

Vitocal 222-S
Type AWBT(-M)/AWBT(-M)-E/AWBT(-M)-E-AC 221.C04 to C16
Compact heat pump, split version

For applicability, see the last page



VITOCAL 222-S



Safety instructions

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.

Target group

These instructions are exclusively intended for authorised contractors.

- Work on the refrigerant circuit may only be carried out by authorised refrigeration engineers.
- Work on electrical equipment must only be carried out by a qualified electrician.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.

Regulations to be observed

- National installation regulations
- Statutory regulations for the prevention of accidents
- Statutory regulations for the protection of the environment
- Codes of Practice of the relevant trade associations
- All relevant safety regulations as defined by DIN, EN, DVGW, VDE and locally applicable standards
 - Ⓐ ÖNORM, EN and ÖVE
 - ⒸH SEV, SUVA, SVTI, SWKI and SVGW

Safety instructions for working on the system

Working on the system

- Isolate the system from the power supply, e.g. by removing the separate fuse or by means of a mains isolator, and check that it 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 can cause burns.

- Before maintenance and service work, switch OFF the appliance and let it cool down.
- Never touch hot surfaces on the appliance, fittings or pipework.



Please note

Electronic assemblies can be damaged by electrostatic discharge.

Prior to commencing work, touch earthed objects such as heating or water pipes to discharge static loads.

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.

Safety instructions (cont.)**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.

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Disposal of packaging










Please dispose of packaging waste in line with statutory regulations.

DE: Use the disposal system organised by Viessmann.







AT: Use the ARA statutory disposal system (Altstoff Recycling Austria AG, licence number 5766).

CH: Packaging waste is disposed of by the HVAC contractor.

Symbols

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

Intended use

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

Depending on the version, the appliance can only be used for the following purposes:

- Central heating
- Central cooling
- DHW heating

Intended use (cont.)

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

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

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

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

Note

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

Product information

Layout

The Vitocal 222-S is a split compact heat pump, comprising 1 indoor unit with integral DHW cylinder and 1 outdoor unit.

Required accessories

A hydraulic connection set is required to install the appliance.

Refrigerant circuit

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

The indoor and outdoor units are connected to each other hydraulically via the refrigerant lines.

Hydraulics

The high efficiency circulation pump (secondary pump) installed in the indoor unit pumps the heating water into the secondary circuit. The integral 3-way diverter valve for "central heating/DHW heating" changes over between central heating and DHW heating.

Central heating

The heat pump can supply up to 3 heating circuits: 1 heating circuit without mixer and 2 heating circuits with mixer.

For heating circuits with mixer, a heating water buffer cylinder is necessary in the secondary circuit flow. All heating circuits are connected in parallel to this heating water buffer cylinder.

If a heating water buffer cylinder is not used, 1 heating circuit with mixer can be connected directly to the heat pump. For this, the installation kit with mixer (accessories) must be fitted in the indoor unit. The heating circuit without mixer must be connected, otherwise the heating circuit with mixer cannot be supplied with heat. Permissible system configurations: See following table

Central cooling (type AWBT(-M)-E-AC 222.A)

Central cooling is possible either via a heating/cooling circuit or via a separate cooling circuit.

For central cooling, the refrigerant circuit is reversed and heat is extracted from the cooling circuit.

Note

In conjunction with the installation kit with mixer (accessories), only the heating circuit without mixer can be cooled.

Heat pump control unit

The entire heating system is monitored and controlled by the integral Vitotronic 200, type WO1C heat pump control unit.

Product information (cont.)

Permissible system configurations

System configuration	Heating/cooling circuits			
	Without mixer A1/HC1	With mixer M2/HC2	With mixer M3/HC3	Separate cooling circuit SKK
Without heating water buffer cylinder	X	—	—	○
With heating water buffer cylinder	X	—	—	○
	X	X	—	○
	X	X	X	○
	—	X	—	○
	—	X	X	○
With installation kit with mixer	X	X	—	—

○ Component may be added.

Type overview

Type	Instantaneous heating water heater	Cooling function	Rated voltage	
			Indoor unit	Outdoor unit
AWBT 221.C	—	—	230 V~	400 V~
AWBT-M 221.C	—	—	230 V~	230 V~
AWBT-E 221.C	X	—	230 V~	400 V~
AWBT-M-E 221.C	X	—	230 V~	230 V~
AWBT-E-AC 221.C	X	X	230 V~	400 V~
AWBT-M-E-AC 221.C	X	X	230 V~	230 V~

Requirements for on-site connections

Indoor unit

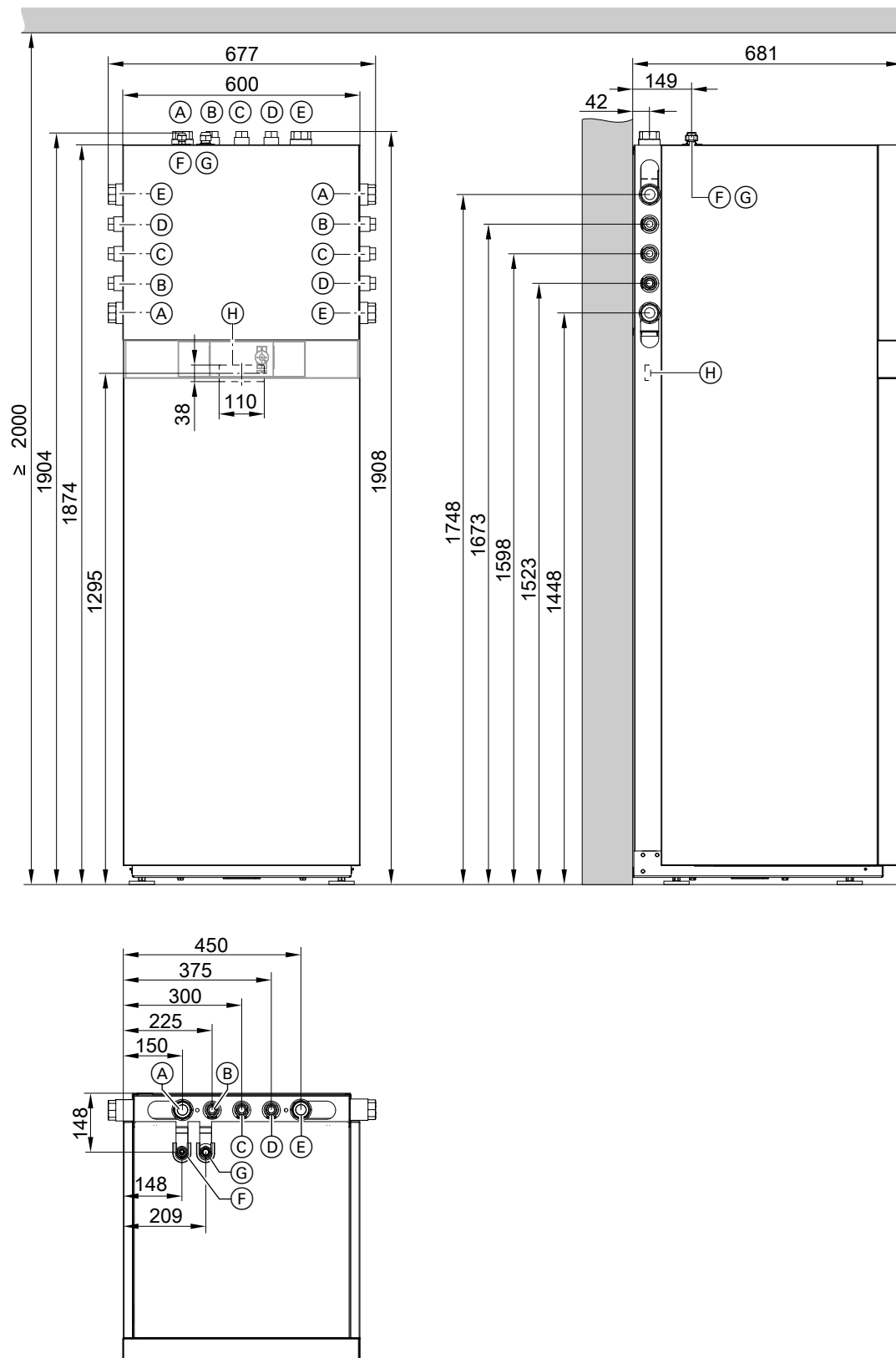


Fig. 1

- (A) Heating water return G 1 ¼ (female thread)
- (B) Cold water G ¾ (female thread)
- (C) DHW circulation G ¾ (female thread)
- (D) DHW G ¾ (female thread)
- (E) Heating water flow G 1 ¼ (female thread)

- (F) Liquid line: Pipe Ø 10 mm, thread UNF 5/8
- (G) Hot gas line: Pipe Ø 16 mm, thread UNF 7/8
- (H) Cable entry:
 - LV leads < 42 V
 - Power cables 400 V~/230 V~

Outdoor unit

Outdoor unit, types 221.C04 to C08

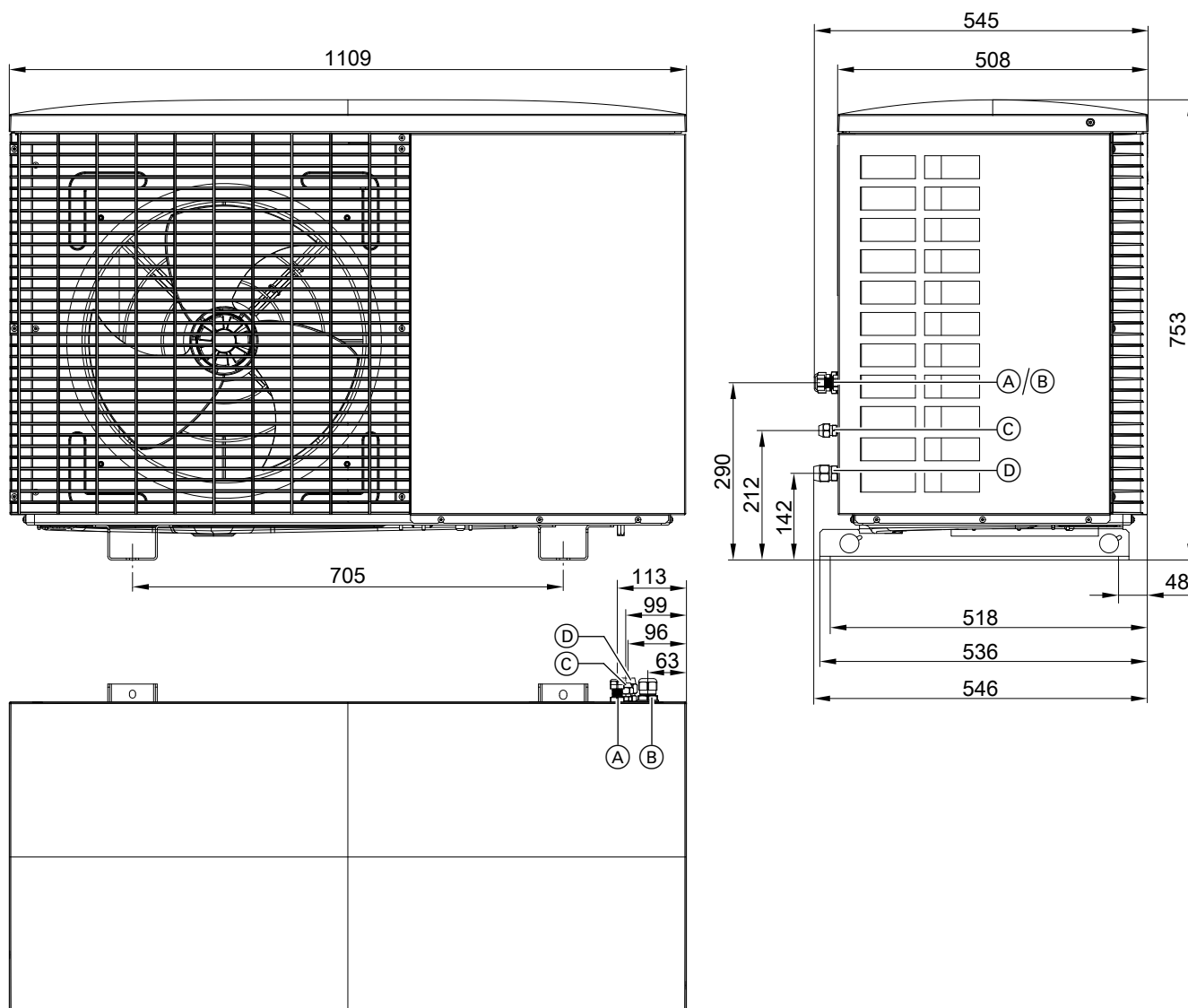


Fig. 2

- Ⓐ Cable entry for Modbus connecting cable, indoor/ outdoor unit
- Ⓑ Power cable entry
- Ⓒ Liquid line
 - 222.C04 to C06: UNF $\frac{7}{16}$ (reducer $\frac{5}{8} \times \frac{7}{16}$ in the standard delivery of the indoor unit)
 - 222.C08: UNF $\frac{5}{8}$
- Ⓓ Hot gas line
 - 222.C04 to C06: UNF $\frac{3}{4}$ (reducer $\frac{7}{8} \times \frac{3}{4}$ in the standard delivery of the indoor unit)
 - 222.C08: UNF $\frac{7}{8}$

Requirements for on-site connections (cont.)

Outdoor units, types 221.C10 to C16

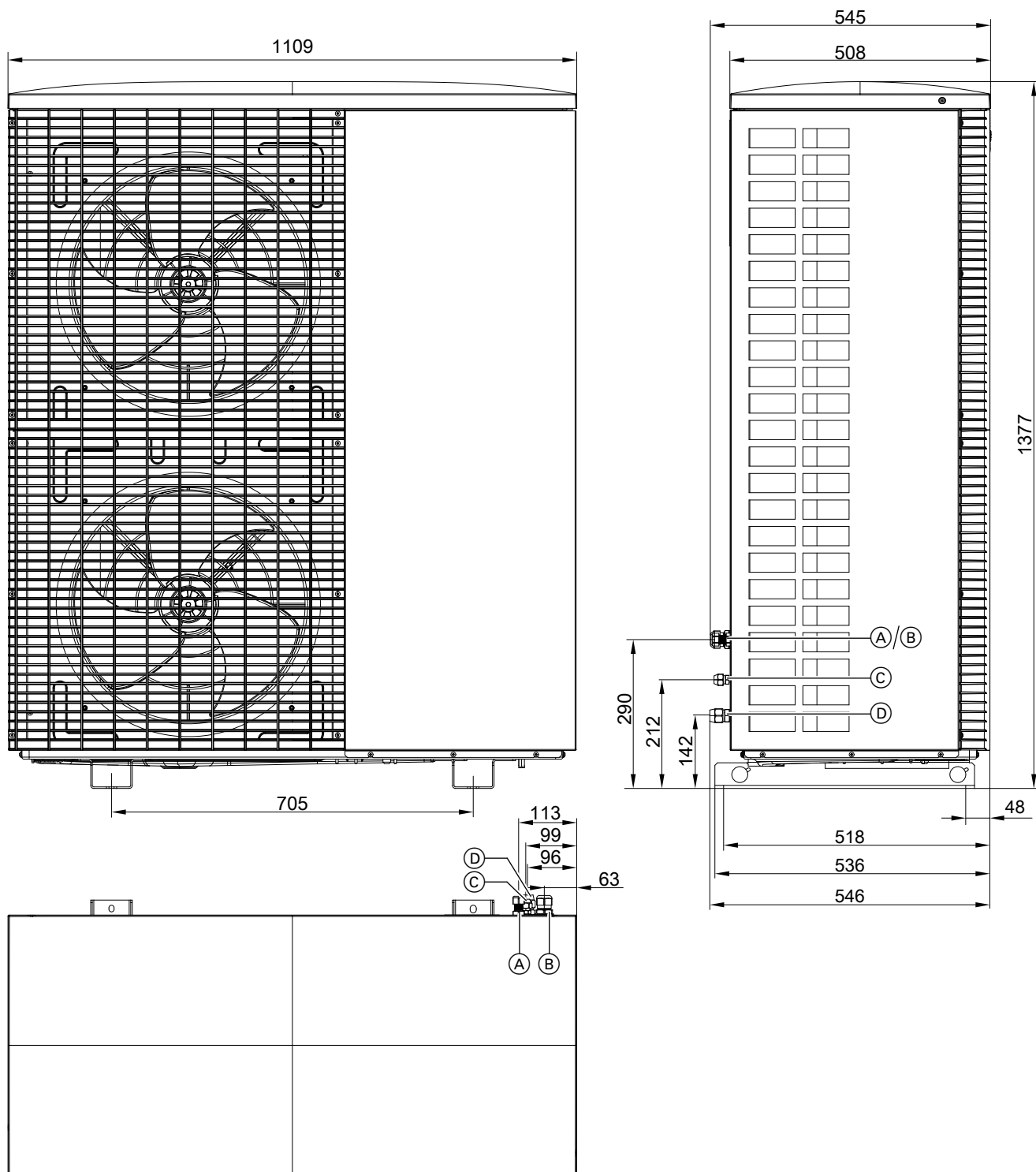


Fig. 3

- (A) Cable entry for indoor/outdoor unit Modbus connecting cable
- (B) Power cable entry
- (C) Liquid line UNF $\frac{5}{8}$
- (D) Hot gas line UNF $\frac{7}{8}$

Installing the outdoor unit

Installation information

Types of installation:

- Floorstanding installation with line entry above ground level
- Floorstanding installation with line entry below ground level
- Wall mounting



Technical guide

Floorstanding installation:

- Use supports for floorstanding installation (accessories).
- Where such supports cannot be used, install the outdoor unit freestanding on a solid base of at least 100 mm height.
- In difficult climatic circumstances (temperatures below zero, snow, humidity), we recommend installing the appliance on a plinth of approx. 300 mm height.
- Take account of the weight of the outdoor unit: see following table.

Wall mounting:

- Use the wall mounting bracket set (accessories).
- The wall must meet the structural requirements.

Siting:

- Never install with the discharge side facing the main wind direction.
- Provide wall outlets and protective pipes for the refrigerant lines and electrical cables without moulded parts or changes of direction.

Weather influences:

- Observe wind loads when installing the unit on sites exposed to the wind.
Where outdoor units are installed on a flat roof, considerable wind loads may occur, depending on the relevant wind load zone and height of the building. For such installation situations we recommend having the substructure sized by a design engineer in accordance with DIN 1991-1-4.
- Incorporate the outdoor unit into the lightning protection system.
- Consider the heat absorbed (heating mode) and heat emitted (cooling mode) by the appliance when designing weatherproofing measures or an enclosure.

Condensate:

- Ensure that the condensate drains off freely. Create a permanent gravel bed under the outdoor unit as a soakaway.
- In regions with prolonged cold seasons, provide an electric ribbon heater (accessories) for the condensate pan.

Insulation against structure-borne noise and vibrations between the building and outdoor unit:


- For line entry **above** ground level, fit pipe bends in the refrigerant lines for vibration compensation: see "Connecting the refrigerant lines".
- Route cables/leads between the indoor and outdoor units free of stress.
- Installation only on walls with a high weight per unit area ($> 250 \text{ kg/m}^2$); in other words not on lightweight walls, roof structures, etc.
- Anti-vibration components are included in the standard delivery of the brackets for wall mounting and floorstanding installation. Do not use additional anti-vibration mounts, springs, rubber mounts, etc.

Installing the outdoor unit (cont.)

Weight of outdoor units

Vitocal 222-S	Type	Weight in kg
230 V appliances	▪ AWBT-M	221.C04
	▪ AWBT-M-E-AC	221.C06
		221.C08
		221.C10
		221.C13
		221.C16
400 V appliances	▪ AWBT	221.C10
	▪ AWBT-E-AC	221.C13
		221.C16

Installation location

- Select a site with good air circulation, so that the cooled air can dissipate and be replaced by warm air.
 - Never install in the corners of rooms, 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.
 - Take the lengths of the refrigerant lines into account: see "Connecting the refrigerant lines".
 - 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**
- Never install next to or below bedroom windows.
 - 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".

Outdoor unit minimum clearances

Types 221.C04 to C08

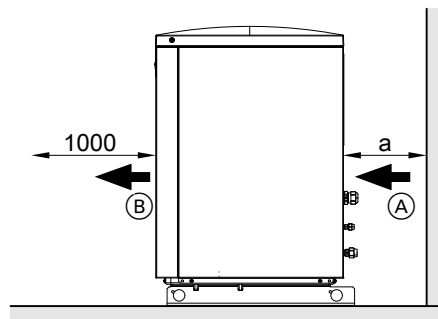
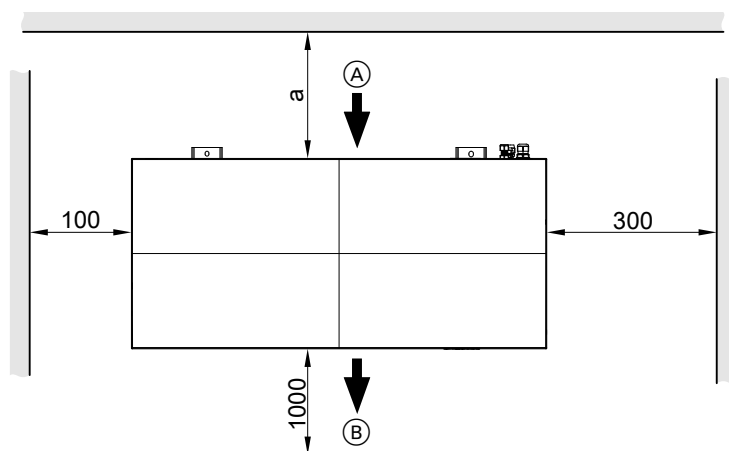


Fig. 4

- Ⓐ Air intake
- Ⓑ Air discharge
- a
 - Line entry above ground level:
≥ 200 mm
 - Line entry below ground level:
≥ 400 mm

Types 221.C10 to C16, 230 V~ and 400 V~

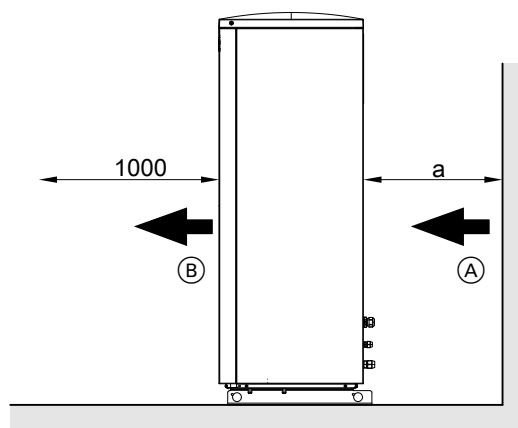
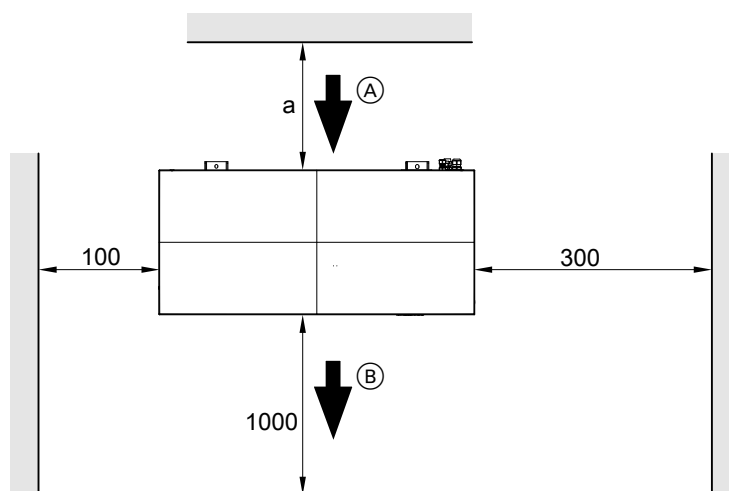


Fig. 5

- Ⓐ Air intake
- Ⓑ Air discharge
- a
 - Line entry above ground level:
≥ 200 mm
 - Line entry below ground level:
≥ 400 mm

Installing the outdoor unit (cont.)

Transport and siting



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.



Please note

If the compressor in the external unit is strongly tilted, lubricant will enter the refrigerant circuit and damage the appliance.

Max. tilting angle: 45°

Floorstanding installation

Foundations

Fit the floor supports on 2 horizontal foundation strips. 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. Follow the standard rules of building engineering.

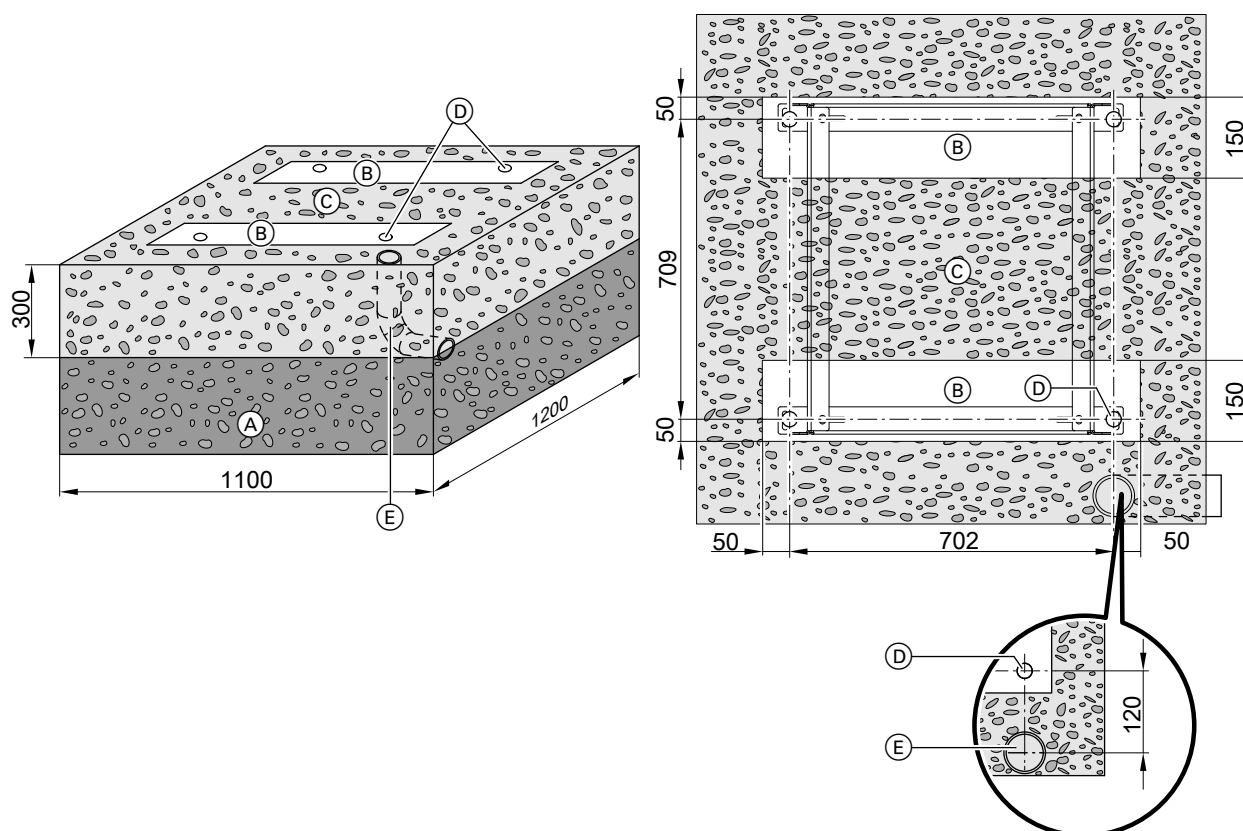


Fig. 6

- (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) Gravel bed as condensate soakaway

- (D) Fixing points for floorstanding installation supports
- (E) Only for line entry below ground level: DN 125 KG conduit with cover and 3 x 30° pipe bends; sealing of line entry with end collar

Floorstanding installation with support; line entry above ground level

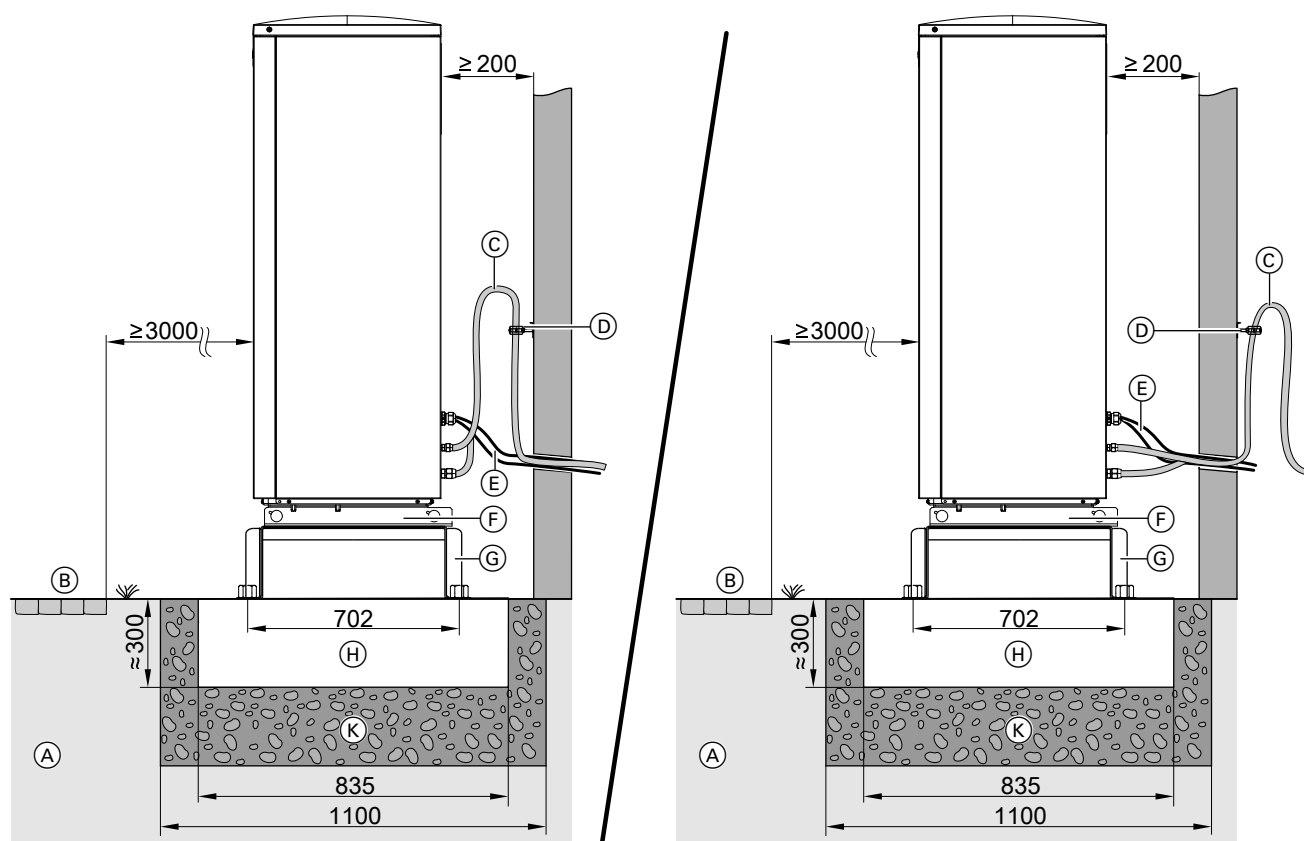


Fig. 7

- (A) Ground
- (B) Pathway, patio
- (C) Pipe bends for vibration compensation in refrigerant lines
- (D) Pipe clips with EPDM lining
- (E) Indoor/outdoor unit bus cable and outdoor unit power cable
- (F) Openings in the base plate for free drainage of condensate
- (G) Supports for floorstanding installation (accessories)
- (H) Foundation strip
- (K) Frost protection for foundations (compacted crushed stone, e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations

Information regarding vibration compensation

(pipe bends ©)

We recommend installing vibration bends, especially in pipes < 5 m.

Installing the outdoor unit (cont.)

Floorstanding installation with support; line entry below ground level

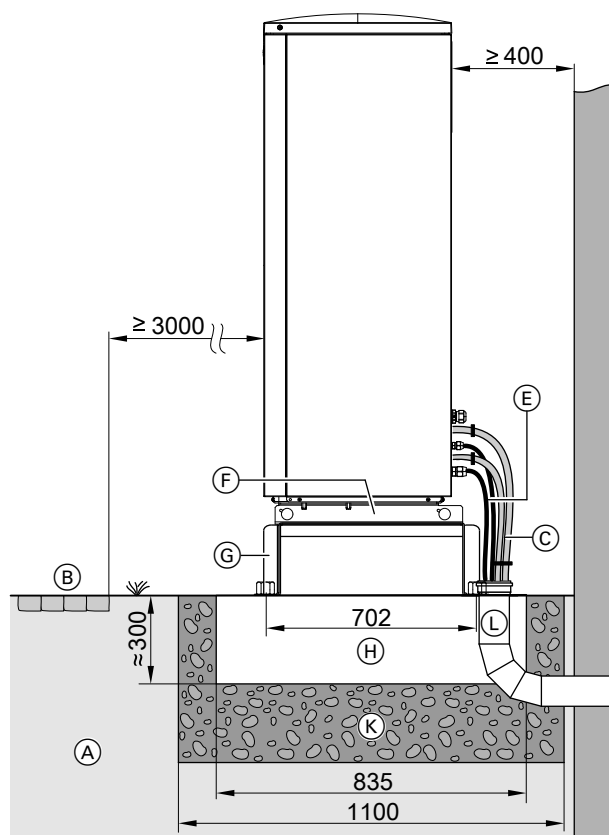


Fig. 8

- (A) Ground
- (B) Pathway, patio
- (C) Refrigerant lines
- (E) Indoor/outdoor unit bus cable and outdoor unit power cable
- (F) Openings in the base plate for free drainage of condensate
- (G) Supports for floorstanding installation (accessories)
- (H) Foundation strip
- (K) Frost protection for foundations (compacted crushed stone, e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations
- (L) DN 125 conduit with cover and 3 x 30° pipe bends; sealing of line entry with end collar

Installing an outdoor unit on foundations

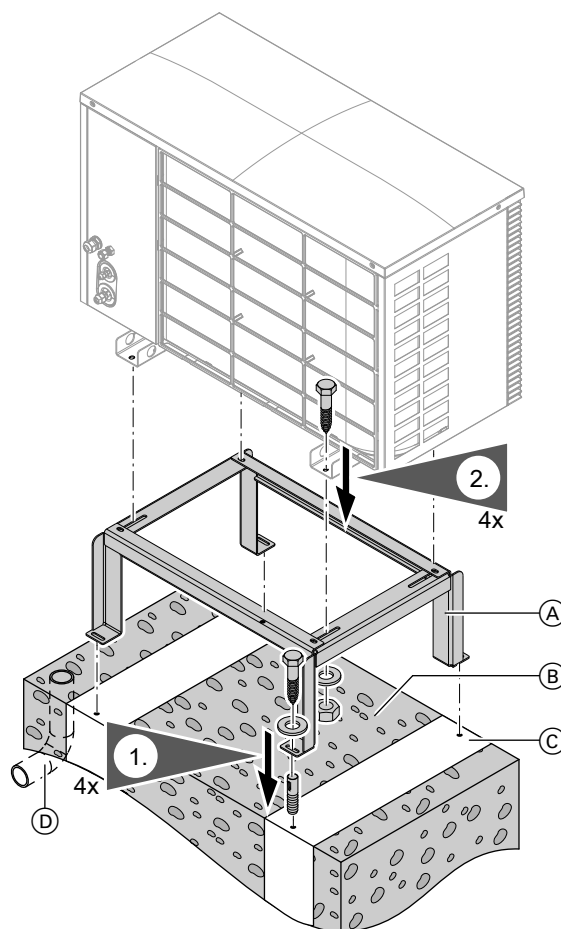


Fig. 9

- (A) Supports for floorstanding installation (accessories)
- (B) Gravel bed as condensate soakaway
- (C) Concrete foundations (see technical guide)
- (D) DN 100 KG conduit (only for line entry below ground level)

Note

We recommend letting condensate drain away **freely** (without a condensate pipe).

Wall mounting

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



Separate installation instructions

Wall mounting with bracket set

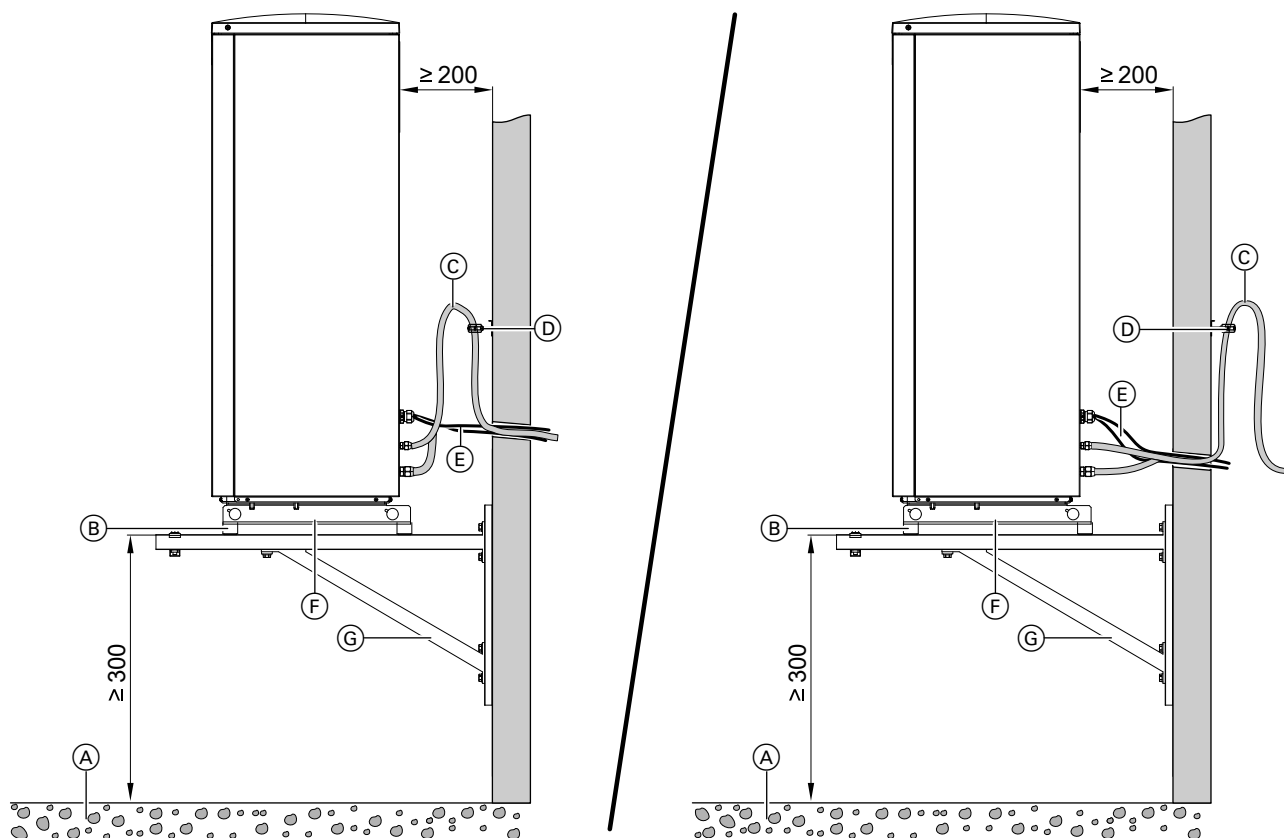


Fig. 10

- Ⓐ Gravel bed as condensate soakaway
- Ⓑ Anti-vibration mounts (standard delivery of bracket)
- Ⓒ Pipe bends for vibration compensation in refrigerant lines
- Ⓓ Pipe clips with EPDM lining

- Ⓔ Indoor/outdoor unit bus cable and outdoor unit power cable
- Ⓕ Openings in the base plate for free drainage of condensate
- Ⓖ Bracket for wall mounting (accessories)

Information regarding vibration compensation (pipe bends Ⓒ)

We recommend installing vibration bends, especially in pipes < 5 m.

Installing the outdoor unit (cont.)

Opening the wiring chamber

Opening the outdoor unit wiring chamber: Types 221.C04 to 221.C08

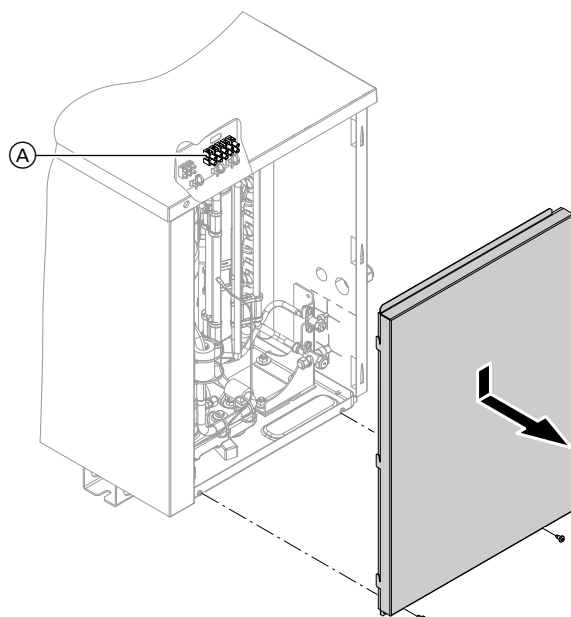


Fig. 11

- Ⓐ Wiring chamber:
- Bus connection to the indoor unit
 - Compressor power supply

Opening the outdoor unit wiring chamber: Types 221.C10 to 221.C16

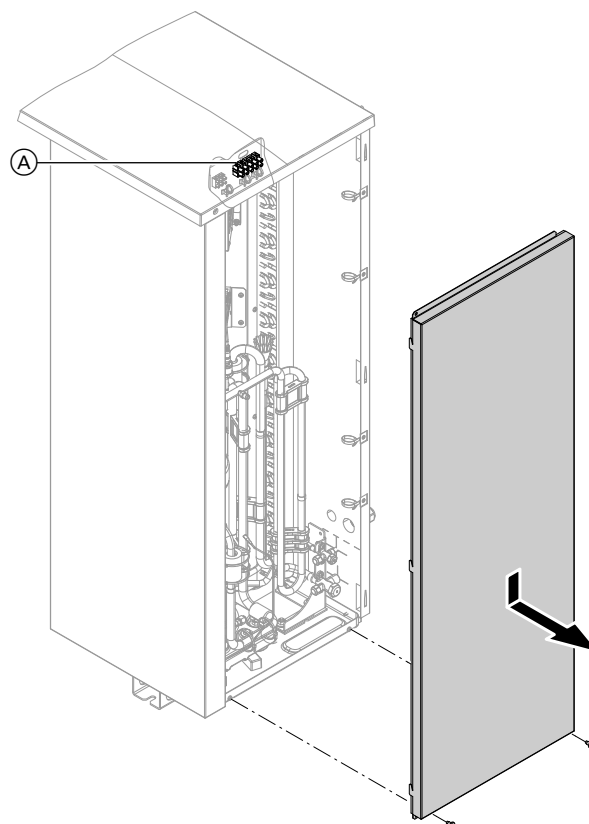


Fig. 12

- Ⓐ Wiring chamber:
- Bus connection to the indoor unit
 - Compressor power supply

Removing the transport brackets

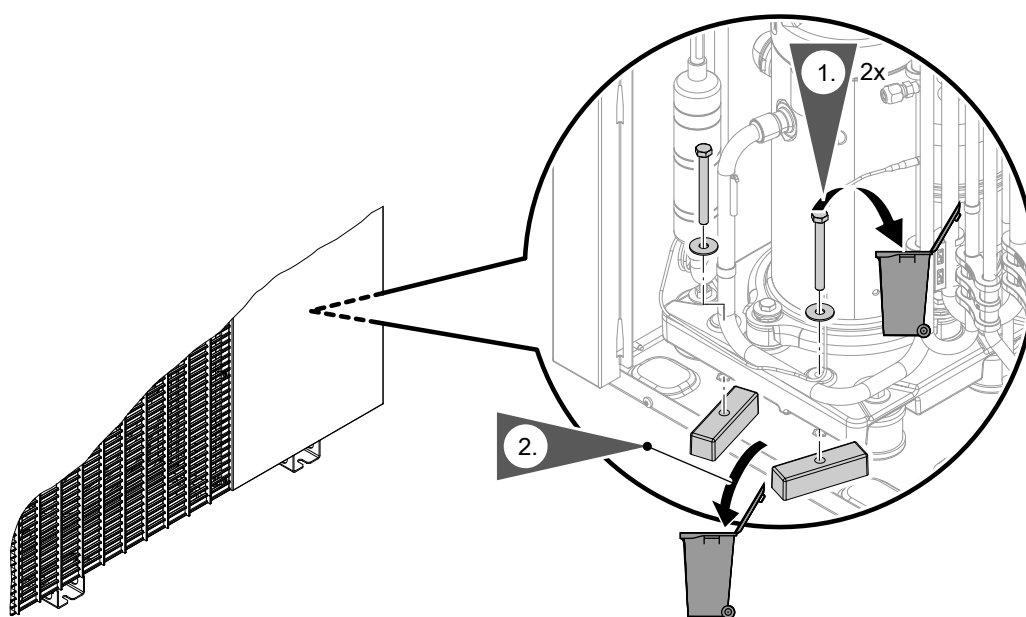


Fig. 13

Installing the indoor unit

Transport

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

Requirements for the installation room

- ! Please note**
Unfavourable ambient conditions 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 (corresponds to an absolute humidity of approx. 25 g water vapour/kg dry air)



Danger

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

- ! Please note**
Overloading the floor can result in damage to the building structure.
Observe the permissible floor load. Take account of the total weight of the appliance: See chapter "Pressure points".

