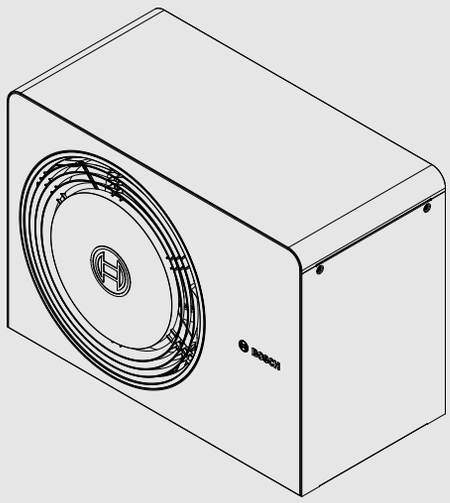
BOSCH

Installation Instructions

Air to water heat pump

AW 4 | 5 | 7 OR-S



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1 Explanation of symbols and safety instructions

1.1 Explanation of symbols

Warnings

In warnings, signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing danger are not taken.

The following signal words are defined and can be used in this document:

DANGER

DANGER indicates that severe or life-threatening personal injury will occur.

WARNING

WARNING indicates that severe to life-threatening personal injury may occur.

CAUTION

CAUTION indicates that minor to medium personal injury may occur.

NOTICE

NOTICE indicates that material damage may occur.

Important information

The info symbol indicates important information where there is no risk to people or property.

Additional symbols

Symbol	Meaning
▶	a step in an action sequence
→	a reference to a related part in the document
•	a list entry
–	a list entry (second level)

Table 1

Symbol	Meaning
	Warning of flammable materials. This appliance uses the flammable refrigerant R290. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	Warning of moving parts. After front cover removal, moving parts can be accessed. Serious injury to hands or fingers. Keep hands away from moving parts. Disconnect power before servicing.
	Maintenance by a qualified person should be done while following the instructions of the service manual.
	For operation follow the instructions of the user manual.

Table 2

1.2 General safety instructions

These installation instructions are intended for plumbers, heating system installers and electricians.

- ▶ Read all installation instructions (heat pump, control system etc) carefully before installation.
- ▶ Follow safety and warning instructions.
- ▶ Follow national and regional regulations, technical regulations and guidelines.
- ▶ Document all work that has been performed.

⚠ Intended operation

This heat pump is intended to be used in a closed heating system for households. All other use is considered unsuitable. Any damage that is caused by such usage is excluded from liability.

⚠ Installation, commissioning and service

The heat pump may only be installed, brought into operation and maintained by authorised personnel.

- ▶ Use only original spare parts.

⚠ Special qualifications for refrigerant R290

Action requiring the product to be opened must only be taken by personnel with knowledge of the properties of and risks associated with the refrigerant R290.

Work on the refrigerant circuit and involving equipment with flammable refrigerants requires special training in addition to standard repair procedures for refrigerant equipment.

- ▶ Follow instructions in applicable laws and regulations.

⚠ Danger of fire or explosion of flammable gases

The product contains the flammable refrigerant R290. If a leak occurs, the refrigerant may form a combustible gas due to mixing with air. There is a risk of fire and explosion.

- ▶ When working on the opened product, use a gas detector to ensure that there is no leakage. The detector must be calibrated for R290 and set to ≤ 25% of the lowest flashpoint.
- ▶ Make sure that there are no sources of ignition in the vicinity of the product.
- ▶ If a R290 leakage is detected, call a R290 qualified technician.

⚠ Electrical work

Electrical work may only be performed by authorised electrical installers.

Before commencing work:

- ▶ Disconnect mains voltage on all poles and ensure it cannot reconnect.
- ▶ Check to ensure that the power is disconnected.
- ▶ Also check the connection diagram for other parts of the system.

⚠ Connection to supply mains

Means to safely disconnect the unit from supply mains must be incorporated.

- ▶ Install a safety switch that disconnects all poles from supply mains. The safety switch shall be an over voltage category III appliance.

⚠ Handover to the user

Instruct the user on the usage and operating conditions for the heating system at handover.

- ▶ Explain how to use the system and in particular provide information on all safety-related instructions.
- ▶ Inform the user that rebuilds and repairs may only be performed by trained installers.
- ▶ Inform the user that inspections and maintenance are necessary for ensuring safe and environmentally-friendly operation.
- ▶ Supply the user with all the installation and maintenance instructions.

2 Product description

2.1 Standard delivery

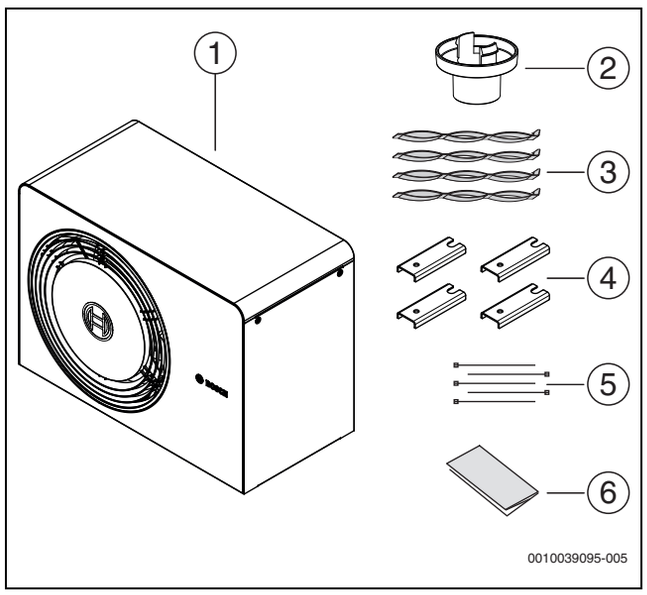

Fig. 1 Standard delivery

[1] Heat Pump
[2] Condensate drain connector
[3] Straps for transport
[4] Ground brackets
[5] Cable ties for fastening the cables in the electric box at installation
[6] Set of documents

A drilling template is printed on the carton of the accessory box. This template can be used to place the necessary anchor points for the heat pump.

2.2 Declaration of Conformity

The design and operating characteristics of this product comply with the British, European and supplementary national requirements.

The UKCA and CE markings declare that the product complies with all the applicable British and European legislation, which is stipulated by attaching these markings.

You can request the complete text of the Declaration of Conformity from the UK address indicated in this document.

2.3 Information about the heat pump

AW OR are heat pumps intended to be connected to the indoor units 12 M, 12 E or 12 MB.

12 M has an integrated electric booster heater, DHW cylinder and a small buffer cylinder.

12 E has an integrated electric booster heater.

12 MB has an integrated electric booster heater and a buffer cylinder.

2.4 Available accessories

- Installation kit with insulation and pipe cover is recommended for all installations where the pipes are routed downward.
- A short heating cable is integrated, but in case of an extended condensate drain pipe is needed an accessory heating cable should be installed if there is a risk of frost.
- Wall brackets are available for wall mounting of the heat pump.
- Floor stand is available for mounting on the ground, in cases where a higher ground clearance is needed.

2.5 Product Overview

The heat pump is equipped with a transport fitting (screw). The transport fitting prevents the heat pump from being damaged in transit.

▶ Remove the transport fitting at installation (→ Chapter 6).

