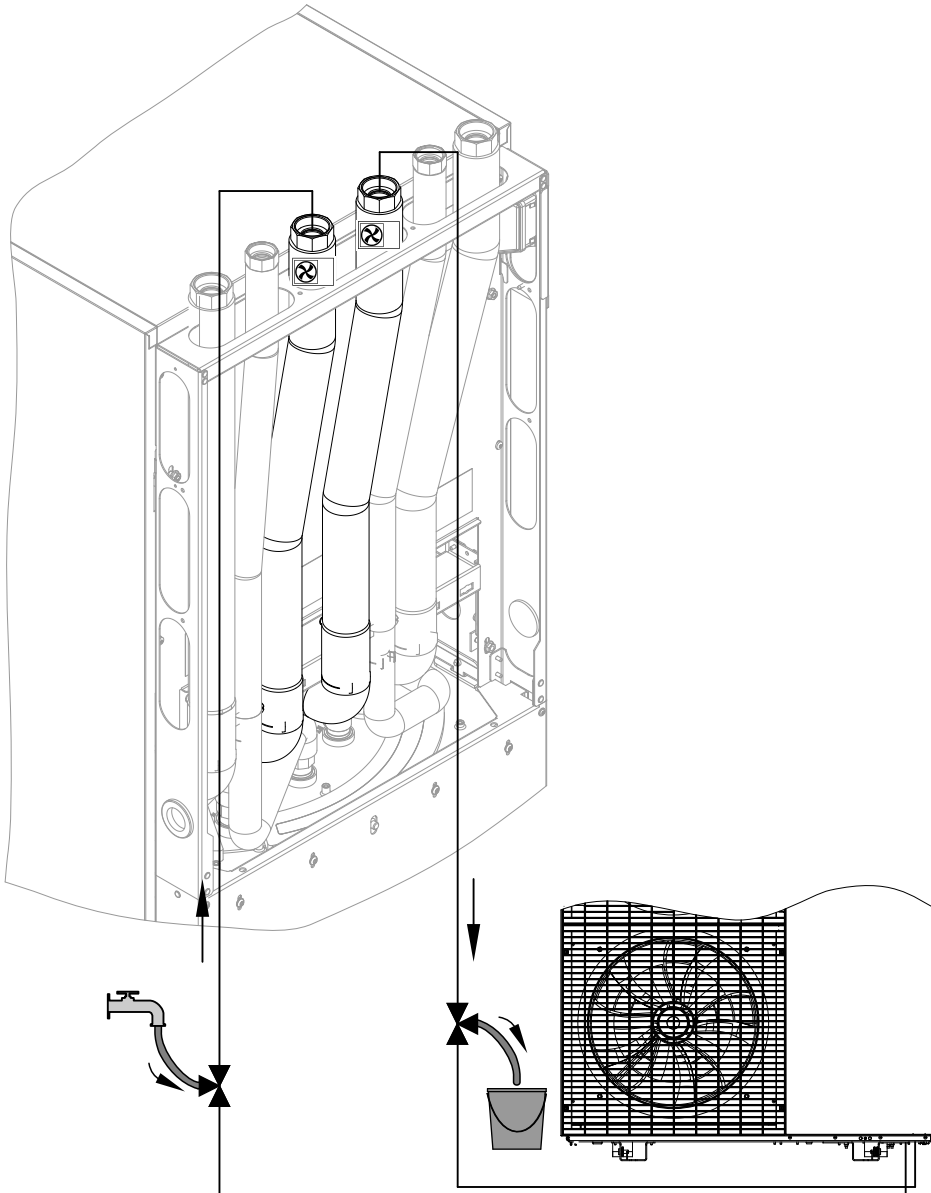


Fig. 59

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

1. Connect the fill hose to the 3-way ball valve in the outdoor unit flow (indoor unit heating water inlet).
2. Open the 3-way ball valve in the outdoor unit flow (indoor unit heating water inlet) as shown in Fig. 77: **Open in all directions**
3. Open the flow between the indoor and outdoor units via the 3-way ball valve in the outdoor unit return: See Fig. 77.
4. Allow the heating water to flow in slowly via the fill hose. Check the system pressure on the display.
5. As soon as the required system pressure has been reached, end the process in the commissioning assistant.
6. Close the 3-way ball valve in the outdoor unit flow (indoor unit heating water inlet). The flow from the outdoor unit remains open. Remove the fill hose.
7. Check the internal and on-site hydraulic 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.



Building up the system pressure (cont.)

Activate system pressure function

To activate this function, start the commissioning assistant. See page 69.



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 69.



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).

**Opening the heat pump (cont.)****Opening the indoor unit**

See page 41.

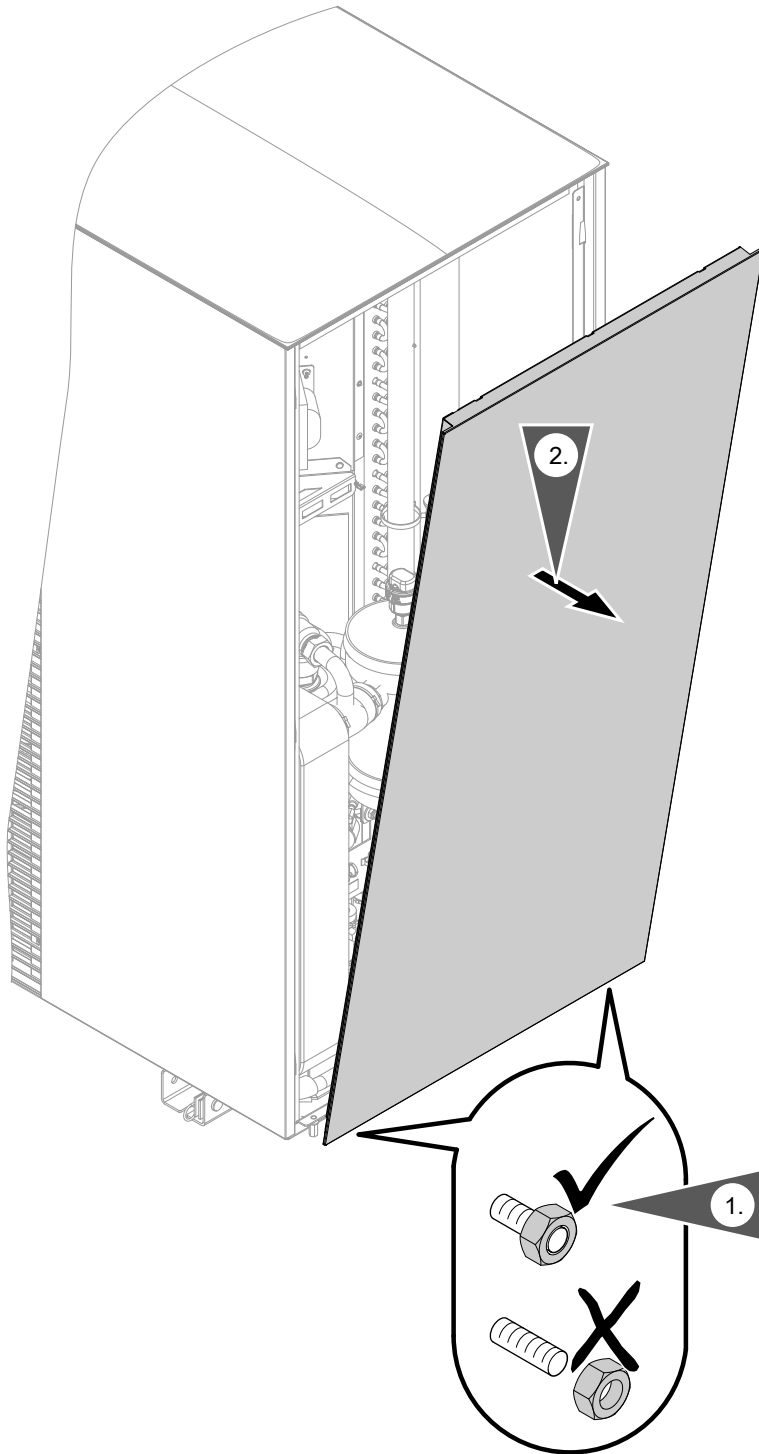
Opening the outdoor unit

Fig. 60





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)

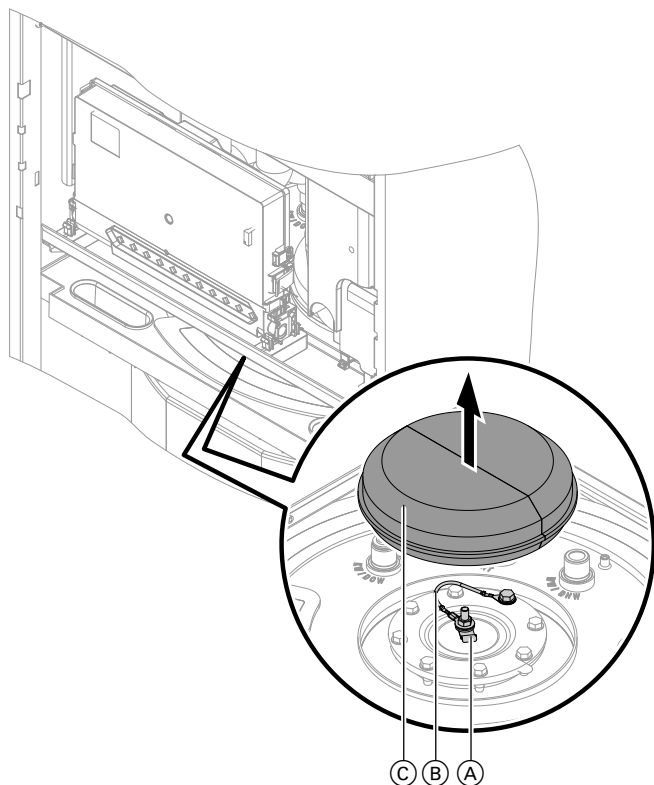


Filling and venting the DHW cylinder on the DHW side

1. Open all DHW draw-off points in the building.
2. Open the on-site drinking water supply.
3. Once air stops coming out of the DHW draw-off point, the DHW cylinder is completely filled.



Testing the anode connection

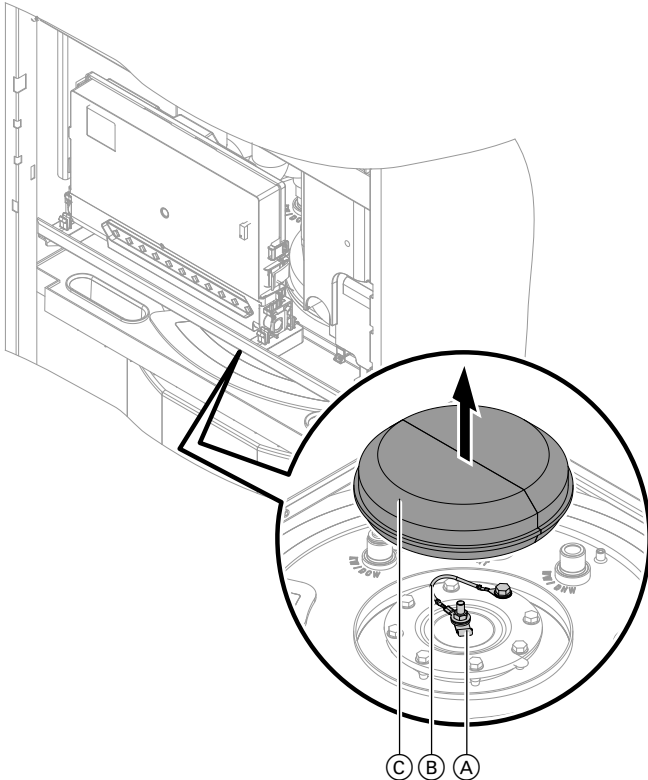


1. Remove thermal insulation (C).
2. Check that earth cable (B) is connected to protective magnesium anode (A).
3. Insert thermal insulation (C).

Fig. 61



Checking the anode earth current with an anode tester



1. Remove thermal insulation (C).
2. Remove earth cable (B) from protective magnesium anode (A).
3. Connect the tester (measuring range up to 5 mA) in series across tab (A) of protective magnesium anode and earth cable (B).

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

4. Insert thermal insulation (C).

Fig. 62



Checking the protective magnesium anode

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



Replacing the protective magnesium anode

Note

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

For removal of the protective magnesium anode: See diagram in chapter "Draining the appliance on the DHW side".



Please note

A short circuit between the protective magnesium anode and the indirect coil negates the protective effect of the magnesium anode. This leads to corrosion damage on the DHW cylinder. Before connecting the electrical cables, check the resistance across terminals (A) and (B) (see diagram in chapter "Cleaning the DHW cylinder"). If the resistance is significantly less than infinity, check whether the protective magnesium anode is touching the indirect coil.

  **Draining the appliance on the DHW side**

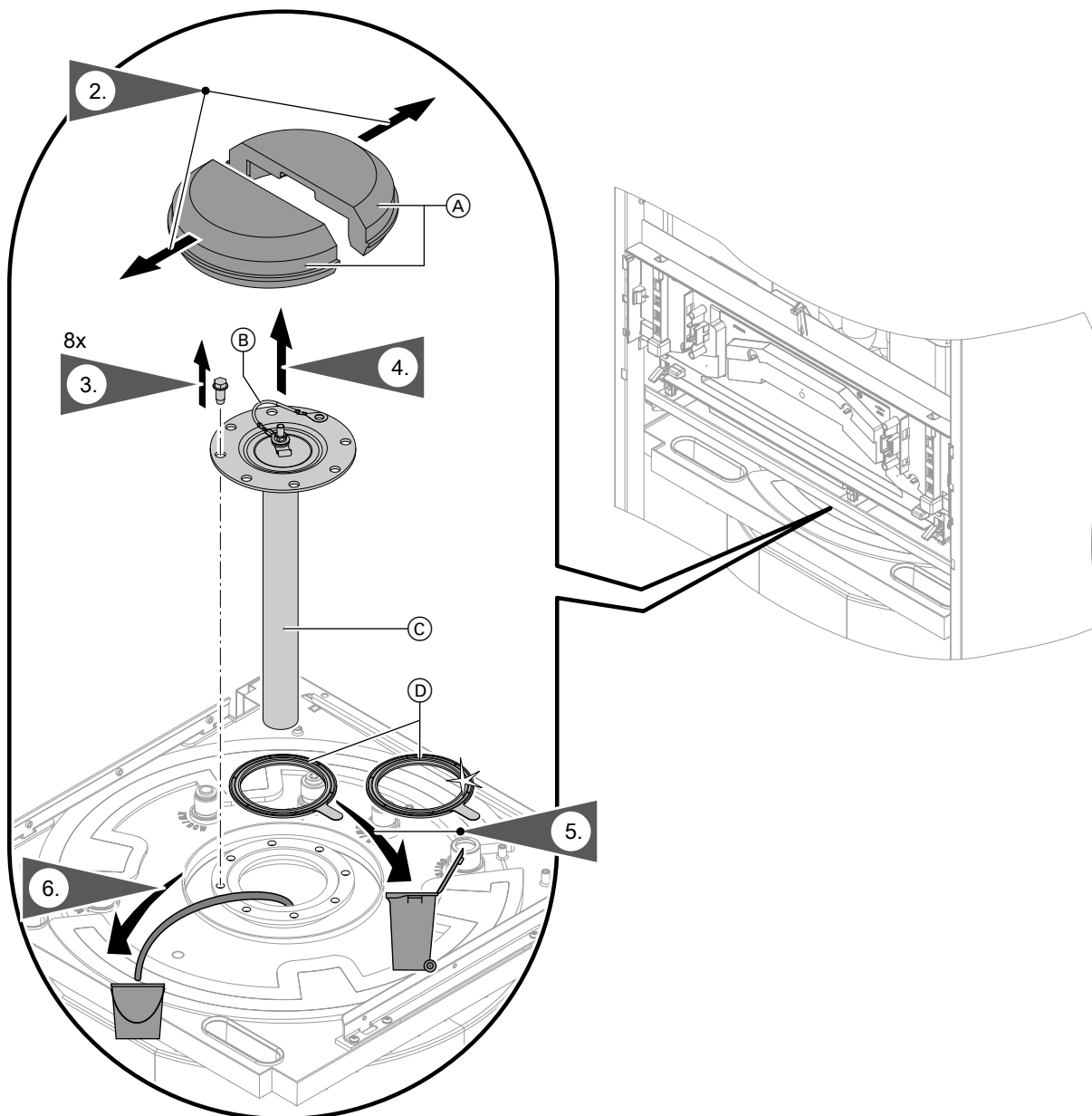


Fig. 63

1. Shut off the drinking water supply.

Note

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

2. Remove thermal insulation (A).

3. Undo the screws.

4. Remove earth cable (B).

Remove protective magnesium anode (C).

5. Remove and dispose of gasket (D).

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

  **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.



Checking all connections on the heating water... (cont.)



Please note

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



Releasing the outdoor unit transport bracket



Please note

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

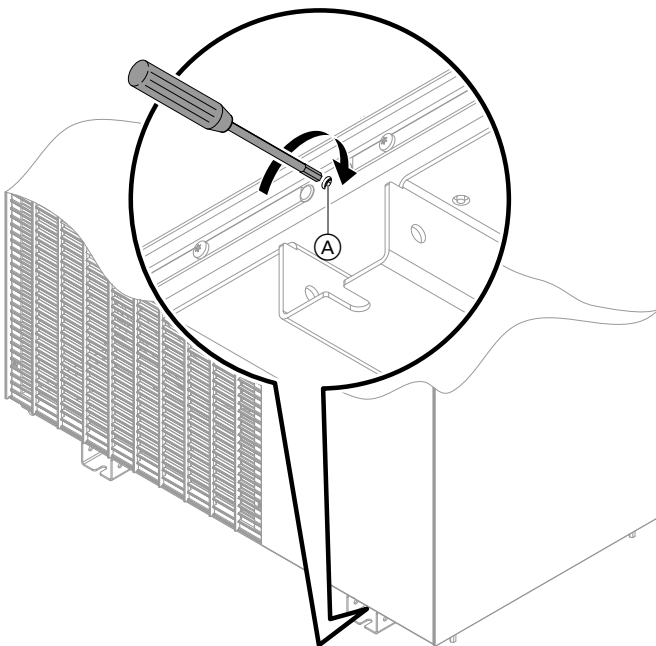


Fig. 64

To **release** the transport bracket securing screw (A) 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:

Pipework	Ø _{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	46 barl	I
Compressor	1.5 l	34 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

Visual checks:

- Check all components for damage.
- Check all components and pipes for corrosion.
- 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

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.



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

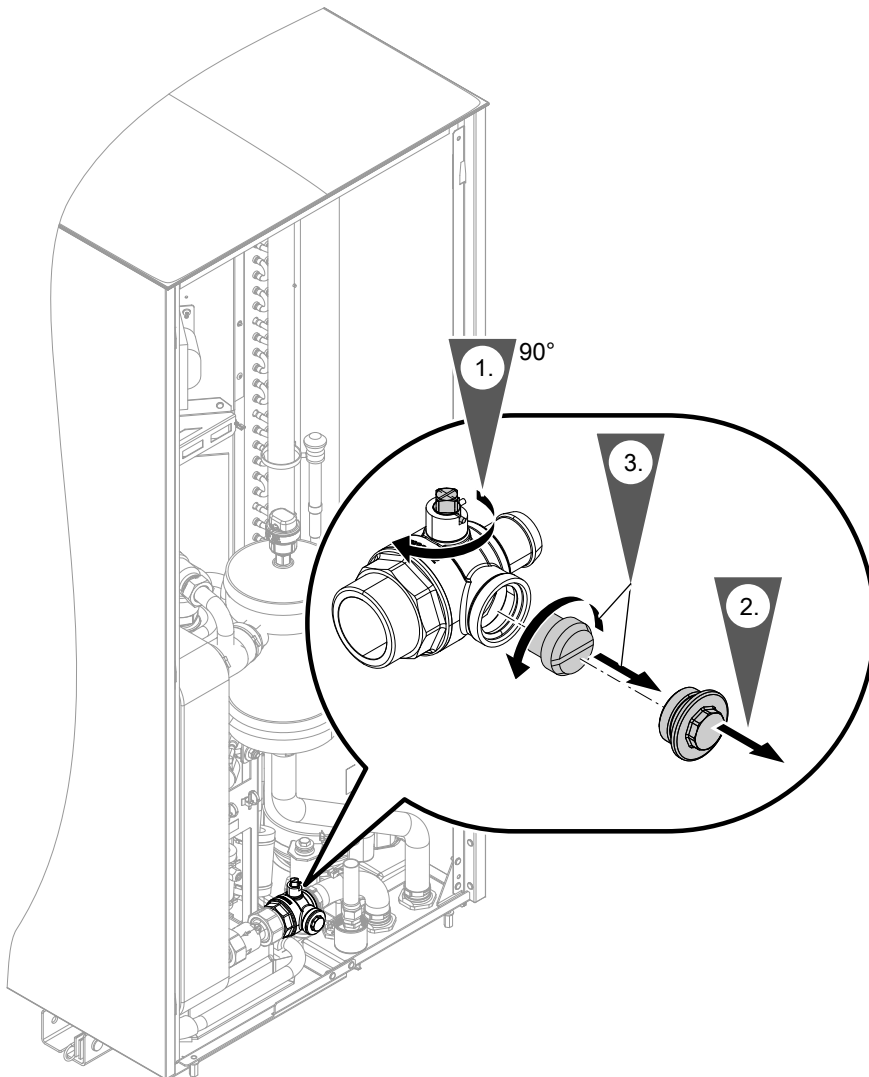


Fig. 65

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:
 $10.0 \pm 0.5 \text{ Nm}$



Checking that the fan in the outdoor unit can run freely



Danger

Contact with the fans while they are operating can result in serious cutting injuries.

- Isolate the outdoor unit from the power supply. Safeguard against unauthorised reconnection.
- Do not open the appliance until the fan has come to a stop.