Minimum room volume (to EN 378):

According to EN 378, the minimum volume of the installation room depends on the refrigerant charge and composition.

$$V_{\min} = \frac{m_{\max}}{G}$$

V_{\min} Minimum room volume in m³

m_{\max} Maximum refrigerant charge in kg

G Practical limit to EN 378, subject to the composition of the refrigerant.
For R410A: 0.44 kg/m³

Note

If several heat pumps are to be installed in one room, the minimum room volume must be calculated according to the appliance with the greatest refrigerant charge.

Vitocal 222-S	Type	Minimum room volume in m ³
230 V appliances	▪ AWBT-M 221.C04	4.1
	▪ AWBT-M-E 221.C06	4.1
	▪ AWBT-M-E-AC 221.C08	5.5
	221.C10	8.2
	221.C13	8.2
	221.C16	8.2
400 V appliances	▪ AWBT 221.C10	8.2
	▪ AWBT-E 221.C13	8.2
	▪ AWBT-E-AC 221.C16	8.2

Note

For line lengths > 12 m, add extra refrigerant. The minimum room volume must be recalculated based on the additional charge.

Installing the indoor unit (cont.)

Minimum clearances

Secondary circuit connections to the left

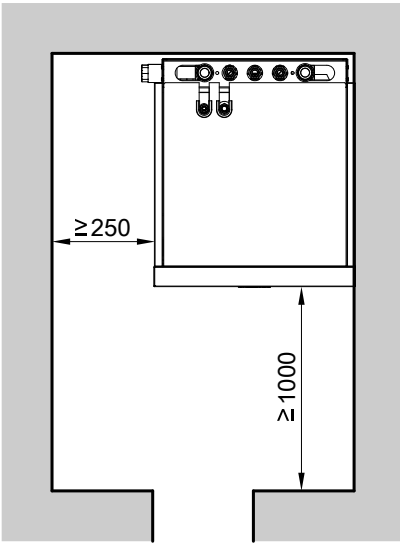


Fig. 14

Secondary circuit connections at the top

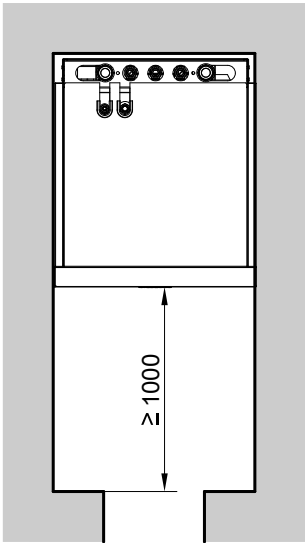


Fig. 16

Secondary circuit connections to the right

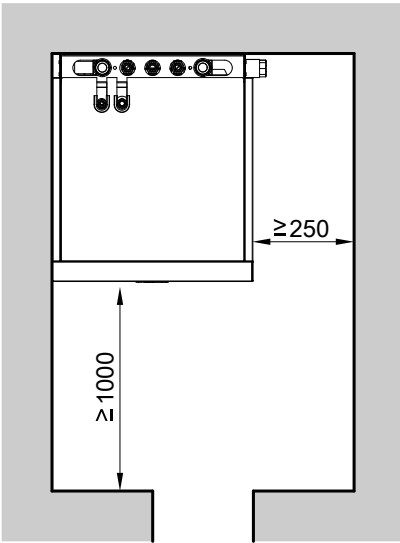


Fig. 15

Installing the indoor unit (cont.)

Minimum room height

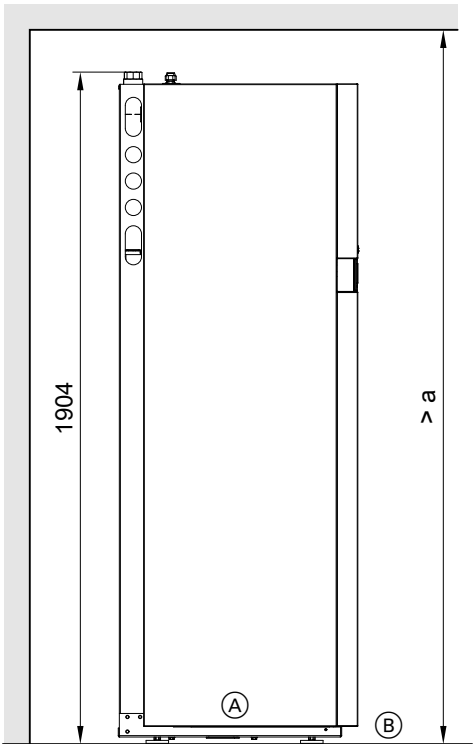


Fig. 17

- (A) Indoor unit
- (B) Finished floor level or top edge of platform for unfinished floors

Minimum room height *a* depends on the hydraulic connection set used.

Hydraulic connection set	Minimum room height <i>a</i> in mm
▪ For installation on finished walls, for upward connection	2100
▪ For installation to the left or right on finished walls	2000

Note
If applicable, remove the packaging box upwards before installation.

Pressure points

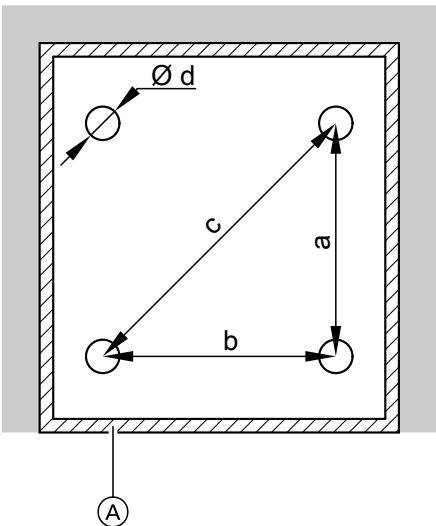


Fig. 18

- (A) Partition joint with edge insulation strip as part of the floor construction
- a 439 mm
- b 506 mm
- c 670 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.*

Installing the indoor unit (cont.)

Total weight with filled DHW cylinder

Vitocal 222-S	Type	Total weight in kg
230 V appliances	▪ AWBT-M	221.C04
	▪ AWBT-M-E	221.C06
	▪ AWBT-M-E-AC	221.C08
		221.C10
		221.C13
		221.C16
400 V appliances	▪ AWBT	221.C10
	▪ AWBT-E	221.C13
	▪ AWBT-E-AC	221.C16

Each pressure point (each with an area of 3217 mm²) is subject to a load of up to 96 kg.

Connecting the refrigerant lines

The outdoor unit is pre-charged with refrigerant R410A.

Oil lift bends

Oil lift bends guarantee that the refrigerant oil is reliably conveyed back to the compressor.

- ! Please note**
Errors in the design and installation of oil lift bends can result in appliance damage.

In the following cases, fit oil lift bends in the vertical hot gas line:

- In heating mode, if the indoor unit is installed higher than the outdoor unit.
 - In cooling mode, if the indoor unit is installed lower than the outdoor unit.
- Distance between the oil lift bends approx. 5 m.

Indoor unit above outdoor unit

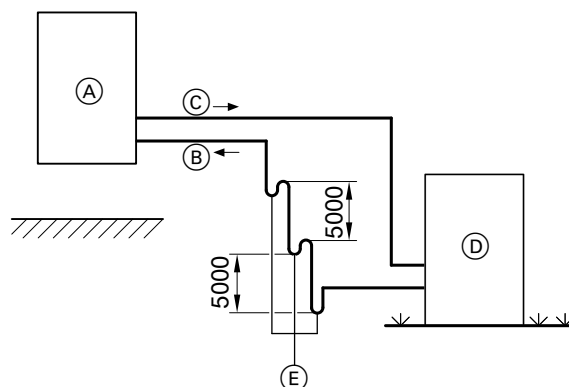


Fig. 19 Example for heating mode: With oil lift bends

- Ⓐ Indoor unit
- Ⓑ Hot gas line (hot gas)
- Ⓒ Liquid line (liquid)
- Ⓓ Outdoor unit
- Ⓔ Oil lift bends

Connecting the refrigerant lines (cont.)

Indoor unit below outdoor unit

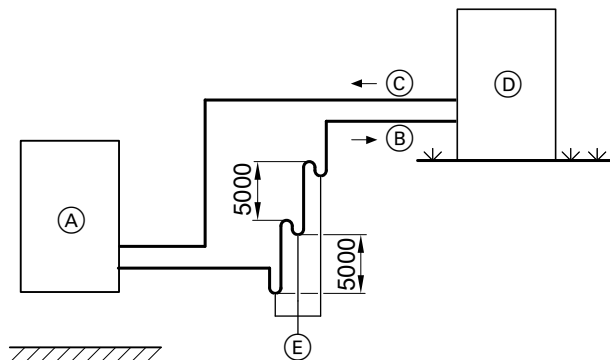


Fig. 20 Example of cooling mode: With oil lift bends

- (A) Indoor unit
- (B) Hot gas line (suction gas)
- (C) Liquid line (LPG)
- (D) Outdoor unit
- (E) Oil lift bends

Wall outlet

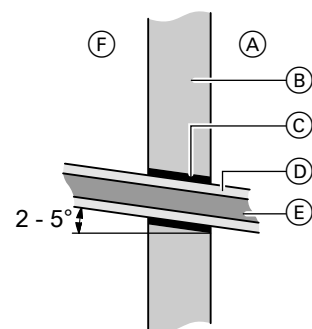


Fig. 21

- (A) Outside the building
- (B) Wall
- (C) PVC or PE pipes, etc.
- (D) Closed cell diffusion-proof thermal insulation
- (E) Refrigerant lines
- (F) Inside the building

The indoor and outdoor units are connected to the refrigerant lines and the connecting cable. Wall outlets are required for this purpose. With these wall outlets, be aware of load bearing sections, lintels, damp proofing elements (e.g. vapour barriers), etc.

Note

In order to prevent structure-borne noise transmission, the refrigerant lines must not come into contact with PVC or PE pipes.

Routing the refrigerant lines

- **Max. height differential, indoor unit – outdoor unit:**
15 m
- **Min. line length:**
3 m
- **Max. line length:**
 - Heating mode**
 - All types: 30 m
 - Cooling mode**
 - 221.C08 and 221.C08: 25 m
 - All other types: 30 m

Note

No additional charging is required for line lengths up to 12 m: See page 63.

Connecting the refrigerant lines (cont.)

Insulation against noise and vibrations for line entry above ground level

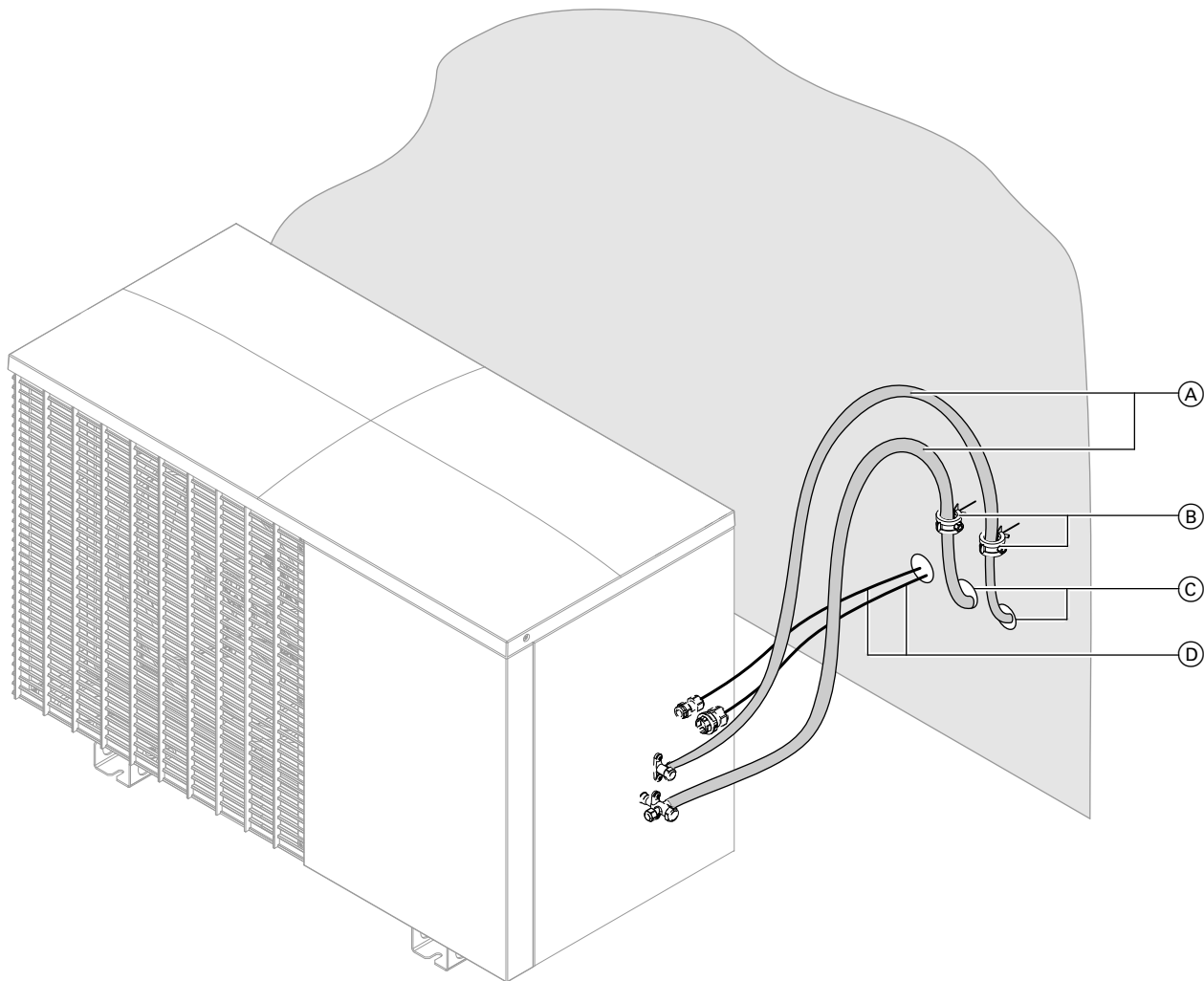


Fig. 22

- (A) Pipe bends for vibration compensation
- (B) Pipe clips with EPDM lining

- (C) Line entry, e.g. KG conduit with thermal insulation
- (D) Indoor/outdoor unit bus cable and outdoor unit power cable

Observe the following during installation:

- Wall outlet:
 - No wall outlet where load bearing sections, lintels, damp proofing elements (e.g. vapour barriers), etc. are located.
 - No structure-borne noise transmission, i.e. avoid contact between metal (refrigerant line) and the building structure.
- Routing the cables and lines:
 - Route cables and refrigerant lines separately.
 - Route the refrigerant lines with pipe bends. This reduces the transmission of vibrations to the pipe wall.
 - Mount pipe clips with soft elastic lining (EPDM) directly downstream of the pipe bends.
- Securing the lines:
 - Secure the lines using only pipe clips with soft elastic insulating lining (EPDM).
 - Only mount pipe clips on components with a mass per unit area $\geq 250 \text{ kg/m}^2$.
 - Do not install the lines on partition walls or ceilings to rooms that require a low noise level (e.g. bedrooms).
- Insulate all lines.

Connection to the outdoor unit

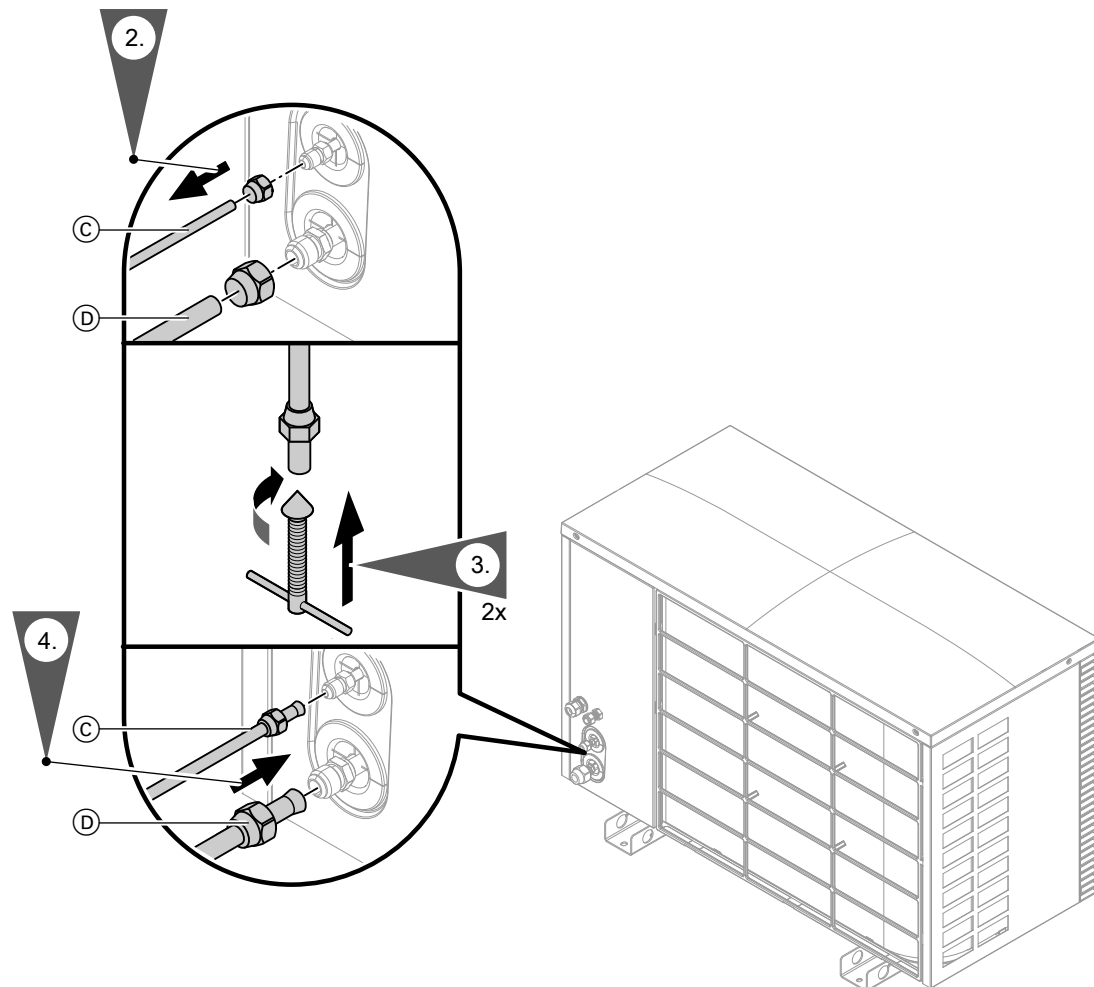


Fig. 23

- © Liquid line
- Ⓓ Hot gas line

1. Remove the side cover: See page 19.
2. Undo the nuts from connections © (liquid line) and Ⓓ (hot gas line) of the refrigerant lines.
Types 221.C04 and 221.C06:
Slide the nuts onto the refrigerant lines prepared on site.
Types 221.C08 to 221.C16:
Replace nuts with union nuts supplied (indoor unit):
 - 5/8 UNF for liquid line
 - 7/8 UNF for hot gas line
3. Flare the pipe ends of the refrigerant lines.
or
Brazing the solder connection of the Euro flanged adaptors (accessories) using shielding gas.
4. Secure the refrigerant lines. Tighten the nuts with the torques shown in the following table.
5. Apply thermal and vapour diffusion-proof insulation to the refrigerant lines.



Please note

Contamination (e.g. metal swarf) or moisture in the refrigerant lines will cause the appliance to malfunction.
Point the pipe openings downwards or temporarily plug them.

Connecting the refrigerant lines (cont.)

Torque for refrigerant lines

Type AWBT(-M)/ AWBT(-M)-E-AC	Line	Connection to the outdoor unit	Torque in Nm
221.C04	Liquid line Ø 6 mm	$\frac{7}{16}$ UNF	14 to 18
221.C06	Hot gas line Ø 12 mm	$\frac{3}{4}$ UNF	50 to 62
221.C08	Liquid line Ø 10 mm	$\frac{5}{8}$ UNF	33 to 42
221.C10	Hot gas line Ø 16 mm	$\frac{7}{8}$ UNF	63 to 77
221.C13			
221.C16			

Connection to the indoor unit

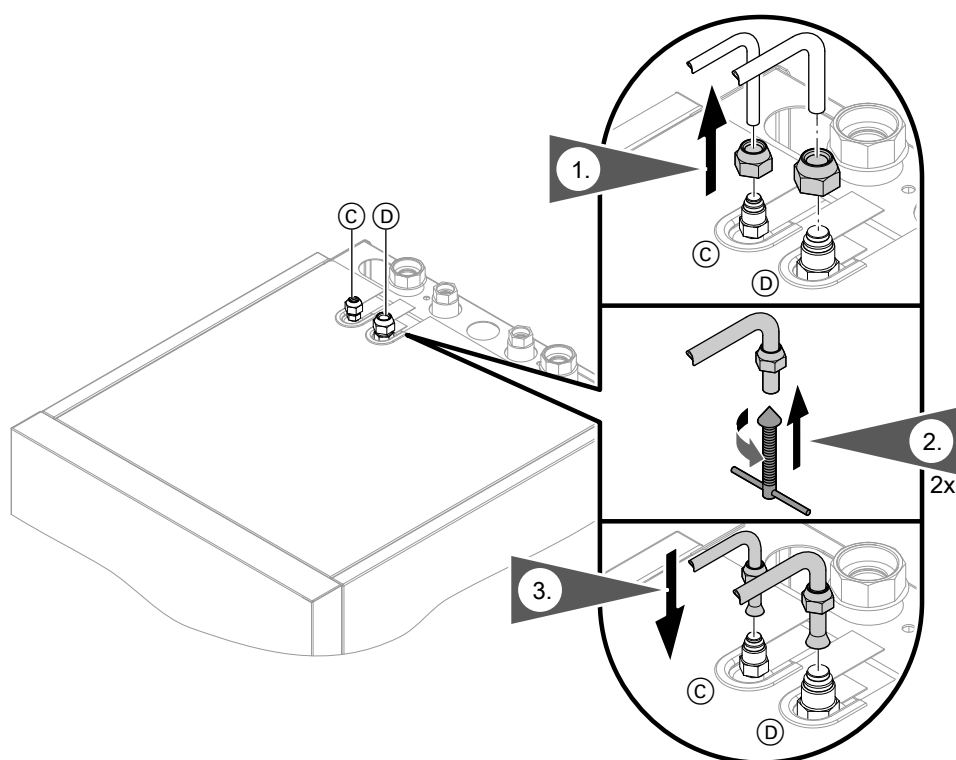


Fig. 24

- Ⓒ Liquid line
- Ⓓ Hot gas line

Note

The refrigerant lines of the indoor unit are filled with nitrogen; positive pressure 1 to 2 bar (0.1 to 0.2 MPa).

1. Undo the nuts from connections Ⓒ (liquid line) and Ⓓ (hot gas line) of the refrigerant lines.

Types 221.C04 and 221.C06:

Replace nuts with union nuts supplied (indoor unit):

- $\frac{5}{8}$ UNF for liquid line
- $\frac{7}{8}$ UNF for hot gas line

Connect supplied reducer with copper seal ring.

Types 221.C08 to 221.C16:

Slide the nuts onto the relevant refrigerant lines from the outdoor unit.



Please note

Contamination (e.g. metal swarf) or moisture in the refrigerant lines will cause the appliance to malfunction. Point the pipe openings downwards or temporarily plug them.

Installation sequence

Connecting the refrigerant lines (cont.)

2. Flare the pipe ends of the refrigerant lines.
or
Braze the solder connection of the Euro flanged adaptors (accessories) using shielding gas.
3. Secure the refrigerant lines. Tighten the nuts with the torques shown in the following table.
4. Apply thermal and vapour diffusion-proof insulation to the refrigerant lines.

Torque for refrigerant lines

Type AWBT(-M), AWBT(-M)-E-AC	Line	Connection to the outdoor unit	Torque in Nm
221.C04 221.C06	Liquid line Ø 6 mm	$\frac{5}{8}$ UNF with reducer	33 to 42
		$\frac{5}{8} \times \frac{7}{16}$	14 to 18
	Hot gas line Ø 12 mm	$\frac{7}{8}$ UNF with reducer	63 to 77
		$\frac{7}{8} \times \frac{3}{4}$	50 to 62
221.C08 221.C10 221.C13 221.C16	Liquid line Ø 10 mm	$\frac{5}{8}$ UNF	33 to 42
	Hot gas line Ø 16 mm	$\frac{7}{8}$ UNF	63 to 77

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 under-floor heating systems.
- Ensure the minimum flow rate, e.g. by means of an overflow valve: See "Specification".

Connecting the secondary circuit (cont.)

Preparing the connections on the DHW side

For connecting the DHW side, observe DIN 1988 and DIN 4753 (CH: SVGW regulations).

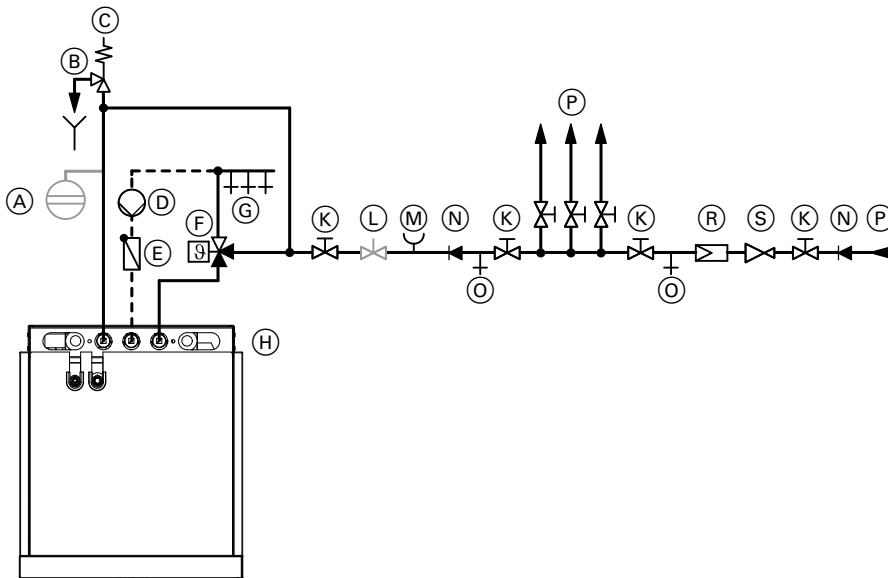


Fig. 25

- | | |
|---|-------------------------------------|
| (A) Expansion vessel, suitable for drinking water | (K) Shut-off valve |
| (B) Visible discharge pipe outlet point (tundish) | (L) Flow regulating valve |
| (C) Safety valve | (M) Pressure gauge connection |
| (D) DHW circulation pump | (N) Non-return valve/pipe separator |
| (E) Spring-loaded check valve | (O) Drain valve |
| (F) Automatic thermostatic mixing valve | (P) Cold water |
| (G) DHW | (R) Drinking water filter |
| (H) Heat pump terminal area (plan view) | (S) Pressure reducer |

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.)

Connecting the secondary side

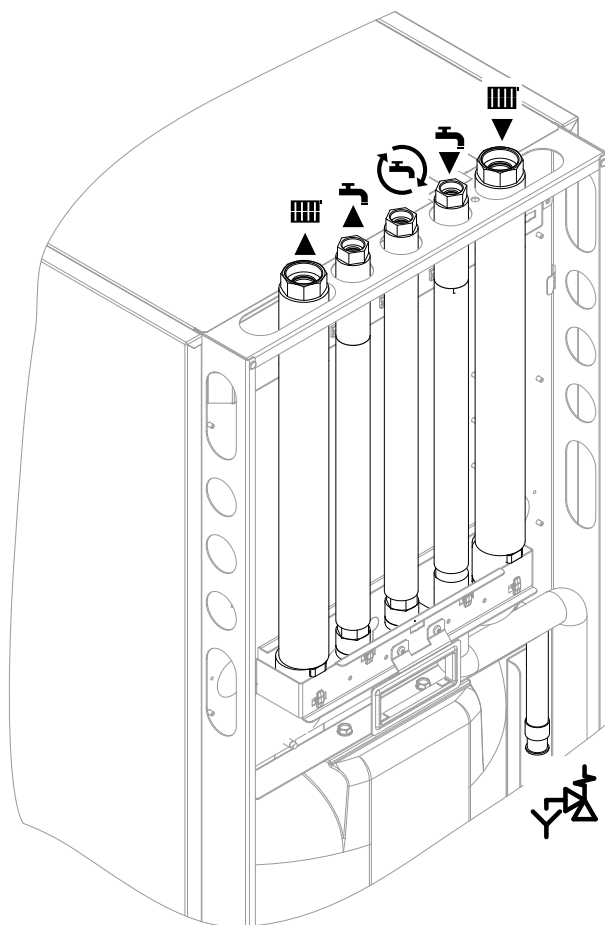



Fig. 26

Symbol	Meaning	Connection
	Heating water flow	G 1 1/4
	DHW	G 3/4
	DHW circulation	G 3/4
	Cold water	G 3/4
	Heating water return	G 1 1/4
	Safety valve drain hose	—

1. Connect the safety valve drain hose  to the public sewage system with a fall and a pipe vent.
2. Connect the "hydraulic connection set, heating circuit for installation on finished walls" (required accessories) to the heat pump.



Separate installation instructions

Note

If the DHW circulation pipe is not required, tightly seal the connection to the heat pump.

3. Only for systems with 2 heating circuits and without heating water buffer cylinder:
For the heating circuit with mixer, fit the "installation kit with mixer" (accessories) in the heat pump.



Separate installation instructions

4. Connect the hydraulic lines to the heat pump.



Please note

Mechanically loaded hydraulic connections lead to leaks, vibrations and appliance damage.
Connect on-site lines so that they are free of load and torque stress.

5. Thoroughly flush the heating system.

6. Check the internal and on-site hydraulic connections for leaks.



Please note

Leaking hydraulic connections lead to appliance damage.
In the event of leaks, drain off liquid via the drain valve. Check the seating of seal rings.
Always replace displaced seal rings.

Note

The secondary circuit air vent valve is located inside the appliance. To vent, connect the hose to the secondary circuit air vent valve and route outwards.

Observe additional information regarding filling and venting: See "Filling and venting the secondary side".

7. Thermally insulate lines inside the building. For heat pumps with a cooling function, use thermal and vapour diffusion-proof insulation.

Aligning the appliance

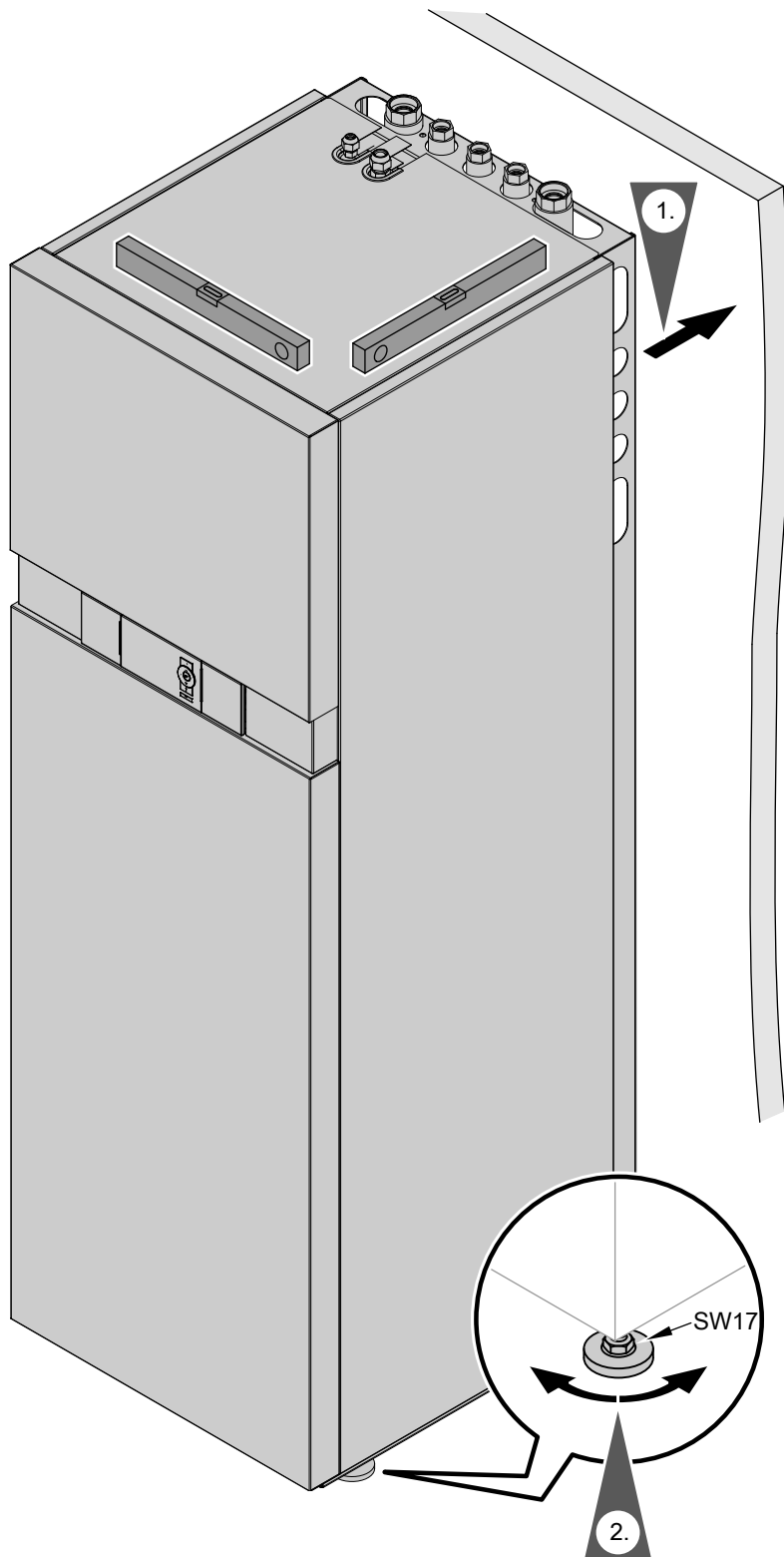


Fig. 27

Type AWBT(-M)-E-AC only: Connecting the cooling circuit

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

Type AWBT(-M)-E-AC only: Connecting the cooling circuit (cont.)

Requirements for the contact humidistat:

- Electrical connection, subject to the type of contact humidistat:
 - 230 V~, 0.5 A:
Connection to X3.8/3.9 on the luster terminals
 - 24 V–:
Connection to F11 on the controller and sensor PCB
- Installation inside the room to be cooled at the cooling water flow (remove thermal insulation if required)
- If several rooms with different relative humidity levels are part of the cooling circuit, fit and connect several contact humidistats in series:
Design the switching contacts as N/C contacts.

Removing the front panels

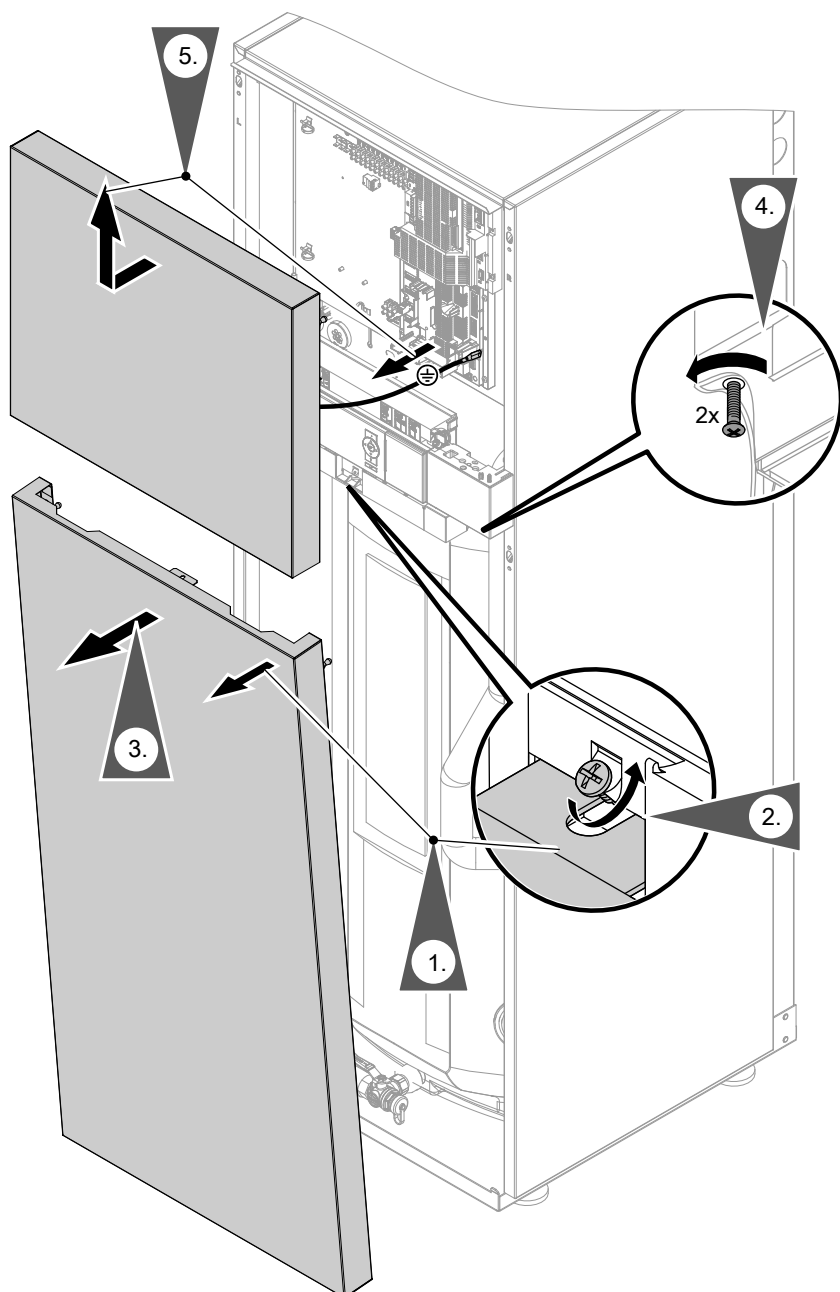


Fig. 28

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.

Note

Make all connections on the control unit panel (see page 38) with **flexible** cables to ensure that it can be placed in the service position (see page 84).



Danger

Damaged wiring insulation wiring 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 drifting of wires into the adjacent voltage area:

- Route LV leads < 42 V separately from cables > 42 V/230 V~/400 V~ and secure with cable ties.
- Only strip the minimum of insulation from cables as close as possible to the terminals and bundle tightly to the corresponding terminals.
- If 2 components are connected to the same terminal, press both cores together in a **single** wire ferrule.