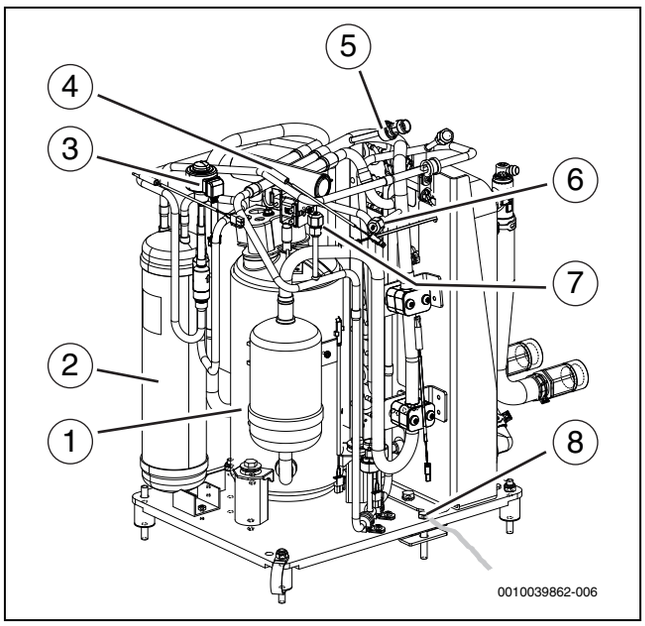

Fig. 2 Product Overview front view

[1] Compressor
[2] Receiver
[3] Electronic expansion valve VR1
[4] 4-way valve
[5] Pressure sensor low pressure
[6] Service port low pressure
[7] Service port high pressure
[8] Transport fitting, to be removed at installation

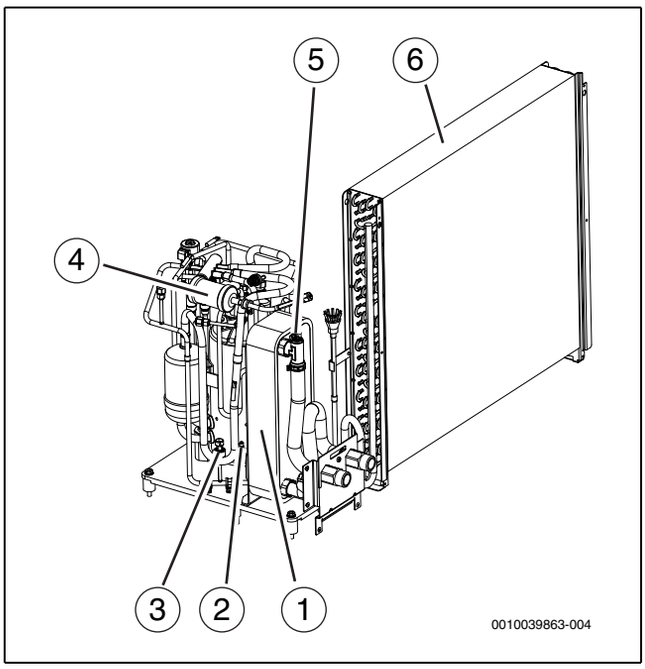

Fig. 3 Product Overview back view

[1] Condenser
[2] Pressure sensor high pressure
[3] Pressure switch sensor high pressure
[4] Dry filter (mounted at service action)
[5] Manual de-airing valve
[6] Evaporator

Open the de-airing valve when filling the system and close it when no more air is coming out.

2.6 Regulations

Follow the directives and regulations given below:

- Local provisions and regulations of the electricity supplier and corresponding special rules
- National building regulations
- **EN 50160** (voltage properties in power grids for public distribution)
- **EN 12828** (heating systems in buildings - Design and installation of water-based heating systems)
- **EN 1717** (Protection of potable water against pollution in potable water installations)
- **EN 378** (Refrigerating systems and heat pumps - Safety and environmental requirements)
- **EN60335-2-40** (Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers)
- **PED, 2014/68/EU** (Pressure equipment directive)

2.7 Dimensions

2.7.1 Heat pump dimensions

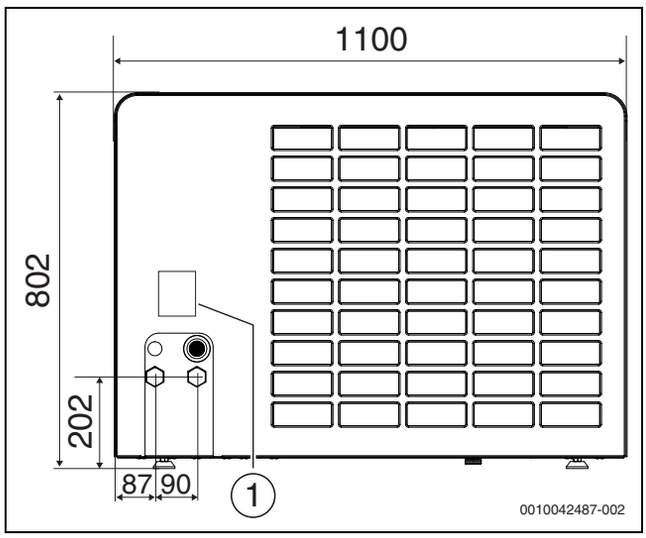

Fig. 4 Heat pump dimensions and connections, rear

[1] Type plate

The type plate contains information on the output, part number and serial number and also the date of manufacture.

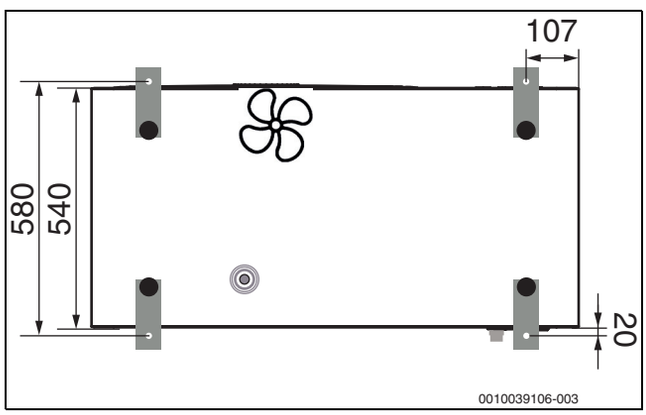

Fig. 5 Heat pump dimensions, top

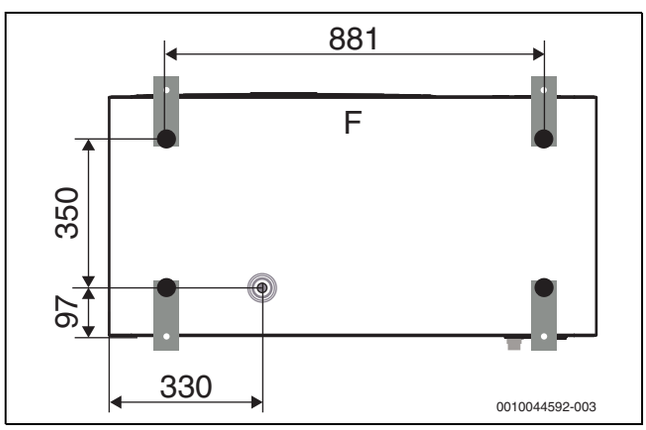

Fig. 6 Distances to drain connector, bottom view

[F] front

2.8 Protection zone

The product contains the refrigerant R290 that has a density greater than air. If a leak occurs, the refrigerant could accumulate near the ground. The refrigerant must therefore be prevented from collecting in niches, drains, gaps, other sinks, hollows or depressions in the building.

No building openings such as light shafts, hatches, valves, down pipes, cellar entrances, windows or doors are permitted within the defined protection zone around the product. The protection zone must not overlap general areas or adjacent plots.

No sources of ignition such as contactors, lamps or electrical switches are permitted within the protection zone.