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

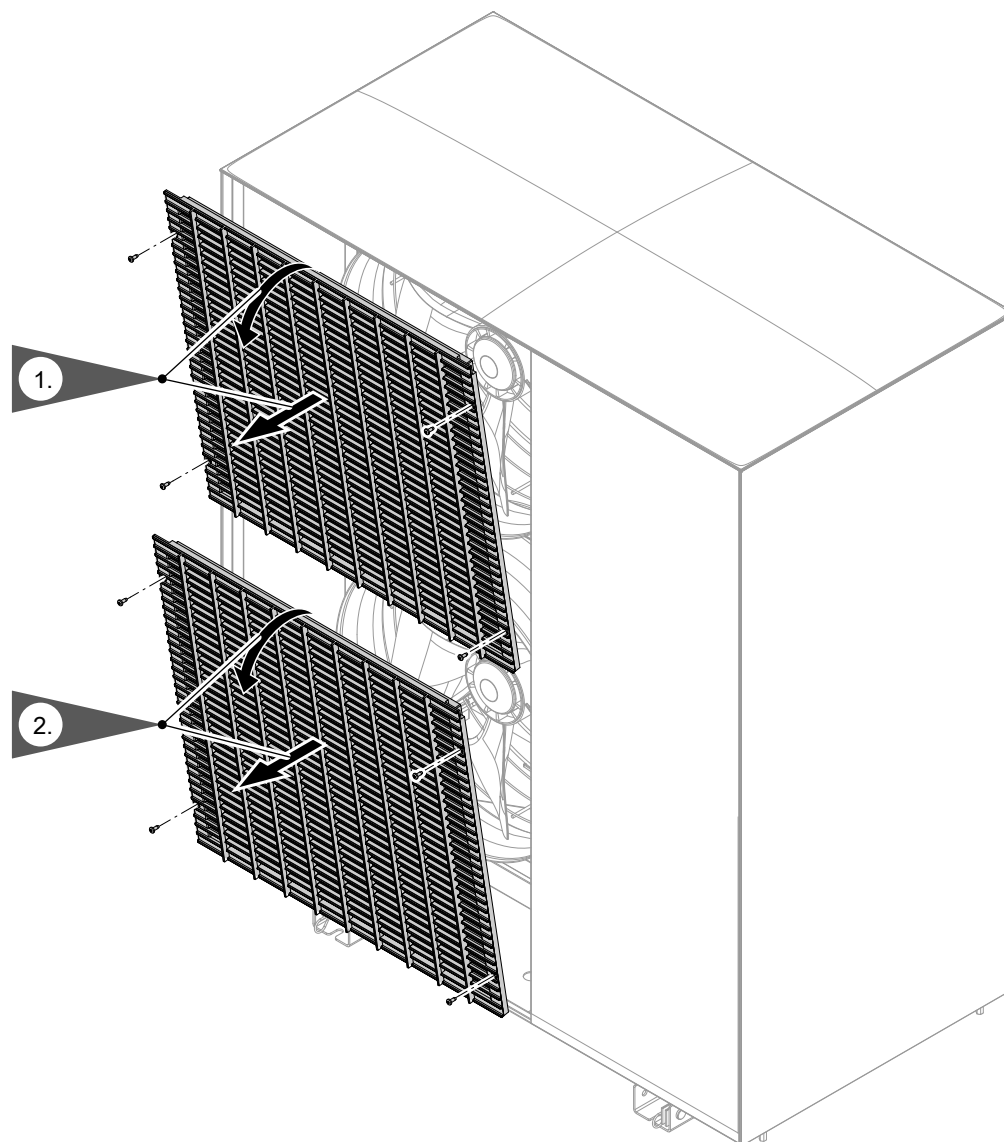


Fig. 66

3. 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.



Cleaning the outdoor unit heat exchanger... (cont.)

- !** **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.)

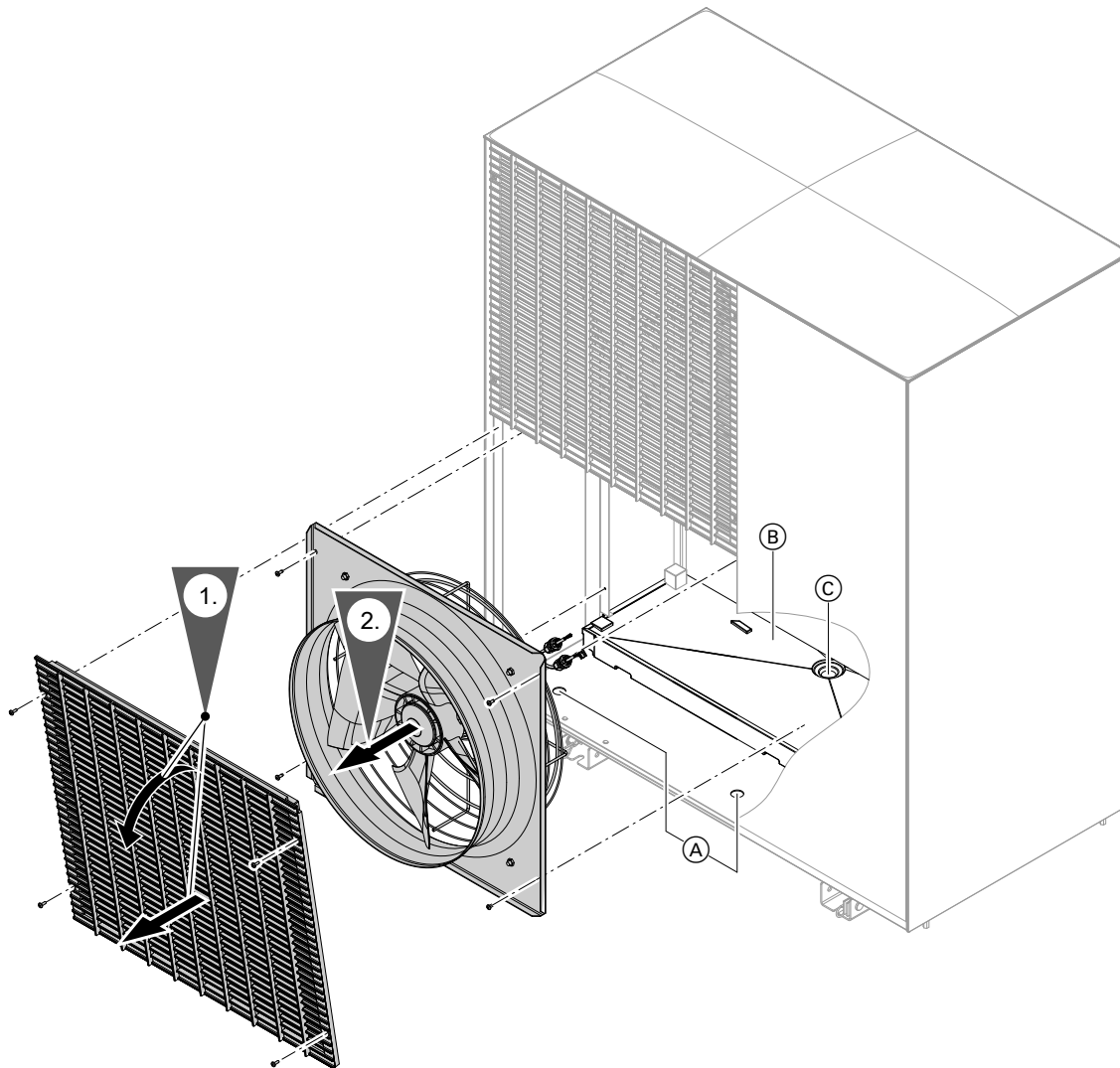


Fig. 67

- (A) Apertures in the base plate
- (B) Condensate pan
- (C) Condensate drain

3. Clean the condensate pan and condensate drain.

Torque for the screws:

$1.8 \pm 0.5 \text{ Nm}$



Cleaning the DHW cylinder

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

Shut off the drinking water supply.
Ensure adequate ventilation in the DHW pipework. Do this by opening a cold and a hot water tap.



Cleaning the DHW cylinder (cont.)

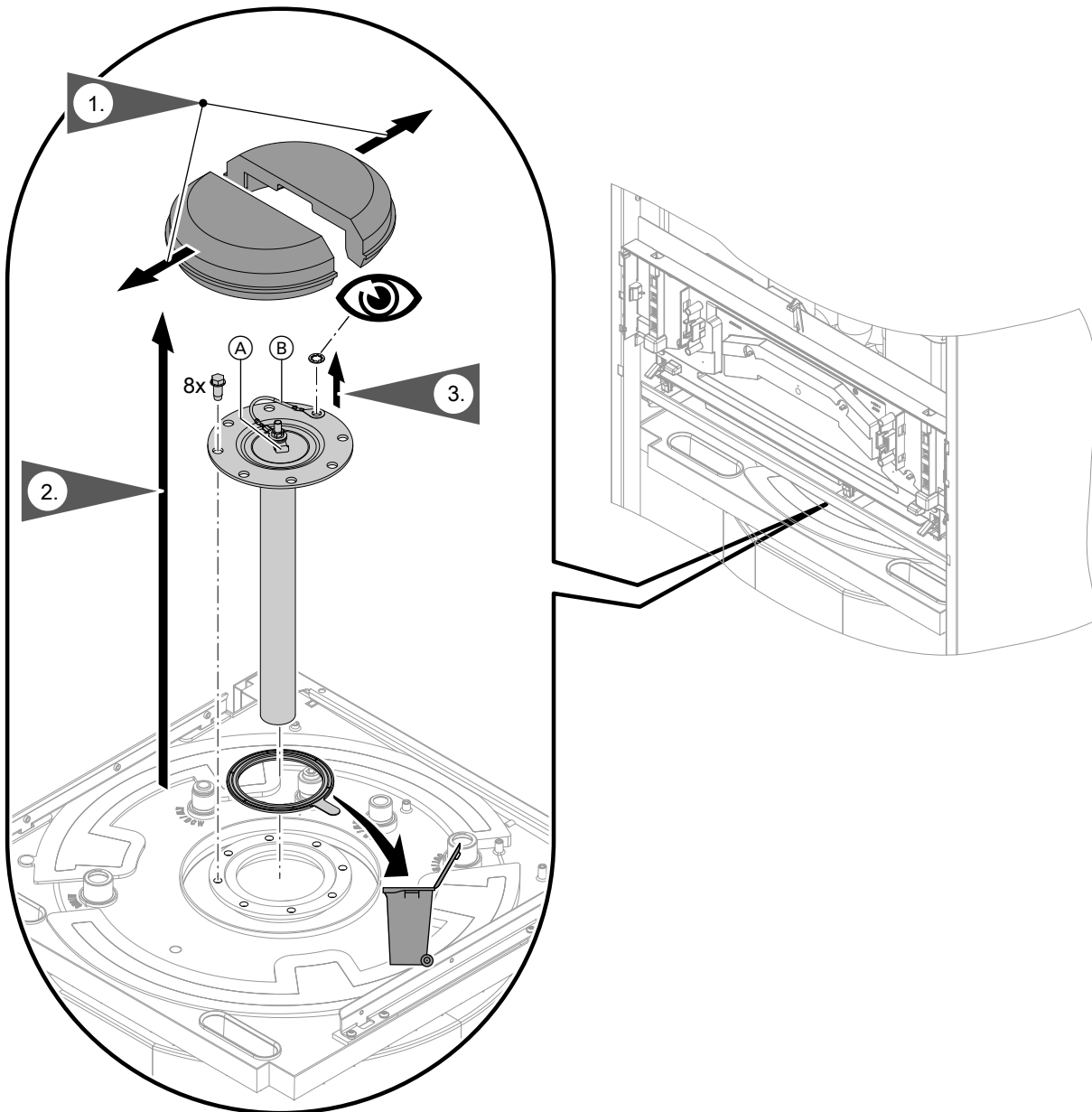


Fig. 68

1. Remove the thermal insulation. Undo the screws.



Danger

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



Please note

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

2. Remove the protective magnesium anode. Replace the gasket.

3. To prevent contaminants entering the pipework, separate the DHW cylinder from the pipework.

4. Remove loose deposits with a high pressure cleaner.



Please note

Water splashes can cause electrical faults. Protect the electrical components of the heat pump from water splashes.



Please note

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





Cleaning the DHW cylinder (cont.)

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



Please note

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



Danger

Cleaning agent residues can result in poisoning.

Fully drain all cleaning agent.

Always observe the information provided by the cleaning agent manufacturer.

- Flush the DHW cylinder thoroughly after cleaning.
- Fit the protective magnesium anode.



Please note

A short circuit between the protective magnesium anode and the indirect coil negates the protective effect of the magnesium anode. This leads to corrosion damage on the DHW cylinder.

Before connecting the cables, check the resistance across terminals (A) and (B). If the resistance is significantly less than infinity, check whether the protective magnesium anode is touching the indirect coil.



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

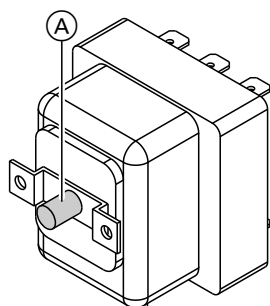


Fig. 69

- (A) High limit safety cut-out reset button



Please note

If the heat pump is exposed to temperatures below $-10\text{ }^{\circ}\text{C}$, 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 heat up.

Heat up the high limit safety cut-out to above $20\text{ }^{\circ}\text{C}$. 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 $82\text{ }^{\circ}\text{C}$.



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.



For commissioning this appliance, see also the operating instructions.

Closing the indoor unit

In reverse order: See page 41.



Closing the outdoor unit

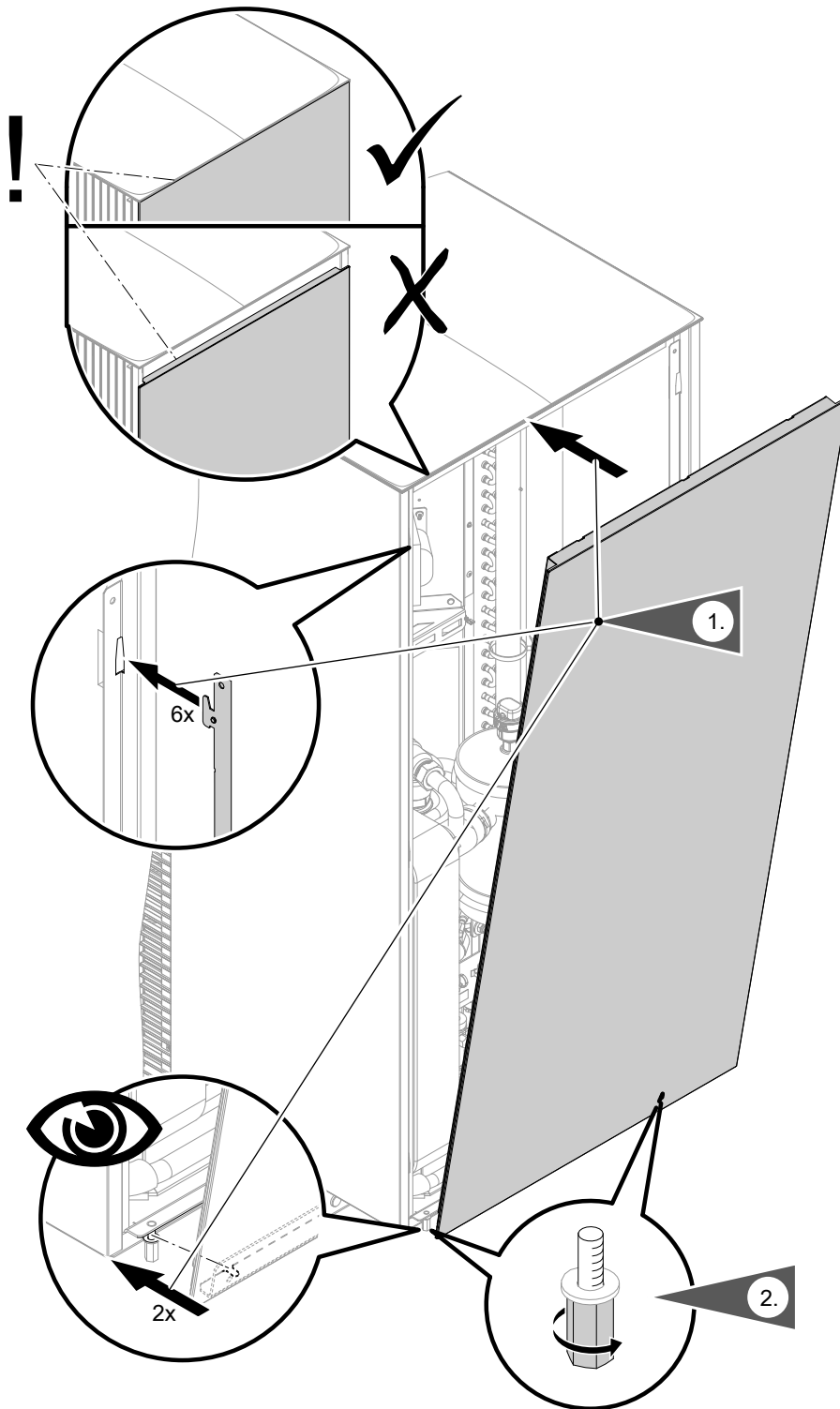


Fig. 70

2. Torque 5.0 +1.0 Nm

Check the indoor and outdoor units for unusual noise, e.g. operating noise from the fan, compressor and circulation pumps. Venting again if required.



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.


Message display on the programming unit

- If there are messages pending in the system, the message and  are displayed. The Lightguide flashes.
- If a central fault message facility is connected, this is switched on.


Types of messages	Meaning
Status	<ul style="list-style-type: none"> ▪ Operating message ▪ No faults in system in normal operation
Warnings	<ul style="list-style-type: none"> ▪ The cause of the message must be remedied. ▪ Limited normal operation
Information	<ul style="list-style-type: none"> ▪ Action may be required ▪ System in normal operation
Faults	<ul style="list-style-type: none"> ▪ The cause of the message must be remedied without delay. ▪ No normal operation
Service messages	<ul style="list-style-type: none"> ▪ The cause of the message must be remedied. ▪ Limited normal operation

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.

Meaning and measures: See tables below.


If "Connection error" and  appear on the display:
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.
Any connected central fault message facility is switched off.

Note

- If an acknowledged fault is not remedied, the fault message will be redisplayed the following day at 7:00 h. The central fault message facility is switched on again.
- 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.

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.

Message display on the programming unit (cont.)

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

Fault messages

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.

Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.1	The heat pump is switched off.	Lead break, flow temperature sensor, secondary circuit / heating/cooling circuit 1	Check resistance value (NTC 10 kΩ) at connection X4.1/X4.2 of the EHCU electronics module. Replace sensor if required.
F.2	The heat pump is switched off.	Short circuit, flow temperature sensor, secondary circuit / heating/cooling circuit 1	Check resistance value (NTC 10 kΩ) at connection X4.1/X4.2 of the EHCU electronics module. Replace sensor if required.
F.3	<ul style="list-style-type: none"> ▪ No defrost ▪ No room cooling 	Lead break, secondary circuit return temperature sensor	Check resistance value (NTC 10 kΩ) at connection X4.3/X4.4 of the EHCU electronics module. Replace sensor if required.
F.4	<ul style="list-style-type: none"> ▪ No defrost ▪ No room cooling 	Short circuit, secondary circuit return temperature sensor	Check resistance value (NTC 10 kΩ) at connection X4.3/X4.4 of the EHCU electronics module. Replace sensor if required.
F.7	<ul style="list-style-type: none"> ▪ Only room heating ▪ No DHW heating 	Lead break, cylinder temperature sensor	<p>Check resistance value (NTC 10 kΩ). Replace sensor if required.</p> <ul style="list-style-type: none"> ▪ Wall mounted indoor unit: Connection on the underside of the appliance to 6-pole connection socket on the right, terminals 9 and 10. ▪ Floorstanding indoor unit: Connection at plug 5 on the HPMU electronics module
F.8	<ul style="list-style-type: none"> ▪ Only room heating ▪ No DHW heating 	Short circuit, cylinder temperature sensor	<p>Check resistance value (NTC 10 kΩ). Replace sensor if required.</p> <ul style="list-style-type: none"> ▪ Wall mounted indoor unit: Connection on the underside of the appliance to 6-pole connection socket on the right, terminals 9 and 10. ▪ Floorstanding indoor unit: Connection at plug 5 on the HPMU electronics module
F.13	An outside temperature value of 0 °C is used to calculate the set flow temperature.	Lead break, outside temperature sensor	<p>Check resistance value (NTC 10 kΩ). Replace sensor if required.</p> <ul style="list-style-type: none"> ▪ Wall mounted indoor unit: Connection on the underside of the appliance to 6-pole connection socket on the right, terminals 11 and 12. ▪ Floorstanding indoor unit: Connection at luster terminals for sensors, terminal 5 and 6

Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.14	An outside temperature value of 0 °C is used to calculate the set flow temperature.	Short circuit, outside temperature sensor	<p>Check resistance value (NTC 10 kΩ). Replace sensor if required.</p> <ul style="list-style-type: none"> ▪ Wall mounted indoor unit: Connection on the underside of the appliance to 6-pole connection socket on the right, terminals 11 and 12. ▪ Floorstanding indoor unit: Connection at luster terminals for sensors, terminal 5 and 6
F.33	Refrigerant circuit off	Lead break, air inlet temperature sensor	<p>Check resistance value (NTC 10 kΩ) at connection X16.3/X16.4 of the VCMU refrigerant circuit controller. Replace sensor if required.</p>
F.34	Refrigerant circuit off	Short circuit, air inlet temperature sensor	<p>Check resistance value (NTC 10 kΩ) at connection X16.3/X16.4 of the VCMU refrigerant circuit controller. Replace sensor if required.</p>
F.74	The heat pump is switched off.	Hydraulic system pressure too low	<p>Top up with water. Vent the system.</p> <p>If the fault occurs repeatedly:</p> <ul style="list-style-type: none"> ▪ Check system pressure sensor with external pressure gauge. ▪ Check the pre-charge pressure of the expansion vessel. ▪ Check settings for set system pressure and range.
F.75	The heat pump is switched off.	No flow in the secondary circuit, or flow sensor faulty	<ul style="list-style-type: none"> ▪ Check secondary pump//heating circuit pump, heating/cooling circuit 1. Replace secondary pump//heating circuit pump, heating/cooling circuit 1 if required. ▪ Check flow sensor. Replace flow sensor if required.
F.87	The safety valve in the indoor unit has opened.	Hydraulic system pressure too high	<p>Reduce the system pressure.</p>
F.91	Function of connected components in emergency mode	DIO electronics module communication error	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check connections to DIO electronics module and connection to HPMU electronics module. ▪ Check whether components are wrongly connected. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace DIO electronics module.



Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.92	Function of connected components in emergency mode	ADIO electronics module communication error	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check connections on ADIO electronics module. ▪ Check whether components are wrongly connected. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace ADIO electronics module.
F.93	Function of connected components in emergency mode	M2IO electronics module communication error	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check connections on M2IO electronics module. ▪ Check whether components are wrongly connected. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace M2IO electronics module.
F.94	Function of the relevant electronics module in emergency mode	SDIO electronics module communication error	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check connections on SDIO electronics module. ▪ Check whether components are wrongly connected. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace SDIO electronics module.
F.99	Function of the electronics modules connected to PlusBus not available	Communication error PlusBus	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check connections at plug 74 of the HPMU electronics module. ▪ Wall mounted indoor unit: Check the connections at plug 74 on the connection socket on the underside of the appliance. ▪ Check whether components are wrongly connected. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace HPMU electronics module.

Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.100	Function of the electronics modules connected to PlusBus not available	Short circuit, PlusBus	<ul style="list-style-type: none"> ▪ Check PlusBus power supply at HPMU electronics module: Isolate all PlusBus components connected. Reconnect each one in turn. ▪ Check connections at plug 74 of the HPMU electronics module. ▪ Wall mounted indoor unit: Check the connections at plug 74 on the connection socket on the underside of the appliance. ▪ Check whether there is a short circuit at the PlusBus cables. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace HPMU electronics module.
F.101	Function of the electronics modules connected to PlusBus not available	Voltage error PlusBus	<ul style="list-style-type: none"> ▪ Check PlusBus power supply at HPMU electronics module: Isolate all PlusBus components connected. Reconnect each one in turn. ▪ Check connections at plug 74 of the HPMU electronics module. ▪ Wall mounted indoor unit: Check the connections at plug 74 on the connection socket on the underside of the appliance. ▪ Check whether there is a short circuit at the PlusBus cables. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace HPMU electronics module.
F.102	No WiFi	Communication error, WiFi communication module	Replace the WiFi communication module.
F.103	No operation possible	HMI programming unit communication error	Replace HMI programming unit.
F.104	Depending on configuration of EM-EA1 extension (DIO electronics module)	External fault message input active	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant for fault message input. Adjust settings if required. ▪ Check connected external appliance.
F.111	Refrigerant circuit off	Lead break, liquid gas temperature sensor, heating	Check resistance value (NTC 10 kΩ) at connection X21.1/X21.2 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.112	Refrigerant circuit off	Short circuit, liquid gas temperature sensor, heating	Check resistance value (NTC 10 kΩ) at connection X21.1/X21.2 of the VCMU refrigerant circuit controller. Replace sensor if required.



Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.117	Refrigerant circuit off	Lead break, evaporator suction gas temperature sensor	Check resistance value (NTC 10 kΩ) at connection X20.5/X20.6 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.118	Refrigerant circuit off	Short circuit, evaporator suction gas temperature sensor	Check resistance value (NTC 10 kΩ) at connection X20.5/X20.6 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.123	Refrigerant circuit off	Lead break, liquid gas temperature sensor, condenser	Check resistance value (NTC 10 kΩ) at connection X15.1/X15.2 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.124	Refrigerant circuit off	Short circuit, liquid gas temperature sensor, condenser	Check resistance value (NTC 10 kΩ) at connection X15.1/X15.2 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.147	Refrigerant circuit off	Lead break, compressor suction gas temperature sensor	Check resistance value (NTC 10 kΩ) at connection X14.7/X14.8 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.148	Refrigerant circuit off	Short circuit, compressor suction gas temperature sensor	Check resistance value (NTC 10 kΩ) at connection X14.7/X14.8 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.149	The refrigerant circuit is controlled with the replacement value.	Lead break, liquid gas temperature sensor, cooling	Check resistance value (NTC 10 kΩ) at connection X16.1/X16.2 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.150	The refrigerant circuit is controlled with the replacement value.	Short circuit, liquid gas temperature sensor, cooling	Check resistance value (NTC 10 kΩ) at connection X16.1/X16.2 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.151	Refrigerant circuit off	Lead break, hot gas temperature sensor	Check resistance value (NTC 10 kΩ) at connection X14.9/X14.10 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.152	Refrigerant circuit off	Short circuit, hot gas temperature sensor	Check resistance value (NTC 10 kΩ) at connection X14.9/X14.10 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.155	The refrigerant circuit is locked.	Fault, electronic expansion valve 1	Check electronic expansion valve 1. Replace expansion valve if required.

Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.156	The refrigerant circuit is locked.	Fault, electronic expansion valve 2	Check electronic expansion valve 2. Replace expansion valve if required.
F.160	No communication between the affected electronics modules	CAN bus general communication fault between the affected electronics modules	<ul style="list-style-type: none"> ▪ Check the CAN bus cable. ▪ Check the CAN bus subscriber numbers. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace the CAN bus cables. Replace the electronics modules if required.
F.425	Values in energy cockpit incorrect	Time synchronisation not possible	<ul style="list-style-type: none"> ▪ Replace CR2032 battery in HPMU electronics module. ▪ Set the time on the programming unit: See operating instructions.
F.430	Operation with internal set value specifications of the heat pump control unit	Communication error, gateway	<ul style="list-style-type: none"> ▪ Check connections and connecting cable to the gateway. Replace cable if required. ▪ Check power supply to the gateway.
F.431	Operation with internal set value specifications of the heat pump control unit	KNX/TP gateway communication error	<ul style="list-style-type: none"> ▪ Check connections and connecting cable to the gateway. Replace cable if required. ▪ Check power supply to KNX/TP gateway.
F.454	The refrigerant circuit is locked.	Incorrect version of operating software for the electronics modules	<ul style="list-style-type: none"> ▪ Check the version of the operating software for HPMU and EHCU electronics modules and for the VCMU refrigerant circuit controller. ▪ Install correct software version if required.
F.472	No communication with energy meter	Communication error, energy meter	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check the connections to the HPMU electronics module. ▪ Check whether components are wrongly connected. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace HPMU electronics module.
F.519	Operation with internal set value specifications of the heat pump control unit	BACnet/IP gateway communication error	<ul style="list-style-type: none"> ▪ Check connections and connecting cable to the gateway. Replace cable if required. ▪ Check power supply to BACnet/IP gateway.



Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.520	Refrigerant circuit off	Communication error, Modbus	<ul style="list-style-type: none"> ▪ Check the Modbus cable between inverter and refrigerant circuit controller VCMU at connection X11/X13 on refrigerant circuit controller VCMU. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace the VCMU refrigerant circuit controller and/or the inverter.
F.542	Mixer closes. Heating circuit pump is operational.	Lead break, flow temperature sensor, heating/cooling circuit 1 with mixer Or Wrong setting during commissioning	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check setting of rotary switch S1 on ADIO electronics module. ▪ Check flow temperature sensor in heating/cooling circuit 1. ▪ Check resistance value (NTC 10 kΩ) at the sensor input on ADIO electronics module. Replace sensor if required.
F.543	Mixer closes. Heating circuit pump is operational.	Short circuit, flow temperature sensor, heating/cooling circuit 1 with mixer	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check setting of rotary switch S1 on ADIO electronics module. ▪ Check flow temperature sensor in heating/cooling circuit 1. ▪ Check resistance value (NTC 10 kΩ) at the sensor input on ADIO electronics module. Replace sensor if required.
F.544	Mixer closes. Heating circuit pump is operational.	Lead break, flow temperature sensor, heating/cooling circuit 2 with mixer Or Wrong setting during commissioning	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check setting of rotary switch S1 on ADIO electronics module. ▪ Check flow temperature sensor in heating/cooling circuit 2. ▪ Check resistance value (NTC 10 kΩ) at the sensor input on ADIO electronics module. Replace sensor if required.
F.545	Mixer closes. Heating circuit pump is operational.	Short circuit, flow temperature sensor, heating/cooling circuit 2 with mixer	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check setting of rotary switch S1 on ADIO electronics module. ▪ Check flow temperature sensor in heating/cooling circuit 2. ▪ Check resistance value (NTC 10 kΩ) at the sensor input on ADIO electronics module. Replace sensor if required.

Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.546	Mixer closes. Heating circuit pump is operational.	Lead break, flow temperature sensor, heating/cooling circuit 3 with mixer Or Wrong setting during commissioning	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check setting of rotary switch on ADIO electronics module. ▪ Check flow temperature sensor in heating/cooling circuit 3. ▪ Check resistance value (NTC 10 kΩ) at the sensor input on ADIO electronics module. Replace sensor if required.
F.547	Mixer closes. Heating circuit pump is operational.	Short circuit, flow temperature sensor, heating/cooling circuit 3 with mixer	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check setting of rotary switch on ADIO electronics module. ▪ Check flow temperature sensor in heating/cooling circuit 3. ▪ Check resistance value (NTC 10 kΩ) at the sensor input on ADIO electronics module. Replace sensor if required.
F.548	Mixer closes. Heating circuit pump is operational.	Lead break, flow temperature sensor, heating/cooling circuit 4 with mixer Or Wrong setting during commissioning	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check setting of rotary switch on ADIO electronics module. ▪ Check flow temperature sensor in heating/cooling circuit 4. ▪ Check resistance value (NTC 10 kΩ) at the sensor input on ADIO electronics module. Replace sensor if required.
F.549	Mixer closes. Heating circuit pump is operational.	Short circuit, flow temperature sensor, heating/cooling circuit 4 with mixer	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check setting of rotary switch on ADIO electronics module. ▪ Check flow temperature sensor in heating/cooling circuit 4. ▪ Check resistance value (NTC 10 kΩ) at the sensor input on ADIO electronics module. Replace sensor if required.
F.623	Mixer closes. Heating circuit pump switches off.	Lead break, return temperature sensor	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at mixer extension kit. Replace sensor if required.
F.624	Mixer closes. Heating circuit pump switches off.	Short circuit, return temperature sensor	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at mixer extension kit. Replace sensor if required.



Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.625	Mixer closes. Heating circuit pump switches off.	Lead break, return temperature sensor, heating/cooling circuit 2	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at mixer extension kit. Replace sensor if required.
F.626	Mixer closes. Heating circuit pump switches off.	Short circuit, return temperature sensor, heating/cooling circuit 2	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at mixer extension kit. Replace sensor if required.
F.627	Mixer closes. Heating circuit pump switches off.	Lead break, return temperature sensor, heating/cooling circuit 3	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at mixer extension kit. Replace sensor if required.
F.628	Mixer closes. Heating circuit pump switches off.	Short circuit, return temperature sensor, heating/cooling circuit 3	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at mixer extension kit. Replace sensor if required.
F.629	Mixer closes. Heating circuit pump switches off.	Lead break, return temperature sensor, heating/cooling circuit 4	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at mixer extension kit. Replace sensor if required.
F.630	Mixer closes. Heating circuit pump switches off.	Short circuit, return temperature sensor, heating/cooling circuit 4	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at mixer extension kit. Replace sensor if required.
F.685	<ul style="list-style-type: none"> ▪ Function of connected components in emergency mode ▪ Frost protection enabled 	HPMU electronics module communication error	<ul style="list-style-type: none"> ▪ Check the connections to the HPMU electronics module. ▪ Check whether components are wrongly connected. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace HPMU electronics module.
F.686	The refrigerant circuit will not start.	VCMU refrigerant circuit controller communication error	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check connections on VCMU refrigerant circuit controller. ▪ Check whether components are wrongly connected. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace the VCMU refrigerant circuit controller.

Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.687	<ul style="list-style-type: none"> ▪ The heat pump is switched off. ▪ No function of connected components 	EHCU electronics module communication error	<ul style="list-style-type: none"> ▪ Check connections on EH-CU electronics module. ▪ Check whether components are wrongly connected. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace the EHCU electronics module.
F.770	Refrigerant circuit off	Lead break, flow temperature sensor, secondary circuit downstream of condenser	Check resistance value (NTC 10 kΩ) at connection X15.3/X15.4 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.771	Refrigerant circuit off	Short circuit, flow temperature sensor, secondary circuit downstream of condenser	Check resistance value (NTC 10 kΩ) at connection X15.3/X15.4 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.772	Refrigerant circuit can only be operated when outside temperatures are above 5 °C	Lead break, oil sump temperature sensor	Check resistance value (NTC 10 kΩ) at connection X20.3/X20.4 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.773	Refrigerant circuit can only be operated when outside temperatures are above 5 °C	Short circuit, oil sump temperature sensor	Check resistance value (NTC 10 kΩ) at connection X20.3/X20.4 of the VCMU refrigerant circuit controller. Replace sensor if required.
F.788	<ul style="list-style-type: none"> ▪ No room heating/cooling ▪ No DHW heating 	Fault, control and/or power supply of 4/3-way valve	<ul style="list-style-type: none"> ▪ Check connections on motor of 4/3-way valve. ▪ Check motor of 4/3-way valve. ▪ Replace motor if necessary.
F.790	<ul style="list-style-type: none"> ▪ No room heating/cooling ▪ No DHW heating 	<ul style="list-style-type: none"> ▪ Motor of 4/3-way valve not correctly mounted ▪ 4/3-way valve faulty 	<ul style="list-style-type: none"> ▪ Check mounting of motor: See separate installation instructions. ▪ Check hydraulic and electrical connections of 4/3-way valve. ▪ Check motor of 4/3-way valve. ▪ Replace motor and/or 4/3-way valve if required.
F.791	Reduced output, instantaneous heating water heater	Phase L1 in power supply of instantaneous heating water heater not present	<ul style="list-style-type: none"> ▪ Check fuse for instantaneous heating water heater. ▪ Check power supply on instantaneous heating water heater and on connections of indoor unit. ▪ Check power cables. ▪ Check instantaneous heating water heater. Replace if required.
F.792	Reduced output, instantaneous heating water heater	Phase L2 in power supply of instantaneous heating water heater not present	<ul style="list-style-type: none"> ▪ Check fuse for instantaneous heating water heater. ▪ Check power supply on instantaneous heating water heater and on connections of indoor unit. ▪ Check power cables. ▪ Check instantaneous heating water heater. Replace if required.



Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.793	Reduced output, instantaneous heating water heater	Phase L3 in power supply of instantaneous heating water heater not present	<ul style="list-style-type: none"> ▪ Check fuse for instantaneous heating water heater. ▪ Check power supply on instantaneous heating water heater and on connections of indoor unit. ▪ Check power cables. ▪ Check instantaneous heating water heater. Replace if required.
F.797	Secondary pump/heating circuit pump, heating/cooling circuit 1 is off. <ul style="list-style-type: none"> ▪ No room heating, heating/cooling circuit 1 ▪ No DHW heating 	Secondary pump/heating circuit pump, heating/cooling circuit 1 is faulty	Isolate the system from the power supply. Restart the system. If the fault persists, replace secondary pump/heating circuit pump, heating/cooling circuit 1.
F.798	Heating circuit pump, heating/cooling circuit 2 is off. <ul style="list-style-type: none"> ▪ No room heating, heating/cooling circuit 2 ▪ No DHW heating 	Heating circuit pump, heating/cooling circuit 2 is faulty	Isolate the system from the power supply. Restart the system. If the fault persists, replace heating circuit pump, heating/cooling circuit 2.
F.799	Secondary pump/heating circuit pump, heating/cooling circuit 1 is off. <ul style="list-style-type: none"> ▪ No room heating, heating/cooling circuit 1 ▪ No DHW heating 	Secondary pump/heating circuit pump, heating/cooling circuit 1 is faulty	Isolate the system from the power supply. Restart the system. If the fault persists, replace secondary pump/heating circuit pump, heating/cooling circuit 1.
F.800	Heating circuit pump, heating/cooling circuit 2 is off. <ul style="list-style-type: none"> ▪ No room heating, heating/cooling circuit 2 ▪ No DHW heating 	Heating circuit pump, heating/cooling circuit 2 is faulty	Isolate the system from the power supply. Restart the system. If the fault persists, replace heating circuit pump, heating/cooling circuit 2.
F.801	Fault, outdoor unit, no refrigerant circuit reversal	4-way diverter valve faulty	<ul style="list-style-type: none"> ▪ Check connections on VCMU refrigerant circuit controller. ▪ Check 4-way diverter valve (function check). Replace coil if required. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace the 4-way diverter valve.
F.808	The refrigerant circuit will not start.	Lower fan not running.	<ul style="list-style-type: none"> ▪ Check connections on VCMU refrigerant circuit controller. ▪ Check fan can rotate freely. ▪ Check lower fan via actuator test. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace the lower fan.
F.812	The refrigerant circuit will not start.	Upper fan not running.	<ul style="list-style-type: none"> ▪ Check connections on VCMU refrigerant circuit controller. ▪ Check fan can rotate freely. ▪ Check upper fan via actuator test. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace the upper fan.

Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.819	The refrigerant circuit will not start.	Lead break, electronic expansion valve 1	<ul style="list-style-type: none"> ▪ Check connections on VCMU refrigerant circuit controller. ▪ Check electronic expansion valve 1 via actuator test. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace electronic expansion valve 1.
F.820	The refrigerant circuit will not start.	Lead break, electronic expansion valve 2	<ul style="list-style-type: none"> ▪ Check connections on VCMU refrigerant circuit controller. ▪ Check electronic expansion valve 2 via actuator test. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace electronic expansion valve 2.
F.823	The refrigerant circuit will not start.	Short circuit, electronic expansion valve 1	<ul style="list-style-type: none"> ▪ Check connections on VCMU refrigerant circuit controller. ▪ Check electronic expansion valve 1 via actuator test. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace electronic expansion valve 1.
F.824	The refrigerant circuit will not start.	Short circuit, electronic expansion valve 2	<ul style="list-style-type: none"> ▪ Check connections on VCMU refrigerant circuit controller. ▪ Check electronic expansion valve 2 via actuator test. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace electronic expansion valve 2.
F.827	The instantaneous heating water heater will not start.	High limit safety cut-out has responded.	<ul style="list-style-type: none"> ▪ Reset the high limit safety cut-out. ▪ Check instantaneous heating water heater. Replace if required. ▪ Safeguard the minimum flow rate. Check flow sensor. Replace if required. ▪ Safeguard the minimum flow rate. Check secondary pump / heating circuit pumps. Replace if required.
F.829	Flow rate too low, insufficient heat provision	Filter in ball valve of outdoor unit is contaminated	Clean the filter in the outdoor unit ball valve.
F.830	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Power supply on inverter faulty	Isolate the system from the power supply. Restart the system. If the fault persists, replace the inverter.
F.831	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Power supply on inverter faulty	Isolate the system from the power supply. Restart the system. If the fault persists, replace the inverter.



Fault messages (cont.)


Message code	System characteristics	Cause	Measures
F.832	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Inverter temperature sensor faulty	Isolate the system from the power supply. Restart the system. If the fault persists, replace the inverter.
F.833	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Inverter temperature sensor faulty	Isolate the system from the power supply. Restart the system. If the fault persists, replace the inverter.
F.834	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Power supply on inverter faulty	Check the power supply of the outdoor unit (compressor power supply). If the fault persists, contact the power supply utility.
F.835	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Unsuitable inverter or inverter incorrectly programmed	Consult Viessmann Technical Service.
F.836	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Overvoltage fault on inverter	<ul style="list-style-type: none"> ▪ Check power connection on compressor. ▪ If the fault persists, replace the inverter. ▪ If the fault persists, replace the compressor.
F.837	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Power supply on compressor faulty	<ul style="list-style-type: none"> ▪ Check the electrical connection between inverter and compressor. ▪ If the fault persists, replace the inverter.
F.838	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Control of inverter faulty	<ul style="list-style-type: none"> ▪ Issue new demand to compressor. ▪ If the fault occurs frequently, replace the inverter.
F.839	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Compressor blocked	<ul style="list-style-type: none"> ▪ Issue new demand to compressor. ▪ If the fault occurs frequently, replace the compressor.
F.841	Compressor running unevenly.	<ul style="list-style-type: none"> ▪ Excessive compressor torque ▪ Compressor power consumption high 	<ul style="list-style-type: none"> ▪ Issue new demand to compressor. ▪ If the fault occurs frequently, replace the compressor. ▪ Issue new demand to compressor. ▪ If the fault persists, replace the compressor.
F.843	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Overvoltage shutdown, inverter	Isolate the system from the power supply. Restart the system. If the fault persists, replace the inverter.
F.845	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Unsuitable inverter or inverter incorrectly programmed	Refer to type plate and order No. to check whether correct part was delivered and installed. If the fault persists, replace the inverter.
F.846	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Compressor rotating field counter-rotating	<ul style="list-style-type: none"> ▪ Check phase connections on inverter. ▪ Check compressor power supply.

Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.847	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Voltage error on inverter	Isolate the system from the power supply. Restart the system. If the fault persists, replace the inverter.
F.848	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Voltage error on inverter	Isolate the system from the power supply. Restart the system. If the fault persists, replace the inverter.
F.864	<ul style="list-style-type: none"> ▪ No defrost ▪ Compressor cannot be switched on. 	Outdoor unit defrost attempt unsuccessful	Check outdoor unit for icing up. De-ice if necessary.
F.865	Refrigerant circuit off	High pressure fault: <ul style="list-style-type: none"> ▪ Air in the secondary circuit ▪ Secondary circuit/heating circuit shut off ▪ Secondary pump or heating circuit pumps blocked or faulty ▪ Condenser contaminated ▪ High pressure sensor faulty ▪ Set flow temperatures for central heating/DHW heating too high 	<ul style="list-style-type: none"> ▪ Vent the secondary circuit. ▪ Check the system pressure. ▪ Check secondary pump and heating circuit pumps. ▪ Flush heating circuits. ▪ Measure voltage at connection X14.1/X14.2 of the VCMU refrigerant circuit controller. Replace sensor if required. ▪ Adjust set temperatures of consumers. ▪ Check outdoor unit for icing up. De-ice if necessary.
F.866	Refrigerant circuit off	Low pressure fault: <ul style="list-style-type: none"> ▪ Too little refrigerant ▪ Evaporator contaminated ▪ Fans blocked or faulty 	<ul style="list-style-type: none"> ▪ Check amount of refrigerant. Top up refrigerant if required. ▪ Clean the evaporator. ▪ Check fans. Remove blockages. Replace fans if required.



Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.867	Heat pump off	<p>Float air vent valve in the outdoor unit has responded.</p> <ul style="list-style-type: none"> ▪ Too much air in the secondary circuit during venting ▪ Quick-action air vent valve may be faulty Or ▪ Refrigerant present in the float air vent valve 	<p>Specialist personnel working on a refrigerant circuit with flammable refrigerant are required to have specific qualifications and certification: See "Safety information".</p> <p> Danger Escaping refrigerant can lead to explosions that result in very serious injuries. Observe guidance on measures and steps to take in the event of escaping refrigerant: See "Safety information".</p> <p>If a message appears during venting:</p> <ul style="list-style-type: none"> ▪ Check the quick-action air vent valve. Replace quick-action air vent valve if required. ▪ Restart filling programme. <p>If a message appears during operation:</p> <ul style="list-style-type: none"> ▪ Isolate the system from the power supply. ▪ Shut off the hydraulic connection between the indoor and outdoor unit. ▪ Notify Viessmann Werke Technical Service.
F.876	The heat pump is switched off.	Lead break, flow sensor	Check flow sensor. Replace flow sensor if required.
F.881	The refrigerant circuit will not start.	Refrigerant circuit safety shutdown	Isolate the system from the power supply. Restart the system. If the fault persists, replace the inverter.
F.912	Refrigerant circuit off	Interior temperature sensor fault	Check resistance value (NTC 10 kΩ) at connection P1.8/P1.9 on the inverter. Replace sensor if required.
F.913	Refrigerant circuit off	Interior temperature too high	Reduce ambient temperature, for example through sun protection.
F.983	The refrigerant circuit will not start.	Internal inverter fault	Check inverter. Replace inverter if required.
F.984	The refrigerant circuit will not start.	Control of electronic expansion valve 1 faulty	<ul style="list-style-type: none"> ▪ Check connections on VCMU refrigerant circuit controller. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace the VCMU refrigerant circuit controller.

Fault messages (cont.)



Message code	System characteristics	Cause	Measures
F.985	The refrigerant circuit will not start.	Control of electronic expansion valve 2 faulty	<ul style="list-style-type: none"> ▪ Check connections on VCMU refrigerant circuit controller. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace the VCMU refrigerant circuit controller.
F.990	Secondary circuit not controlled	Short circuit, temperature sensor	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at connection X17 of the EHCU electronics module. Replace sensor if required.
F.991	Secondary circuit not controlled	Lead break, temperature sensor	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at connection X17 of the EHCU electronics module. Replace sensor if required.
F.992	No heating/cooling of external heating water/coolant buffer cylinder	Short circuit, temperature sensor of external heating water/coolant buffer cylinder	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at connection X17 of the EHCU electronics module. Replace sensor if required.
F.993	No heating of external heating water/coolant buffer cylinder	Lead break, temperature sensor of external heating water/coolant buffer cylinder	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at connection X17 of the EHCU electronics module. Replace sensor if required.
F.994	No heating of external heating water buffer cylinder	Short circuit, temperature sensor of external heating water buffer cylinder	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at connection X17.1/X17.2 of the EHCU electronics module. Replace sensor if required.
F.995	No heating of external heating water buffer cylinder	Lead break, temperature sensor of external heating water buffer cylinder	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at connection X17.1/X17.2 of the EHCU electronics module. Replace sensor if required.



Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.996	No cooling of external coolant buffer cylinder	Short circuit, temperature sensor of external coolant buffer cylinder	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at connection X17 of the EHCU electronics module. Replace sensor if required.
F.997	No cooling of external coolant buffer cylinder	Lead break, temperature sensor of external coolant buffer cylinder	<ul style="list-style-type: none"> ▪ Check the settings in the commissioning assistant. Adjust settings if required. ▪ Check resistance value (NTC 10 kΩ) at connection X17 of the EHCU electronics module. Replace sensor if required.
F.998	The refrigerant circuit will not start.	Flow rate signal faulty	<ul style="list-style-type: none"> ▪ Check flow sensor. Replace if required. ▪ Check CAN bus connections: <ul style="list-style-type: none"> - CAN bus cable, indoor/outdoor unit - Check connection X19 on EHCU electronics module. - Check connections X4 on HPMU electronics module. - Check connection X5 on EHCU electronics module. ▪ Isolate the system from the power supply. Restart the system. If the fault persists, replace the CAN bus cable. Replace EHCU electronics module if required. Replace HPMU electronics module if required. <p>If the fault occurs repeatedly, replace VCMU refrigerant circuit controller, internal CAN bus cable harness and EHCU electronics module.</p>
F.1009	Refrigerant circuit off	Fault, oil sump heater	Check oil sump heater. Check electrical connections X4 on VCMU refrigerant circuit controller. Replace oil sump heater if required.
F.1010	Refrigerant circuit off	Fault, secondary circuit pressure sensor	To check the sensor, measure the voltage at the sensor or at connection X11 of the EHCU electronics module (0 to 5 V). Replace sensor if required.
F.1011	Refrigerant circuit off	Fault, high pressure sensor	To check the sensor, measure the voltage at the sensor or at connection X14.1 to X14.3 of the VCMU refrigerant circuit controller (0 to 5 V). Replace sensor if required.

Fault messages (cont.)

Message code	System characteristics	Cause	Measures
F.1012	Refrigerant circuit off	Fault, low pressure sensor	To check the sensor, measure the voltage at the sensor or at connection X14.4 to X14.6 of the VCMU refrigerant circuit controller (0 to 5 V). Replace sensor if required.
F.1045	External heat generator not ready for operation	Fault on external heat generator	Check the fault message on the control unit of the external heat generator. Remedy the fault.  Installation and service instructions for external heat generator and associated control unit
F.1049	External heat generator not ready for operation	3/2-way mixing valve not switching.	Check the 3/2-way mixing valve. Replace if required.
F.1050	Uncontrolled operation of the external heat generator	Short circuit, boiler water temperature sensor, external heat generator	Check resistance value (NTC 10 kΩ) at connection TS2 of the HIO electronics module. Replace sensor if necessary.
F.1051	Uncontrolled operation of the external heat generator	Lead break, boiler water temperature sensor, external heat generator	Check resistance value (NTC 10 kΩ) at connection TS2 of the HIO electronics module. Replace sensor if necessary.
F.1054	External heat generator not ready for operation	Max. temperature of external heat generator exceeded	Check the cause of exceeding the max. temperature at the external heat generator. Remedy any fault.  Installation and service instructions for external heat generator and associated control unit
F.1056	Heat pump off	Inverter relay faulty	Replace inverter.

Warning messages

Note

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

Message code	System characteristics	Cause	Measures
A.2	<ul style="list-style-type: none"> ▪ Frost protection enabled ▪ Heat demand, heat pump running. ▪ DHW circulation pump enabled 	Outside temperature has undershot the specified frost protection limit.	No action required
A.11	Central heating/cooling only for some rooms	System pressure too low	Top up with water.
A.12	Incorrect time	Battery in HPMU electronics module flat.	<ul style="list-style-type: none"> ▪ Replace CR2032 battery in HPMU electronics module. ▪ Set the time on the programming unit: See operating instructions.

Warning messages (cont.)

Message code	System characteristics	Cause	Measures
A.16	<ul style="list-style-type: none"> ▪ Refrigerant circuit off: Inverter and compressor cannot be switched on. ▪ Instantaneous heating water heater is switched off. The instantaneous heating water heater will not start. 	Minimum flow rate undershot	<ul style="list-style-type: none"> ▪ Check secondary pump/heating circuit pump, heating/cooling circuit 1. ▪ Check flow sensor.
A.17	No increased DHW hygiene	<ul style="list-style-type: none"> ▪ Temperature for increased DHW hygiene is not reached. ▪ DHW cylinder volume may be too large 	<ul style="list-style-type: none"> ▪ Set period for increased DHW hygiene to fall on a period with low DHW demand. ▪ Check DHW cylinder sizing.
A.21	The safety valve in the indoor unit has opened.	Hydraulic system pressure too high	Check the expansion vessel.
A.62	No scanning possible for secondary pump/heating circuit pump, heating/cooling circuit 1	Lead break, PWM signal, secondary pump/heating circuit pump, heating/cooling circuit 1	Isolate the system from the power supply. Restart the system. If the message remains displayed, replace secondary pump/heating circuit pump, heating/cooling circuit 1.
A.63	No scanning possible for heating circuit pump, heating/cooling circuit 2	Lead break, PWM signal, heating circuit pump, heating/cooling circuit 2	Isolate the system from the power supply. Restart the system. If the message remains displayed, replace heating circuit pump, heating/cooling circuit 2.
A.65	No room heating/cooling, heating/cooling circuit 2	Heating circuit pump, heating/cooling circuit 2 running dry.	Fill system and vent.
A.66	Secondary pump/heating circuit pump, heating/cooling circuit 1 not running.	No PWM signal, secondary pump/heating circuit pump, heating/cooling circuit 1 Incorrect circulation pump installed	Use only spare parts supplied or approved by Viessmann.
A.68	Heating circuit pump, heating/cooling circuit 2 not running.	No PWM signal, heating circuit pump, heating/cooling circuit 2 Incorrect circulation pump installed	Use only spare parts supplied or approved by Viessmann.
A.70	Flow rate too low	Filter in ball valve of outdoor unit is contaminated	Clean the filter in the outdoor unit ball valve.
A.71	Insufficient compressor output	Excess current on compressor	If message occurs frequently, check compressor.
A.72	Insufficient compressor output	Current of power factor correction filter too high	If message occurs frequently, check inverter.
A.73	Insufficient compressor output	Frequency deviation between actual and set compressor speed	If message occurs frequently, check compressor.
A.74	<ul style="list-style-type: none"> ▪ Unusual operating noise ▪ Unusual starting and operational characteristics 	Pressure drop in secondary circuit	<ul style="list-style-type: none"> ▪ Check the expansion vessel. ▪ Fill system and vent.

Warning messages (cont.)

Message code	System characteristics	Cause	Measures
A.75	<ul style="list-style-type: none"> ▪ Unusual operating noise ▪ Unusual starting and operational characteristics 	Pressure spikes in secondary circuit	<ul style="list-style-type: none"> ▪ Check the expansion vessel. ▪ Check the system pressure. Top up with water and vent if required.
A.80	Refrigerant circuit off: Inverter and compressor cannot be switched on.	Fan blocked	<ul style="list-style-type: none"> ▪ Check outdoor unit for icing up. De-ice if necessary. ▪ Check fans can rotate freely.
A.81	<ul style="list-style-type: none"> ▪ Performance factor (COP) too low ▪ Compressor output too low ▪ Refrigerant circuit off 	Insufficient heat transfer in evaporator	Check evaporator. Clean if necessary.
A.82	Unstable control due to faulty pressure signal	Fault through internal monitoring of the pressure sensors of the affected CAN bus subscriber	<ul style="list-style-type: none"> ▪ Check CAN bus subscribers ▪ Check refrigerant circuit controller VCMU power supply. ▪ Check electronics module HPMU power supply. ▪ If the message occurs frequently, replace refrigerant circuit controller VCMU and/or electronics module HPMU.
A.83	No DHW heating	Cylinder temperature sensor signal faulty	<p>Check resistance value (NTC 10 kΩ). Replace sensor if required.</p> <ul style="list-style-type: none"> ▪ Wall mounted indoor unit: Connection on the underside of the appliance to 6-pole connection socket on the right, terminals 9 and 10. ▪ Floorstanding indoor unit: Connection at plug 5 on the HPMU electronics module
A.84	No room heating	Return temperature sensor signal faulty	Check resistance value (NTC 10 kΩ) at connection X4.3/X4.4 of the EHCU electronics module. Replace sensor if required.
A.85	No DHW heating	Cylinder temperature sensor signal faulty	<p>Check resistance value (NTC 10 kΩ). Replace sensor if required.</p> <ul style="list-style-type: none"> ▪ Wall mounted indoor unit: Connection on the underside of the appliance to 6-pole connection socket on the right, terminals 9 and 10. ▪ Floorstanding indoor unit: Connection at plug 5 on the HPMU electronics module
A.86	No room heating, heating/cooling circuit 1	Faulty signal, flow temperature sensor, secondary circuit / heating/cooling circuit 1	Check resistance value (NTC 10 kΩ) at connection X4.1/X4.2 of the EHCU electronics module. Replace sensor if required.
A.87	No room heating, heating/cooling circuit 2	Faulty signal, flow temperature sensor, heating/cooling circuit 2	Check resistance value (NTC 10 kΩ) at the sensor input on ADIO electronics module. Replace sensor if required.



Warning messages (cont.)

Message code	System characteristics	Cause	Measures
A.91	<ul style="list-style-type: none"> ▪ The refrigerant circuit is temporarily switched off ▪ Central heating and DHW heating only via instantaneous heating water heater 	<ul style="list-style-type: none"> ▪ Outside temperature too low for heat pump operation ▪ Operation without outdoor unit, for example for screed drying ▪ Fault refrigerant circuit 	No action required
A.93	Refrigerant circuit operation impaired	Values for hot gas pressure in relation to hot gas temperature not plausible	<p>Check sensors. Replace both sensors if required.</p> <ul style="list-style-type: none"> ▪ To check the high pressure sensor, measure the voltage at connection X14.1 to X14.3 of the VCMU refrigerant circuit controller (0 to 5 V). ▪ To check the hot gas temperature sensor, check resistance value (NTC 10 kΩ) at connection X14.9/X14.10 of the VCMU refrigerant circuit controller.
A.94	Refrigerant circuit operation impaired	Values for suction gas pressure in relation to suction gas temperature not plausible	<p>Check sensors. Replace both sensors if required.</p> <ul style="list-style-type: none"> ▪ To check the low pressure sensor, measure the voltage at connection X14.4 to X14.6 of the VCMU refrigerant circuit controller (0 to 5 V). ▪ To check the suction gas temperature sensor, check resistance value (NTC 10 kΩ) at connection X14.7/X14.8 of the VCMU refrigerant circuit controller.
A.96	<ul style="list-style-type: none"> ▪ Unusual operating noise ▪ Unusual starting and operational characteristics 	Air in the secondary circuit	Vent the system. Top up with water if required.
A.99	Refrigerant circuit temporarily off (condenser frost protection)	Flow temperature in secondary circuit downstream of condenser too low	No action required
A.100	Settings on the heat pump control unit deleted	Data memory on the electronics modules faulty	<ul style="list-style-type: none"> ▪ No action required ▪ If the fault occurs repeatedly, replace electronics modules.

Warning messages (cont.)

Message code	System characteristics	Cause	Measures
A.101	Refrigerant circuit operation impaired	Values for hot gas temperature in relation to hot gas pressure not plausible	Check sensors. Replace both sensors if required. <ul style="list-style-type: none"> ▪ To check the high pressure sensor, measure the voltage at connection X14.1 to X14.3 of the VCMU refrigerant circuit controller (0 to 5 V). ▪ To check the hot gas temperature sensor, check resistance value (NTC 10 kΩ) at connection X14.9/X14.10 of the VCMU refrigerant circuit controller.
A.102	Refrigerant circuit operation impaired	Values for suction gas temperature in relation to suction gas pressure not plausible	Check sensors. Replace both sensors if required. <ul style="list-style-type: none"> ▪ To check the low pressure sensor, measure the voltage at connection X14.4 to X14.6 of the VCMU refrigerant circuit controller (0 to 5 V). ▪ To check the suction gas temperature sensor, check resistance value (NTC 10 kΩ) at connection X14.7/X14.8 of the VCMU refrigerant circuit controller.

Further messages
Note

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

Service messages

Message code	Meaning
P.1	Service due after interval.
P.4	Top up heating water.
P.8	Service due after hours run.
P.34	Maintenance of hydraulic filter strainer necessary

Status messages

Message code	Meaning
S.60	Summer mode active (outside temperature economy function)
S.74	Heating suppression, heating
S.75	DHW circulation pump active
S.94	No demand, external hook-up, heating/cooling circuit 1
S.95	No demand, external hook-up, heating/cooling circuit 2
S.96	No demand, external hook-up, heating/cooling circuit 3

Further messages (cont.)

Message code	Meaning
S.115	4/3-way valve in position DHW heating
S.116	4/3-way valve in position heating/cooling circuit 1
S.117	4/3-way valve in position heating/cooling circuit 2
S.118	4/3-way valve in position internal buffer cylinder/bypass
S.120	Smart grid: Standard mode activated
S.121	Smart grid: Recommended mode activated
S.122	Smart grid: Forced mode activated
S.123	Heat pump off
S.124	Heat pump pre-run phase
S.125	Heat pump heating
S.126	Heat pump cooling
S.127	Prepare heat pump defrost
S.128	Heat pump defrosting
S.129	Heat pump run-on phase
S.130	Electric booster heater off
S.131	Electric booster heater: Level 1 active
S.132	Electric booster heater: Level 2 active
S.133	Electric booster heater: Level 3 active
S.134	4/3-way valve idle
S.135	4/3-way valve defrosting
S.136	4/3-way valve room heating/cooling
S.161	Filling in progress
S.162	Venting in progress
S.163	Heat pump: System status inactive
S.164	Heat pump: System status maintenance standby
S.165	Heat pump: System status control
S.167	Actuator test active
S.176	Heat pump control unit: Defrost demand issued
S.186	Frost protection DHW cylinder active
S.187	Frost protection heat pump active
S.188	Frost protection heating water buffer cylinder active
S.189	Frost protection integral heating water buffer cylinder active

Information

Message code	Meaning
I.9	Screed drying active
I.10	DHW heating runtime limit
I.56	External demand active
I.57	External blocking active
I.59	Parameters were restored: Parameter set was flashed to electronics module.
I.63	Cooling circuit not ready
I.70	Inverter: Excess current detected in power grid
I.71	Inverter: Overvoltage detected in power grid
I.72	Inverter: Undervoltage detected in power grid
I.73	Inverter: Overvoltage detected in DC intermediate circuit

Further messages (cont.)

Message code	Meaning
I.74	Inverter: Undervoltage detected in DC intermediate circuit
I.75	Inverter: Excess temperature detected in internal power module
I.76	Inverter: Excess temperature detected in power factor correction filter (PFC)
I.77	Inverter: Excess current warning detected in power factor correction filter (PFC)
I.78	Inverter: Autonomous output reduction (derating) due to excessive output-side power demand
I.79	Inverter: Autonomous output reduction (derating) due to excessive output-side power demand from the compressor
I.80	Inverter: Internal output restriction (field weakening operation) due to excessive output-side power demand of the compressor
I.81	Inverter: Autonomous output reduction (derating) due to excessive temperature of the internal power module
I.82	Inverter: Autonomous output reduction (derating) due to excessive temperature of the power factor correction filter
I.83	4/3-way valve: Minimum flow rate reached
I.84	4/3-way valve: Minimum return temperature reached
I.85	Controlled low pressure shutdown, refrigerant circuit
I.86	Controlled high pressure shutdown, refrigerant circuit
I.89	Time set forward
I.90	Time set back
I.92	Energy balance reset
I.96	Unknown lag appliance
I.98	A new lag appliance has been detected.
I.99	Hygiene function target temperature reached
I.100	Max. condensing pressure reached
I.101	Min. heating operation evaporation pressure reached
I.102	Min. cooling operation evaporation pressure reached
I.103	Max. evaporation pressure reached
I.104	Max. discharge pressure reached
I.105	Max. runtime lower evaporation temperature reached
I.106	Max. compressor pressure differential reached
I.107	Max. condensing temperature reached
I.108	Max. compressor torque reached
I.109	Max. compressor evaporation temperature reached
I.110	Min. compressor pressure condition reached
I.111	Min. compressor evaporation temperature reached
I.112	Min. outlet temperature on condenser reached
I.113	Smart grid: Forced shutdown active
I.114	Smart grid: Standard mode active
I.115	Smart grid: Recommended switch-on active
I.116	Smart grid: Forced switch-on active
I.117	Home energy management system active
I.118	Underfloor temperature limiter, heating/cooling circuit 1 active
I.119	Underfloor temperature limiter, heating/cooling circuit 2 active
I.120	Heat pump quieter operation mode active
I.121	Contact humidistat, heating/cooling circuit 1 active
I.122	Contact humidistat, heating/cooling circuit 2 active



Further messages (cont.)

Message code	Meaning
I.123	Refrigerant circuit, max. return temperature reached
I.124	Refrigerant circuit, min. return temperature reached
I.125	Refrigerant circuit, max. primary inlet temperature reached
I.126	Refrigerant circuit, min. primary inlet temperature reached
I.127	Max. pressure differential for compressor start reached
I.128	Min. oil sump temperature reached
I.129	Refrigerant circuit reversal: Pressure differential too low
I.130	Heat pump start phase: Timeout
I.131	Min. evaporation temperature reached
I.135	Defrosting active
I.142	Min. compressor runtime not reached
I.143	Power-OFF enabled

Overview of electrical terminal areas

See page 43 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 HMI programming unit

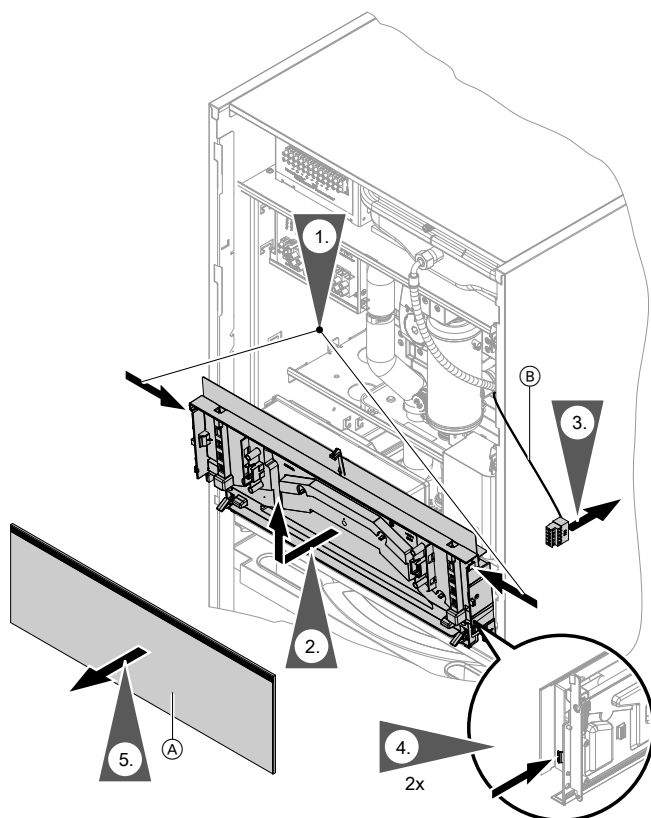


Fig. 71

- (A) HMI programming unit
- (B) Connection pipe

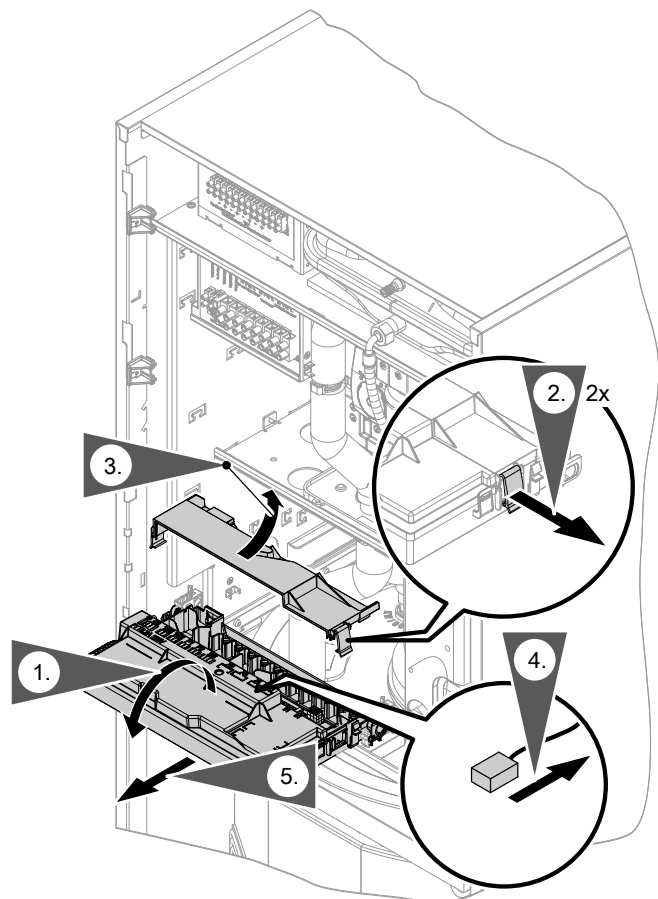
Replacing the HMI programming unit connecting cable

- ! 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 HPMU electronics module

Remove programming unit: See previous chapter.