Cable lengths in the indoor/outdoor unit

Cables		Indoor unit	Outdoor unit, types	
			221.C04 to C08	221.C10 to C16
Power cables	Heat pump control unit 230 V~	1.5 m	—	—
	Compressor 230 V~/400 V~	—	1.2 m	1.9 m
Other connecting cables	230 V~, e.g. for circulation pumps	1.5 m	—	—
	< 42 V, e.g. for sensors	1.1 m	—	—
Indoor/outdoor unit bus cable (flexible data cable)	Modbus	1.1 m	1.2 m	1.9 m

Recommended flexible power cables

Indoor unit

Power supply		Cable	Max. cable length
Heat pump control unit 230 V~	Without power-OFF	3 x 1.5 mm ²	
	With power-OFF	5 x 1.5 mm ²	
Instantaneous heating water heater	400 V~	5 x 2.5 mm ²	25 m
	230 V~	7 x 2.5 mm ²	25 m

Electrical connection (cont.)**Outdoor units**

Vitocal 222-S	Type		Cable	Max. cable length
230 V appliances	▪ AWBT-M	221.C04	3 x 2.5 mm ²	29 m
	▪ AWBT-M-E	221.C06	3 x 2.5 mm ²	29 m
	▪ AWBT-M-E-AC	221.C08	3 x 2.5 mm ²	29 m
		221.C10	3 x 2.5 mm ²	20 m
			or	
			3 x 4.0 mm ²	32 m
		221.C13	3 x 2.5 mm ²	20 m
			or	
			3 x 4.0 mm ²	32 m
		221.C16	3 x 2.5 mm ²	20 m
			or	
			3 x 4.0 mm ²	32 m
400 V appliances	▪ AWBT	221.C10	5 x 2.5 mm ²	30 m
	▪ AWBT-E	221.C13	5 x 2.5 mm ²	30 m
	▪ AWBT-E-AC	221.C16	5 x 2.5 mm ²	30 m

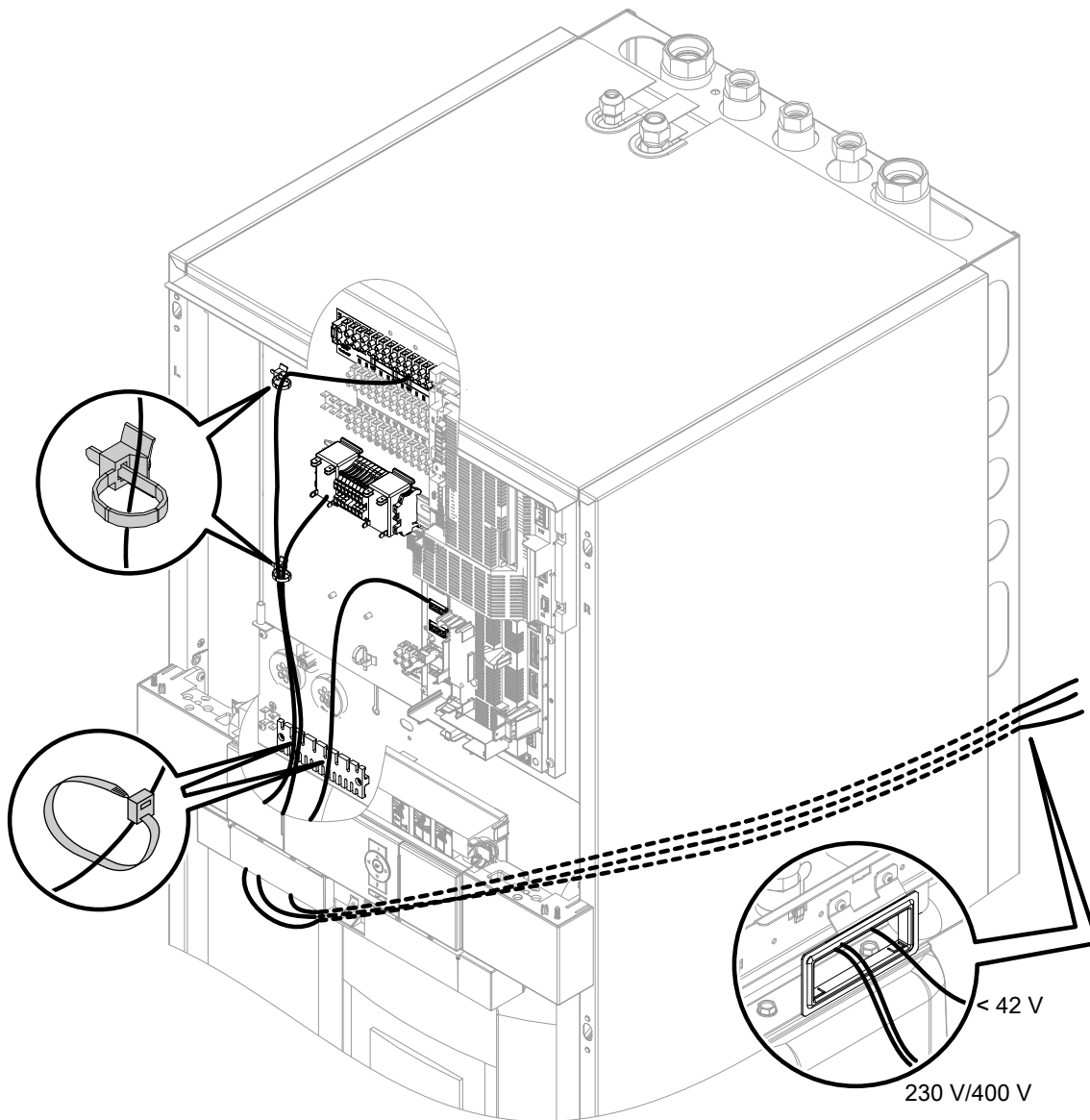
Electrical connection (cont.)**Indoor unit: Routing cables to the wiring chamber**

Fig. 29

Connecting the Vitoconnect (accessories)

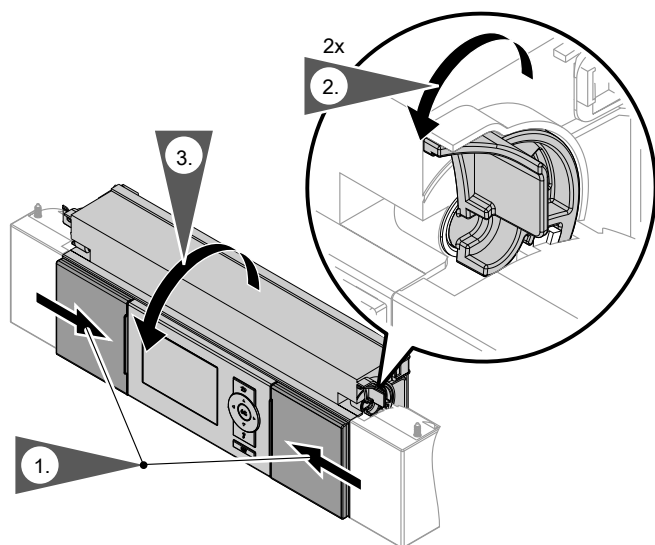


Fig. 30

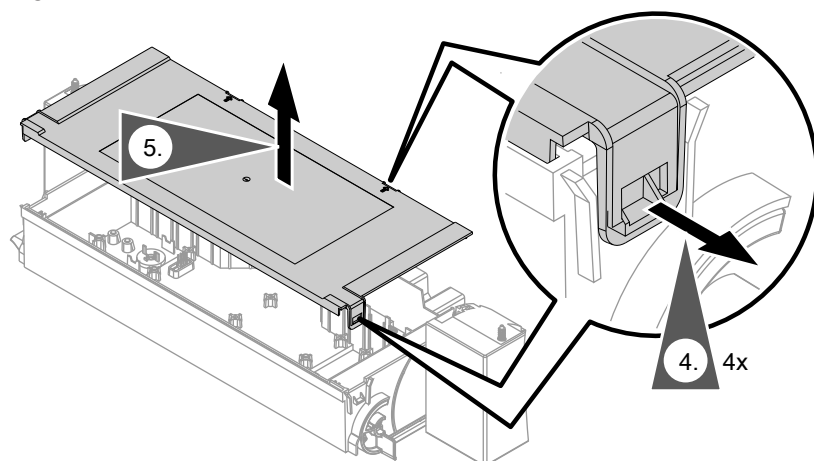
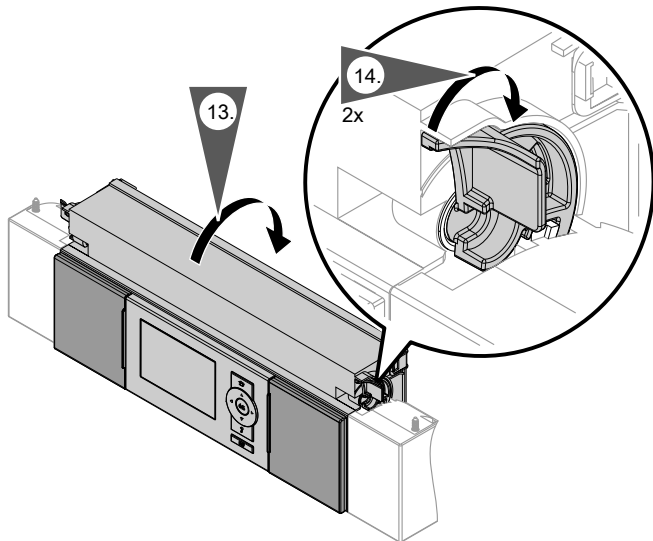
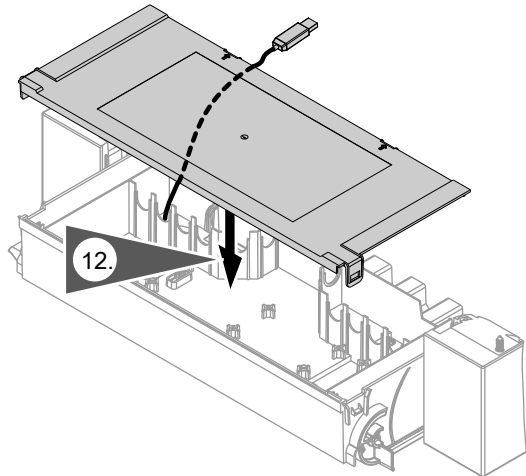
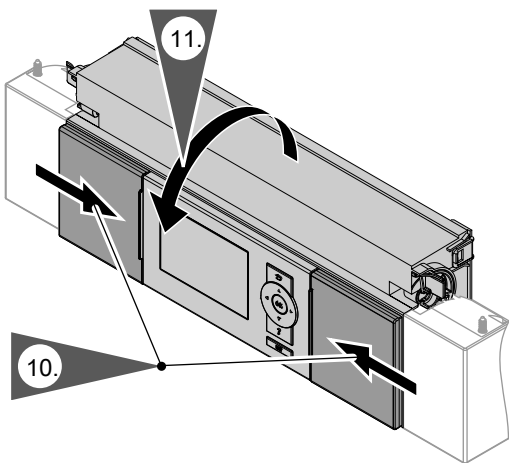
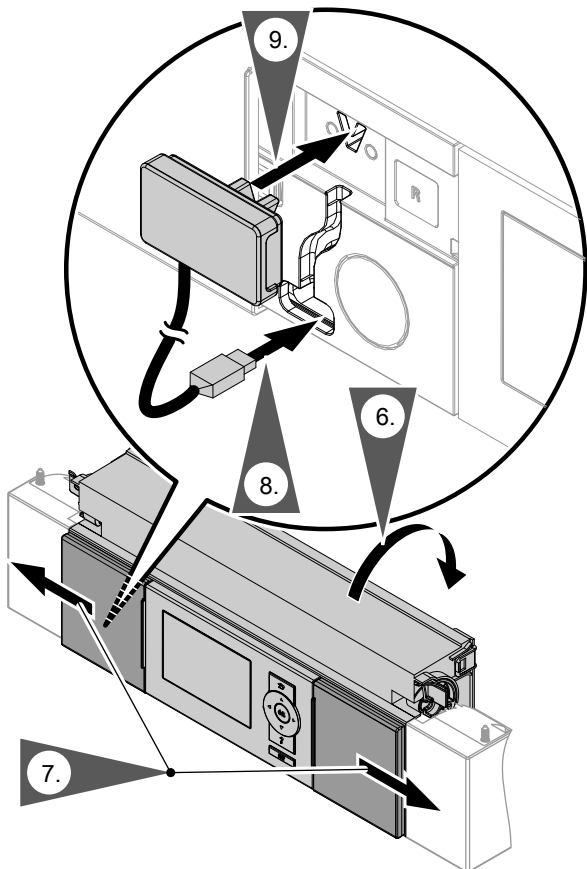


Fig. 31

Electrical connection (cont.)



Indoor unit: Overview of connections

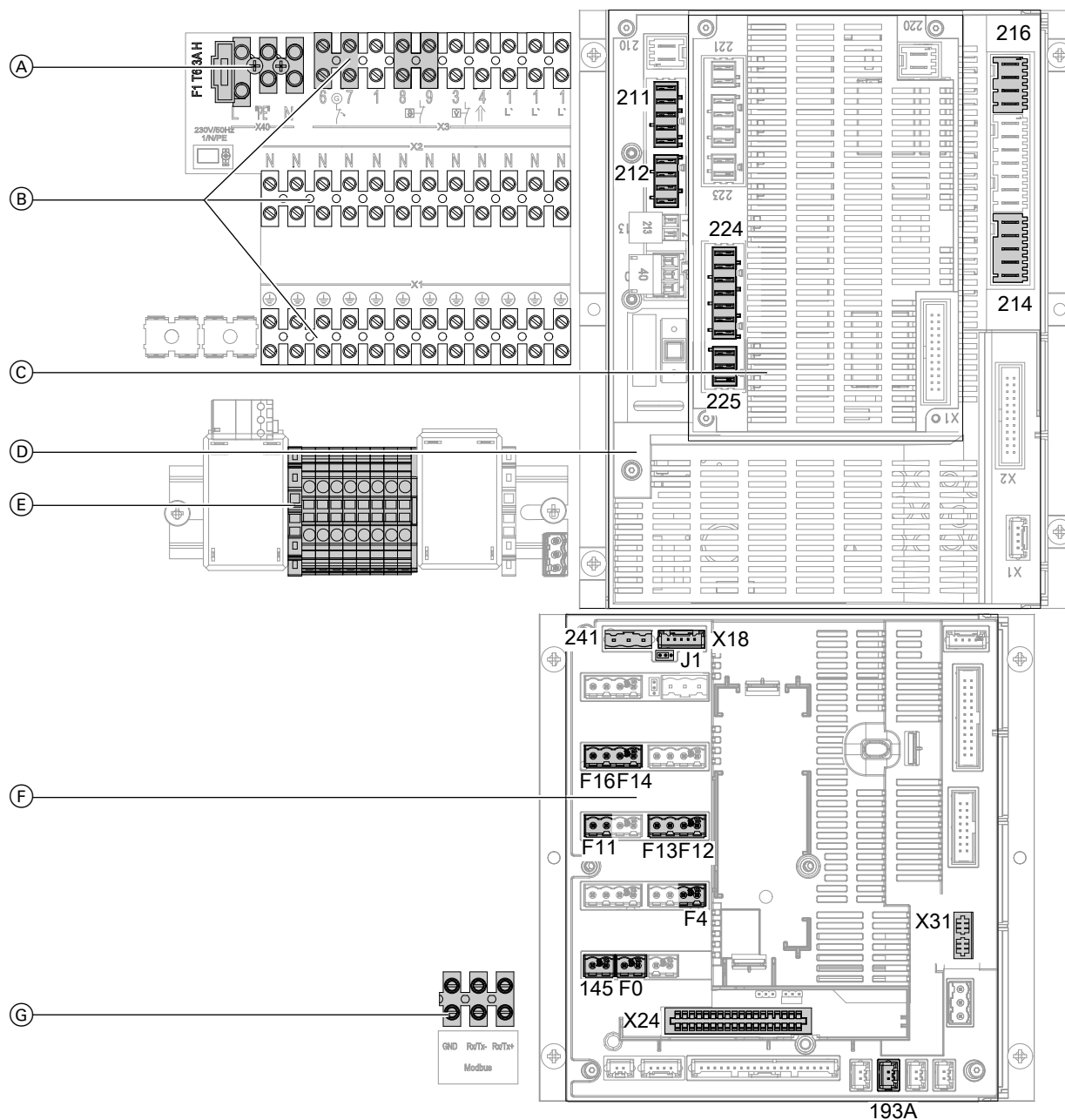


Fig. 36

- (A) Power supply 230 V~: See page 50.
F1 Fuse 6.3 A (slow)
- (B) Luster terminals: See page 43.
X1 Terminals for earth conductors of **all** associated system components
X2 Terminals for neutral conductors of **all** associated system components
- (C) Expansion PCB on main PCB: See page 41.
- (D) Main PCB: See page 39.
F3 Fuse 6.3 A (slow)
- (E) If available:
Control module and power supply for instantaneous heating water heater: See page 52 onwards.
- (F) Controller and sensor PCB: See page 44.
- (G) Connection for bus cable to outdoor unit (Modbus)

Electrical connection (cont.)




Indoor unit: Main PCB (230 V~ components)

Information regarding the connection values


- The specified output is the recommended connected load.
- Total output of all components connected directly to the heat pump control unit (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.

Set the required parameters during commissioning:
See page 73 onwards.

Plug 211

Terminals	Function	Explanation
211.2  1.	Secondary pump	<ul style="list-style-type: none"> ▪ In systems without a heating water buffer cylinder, no other heating circuit pump is required: See terminal 212.2. ▪ Connect a temperature limiter to restrict the maximum temperature for underfloor heating circuits (if installed) in series. <p>Connection values</p> <ul style="list-style-type: none"> ▪ Output: 140 W ▪ Voltage: 230 V~ ▪ Max. switching current: 4(2) A
211.3 	Control of instantaneous heating water heater, stage 1	<p>Connection values</p> <ul style="list-style-type: none"> ▪ Output: 10 W ▪ Voltage: 230 V~ ▪ Max. switching current: 4(2) A
211.5  AC	Type AWBT(-M)-E-AC: 3-way diverter valves for heating water buffer cylinder bypass in cooling mode	<p>Connect the 3-way diverter valves for the heating water buffer cylinder bypass in parallel.</p> <p>Connection values</p> <ul style="list-style-type: none"> ▪ Output: 10 W ▪ Voltage: 230 V~ ▪ Max. switching current: 4(2) A

Plug 212

Terminals	Function	Explanation
212.2  A1	Heating circuit pump for heating circuit without mixer A1/HC1	<ul style="list-style-type: none"> ▪ This pump is connected in addition to the secondary pump if a heating water buffer cylinder is installed. ▪ Connect the temperature limiter to restrict the maximum temperature for underfloor heating systems (if installed) in series. <p>Connection values</p> <ul style="list-style-type: none"> ▪ Output: 100 W ▪ Voltage: 230 V~ ▪ Max. switching current: 4(2) A

Electrical connection (cont.)

Plug 212

Terminals	Function	Explanation
212.3	DHW circulation pump	Connection values <ul style="list-style-type: none">Output: 50 WVoltage: 230 V~Max. switching current: 4(2) A
212.4	3-way diverter valve for heating water buffer cylinder bypass or heat pump in the case of dual alternative mode	Connection values <ul style="list-style-type: none">Output: 130 WVoltage: 230 V~Max. switching current: 4(2) A

Connecting a temperature limiter as a maximum temperature limiter for underfloor heating

Connecting a general temperature limiter (B)

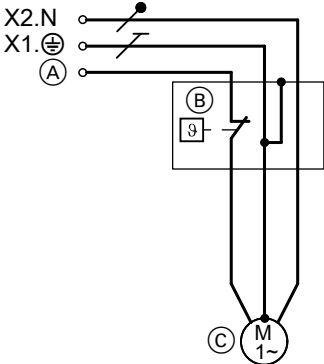


Fig. 37

Connecting the temperature limiter, part no. 7151 728, 7151 729 (B)

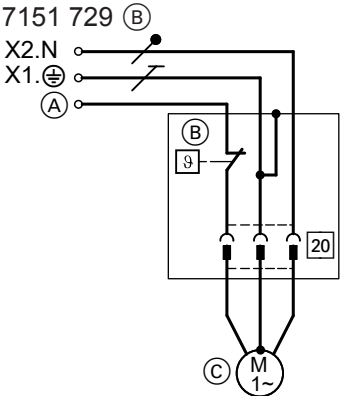


Fig. 38

	Connection (A) to control unit	Circulation pump (C)
Heating circuit without mixer A1/HC1		
▪ Without heating water buffer cylinder	211.2	Secondary pump
▪ With heating water buffer cylinder	212.2	Heating circuit pump A1/HC1
Heating circuit with mixer M2/HC2	225.1	Heating circuit pump M2/HC2

Connecting the temperature limiter, part no. 7151 728, 7151 729 (B) to the mixer extension kit

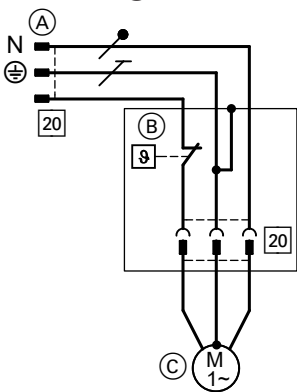






Fig. 39



- (A) Connect plug 20 to the extension kit.
- (B) Temperature limiter
- (C) Heating circuit pump M3/HC3

Electrical connection (cont.)

Plug 214

Terminals	Function	Explanation
214.1  M2	External hook-up, heating/cooling circuits: Central heating demand, heating circuit M2/HC2	230 V~ digital input: <ul style="list-style-type: none"> 230 V~: Central heating demand for heating circuit M2/HC2 active 0 V: No demand Breaking capacity 230 V, 0.15 A
214.2  M2	External hook-up, heating/cooling circuits: Central cooling demand, heating circuit M2/HC2	230 V~ digital input: <ul style="list-style-type: none"> 230 V~: Central cooling demand for heating circuit M2/HC2 active 0 V: No demand Breaking capacity 230 V, 0.15 A
214.3  M3	External hook-up, heating/cooling circuits: Central heating demand, heating circuit M3/HC3	230 V~ digital input: <ul style="list-style-type: none"> 230 V~: Central heating demand for heating circuit M3/HC3 active 0 V: No demand Breaking capacity 230 V, 0.15 A
214.4  M3	External hook-up, heating/cooling circuits: Central cooling demand, heating circuit M3/HC3	230 V~ digital input: <ul style="list-style-type: none"> 230 V~: Central cooling demand for heating circuit M3/HC3 active 0 V: No demand Breaking capacity 230 V, 0.15 A

Plug 216

Terminals	Function	Explanation
216.1  A1	External hook-up, heating/cooling circuits: Central heating demand, heating circuit A1/HC1	230 V~ digital input: <ul style="list-style-type: none"> 230 V~: Central heating demand for heating circuit A1/HC1 active 0 V: No demand Breaking capacity 230 V, 2 mA
216.2  A1	External hook-up, heating/cooling circuits: Central cooling demand, heating circuit A1/HC1	230 V~ digital input: <ul style="list-style-type: none"> 230 V~: Central cooling demand for heating circuit A1/HC1 active 0 V: No demand Breaking capacity 230 V, 0.15 A

Indoor unit: Expansion PCB on main PCB (230 V~ components)

Information regarding the connection values

- The specified output is the recommended connected load.
- Total output of all components connected directly to the heat pump control unit (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.

Set the required parameters during commissioning:
See page 73 onwards.

Electrical connection (cont.)

Plug 224

Terminals	Function	Explanation
224.4	Control of an instantaneous heating water heater	Connection values: <ul style="list-style-type: none"> Output: 10 W Voltage: 230 V~ Max. switching current: 4(2) A



Instantaneous heating water heater



Type AWBT(-M): Accessories

Installation instructions, instantaneous heating water heater

Control and power circuit of the instantaneous heating water heater

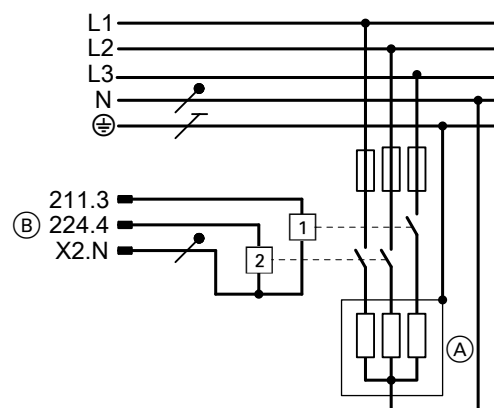


Fig. 40

- (A) Instantaneous heating water heater
 (B) Connection to the main PCB and expansion PCB
 211.3 stage 1
 224.4 stage 2



Plug 225

Terminals	Function	Explanation
225.1	Heating circuit pump of the heating circuit with mixer M2/HC2	Connect a temperature limiter to restrict the maximum temperature for underfloor heating circuits (if installed) in series. Connection values: <ul style="list-style-type: none"> Output: 100 W Voltage: 230 V~ Max. control current: 4(2) A
M2		
225.2	Mixer motor control, heating circuit M2/HC2 Signal mixer CLOSE ▼	Connection values: <ul style="list-style-type: none"> Output: 10 W Voltage: 230 V~ Max. control current: 0.2(0.1) A
M2		
225.3	Mixer motor control, heating circuit M2/HC2 Signal mixer OPEN ▲	Connection values: <ul style="list-style-type: none"> Output: 10 W Voltage: 230 V~ Max. control current: 0.2(0.1) A
M2		

Electrical connection (cont.)

Indoor unit: Luster terminals (signal and safety connections)

Set the required parameters during commissioning:
See page 73 onwards.

Terminals	Function	Explanation
X3.1	Switched phase	Via control unit ON/OFF switch Note <i>Observe the total load 1000 W of all connected components.</i>
X3.6 X3.7 	Power-OFF (jumper fitted at the factory)	Requires floating contact: <ul style="list-style-type: none"> ▪ Closed: Heat pump operational ▪ Open: Heat pump shut down ▪ Breaking capacity 230 V~, 0.15 A <p>Remove jumper when connecting.</p> <p>Note</p> <ul style="list-style-type: none"> ▪ No parameters need to be set ▪ The compressor is "forced" off as soon as the contact opens. ▪ The power-OFF signal switches off the power supply to the relevant components, subject to the power supply utility. ▪ For the instantaneous heating water heater, the stages to be switched off can be selected (parameter "Output for instant. heating water heater at power-OFF 790A"). ▪ 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. <p>For further information regarding power-OFF: See chapter "Power supply".</p> <p>In connection with Smart Grid: Do not connect the power-OFF signal. Do not remove jumper.</p>
X3.8 X3.9 	<p>Type AWBT(-M)-E-AC:</p> <ul style="list-style-type: none"> ▪ Frost stat and/or Contact humidistat 230 V~ ▪ Or jumper <p>Type AWBT(-M)/AWBT(-M)-E:</p> <ul style="list-style-type: none"> ▪ Jumper 	<p>Requires floating contact:</p> <ul style="list-style-type: none"> ▪ Closed: Safety chain has continuity ▪ Open: Safety chain interrupted; heat pump shut down ▪ Breaking capacity 230 V~, 0.15 A <p>Connection:</p> <ul style="list-style-type: none"> ▪ Connected in series if both safety components are installed ▪ Insert jumper if no safety components are installed.
X40.L1	Heat pump control unit power supply: Phase L1 X40.⊕ Earth conductor terminal X40.N Neutral conductor terminal	Power supply 230 V~: See page 49 onwards.

Electrical connection (cont.)**Indoor unit: Controller and sensor PCB (LV connections)**

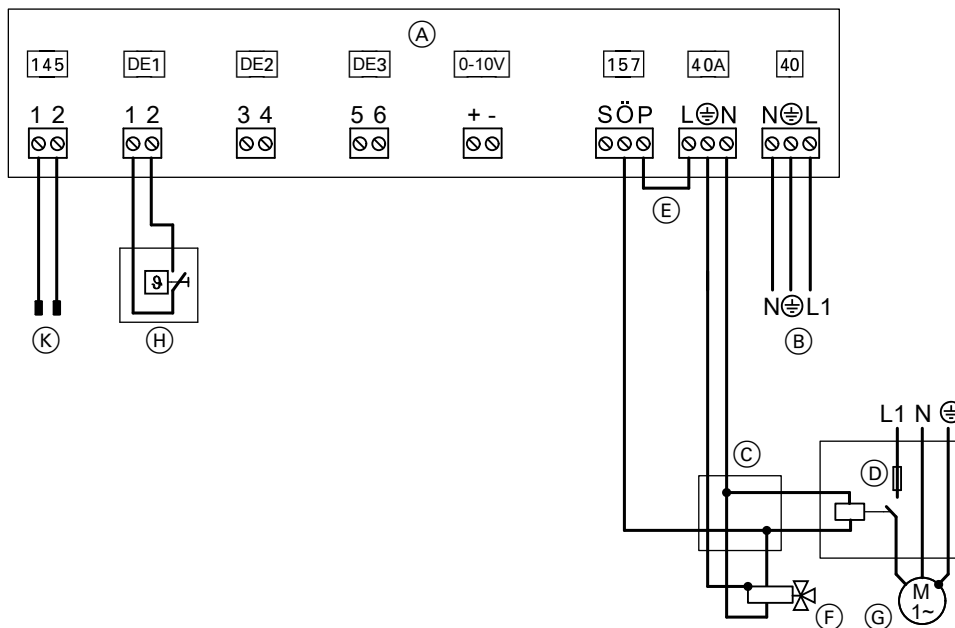
Set the required parameters during commissioning:
See page 73 onwards.

Sensors

Plug	Sensor	Type
F0	Outside temperature sensor	NTC 10 kΩ
F4	Buffer temperature sensor	NTC 10 kΩ
F11	Contact humidistat 24 V– Note <i>If a 230 V~ contact humidistat (connection to X3.8/X3.9) is used for cooling, insert a jumper, otherwise the heat pump will not start (message "CA Protectn device primry").</i>	—
F12	Flow temperature sensor, heating circuit with mixer M2/HC2	NTC 10 kΩ
F13	System flow temperature sensor (downstream of heating water buffer cylinder)	NTC 10 kΩ
F14	Flow temperature sensor, cooling circuit (heating circuit without mixer A1/HC1 or separate cooling circuit SKK)	NTC 10 kΩ
F16	Room temperature sensor, cooling circuit ▪ Required for separate cooling circuit SKK ▪ Recommended for heating/cooling circuit without mixer A1/HC1	NTC 10 kΩ
F26	Buffer temperature sensor, cooling	NTC 10 kΩ
145	KM-BUS (wires interchangeable) Use the KM-BUS distributor (accessories) if several devices are connected. KM-BUS subscribers (examples): ▪ Mixer extension kit for heating circuit M3/HC3 ▪ Remote control (set heating circuit allocation on the remote control) ▪ EA1 extension, AM1 extension ▪ Communication interface Vitocom 100, type GSM2	—
241	Modbus (do not interchange the wires) Connection for electricity meter of photovoltaic system	—
J1	Jumper for Modbus terminator ☐ Terminator enabled (delivered condition) ☐ Terminator not active	—
X18	Modbus (do not interchange the wires) ▪ Connected at the factory: Modbus connecting cable to the outdoor unit or ▪ Modbus distributor (accessories) if additional devices are to be connected, e.g. Vitovent 300-F: See "Modbus distributor" installation instructions.	—
X24	Connection for LON communication module: See "LON communication module" installation instructions	—
X31	Coding card slot	—
193 A	PWM signal connection for heating circuit pump M2/HC2	—

Swimming pool heating

- *Swimming pool heating is controlled via EA1 extension with KM-BUS.*
- *Make connections to EA1 extension **only** in accordance with Fig. 41.*
- *A filter circuit pump **cannot** be controlled via the heat pump control unit.*



- (A) EA1 extension
- (B) Power supply 1/N/PE 230 V/50 Hz
- (C) Junction box (on site)
- (D) Fuses and contactor for circulation pump for swimming pool heating (accessories)
- (E) Jumper
- (F) 3-way diverter valve for "swimming pool" (zero volt: Charging the heating water buffer cylinder)
- (G) Circulation pump for swimming pool heating (accessories)
- (H) Temperature controller for regulating swimming pool temperature (floating contact: 230 V~, 0.1 A, accessories)
- (K) KM-BUS connection to the controller and sensor PCB

Outdoor unit: Routing cables to the wiring chamber

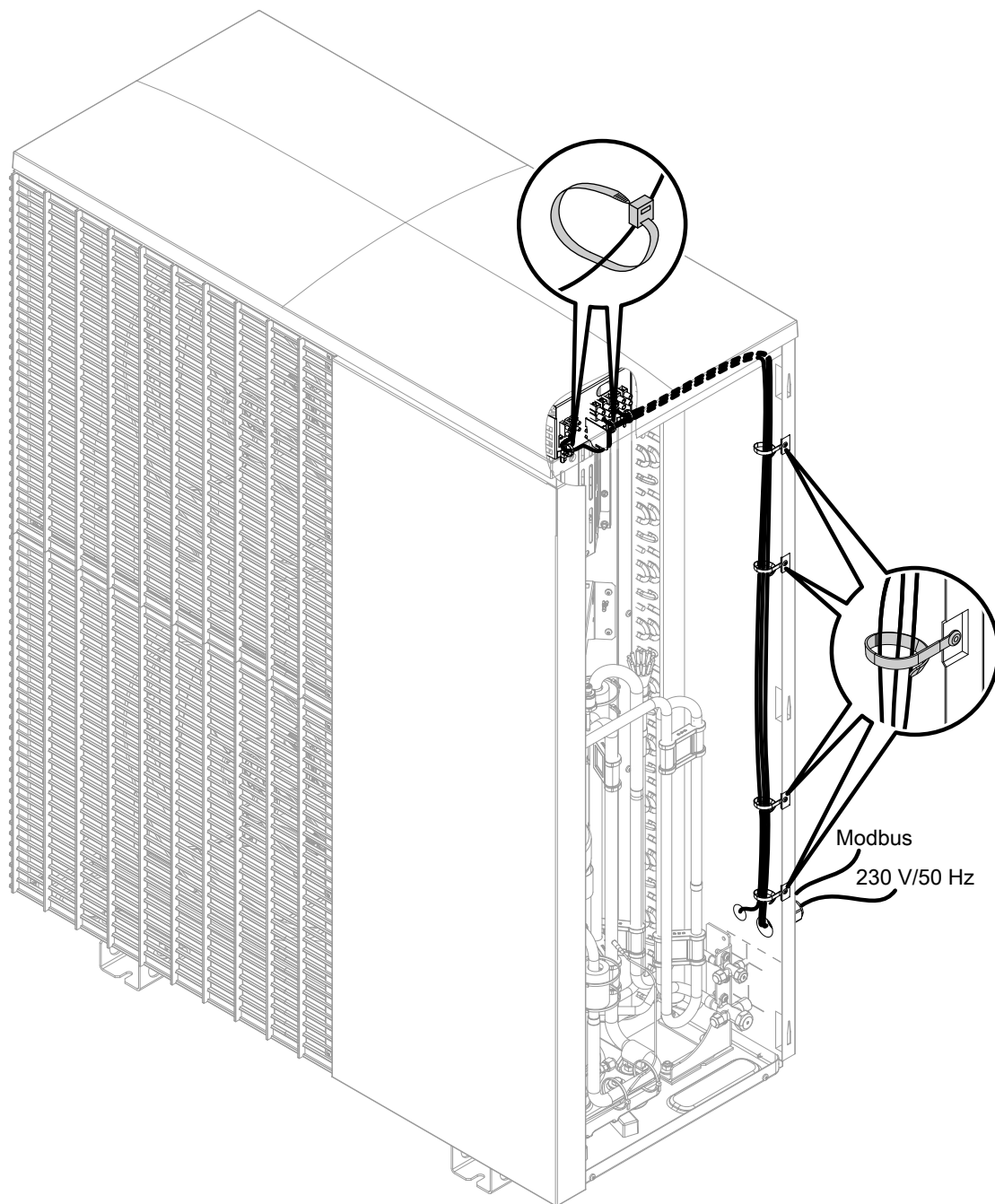


Fig. 42

Electrical connection (cont.)

Outdoor unit: Overview of electrical connections

Types 221.C04 to 221.C08, 230 V~

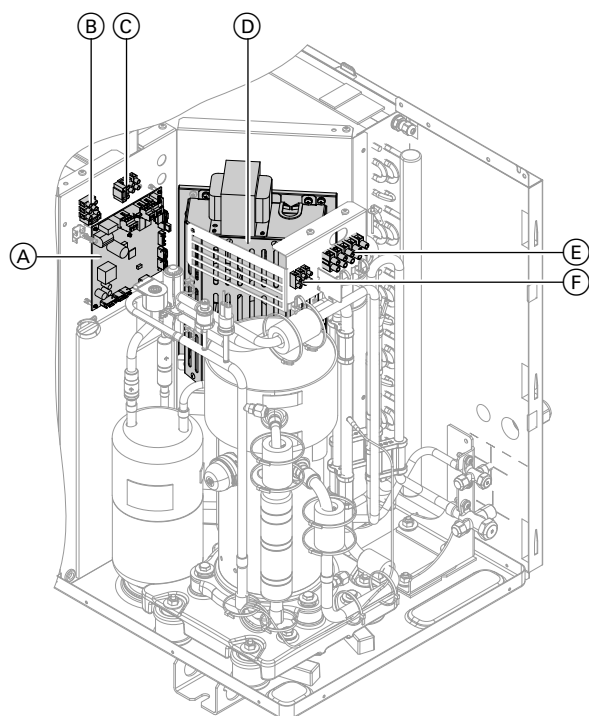


Fig. 43

- Ⓐ EEV PCB (refrigerant circuit controller)
- Ⓑ Fan fuse 6.3 A (slow)
- Ⓒ Refrigerant circuit controller fuse 6.3 A (slow)
- Ⓓ Inverter
- Ⓔ Mains terminals 230 V/50 Hz:
See page 50.
- Ⓕ Modbus terminal for bus cable, outdoor unit —
indoor unit: See next chapter.

Types 221.C10 to 221.C16, 230 V~

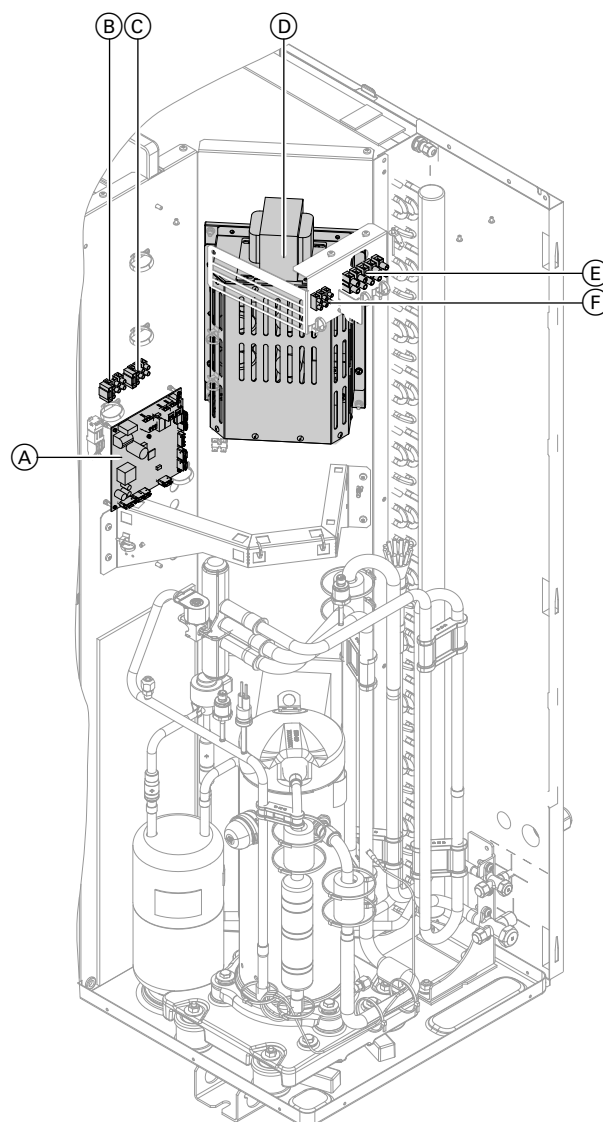


Fig. 44

- Ⓐ EEV PCB (refrigerant circuit controller)
- Ⓑ Fan fuse 6.3 A (slow)
- Ⓒ Refrigerant circuit controller fuse 6.3 A (slow)
- Ⓓ Inverter
- Ⓔ Mains terminals 230 V/50 Hz:
See page 50.
- Ⓕ Modbus terminal for bus cable, outdoor unit —
indoor unit: See next chapter.

Types 221.C10 to 221.C16, 400 V~

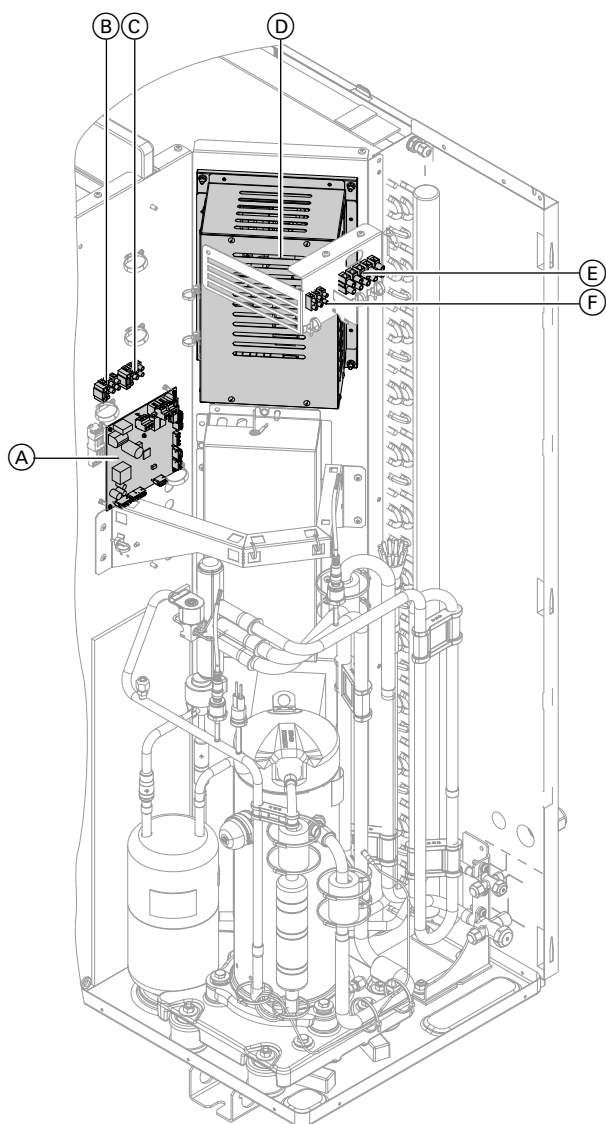


Fig. 45

- Ⓐ EEV PCB (refrigerant circuit controller)
- Ⓑ Fan fuse 6.3 A (slow)
- Ⓒ Refrigerant circuit controller fuse 6.3 A (slow)
- Ⓓ Inverter
- Ⓔ Mains terminals 400 V/50 Hz:
See page 50.
- Ⓕ Modbus terminal for bus cable, outdoor unit —
indoor unit: See next chapter.

Connecting the bus cable between the indoor and outdoor unit

Use a flexible data cable, e.g. LiYCY.

Electrical connection (cont.)

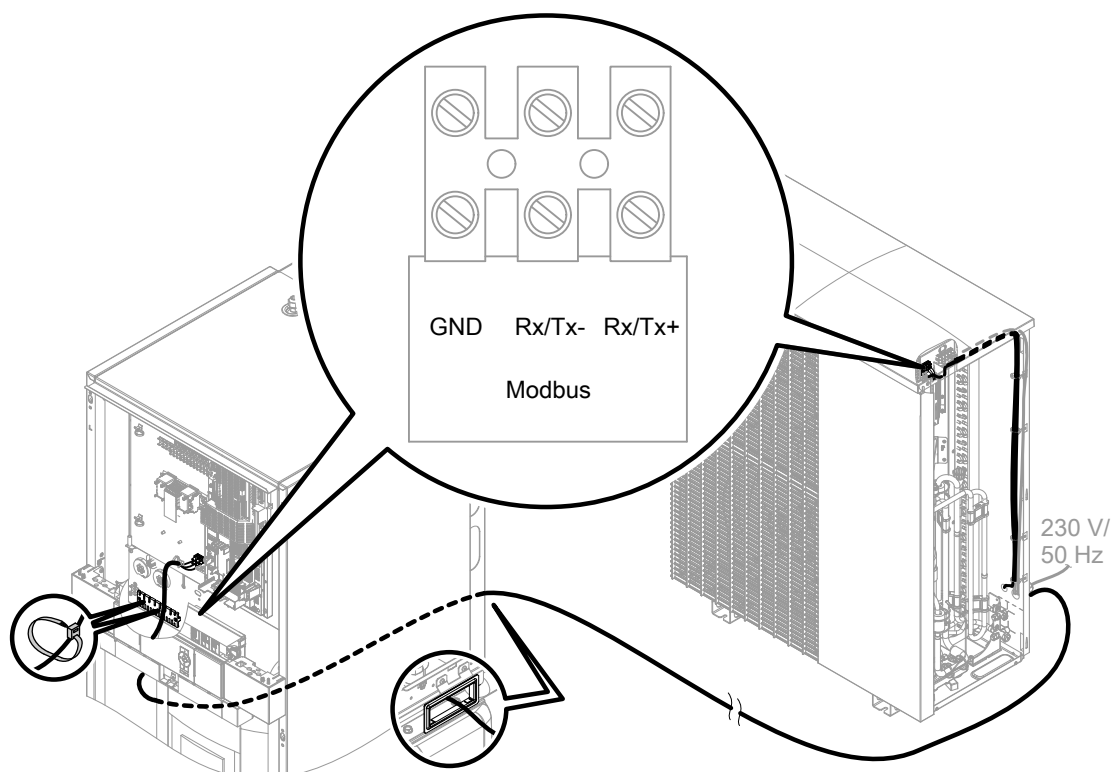



Fig. 46

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.
- Residual current devices to DIN VDE 0100-530 selecting and sizing.

**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
- Technical connection requirements specified by the local power supply utility

**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.

Never interchange cores "L" and "N".

- In negotiations with your power supply utility, different supply tariffs for the main power circuits may be offered.

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.

Power supply (cont.)

- 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.
- When using power generated on site (use of power generated by the PV system to meet own requirements):
During the power-OFF period, it is **not** possible to operate the compressor utilising power generated on site.
- Protect the power cable to the heat pump control unit with an MCB/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 when the power is switched off. Observe the power consumption of the connected consumers.
- The PE wire of the power cable must be approx. 10 mm longer than the N and L wires.

Heat pump control unit power supply 230 V~

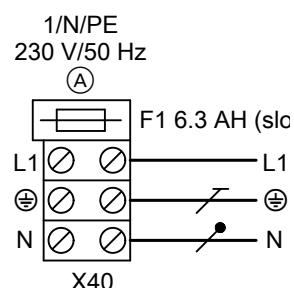


Fig. 47

Note

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

- Max. fuse rating 16 A
- Standard tariff (no optional economy tariff with power-OFF facility)
- Recommended power cable: 3 x 1.5 mm²
(5 x 1.5 mm² with power-OFF)

Outdoor unit power supply

- Economy tariff and power-OFF can be used.
- No parameters need to be set when using economy tariff with power-OFF. The compressor is shut down during the power-OFF period.
- During power-OFF, the diagnostic functions for the external unit are not supported.