2.8.1 Protection zone, ground-placed heat pump by wall

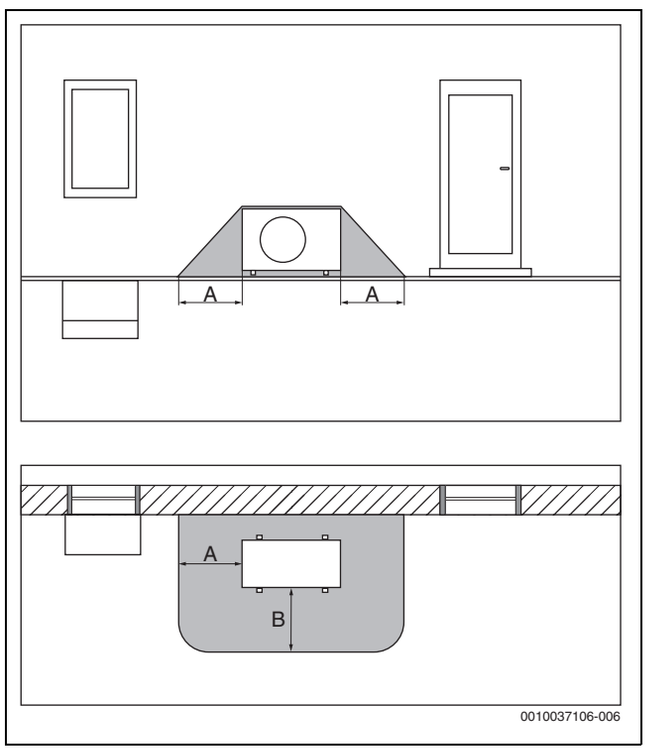

Fig. 7 Protection zone ground-placed

[A] 1000 mm
[B] 1000 mm

2.8.2 Protection zone, ground-placed heat pump free standing or on a flat roof

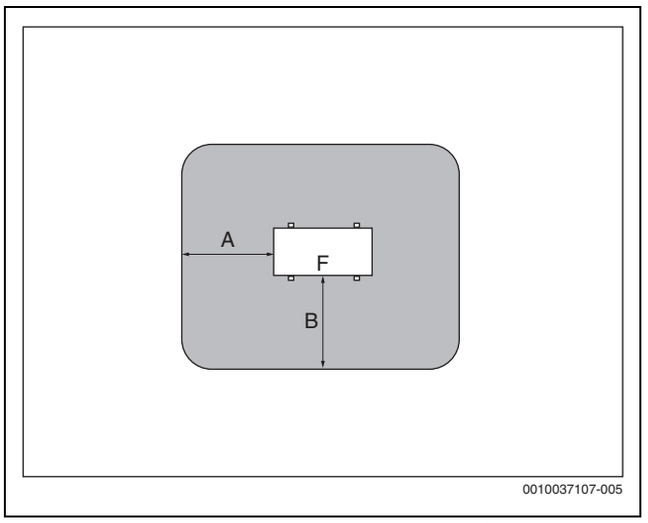

Fig. 8 Protection zone ground-placed on plot or roof

[A] 1000 mm
[B] 1000 mm
[F] Front

2.8.3 Protection zone, ground-placed heat pump in a corner

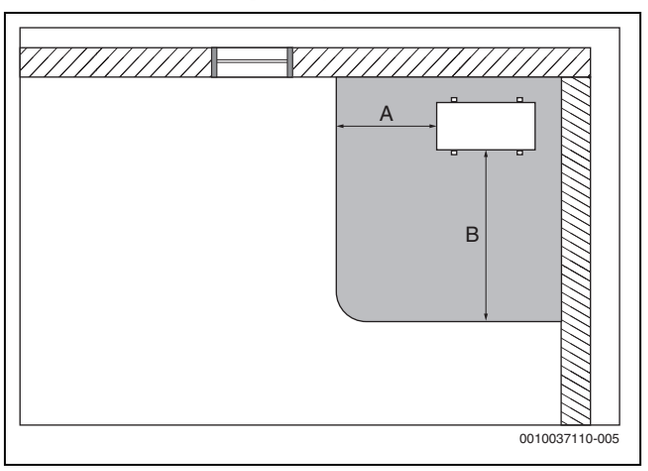

Fig. 9 Protection zone ground-placed in a corner

[A] 1000 mm
[B] 2000 mm

3 Preparing for installation

3.1 Transport and storage

DANGER

Danger to life due to fire!

The product contains the flammable refrigerant R290. If a leak occurs, the refrigerant may form a combustible gas due to mixing with air. There is a risk of fire and explosion.

- The product must be stored in a well-ventilated room without continuous sources of ignition (e.g. an open flame, a wall-mounted conventional gas boiler or an electric heater).

The heat pump must always be transported and stored in an upright position. However, the heat pump may be temporarily tilted ≤ 45°, but not laid flat.

The heat pump cannot be stored in temperatures below − 30 °C or above +60 °C.

The heat pump must be stored so that it is not subject to mechanical damage.

Use the delivered straps when transporting the heat pump without the packaging. Remove the straps after the heat pump has been placed at the mounting foundation.

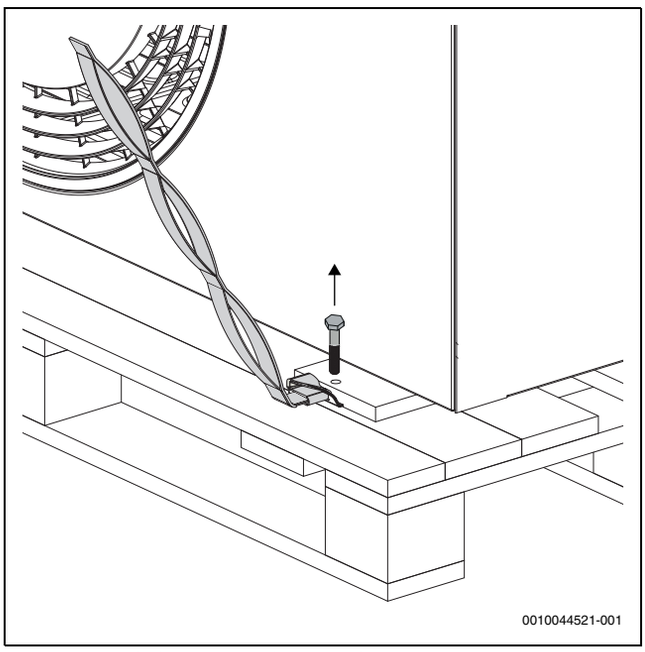

Fig. 10 Attach the straps and remove the screws

NOTICE

Risk of damage!

The metal brackets and the wooden parts are not firmly attached to the heat pump, there is thus a risk that it can slide while carrying.

- ▶ Be at least two persons while carrying the heat pump.
- ▶ Observe that the heat pump is heavier on the compressor side (→ graphic 11).

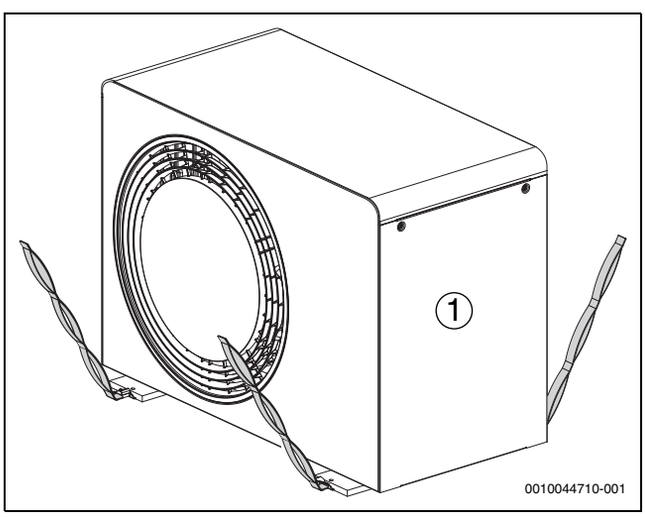

Fig. 11 Use the straps when transporting the heat pump without packaging

[1] Compressor side

The wooden parts, metal brackets and straps can be reused to carry the indoor unit 12 M (→ Installation instructions of the Indoor unit).

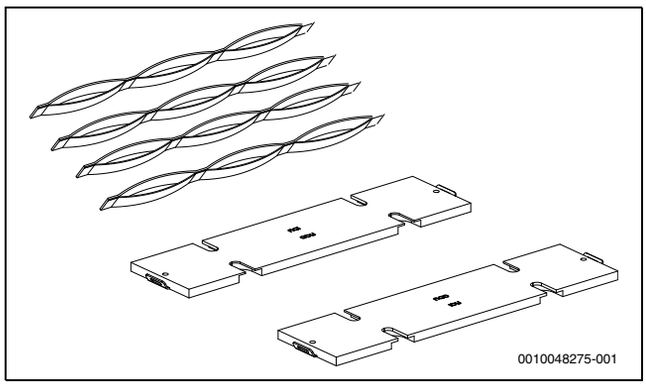

Fig. 12 Wooden parts, metal brackets and straps

CAUTION

Risk of corrosion!

Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient performance.

- ▶ Do not install the outdoor unit in areas where corrosive gases, such as acid or alkaline gas, are produced.
- ▶ Do not install the product where it could be exposed to direct sea wind (salty wind).
- ▶ Do not install the outdoor unit in the immediate vicinity of the sea, a minimum distance to sea of 500 m is required. For France and Ireland the minimum required distance to sea is 1000 m.

3.2 Installation location

- ▶ The heat pump has to be placed outside, on a flat and solid surface.
- ▶ When positioning the heat pump, make sure that it can be accessed at all times so that maintenance can be carried out. If access is restricted, e.g. due to the ceiling height, a plan must be drawn up to ensure that maintenance can be carried out without additional time expenditure or costly aids.
- ▶ Attention in connection with placement must be paid to the heat pump's sound pressure level, for example, in order to prevent neighbours from exposure to disturbing sounds.
- ▶ Avoid placing the heat pump outside sound-sensitive rooms.
- ▶ Do not position the heat pump in a corner where it is enclosed by walls on 3 sides as this may lead to increased noise levels and abnormal soiling of the evaporator.