Removing the programming unit and electronics... (cont.)



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

Fig. 72

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. 72.

Removing the programming unit and electronics... (cont.)

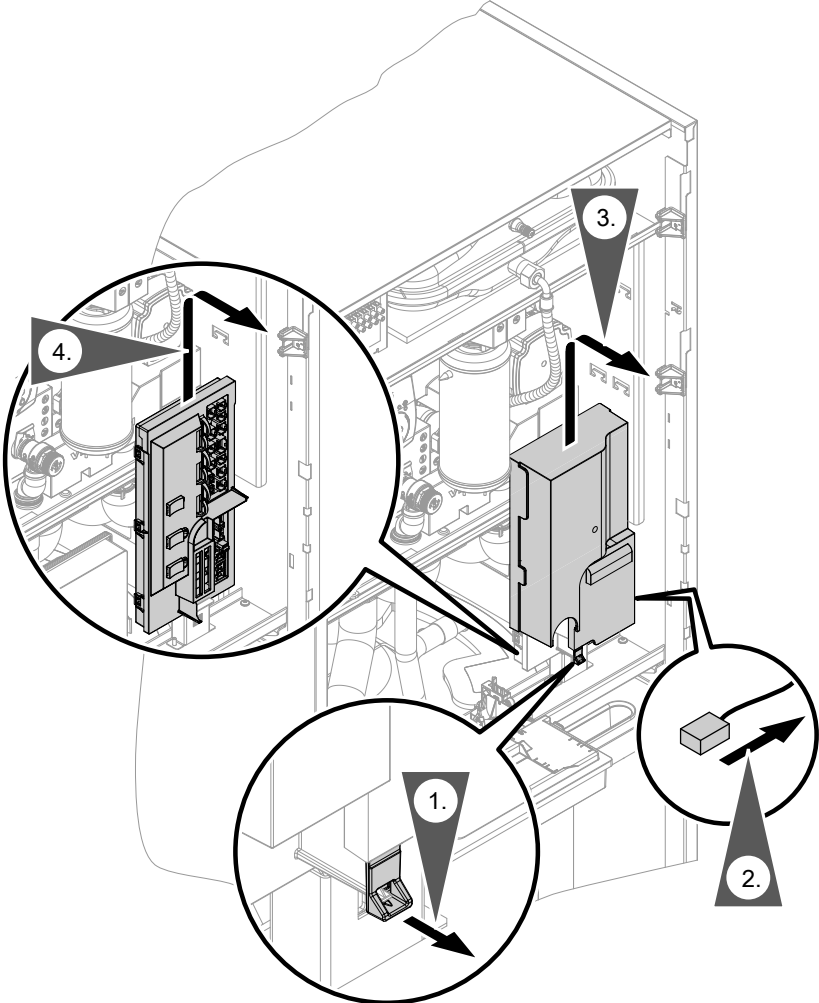
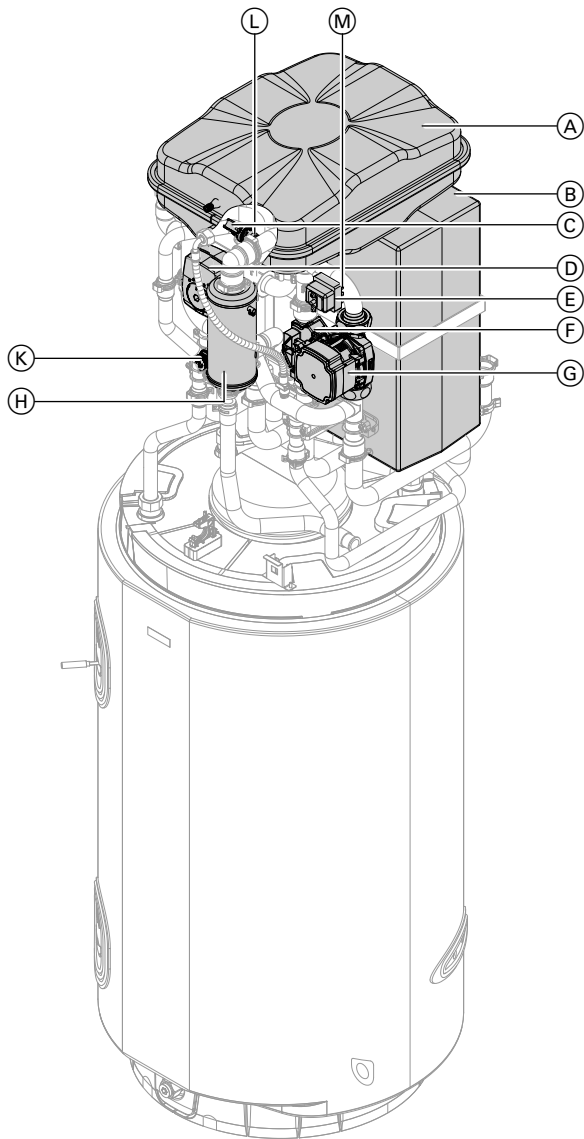


Fig. 73

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

Overview of internal components






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

Fig. 74

- Ⓐ Expansion vessel
- Ⓑ Integrated buffer cylinder

Draining indoor unit on the secondary side

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

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.

Removing hydraulic components and EPP... (cont.)



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.

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
- 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 the expansion vessel

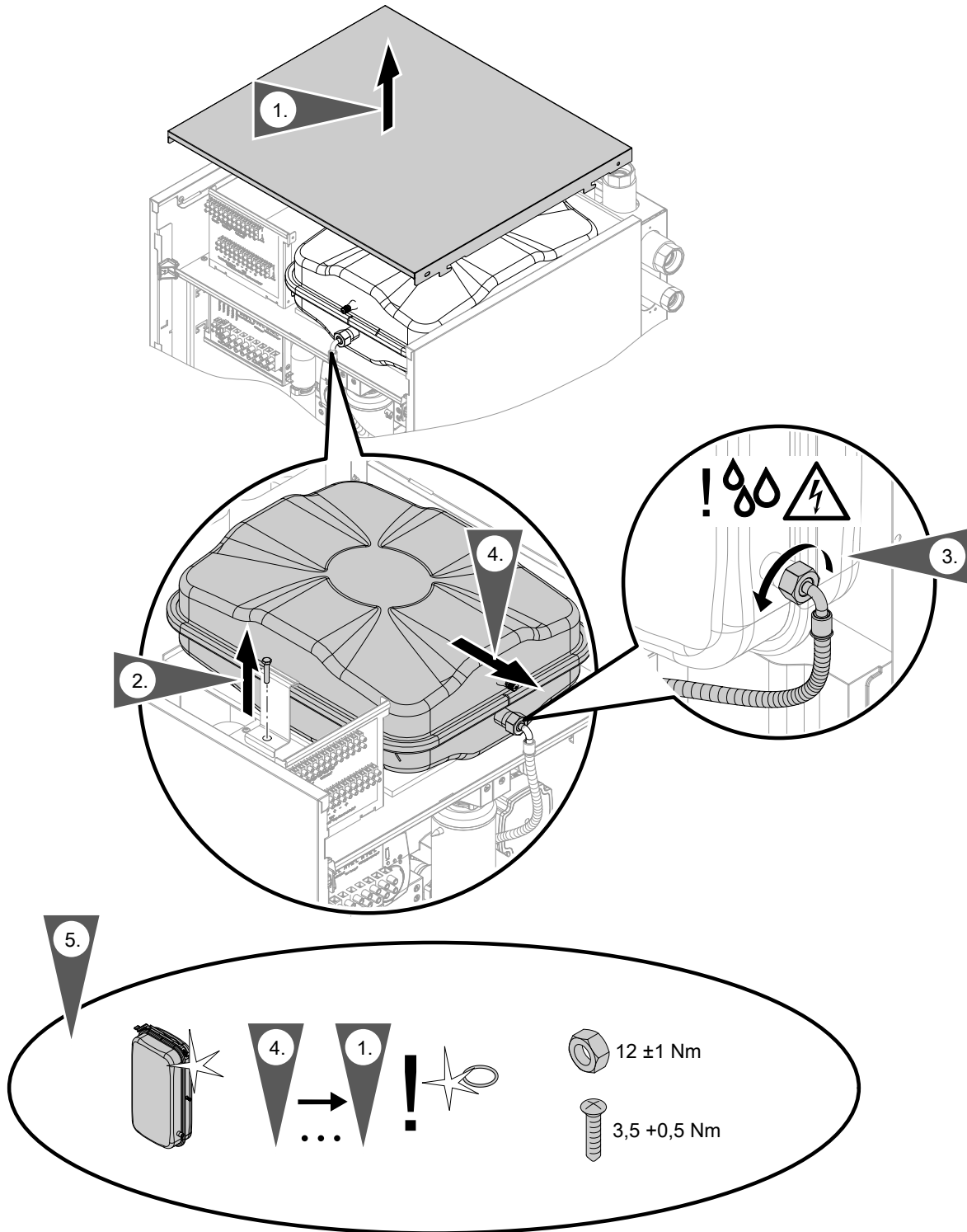


Fig. 75

Maintenance

Removing hydraulic components and EPP... (cont.)

Removing the instantaneous heating water heater

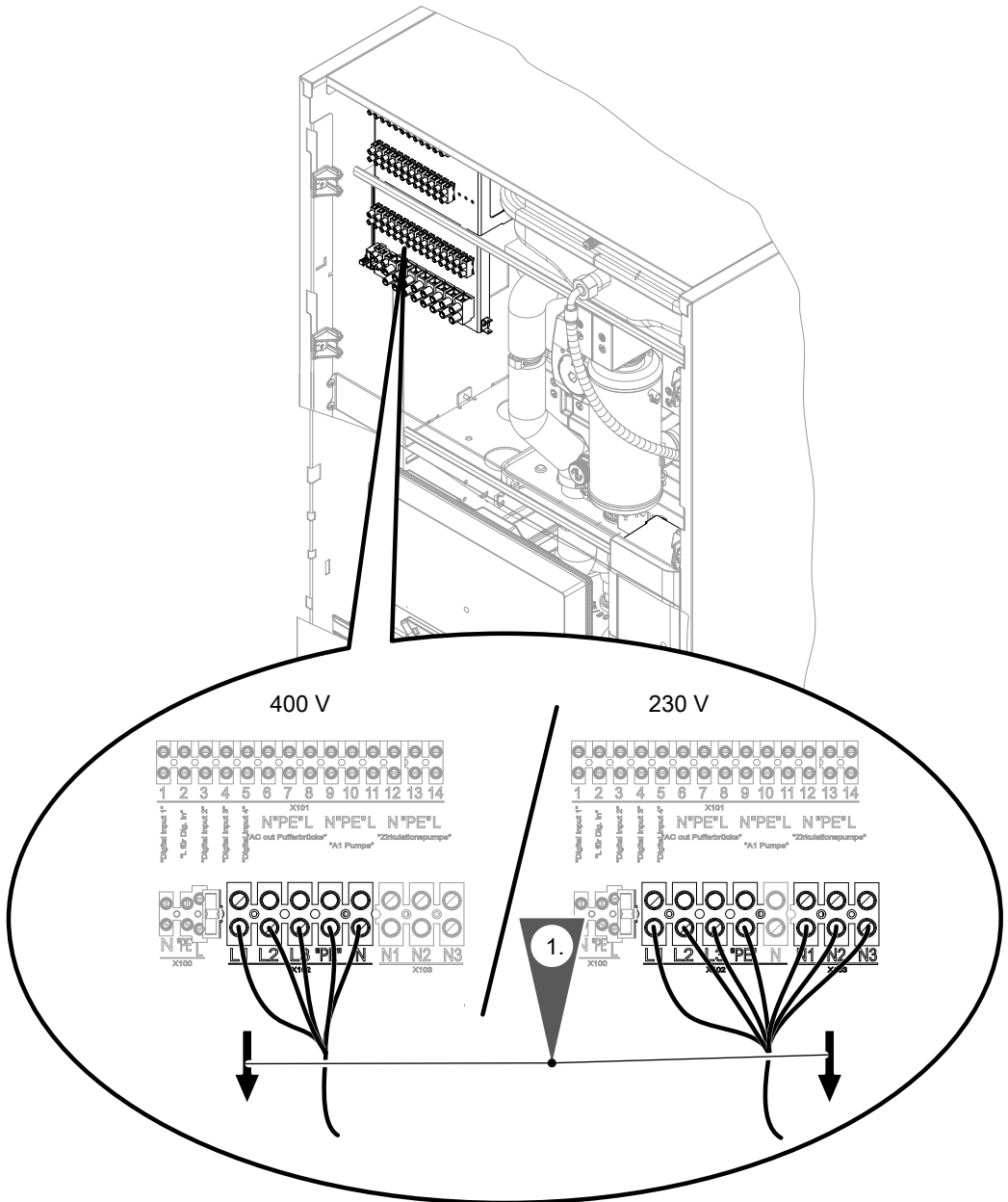


Fig. 76

Removing hydraulic components and EPP... (cont.)

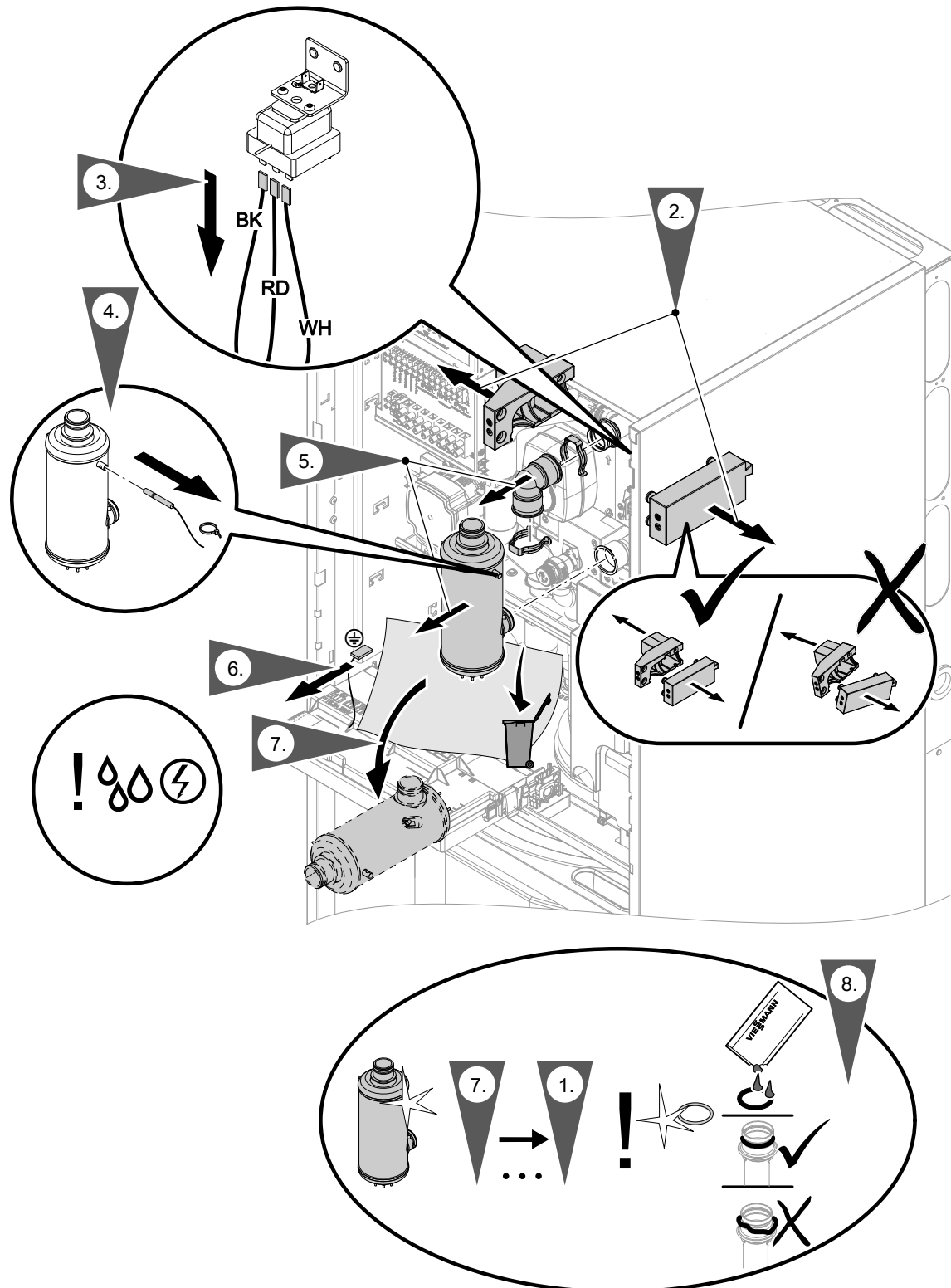


Fig. 77 Observe the colour coding of the core wires connected to the high limit safety cut-out (as per IEC 60757):

BK Black
 RD Red
 WH White

Removing hydraulic components and EPP... (cont.)