Note

Free terminals for internal use.

Power supply (cont.)

Outdoor unit power supply 230 V~: Type AWBT-M/AWBT-M-E/AWBT-M-E-AC 221.C04 to 221.C16

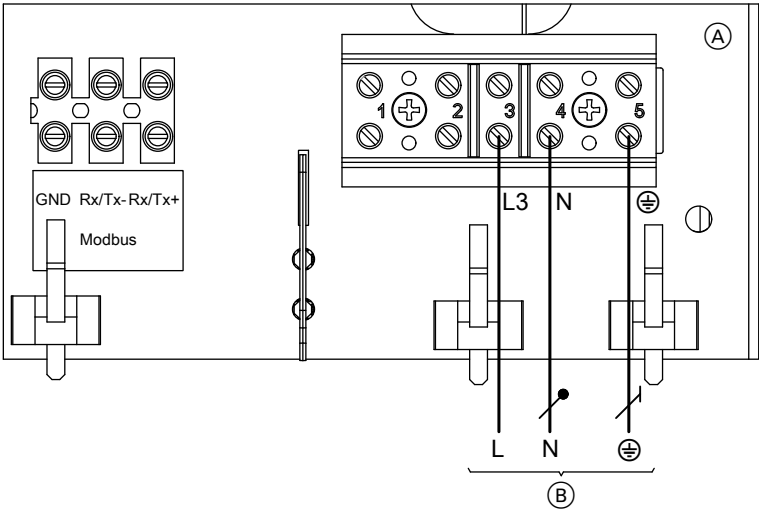


Fig. 48

- (A) Outdoor unit wiring chamber: See page 19.
(B) Power supply 230 V/50 Hz

Max. cable length

Vitocal 222-S	Type	Cable	Max. cable length
230 V appliances	▪ AWBT-M ▪ AWBT-M-E ▪ AWBT-M-E-AC	221.C04	3 x 2.5 mm ² 29 m
		221.C06	3 x 2.5 mm ² 29 m
		221.C08	3 x 2.5 mm ² 29 m
		221.C10	3 x 2.5 mm ² 20 m
		or	
		3 x 4.0 mm ²	32 m
		221.C13	3 x 2.5 mm ² 20 m
		or	
		3 x 4.0 mm ²	32 m
		221.C16	3 x 2.5 mm ² 20 m
		or	
		3 x 4.0 mm ²	32 m

Max. fuse rating

Type AWBT-M/AWBT-M-E/AWBT-M-E-AC

221.C04	221.C06	221.C08	221.C10	221.C13	221.C16
16 A	16 A	16 A	25 A	25 A	25 A

Outdoor unit power supply 400 V~: Type AWBT/
AWBT-E/AWBT-E-AC 221.C10 to 221.C16

- ! **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.

Power supply (cont.)

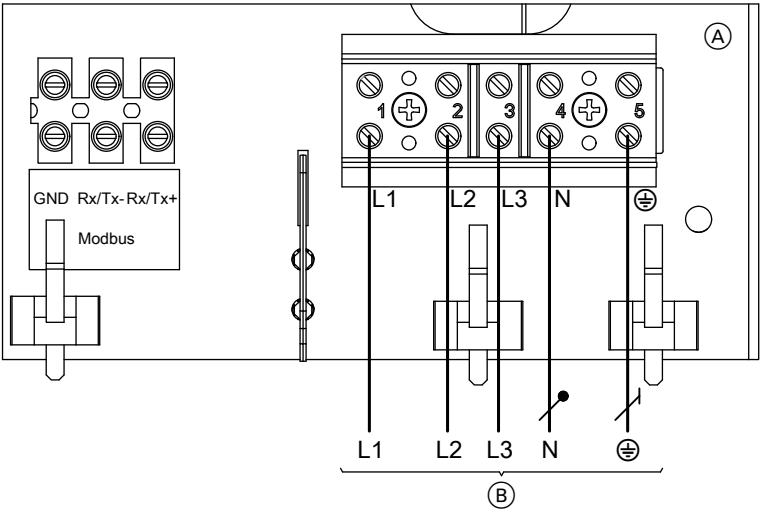


Fig. 49

- (A) Outdoor unit wiring chamber: See page 19.
- (B) Power supply 400 V/50 Hz

Max. cable length

Vitocal 222-S	Type	Cable	Max. cable length
400 V appliances	▪ AWBT 221.C10	5 x 2.5 mm ²	30 m
	▪ AWBT-E 221.C13	5 x 2.5 mm ²	30 m
	▪ AWBT-E-AC 221.C16	5 x 2.5 mm ²	30 m

Max. fuse rating

Type AWBT/AWBT-E/AWBT-E-AC	221.C10	221.C13	221.C16
Max. fuse rating	16 A	16 A	16 A

Instantaneous heating water heater power supply

- Type AWBT(-M)-E/AWBT(-M)-E-AC 221.C:
- Factory-fitted
- Type AWBT(-M) 221.C:
- Accessories

Power supply (cont.)

1/N/PE 230 V/50 Hz

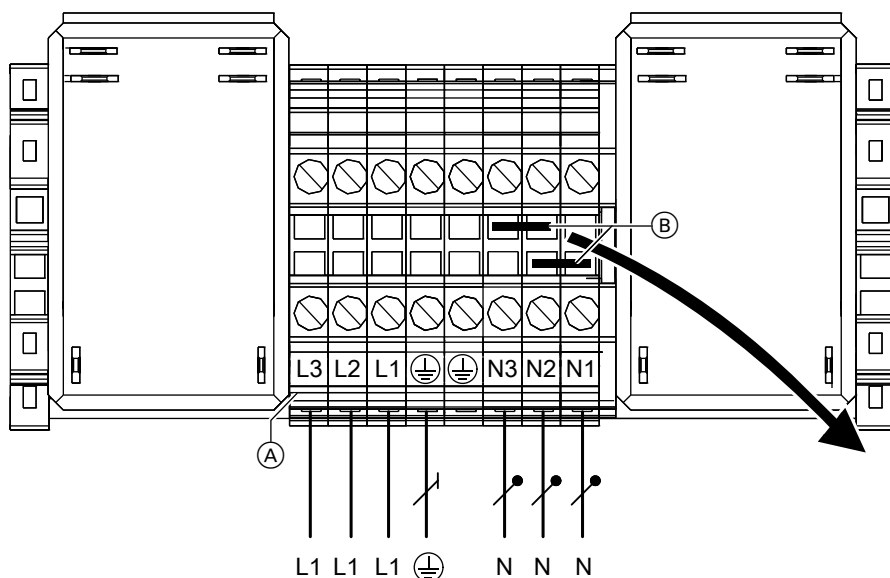


Fig. 50

- (A) Mains terminals, switching module, instantaneous heating water heater
- (B) Jumpers

Remove **both** jumpers (B) in the case of a 1/N/PE 230 V/50 Hz power supply.

- Recommended power cable:
7 x 2.5 mm²
- Max. fuse rating 16 A
- Economy tariff and power-OFF can be applied

3/N/PE 400 V/50 Hz

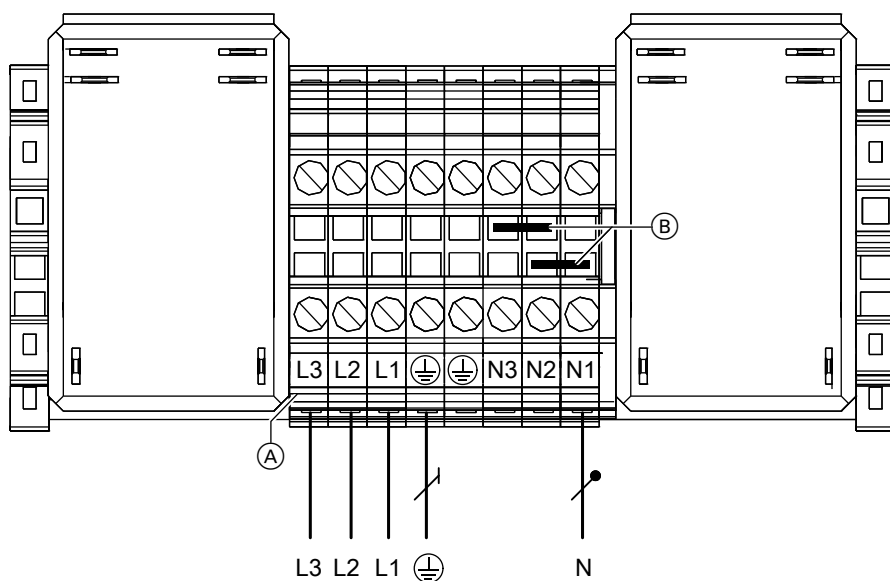


Fig. 51

- (A) Mains terminals, switching module, instantaneous heating water heater
- (B) Jumpers

Power supply (cont.)

Do **not** remove jumpers (B) in the case of a 3/N/PE 400 V/50 Hz power supply.

- Recommended power cable:
5 x 2.5 mm²
- Max. fuse rating 16 A
- Economy tariff and power-OFF can be applied

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

The power-OFF signal is connected directly to the heat pump control unit. The compressor is "forced" off when power-OFF is enabled.

Parameter **"Output for instant. heating water heater at power-OFF 790A"** determines whether and at what stage an instantaneous heating water heater remains operational during the power-OFF period.

Note

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

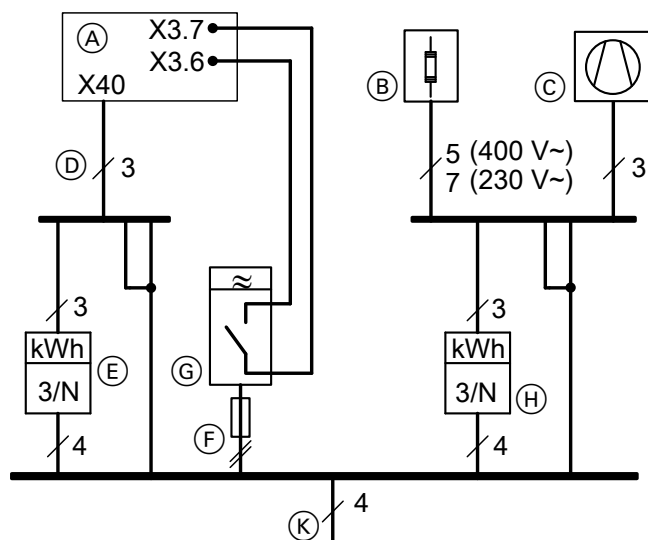


Fig. 52 Diagram excluding fuses and RCD

- (A) Heat pump control unit (indoor unit, luster terminals: See chapter "Indoor unit: Overview of connections")
- (B) Instantaneous heating water heater (if installed)
- (C) Heat pump compressor (outdoor unit)
- (D) Heat pump control unit power supply: See chapter "Heat pump control unit power supply 230 V~"
- (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

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

The power-OFF signal is connected to the on-site contactor of the economy tariff power supply and to the heat pump control unit. The compressor **and** instantaneous heating water heater are "forced" off when power-OFF is enabled.

Note

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

Power supply (cont.)

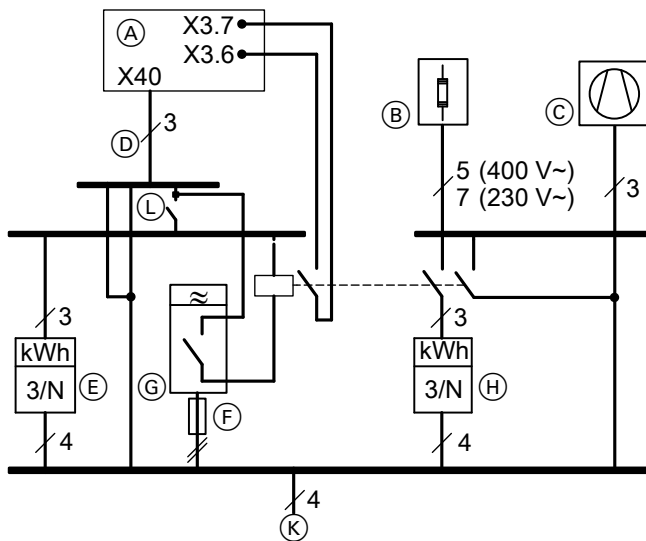


Fig. 53 Diagram excluding fuses and RCD

- Ⓐ Heat pump control unit (indoor unit, luster terminals: See chapter "Indoor unit: Overview of connections")
- Ⓑ Instantaneous heating water heater (if installed)
- Ⓒ Heat pump compressor (outdoor unit)
- Ⓓ Heat pump control unit power supply: See chapter "Heat pump control unit power supply 230 V~"
- Ⓔ Premium tariff meter
- Ⓕ Ripple control receiver backup fuse
- Ⓖ Ripple control receiver (contact open: Power-OFF enabled) with backup fuse
- Ⓗ Economy tariff meter
- Ⓚ Feed: TNC system
- Ⓛ Mains isolator

Mains power supply in conjunction with on-site power consumption

Without power-OFF

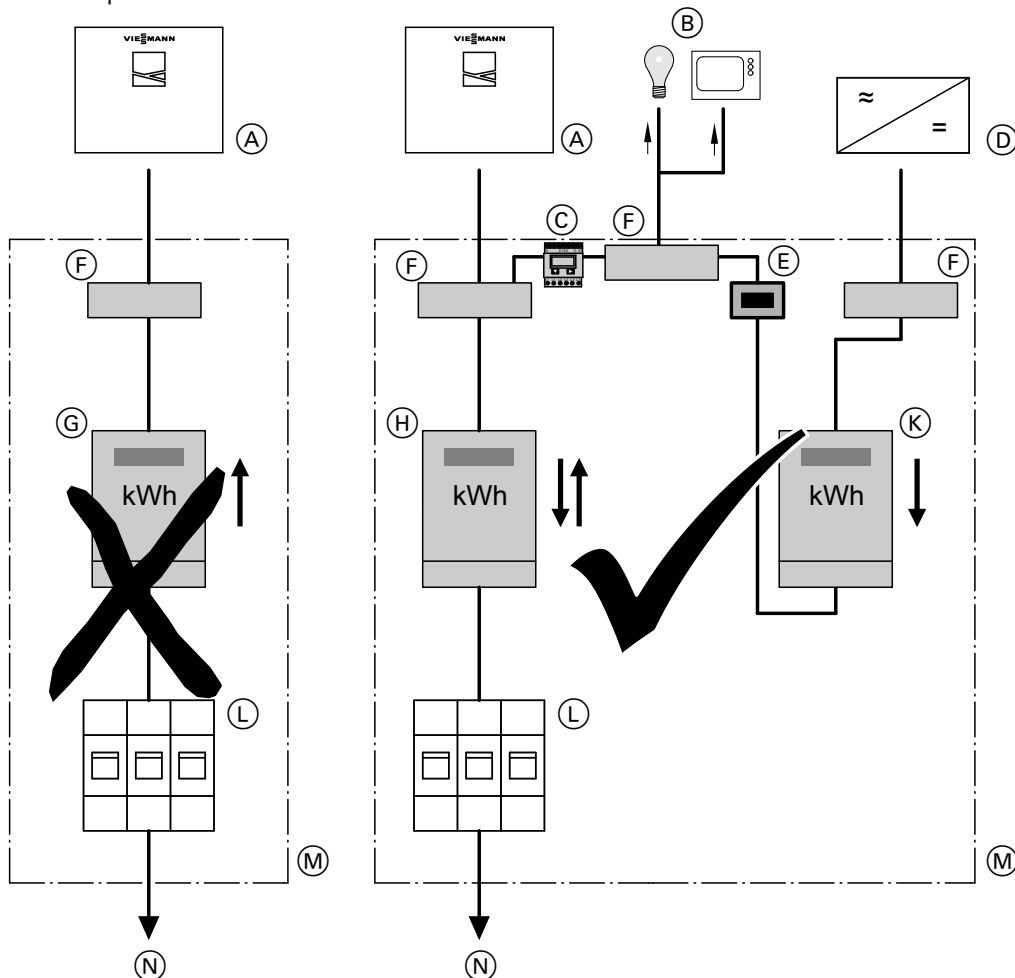


Fig. 54

- (A) Heat pump
- (B) Additional consumers (of power generated on site) in the household
- (C) Electricity meter
- (D) Inverter
- (E) Isolator for the PV system
- (F) Terminal
- (G) Double-tariff meter (for special tariff for heat pump)
Not permissible in conjunction with PV systems for on-site power consumption
- (H) Bi-directional meter (for PV systems to consume power on site):
Energy taken from power supply utility and energy fed into power supply utility
- (K) Meter with reverse block:
For energy generated by PV system
- (L) Isolator for the domestic power supply connection (distribution panel)
- (M) Distribution panel
- (N) Domestic distribution box

Smart Grid

- The Smart Grid functions are switched via both PSU floating contacts.
- Both floating contacts are connected to the EA1 extension in accordance with Fig. 55.

Power supply (cont.)

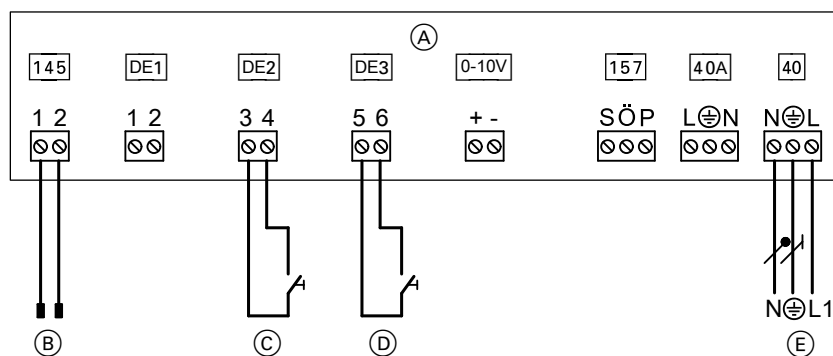


Fig. 55

- (A) EA1 extension
- (B) Connection to controller and sensor PCB
- (C) Floating N/O contact 1: The agreement of the power supply utility may be required
- (D) Floating N/O contact 2: The agreement of the power supply utility may be required
- (E) Power supply 1/N/PE 230 V/50 Hz

Note

- If Smart Grid is enabled ("**Enable Smart Grid 7E80**" set to "**1**"), both inputs DE2 and DE3 **cannot** be used for signals "External demand" or "External blocking".
- The power-OFF function is integral to Smart Grid. Therefore do **not** connect the power-OFF signal to terminals X3.6 and X3.7. Do **not** remove jumper.

Closing the heat pump

**Please note**

- If a casing door is not securely closed this can lead to damage from condensation, vibrations and excessive noise.
- Seal the appliance so it is soundproof and diffusion-proof.
 - On pipe and hose outlets, ensure the thermal insulation is seated correctly.

**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. Attach earth conductor to front panel and side panel.

Fitting the front panels of the indoor unit

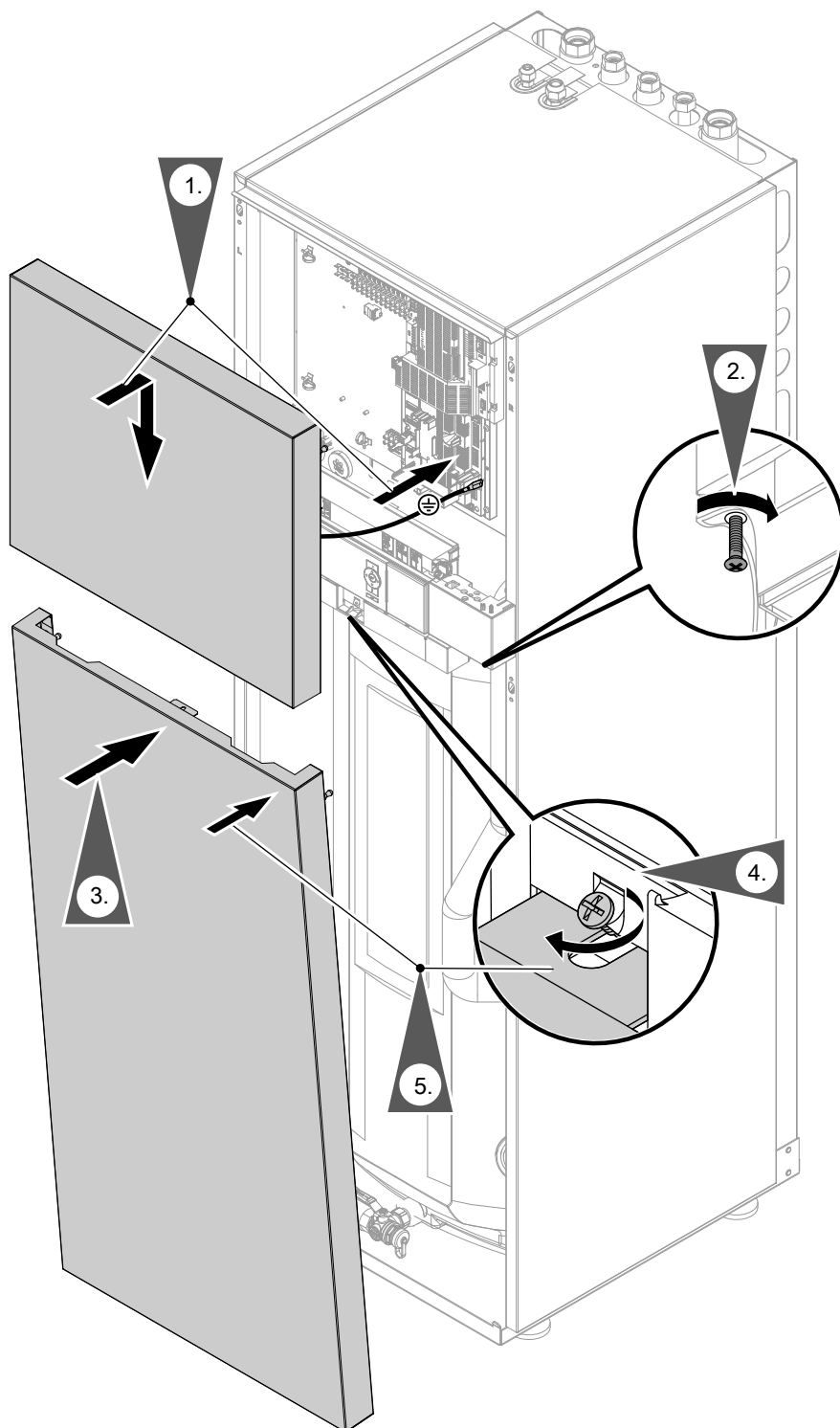


Fig. 56

4. Ensure that the locking screws are tightened before operating.

Fitting the side cover for the outdoor unit

In reverse order to "Opening the outdoor unit wiring chamber": See page 19.



Steps - commissioning, inspection and maintenance

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				Inspection steps	
				Maintenance steps	
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•				2. Compiling reports.....	60
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•				4. Checking the refrigerant lines for leaks.....	60
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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** the wiring chambers (see chapter "Overview of connections: indoor unit" and "Overview of connections: outdoor unit").
- When working on the appliances (indoor/outdoor units), isolate the system from the power supply, e.g. at the 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 connectors **must** be reconnected. The appliance and pipework must be connected to the equipotential bonding of the building.



Please note

Commissioning immediately after siting the appliance can lead to appliance damage. Wait **at least 30 min** between siting and commissioning the appliance.



Please note

Refrigerant can escape when working on the refrigerant circuit. Work on the refrigerant circuit must **only** be carried out by a certified contractor (in accordance with EC 842/2006 and 303/2008).

Note

If connections in the refrigerant circuit are separated, we recommend installing a filter dryer on site.

- *The on-site filter dryer must be able to receive a flow from both sides (bi-flow).*
- *We recommend installing it in the liquid line, outside the indoor unit but inside the building.*

1. Remove front panel: See page 32.
2. When work is complete, close the heat pump: See page 57.



For commissioning the appliance, see also the "Vitotronic 200" operating instructions.



Compiling reports

Enter the readings taken during commissioning into the reports on page 134 onwards and the operator's log (if available).



Purging the refrigerant lines and indoor unit

Purge the refrigerant lines and indoor unit with nitrogen.

The indoor unit is charged with nitrogen; positive pressure approx. 1 to 2 bar (0.1 to 0.2 MPa).



Checking the refrigerant lines for leaks

Perform a tightness and pressure test with dry nitrogen with at least 20 bara/2.0 MPa (max. 43 bara/4.3 MPa).



Evacuating the refrigerant lines and indoor unit



Please note

Commissioning is weather-dependent. At outside temperatures below 0 °C, moisture can condense and sublimate in the refrigerant lines. If water droplets and/or ice particles enter the compressor, they may cause damage to the appliance.

In the case of high relative humidity or outside temperatures below 0 °C, please observe the following:

- Use nitrogen 5.0 for the pressure test.
- During evacuation, take suitable steps to keep the surface temperature of the refrigerant lines **above** 0 °C.



Danger

Direct contact with refrigerant can be harmful to skin.

Wear safety goggles and protective gloves when working on the refrigerant circuit.



Please note

Escaping refrigerant will cause environmental pollution.

- Before evacuating the refrigerant lines and the internal unit, check all connections for tightness with leak detection spray.
- Keep the valves on the external unit shut, and fill the system with nitrogen through the service valve. The test pressure is the max. permissible operating pressure.

Evacuating the indoor unit with a vacuum gauge

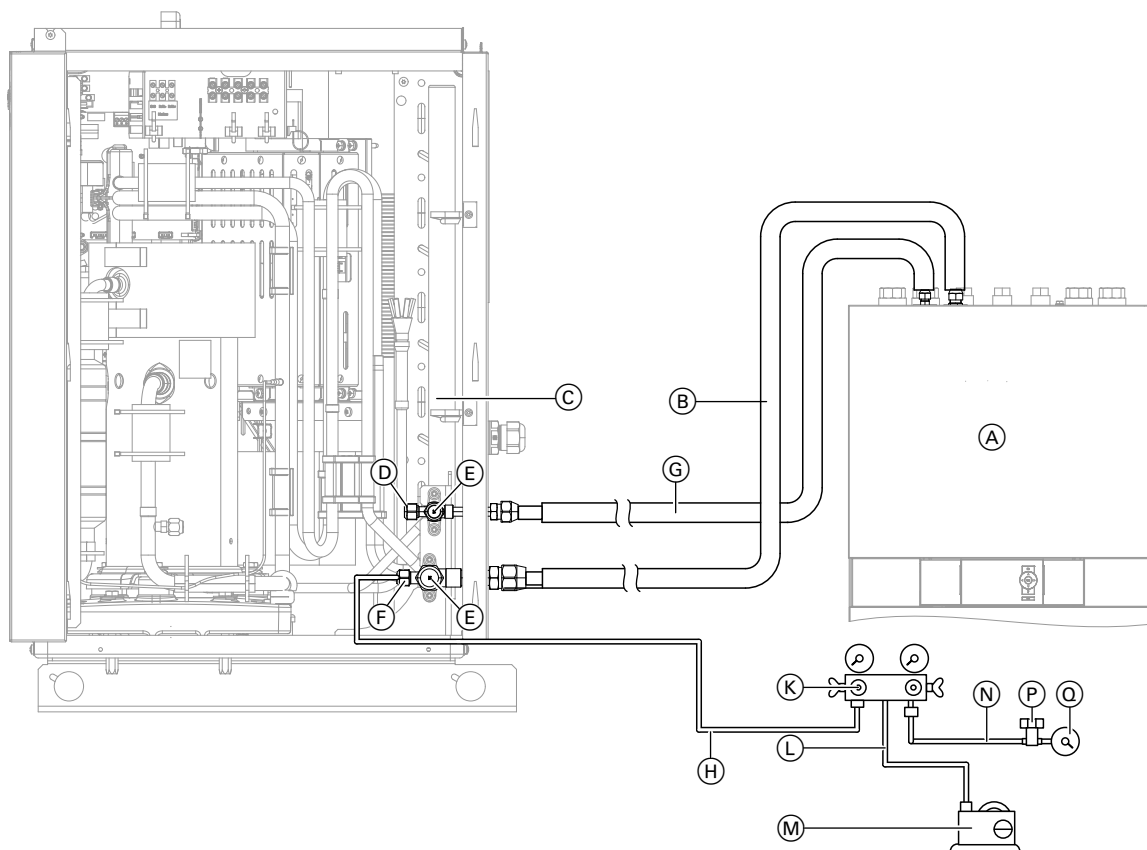


Fig. 57 Example, type AWBT(-M)-E-AC 222.C06

- | | |
|--|--|
| (A) Indoor unit | (G) Liquid line |
| (B) Hot gas line | (H) Fill hose between pressure gauge set and outdoor unit |
| (C) Outdoor unit | (K) Pressure gauge set |
| (D) Only for types 222.C08 to 222.C16:
Service valve (Schrader valve) | (L) Connection hose between pressure gauge set and vacuum pump |
| (E) Shut-off valve | (M) Vacuum pump |
| (F) Service valve (Schrader valve) | |





Evacuating the refrigerant lines and indoor unit (cont.)

(N) Connection hose between pressure gauge set and vacuum gauge

(P) Valve for vacuum gauge
(Q) Vacuum gauge

! Please note
Overpressure will damage the vacuum gauge. Never subject the vacuum gauge to positive pressure.

1. Close all valves at the pressure gauge set.
2. Make all connections as shown above.

Note

- Shut-off valve (E) **must** remain closed.
- For **all** connections, counterhold with a second open-ended spanner.

3. Start the vacuum pump.
At the pressure gauge set, open the valve to the vacuum pump and the valve to the hot gas connection.
4. After approx. 5 min, open the valve to the vacuum gauge.
Leave the vacuum pump running until the indication on the vacuum gauge is almost at "0" (at least 30 min).

Note

The vacuum pump runtime will depend on the ambient conditions.

5. On the pressure gauge set, close the valve to the vacuum pump.
Stop the vacuum pump and wait approx. 5 min. If the indication on the vacuum gauge rises, there is a leak.
Eliminate the leak and repeat the process.

6. Close all valves at the pressure gauge set.

7. Remove the vacuum pump and vacuum gauge.

Evacuating the indoor unit with the service function (pump down)

1. **Service menu:**
Press **OK** + **≡** simultaneously and hold for approx. 4 s.

2. **"Service functions"**

3. **"Evacuate refrigerant line"**

4. Start the process with **"Yes"**.
 - **"Initialisation"** is shown.
 - The secondary pump starts.
 - The compressor starts within 4 min. Refrigerant circuit reversal is active.

Note

If the compressor does not start within 4 min, terminate the function with **↶** and restart.

5. Once the compressor is running, close the liquid line shut-off valve on the outdoor unit.
 - The suction gas pressure falls.
 - **"Is active"** is shown.
 - Once the suction gas pressure has fallen below the minimum value, **"Terminates shortly"** is shown.

6. As soon as **"Terminates shortly"** is shown, close the hot gas line shut-off valve on the outdoor unit. Once the suction gas pressure has fallen yet further, the compressor stops.



Charging the refrigerant lines and indoor unit

Note

- The outdoor unit is pre-charged with refrigerant R410A.
- No additional charging is required for line lengths up to 12 m.
- For lengths of refrigerant lines, see page 24.
- The system may only be recharged with refrigerant R410A in a **liquid state**.



Danger

Direct contact with refrigerant can harm the skin. Wear safety goggles and protective gloves when working on the refrigerant circuit.



Please note

Recharging the system with refrigerant or evacuating the refrigerant can cause the condenser to freeze up. Flush the secondary side of the condenser with water or drain it completely.



Please note

Mechanical stress will damage the connections. For **all** connections, counterhold with a second open-ended spanner.

Line lengths up to 12 m:

1. Promptly undo the fill hose from the service valve (Schrader valve) of the outdoor unit: The pressure in the pipework must be greater than the ambient pressure.
2. Fit the union nut with copper cap to the service valve (Schrader valve) of the outdoor unit: Torque 15 to 20 Nm
3. Remove the caps from the shut-off valves of the outdoor unit.
4. Open both shut-off valves and refit the caps.

Line lengths 12 to 30 m:

1. Connect the hose between the pressure gauge set and refrigerant bottle. Evacuate the hose and pressure gauge set.

2. Recharge with the required amount of refrigerant: See following table.



Please note

Escaping refrigerant will cause environmental pollution. Extract refrigerant from the fill hoses and pressure gauge set.

3. Close the valves at the pressure gauge set.
4. Remove the caps from the shut-off valves of the outdoor unit.
5. Open both shut-off valves and refit the caps.
6. Promptly undo the fill hose from the service valve (Schrader valve) of the outdoor unit: The pressure in the pipework must be greater than the ambient pressure.
7. Fit the union nut with copper cap to the service valve (Schrader valve) of the outdoor unit: Torque 15 to 20 Nm
8. Enter the amount of refrigerant recharged on the type plate and in the operator's log.

Information for systems with a refrigerant charge of 3.0 kg R410A or more:

- The operator's log must be maintained.
- An annual tightness test is mandatory.

Refrigerant charge per metre line length (for line lengths from 12 m to 30 m)

Type AWBT(-M)/AWBT(-M)-E/ AWBT(-M)-E-AC	R410A in g/m
221.C04	17
221.C06	17
221.C08	60
221.C10	28
221.C13	28
221.C16	28



Checking the refrigerant circuit for leaks



Danger

The refrigerant is a non-poisonous gas that displaces air. Uncontrolled escape of refrigerant in enclosed spaces can result in breathing difficulties and suffocation.

- Ensure adequate ventilation in enclosed spaces.
- Always observe regulations and guidelines on handling this type of refrigerant.



Danger

Direct contact with refrigerant can be harmful to skin.

Wear safety goggles and protective gloves when working on the refrigerant circuit.

Check the connections for refrigerant leaks:

- All swaged connections of the refrigerant lines between the internal and the external unit
- All brazed joints and threaded fittings of the refrigerant lines in the internal and external units



Please note

Refrigerant can escape when working on the refrigerant circuit.

Work on the refrigerant circuit must **only** be carried out by a certified contractor (in accordance with EC 842/2006 and 303/2008).



Filling and venting the secondary side

Unsuitable fill and top-up water increases the level of deposits and corrosion. This can lead to system damage.

Observe VDI 2035 regarding quality and amount of heating water, including fill and top-up water.

- Flush the heating system thoroughly before filling.
- Only fill with water of potable quality.
- Soften fill and top-up water with a water hardness above 3 °dH (0.53 mol/m³), e.g. with the small softening system for heating water: See Vitoset pricelist.



Filling and venting the secondary side (cont.)

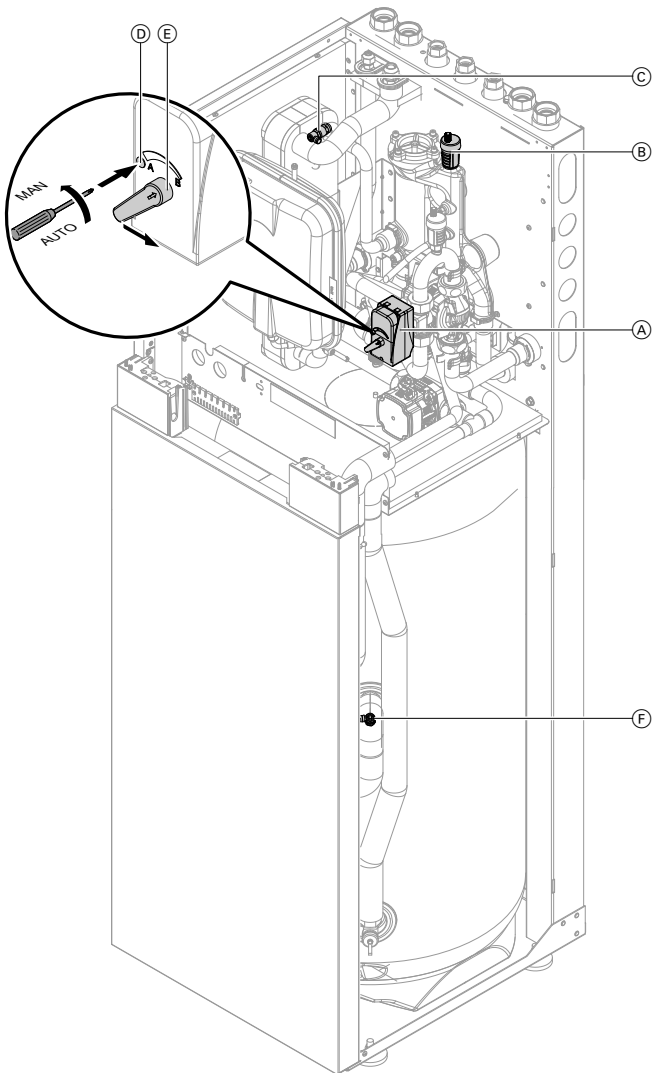


Fig. 58

1. Open any non-return valves installed on site.
2. Check the pre-charge pressure of the expansion vessel. Recharge if required.

3. Fill (flush) and vent the secondary circuit via an on-site connection.



Please note

To prevent appliance damage, check the secondary circuit flow and return connections to the appliance for **leaks**. In the case of leaks, switch off the appliance immediately, drain the water and check the seating of the seal rings. Always replace displaced seal washers.

4. Check the system pressure at the pressure gauge. Top up with water if required.
 - Minimum system pressure: 0.8 bar (80 kPa)
 - Permissible operating pressure: 3.0 bar (0.3 MPa)
5. Move the control unit panel into the service position.
6. Open the programming unit.
7. Slightly open quick-action air vent valve (B); it remains open. Connect the on-site hose to secondary circuit air vent valve (C).



Please note

Escaping liquids can lead to electrical defects. Protect electrical components from escaping liquids.

8. Open secondary circuit air vent valve (C).



Danger

Escaping hot water and hot steam can cause serious injury and damage the heating system. Only open drain and fill valves when the heating system is cold.

9. Move 3-way diverter valve (A) to its centre position: Press (D) and turn anti-clockwise to lock in the "MAN" position. Move lever (E) to a vertical position.
10. If necessary, vent the indirect coil in the DHW cylinder using secondary circuit air vent valve (F) for the DHW cylinder.
11. Close secondary circuit air vent valve (C).
12. Turn the 3-way diverter valve clockwise to the "AUTO" position.



Filling and venting the secondary side (cont.)

Note

- Move the control unit panel into the service position:
See page 84.
- Open the programming unit:
See page 83.



Filling and venting the DHW cylinder on the DHW side

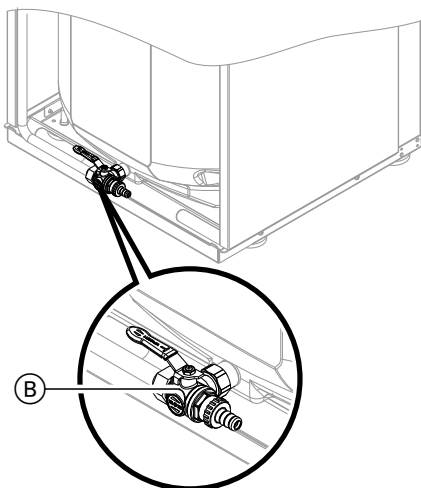


Fig. 59

1. The lever on valve ② must be in the "left" position.
2. Open the on-site DHW supply and a DHW draw-off point.
3. Once air stops coming out of the DHW draw-off point, the loading cylinder is completely filled.



Checking the expansion vessel and heating circuit pressure



Testing the anode connection

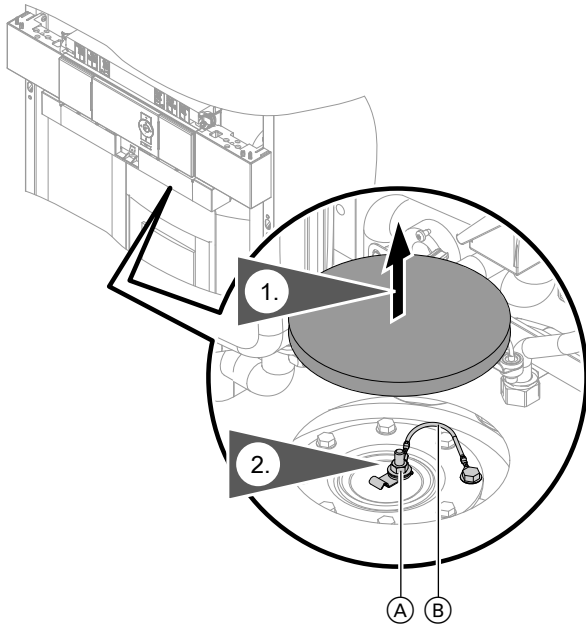


Fig. 60

- (A) Protective magnesium anode
- (B) Earth cable

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



Measuring the anode earth current with an anode tester

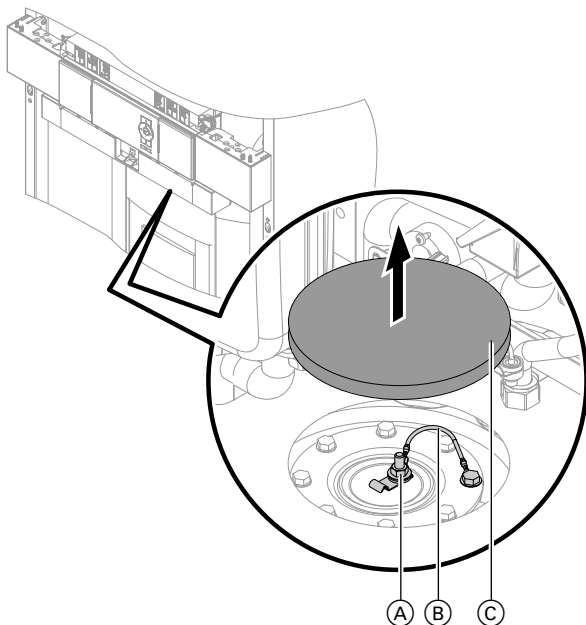


Fig. 61

1. Remove the cover. Disconnect earth cable (A) from tab (B).



Measuring the anode earth current with an anode... (cont.)

2. Connect the tester (measuring range up to 5 mA) in series across tab (B) and earth cable (A).

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



Testing the protective magnesium anode

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



Replacing the protective magnesium anode

Note

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

Magnesium anode removal: See Fig. in chapter "Cleaning the DHW cylinder"



Please note

A short circuit between the magnesium anode and the internal 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 Fig. in chapter "Cleaning the DHW cylinder"). If the resistance is significantly less than infinity, check whether the magnesium anode is touching the internal indirect coil.



Draining the appliance on the drinking water side

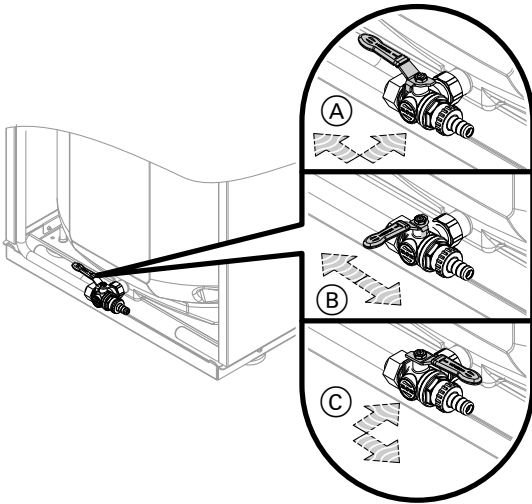


Fig. 62

- (A) Operation
- (B) Drain the drinking water circuit in the appliance **excluding** the DHW cylinder via the cold water connection
- (C) Drain the drinking water circuit in the appliance **and** the DHW cylinder via the DHW connection. The cold water connection remains filled.

1. Connect the hose to the drain valve and route it into a suitable container or drain outlet.

Note

Ensure adequate ventilation in the DHW pipework.

2. Turn drain valve from lever position (A) to lever position (B) or (C) as required.



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.