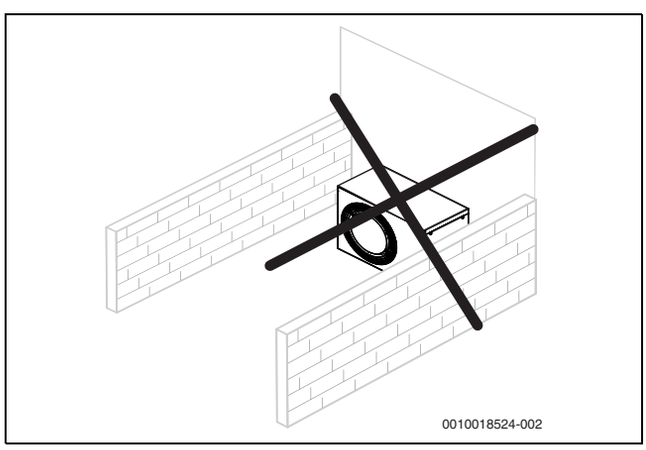

Fig. 13 Avoid placement with surrounding walls

- For freestanding heat pumps (not near buildings or on a roof):
  - Protect the intake side with a wall or similar.

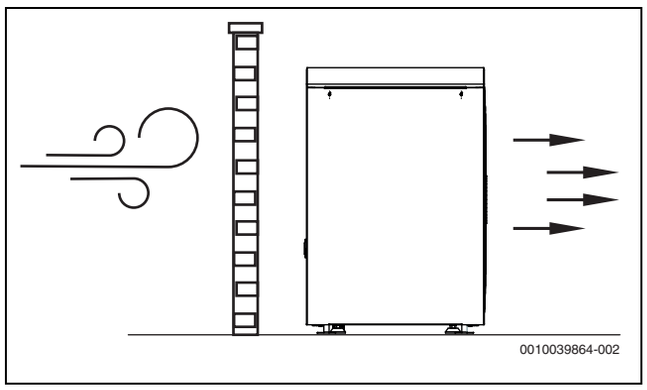

Fig. 14 Free standing heat pump

- Do not position the heat pump in a location where its front is exposed to the wind.
- The heat pump must not be positioned where there is a risk of large amounts of snow or water sliding down from the house roof. If this cannot be avoided, a protective roof must be installed.
  - Install the roof at least 1000 mm above the heat pump.

3.3 Positioning clearances

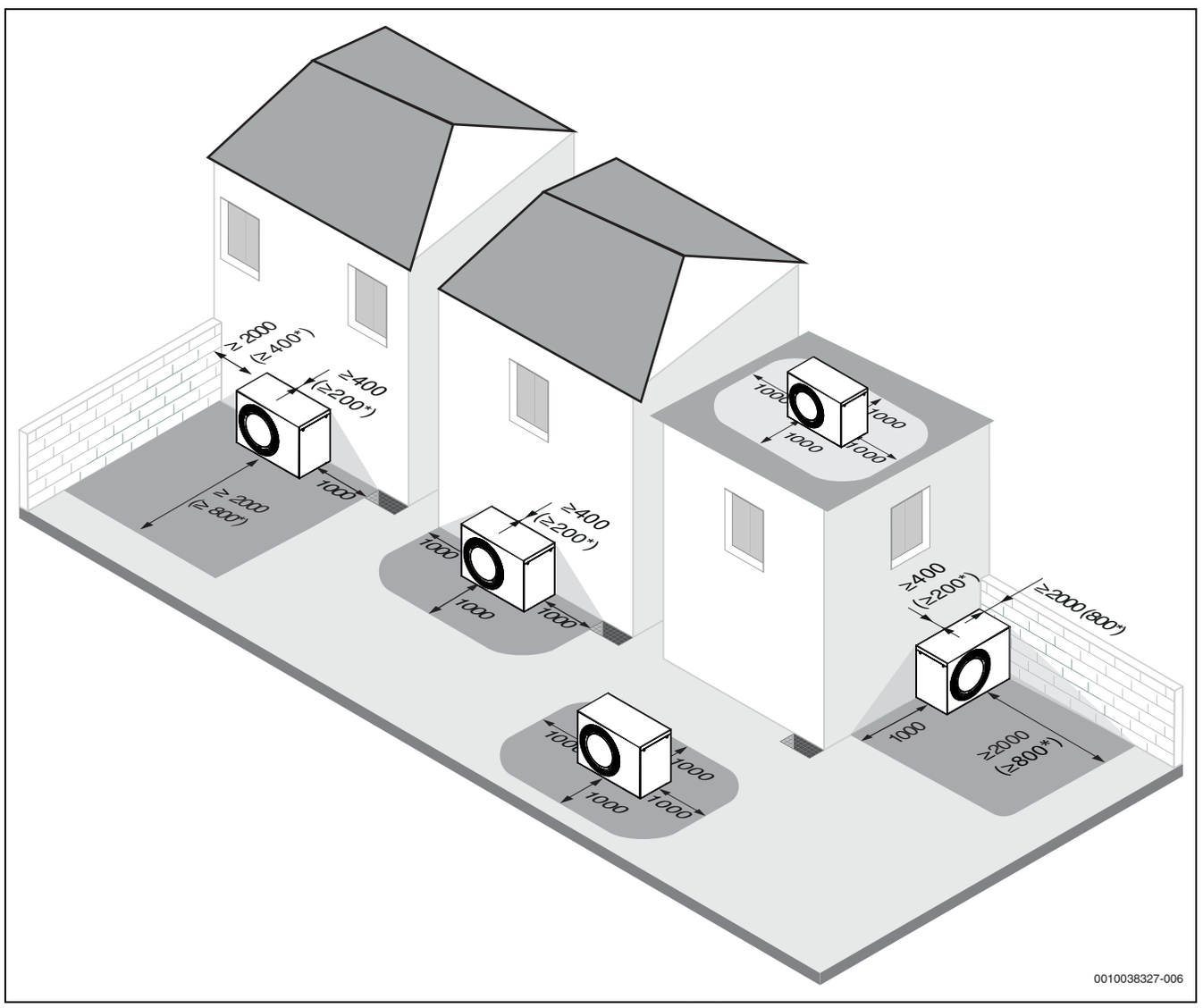

Fig. 15 Recommended space between the heat pump and surrounding solid objects (mm)

[*] Minimum clearance. The space can be reduced on the back and one of the sides at the same time or only at the front, but please note that this may lead to a higher noise level and/or a lower thermal performance.

3.4 Water quality

3.4.1 Quality requirements for the heating water

The quality of the fill and top-up water is an essential factor for increased efficiency, functional reliability, long service life and for maintaining the operational readiness of a heating system.

Unsuitable water can damage the heat exchanger or cause a fault in the heat generator or DHW supply!

Unsuitable or contaminated water can lead to sludge formation, corrosion or scaling. Unsuitable antifreeze or hot water additives (inhibitors or anti-corrosion agents) can damage the heat generator and heating system.

- ▶ Only fill the heating system with potable water. Do not use well or groundwater.
- ▶ Determine the water hardness of the filling water, before filling the system.
- ▶ Flush the heating system prior to filling.
- ▶ If magnetite (iron oxide) is present, anti-corrosion measures are required and the installation of a magnetite separator and a de-airing valve in the heating system is recommended.
- ▶ The limit values in table 3 must not be exceeded, even if national directives contain higher limits.

Water quality	Unit	Value
Conductivity	µS/cm	≤ 2500
pH		≥ 6,5... ≤ 9,5
Chloride	ppm	≤ 250
Sulphate	ppm	≤ 250
Sodium	ppm	≤ 200

Table 3 Boundary conditions for potable water (filling water)

- ▶ Check the pH value after > 3 months of operation. Ideally at the first service.

Material of heat generator	Heating water	pH value range
Copper brazed heat exchangers	•Untreated potable water •Fully softened water	7.5[1] – 10.0
	• Low-salt operation < 100 µS/cm	7.0[1] – 10.0

1) If pH value is < 8.2 an on-site test for ferrous corrosion is necessary

Table 4 pH value ranges after > 3 months of operation

- ▶ Treat the fill and top up water according to the instructions in the following section.

Depending on the hardness of the filling water, the system water volume and the maximum heat output of the heat generator, water treatment may be required to avoid a damage in water heating installations, due to the formation of lime scale.