Removing the sensors

Removing the flow sensor

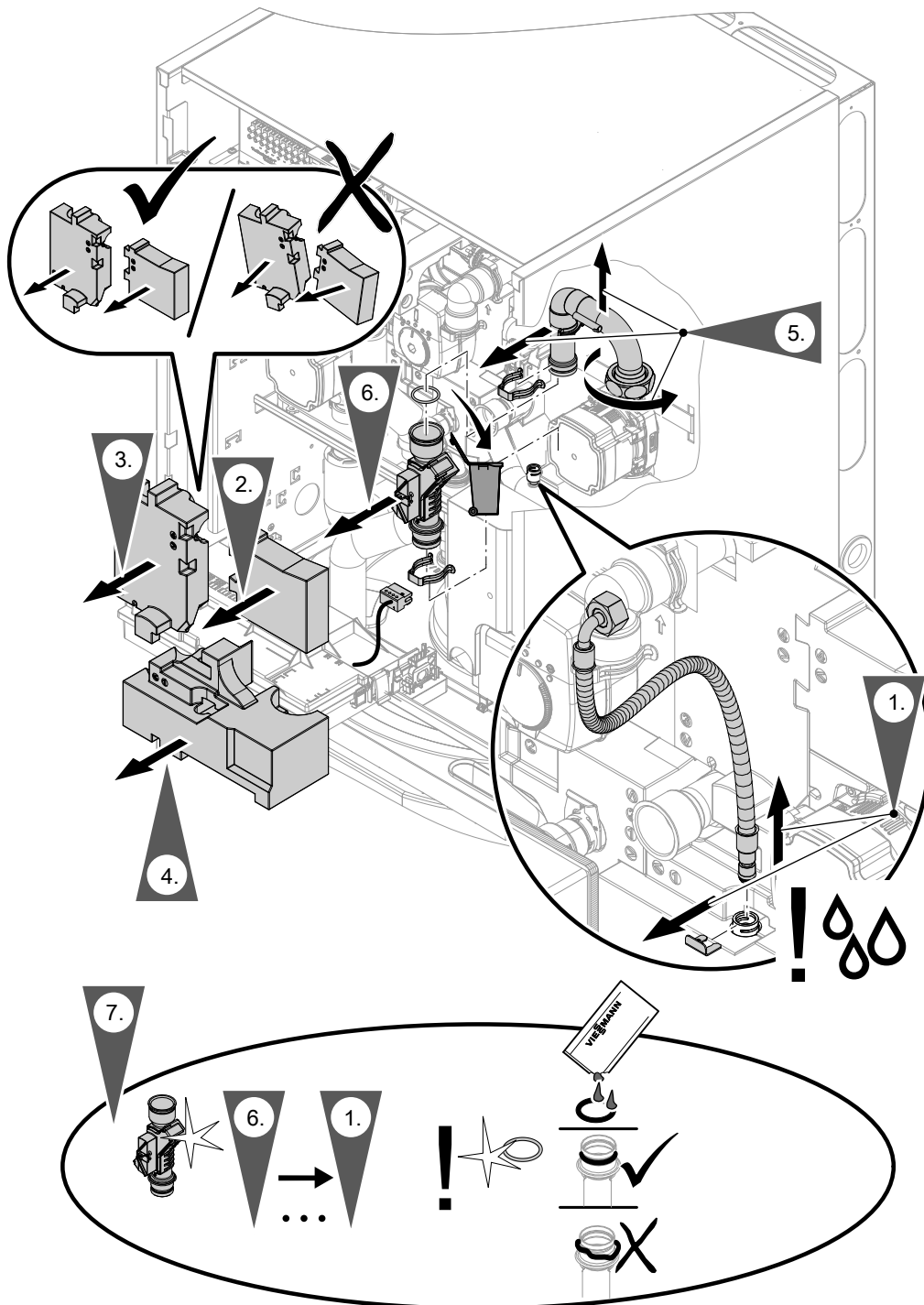


Fig. 78

Removing the secondary circuit temperature sensors

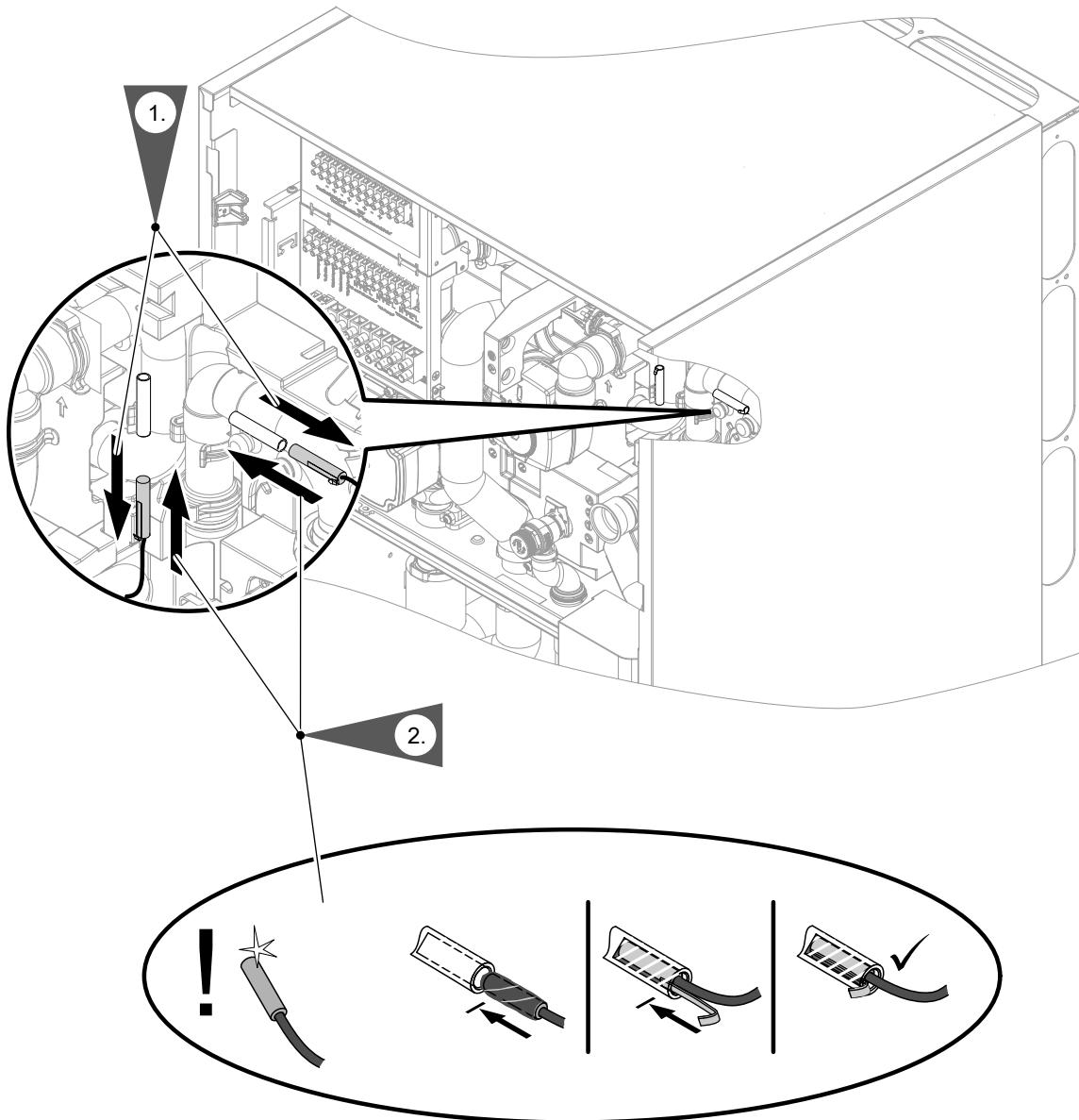


Fig. 79

Removing hydraulic components and EPP... (cont.)

Removing the pressure sensor

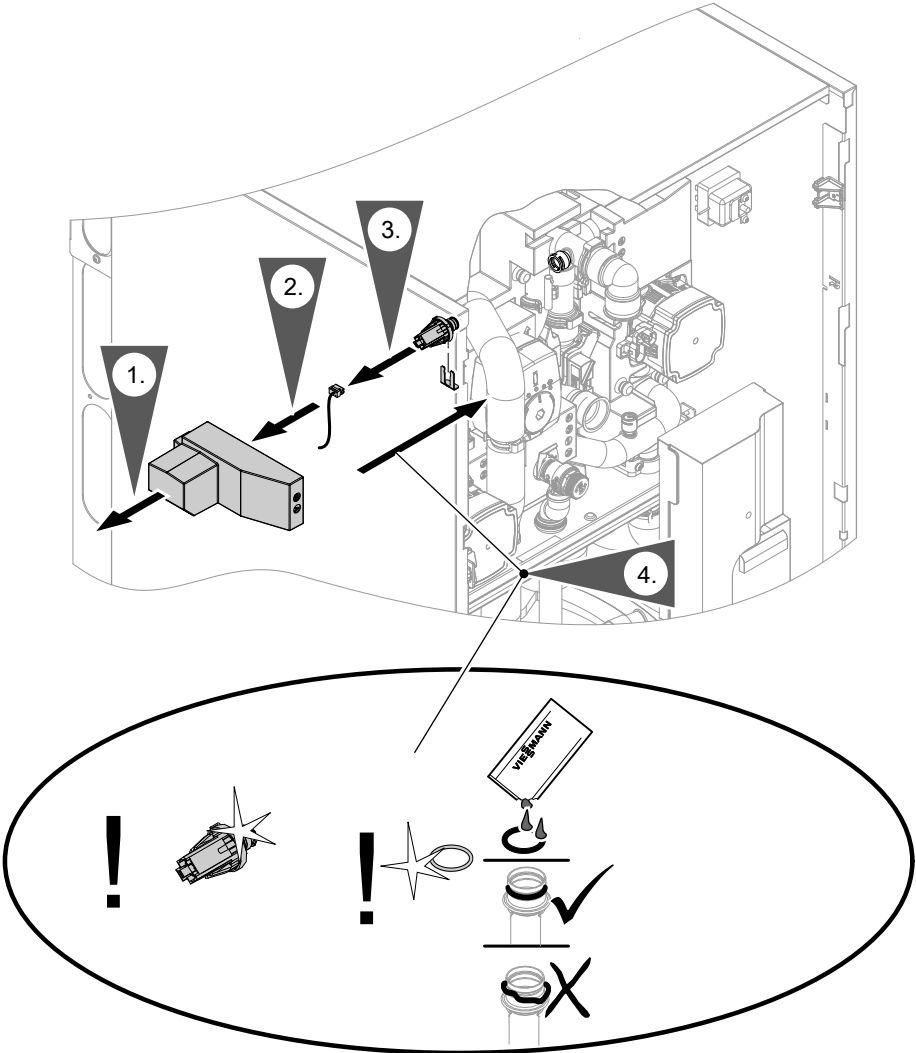


Fig. 80

Removing the circulation pump head

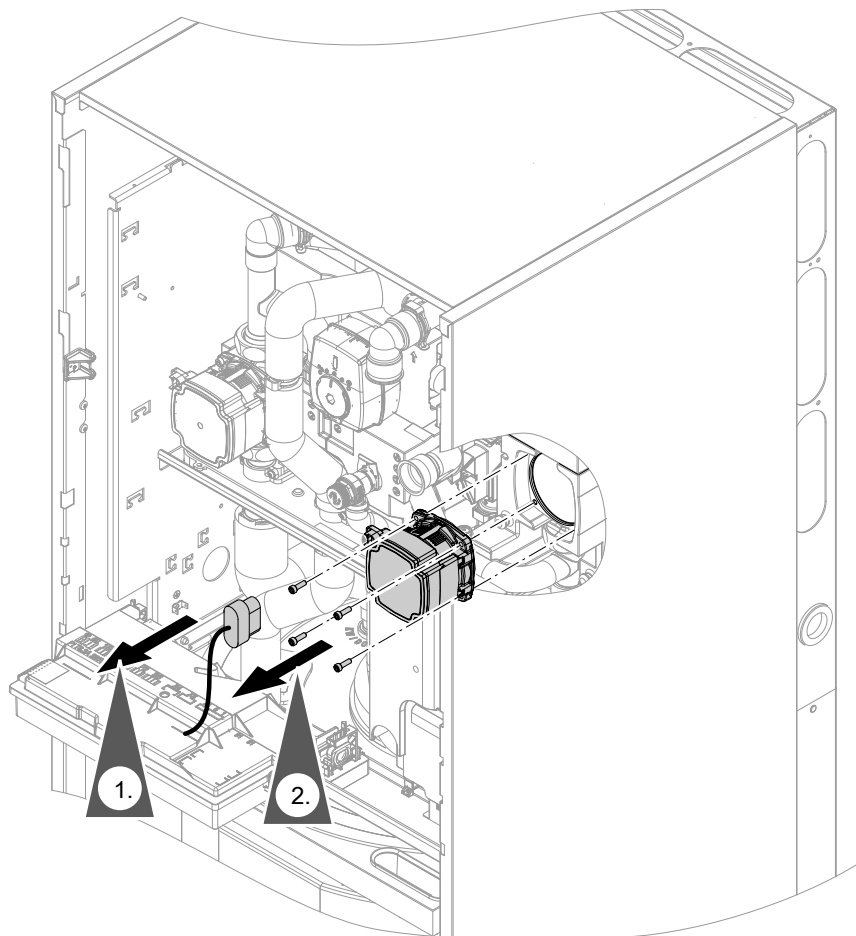


Fig. 81

Torque settings

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

Maintenance

Status display, internal circulation pump

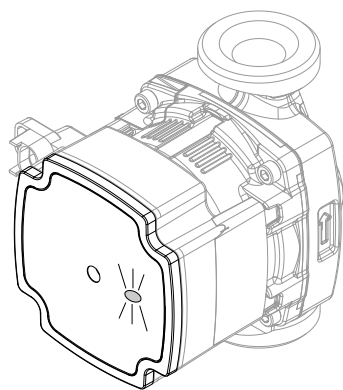


Fig. 82

LED	Meaning
Flashes green.	Normal operation, circulation pump runs on demand.
Illuminates green.	<ul style="list-style-type: none"> ▪ Circulation pump runs continuously with maximum output, e.g. when the PWM signal is interrupted. ▪ No fault message
Illuminates red.	<ul style="list-style-type: none"> ▪ Fault with fault message ▪ Indoor unit is isolated from power supply. LED lights up for the duration of the run-on time, approx 30 to 60 s long.

Checking the temperature sensors

Temperature sensor NTC 10 k Ω	Connection
<ul style="list-style-type: none"> ▪ Outside temperature sensor 	<ul style="list-style-type: none"> ▪ Luster terminals for sensors, terminal 5 and 6 ▪ Plug 1 on the HPMU electronics module
<ul style="list-style-type: none"> ▪ Cylinder temperature sensor 	Plug 5 on the HPMU electronics module
<ul style="list-style-type: none"> ▪ Flow temperature sensor Or ▪ Flow temperature sensor, heating/cooling circuit 1 	<ul style="list-style-type: none"> ▪ Cable harness in the indoor unit ▪ Position of the temperature sensor: See chapter "Indoor unit maintenance: Overview of internal components".
<ul style="list-style-type: none"> ▪ Return temperature sensor 	<ul style="list-style-type: none"> ▪ Cable harness in the indoor unit ▪ Position of the temperature sensor: See chapter "Indoor unit maintenance: Overview of internal components".
<ul style="list-style-type: none"> ▪ External heating water buffer cylinder: Temperature sensor For indoor unit with 1 integrated heating/cooling circuit 	Luster terminals for sensors, terminal 7 and 8
<ul style="list-style-type: none"> ▪ Room temperature sensor 	On Vitotrol 300-E

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 mm²). Depending on the test result, replace the lead or the outside temperature sensor.

Checking the temperature sensors (cont.)

Viessmann NTC 10 k Ω (blue marking)

$\vartheta / ^\circ\text{C}$	R / k Ω	$\vartheta / ^\circ\text{C}$	R / k Ω	$\vartheta / ^\circ\text{C}$	R / k Ω	$\vartheta / ^\circ\text{C}$	R / k Ω	$\vartheta / ^\circ\text{C}$	R / k Ω	$\vartheta / ^\circ\text{C}$	R / k Ω
-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

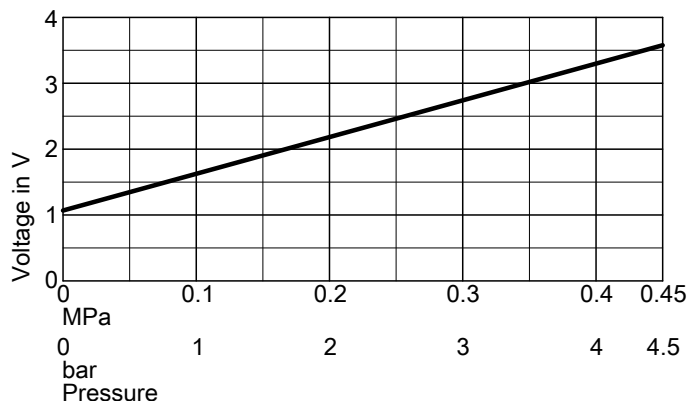


Fig. 83

Checking the fuse

- Fuse F1 is located in the HPMU electronics module: See page 51.
 - Fuse F2 is located on the luster terminal for the heat pump control unit power supply: See page 59.
1. Switch off the power supply.
 2. Open the HPMU electronics module.
 3. Check the fuse. Replace if required.

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**.

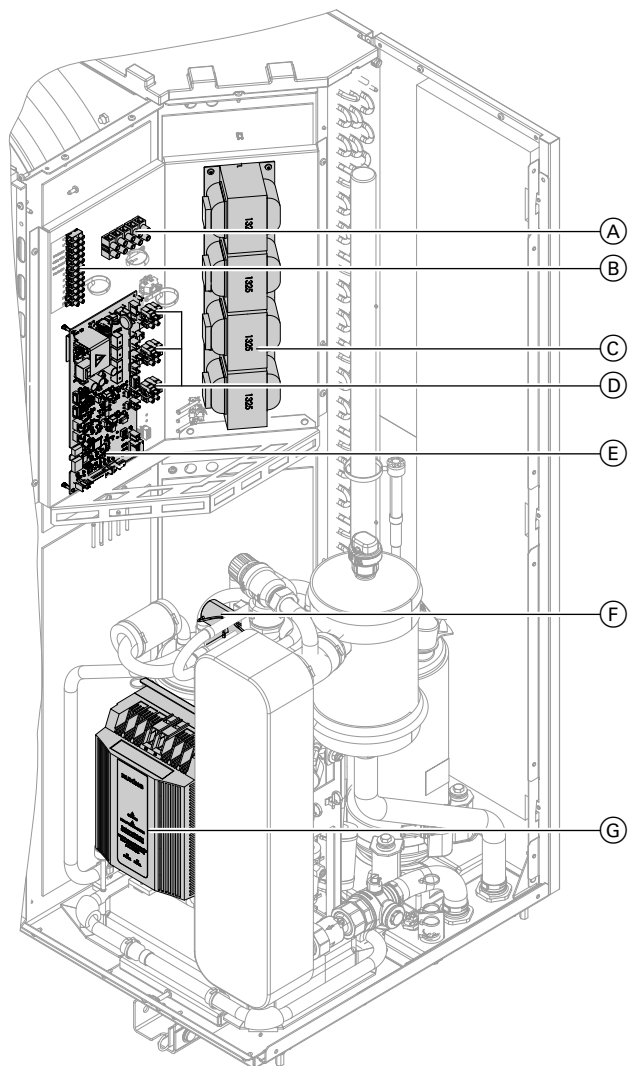


Danger

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.

Overview of electrical components



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



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.

Fig. 84

- Ⓐ Terminal strip, 400 V~ power supply
- Ⓑ Terminal strip, 230 V~ power supply

Checklist for maintenance work

Note

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

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 be 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.
- 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
<p>1 General working environment</p> <ul style="list-style-type: none"> ▪ Inform the following persons of the type of work to be carried out: <ul style="list-style-type: none"> – 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: <ul style="list-style-type: none"> Remove all flammable materials and ignition sources. 		
<p>2 Checking for the presence of refrigerant</p> <ul style="list-style-type: none"> ▪ In order to recognise a flammable atmosphere in time: <ul style="list-style-type: none"> 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. 		
<p>3 Fire extinguisher</p> <p>A CO₂ or powder extinguisher must be to hand in the following cases:</p> <ul style="list-style-type: none"> ▪ Refrigerant is being drained. ▪ Refrigerant is being topped up. ▪ Welding or brazing/soldering work is being carried out. 		
<p>4 Sources of ignition</p> <ul style="list-style-type: none"> ▪ When carrying out work on a refrigerant circuit that contains or previously contained flammable refrigerant, never use ignition sources that could ignite the refrigerant. <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Remove all flammable materials and ignition sources. ▪ Display no smoking signs. 		

Checklist for maintenance work (cont.)

Measure	Completed	Comments
<p>5 Ventilating the work location</p> <ul style="list-style-type: none"> ▪ 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. 		
<p>6 Checking the refrigeration system</p> <ul style="list-style-type: none"> ▪ 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. <p>Perform the following checks:</p> <ul style="list-style-type: none"> ▪ 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. 		
<p>7 Checks on electrical components</p> <ul style="list-style-type: none"> ▪ 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. <p>Carry out the following safety checks:</p> <ul style="list-style-type: none"> ▪ 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
<p>8 Repairs on sealed enclosures</p> <ul style="list-style-type: none"> ▪ 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. <p>! Please note</p> <ul style="list-style-type: none"> ▪ Silicone as a sealant can affect the function of leak detection devices. Do not use silicone as a sealant. <ul style="list-style-type: none"> ▪ 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. 		
<p>9 Repairs on components that are suitable for flammable atmospheres</p> <ul style="list-style-type: none"> ▪ 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. 		
<p>10 Wiring</p> <ul style="list-style-type: none"> ▪ 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. 		
<p>11 Refrigerant detectors</p> <ul style="list-style-type: none"> ▪ 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
<p>12 Leak detection The following leak detection processes are suitable for appliances with flammable refrigerant:</p> <p>Leak detection with electronic refrigerant detectors:</p> <ul style="list-style-type: none"> ▪ 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. <p>Leak detection with liquid leak detectors:</p> <ul style="list-style-type: none"> ▪ Liquid leak detectors are suitable for use with most refrigerants. <p>! 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.</p> <p>Measures to take if a leak in the refrigerant circuit occurs or is suspected:</p> <ul style="list-style-type: none"> ▪ 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. 		
<p>13 Extracting the refrigerant Carry out the work in accordance with chapter "Extracting the refrigerant".</p>		
<p>14 Testing pressure resistance Carry out the work according to chapter "Testing pressure resistance".</p>		
<p>15 Filling the refrigerant circuit Carry out the work in accordance with chapter "Filling the refrigerant circuit".</p>		
<p>16 Shutdown Carry out the work in accordance with chapter "Final decommissioning and disposal".</p>		
<p>17 Identification (labelling the heat pump)</p> <p>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:</p> <ul style="list-style-type: none"> ▪ 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.

Overview of internal components (cont.)