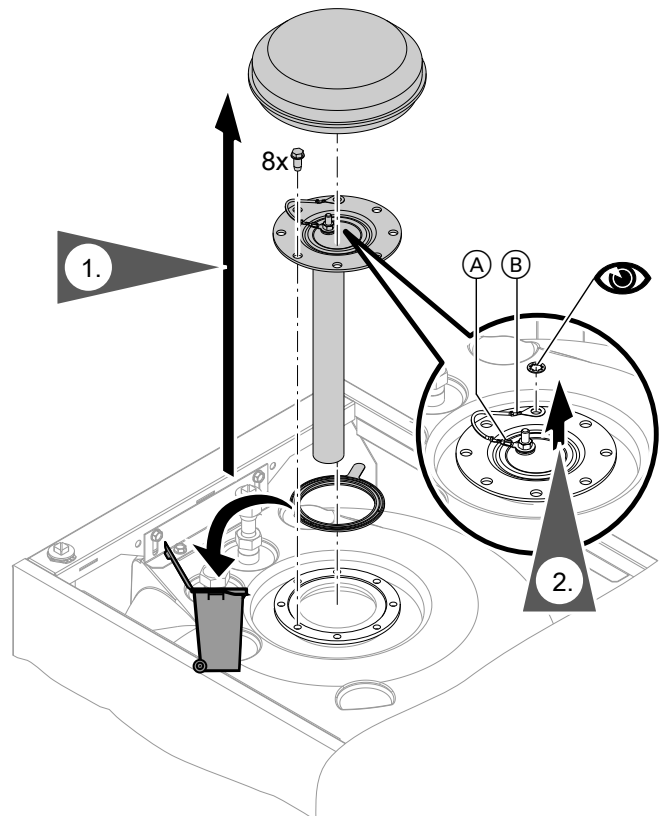


Fig. 63



Cleaning the DHW cylinder (cont.)

1. Remove the protective magnesium anode.



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.

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

4. Remove loose deposits with a pressure cleaner.



Please note

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

5. Use a chemical cleaning agent to remove hard deposits that cannot be removed with a 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.

6. Flush the DHW cylinder thoroughly after cleaning.

7. 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 that the fan in the outdoor unit can run freely



Danger

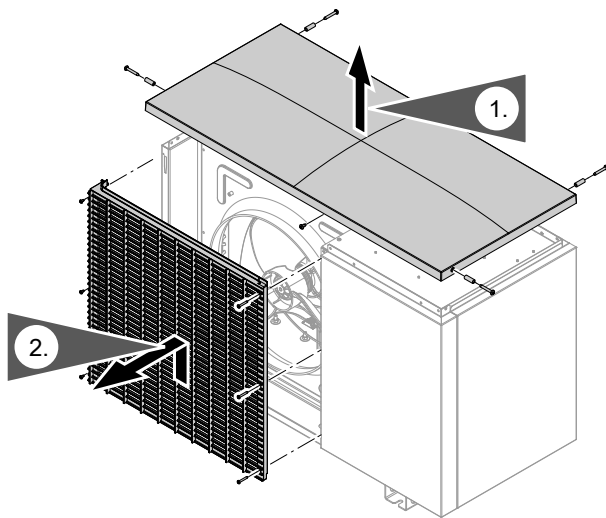
Contact with the fans while they are operating can result in serious cutting injuries.

- 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.)

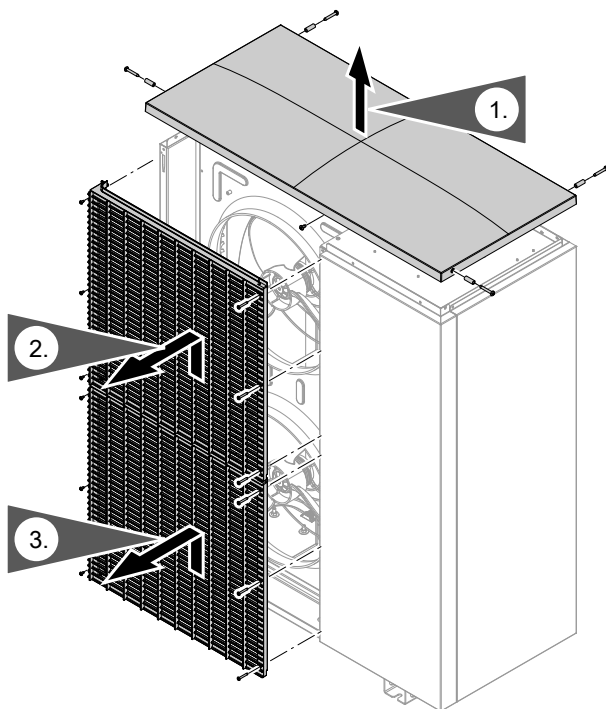
Types 221.C04 to 221.C08



3. Turn the fan by hand.

Fig. 64

Types 221.C10 to 221.C16



4. Turn the fan by hand.

Fig. 65



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 and safeguard against 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 and safeguard against reconnection.
- Do not open the appliance until the fan has come to a stop.



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

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. Clean the heat exchanger **from the inside out** with compressed air.



Please note

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

3. 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.



Checking the thermal insulation of flared connections



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.



Closing the heat pump

See page 57.



Switching on the power supply

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



Starting the heat pump



Please note

Operating the appliance with insufficient refrigerant results in appliance damage.

- Before starting the appliance, the internal unit and the refrigerant lines must be charged with the indicated amount of refrigerant: See chapter "Charging the refrigerant lines and internal unit".
- The refrigerant circuit must be checked for tightness: See chapter "Checking the refrigerant circuit for tightness".
- The fill valves on the external unit must be open when the appliance is switched on: See chapter "Charging the refrigerant lines and internal unit".

2. Wait 2 min.

3. Switch ON internal unit voltage.

4. Start internal unit at the ON/OFF switch.

Note

If the internal unit is switched on before the external unit or the waiting time is shorter than 2 min, the fault message "0A Fault external unit" appears.



"Vitotronic 200" service instructions

Follow the sequence shown

1. Switch ON external unit voltage.



Commissioning the system

Commissioning (configuration, parameter settings and function check) can be carried out with or without the commissioning wizard (see following chapter and service instructions for the heat pump control unit).

Note

The type and extent of the parameters depend on the appliance type, on the selected system scheme and the accessories employed.

Commissioning with the commissioning assistant

The commissioning assistant automatically guides you through all the menus where settings have to be made. For this, "Coding level 1" is automatically active.



Please note

Incorrect operation at "Coding level 1" may result in damage to the appliance and the heating system.


Observe the service instructions for the "Vitotronic 200", otherwise the appliance warranty will be void.

Switch ON the ON/OFF switch on the control unit.

- The prompt "**Start commissioning?**" appears **automatically** on commissioning.

Note

The commissioning assistant can also be started manually:

To do this, press and hold  when switching on the control unit (progress bar visible).

- When the unit is first commissioned, the display is in German.

Sprache	
Deutsch	DE <input checked="" type="checkbox"/>
Bulgarski	BG <input type="checkbox"/>
Cesky	CZ <input type="checkbox"/>
Dansk	DK <input type="checkbox"/>
Wählen mit 	

Fig. 66

- Manually switching some appliance components during commissioning enables the control unit to display messages. These messages are not appliance faults.

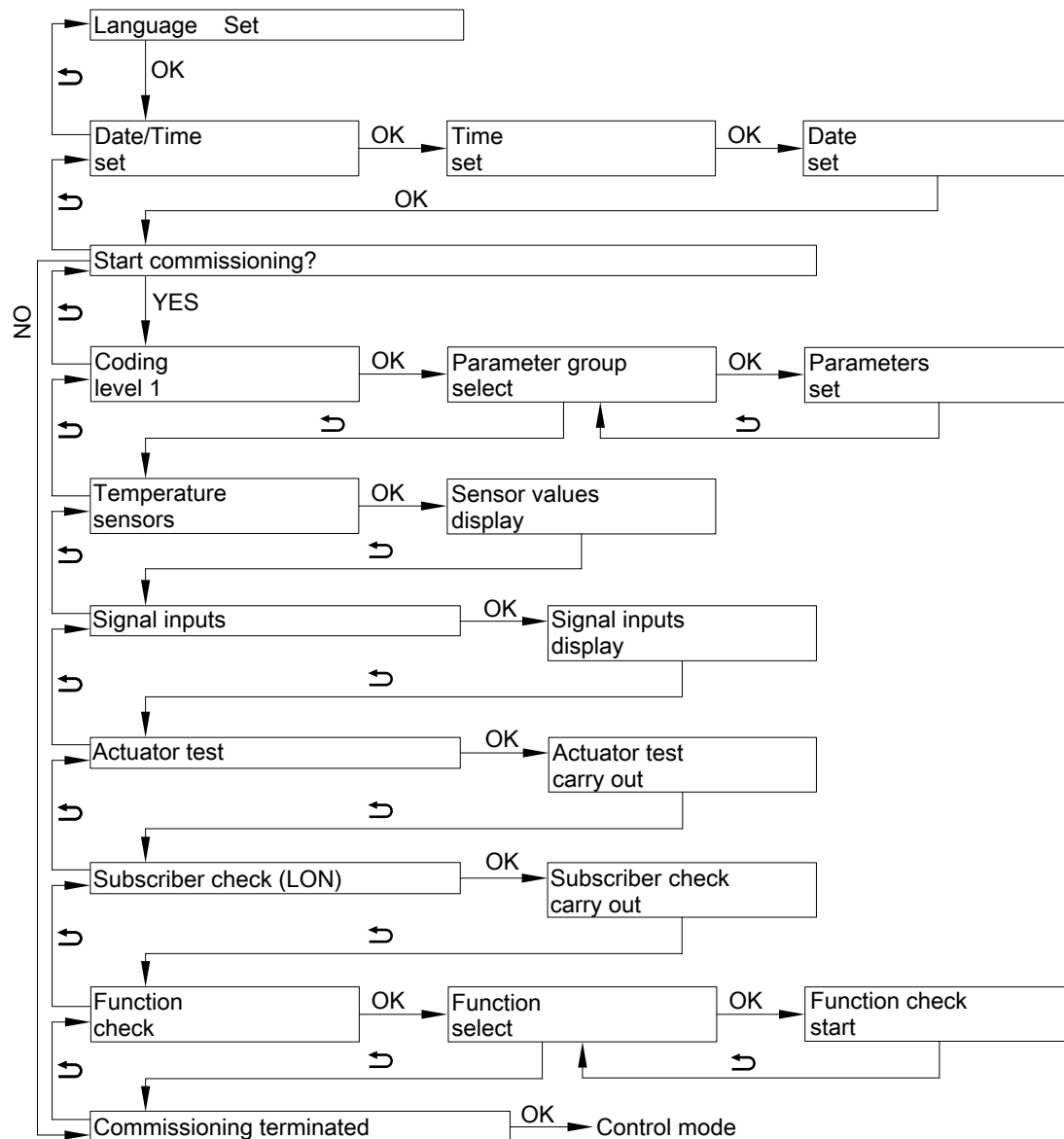


Fig. 67

Commissioning without the commissioning assistant

Activating the service menu

The service menu can be activated from any other menu.
Press and hold **OK** + **≡** simultaneously for approx. 4 s.

Deactivating the service menu

The service menu remains active until it is disabled with **"Terminate service?"**, or if no key is pressed for 30 min.

Setting parameters using "System scheme 7000" as an example

To set a parameter, first select the parameter group and then the parameter.

Service menu:

1. Press and hold **OK** + **≡** simultaneously for approx. 4 s.
2. Select **"Coding level 1"**.
3. Select parameter group: **"System definition"**
4. Select parameter: **"System scheme 7000"**
5. Set a system scheme: e.g. **"6"**

Alternatively, if the service menu was already active:

Extended menu:

1. **≡**



Commissioning the system (cont.)

2. "Service"
3. Select "Coding level 1".
4. Select parameter group: "System definition"
5. Select parameter: "System scheme 7000"
6. Set a system scheme: e.g. "6"

Required parameters for components connected on site

Parameters may need to be set subject to the appliance type, the selected system scheme and the accessories used.

Overview of required parameters: See the following chapter.



Detailed explanations of parameters
"Vitotronic 200" service instructions

System scheme

Notes regarding the installation kit with mixer ("Type of assembly kit 7044" set to "1")

The following system components are not monitored, even if this is shown in the system scheme:

- Heating water buffer cylinder in the secondary circuit flow
- Heating circuit M3/HC3 (central heating and cooling)
- Separate cooling circuit

System schemes

Component	System scheme											
	0	1	2	3	4	5	6	7	8	9	10	11
Heating circuit												
A1/HC1	—	X	X	—	—	X	X	—	—	X	X	—
M2/HC2	—	—	—	X	X	X	X	X	X	X	X	—
M3/HC3	—	—	—	—	—	—	—	X	X	X	X	—
DHW cylinder	X	—	X	—	X	—	X	—	X	—	X	—
Heating water buffer cylinder	—	○	○	X	X	X	X	X	X	X	X	—
Instantaneous heating water heater	○	○	○	○	○	○	○	○	○	○	○	○
Swimming pool	—	○	○	○	○	○	○	○	○	○	○	—
Cooling												
A1/HC1	—	○	○	—	—	○	○	—	—	○	○	—
M2/HC2	—	—	—	○	○	○	○	○	○	○	○	—
M3/HC3	—	—	—	—	—	—	—	○	○	○	○	—
Sep. cooling circuit SKK	○	○	○	○	○	○	○	○	○	○	○	—
Energy meter	○	○	○	○	○	○	○	○	○	○	○	—
Ventilation unit	○	○	○	○	○	○	○	○	○	○	○	—

X Component is selected.

○ Component may be added.

For detailed information on system examples: See www.viessmann-schemen.com.



Parameters for circulation pumps and other components

Heating circuit pump

Parameter	Setting
"System definition" →	
"System scheme 7000"	<ul style="list-style-type: none"> ▪ With heating circuit HC1 without mixer or ▪ With heating circuit HC2 with mixer or ▪ With heating circuit HC3 with mixer

DHW circulation pump

Parameter	Setting
Extended menu →	
"Time program DHW circulation"	Set a time program.

Installation kit with mixer for heating circuit M2/HC2

Parameter	Setting
"System definition" →	
"Type of assembly kit 7044"	"1"
"Internal hydraulics" →	
"Rated output heating circuit pump HC2 734A"	Set the required rated output in %.

Mixer extension kit for heating circuit M3/HC3

Parameter	Setting
"System definition" →	
"System scheme 7000"	With heating circuit HC3 Note Set rotary switch S1 in the extension kit to "2": See "Mixer extension kit" installation instructions.

Remote control for heating/cooling circuit or Vitocomfort 200

Parameter	Setting
"Heating circuit 1"/"Heating circuit 2"/"Heating circuit 3" →	
"Remote control 2003" or "Remote control 3003" or "Remote control 4003"	"1" Note To assign a heating circuit, set the code at the remote control: See "Vitotrol" installation instructions.

Room temperature sensor for separate cooling circuit

Parameter	Setting
"Cooling" →	
"Ranking room temp sensor separate cooling circuit 7106"	"0" Connection F16 "1" Heating circuit HC1 "2" Heating circuit HC2 "3" Heating circuit HC3 "4" Do not adjust.



Commissioning the system (cont.)

Vitocom 100, type GSM2

Parameter	Setting
"System definition" →	
"Vitocom 100 7017"	"1"

External extension

Parameter	Setting
"System definition" →	
"External extension 7010"	"1" EA1 extension "2" AM1 extension "3" EA1 and AM1 extensions Note <i>For parameters for external functions, see the following table.</i>

Parameters for external functions

External demand

Parameter	Setting
"Internal hydraulics" → if necessary	
"Flow temperature external demand 730C"	Set flow temperature for external demand

External starting of the compressor; mixer in control mode or OPEN

Parameter	Setting
"System definition" →	
"Effect of external demand on heat pump/heating circuits 7014"	"0" to "7" (Observe parameter "Flow temperature external demand 730C")

External changeover of the operating status of various system components

Parameter	Setting
"System definition" →	
"System components for external changeover 7011"	"0" to "127"
"Operating status for external changeover 7012"	"0" to "3"
"Duration of external changeover 7013"	"0" to "12"

External blocking of compressor and pumps

Parameter	Setting
"System definition" →	
"Effect of external blocking on pumps/compressor 701A"	"0" to "31"

External blocking of the compressor; mixer in control mode or CLOSED

Parameter	Setting
"System definition" →	
"Effect of ext. blocking on heat pump/heating circuits 7015"	"0" to "8"
"Effect of external blocking on pumps/compressor 701A"	"0" to "31"



External hook-up for heating/cooling circuits

Parameter	Setting
"Heating circuit 1"/"Heating circuit 2"/"Heating circuit 3" →	
"Remote control 2003" or "Remote control 3003" or "Remote control 4003"	"2"

Type AWBT(-M)-E-AC: Cooling function parameters

Parameter	Setting
"Cooling" →	
"Cooling function 7100"	"3"
"Cooling circuit 7101"	"1" Heating circuit HC1 "2" Heating circuit HC2 "3" Heating circuit HC3 "4" Separate cooling circuit SKK

Parameters for instantaneous heating water heater

Parameter	Setting
"Electr booster heater" →	
"Enable instantaneous heating water heater 7900"	"1"
"Output for instant. heating water heater at power-OFF 790A"	"1" 3 kW "2" 6 kW "3" 9 kW

Enable instantaneous heating water heater for DHW heating

Parameter	Setting
"DHW" →	
"Enable electric heaters for DHW heating 6015"	"1"

Parameters for swimming pool water heating

Parameter	Setting
"System definition" →	
"External extension 7010"	"1" or "3"
"Swimming pool 7008"	"1"

Parameters for ventilation with Vitovent 200-C

Parameter	Setting
"Ventilation" →	
"Vitovent enable 7D00"	"2" Vitovent 200-C




Commissioning the system (cont.)

Further enabling for Vitovent 200-C if necessary

Parameter	Setting
"Ventilation" →	
"Enable preheater bank electric 7D01"	"0" Defrosting without preheating coil ("Strategy, passive frost protection 7D2C") "1" Frost protection with preheating coil; defrosting via bypass "2" Frost protection with preheating coil; comfort function
"Strategy, passive frost protection 7D2C"	"0" Fans OFF "1" Defrosting via bypass "2" Supply air fan OFF
"Type of heat exchanger 7D2E"	"0" Countercurrent heat exchanger "1" Enthalpy heat exchanger
"Installation position 7D2F"	"0" Ceiling mounting "1" Wall mounting
"Function, external 230 V input, ventilation 7D3A"	"1" External switch (bathroom switch) enabled

Adjust values for Vitovent 200-C if necessary

Parameter	Setting
"Ventilation" →	
"Set room temperature 7D08"	"100" to "300" (± 10 to 30 °C)
"Flow rate reduced ventilation 7D0A"	Subject to sizing  Ventilation unit service instructions
"Flow rate nominal ventilation 7D0B"	
"Flow rate intensive ventilation 7D0C"	

Parameters for ventilation with Vitovent 200-W/300-C/300-W

Parameter	Setting
"Ventilation" →	
"Vitovent enable 7D00"	"3" Vitovent 200-W or Vitovent 300-C or Vitovent 300-W



Adjust values for Vitovent 200-W/300-C/300-W if necessary

Parameter	Setting
"Ventilation" →	
"Set room temperature C108"	Max. 4 K higher or lower than "Standard room temperature 2000" (adjustment value: 1 ± 0.1 °C)
"Background ventilation C109"	Ventilation unit service instructions
"Reduced ventilation C10A"	
"Standard ventilation C10B"	
"Intensive ventilation C10C"	
"Background ventilation, second fan duct C189" (Vitovent 200-W only)	
"Reduced ventilation, second fan duct C18A" (Vitovent 200-W only)	
"Standard ventilation, second fan duct C18B" (Vitovent 200-W only)	
"Intensive ventilation, second fan duct C18C" (Vitovent 200-W only)	

Parameters for ventilation with Vitovent 300-F

Parameter	Setting
"Ventilation" →	
"Vitovent enable 7D00"	"1" Vitovent 300-F

Further enabling for Vitovent 300-F if necessary

Parameter	Setting
"Ventilation" →	
"Enable preheater bank electric 7D01"	"1"
"Enable reheater bank hydraulic 7D02"	"1"
"Enable humidity sensor 7D05"	"1"
"Enable CO2 sensor 7D06"	"1"
"Type of heat exchanger 7D2E"	"0" Countercurrent heat exchanger "1" Enthalpy heat exchanger

Adjust values for Vitovent 300-F if necessary

Parameter	Setting
"Ventilation" →	
"Set room temperature 7D08"	"100" to "300" (± 10 to 30 °C)
"Flow rate reduced ventilation 7D0A"	Ventilation unit service instructions
"Flow rate nominal ventilation 7D0B"	
"Flow rate intensive ventilation 7D0C"	



Commissioning the system (cont.)

Parameters for utilisation of power generated on site

Parameter	Setting
"Photovoltaics" →	
"Enable own energy consumption PV 7E00"	"1"
"Threshold for electrical power 7E04"	"0" to "300" (\triangleq 0 to 30 kW)

Enable required functions for utilisation of power generated on site

Parameter	Setting
"Photovoltaics" →	
"Enable own energy consumptn for set DHW temperature 2 7E10"	"1"
"Enable own energy consumption for DHW heating 7E11"	"1"
"Enable own energy consumptn for heating water buffer cyl. 7E12"	"1"
"Enable own energy consumption for heating 7E13"	"1"
"Enable own energy consumption for cooling 7E15"	"1"

Specify the temperature differential to the selected set value for the chosen function

Parameter	Setting
"Photovoltaics" →	
"Raise set DHW cylinder temperature PV 7E21"	"0" to "500" (\triangleq 0 to 50 K)
"Raise set heating water buffer cylinder temp PV 7E22"	"0" to "400" (\triangleq 0 to 40 K)
"Raise set room temperature PV 7E23"	"0" to "100" (\triangleq 0 to 10 K)
"Reduce set room temperature PV 7E25"	"0" to "100" (\triangleq 0 to 10 K)

Parameters for Smart Grid

Parameter	Setting
"Smart Grid" →	
"Enable Smart Grid 7E80"	"1"
"Smart Grid Enable elec heat 7E82"	"1" Stage 1 "2" Stage 2 "3" Stage 3

Specify the temperature differential to the selected set value for the chosen function

Parameter	Setting
"Smart Grid" →	
"Smart Grid set value increase for DHW heating 7E91"	"0" to "500" (\triangleq 0 to 50 K)
"Smart Grid set value increase for htg wtr buff 7E92"	"0" to "400" (\triangleq 0 to 40 K)
"Smart Grid set value increase for centr htg 7E93"	"0" to "100" (\triangleq 0 to 10 K)
"Smart Grid set value decrease for room t cool 7E95"	"0" to "100" (\triangleq 0 to 10 K)



Checking the heat pump for noise

Checking the appliance for unusual noises, e.g. operating noise of fan, compressor and pumps. Venting again if required.



Checking the system function

- Check the function of all system components, e.g. circulation pumps, 3-way diverter valves.
- Scan temperatures at the heat pump control unit.
- Possibly check heat meter readings.

4-way diverter valve in the outdoor unit

- The 4-way diverter valve is at zero volt in heating mode.
- In cooling mode, the 4-way diverter valve is live. The heat pump is operated in reverse (refrigerant circuit reversal).

Resetting the high limit safety cut-out for type AWBT(-M)-E/AWBT(-M)-E-AC

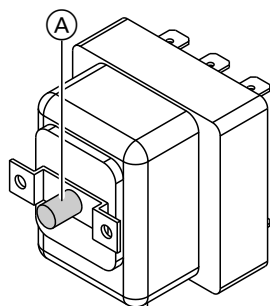


Fig. 68

- Ⓐ High limit safety cut-out reset button



Please note

If the heat pump is exposed to temperatures below $-15\text{ }^{\circ}\text{C}$, 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 $85\text{ }^{\circ}\text{C}$.



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.

Overview of electrical components

- **Indoor unit:**
See page 38 onwards.
- **Outdoor unit:**
See page 47 onwards.

Indoor unit: Opening the programming unit

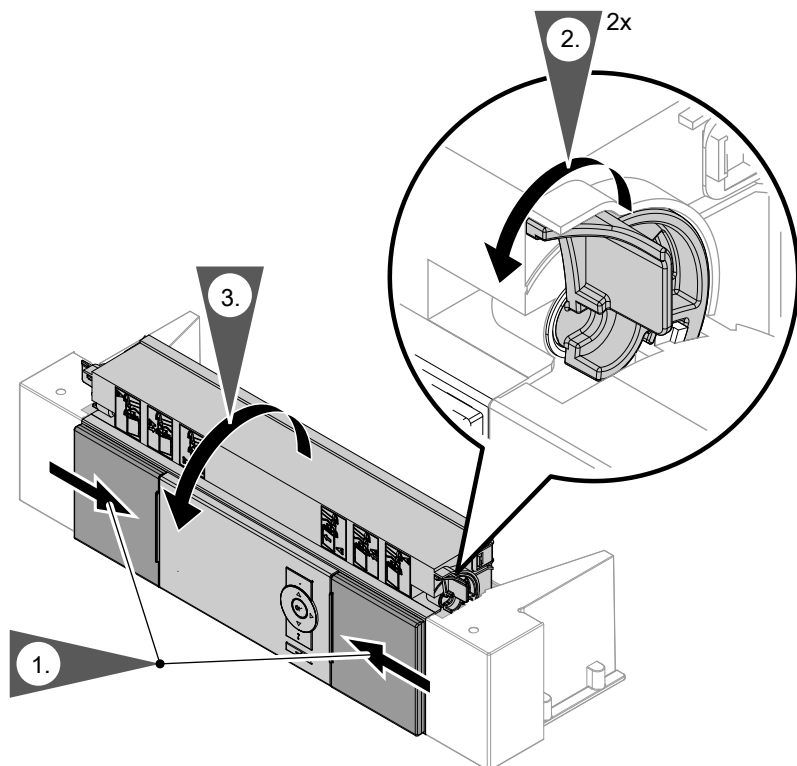


Fig. 69

Removing the cover from the programming unit if necessary

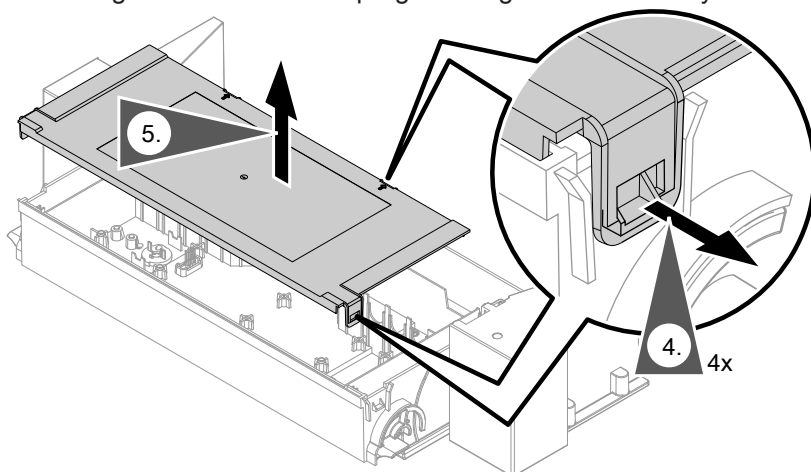


Fig. 70

Indoor unit: Placing the control unit panel in its service position

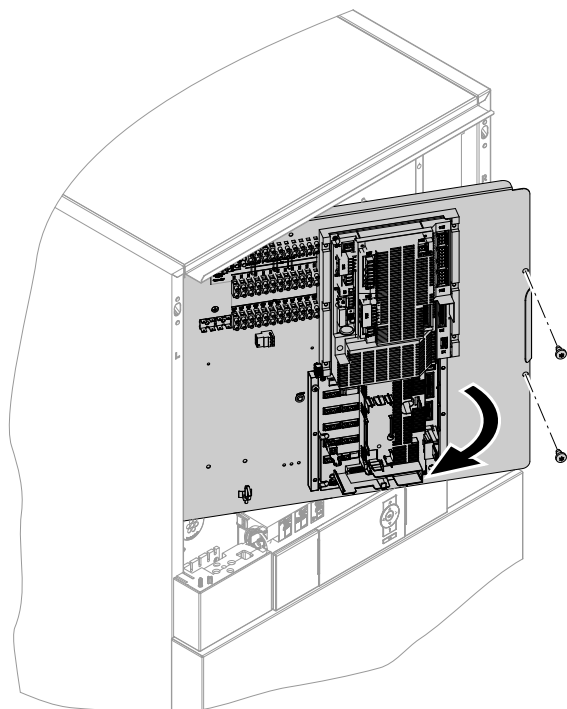


Fig. 71

Overview of internal components: Indoor unit

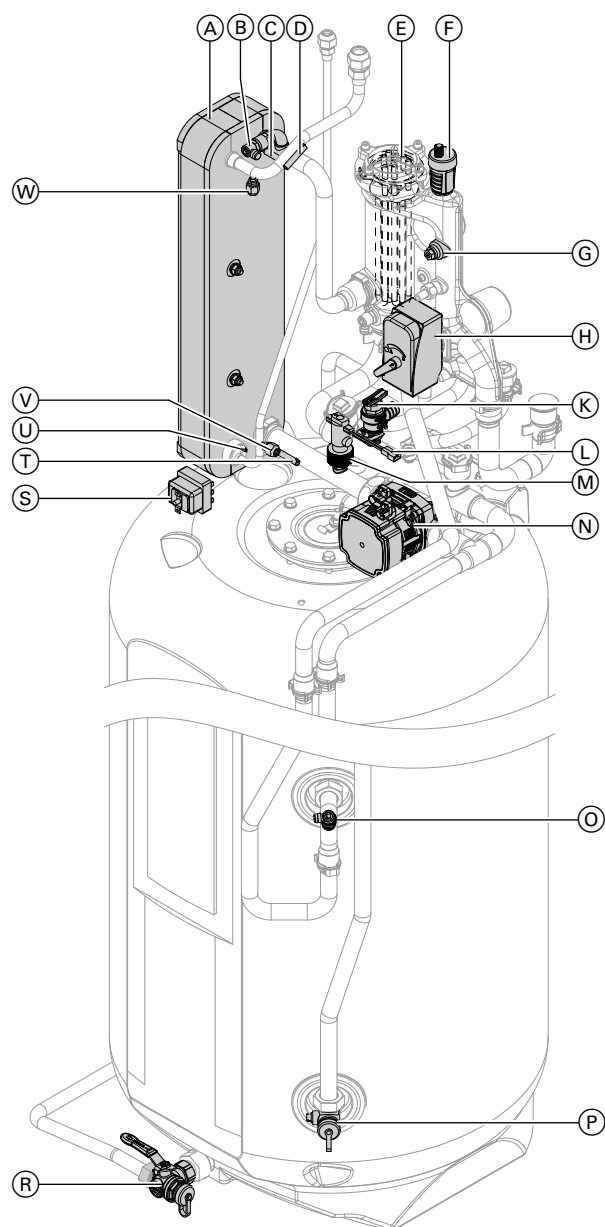


Fig. 72

- (A) Condenser
- (B) Secondary circuit air vent valve
- (C) Secondary circuit flow temperature sensor upstream of instantaneous heating water heater (F3)
- (D) Reversible suction gas temperature sensor (F24)
- (E) Type AWBT(-M)-E/AWBT(-M)-E-AC only: Instantaneous heating water heater
- (F) Quick-action air vent valve G $\frac{3}{8}$
- (G) Secondary circuit flow temperature sensor (F8)
- (H) 3-way diverter valve "central heating/DHW heating"
- (K) Safety valve
- (L) Pressure gauge
- (M) Flow switch
- (N) Secondary pump
- (O) Secondary circuit air vent valve, DHW cylinder
- (P) Secondary circuit drain and fill valve
- (R) Drain and fill valve, DHW side
- (S) Type AWBT(-M)-E/AWBT(-M)-E-AC only: High limit safety cut-out (STB), instantaneous heating water heater
- (T) Secondary circuit return temperature sensor (F9)
- (U) Liquid gas temperature sensor (F25)
- (V) Indoor unit service valve: Schrader valve; can be used in place of the outdoor unit service valve for checking the pressure and evacuating the refrigerant circuit.
- (W) Indoor unit service valve: Schrader valve; can be used in place of the outdoor unit service valve for checking the pressure and evacuating the refrigerant circuit.

Overview of internal components: Outdoor unit



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: Outdoor unit (cont.)

Outdoor unit, types 221.C04 to C08

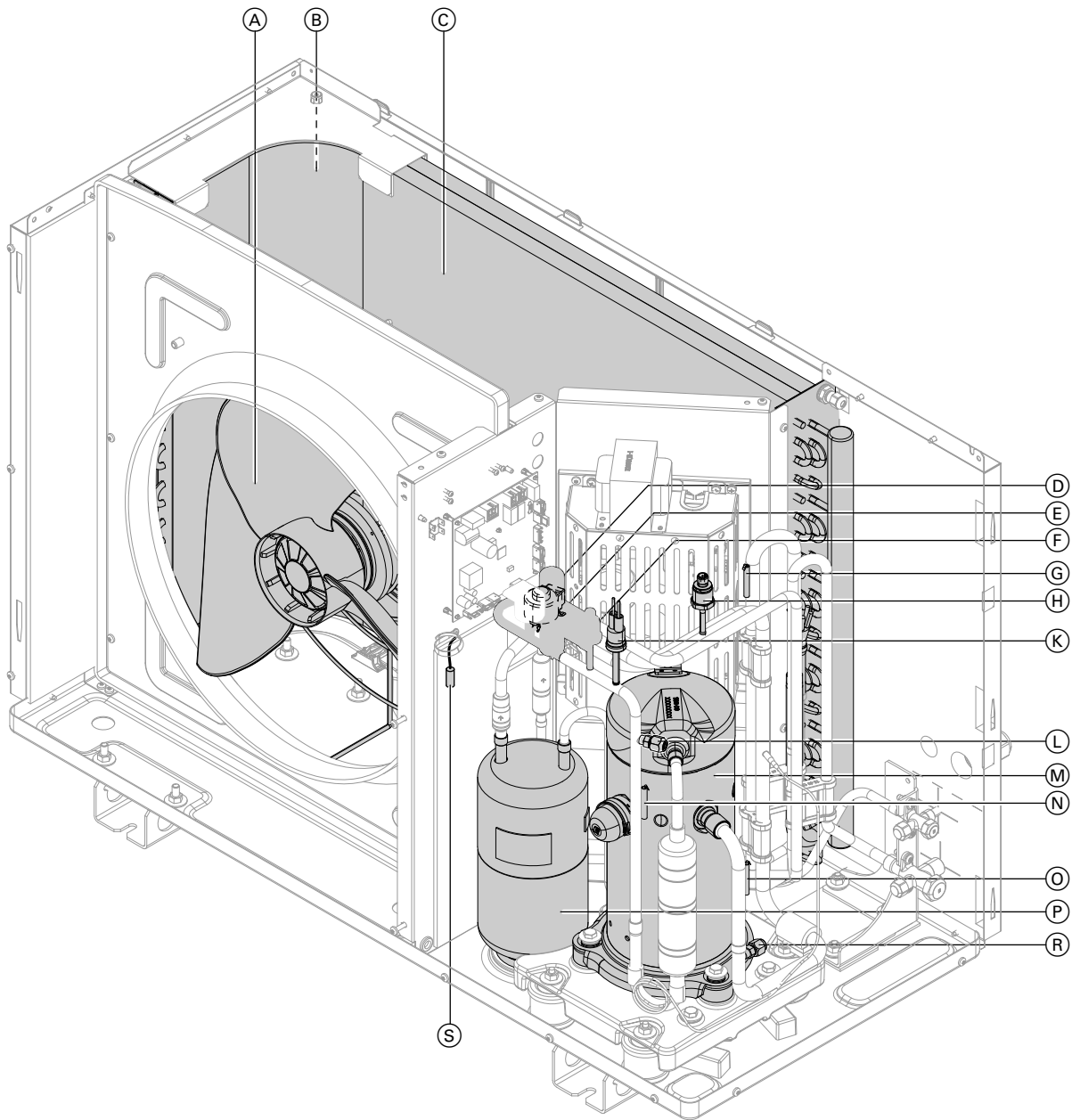


Fig. 73

- | | |
|--|--|
| (A) Fan | (L) Schrader valve, high pressure side |
| (B) Air intake temperature sensor (T5) | (M) Compressor |
| (C) Heat exchanger (evaporator) | (N) Hot gas temperature sensor (T6) |
| (D) Electronic expansion valve | (O) Compressor suction gas temperature sensor (T4) |
| (E) 4-way diverter valve | (P) Refrigerant receiver |
| (F) High pressure sensor | (R) Schrader valve, low pressure side |
| (G) Evaporator suction gas temperature sensor (T7) | (S) Refrigerant circuit controller temperature sensor (T2) |
| (H) Low pressure sensor | |
| (K) Safety high pressure switch | |

Overview of internal components: Outdoor unit (cont.)

Outdoor unit, types 221.C10 to C16

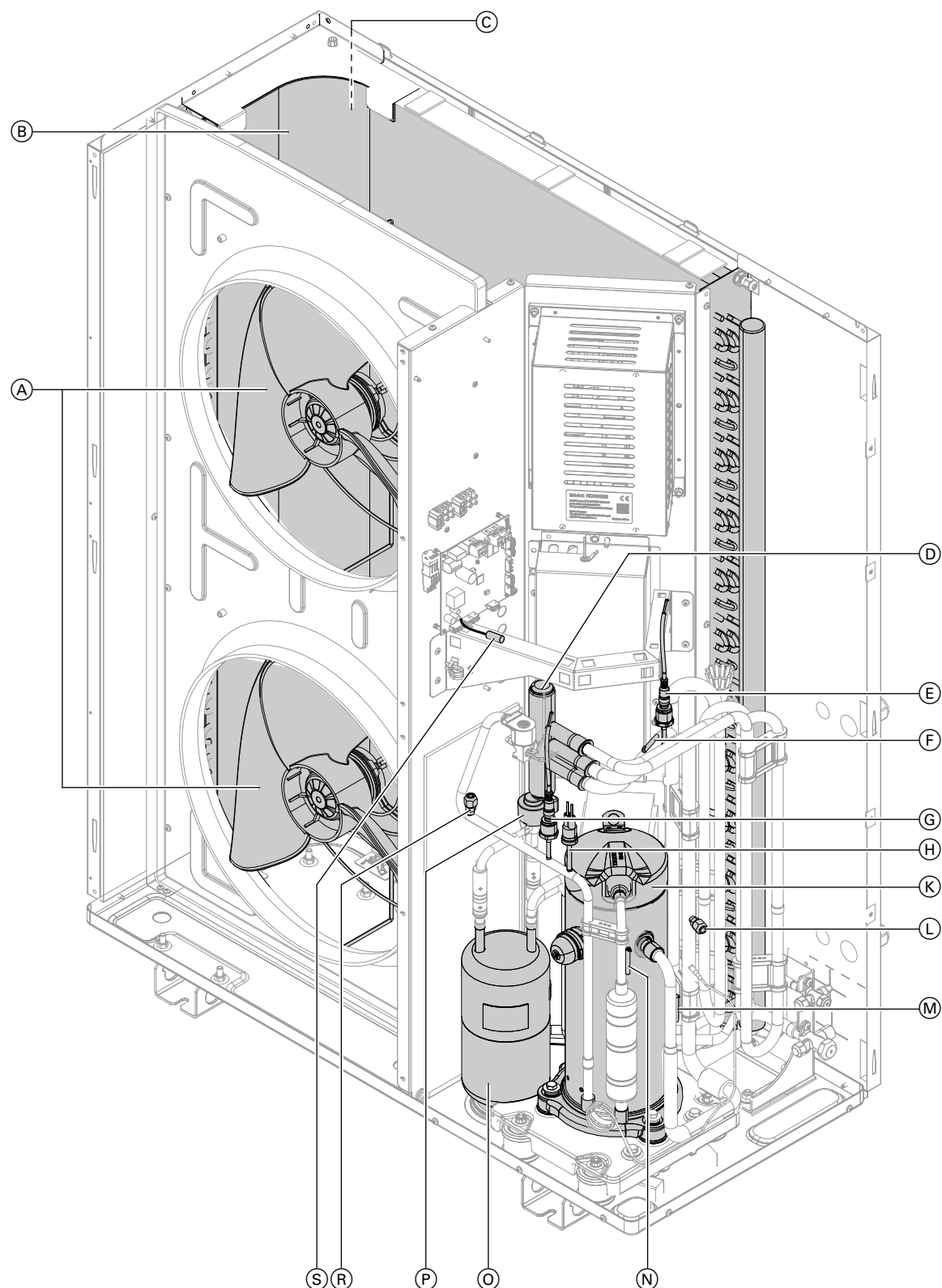


Fig. 74

- | | |
|--|--|
| (A) Fan | (G) High pressure sensor |
| (B) Heat exchanger (evaporator) | (H) Safety high pressure switch |
| (C) Air intake temperature sensor (T5) | (K) Compressor |
| (D) 4-way diverter valve | (L) Schrader valve, low pressure side |
| (E) Low pressure sensor | (M) Compressor suction gas temperature sensor (T4) |
| (F) Evaporator suction gas temperature sensor (T7) | (N) Hot gas temperature sensor (T6) |

Overview of internal components: Outdoor unit (cont.)

- ⓪ Refrigerant receiver
- Ⓟ Electronic expansion valve
- Ⓡ Schrader valve, high pressure side
- Ⓢ Refrigerant circuit controller temperature sensor (T2)

Draining the heat pump on the secondary side

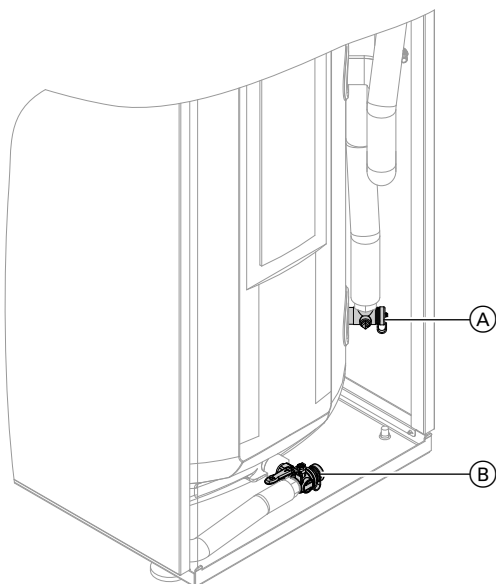


Fig. 75

- Ⓐ Drain and fill valve, secondary side
- Ⓑ Drain and fill valve, DHW side

1. Close the on-site boiler drain and fill valve.

2. Draining the heating water side

Connect the hose to the drain and fill valve of the secondary circuit.
Open the secondary circuit drain and fill valve.

3. Draining the DHW side

See chapter "Draining the appliance on the DHW side", page 69.

Checking the temperature sensors

Connection to the indoor unit

Temperature sensors are connected to the controller and sensor PCB: See page 44.

Temperature sensor	Test element
<ul style="list-style-type: none"> ▪ Outside temperature sensor (F0) ▪ Buffer temperature sensor (F4) ▪ Cylinder temperature sensor, top (F6) ▪ Flow temperature sensor, heating circuit with mixer M2/HC2 (F12) ▪ System flow temperature sensor (F13) ▪ Cooling circuit flow temperature sensor (direct heating circuit A1/HC1 or separate cooling circuit SKK) (F14) ▪ Room temperature sensors 	NTC 10 kΩ
<ul style="list-style-type: none"> ▪ Secondary circuit flow temperature sensor (F8) ▪ Secondary circuit return temperature sensor (F9) ▪ Secondary circuit flow temperature sensor upstream of instantaneous heating water heater (F3) ▪ Reversible suction gas temperature sensor (F24) ▪ Liquid gas temperature sensor (F25) 	Pt500A (PTC)

Checking the temperature sensors (cont.)

Connection to the outdoor unit

Temperature sensors are connected to the refrigerant circuit controller in the outdoor unit (see label in the outdoor unit): See page 87.

Temperature sensor	Test element
<ul style="list-style-type: none"> ▪ Inverter ambient temperature sensor (T2) ▪ Compressor suction gas temperature sensor (T4) ▪ Air intake temperature sensor (T5) ▪ Hot gas temperature sensor (T6) ▪ Evaporator suction gas temperature sensor (T7) 	NTC 10 kΩ

Indoor unit: Viessmann NTC 10 kΩ (blue marking)

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

Checking the temperature sensors (cont.)