Requirements on the fill and top-up water

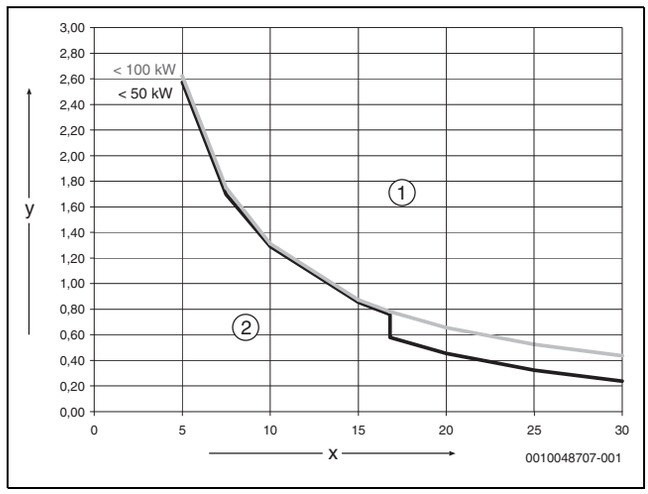

Fig. 16 Heat generators < 50 kW-100 kW

[x] Total hardness in °dH
[y] Maximum possible water volume over the service life of the heat source in m^3
[1] Above the curve, only use desalinated fill and top-up water, with a conductivity of ≤ 10 µS/cm
[2] Below the curve, untreated fill and top-up water according to drinking water regulation can be used

For systems with a specific system water content >40 l/kW, water treatment is mandatory. If there are several heat generators in the heating system, then the system water volume must be related to the heat generator with the lowest output.

	Water hardness unit conversion				
	°dH	°e	°fH	ppm	mmol/l
1°dH=	1	1,25	1,8	17,8	0,1783
1°e=	0,798	1	1,4	14,3	0,142
1°fH=	0,56	0,7	1	10	0,1
1 ppm CaCO3 (USA)	0,056	0,07	0,1	1	0,01
1mmol/l=	5,6	7,02	10	100	1

Table 5 Water hardness unit conversion

A recommended and approved method for water treatment is desalination of the fill and top-up water to a conductivity of ≤ 10 µS/cm.

Prevention of corrosion

In most cases, corrosion plays only a minor role in heating systems. A precondition for this is however, that the system is a corrosion-sealed water heating installation. This means that there is practically no access of oxygen to the system during operation.

Continuous introduction of oxygen leads to corrosion and can thus cause rusting and rust sludge formation. Sludge formation can not only cause blockages and therefore a diminished heat supply but also deposits (similar to lime scale deposits) on the hot surfaces of the heat exchanger.

The amount of oxygen introduced by the fill- and top-up water are generally very small and can therefore be ignored.

To avoid oxygenation, connection pipes must be diffusion-tight!
The use of rubber hoses should be avoided.

The intended connection accessories should be used in the installation.

During operation, pressure maintenance with regard to oxygen ingress and in particular the function, correct sizing and correct setting (pre-

charge pressure) of the expansion vessel is of highest importance. Check the pre-charge pressure and function annually.

Furthermore, the function of automatic air vents should also be checked during maintenance.

It is also important to check and document the top-up water quantities via a water meter. Larger and regularly required water top-up quantities indicate insufficient pressure maintenance, leaks or continuous oxygen input.

Antifreeze

Unsuitable antifreeze can damage the heat exchanger or cause a fault in the heat source or DHW supply.

Unsuitable antifreeze can damage the heat source and heating system. Only use antifreeze as listed in the document 6720841872, which contains antifreeze products approved by us.

- ▶ Only use antifreeze according to the specifications of the manufacturer, e.g with regard to the minimum concentration.
- ▶ Follow the instructions of the manufacturer of the antifreeze about regular checking of the concentration and corrective measures.
- ▶ The use of antifreeze reduces the efficiency.

Heating water additives

Unsuitable heating water additives can cause damage to the heat source and heating system or cause a fault in the heat source or DHW supply.

The use of a heating water additive, e.g. corrosion inhibitor, is only allowed, if the manufacturer of the heating water additive certifies its suitability for all materials in the heating system.

- ▶ Only use heating water additives in accordance with the instructions of its manufacturer about concentration, regular checking of the concentration and corrective measures.

Sealants in the heating water can cause deposits in the heat generator, therefore it is not advisable to use it.

Suitable water treatment products (inhibitors/cleaners) can be obtained from the following manufacturers:

Follow the guidance of BS7593:2019[1)] for treatment of water in domestic hot water heating systems.

ADEY	01242 546700
	www.adey.com
FERNOX	0330 100 7750
	www.fernox.com
SENTINEL	01928 704330
	www.sentinelprotects.com/uk

Table 6

1) Only applicable in the United Kingdom

3.5 Minimum volume and execution of the heating system

To safeguard the heat pump function and avoid an excessive number of start/stop cycles, incomplete defrosting and unnecessary alarms, it must be possible to store a sufficient amount of energy in the system. This energy is stored in the water volume of the heating system, and also in the components of the system (radiators) and concrete floor (underfloor heating system).

Check the Installer instructions for the respective Indoor unit (IDU) for the conditions of the heating system.

4 Installation

NOTICE

Damage to the heat pump due to water!

Electrical connections and electronics can be damaged if they are exposed to water. The outer casing is a prerequisite for meeting the heat pump's IP rating.

- ▶ The heat pump must not be placed outdoors without its back panel, side panels, front plate and roof.
- ▶ Mount side panels without delay after the electric connections are done.
- ▶ The heat pump may not be operated without the outer casing.

CAUTION

Risk of injury!

During transport and installation there is a risk of crushing injury. During maintenance, internal parts of the appliance may become hot.

- ▶ The installer is obliged to wear gloves during transport, installation and maintenance.

CAUTION

Risc of injury!

For installation it is not necessary to remove the front panel. Access to the refrigerant circuit and electrical cabinet is possible from the side. In case there is a need to remove the front panel, be aware of moving parts. Serious injury to hand or fingers may occur.

- ▶ Keep hands away from moving parts.
- ▶ Disconnect power before servicing.

4.1 Checklist

Each installation is different. The checklist below provides a general description of the installation process.

1. Install, level and fix the heat pump on a solid surface. The drill template on the carton box can be used for this.
2. Remove the transport fitting (screw) for the compressor plate (→bild 31).
3. Pull out the loop of the drip tray heater and push it through the drain connector (→bild 25). Attach the drain connector to the heat pump.
4. Install a condensate tube from the heat pump and possibly a pipe trace heater (→accessory heating cable instructions).
5. Connect the pipes between the heat pump and the indoor unit.
6. Connect CAN-BUS cable to heat pump and indoor unit.
7. Connect power supply of the heat pump.

4.2 Mounting the heat pump

CAUTION

Risk of trapping or injury!

The heat pump may tilt if it is not fixed correctly.

- ▶ Fix the heat pump to the floor.

NOTICE

Risk of Installation problems if installed on sloping surface!

The condensate drainage and functionality will be impaired.

- ▶ Make sure that the inclination of the heat pump in the horizontal and vertical direction is no more than 1%.

- ▶ Use the drill template printed on the accessory carton box to position the bolts correctly.
- ▶ Adjust the height using the adjustable feet so that the heat pump does not tilt.
- ▶ Secure the heat pump to the ground using suitable screws.

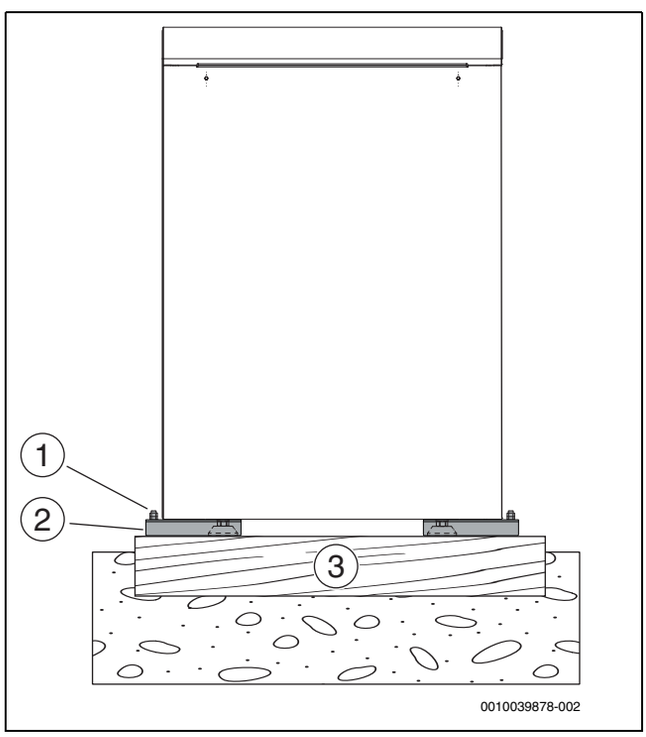

Fig. 17 Securing the heat pump

[1] 4 pieces M10 X 120 mm (not included)
[2] Ground brackets
[3] Flat and strong surface, e.g. concrete plinths

4.3 Installation on floor stand

The heat pump can be mounted on a floor stand if a higher ground clearence is needed. For information on how to assemble the floor stand see the accessory manual.