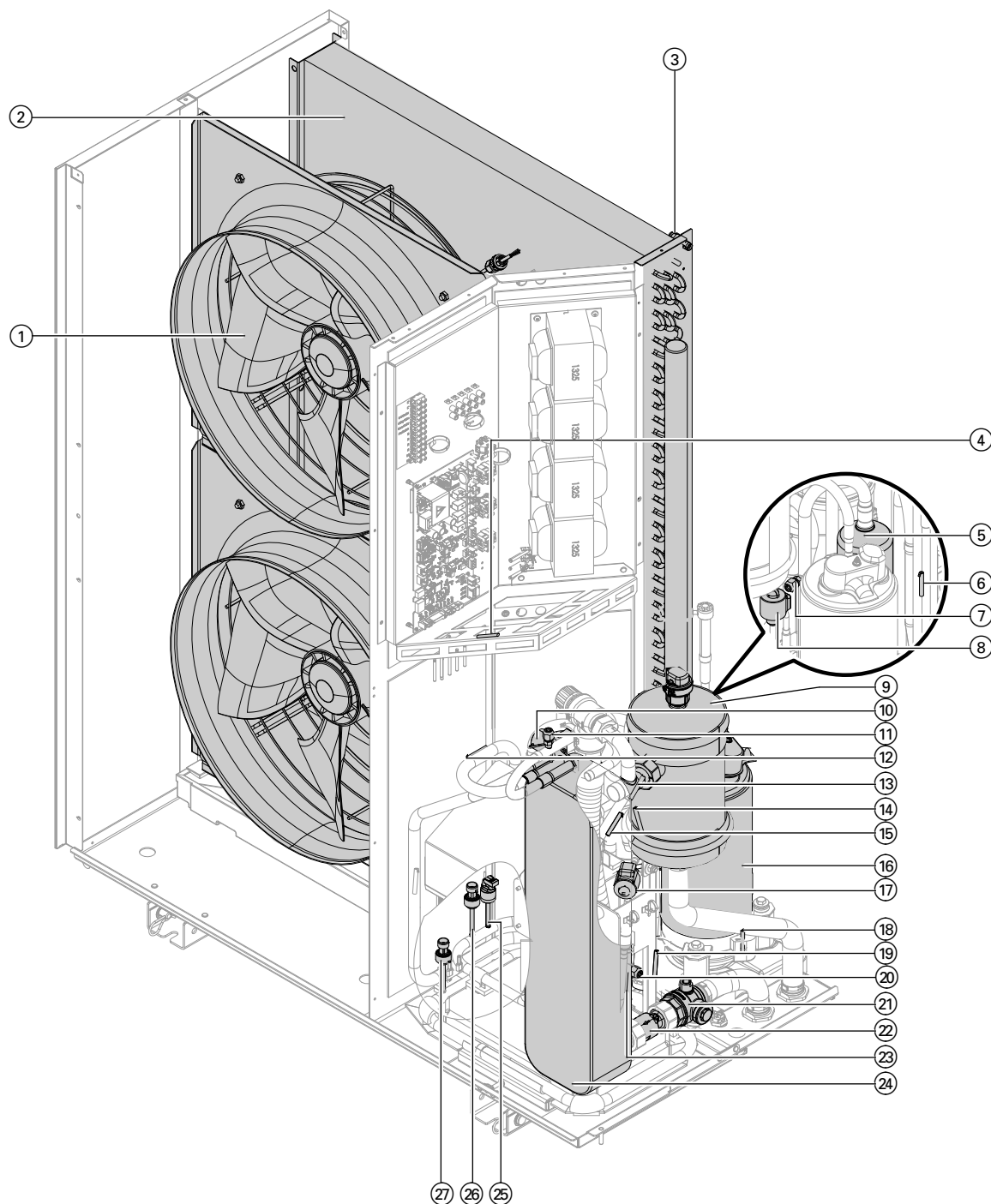







Fig. 85

- | | |
|---|---|
| ① Fan | ⑮ Hot gas temperature sensor |
| ② Evaporator | ⑯ Compressor |
| ③ Air intake temperature sensor | ⑰ Electronic expansion valve 1 |
| ④ Interior temperature sensor | ⑱ Oil sump temperature sensor |
| ⑤ Accumulator | ⑲ Compressor temperature sensor, compressor |
| ⑥ Liquid gas temperature sensor, cooling | ⑳ Schrader valve, high pressure side 2 |
| ⑦ Schrader valve, low pressure side | ㉑ Ball valve with filter |
| ⑧ Electronic expansion valve 2 | ㉒ Non-return valve |
| ⑨ Float air vent valve with quick-action air vent valve | ㉓ Liquid gas temperature sensor, heating |
| ⑩ 4-way diverter valve | ㉔ Condenser |
| ⑪ Schrader valve, high pressure side 1 | ㉕ High pressure switch PSH |
| ⑫ Suction gas temperature sensor, evaporator | ㉖ High pressure sensor |
| ⑬ Secondary circuit flow temperature sensor | ㉗ Low pressure sensor |
| ⑭ Liquid gas temperature sensor, condenser | |

Refrigerant circuit flowchart

Labelling of the sensors in acc. with EN 1861:

-  High pressure sensor
-  Low pressure sensor
-  Temperature sensor
-  High pressure switch PSH
-  High limit safety cut-out

Flow rates:

- Secondary side (heating water)
 - Min. flow rate: 0.350 m³/h (350 l/h)
 - Max. flow rate: 2.050 m³/h (2050 l/h)
- Primary side (air)
 - Min. air flow rate: 2900 m³/h
 - Max. air flow rate: 5300 m³/h

Heating mode

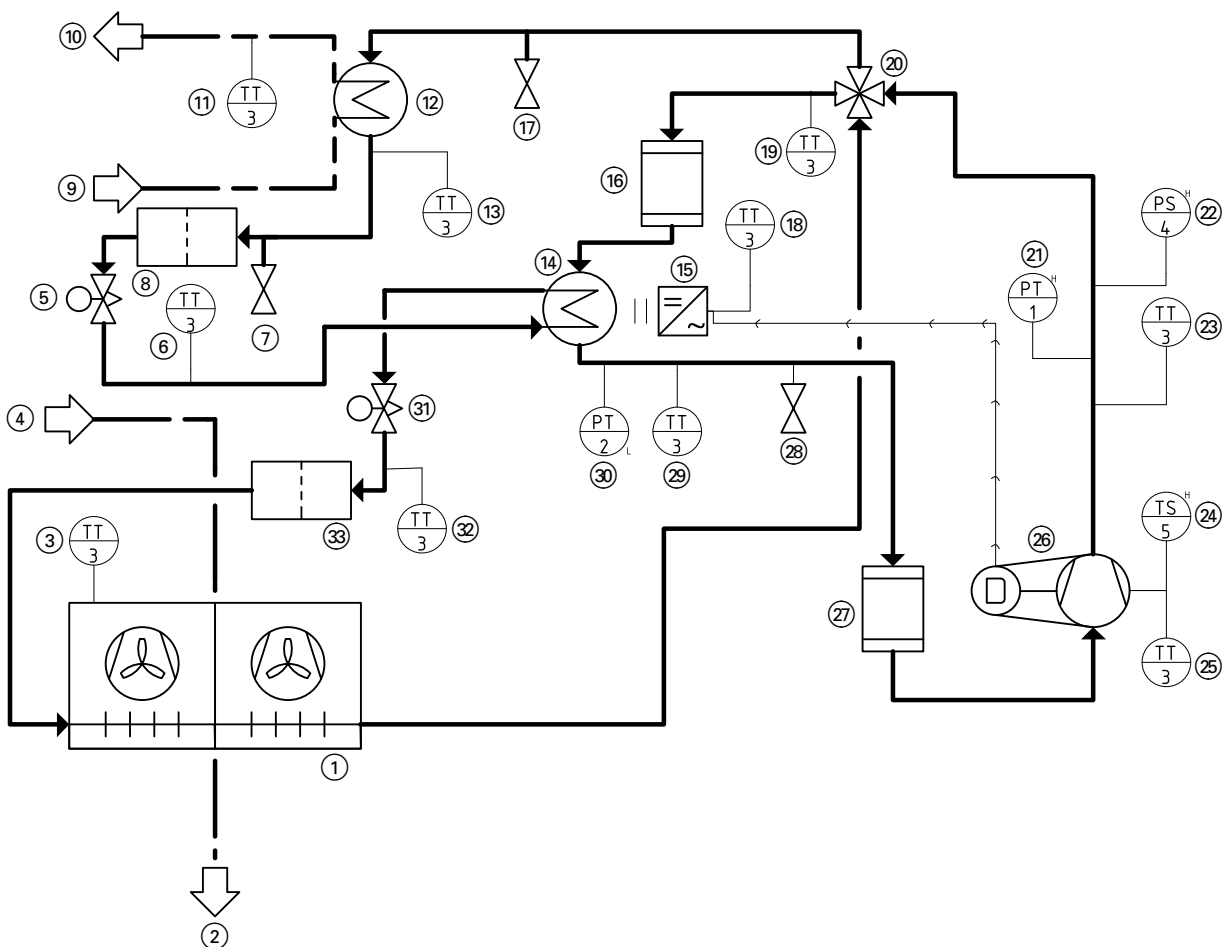


Fig. 86

- | | |
|--|--|
| <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> ⑭ Heat exchanger ⑮ Inverter ⑯ Refrigerant collector ⑰ Schrader valve, high pressure side 1 ⑱ Inverter 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 Compressor temperature sensor ㉖ Compressor |
|--|--|

Refrigerant circuit flowchart (cont.)

- ⑲ Accumulator
- ⑳ Schrader valve, low pressure side
- ㉑ Suction gas temperature sensor, compressor
- ㉒ Low pressure sensor
- ㉓ Electronic expansion valve 2
- ㉔ Liquid gas temperature sensor, cooling
- ㉕ Filter, electronic expansion valve 2

Cooling mode

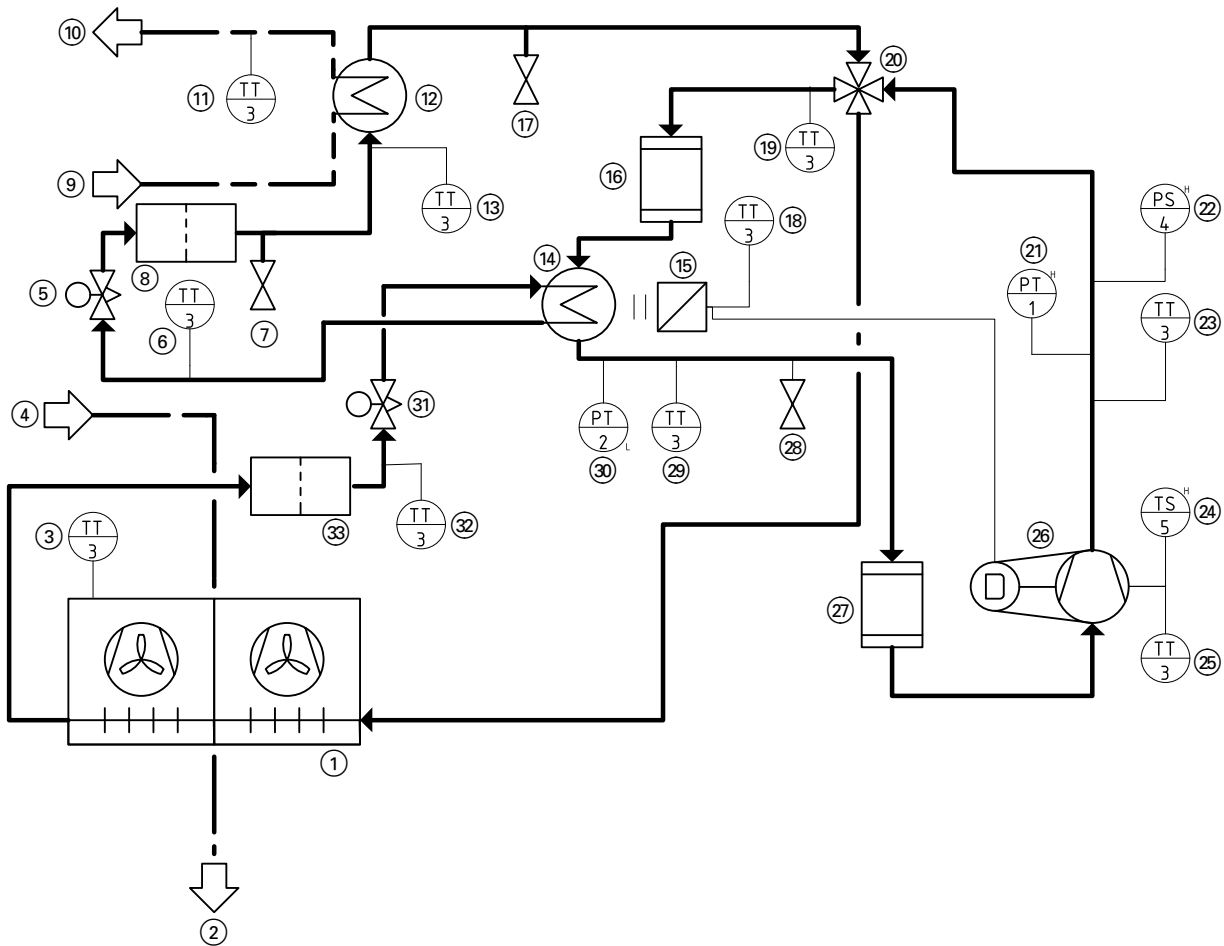


Fig. 87

- 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 Inverter 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 Compressor 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

Maintenance

Extracting the refrigerant

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

Also take into account the following points:

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

1. 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.
5. Connect the refrigerant bottle to the extraction equipment. Connect the extraction equipment to the refrigerant circuit Schrader valve via the manifold.

6. Extract the refrigerant from all parts of the refrigerant circuit using the extraction equipment.

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. Purge the refrigerant circuit with oxygen-free nitrogen for 5 min at least twice.
 - On no account use air or compressed air.
 - Observe the permissible operating pressure of the refrigerant circuit: See "Specification".
9. Release the positive pressure.
10. 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.

11. 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.
12. 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.*

13. Once the refrigerant has been completely evacuated, close the Schrader valves so they are gas-tight. To achieve this, counterhold the valve body. Torque for dust cap union nut: 15 Nm

Extracting the refrigerant (cont.)

14. 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 to max. 1.44 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 136 136 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 valves so they are gas-tight. To achieve this, counterhold the valve body.
Torque for dust cap union nut: 15 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 cap of the low pressure Schrader valve: 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.

2. Open the check valve: Flow also in direction opposite to arrow.
For this, rotate the slot by 90° (slot in direction of flow).
Allow the heating water to fully drain from the outdoor unit.
3. Close the check valve: Flow only in direction of arrow.
For this, rotate the slot back by 90° (slot perpendicular to direction of flow).

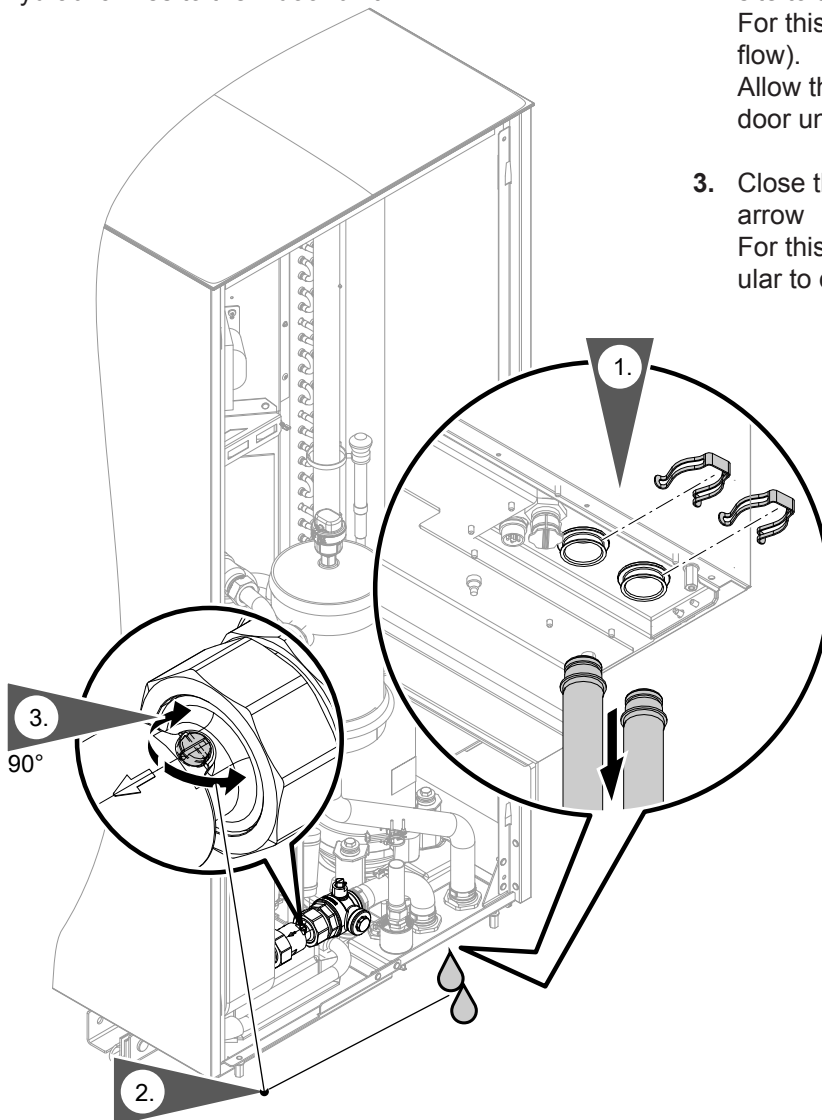


Fig. 88

Removing the hydraulic components

Before dismantling hydraulic components from the outdoor unit, empty the hydraulic connection lines to the indoor unit.

Note

For some parts: See separate installation instructions for the part.

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

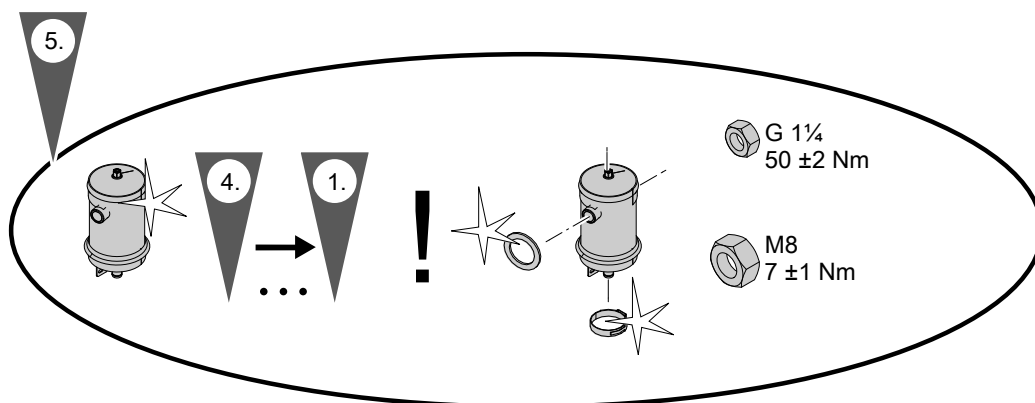
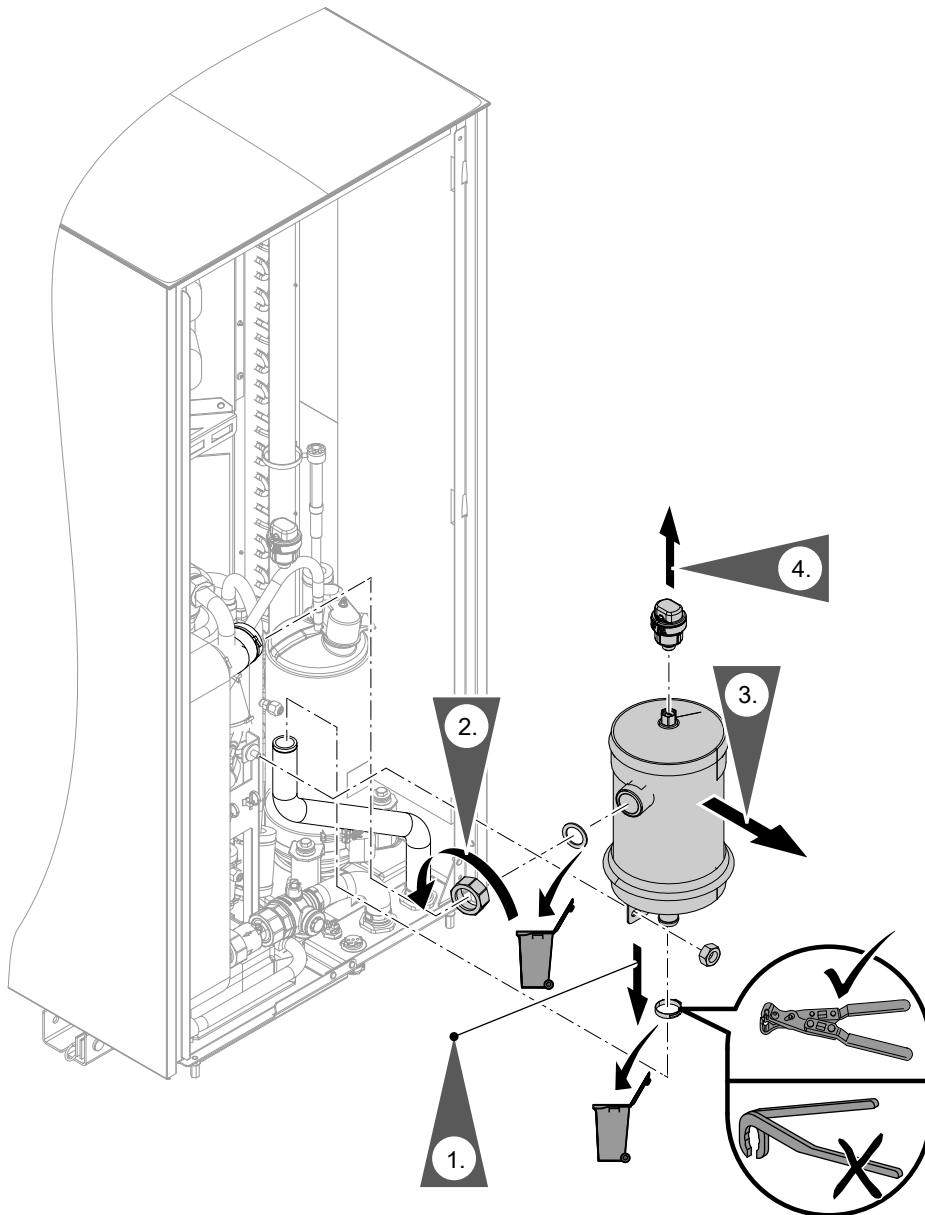


Fig. 89

Removing the hydraulic components (cont.)

Removing the ball valve with filter

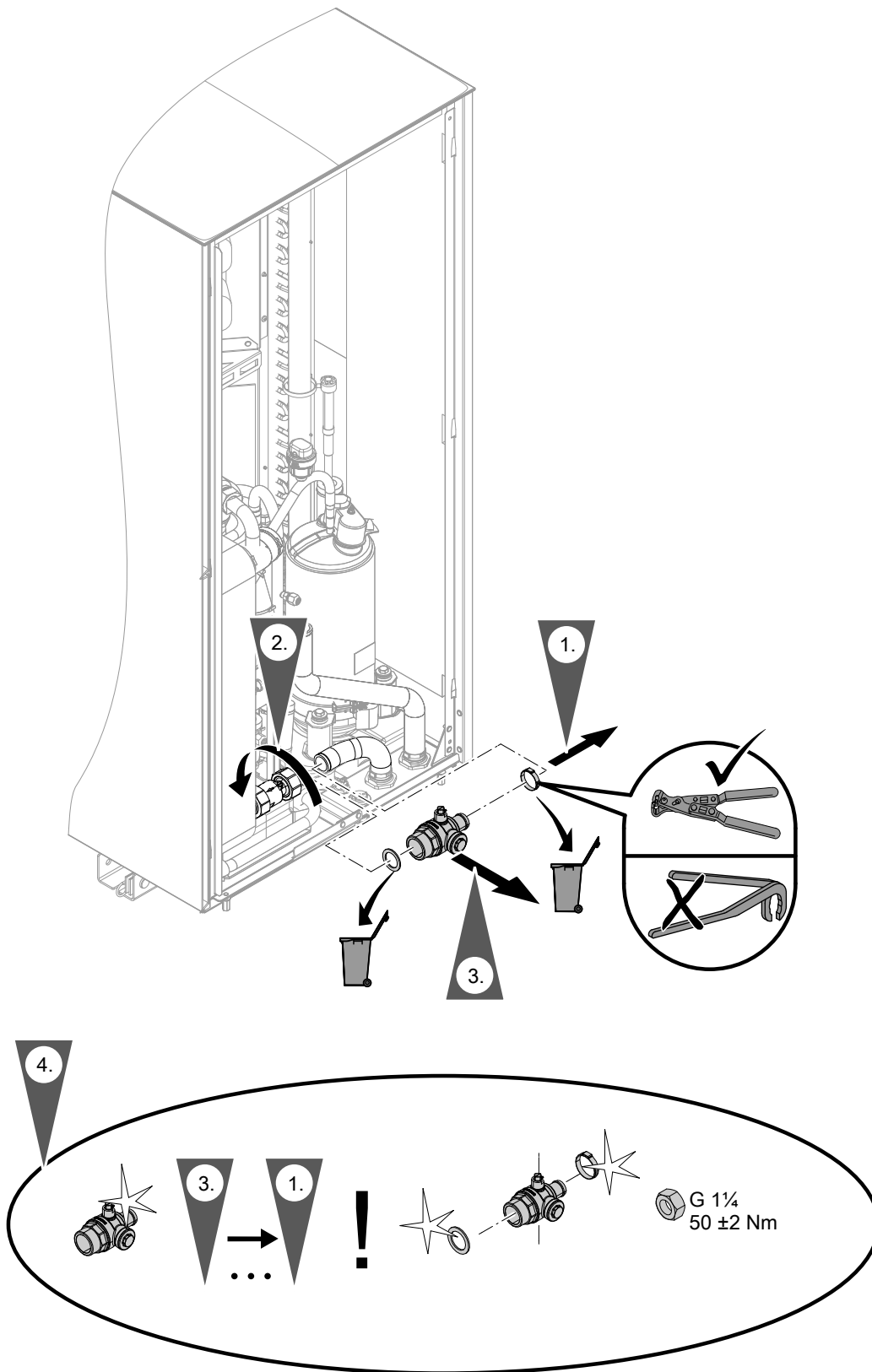


Fig. 90

Checking the temperature sensors

Temperature sensors are connected to the VCMU refrigerant circuit controller in the outdoor unit.