Indoor unit: Viessmann NTC 20 k Ω (orange 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	702.156	10	40.034	60	4.943	110	1.009	165	0.259	215	0.097
-35	503.154	15	31.537	65	4.136	115	0.879	170	0.233	220	0.089
-30	364.902	20	25.027	70	3.478	120	0.768	175	0.209	225	0.081
-25	257.655	25	20.000	75	2.937	125	0.673	180	0.189	230	0.075
-20	198.442	30	16.090	80	2.492	130	0.592	185	0.171	235	0.069
-15	148.362	35	13.028	85	2.123	135	0.522	190	0.154	240	0.063
-10	112.403	40	10.613	90	1.816	140	0.461	195	0.140	245	0.058
-5	85.788	45	8.696	95	1.559	145	0.409	200	0.127	250	0.054
0	66.048	50	7.166	100	1.34	150	0.364	205	0.116	255	0.050
5	51.214	55	5.936	105	1.16	160	0.289	210	0.106	260	0.046

Checking the temperature sensors (cont.)

Indoor unit: Viessmann Pt500A (green marking)

$\vartheta / ^\circ\text{C}$	R / Ω	$\vartheta / ^\circ\text{C}$	R / Ω	$\vartheta / ^\circ\text{C}$	R / Ω	$\vartheta / ^\circ\text{C}$	R / Ω	$\vartheta / ^\circ\text{C}$	R / Ω	$\vartheta / ^\circ\text{C}$	R / Ω
-30	441.1	1	502.0	32	562.3	63	623.9	94	681.2	125	739.8
-29	443.1	2	503.9	33	564.2	64	622.0	95	683.1	126	741.7
-28	445.1	3	505.9	34	566.1	65	625.8	96	685.0	127	743.5
-27	447.0	4	507.8	35	568.1	66	627.7	97	686.9	128	745.4
-26	449.0	5	509.8	36	570.0	67	629.7	98	688.8	129	747.3
-25	451.0	6	511.7	37	571.9	68	631.6	99	690.7	130	749.2
-24	453.0	7	513.7	38	573.9	69	633.5	100	692.6	131	751.1
-23	454.9	8	515.6	39	575.8	70	635.4	101	694.4	132	752.9
-22	456.9	9	517.6	40	577.7	71	637.3	102	696.3	133	754.8
-21	458.9	10	519.5	41	579.7	72	639.2	103	698.2	134	756.7
-20	460.8	11	521.5	42	581.6	73	641.1	104	700.1	135	758.6
-19	462.8	12	523.4	43	583.5	74	643.1	105	702.0	136	760.4
-18	464.8	13	525.4	44	585.4	75	645.0	106	703.9	137	762.3
-17	466.7	14	527.3	45	587.4	76	646.9	107	705.8	138	764.2
-16	468.7	15	529.3	46	589.3	77	648.8	108	707.7	139	766.1
-15	470.6	16	531.2	47	591.2	78	650.7	109	709.6	140	767.9
-14	472.6	17	533.2	48	593.2	79	652.6	110	711.5	141	769.8
-13	474.6	18	535.1	49	595.1	80	654.5	111	713.4	142	771.7
-12	476.5	19	537.0	50	597.0	81	656.4	112	715.3	143	773.6
-11	478.5	20	539.0	51	598.9	82	658.3	113	717.2	144	775.4
-10	480.5	21	540.9	52	600.9	83	660.2	114	719.0	145	777.3
-9	482.4	22	542.9	53	602.8	84	662.1	115	720.9	146	779.2
-8	484.4	23	544.8	54	604.7	85	664.0	116	722.8	147	781.0
-7	486.3	24	546.8	55	606.6	86	665.9	117	724.7	148	782.9
-6	488.3	25	548.7	56	608.6	87	667.9	118	726.6	149	784.8
-5	490.2	26	550.6	57	610.5	88	669.8	119	728.5	150	786.7
-4	492.2	27	552.6	58	612.4	89	671.7	120	730.4	151	788.5
-3	494.2	28	554.5	59	614.0	90	673.6	121	732.2	152	790.4
-2	496.1	29	556.5	60	616.2	91	675.5	122	734.1	153	792.3
-1	498.1	30	558.4	61	618.2	92	677.4	123	736.0	154	794.1
0	500.0	31	560.3	62	620.1	93	679.3	124	737.9	155	796.0

Checking the temperature sensors (cont.)

Outdoor unit: Viessmann 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 fuses

Fuse locations:

- Indoor unit:
See page 38 onwards.
- Outdoor unit:
See page 47 onwards.
- Fuse F1 is located on the mains terminal of the heat pump control unit.
Fuse F3 is located on the main PCB.
- The fuses for the fan and the refrigerant circuit controller are located above the EEV PCB.

Fuse type:

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

Checking the fuses (cont.)

1. Switch OFF the power supply.
2. Opening the wiring chamber.
3. Check fuses. Replace if necessary.



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 specified response characteristics.



Danger

Removing the fuse 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**.

Overview of indoor unit assemblies

The following details are required when ordering parts:

- Serial no. (see type plate (A))
- Assembly (from this parts list)
- Position number of the individual part within the assembly (from this parts list)

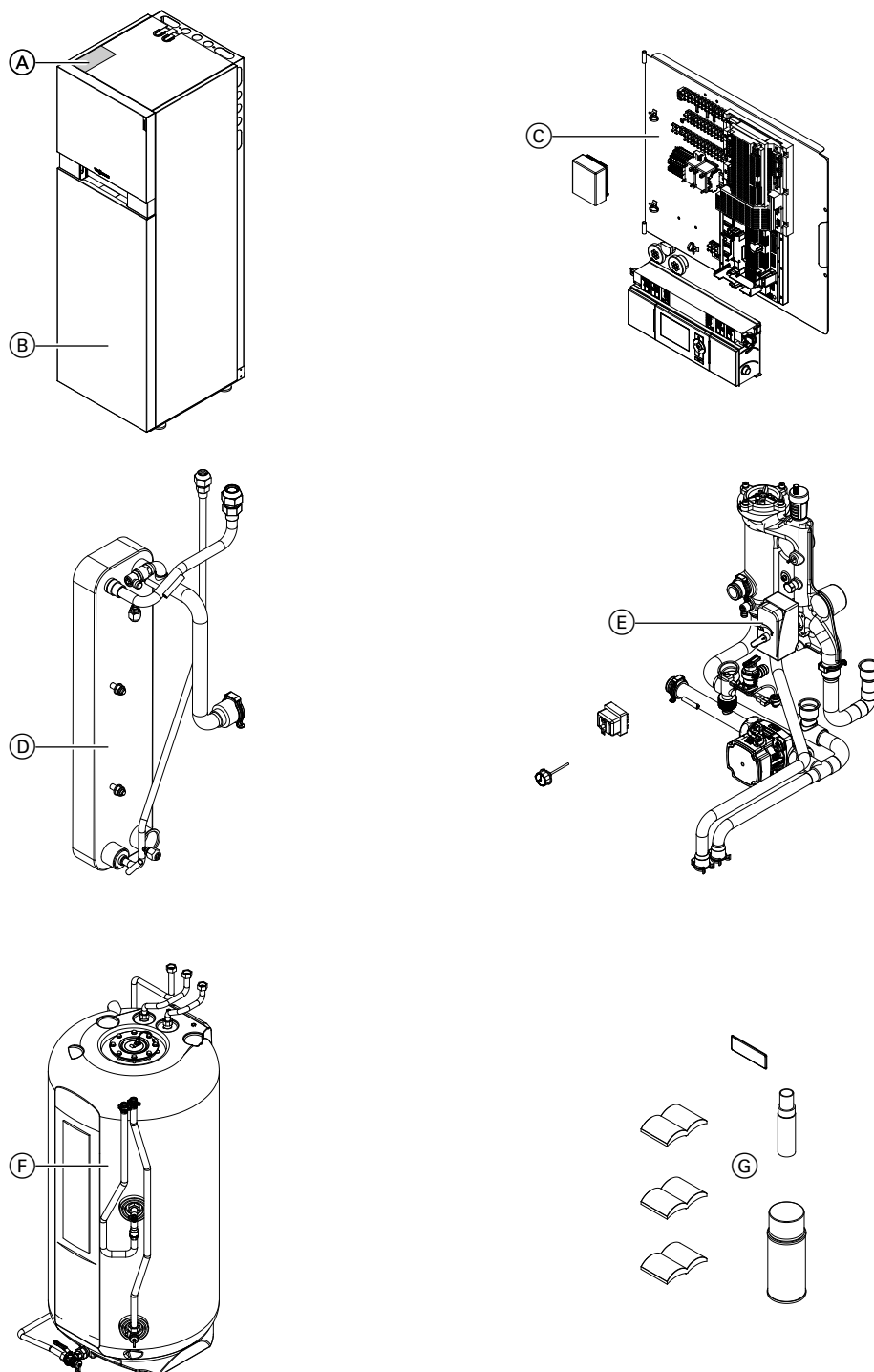


Fig. 76

- (A) Type plate
- (B) Indoor unit casing assembly
- (C) Indoor unit electrical equipment assembly
- (D) Indoor unit condenser assembly
- (E) Indoor unit hydraulic assembly
- (F) DHW cylinder assembly
- (G) Miscellaneous assembly

Indoor unit casing

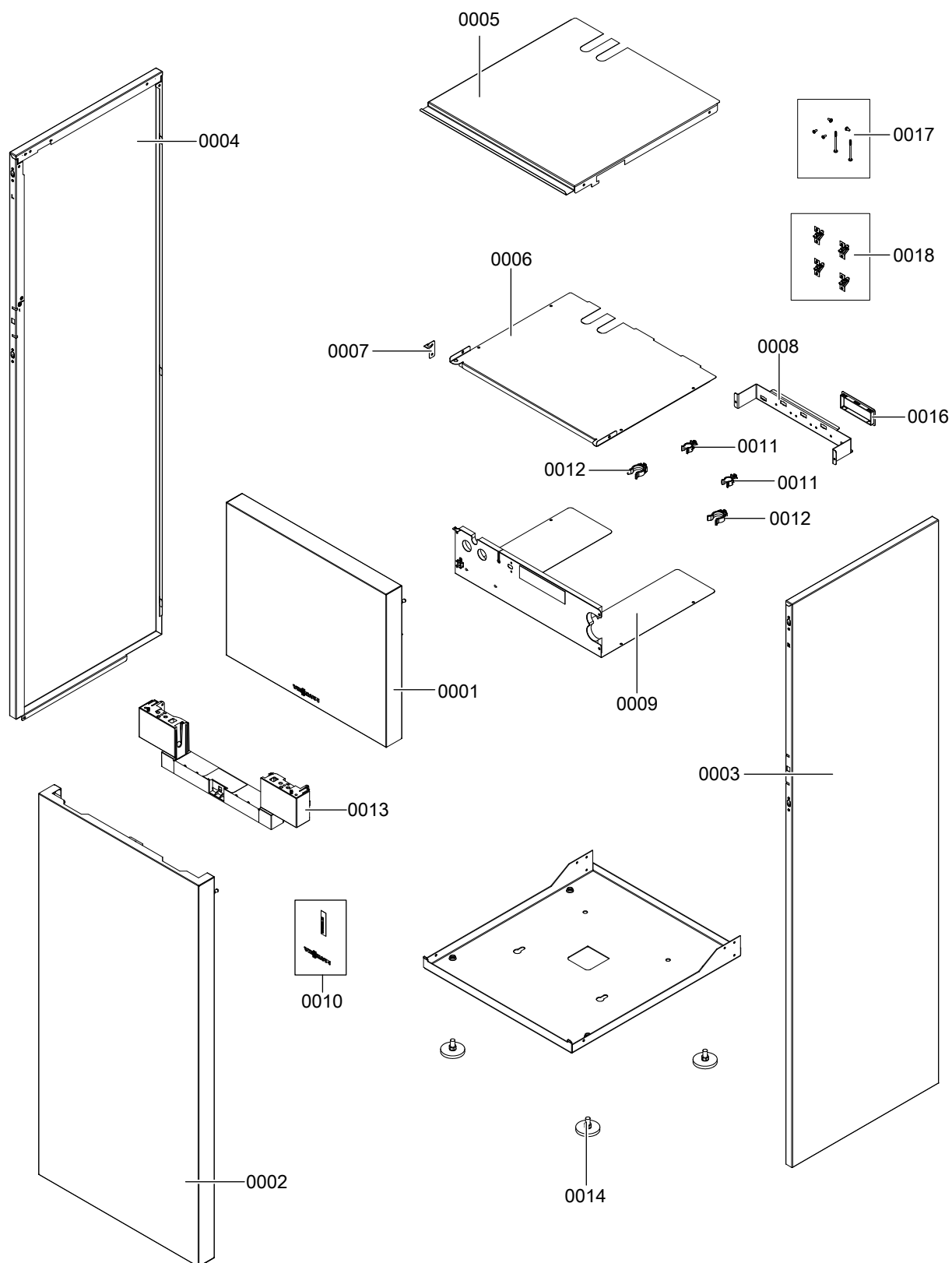


Fig. 77

Indoor unit casing (cont.)

Pos.	Part
0001	Front panel, top
0002	Front panel, bottom
0003	Side panel, right
0004	Side panel, left
0005	Top panel
0006	Inner top panel
0007	Control unit panel fixing
0008	Pipe clip retaining bracket
0009	Control unit panel, bottom
0010	Logos
0011	Pipe clip Ø 18 mm
0012	Pipe clip Ø 28 mm
0013	Control unit support
0014	Adjustable foot
0016	Edge protection
0017	Connecting elements
0018	Fixing elements (2 pce)

Indoor unit electrical equipment

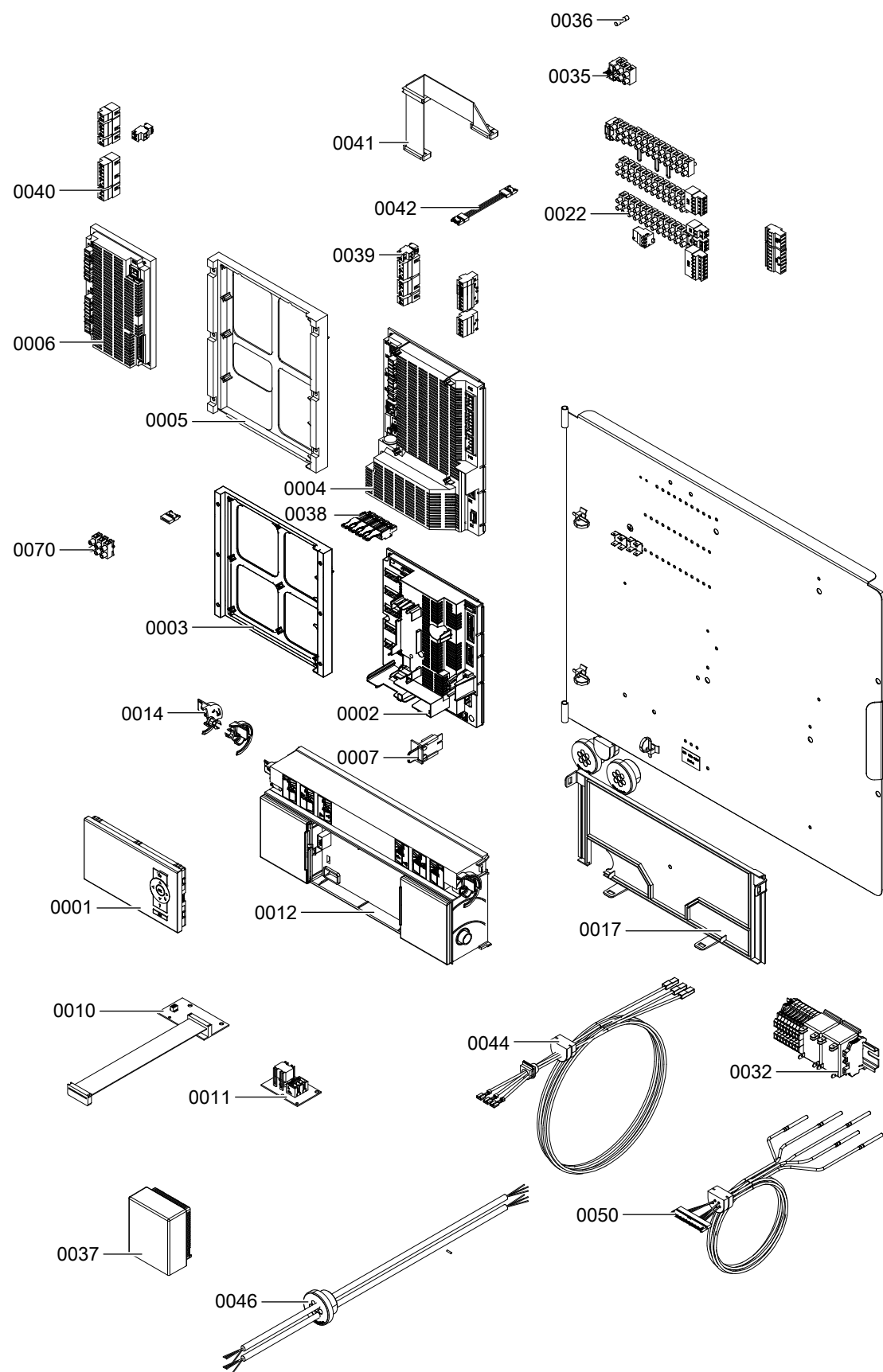


Fig. 78

Indoor unit electrical equipment (cont.)

Pos.	Part
0001	Programming unit
0002	Controller and sensor PCB with cover (CU401)
0003	Base support, controller and sensor PCB
0004	Main PCB with cover (MB761)
0005	Base support, main PCB
0006	Expansion PCB with cover (SA135)
0007	Coding card
0010	PCB with connection adaptor (SA136-A10)
0011	PCB with connection adaptor, ON/OFF switch (SA137-A10)
0012	Programming unit
0014	Locking bolts, left/right
0017	Back panel, programming unit
0022	Luster terminals with cable harness 230 V~
0032	Type AWBT(-M)-E/AWBT(-M)-E-AC only: Control module for instantaneous heating water heater
0035	Mains terminals with fuse holder
0036	Fuses 6.3 A (slow) (set)
0037	Outside temperature sensor NTC 10 kΩ
0038	Mating plug for controller and sensor PCB
0039	Mating plug for main PCB
0040	Mating plug for expansion PCB
0041	Ribbon cable AWG 28, 24 x 0.09 mm
0042	4-pole connecting cable, length 85 mm
0044	Type AWBT(-M)-E/AWBT(-M)-E-AC only: Instantaneous heating water heater connecting cable
0046	Secondary pump connecting cable
0050	Low voltage cable harness

Indoor unit condenser

Components

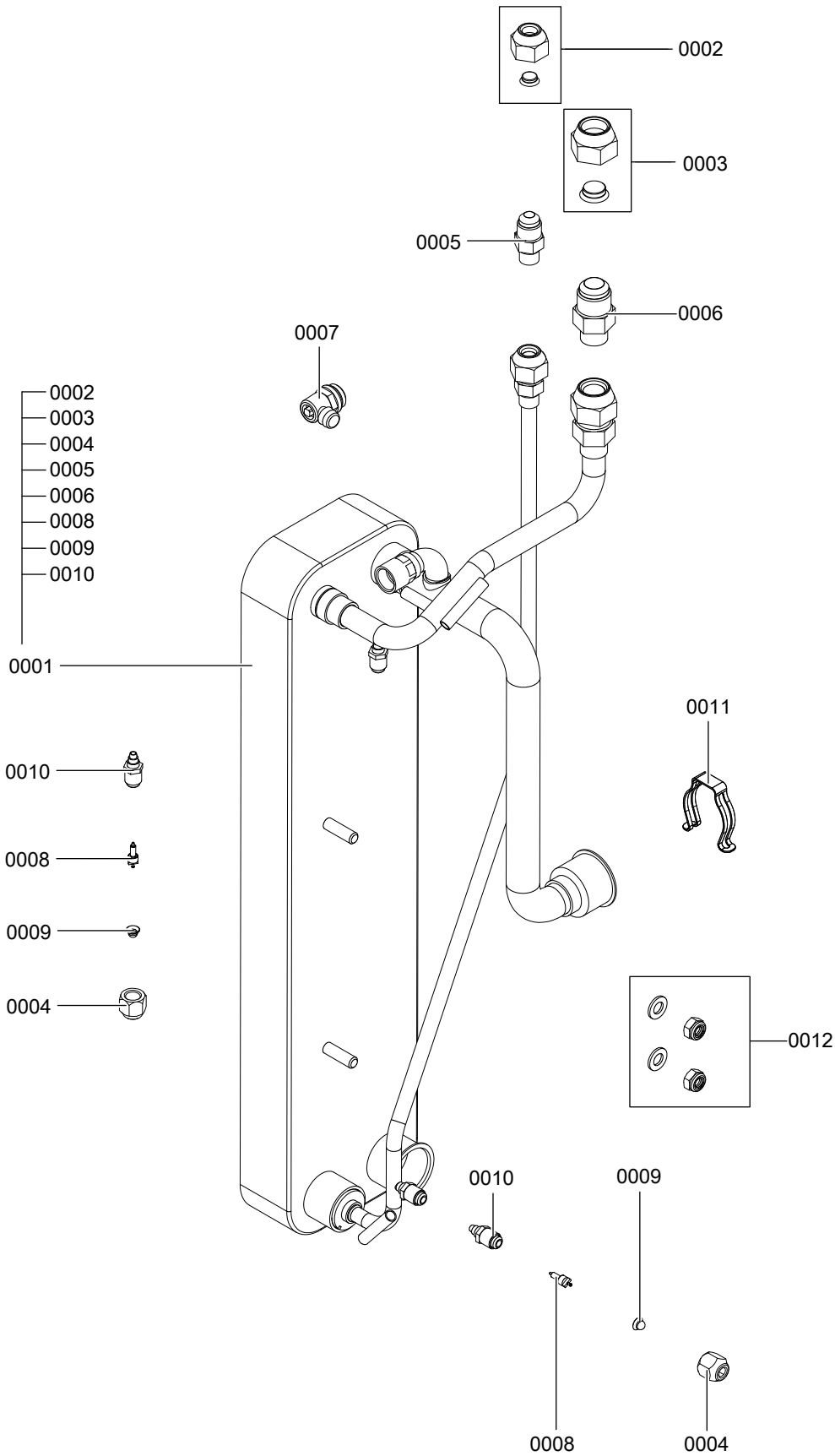


Fig. 79

Indoor unit condenser (cont.)

Pos.	Part
0001	Condenser connection assembly
0002	Union nut UNF 5/8 for liquid line
0003	Union nut UNF 7/8 for hot gas line
0004	Union nut G 1/4 with sealing cap for Schrader valve
0005	Soldered bush 10 x UNF 5/8
0006	Soldered bush 15/16 x UNF 7/8
0007	Air vent valve G 3/8
0008	Schrader valve
0009	Sealing cap for Schrader valve
0010	Valve body 7/16
0011	Spring clip Ø 28 mm
0012	Condenser screw set



This diagram is an exploded view of a mechanical assembly, likely a pump or engine component. It shows the following parts and their assembly relationships:

- 0002**: Main housing or casing.
- 0003**: Internal engine or pump unit.
- 0004**: Small connector or fitting.
- 0005**: Rectangular component, possibly a filter or sensor.
- 0006**: Long drive shaft.
- 0007**: Small screw or pin.
- 0008**: Mounting bracket or plate.
- 0009**: Flexible hose or pipe.
- 0010**: Small cylindrical component, possibly a valve or plug.
- 0011**: Long drive shaft.
- 0012**: Long drive shaft.
- 0013**: U-shaped pipe or manifold.
- 0014**: Long pipe or hose.
- 0015**: Flange or mounting plate.
- 0016**: Small connector or fitting.
- 0017**: O-ring or seal.
- 0018**: Various O-rings and seals.
- 0019**: Various O-rings and seals.
- 0020**: Various O-rings and seals.
- 0021**: Mounting bracket or plate.
- 0022**: Various O-rings and seals.
- 0023**: Various O-rings and seals.
- 0024**: Small bracket or clip.
- 0025**: Small bracket or clip.
- 0026**: Mounting bracket or plate.
- 0027**: Small bracket or clip.

The diagram includes several sub-assemblies and individual components, all labeled with their respective part numbers. The assembly is shown in a disassembled state to illustrate the relationship between the parts.

102

Hydraulics, indoor unit (cont.)

Pos.	Part
0001	Hydraulic block
0002	Diaphragm expansion vessel 10 l
0003	High efficiency circulation pump with PWM control
0004	Safety valve 3 bar (0.3 MPa)
0005	Servomotor, 3-way diverter valve
0006	Drain hose safety valve
0007	Pressure gauge
0008	Valve insert, 3-way diverter valve
0009	Connection pipe, diaphragm expansion vessel
0010	Quick-action air vent valve G $\frac{3}{8}$
0011	Secondary circuit return line
0012	DHW cylinder flow line
0013	Heating water flow line
0014	Line from circulation pump — plate heat exchanger
0015	Plug for instantaneous heating water heater
0016	Air vent valve G $\frac{3}{8}$
0017	Gasket for instantaneous heating water heater/plug
0018	O-ring 28.0 x 2.5 mm
0019	Gasket A 35 x 45 x 2 mm
0020	Gasket A 10 x 15 x 1.5 mm (5 pce)
0021	Gaskets and O-rings (set)
0022	Spring clip \varnothing 25 mm
0023	Spring clip \varnothing 28 mm
0024	Clip \varnothing 18 mm (5 pce)
0025	Clip \varnothing 10 mm
0026	Hydraulic block screws (set)
0027	Flow switch

Type AWBT(-M)-E/AWBT(-M)-E-AC

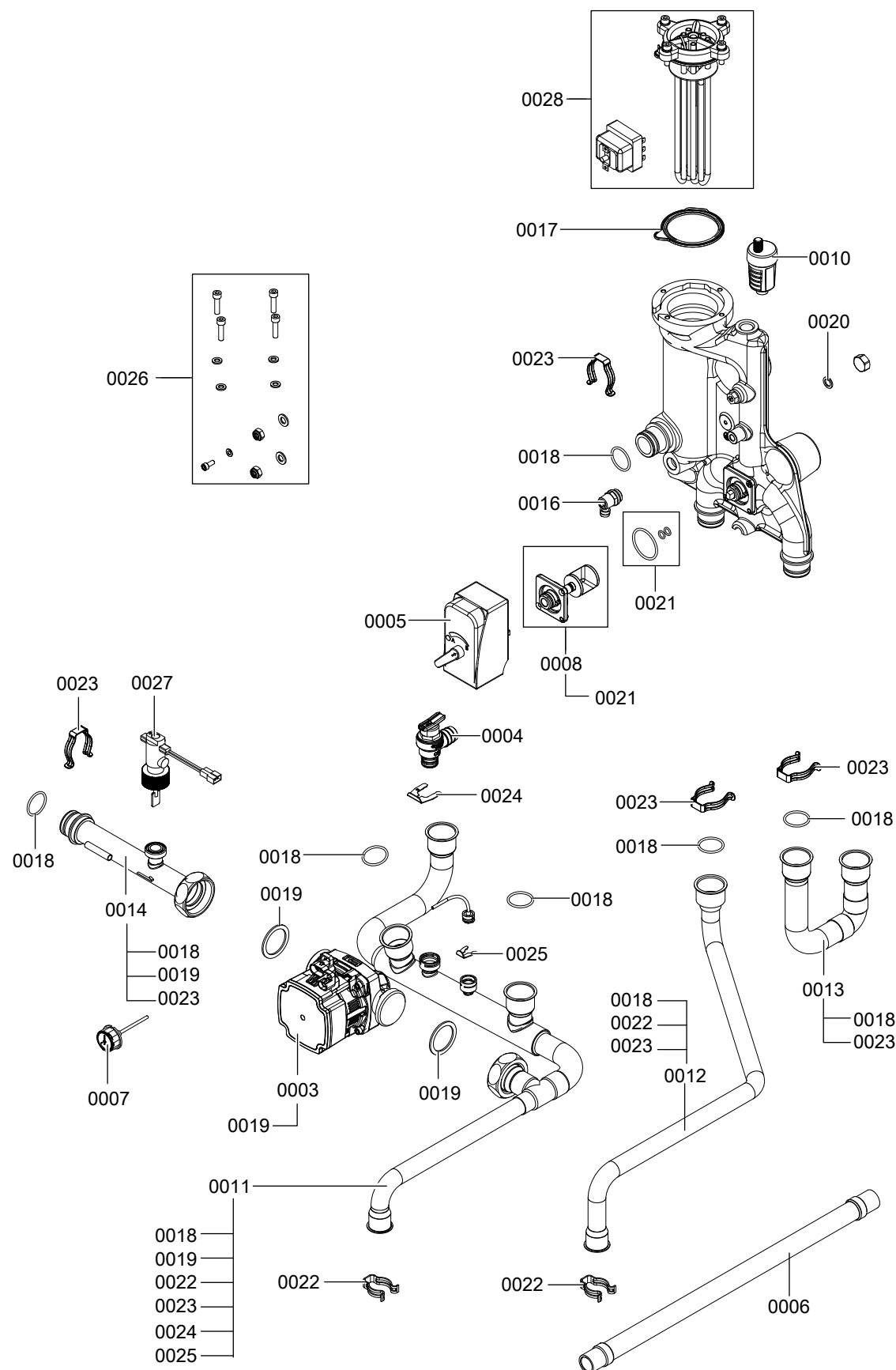


Fig. 81

Hydraulics, indoor unit (cont.)

Pos.	Part
0001	Hydraulic block
0003	High efficiency circulation pump with PWM control
0004	Safety valve 3 bar (0.3 MPa)
0005	Servomotor, 3-way diverter valve
0006	Drain hose safety valve
0007	Pressure gauge
0008	Valve insert, 3-way diverter valve
0010	Quick-action air vent valve G $\frac{3}{8}$
0011	Secondary circuit return line
0012	DHW cylinder flow line
0013	Heating water flow line
0014	Line from circulation pump — plate heat exchanger
0016	Air vent valve G $\frac{3}{8}$
0017	Gasket for instantaneous heating water heater/plug
0018	O-ring 28.0 x 2.5 mm
0019	Gasket A 35 x 45 x 2 mm
0020	Gasket A 10 x 15 x 1.5 mm (5 pce)
0021	Gaskets and O-rings (set)
0022	Spring clip \varnothing 25 mm
0023	Spring clip \varnothing 28 mm
0024	Clip \varnothing 18 mm (5 pce)
0025	Clip \varnothing 10 mm
0026	Hydraulic block screws (set)
0027	Flow switch
0028	Instantaneous heating water heater

Indoor unit DHW cylinder

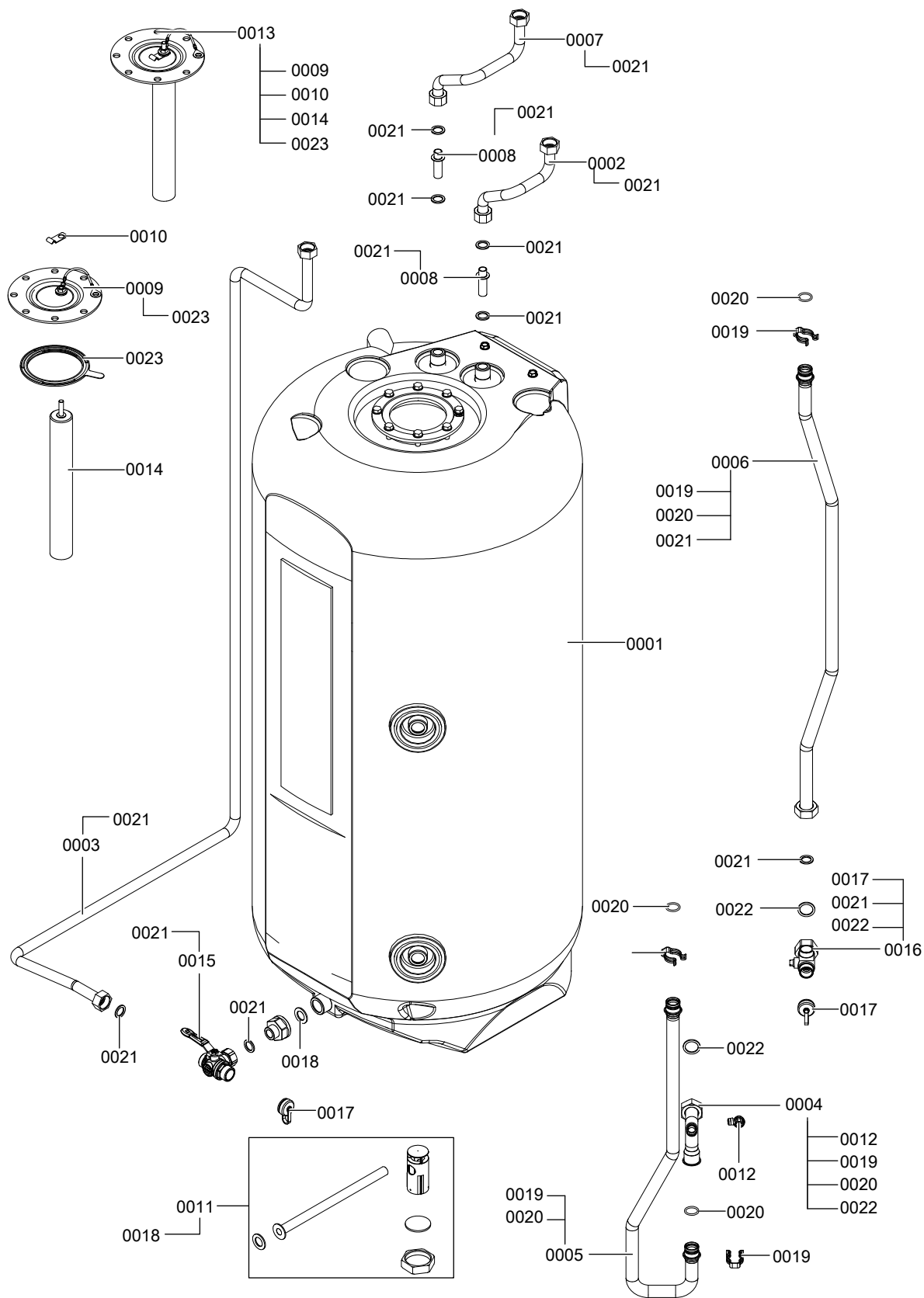


Fig. 82

Indoor unit DHW cylinder (cont.)

Pos.	Part
0001	DHW cylinder with internal indirect coil 220 l
0002	DHW line
0003	Cold water line
0004	Pipe bend, DHW cylinder flow
0005	DHW cylinder flow line
0006	DHW cylinder return line
0007	DHW circulation pipe
0008	Sleeve
0009	Flange for protective magnesium anode with gasket
0010	High limit safety cut-out fixing
0011	Small parts (set)
0012	Air vent valve G $\frac{3}{8}$
0013	Protective magnesium anode with flange and gasket
0014	Protective magnesium anode
0015	Shut-off valve G $\frac{3}{8}$
0016	Drain and fill valve G $\frac{3}{4}$
0017	Locking cap G $\frac{3}{4}$ with retaining loop
0018	Gasket 18 x 30 x 2.0 mm
0019	Spring clip \varnothing 25 mm
0020	O-ring \varnothing 20.63 x 2.62 mm (set)
0021	Gasket A 17 x 24 x 2.0 mm (set)
0022	Gasket 23 x 30 x 2.0 mm
0023	Flange gasket

Miscellaneous

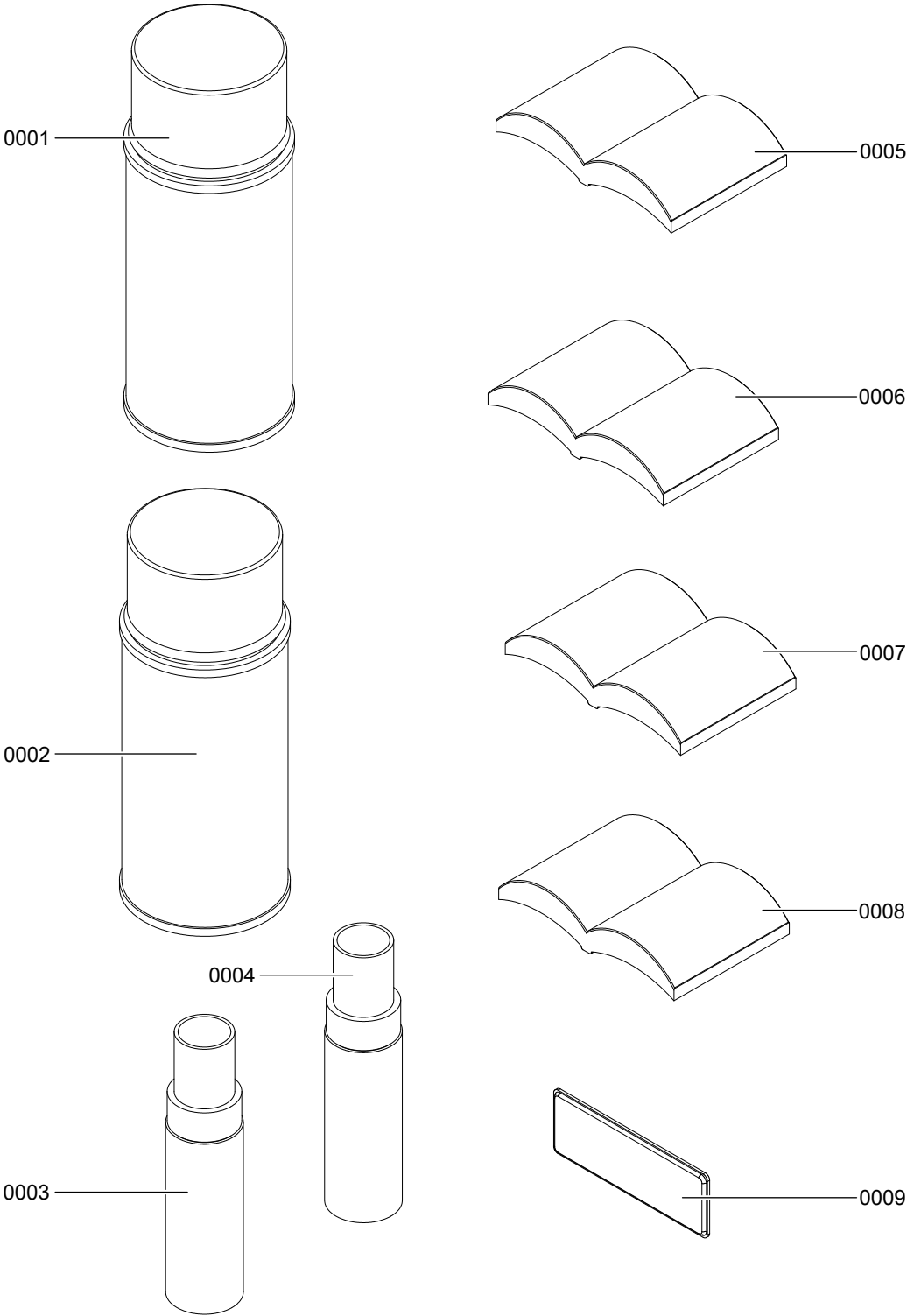


Fig. 83

Miscellaneous (cont.)

Pos.	Part
0001	Touch-up spray paint, Vitosilver
0002	Touch-up spray paint, white
0003	Touch-up paint stick, Vitosilver
0004	Touch-up paint stick, white
0005	Installation and service instructions
0006	Vitotronic 200, type WO1C operating instructions
0007	Vitotronic 200, type WO1C service instructions
0008	Connection and wiring diagram
0009	Special grease



Miscellaneous (cont.)

Overview of assemblies, outdoor unit 230 V~

The following details are required when ordering parts:

- Serial no. (see type plate (A))
- Assembly (from this parts list)
- Position number of the individual part within the assembly (from this parts list)

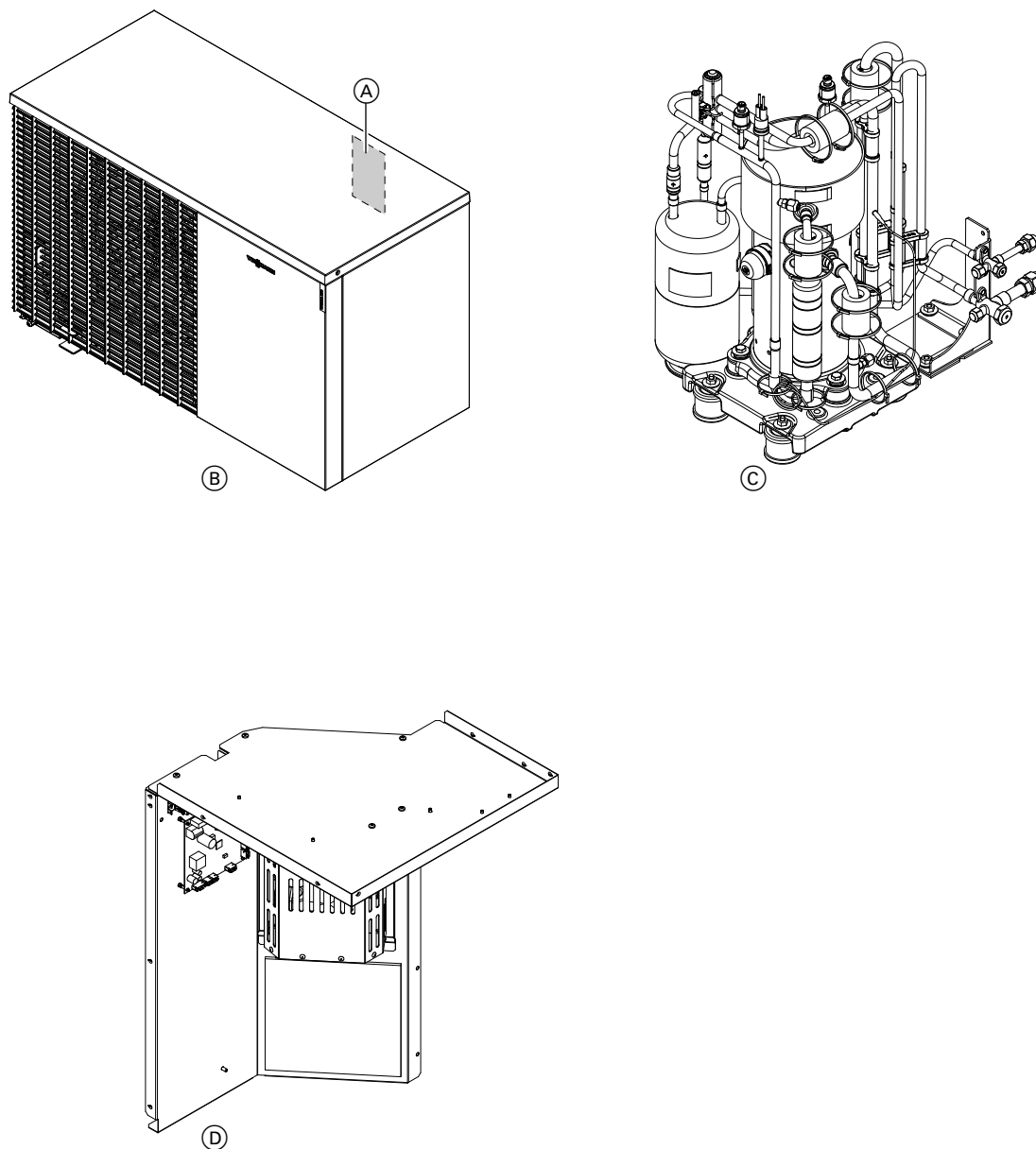


Fig. 84

- (A) Type plate
- (B) Outdoor unit casing assembly
- (C) Outdoor unit refrigerant circuit assembly
- (D) Outdoor unit electrical equipment assembly

Outdoor unit casing 230 V~

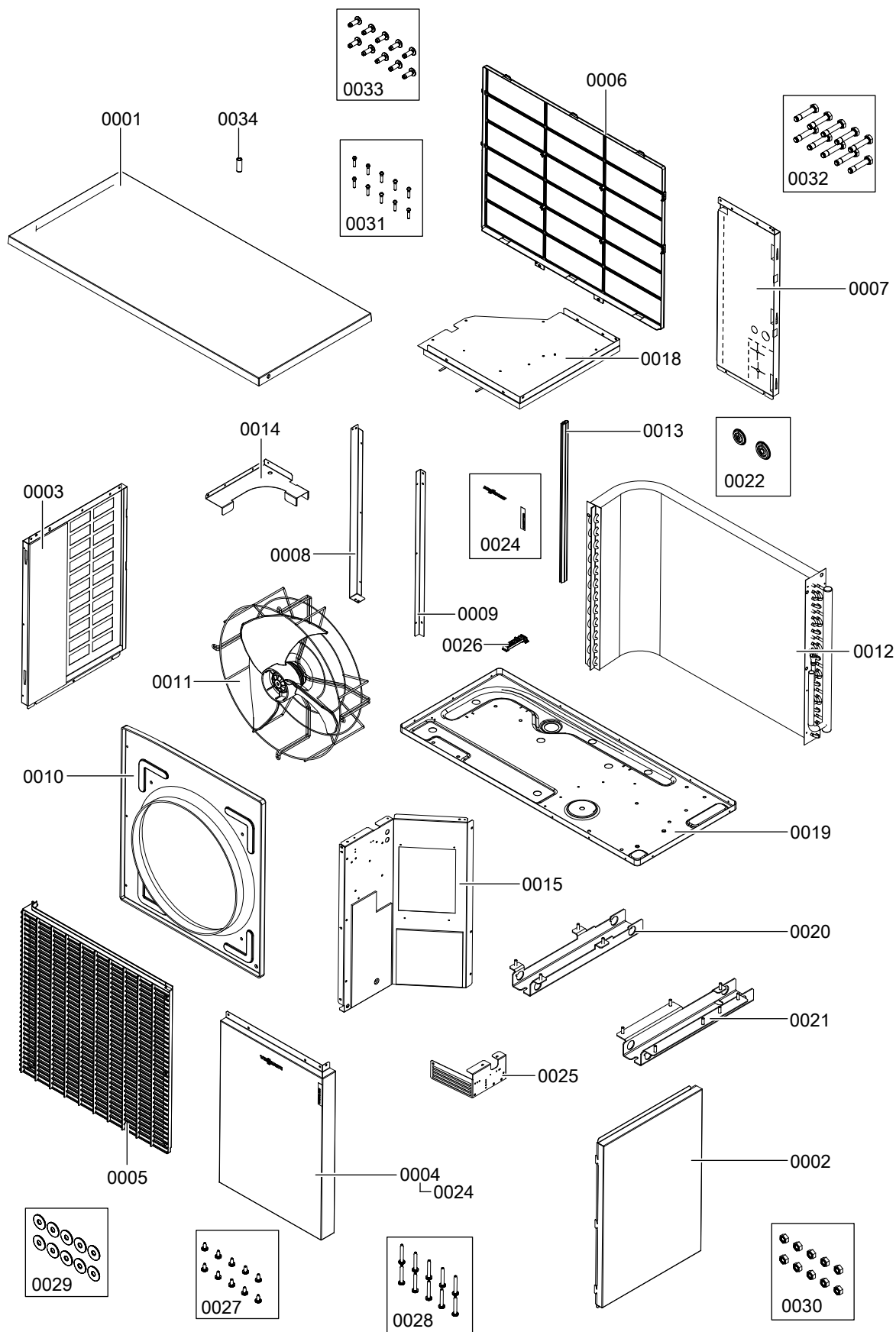


Fig. 85

Outdoor unit casing 230 V~ (cont.)