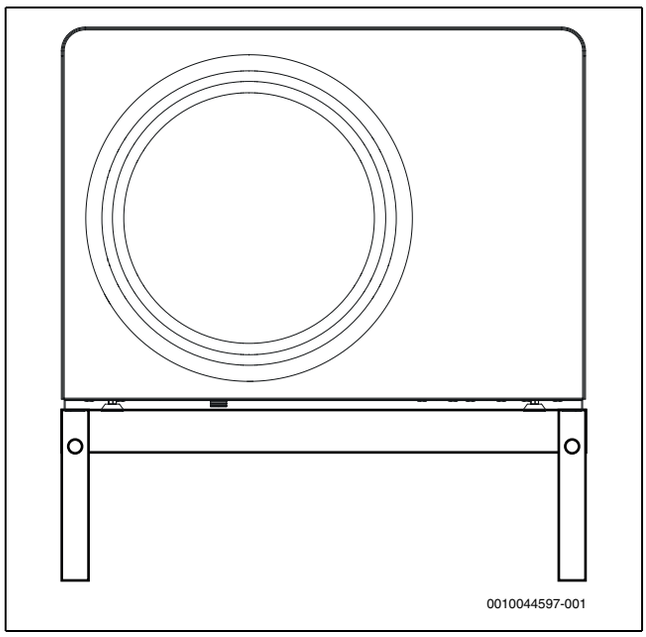

Fig. 18 Heat pump on floor stand

4.4 Installation with installation kit

The heat pump can be mounted with a pipe and insulation kit both for ground placement and wall mounted. For information on how to assemble the kit see the accessory manual.

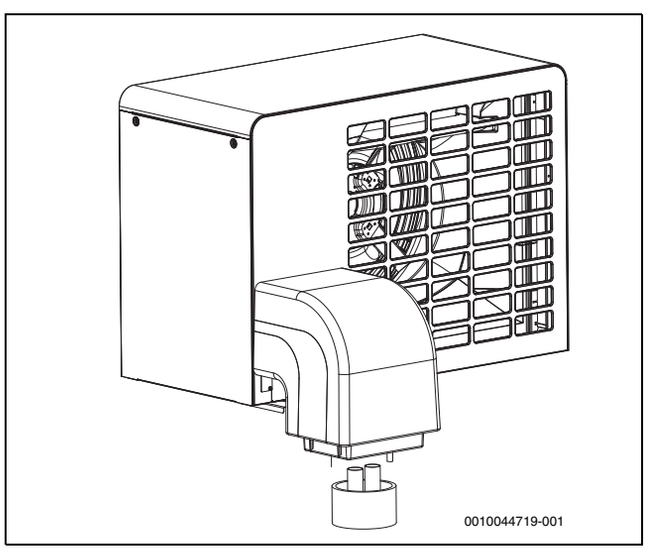

Fig. 19 Installations kit, ground mounted

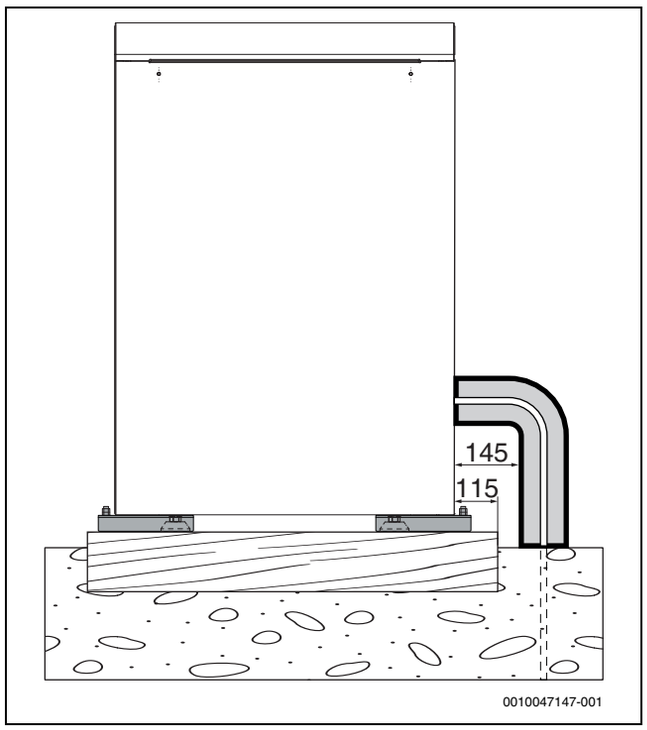

Fig. 20 Side view with installation kit

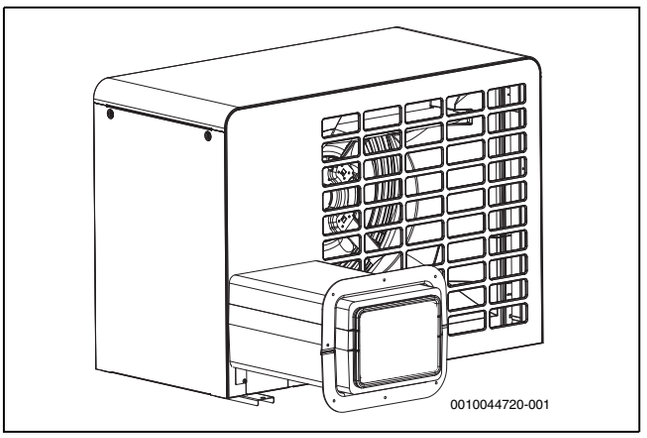

Fig. 21 Installation kit, wall hung

4.5 Assembly of wall mounted outdoor unit

CAUTION

Risk of personal injury!

The use of unsuitable fastening elements may result in personal injury.

- ▶ Use fastening elements suited for the wall material to mount the wall brackets.

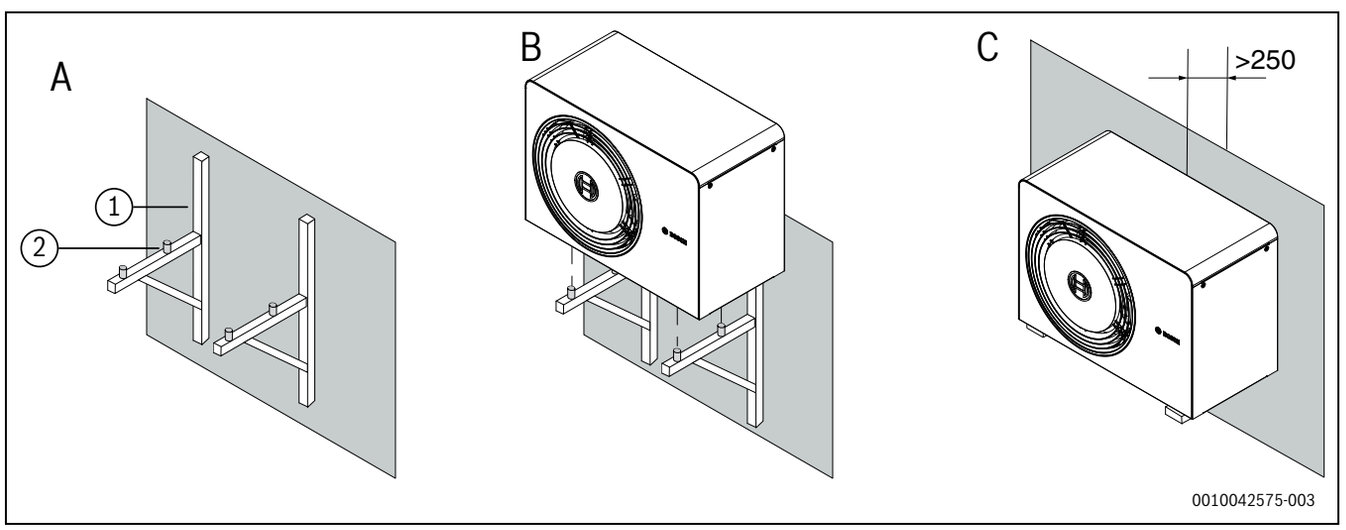

Fig. 22 Wall mounted outdoor unit (mm)

[1] Wall bracket (accessory)
[2] Dampers
[A] Screw the wall brackets to the wall (→accessory manual)
[B] Place the outdoor unit on the wall brackets and fix the dampers
[C] Position the outdoor unit with dampers in final place and screw the outdoor unit to the wall brackets

Make sure that the thickness of the wall is able to support the total load.