Temperature sensor NTC 10 k Ω	Connection
<ul style="list-style-type: none">▪ 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 k Ω (no marking)

ϑ / °C	R / k Ω	ϑ / °C	R / k Ω	ϑ / °C	R / k Ω	ϑ / °C	R / k Ω	ϑ / °C	R / k Ω	ϑ / °C	R / k Ω
-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

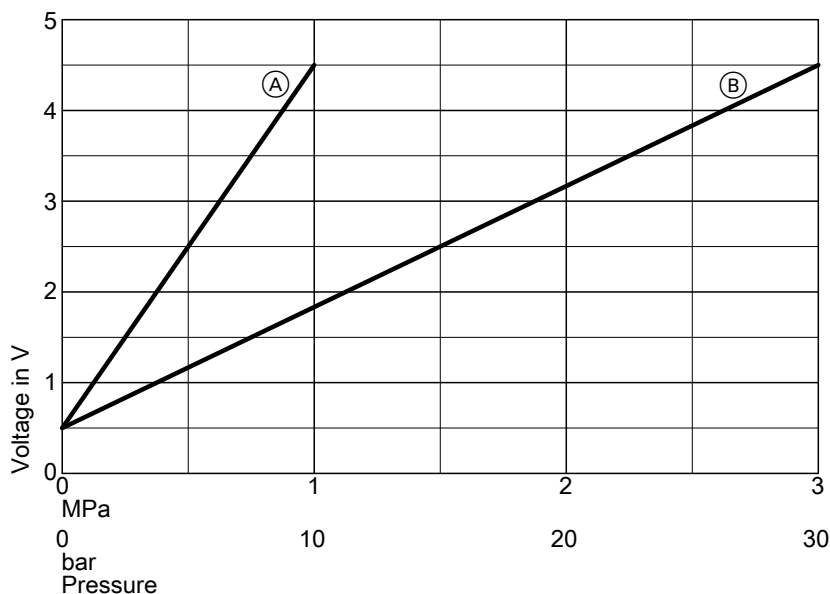


Fig. 91

- Ⓐ Low pressure sensor
- Ⓑ High pressure sensor

Checking the fuses

The fuses are located next to the VCMU refrigerant circuit controller: See page 136.

Fuse type:

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



Danger

Removing fuses does **not switch the power circuit to zero volt**. Contact with live components can lead to serious injury from electric current.

Before working on the equipment, always ensure that **the power circuit is also at zero volt**.

1. Switch off the power supply.
2. Remove right-hand side panel of the outdoor unit.
3. Check the fuse. Replace if required.



Danger

Incorrect or improperly fitted fuses can lead to an increased risk of fire.

- Insert fuses without using any force. Position fuses correctly.
- Only use structurally identical types with the same response characteristics.

Commissioning/service reports

Hydraulic parameter report

Settings and test values	Set value	Commissioning	Maintenance/ service
Checking external heating 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 :			
<ul style="list-style-type: none"> ▪ At secondary circuit flow temperature = 35 °C and air intake temperature \leq 15 °C 	K	4 to 8	
<ul style="list-style-type: none"> ▪ At secondary circuit flow temperature = 35 °C and air intake temperature $>$ 15 °C 	K	4 to 13	
Checking mixer, 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 AWOT-E-AC	151.A10	151.A13	151.A16	
Heating performance data to EN 14511 (A2/W35)				
Rated heating output	kW	5.8	6.7	7.6
Air flow rate				
Power consumption	kW	1.41	1.76	2.00
Coefficient of performance ϵ (COP) in heating mode		4.1	3.8	3.8
Output control	kW	2.2 to 11.0	2.6 to 12.3	3.0 to 13.7
Heating performance data to EN 14511 (A7/W35, 5 K spread)				
Rated heating output	kW	7.3	8.1	9.1
Fan speed	rpm	430	440	567
Air flow rate	m ³ /h	4045	4188	5393
Power consumption	kW	1.46	1.65	1.86
Coefficient of performance ϵ (COP) in heating mode		5.0	4.9	4.9
Output control	kW	2.6 to 12.0	3.0 to 13.4	3.3 to 14.9
Heating performance data to EN 14511 (A-7/W35)				
Rated heating output	kW	9.7	11.1	12.4
Power consumption	kW	3.23	3.96	4.4
Coefficient of performance ϵ (COP) in heating mode		3.0	2.8	2.8
Air intake temperature				
Cooling mode				
▪ Min.	°C	10	10	10
▪ Max.	°C	45	45	45
Heating mode				
▪ Min.	°C	-20	-20	-20
▪ Max.	°C	40	40	40
Heating water (secondary circuit)				
Capacity excl. expansion vessel	l	10	10	10
Heat pump circuit minimum flow rate (defrosting)	l/h	1000	1000	1000
Max. flow temperature	°C	70	70	70
Outdoor unit electrical values				
Rated voltage, compressor		3/N/PE 400 V/50 Hz		
Max. operating current, compressor	A	11.5	11.5	11.5
Cos ϕ		0.92	0.92	0.92
Compressor starting current, inverter controlled	A	< 10	< 10	< 10
Starting current, compressor with stalled armature	A	< 10	< 10	< 10
Fuse protection		B16A	B16A	B16A
IP rating		IP X4	IP X4	IP X4

Specification (cont.)

Type AWOT-E-AC		151.A10	151.A13	151.A16
Indoor unit electrical values				
PCB				
▪ Rated voltage			1/N/PE 230 V/50 Hz	
▪ Power supply fuse protection		1 x B16A	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	8
▪ Power supply fuse protection		3 x B16A	3 x B16A	3 x B16A
Max. power consumption				
Fan	W	2 x 140	2 x 140	2 x 140
Outdoor unit	kW	4.8	5.4	5.4
Secondary pump (PWM)	W	60	60	60
Control unit/PCB, indoor unit	W	65	65	65
Control unit/PCB power, indoor unit	W	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
▪ Frequency range	MHz	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5
▪ Max. transmission power	dBm	+15	+15	+15
Low power radio				
▪ Transfer standard		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
▪ Max. transmission power	dBm	+6	+6	+6
Service link				
▪ Transfer standard		LTE-CAT-NB1	LTE-CAT-NB1	LTE-CAT-NB1
▪ Frequency range band 3	MHz	1710 to 1785	1710 to 1785	1710 to 1785
▪ Frequency range band 8	MHz	880 to 915	880 to 915	880 to 915
▪ Frequency range band 20	MHz	832 to 862	832 to 862	832 to 862
▪ Max. transmission power	dBm	+23	+23	+23
Refrigerant circuit				
Refrigerant				
▪ Safety group		R290 A3	R290 A3	R290 A3
▪ Charge weight	kg	2	2	2
▪ Global warming potential (GWP) ^{*1}		0.02	0.02	0.02
▪ CO ₂ equivalent	t	0.00004	0.00004	0.00004
Compressor (hermetically sealed)				
▪ Type	Type	Twin rotary	Twin rotary	Twin rotary
▪ Oil in compressor	Type	HAF68	HAF68	HAF68
▪ Oil volume in compressor	l	1.150 ±0.020	1.150 ±0.020	1.150 ±0.020
Permissible operating pressure				
▪ High pressure side	bar	30.3	30.3	30.3
	MPa	3.03	3.03	3.03
▪ Low pressure side	bar	30.3	30.3	30.3
	MPa	3.03	3.03	3.03

Specification

Specification (cont.)

Type AWOT-E-AC		151.A10	151.A13	151.A16
Integral DHW cylinder				
Capacity	l	190	190	190
Outdoor unit dimensions				
Total length	mm	600	600	600
Total width	mm	1144	1144	1144
Total height	mm	1382	1382	1382
Indoor unit dimensions				
Total length	mm	597	597	597
Total width	mm	600	600	600
Total height	mm	1900	1900	1900
Total weight				
Indoor unit with 1 integrated heating/cooling circuit				
▪ Empty	kg	170	170	170
▪ With filled buffer cylinder	kg	386	386	386
Outdoor unit	kg	197	197	197
Permissible operating pressure, secondary side				
	bar	3	3	3
	MPa	0.3	0.3	0.3
Connections with connection pipes supplied				
Heating water flow/return, heating circuits or heating water buffer cylinder	mm	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0
Heating water flow/return, DHW cylinder	mm	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
Length of connection line indoor — outdoor unit (hydraulic connection set)				
	m	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)	56	56	56
▪ Max.	dB(A)	66	66	66
▪ In night mode	dB(A)	59	59	59
Energy efficiency class to Commission Regulation (EU) No. 813/2013 Heating, average climatic conditions				
▪ Low temperature application (W35)		A+++	A+++	A+++
▪ Medium temperature application (W55)		A++	A++	A++

Specification (cont.)

Type AWOT-E-AC	151.A10	151.A13	151.A16
Heating performance data to Commission Regulation (EU) No. 813/2013 (average climatic conditions)			
Low temperature application (W35)			
▪ Energy efficiency η_s	%	190	178
▪ Rated heating output P_{rated}	kW	9.8	12.4
▪ Seasonal coefficient of performance (SCOP)		4.825	4.525
Medium temperature application (W55)			
▪ Energy efficiency η_s	%	145	141
▪ Rated heating output P_{rated}	kW	9.37	12.1
▪ Seasonal coefficient of performance (SCOP)		3.7	3.6
Heat pumps with 230 V~ outdoor unit			
Type AWOT-M-E-AC	151.A10	151.A13	151.A16
Heating performance data to EN 14511 (A2/W35)			
Rated heating output	kW	5.8	6.7
Power consumption	kW	1.41	1.76
Coefficient of performance ε (COP) in heating mode		4.1	3.8
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	1.46	1.65
Coefficient of performance ε (COP) in heating mode		5.0	4.9
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	3.23	3.96
Coefficient of performance ε (COP) in heating mode		3.0	2.8
Air intake temperature			
Cooling mode			
▪ Min.	°C	10	10
▪ Max.	°C	45	45
Heating mode			
▪ Min.	°C	-20	-20
▪ Max.	°C	40	40

Specification

Specification (cont.)

Type AWOT-M-E-AC		151.A10	151.A13	151.A16
Heating water (secondary circuit)				
Capacity excl. expansion vessel	l	18	18	18
Heat pump circuit minimum flow rate (defrosting)	l/h	1000	1000	1000
Max. flow temperature	°C	70	70	70
Outdoor unit electrical values				
Rated voltage, compressor		1/N/PE 230 V/50 Hz		
Max. operating current, compressor	A	21	23	24
Cos φ		0.92	0.92	0.92
Compressor starting current, inverter controlled	A	< 10	< 10	< 10
Starting current, compressor with stalled armature	A	< 10	< 10	< 10
Fuse protection	A	B25A	B25A	B25A
IP rating		IP X4	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	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	8
▪ Power supply fuse protection		3 x B16A	3 x B16A	3 x B16A
Max. power consumption				
Fan	W	2 x 140	2 x 140	2 x 140
Outdoor unit	kW	4.8	5.4	5.4
Secondary pump (PWM)	W	60	60	60
Control unit/PCB, indoor unit	W	65	65	65
Control unit/PCB power, indoor unit	W	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
▪ Frequency range	MHz	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5
▪ Max. transmission power	dBm	+15	+15	+15
Low power radio				
▪ Transfer standard		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
▪ Max. transmission power	dBm	+6	+6	+6
Service link				
▪ Transfer standard		LTE-CAT-NB1	LTE-CAT-NB1	LTE-CAT-NB1
▪ Frequency range band 3	MHz	1710 to 1785	1710 to 1785	1710 to 1785
▪ Frequency range band 8	MHz	880 to 915	880 to 915	880 to 915
▪ Frequency range band 20	MHz	832 to 862	832 to 862	832 to 862
▪ Max. transmission power	dBm	+23	+23	+23

Specification (cont.)

Type AWOT-M-E-AC		151.A10	151.A13	151.A16
Refrigerant circuit				
Refrigerant		R290	R290	R290
▪ Safety group		A3	A3	A3
▪ Charge weight	kg	2	2	2
▪ Global warming potential (GWP) ²		0.02	0.02	0.02
▪ CO ₂ equivalent	t	0.00004	0.00004	0.00004
Compressor (hermetically sealed)	Type	Twin rotary	Twin rotary	Twin rotary
▪ Oil in compressor	Type	HAF68	HAF68	HAF68
▪ Oil volume in compressor	l	1.150 ±0.020	1.150 ±0.020	1.150 ±0.020
Permissible operating pressure				
▪ High pressure side	bar	30.3	30.3	30.3
	MPa	3.03	3.03	3.03
▪ Low pressure side	bar	30.3	30.3	30.3
	MPa	3.03	3.03	3.03
Integral DHW cylinder				
Capacity	l	190	190	190
Outdoor unit dimensions				
Total length	mm	600	600	600
Total width	mm	1144	1144	1144
Total height	mm	1382	1382	1382
Indoor unit dimensions				
Total length	mm	597	597	597
Total width				
▪ With 1 integrated heating/cooling circuit	mm	600	600	600
Total height	mm	1900	1900	1900
Total weight				
Indoor unit with 1 integrated heating/cooling circuit				
▪ Empty	kg	170	170	170
▪ With filled buffer cylinder	kg	386	386	386
Outdoor unit	kg	191	191	191
Permissible operating pressure, secondary side				
	bar	3	3	3
	MPa	0.3	0.3	0.3
Connections with connection pipes supplied				
Heating water flow/return, heating circuits or heating water buffer cylinder	mm	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0
Heating water flow/return, DHW cylinder	mm	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
Length of connection line indoor — outdoor unit (hydraulic connection set)	m	5 to 20	5 to 20	5 to 20

Specification

Specification (cont.)

Type AWOT-M-E-AC	151.A10	151.A13	151.A16
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)	56	56	56
▪ Max. dB(A)	66	66	66
▪ In night mode dB(A)	59	59	59
Energy efficiency class to Commission Regulation (EU) No. 813/2013 Heating, average climatic conditions			
▪ Low temperature application (W35)	A+++	A+++	A+++
▪ Medium temperature application (W55)	A++	A++	A++
Heating performance data to Commission Regulation (EU) No. 813/2013 (average climatic conditions)			
Low temperature application (W35)			
▪ Energy efficiency η_s %	190	178	178
▪ Rated heating output P_{rated} kW	9.8	12.4	13.67
▪ Seasonal coefficient of performance (SCOP)	4.825	4.525	4.525
Medium temperature application (W55)			
▪ Energy efficiency η_s %	145	141	141
▪ Rated heating output P_{rated} kW	9.37	12.1	13.37
▪ Seasonal coefficient of performance (SCOP)	3.7	3.6	3.6

Heat pumps with 230 V~ outdoor unit

Type AWOT-M-E-AC	151.A10 SP	151.A13 SP	151.A16 SP
Heating performance data to EN 14511 (A2/W35)			
Rated heating output kW	5.8	6.7	7.6
Power consumption kW	1.41	1.76	2.00
Coefficient of performance ϵ (COP) in heating mode (tolerance ± 5 %)	4.1	3.8	3.8
Output control kW	2.2 to 11.0	2.6 to 12.3	3.0 to 13.7
Heating performance data to EN 14511 (A7/W35, 5 K spread)			
Rated heating output kW	7.3	8.1	9.1
Fan speed rpm	430	440	567
Air flow rate m ³ /h	4045	4188	5393
Power consumption kW	1.46	1.65	1.86
Coefficient of performance ϵ (COP) in heating mode (tolerance ± 5 %)	5.0	4.9	4.9
Output control kW	2.6 to 12.0	3.0 to 13.4	3.3 to 14.9

Specification (cont.)

Type AWOT-M-E-AC		151.A10 SP	151.A13 SP	151.A16 SP
Heating performance data to EN 14511 (A-7/W35)				
Rated heating output	kW	9.7	11.1	12.4
Power consumption	kW	3.23	3.96	4.539
Coefficient of performance ϵ (COP) in heating mode		3.0	2.8	2.8
Air intake temperature				
Cooling mode				
▪ Min.	°C	10	10	10
▪ Max.	°C	45	45	45
Heating mode				
▪ Min.	°C	-20	-20	-20
▪ Max.	°C	40	40	40
Heating water (secondary circuit)				
Capacity excl. expansion vessel	l	18	18	18
Heat pump circuit minimum flow rate	l/h	1000	1000	1000
Max. flow temperature	°C	70	70	70
Outdoor unit electrical values				
Rated voltage, compressor		1/N/PE 230 V/50 Hz		
Max. operating current, compressor	A	21	23	24
Cos ϕ		0.92	0.92	0.92
Compressor starting current, inverter controlled	A	< 10	< 10	< 10
Starting current, compressor with stalled armature	A	< 10	< 10	< 10
Fuse protection	A	B25A	B25A	B25A
IP rating		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	kW	4.8	4.8	4.8
Power supply, indoor unit				
▪ Rated voltage		1/N/PE 230 V/50 Hz		
▪ Power supply fuse protection		1 x B32A	1 x B32A	1 x B32A
Max. power consumption				
Fan	W	2 x 140	2 x 140	2 x 140
Outdoor unit	kW	4.8	5.4	5.4
Secondary pump (PWM)	W	60	60	60
Control unit/PCB, indoor unit	W	65	65	65
Control unit/PCB power, indoor unit	W	1000	1000	1000

Specification

Specification (cont.)

Type AWOT-M-E-AC		151.A10 SP	151.A13 SP	151.A16 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
▪ Frequency range	MHz	2000 to 2483.5	2000 to 2483.5	2000 to 2483.5
▪ Max. transmission power	dBm	+15	+15	+15
Low power radio				
▪ Transfer standard		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
▪ Max. transmission power	dBm	+6	+6	+6
Service link				
▪ Transfer standard		LTE-CAT-NB1	LTE-CAT-NB1	LTE-CAT-NB1
▪ Frequency range band 3	MHz	1710 to 1785	1710 to 1785	1710 to 1785
▪ Frequency range band 8	MHz	880 to 915	880 to 915	880 to 915
▪ Frequency range band 20	MHz	832 to 862	832 to 862	832 to 862
▪ Max. transmission power	dBm	+23	+23	+23
Refrigerant circuit				
Refrigerant		R290	R290	R290
▪ Safety group		A3	A3	A3
▪ Charge weight	kg	2	2	2
▪ Global warming potential (GWP) ^{*3}		0.02	0.02	0.02
▪ CO ₂ equivalent	t	0.00004	0.00004	0.00004
Compressor (hermetically sealed)	Type	Twin rotary	Twin rotary	Twin rotary
▪ Oil in compressor	Type	HAF68	HAF68	HAF68
▪ Oil volume in compressor	l	1.150 ±0.020	1.150 ±0.020	1.150 ±0.020
Permissible operating pressure				
▪ High pressure side	bar	30.3	30.3	30.3
	MPa	3.03	3.03	3.03
▪ Low pressure side	bar	30.3	30.3	30.3
	MPa	3.03	3.03	3.03
Integral DHW cylinder				
Capacity	l	190	190	190
Outdoor unit dimensions				
Total length	mm	600	600	600
Total width	mm	1144	1144	1144
Total height	mm	1382	1382	1382
Indoor unit dimensions				
Total length	mm	597	597	597
Total width	mm	600	600	600
Total height	mm	1900	1900	1900
Total weight				
Indoor unit with 1 integrated heating/cooling circuit				
▪ Empty	kg	170	170	170
▪ With filled buffer cylinder	kg	386	386	386
Outdoor unit	kg	191	191	191

^{*3} Based on the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

Specification (cont.)

Type AWOT-M-E-AC		151.A10 SP	151.A13 SP	151.A16 SP
Permissible operating pressure, secondary side	bar	3	3	3
	MPa	0.3	0.3	0.3
Connections with connection pipes supplied				
Heating water flow/return, heating circuits or heating water buffer cylinder	mm	Cu 28 x 1.0	Cu 28 x 1.0	Cu 28 x 1.0
Heating water flow/return, DHW cylinder	mm	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
Length of connection line indoor — outdoor unit (hydraulic connection set)	m	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)	56	56	56
▪ Max.	dB(A)	66	66	66
▪ In night mode	dB(A)	59	59	59
Energy efficiency class to Commission Regulation (EU) No. 813/2013 Heating, average climatic conditions				
▪ Low temperature application (W35)		A+++	A+++	A+++
▪ Medium temperature application (W55)		A+++	A++	A++
Heating performance data to Commission Regulation (EU) No. 813/2013 (average climatic conditions)				
Low temperature application (W35)				
▪ Energy efficiency η_s	%	190	178	178
▪ Rated heating output P_{rated}	kW	9.8	12.4	13.67
▪ Seasonal coefficient of performance (SCOP)		4.825	4.525	4.525
Medium temperature application (W55)				
▪ Energy efficiency η_s	%	145	141	141
▪ Rated heating output P_{rated}	kW	9.37	12.1	13.37
▪ Seasonal coefficient of performance (SCOP)		3.7	3.6	3.6

Commissioning order

Email this request form, together with the system scheme, to your local Viessmann sales office. 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.

Observe the following regulations:

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

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

Note

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

Final decommissioning and disposal (cont.)

Decommissioning:

- Positioning requirements apply only so long as the outdoor unit is filled with refrigerant: See page 17.
- 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 145.

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 145.

Transport:

- Observe transport information: See page 17. 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.

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

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