Pos.	Part
0001	Cover with gasket
0002	Side panel, right with sound insulation
0003	Side panel, left with sound insulation
0004	Front panel with sound insulation
0005	Fan grille
0006	Evaporator grille
0007	Back panel with sound insulation
0008	Guide rail, left
0009	Guide rail, right
0010	Fan retainer
0011	Axial fan
0012	Evaporator
0013	Profiled seal
0014	Evaporator cover
0015	Separating plate
0018	Refrigerant circuit cover
0019	Base plate
0020	Strut, left
0021	Strut, right
0022	Diaphragm grommet (set)
0024	Logo (set)
0025	Mains terminal retaining bracket
0026	Evaporator mount
0027	Self-tapping screw ST 4.8 x 9.5 -F (set)
0028	Self-tapping screw ST 4.8 x 32 -F (set)
0029	Mudguard washer 8.4 x 25 x 1.5 mm (set)
0030	Hexagon nut M 8 (set)
0031	Screw 35 x 16 (set)
0032	Hexagon screw M 8 x 40 - 8.8 (set)
0033	Screw M 6 x 20 (set)
0034	Spacer sleeve (set)

Refrigerant circuit, outdoor unit types 221.C04 to 221.C08, 230 V~

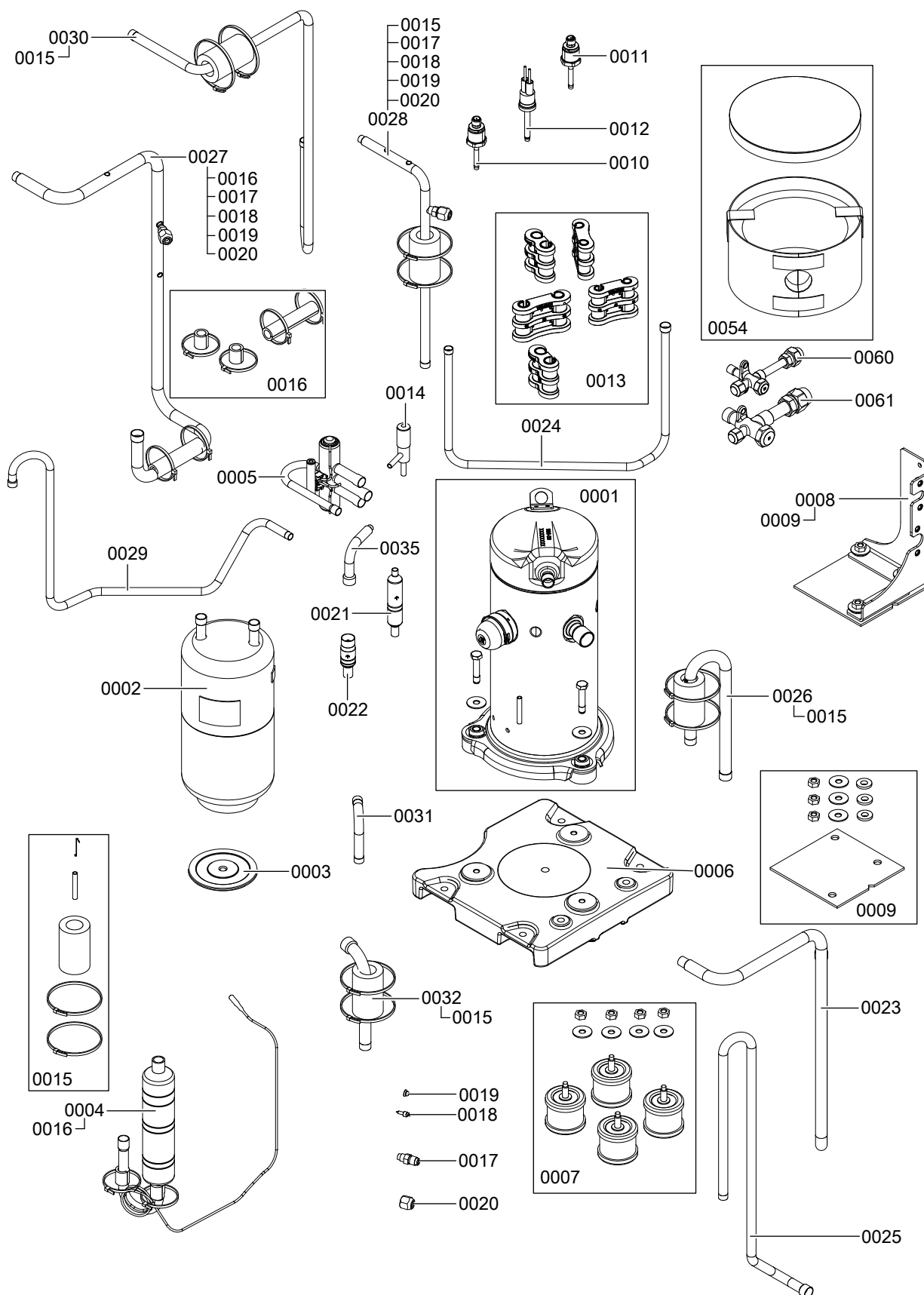


Fig. 86

Refrigerant circuit, outdoor unit types 221.C04... (cont.)

Pos.	Part
0001	Compressor
0002	Refrigerant receiver
0003	Refrigerant receiver base fixing
0004	Oil separator
0005	4-way diverter valve
0006	Compressor base plate
0007	Anti-vibration mounts
0008	Service valve retaining bracket
0009	Retaining bracket base
0010	High pressure sensor
0011	Low pressure sensor
0012	Safety high pressure switch
0013	Refrigerant line anti-vibration mounts (set)
0014	Electronic expansion valve
0015	Sensor well (set)
0016	Fixing kit, capillary tube
0017	Valve body $\frac{7}{16}$
0018	Schrader valve
0019	Sealing cap B 6
0020	Union nut, Schrader valve
0021	Filter, electronic expansion valve — evaporator
0022	Filter
0023	Refrigerant line, evaporator — 4-way diverter valve
0024	Refrigerant line, filter – evaporator
0026	Refrigerant line, 4-way diverter valve — evaporator
0027	Suction gas line, 4-way diverter valve
0028	Hot gas line, 4-way diverter valve
0029	Refrigerant line, service valve — refrigerant receiver
0030	Refrigerant line, 4-way diverter valve — service valve
0031	Hot gas line, compressor
0032	Suction gas line, compressor
0035	Refrigerant line, electronic expansion valve — filter
0054	Types 222.C06 and 222.C08 only Compressor cover
0060	<ul style="list-style-type: none"> ▪ Types 222.C04: Service valve $\frac{7}{16}$ ▪ Types 222.C06 and 222.C08: Service valve $\frac{5}{8}$
0061	<ul style="list-style-type: none"> ▪ Types 222.C04: Service valve $\frac{3}{4}$ ▪ Types 222.C06 and 222.C08: Service valve $\frac{7}{8}$

Outdoor unit electrical equipment 230 V~

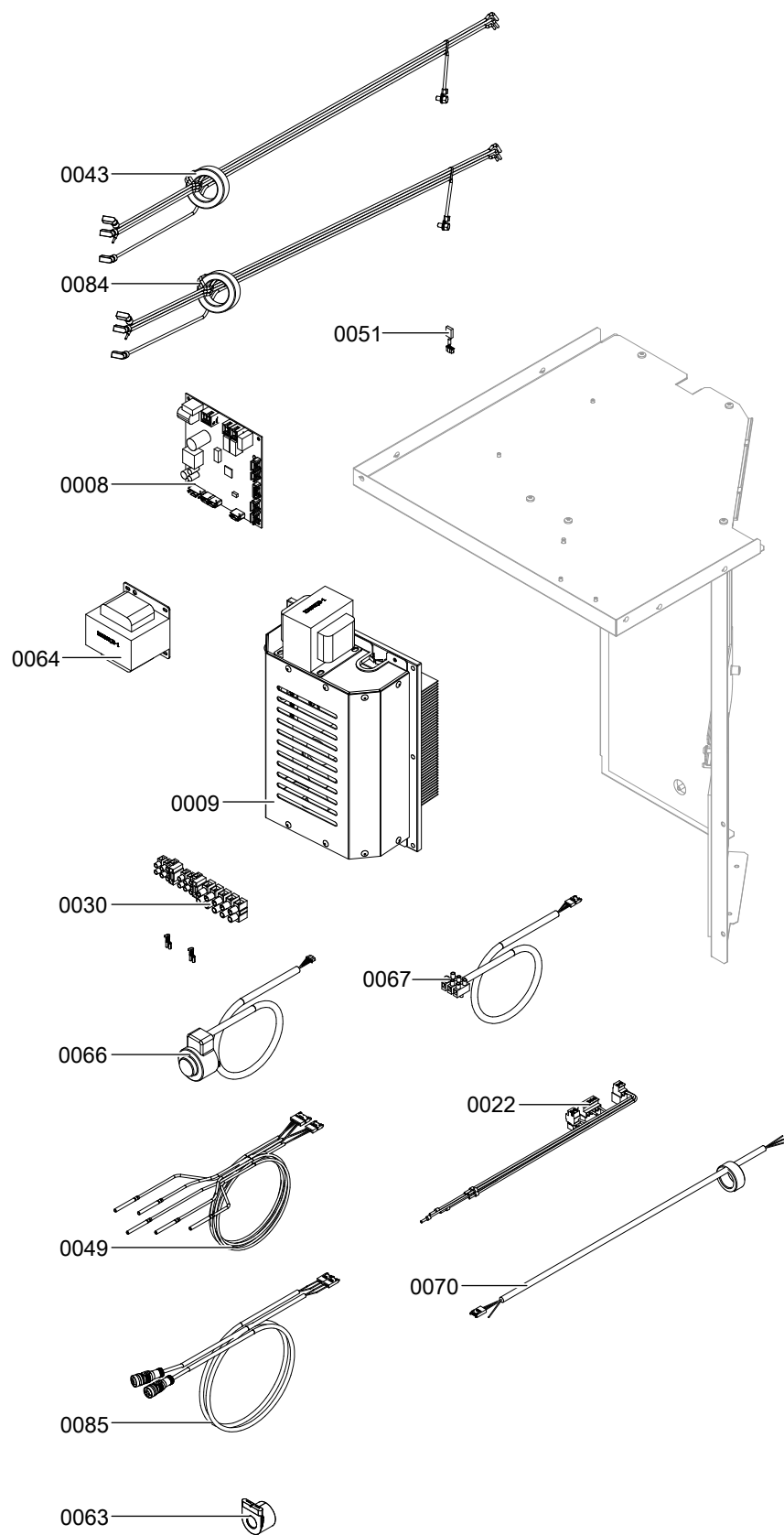


Fig. 87

Outdoor unit electrical equipment 230 V~ (cont.)

Pos.	Part
0008	EEV PCB (refrigerant circuit controller)
0009	Inverter
0022	230 V~ cable harness
0030	Mains terminals
0043	Connecting cable, compressor
0049	Temperature sensor cable harness
0051	Adaptor for safety high pressure switch
0063	Coil, 4-way diverter valve
0064	Suppressor choke
0066	Electronic expansion valve stepper motor
0067	Bus cable, indoor/outdoor unit (Modbus)
0070	Communication cable, refrigerant circuit controller — inverter
0084	Connecting cable, inverter — compressor
0085	Connecting lead, pressure sensors



Outdoor unit electrical equipment 230 V~ (cont.)

Overview of assemblies, outdoor unit 230 V~

The following details are required when ordering parts:

- Serial no. (see type plate (A))
- Assembly (from this parts list)
- Position number of the individual part within the assembly (from this parts list)

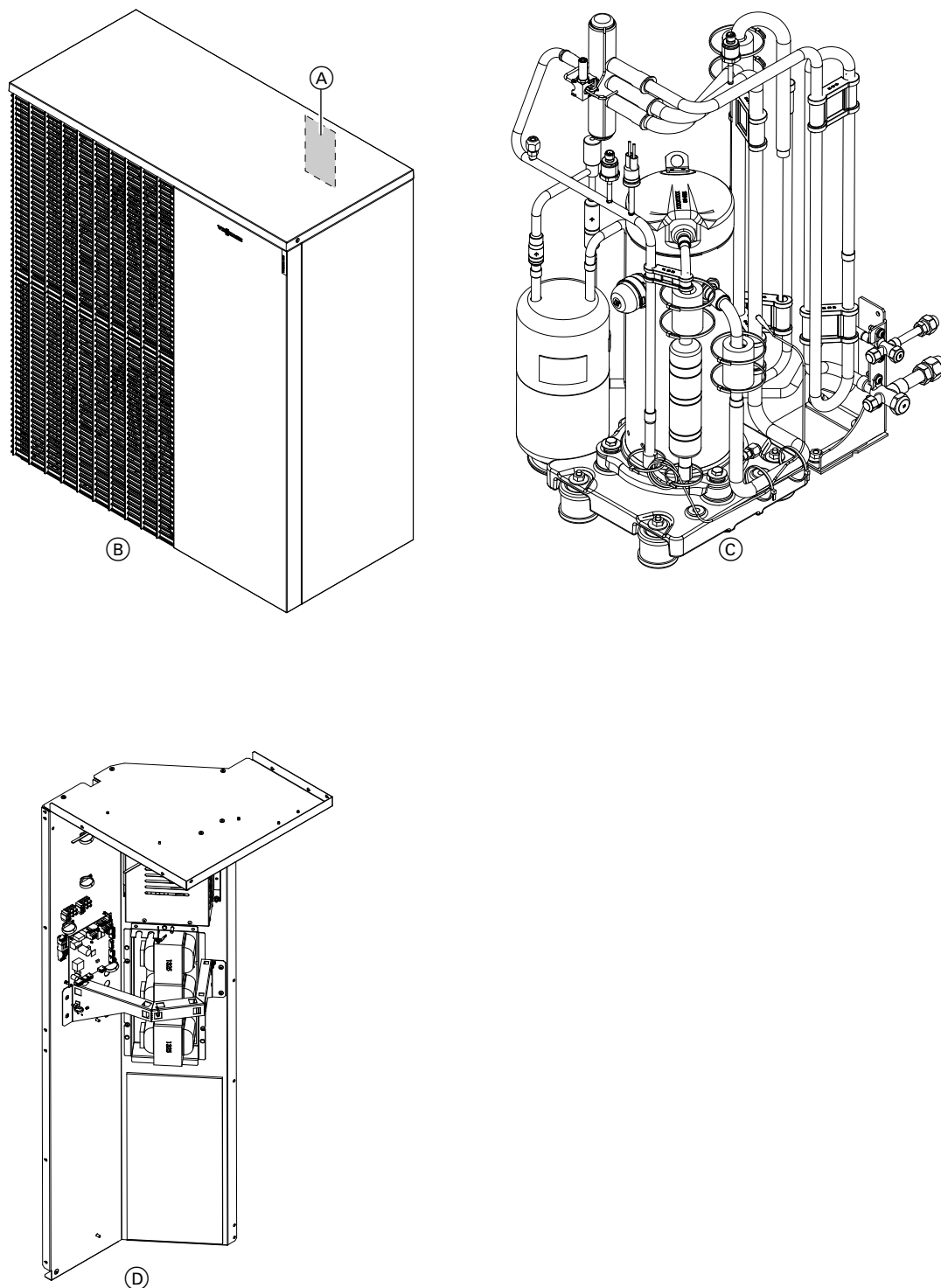


Fig. 88

- (A) Type plate
- (B) Outdoor unit casing assembly
- (C) Outdoor unit refrigerant circuit assembly
- (D) Outdoor unit electrical equipment assembly

Outdoor unit casing 230 V~

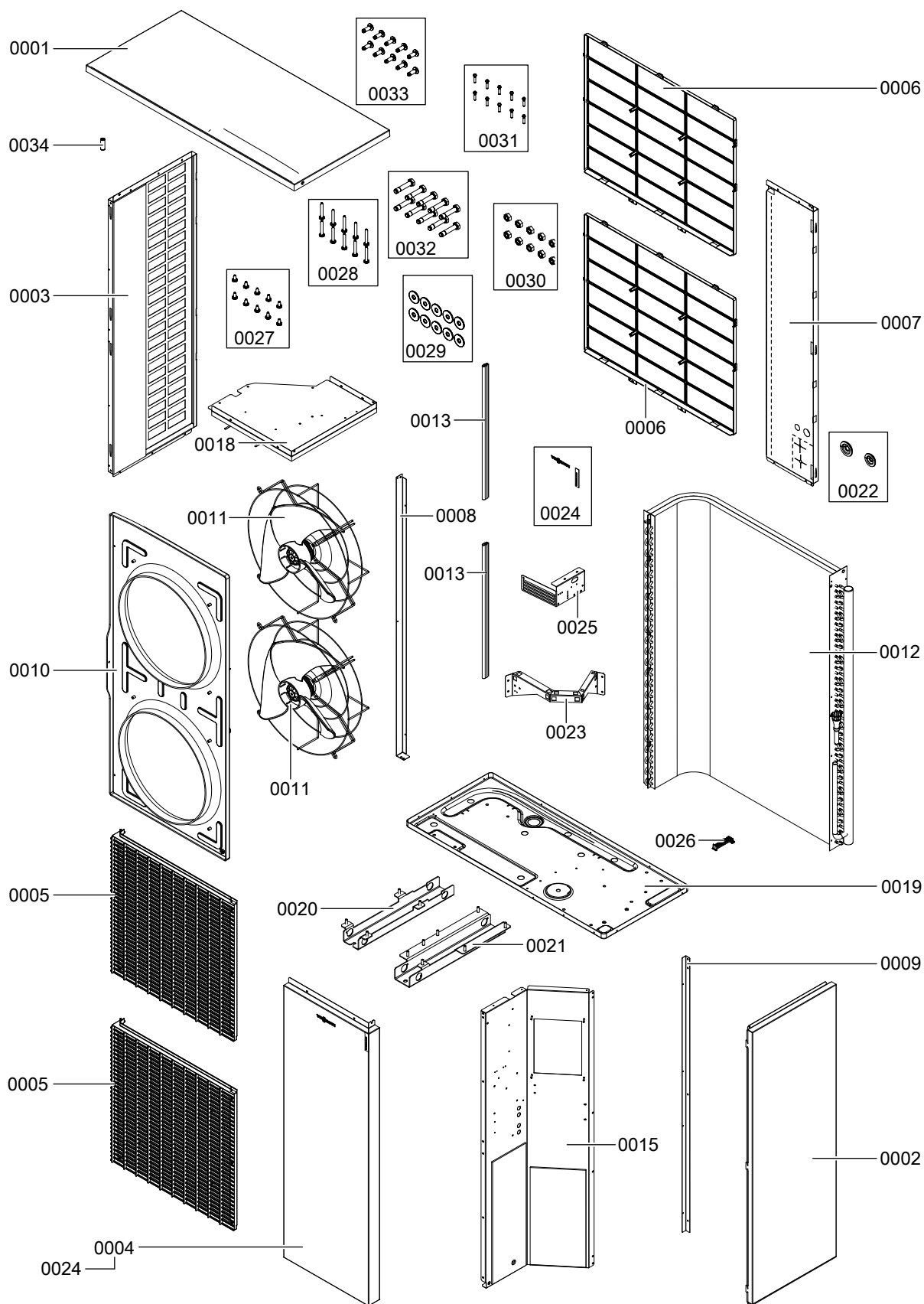


Fig. 89

Outdoor unit casing 230 V~ (cont.)

Pos.	Part
0001	Cover with gasket
0002	Side panel, right with sound insulation
0003	Side panel, left with sound insulation
0004	Front panel with sound insulation
0005	Fan grille
0006	Evaporator grille
0007	Back panel with sound insulation
0008	Guide rail, left
0009	Guide rail, right
0010	Fan retainer
0011	Axial fan
0012	Evaporator
0013	Profiled seal
0014	Evaporator cover
0015	Separating plate
0018	Refrigerant circuit cover
0019	Base plate
0020	Strut, left
0021	Strut, right
0022	Diaphragm grommet (set)
0023	Cable guide
0024	Logo (set)
0025	Mains terminals retaining bracket
0026	Evaporator mount
0027	Self-tapping screw ST 4.8 x 9.5 -F (set)
0028	Self-tapping screw ST 4.8 x 32 -F (set)
0029	Mudguard washer 8.4 x 25 x 1.5 (set)
0030	Hexagon nut M 8 (set)
0031	Screw 35 x 16 (set)
0032	Hexagon screw M 8 x 40 -8.8 (set)
0033	Screw M 6 x 20 (set)
0034	Spacer sleeve (set)

Outdoor unit refrigerant circuit 230 V~

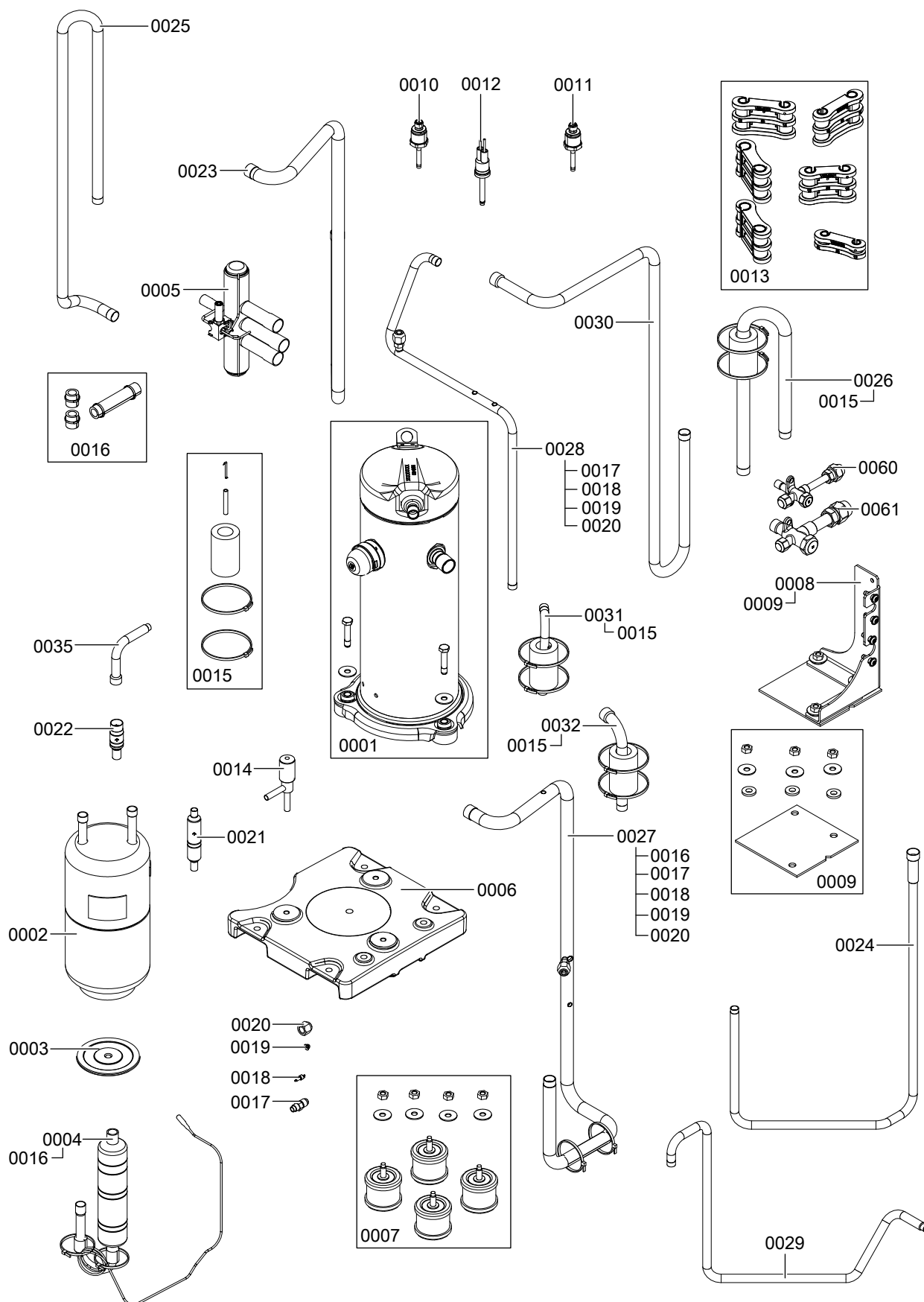


Fig. 90

Outdoor unit refrigerant circuit 230 V~ (cont.)

Pos.	Part
0001	Compressor
0002	Refrigerant receiver
0003	Refrigerant receiver base fixing
0004	Oil separator
0005	4-way diverter valve
0006	Compressor base plate
0007	Anti-vibration mounts
0008	Service valve retaining bracket
0009	Retaining bracket base
0010	High pressure sensor
0011	Low pressure sensor
0012	Safety high pressure switch
0013	Refrigerant line anti-vibration mounts (set)
0014	Electronic expansion valve
0015	Sensor well (set)
0016	Fixing kit, capillary tube
0017	Valve body $\frac{7}{16}$
0018	Schrader valve
0019	Sealing cap B 6
0020	Union nut, Schrader valve
0021	Filter EEV — evaporator
0022	Filter
0023	Refrigerant line, evaporator — 4-way diverter valve
0024	Refrigerant line, filter – evaporator
0025	Refrigerant line, 4-way diverter valve — service valve
0026	Refrigerant line, 4-way diverter valve — evaporator
0027	Suction gas line, 4-way diverter valve
0028	Hot gas line, 4-way diverter valve
0029	Refrigerant line, service valve — refrigerant receiver
0031	Hot gas line, compressor
0032	Suction gas line, compressor
0035	Refrigerant line, electronic expansion valve — filter
0060	Service valve $\frac{5}{8}$
0061	Service valve $\frac{7}{8}$

Outdoor unit electrical equipment 230 V~

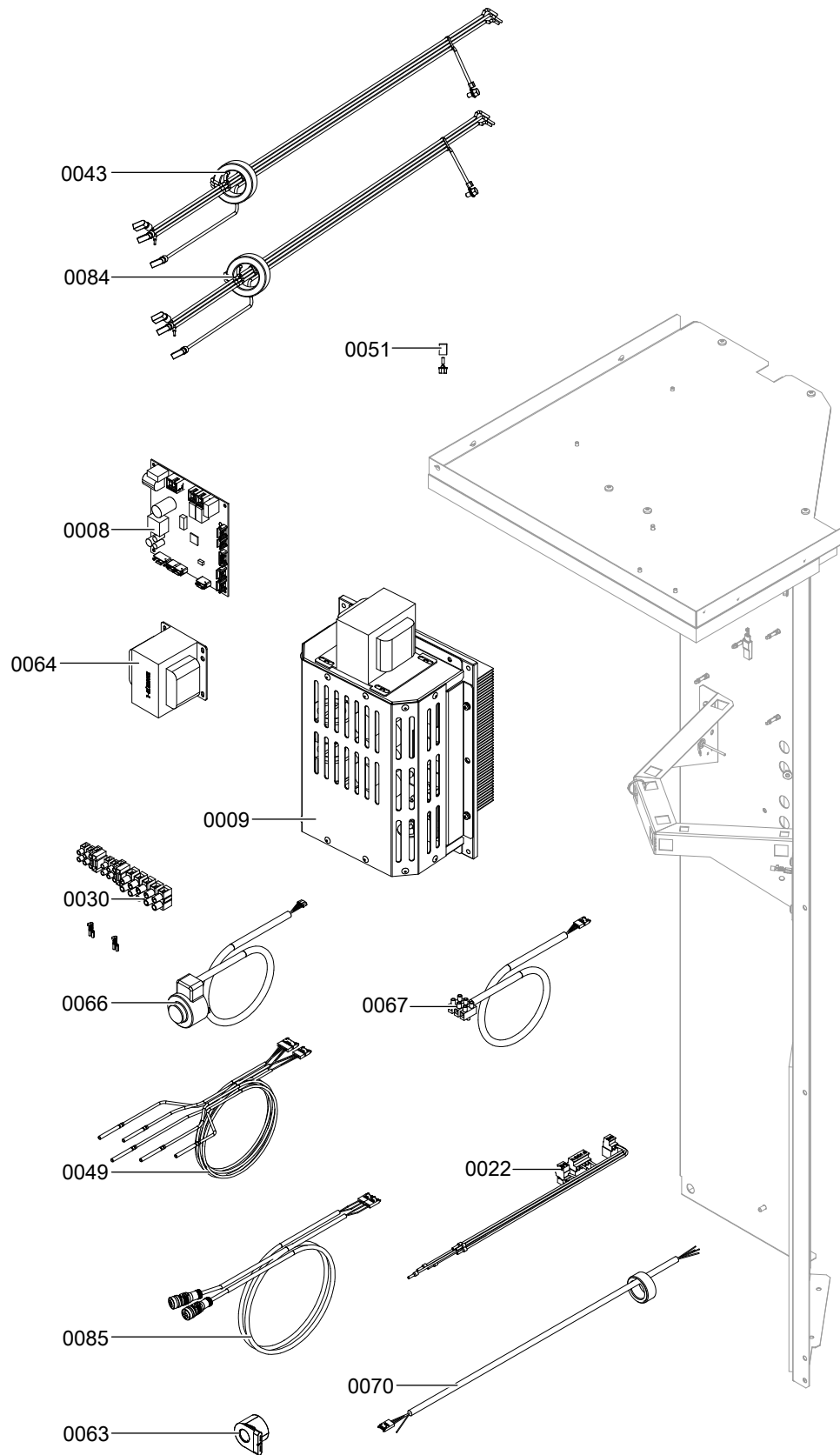


Fig. 91

Outdoor unit electrical equipment 230 V~ (cont.)

Pos.	Part
0008	EEV PCB (refrigerant circuit controller)
0009	Inverter
0022	230 V~ cable harness
0030	Mains terminals
0043	Connecting cable, compressor
0049	Temperature sensor cable harness
0051	Adaptor for safety high pressure switch
0063	Coil, 4-way diverter valve
0064	Suppressor choke
0066	Electronic expansion valve stepper motor
0067	Bus cable, indoor/outdoor unit (Modbus)
0070	Communication cable, refrigerant circuit controller — inverter
0084	Connecting cable, inverter — compressor
0085	Connecting lead, pressure sensors

Outdoor unit electrical equipment 230 V~ (cont.)

Overview of assemblies, outdoor unit 400 V~

The following details are required when ordering parts:

- Serial no. (see type plate (A))
- Assembly (from this parts list)
- Position number of the individual part within the assembly (from this parts list)

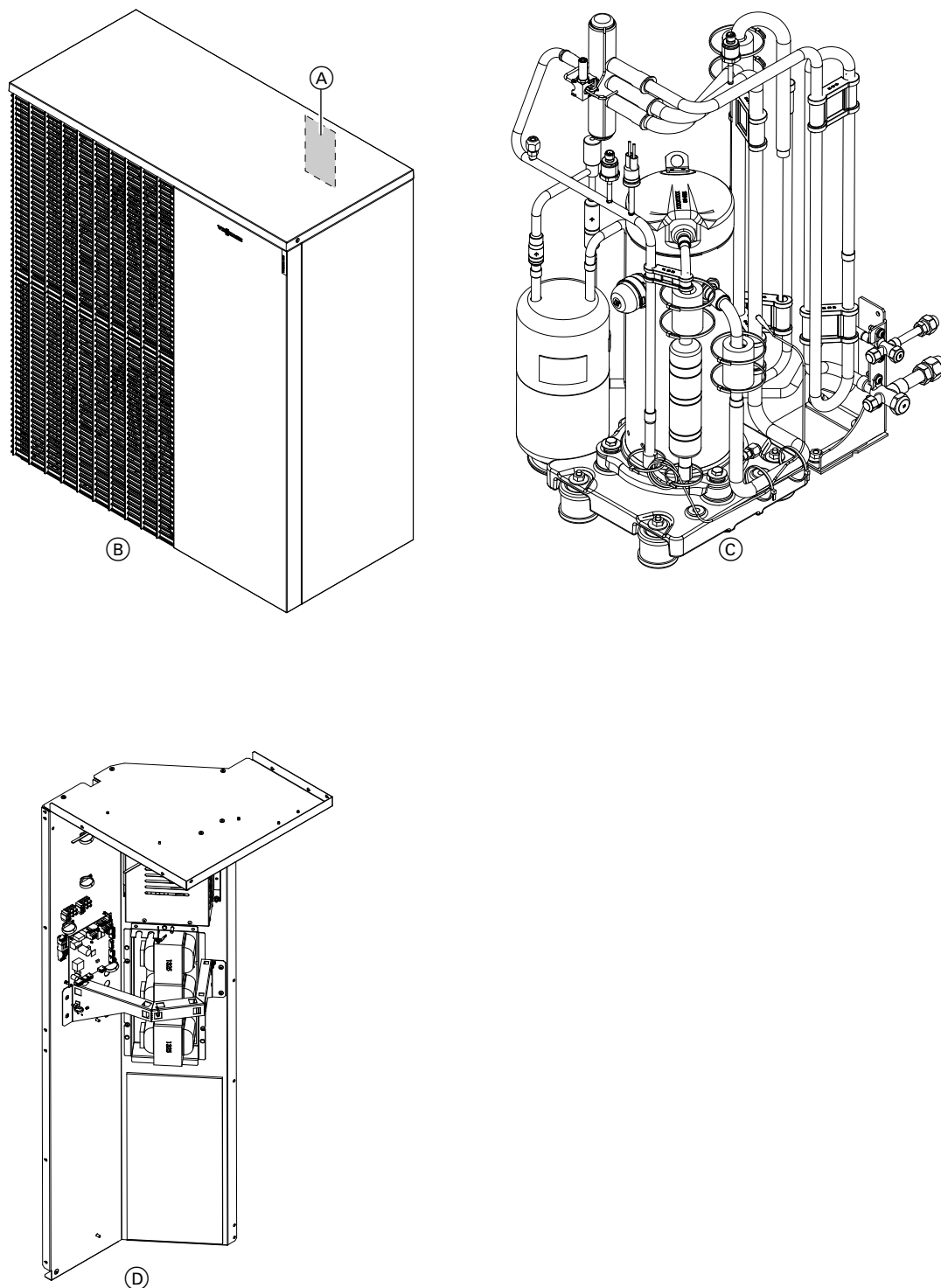


Fig. 92

- (A) Type plate
- (B) Outdoor unit casing assembly
- (C) Outdoor unit refrigerant circuit assembly
- (D) Outdoor unit electrical equipment assembly

Outdoor unit casing 400 V~

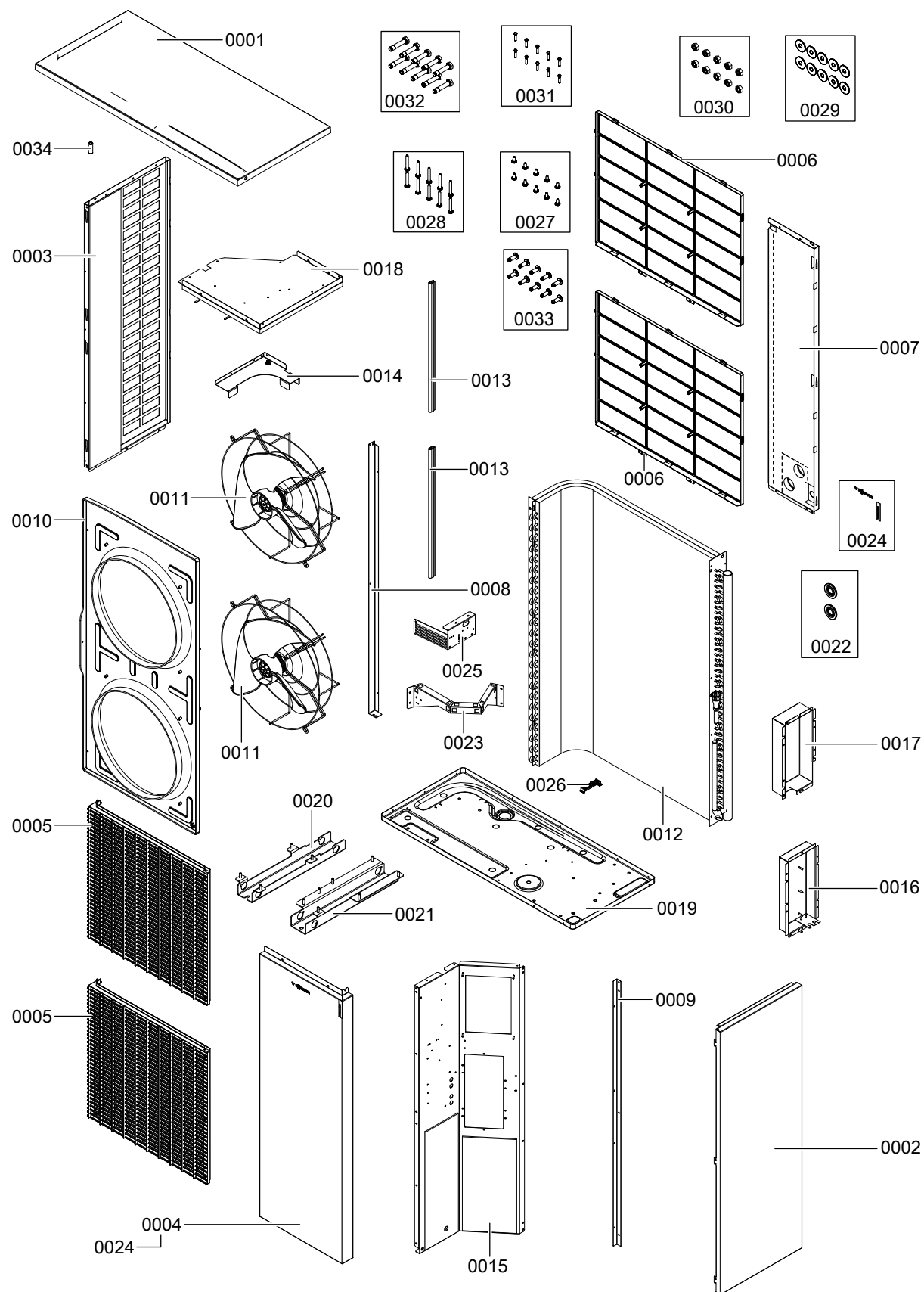


Fig. 93

Outdoor unit casing 400 V~ (cont.)