If the access to the outdoor unit is via a ladder, do not install the outdoor unit more than 3m from the ground level.

4.6 Foundation plan without floor stand

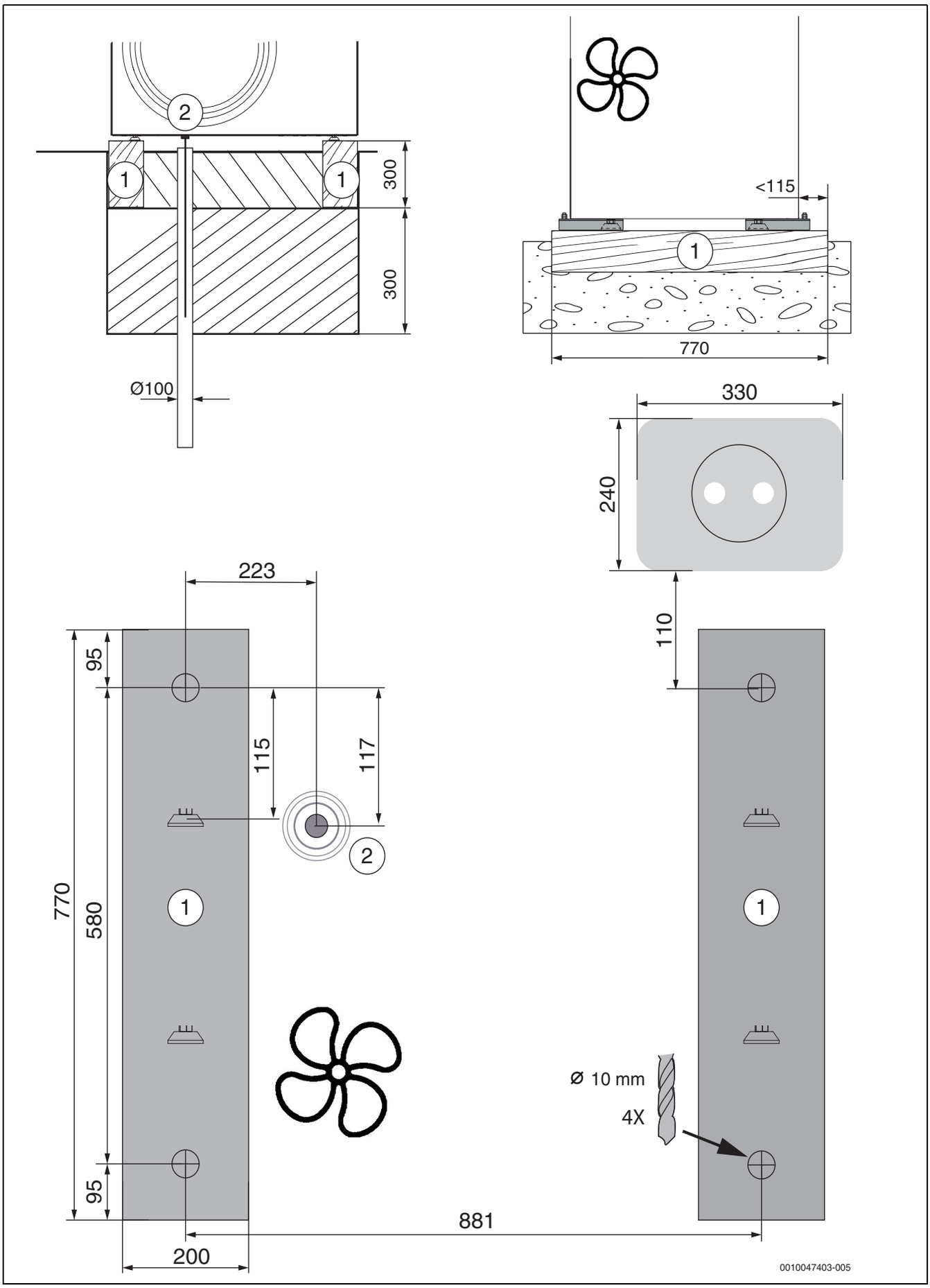

Fig. 23 Foundation plan, alternative 1

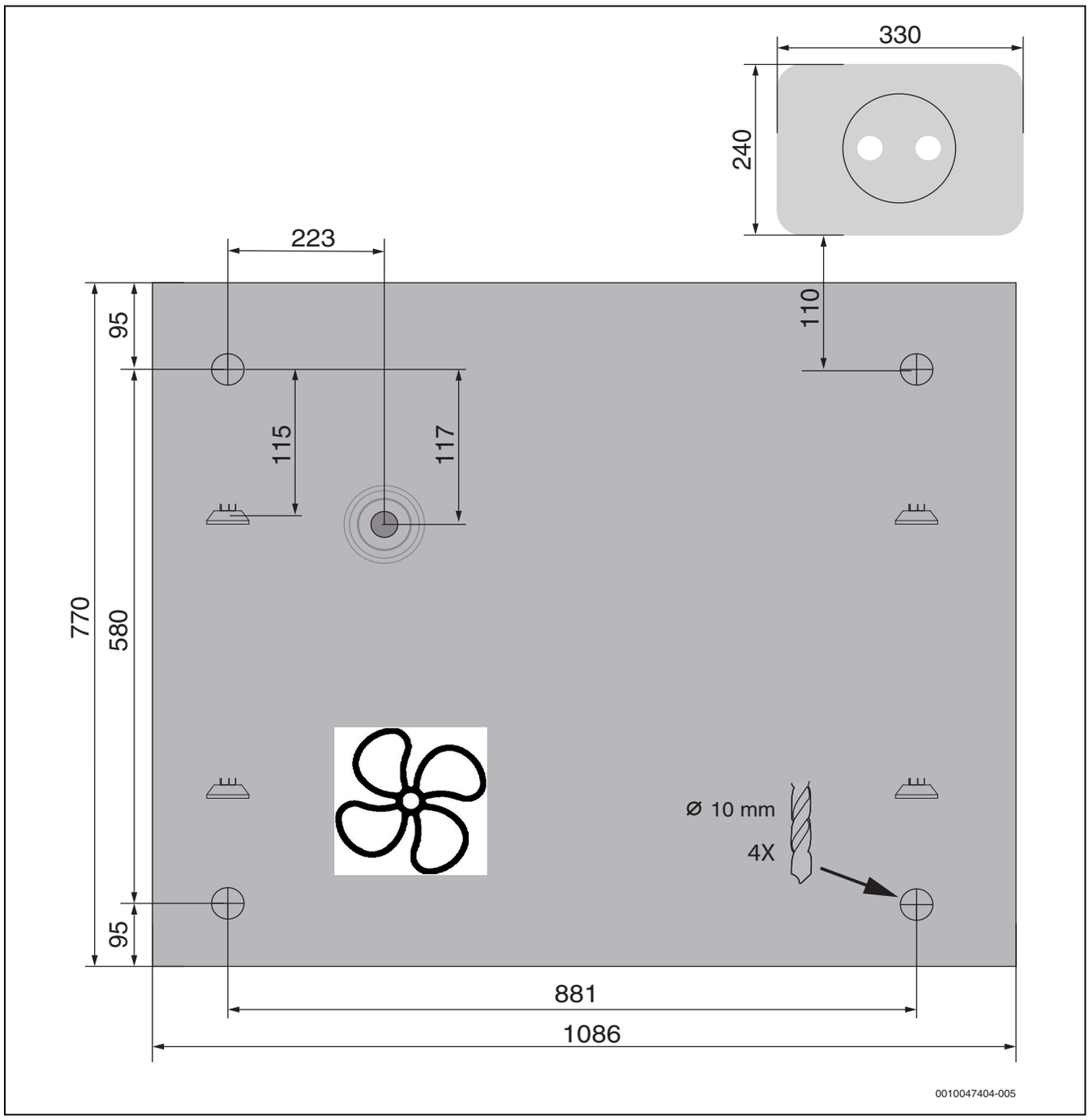

Fig. 24 Foundation plan, alternative 2

5 Hydraulic connections

5.1 Pipe connections, general

NOTICE

Residue in the pipework can damage the system.