Pos.	Part
0001	Cover with gasket
0002	Side panel, right with sound insulation
0003	Side panel, left with sound insulation
0004	Front panel with sound insulation
0005	Fan grille
0006	Evaporator grille
0007	Back panel with sound insulation
0008	Guide rail, left
0009	Guide rail, right
0010	Fan retainer
0011	Axial fan
0012	Evaporator
0013	Profiled seal
0014	Evaporator cover
0015	Separating plate
0016	Inverter coil retaining bracket
0017	Inverter coil cover
0018	Refrigerant circuit cover
0019	Base plate
0020	Strut, left
0021	Strut, right
0022	Diaphragm grommet (set)
0023	Cable guide
0024	Logo (set)
0025	Mains terminals retaining bracket
0026	Evaporator mount
0027	Self-tapping screw ST 4.8 x 9.5 -F (set)
0028	Self-tapping screw ST 4.8 x 32 -F (set)
0029	Mudguard washer 8.4 x 25 x 1.5 (set)
0030	Hexagon nut M 8 (set)
0031	Screw 35 x 16 (set)
0032	Hexagon screw M 8 x 40 - 8.8 (set)
0033	Screw M 6 x 20 (set)
0034	Spacer sleeve (set)

Outdoor unit refrigerant circuit 400 V~

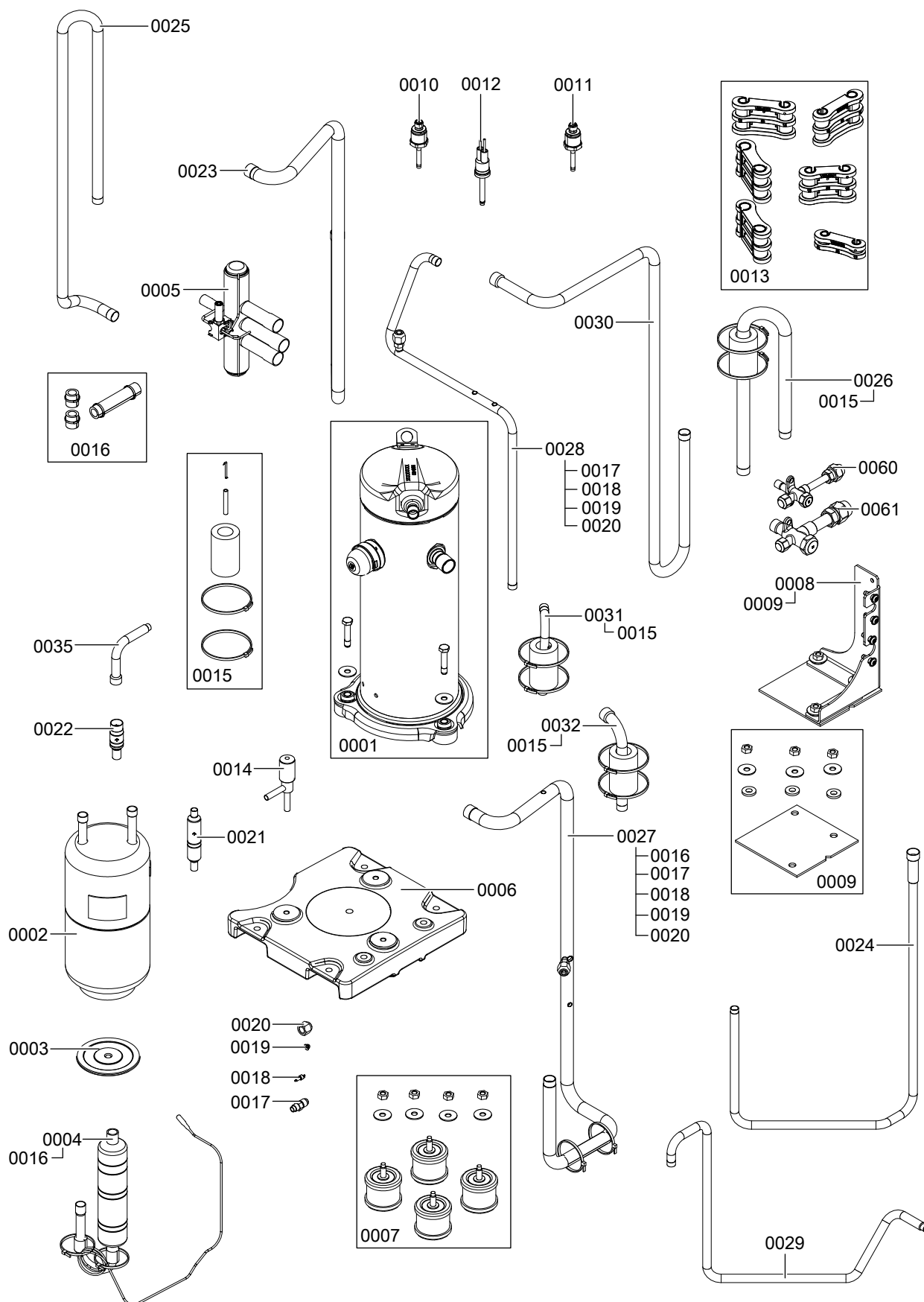


Fig. 94

Outdoor unit refrigerant circuit 400 V~ (cont.)

Pos.	Part
0001	Compressor
0002	Refrigerant receiver
0003	Refrigerant receiver base fixing
0004	Oil separator
0005	4-way diverter valve
0006	Compressor base plate
0007	Anti-vibration mounts
0008	Service valve retaining bracket
0009	Retaining bracket base
0010	High pressure sensor
0011	Low pressure sensor
0012	Safety high pressure switch
0013	Refrigerant line anti-vibration mounts (set)
0014	Electronic expansion valve
0015	Sensor well (set)
0016	Fixing kit, capillary tube
0017	Valve body $\frac{7}{16}$
0018	Schrader valve
0019	Sealing cap B 6
0020	Union nut, Schrader valve
0021	Filter EEV — evaporator
0022	Filter
0023	Refrigerant line, evaporator — 4-way diverter valve
0024	Refrigerant line, filter – evaporator
0025	Refrigerant line, 4-way diverter valve — service valve
0026	Refrigerant line, 4-way diverter valve — evaporator
0027	Suction gas line, 4-way diverter valve
0028	Hot gas line, 4-way diverter valve
0029	Refrigerant line, service valve — refrigerant receiver
0031	Hot gas line, compressor
0032	Suction gas line, compressor
0035	Refrigerant line, electronic expansion valve — filter
0060	Service valve $\frac{5}{8}$
0061	Service valve $\frac{7}{8}$

Outdoor unit electrical equipment 400 V~

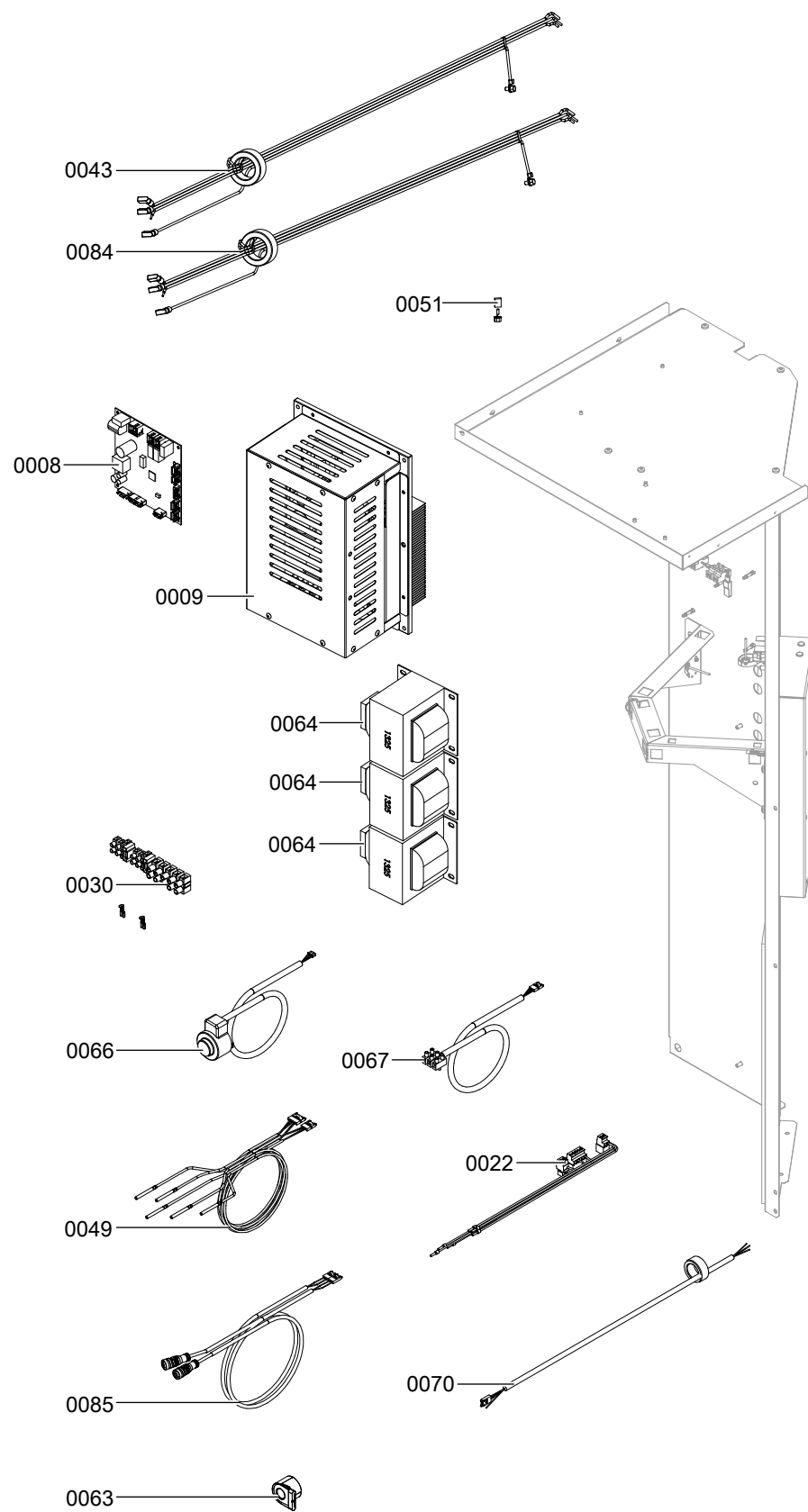


Fig. 95

Outdoor unit electrical equipment 400 V~ (cont.)

Pos.	Part
0008	EEV PCB (refrigerant circuit controller)
0009	Inverter
0022	230 V~ cable harness
0030	Mains terminals
0043	Connecting cable, compressor
0049	Temperature sensor cable harness
0051	Adaptor for safety high pressure switch
0063	Coil, 4-way diverter valve
0064	Suppressor choke
0066	Electronic expansion valve stepper motor
0067	Bus cable, indoor/outdoor unit (Modbus)
0070	Communication cable, refrigerant circuit controller — inverter
0084	Connecting cable, inverter — compressor
0085	Connecting lead, pressure sensors

Hydraulic parameter report

Settings and test values	Set value	Commissioning	Maintenance/ service
Checking external heating circuit pumps			
Circulation pump type			
Circulation pump stage			
Overflow valve setting			
Commissioning, primary circuit			
Air intake temperature ("Diagnosis" → "System overview")	°C		
Air discharge temperature ("Diagnosis" → "System overview")	°C		
Temperature differential (air intake/ discharge) ΔT :			
▪ At secondary circuit flow temperature = 35 °C and air intake temperature ≤ 15 °C	K	4 to 8	
▪ At secondary circuit flow temperature = 35 °C and air intake temperature > 15 °C	K	4 to 13	
Checking mixer, heat pump and cylinder heating			
Checked under the following conditions:			
Room temperature	°C		
Outside temperature	°C		
Temperature "Cylinder temp. top" con- stant?		Yes (± 1 K)	
Secondary circuit flow temperature	°C	Rising	From To From To
Temperature differential ΔT "Flow temp. secondary" / "Return temp. sec."	K	6 to 8	

Control parameter report

 **Parameter description**
"Vitotronic 200" service instructions

System definition

Parameter	Code	Delivered condition	Commission- ing	Maintenance/ service
System scheme: See chapter "System scheme"	7000	2		
Interval for long term average outside tem- perature	7002	180 min		
Temperature differential for calculating the heating limit	7003	40 (± 4 K)		
Temperature differential for calculating the cooling limit	7004	40 (± 4 K)		
Swimming pool	7008	0		
Enable flow temperature sensor cooling cir- cuit	7009	Do not adjust.		
Output lag heat pump	700B	Do not adjust.		

Control parameter report (cont.)

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Temperature range input 0...10 V, cooling mode	700E	Do not adjust.		
External extension	7010	0		
System components for external change-over	7011	0		
Operating status for external changeover	7012	2		
Duration of external changeover	7013	8 h		
Effect of external demand on heat pump/heating circuits	7014	4		
Effect of ext. blocking on heat pump/heating circuits	7015	4		
Vitocom 100 (type GSM/GSM2 only)	7017	0		
Temperature range input 0..10V	7018	1000 (\pm 10 V)		
Priority external demand	7019	0		
Effect of external blocking on pumps/compressor	701A	0		
Common flow temperature sensor system	701B	0		
Operating status after message A9, C9	701C	0		
Effect of OM changeover to ventilation	701F	3		
Type of assembly kit	7044	0		
Holiday program effect	7050	384		

Compressor

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Enable compressor	5000	1		
Evaporator temperature for defrost end	5010	Automatically preset		
Enable use of compressor stage	5012	15		
Output compressor stage	5030	Rated heating output according to type plate		

Control parameter report (cont.)**DHW**

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
"Set DHW temperature"	6000	500 (\pm 50 °C)		
"Min. DHW temperature"	6005	100 (\pm 10 °C)		
"Max. DHW temperature"	6006	600 (\pm 60 °C)		
"Hysteresis DHW temperature heat pump"	6007	50 (\pm 5 K)		
"Hysteresis DHW temperature booster heater"	6008	100 (\pm 10 K)		
"Start optimisation for DHW heating"	6009	0		
"Stop optimisation for DHW heating"	600A	0		
"Set DHW temperature 2"	600C	600 (\pm 60 °C)		
"Temperature rise per hour for DHW heating"	600D	30 K/h		
"Temperature sensor at bottom of DHW cylinder"	600E	0		
"Max. runtime DHW heating in heating mode"	6011	240 (\pm 24 min)		
"Max. interruption of DHW heating for central heating"	6012	90 (\pm 9 min)		
"Enable booster heaters for DHW heating"	6014	0		
"Enable electric heaters for DHW heating"	6015	0		
"Priority DHW heating with combi cylinder"	6016	0		
"Start attempts for DHW after high pressure shutdown"	6017	0		
"Shutdown hysteresis inst. heating water heater"	601E	10 (\pm 1 K)		
"Enable elec. heating/ext. HS for reheating only"	6040	0		

Electric booster heater

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
"Enable instantaneous heating water heater"	7900	1		
"Enable electric heaters for DHW heating"	7901	0		
"Enable instant. heating water heater for central heating"	7902	0		
"Start delay instantaneous heating water heater"	7905	30 min		
"Max. output instantaneous heating water heater"	7907	3		
"Output for instant. heating water heater at power-OFF"	790A	0		
"Dual mode temp. instant. heating water heater"	790B	500 (\pm 50 °C)		

Control parameter report (cont.)**Internal hydraulics**

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Heat pump for drying a building	7300	0		
Time program for screed drying	7303	0		
Set flow temperature external demand, cooling	730A	Do not adjust.		
Set flow temperature external demand	730C	500 (± 50 °C)		
Start threshold	730E	300 (± 30 K x min)		
Compressor performance at min. outside temperature	730F	50 %		
Compressor performance at max. outside temperature	7310	20 %		
Cycle rate heating circuit pumps	7319	0		
Rated output heating circuit pump HC2	734A	60 %		
Starting time high efficiency circulation pump	7365	Do not adjust.		
Screed program start day	7378	1		
Screed program end day	7379	31		

Primary source

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
"Primary source ctrl strategy"	7401	Never adjust		

Heating water buffer cylinder

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
"Enable buffer cylinder/low loss header"	7200	0		
"Temp in operating status fixed value for buffer cyl"	7202	500 (± 50 °C)		
"Hysteresis temperature heating buffer cylinder"	7203	50 (± 5 K)		
"Max. temperature buffer cylinder"	7204	600 (± 60 °C)		
"Stop optimisation heating buffer cylinder"	7205	0		
"Temp. limit op. status fixed value for buffer cylinder"	7208	500 (± 50 °C)		
"Stop hysteresis, heating water buffer cylinder"	7209	0 (± 0 K)		
"Operating mode, fixed value only for heat demand"	720A	0		

Control parameter report (cont.)**Heating circuit 1**

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Standard room temperature	2000	200 (± 20 °C)		
Reduced room temperature	2001	160 (± 16 °C)		
Remote control	2003	0		
Room temperature control	2005	0 Without remote control 2 With remote control		
Heating curve level	2006	0 (± 0 K)		
Heating curve slope	2007	6 (± 0.6)		
Influence room temperature hook-up	200A	10		
Room temperature hook-up	200B	0		
Max. flow temperature heating circuit	200E	550 (± 55 °C)		
Runtime mixer heating circ	2015	Do not adjust.		
Room temperature in party mode	2022	200 (± 20 °C)		

Heating circuit 2

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Standard room temperature	3000	200 (± 20 °C)		
Reduced room temperature	3001	160 (± 16 °C)		
Remote control	3003	0		
Room temperature control	3005	0 Without remote control 2 With remote control		
Heating curve level	3006	0 (± 0 K)		
Heating curve slope	3007	6 (± 0.6)		
Influence room temperature hook-up	300A	10		
Room temperature hook-up	300B	0		
Max. flow temperature heating circuit	300E	550 (± 55 °C)		
Runtime mixer heating circ	3015	Do not adjust.		
Room temperature in party mode	3022	200 (± 20 °C)		

Control parameter report (cont.)**Heating circuit 3**

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Standard room temperature	4000	200 (± 20 °C)		
Reduced room temperature	4001	200 (± 20 °C)		
Remote control	4003	0		
Room temperature control	4005	0 Without remote control 2 With remote control		
Heating curve level	4006	0 (± 0 K)		
Heating curve slope	4007	6 (± 0.6)		
Influence room temperature hook-up	400A	10		
Room temperature hook-up	400B	0		
Max. flow temperature heating circuit	400E	550 (± 55 °C)		
Runtime mixer heating circ	4015	Do not adjust.		
Room temperature in party mode	4022	160 (± 16 °C)		

Cooling

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
"Cooling function"	7100	0		
"Cooling circuit"	7101	1		
"Set room temperature separate cooling circuit"	7102	200 (± 20 °C)		
"Min. flow temperature cooling"	7103	200 (± 20 °C)		
"Influence room temperature hook-up cooling circuit"	7104	0		
"Room temperature control cooling circuit"	7105	1		
"Ranking room temp sensor separate cooling circuit"	7106	0		
"Hysteresis room temp cooling circuit"	7107	10 (± 1 K)		
"Enable flow temperature sensor cooling circuit"	7109	1		
"Cooling curve level"	7110	0 (± 0 K)		
"Cooling curve slope"	7111	12 (± 1.2)		
"Remote control cooling circ"	7116	Never adjust		
"Enable active cooling"	71FE	0		

Ventilation: Vitovent 200-C and Vitovent 300-F

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Vitovent enable	7D00	0		
Enable preheater bank electric	7D01	0		
Enable reheater bank hydraulic	7D02	0		
Enable target temperature control	7D04	0		
Enable humidity sensor	7D05	0		
Enable CO2 sensor	7D06	0		
Set room temperature	7D08	200 (± 20 °C)		

Control parameter report (cont.)

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Flow rate reduced ventilation	7D0A	<ul style="list-style-type: none"> Vitovent 200-C: 75 m³/h Vitovent 300-F: 120 m³/h 		
Flow rate nominal ventilation	7D0B	<ul style="list-style-type: none"> Vitovent 200-C: 115 m³/h Vitovent 300-F: 170 m³/h 		
Flow rate intensive ventilation	7D0C	<ul style="list-style-type: none"> Vitovent 200-C: 155 m³/h Vitovent 300-F: 215 m³/h 		
Min. supply air temperature for bypass	7D0F	160 (± 16 °C)		
CO2 value for raising the flow rate	7D18	800 ppm		
Humidity value for raising the flow rate	7D19	65 %		
Interval time frost protection ventilation	7D1A	15 min		
Intensive ventilation duration	7D1B	120 min		
Actual source room temperature	7D1D	1		
Heating circuit for blocking bypass damper	7D21	7		
Control voltage matching	7D27	0 (± 0 V)		
Fan for control voltage matching	7D28	0		
Strategy, passive frost protection	7D2C	0		
Type of heat exchanger	7D2E	0		
Installation position	7D2F	0		
Function, external 230 V input, ventilation	7D3A	0		
Duration, bathroom vent.	7D3B	30 min		
Starting block, ventilation periods part 1	7D5E	0		
Starting block, ventilation periods part 2	7D5F	0		
Control voltage matching, supply air fan	7D71	0 V		
Control voltage matching, exhaust air fan	7D72	0 V		
Sensor matching, outdoor air temp after pre-heating coil	7D76	0 K		
Sensor matching, supply air temperature	7D77	0 K		
Sensor matching, extract air temperature	7D79	0 K		

Ventilation: Vitovent 200-W, Vitovent 300-C and Vitovent 300-W

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Vitovent enable	7D00	0		
Heating circuit for blocking bypass damper	7D21	7		
Preheating coil	C101	1		
Reheater coil	C102	0		
Humidity sensor	C105	0		
Set CO2 value	C106	0		
Set room temperature	C108	220 (± 22 °C)		

Control parameter report (cont.)

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Background ventilation	C109	<ul style="list-style-type: none"> Vitovent 200-W: 15 % Vitovent 300-C: 30 m³/h Vitovent 300-W: 50 m³/h 		
Reduced ventilation	C10A	<ul style="list-style-type: none"> Vitovent 200-W: 25 % Vitovent 300-C: 75 m³/h Vitovent 300-W: 100 m³/h 		
Standard ventilation	C10B	<ul style="list-style-type: none"> Vitovent 200-W: 50 % Vitovent 300-C: 100 m³/h Vitovent 300-W: 150 m³/h 		
Intensive ventilation	C10C	<ul style="list-style-type: none"> Vitovent 200-W: 75 % Vitovent 300-C: 125 m³/h Vitovent 300-W: 225 m³/h 		
Background ventilation, second fan duct	C189	15 %		
Reduced ventilation, second fan duct	C18A	25 %		
Standard ventilation, second fan duct	C18B	50 %		
Intensive ventilation, second fan duct	C18C	75 %		
Bypass mode	C1A0	0		
Central heating and heat recovery	C1A1	0		
Imbalance permitted	C1A2	1		
Specified imbalance	C1A3	0		
Set reheater coil temperature	C1A4	210 (± 21 °C)		
Humidity sensor sensitivity	C1A6	0		
Min. temperature, geothermal heat exchanger	C1AA	50 (± 5 °C)		
Max. temperature, geothermal heat exchanger	C1AB	250 (± 25 °C)		
Function, input 1	C1B0	0		
Min. voltage, input 1	C1B1	0 (10 ± 1 V)		
Min. voltage, input 2	C1C1	0 (10 ± 1 V)		
Flow rate correction	C1C7	100		

Control parameter report (cont.)**Photovoltaics**

Parameter	Code	Delivered condition	Commissioning	Maintenance/service
Enable own energy consumption PV	7E00	0		
Prop. of external current	7E02	10 (\pm 10 %)		
Threshold for electrical power	7E04	<ul style="list-style-type: none"> Types 221.C04 to 221.C08: 10 (\pm 10 W) Types 221.C10 to 221.C16: 15 (\pm 15 W) 		
Enable own energy consumptn for set DHW temperature 2	7E10	0		
Enable own energy consumption for DHW heating	7E11	0		
Enable own energy consumptn for heating water buffer cyl.	7E12	0		
Enable own energy consumption for heating	7E13	0		
Enable own energy consumption for cooling	7E15	0		
Raise set DHW cylinder temperature PV	7E21	0 (\pm 0 K)		
Raise set heating water buffer cylinder temp PV	7E22	0 (\pm 0 K)		
Raise set room temperature PV	7E23	0 (\pm 0 K)		
Reduce set room temperature PV	7E25	0 (\pm 0 K)		

Smart Grid

Parameter	Code	Delivered condition	Commissioning	Maintenance/Service
"Enable Smart Grid"	7E80	0		
"Smart Grid Enable elec heat"	7E82	0		
"Smart Grid set value increase for DHW heating"	7E91	0 (\pm 0 K)		
"Smart Grid set value increase for htg wtr buff"	7E92	0 (\pm 0 K)		
"Smart Grid set value increase for centr htg"	7E93	0 (\pm 0 K)		
"Smart Grid set value decrease for room t cool"	7E95	0 (\pm 0 K)		

Time

Parameter	Code	Delivered condition	Commissioning	Maintenance/Service
"Automatic changeover summertime - wintertime"	7C00	1		
"Start summertime - month"	7C01	3		
"Start summertime - week"	7C02	5		
"Start summertime - day"	7C03	7		
"Start wintertime - month"	7C04	10		
"Start wintertime - week"	7C05	5		
"Start wintertime - day"	7C06	7		

Control parameter report (cont.)**Control**

Parameter	Code	Delivered condition	Commission- ing	Maintenance/ service
"Lock out controls"	8800	0		
"Level enable, time program quieter operation"	8801	0		
"User level for display, energy stmt"	8811	1		

Specification

230 V appliances

Type AWBT-M/AWBT-M-E/AWBT-M-E-AC		221.C0 4	221.C0 6	221.C0 8	221.C1 0	221.C1 3	221.C1 6
Heating performance data to EN 14511 (A2/W35)							
Rated heating output	kW	2.61	3.10	4.04	5.01	5.92	6.47
Fan speed	rpm	600	600	650	600	600	600
Power consumption	kW	0.73	0.84	1.02	1.27	1.48	1.79
Coefficient of performance ϵ (COP) in heating mode		3.57	3.67	3.96	3.96	4.01	3.61
Output control	kW	2.30 to 4.20	3.00 to 5.70	3.50 to 7.00	4.00 to 9.50	4.50 to 10.30	5.00 to 11.80
Heating performance data to EN 14511 (A7/W35, 5 K spread)							
Rated heating output	kW	3.96	4.75	5.62	7.01	7.85	8.64
Fan speed	rpm	600	600	650	600	600	600
Air flow rate	m ³ /h	2250	2250	2600	4500	4500	4500
Power consumption	kW	0.87	1.03	1.19	1.49	1.66	1.90
Coefficient of performance ϵ (COP) in heating mode		4.56	4.60	4.71	4.69	4.72	4.54
Output control	kW	3.20 to 5.70	3.80 to 6.60	4.60 to 8.50	5.00 to 12.60	5.00 to 13.70	5.50 to 14.30
Heating performance data to EN 14511 (A-7/W35)							
Rated heating output	kW	3.81	5.53	6.67	8.69	9.50	11.03
Power consumption	kW	1.31	1.96	2.31	2.77	3.09	3.90
Coefficient of performance ϵ (COP) in heating mode		2.91	2.82	2.89	3.14	3.07	2.83
Cooling performance data to EN 14511 (A35/W7)							
Rated cooling capacity	kW	2.17	3.14	3.20	3.78	4.71	5.64
Fan speed	rpm	600	600	650	600	600	600
Power consumption	kW	0.97	1.27	1.18	1.70	2.00	2.28
Energy efficiency ratio EER in cooling mode		2.25	2.48	2.72	2.23	2.35	2.47
Output control	kW	Up to 3.00	Up to 3.50	Up to 3.80	Up to 5.50	Up to 5.80	Up to 6.00
Cooling performance data to EN 14511 (A35/W18)							
Rated cooling capacity	kW	4.50	4.85	5.35	6.00	7.39	9.45
Fan speed	rpm	600	600	650	600	600	600
Power consumption	kW	1.32	1.34	1.40	1.66	1.99	2.82
Energy efficiency ratio EER in cooling mode		3.40	3.60	3.81	3.60	3.71	3.35
Output control	kW	Up to 5.00	Up to 5.50	Up to 6.20	Up to 7.00	Up to 8.50	Up to 10.00
Air intake temperature							
Cooling mode (type AWBT-M-E-AC only)							
▪ Min.	°C	15	15	15	15	15	15
▪ Max.	°C	43	43	43	43	43	43
Heating mode							
▪ Min.	°C	-20	-20	-20	-20	-20	-20
▪ Max.	°C	35	35	35	35	35	35

Specification (cont.)

Type AWBT-M/AWBT-M-E/AWBT-M-E-AC		221.C0 4	221.C0 6	221.C0 8	221.C1 0	221.C1 3	221.C1 6
Heating water (secondary circuit)							
Minimum flow rate	l/h	700	700	700	1400	1400	1400
Minimum volume in the heating system, cannot be fitted with shut-off devices	l	50	50	50	50	50	50
Max. external pressure drop (RFH) at minimum flow rate	mbar	705	705	705	500	500	500
	kPa	70.5	70.5	70.5	50	50	50
Max. flow temperature	°C	60	60	60	60	60	60
Outdoor unit electrical values							
Rated voltage, compressor		1/N/PE 230 V/50 Hz					
Max. operating current, compressor	A	13.0	14.6	14.6	19.3	23.3	23.3
Starting current, compressor	A	15	15	15	15	15	15
Fuse rating	A	16	16	16	25	25	25
IP rating		IPX4	IPX4	IPX4	IPX4	IPX4	IPX4
Indoor unit electrical values							
Heat pump control unit/PCB		1/N/PE 230 V/50 Hz					
▪ Rated voltage, control unit/PCB		1 x B16A					
▪ Power supply fuse rating		6.3 A (slow)/250 V					
▪ Internal fuse							
Instantaneous heating water heater							
▪ Type AWBT-M-E/AWBT-M-E-AC:							
Factory-fitted							
▪ Type AWBT-M:							
Accessories							
▪ Rated voltage		1/N/PE 230 V/50 Hz					
		or					
		3/N/PE 400 V/50 Hz					
		9					
▪ Heating output	kW	3 x B16A					
▪ Power supply fuse rating							
Max. power consumption							
Fan	W	45	45	115	2 x 45	2 x 45	2 x 45
Outdoor unit	kW	2.85	3.20	3.30	4.36	5.08	5.08
Secondary pump (PWM)	W	60	60	60	60	60	60
Control unit/PCB, outdoor unit	W	15	15	15	15	15	15
Control unit/PCB, indoor unit	W	10	10	10	10	10	10
Control unit/PCB power, indoor unit	W	1000	1000	1000	1000	1000	1000
Refrigerant circuit							
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A
▪ Refrigerant charge	kg	1.80	1.80	2.39	3.60	3.60	3.60
▪ Global warming potential (GWP)		2088	2088	2088	2088	2088	2088
▪ CO ₂ equivalent	t	3.8	3.8	< 5.0	7.5	7.5	7.5
▪ Top-up charge for line lengths > 12 m to ≤ 30 m	g/m	20	20	60	33	33	33

Specification (cont.)

Type AWBT-M/AWBT-M-E/AWBT-M-E-AC		221.C0 4	221.C0 6	221.C0 8	221.C1 0	221.C1 3	221.C1 6
Compressor (hermetically sealed)	Type	Scroll					
▪ Oil in compressor	Type	3 MAF POE					
▪ Quantity of oil in compressor	l	0.76	0.76	0.76	1.17	1.17	1.17
Permissible operating pressure							
▪ High pressure side	bar	43	43	43	43	43	43
	MPa	4.3	4.3	4.3	4.3	4.3	4.3
▪ Low pressure side	bar	28	28	28	28	28	28
	MPa	2.8	2.8	2.8	2.8	2.8	2.8
Integral DHW cylinder							
Capacity	l	210	210	210	210	210	210
Max. draw-off volume at DHW temperature 40 °C	l	290	290	290	290	290	290
Performance factor N _L to DIN 4708		1.6	1.6	1.6	1.6	1.6	1.6
Max. draw-off rate at the specified performance factor N _L and DHW heating from 10 to 45 °C	l/min	17.3	17.3	17.3	17.3	17.3	17.3
Max. permissible DHW temperature	°C	70	70	70	70	70	70
Outdoor unit dimensions							
Total length	mm	546	546	546	546	546	546
Total width	mm	1109	1109	1109	1109	1109	1109
Total height	mm	753	753	753	1377	1377	1377
Indoor unit dimensions							
Total length	mm	681	681	681	681	681	681
Total width	mm	600	600	600	600	600	600
Total height	mm	1874	1874	1874	1874	1874	1874
Total weight							
Outdoor unit	kg	94	94	99	137	137	137
Indoor unit							
▪ Type AWBT-M	kg	168	168	168	169	169	169
▪ Type AWBT-M-E/ AWBT-M-E-AC	kg	169	169	169	170	170	170
Permissible operating pressure, secondary side							
	bar	3	3	3	3	3	3
	MPa	0.3	0.3	0.3	0.3	0.3	0.3

Specification (cont.)

Type AWBT-M/AWBT-M-E/AWBT-M-E-AC		221.C0 4	221.C0 6	221.C0 8	221.C1 0	221.C1 3	221.C1 6
Secondary circuit connections (with connection accessories, female thread)							
Heating water flow	G	1¼	1¼	1¼	1¼	1¼	1¼
Heating water return	G	1¼	1¼	1¼	1¼	1¼	1¼
DHW	G	¾	¾	¾	¾	¾	¾
Cold water	G	¾	¾	¾	¾	¾	¾
DHW circulation	G	¾	¾	¾	¾	¾	¾
Refrigerant line connections							
Liquid line							
▪ Pipe Ø	mm	6 x 1	6 x 1	10 x 1	10 x 1	10 x 1	10 x 1
▪ Indoor unit	UNF	⅝	⅝	⅝	⅝	⅝	⅝
▪ Outdoor unit	UNF	7/16	7/16	⅝	⅝	⅝	⅝
Hot gas line							
▪ Pipe Ø	mm	12 x 1	12 x 1	16 x 1	16 x 1	16 x 1	16 x 1
▪ Indoor unit	UNF	7/8	7/8	7/8	7/8	7/8	7/8
▪ Outdoor unit	UNF	¾	¾	7/8	7/8	7/8	7/8
Length of liquid line and hot gas line							
▪ Heating mode	m	3 to 30	3 to 30	3 to 30	3 to 30	3 to 30	3 to 30
▪ Cooling mode	m	3 to 30	3 to 30	3 to 25	3 to 30	3 to 30	3 to 30
Sound power of outdoor unit at rated heating output (Measurements with reference to EN 12102/ EN ISO 9614-2)							
Weighted total sound power level							
▪ At A7±3 K/W55±5 K (max.)	dB(A)	56	56	58	60	61	61
▪ At A7±3 K/W55±5 K in night mode	dB(A)	50	50	50	55	55	55
Energy efficiency class to EU Regulation no. 811/2013							
Heating, average climatic conditions							
▪ Low temperature applications (W35)		A++	A++	A++	A++	A++	A++
▪ Medium temperature applications (W55)		A+	A++	A++	A++	A++	A++
DHW heating, draw-off profile (L)		A	A	A	A	A	A
Performance data as per EU Regulation no. 811/2013 (average climatic conditions)							
Low temperature applications (W35)							
▪ Energy efficiency η_s	%	169	170	175	175	175	175
▪ Rated heating output P_{rated}	kW	5.37	5.59	6.84	9.32	9.98	10.61
Medium temperature applications (W55)							
▪ Energy efficiency η_s	%	122	125	127	129	129	130
▪ Rated heating output P_{rated}	kW	5.26	5.09	6.40	9.35	10.04	10.71
Sound power level to ErP							
Sound power level, outdoor unit	dB(A)	53	54	55	56	56	56

Specification (cont.)**400 V appliances**

Type AWBT/AWBT-E/AWBT-E-AC		221.C10	221.C13	221.C16
Heating performance data to EN 14511 (A2/W35)				
Rated heating output	kW	5.90	6.31	7.02
Fan speed	rpm	600	600	600
Power consumption	kW	1.44	1.59	1.78
Coefficient of performance ϵ (COP) in heating mode		4.10	3.98	3.94
Output control	kW	3.50 to 10.50	4.00 to 11.40	4.50 to 12.00
Heating performance data to EN 14511 (A7/W35, 5 K spread)				
Rated heating output	kW	7.58	8.61	10.11
Fan speed	rpm	600	600	600
Air flow rate	m ³ /h	4500	4500	4500
Power consumption	kW	1.51	1.77	2.04
Coefficient of performance ϵ (COP) in heating mode		5.01	4.87	4.95
Output control	kW	4.70 to 13.60	5.20 to 14.20	5.70 to 14.70
Heating performance data to EN 14511 (A-7/W35)				
Rated heating output	kW	10.09	10.74	11.60
Power consumption	kW	3.17	3.58	3.87
Coefficient of performance ϵ (COP) in heating mode		3.18	3.00	3.00
Cooling performance data to EN 14511 (A35/W7)				
Rated cooling capacity	kW	4.92	6.11	7.02
Fan speed	rpm	600	600	600
Power consumption	kW	1.82	2.20	2.53
Energy efficiency ratio EER in cooling mode		2.70	2.78	2.77
Output control	kW	Up to 6.0	Up to 6.5	Up to 7.1
Cooling performance data to EN 14511 (A35/W18)				
Rated cooling capacity	kW	6.20	7.55	10.00
Fan speed	rpm	600	600	600
Power consumption	kW	1.77	2.29	3.57
Energy efficiency ratio EER in cooling mode		3.50	3.30	2.80
Output control	kW	Up to 8.0	Up to 9.5	Up to 10.5
Air intake temperature				
Cooling mode (type AWBT-E-AC only)				
▪ Min.	°C	15	15	15
▪ Max.	°C	43	43	43
Heating mode				
▪ Min.	°C	-20	-20	-20
▪ Max.	°C	35	35	35

Specification (cont.)

Type AWBT/AWBT-E/AWBT-E-AC		221.C10	221.C13	221.C16
Heating water (secondary circuit)				
Minimum flow rate	l/h	1400	1400	1400
Minimum volume in the heating system, cannot be fitted with shut-off devices	l	50	50	50
Max. external pressure drop (RFH) at minimum flow rate	mbar	500	500	500
	kPa	50	50	50
Max. flow temperature	°C	60	60	60
Outdoor unit electrical values				
Rated voltage, compressor		3/N/PE 400 V/50 Hz		
Max. operating current, compressor	A	8.7	8.7	8.7
Starting current, compressor	A	15	15	15
Fuse rating	A	16	16	16
IP rating		IPX4	IPX4	IPX4
Indoor unit electrical values				
Heat pump control unit/PCB				
▪ Rated voltage, control unit/PCB		1/N/PE 230 V/50 Hz		
▪ Power supply fuse rating		1 x B16A		
▪ Internal fuse		6.3 A (slow)/250 V		
Instantaneous heating water heater				
▪ Type AWBT-E/AWBT-E-AC:				
Factory-fitted				
▪ Type AWBT:				
Accessories				
▪ Rated voltage				
▪ Heating output		1/N/PE 230 V/50 Hz		
▪ Power supply fuse rating		or		
		3/N/PE 400 V/50 Hz		
		9		
		3 x B16 A		
Max. power consumption				
Fan	W	2 x 45	2 x 45	2 x 45
Outdoor unit	kW	5.13	5.13	5.15
Secondary pump (PWM)	W	60	60	60
Control unit/PCB, outdoor unit	W	15	15	15
Control unit/PCB, indoor unit	W	10	10	10
Control unit/PCB power, indoor unit	W	1000	1000	1000
Refrigerant circuit				
Refrigerant		R410A	R410A	R410A
▪ Refrigerant charge	kg	3.60	3.60	3.60
▪ Global warming potential (GWP)		2088	2088	2088
▪ CO ₂ equivalent	t	7.5	7.5	7.5
▪ Top-up charge for line lengths > 12 m to ≤ 30 m	g/m	33	33	33
Compressor (hermetically sealed)	Type	Scroll		
▪ Oil in compressor	Type	3 MAF POE		
▪ Quantity of oil in compressor	l	1.17	1.17	1.17

Specification

Specification (cont.)

Type AWBT/AWBT-E/AWBT-E-AC		221.C10	221.C13	221.C16
Permissible operating pressure				
▪ High pressure side	bar	43	43	43
	MPa	4.3	4.3	4.3
▪ Low pressure side	bar	28	28	28
	MPa	2.8	2.8	2.8
Integral DHW cylinder				
Capacity	l	210	210	210
Max. draw-off volume at DHW temperature 40 °C	l	290	290	290
Performance factor N _L to DIN 4708		1.6	1.6	1.6
Max. draw-off rate at the specified performance factor N _L and DHW heating from 10 to 45 °C	l/min	17.3	17.3	17.3
Max. permissible DHW temperature	°C	70	70	70
Outdoor unit dimensions				
Total length	mm	546	546	546
Total width	mm	1109	1109	1109
Total height	mm	1377	1377	1377
Indoor unit dimensions				
Total length	mm	681	681	681
Total width	mm	600	600	600
Total height	mm	1874	1874	1874
Total weight				
Outdoor unit	kg	148	148	148
Indoor unit				
▪ Type AWBT	kg	169	169	169
▪ Type AWBT-E/AWBT-E-AC	kg	170	170	170
Permissible operating pressure, secondary side				
	bar	3	3	3
	MPa	0.3	0.3	0.3
Secondary circuit connections (with connection accessories, female thread)				
Heating water flow	G	1¼	1¼	1¼
Heating water return	G	1¼	1¼	1¼
DHW	G	¾	¾	¾
Cold water	G	¾	¾	¾
DHW circulation	G	¾	¾	¾

Specification (cont.)

Type AWBT/AWBT-E/AWBT-E-AC		221.C10	221.C13	221.C16
Refrigerant line connections				
Liquid line				
▪ Pipe Ø	mm	10 x 1	10 x 1	10 x 1
▪ Indoor unit	UNF	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$
▪ Outdoor unit	UNF	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$
Hot gas line				
▪ Pipe Ø	mm	16 x 1	16 x 1	16 x 1
▪ Indoor unit	UNF	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$
▪ Outdoor unit	UNF	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$
Length of liquid line and hot gas line				
▪ Heating mode	m	3 to 30	3 to 30	3 to 30
▪ Cooling mode	m	3 to 30	3 to 30	3 to 30
Sound power of outdoor unit at rated heating output (Measurements with reference to EN 12102/ EN ISO 9614-2)				
Weighted total sound power level				
▪ At $A7^{\pm 3} K/W55^{\pm 5} K$ (max.)	dB(A)	61	61	61
▪ At $A7^{\pm 3} K/W55^{\pm 5} K$ in night mode	dB(A)	55	55	55
Energy efficiency class to EU Regulation no. 811/2013				
Heating, average climatic conditions				
▪ Low temperature applications (W35)		A ⁺⁺	A ⁺⁺	A ⁺⁺
▪ Medium temperature applications (W55)		A ⁺⁺	A ⁺⁺	A ⁺⁺
DHW heating, draw-off profile (L)				
		A	A	A
Performance data as per EU Regulation no. 811/2013 (average climatic conditions)				
Low temperature applications (W35)				
▪ Energy efficiency η_s	%	180	183	182
▪ Rated heating output P_{rated}	kW	9.75	11.17	
Medium temperature applications (W55)				
▪ Energy efficiency η_s	%	132	131	134
▪ Rated heating output P_{rated}	kW	9.67	10.83	11.98
Sound power level to ErP				
Sound power level, outdoor unit	dB(A)	56	56	56

Commissioning order

Fax the following request, together with the enclosed system scheme, to your local Viessmann sales office. A competent employee must be present when the system is commissioned.

System details:

Requester _____

System location _____

Tick check list boxes:

- ☐ 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 sealed
- ☐ Components for cooling mode fully installed (optional)
- ☐ Components for ventilation fully installed (optional)
- ☐ Components for PV system fully installed (optional)

Preferred appointment:

1. Date _____
 Time _____
2. Date _____
 Time _____

The work that is requested to be carried out by Viessmann will be billed 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 household waste.

For decommissioning the system, isolate the system from the power supply and allow components to cool down where appropriate.

All components must be disposed of correctly.

Declaration of conformity

The following types of Vitocal 222-S:

AWBT

AWBT-M

AWBT-E

AWBT-M-E

AWBT-E-AC

AWBT-M-E-AC

Including the Vitotronic 200, type WO1C heat pump control unit

We, Viessmann Werke GmbH & Co. KG, D-35107 Allendorf, declare as sole responsible body that the named product complies with the provisions of the following directives and regulations:

2014/68/EU	Pressure Equipment Directive
2014/30/EU	EMC Directive
2014/35/EU	Low Voltage Directive
2011/65/EU	RoHS II
2009/125/EC	Ecodesign Directive
2010/30/EU	Directive for energy consumption labelling
811/2013	EU Regulation "Energy Efficiency Label"
813/2013	EU Regulation "Energy Efficiency Requirements"

Details according to the Pressure Equipment Directive (2014/68/EU): Category I, Module A

Applied standards:

DIN 8901:2002-12	EN 60335-2-40:2003+A11+A12+A1+Corrigendum +A2:2009
EN 349: 2008	EN 60335-2-40:2010-03
EN 378: 2012	EN 61000-3-2:2014
EN 50090-2-2:2007-11	EN 61000-3-3:2013
EN 55014-1:2011	EN 61000-3-11:2001-04
EN 55014-2:2009	EN 61000-3-12:2005-09
EN 55022: 2010	EN 62233: 2008
EN 60335-1:2012	EN 62233 Corrigendum 1:2009-04
EN 60335-1:2012/AC2014	ISO 12100:2010
EN 60335-1:2012/A11:2014	EN ISO 13857:2008
IEC 60335-1:2010/A1:2013	BGR 500, chapter 2.35

In accordance with the listed directives, this product is designated with **CE**.

Allendorf, 10 June 2017

Viessmann Werke GmbH & Co. KG



Authorised signatory Manfred Sommer

The **product characteristics** determined as system values for the product **Vitocal 222-S** (see technical guide) can be utilised to assess the energy consumption of heating and ventilation systems to DIN V 4701-10 specified by the EnEV [Germany].

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Applicability

Serial No.:

7745685	7745686	7745687	7745688
7745689	7745690	7745691	7745692
7745693	7749598	7749599	7749600
7749601	7749602	7749603	

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