Solids, metal/plastic filings, flux and thread tape residue and similar material can get stuck in pumps, valves and heat exchangers.

- ▶ Keep foreign bodies from entering the pipework.
- ▶ Do not leave pipe parts and connections directly on the ground.
- ▶ When deburring, make sure that no residue remains in the pipe.
- ▶ Before connecting the heat pump and indoor unit, rinse the pipe system to remove any foreign bodies.

NOTICE

Material damage due to frost and UV radiation!

In case of a power outage the water in the pipes may freeze.

The insulation may become brittle due to UV radiation and crack after some time.

- ▶ Use insulation with a thickness of at least 19 mm for pipework and connections outdoors.
- ▶ Install drain valves so that the water can be drained out of the lines to and from the heat pump if it is not going to be used for some time or if there is a risk of frost.
- ▶ Use UV and moisture-resistant insulation.

Insulation/gaskets.

- ▶ All heat-bearing lines must be fitted with suitable heat insulation in accordance with applicable standards.
- ▶ In cooling mode, all connections and lines must be insulated according to applicable standards to prevent condensation.
- ▶ Insulate the wall insertion.

Dimension the pipes according to the instructions (→installation instructions for the indoor unit).

- ▶ Avoid splicing the heat transfer pipes to minimise pressure drop.
- ▶ Use PEX pipes for all connections between the heat pump and indoor unit.
- ▶ Use only material (pipes and connections) from the same PEX distributor to avoid leakage.
- ▶ Pre-insulated AluPEX pipes are recommended since they make installation easier and prevent gaps in the insulation. PEX or AluPEX pipes also devibrate and insulate against noise transfer to the heating system.

If a different material than PEX is used, the following is required:

- ▶ Install a particulate filter intended for outdoor use on the heat pump return line, directly on the heat exchanger.
- ▶ Insulate the particle filter as other connections.
- ▶ Devibrate the heat pump connection with a hose intended for outside use and insulate it.

5.2 Drain for condensate

NOTICE

Damage due to risk of frost!

If the condensate freezes and cannot be routed away from the heat pump, the evaporator may be damaged.

- ▶ Always install pipe trace heating if ice is likely to form in the condensate hose.

The product contains the refrigerant R290. In the event of a leak, the refrigerant may end up in the ground via the condensate drain.

- ▶ Use a frost free siphon if the condensate pipe is connected to an existing outlet pipe / rain drainage.

Condensate must be routed away from the heat pump via a frost-free drain; the drain must slope sufficiently to prevent water from accumulating in the pipe.

The condensate can be drained into a gravel bed or culvert.

A loop of the drip tray heater cable can be pulled out approx. 50 cm and pushed into the drain pipe. This only applies if pipe trace heating is not used.

The drain pipe must have a larger diameter than the drain connector and not be fitted to each other.

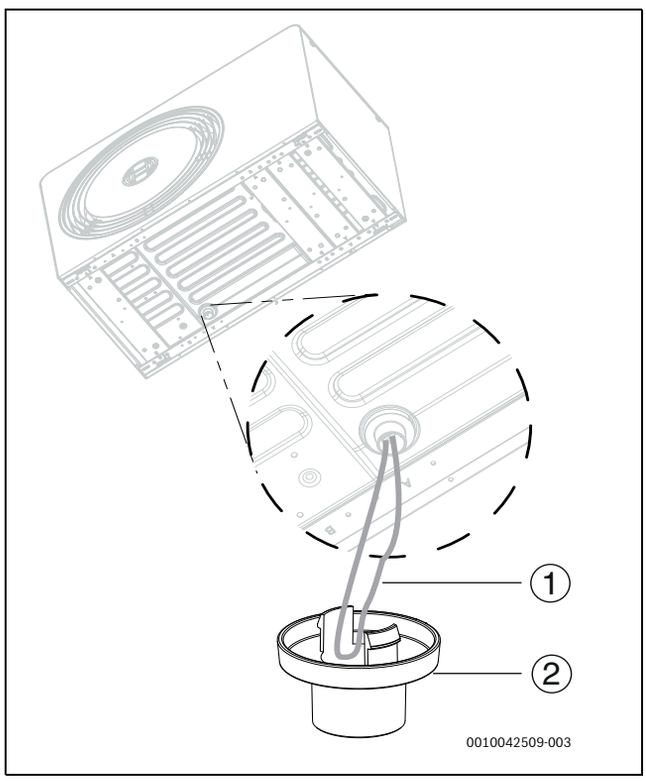

Fig. 25 Installation of drain connector

[1] Loop of drip tray heater cable
[2] Drain connector

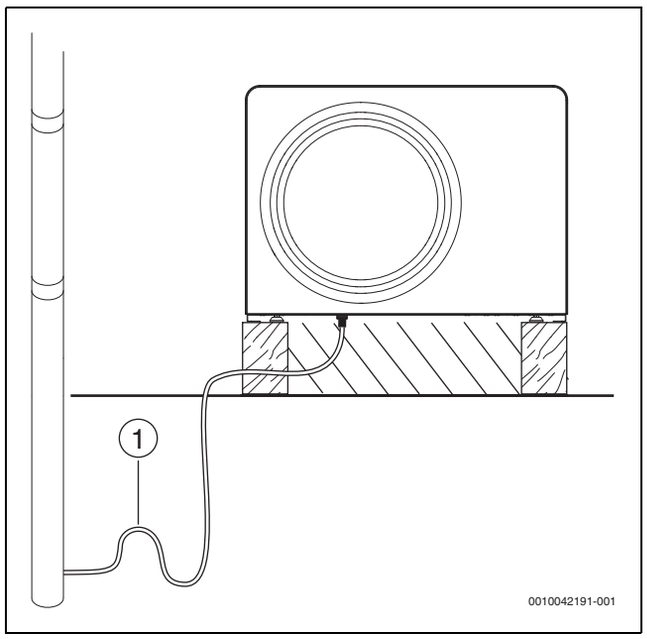

Fig. 26 Condensation drain in sewage / rain drainage

[1] Siphon

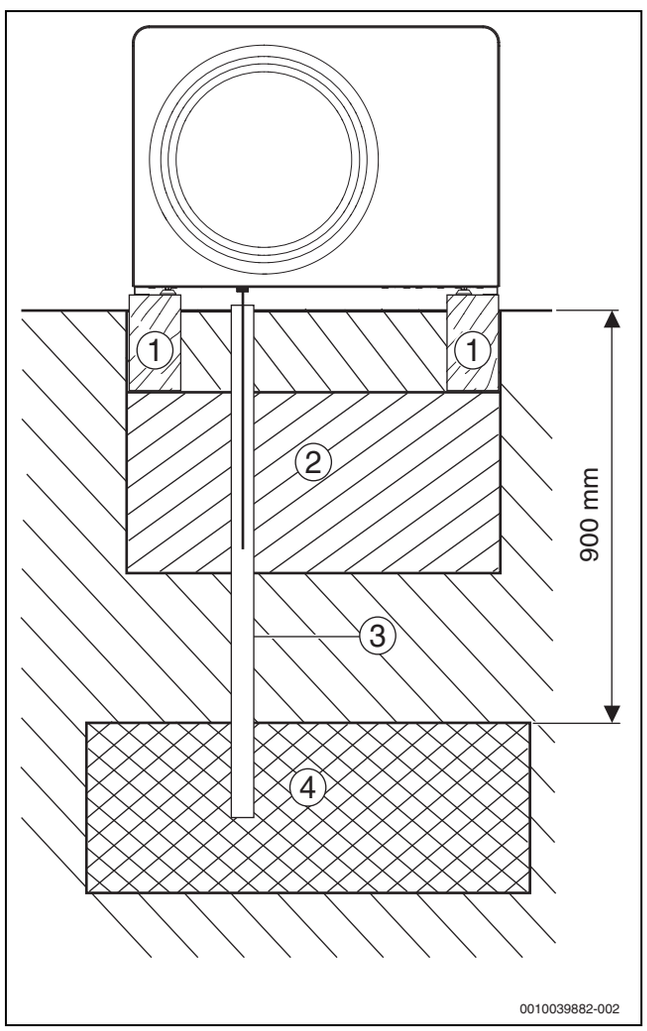

Fig. 27 Condensation drain in gravel bed

[1] Concrete plinths
[2] Shingle 300 mm
[3] Condensation water pipe Ø 100 mm
[4] Gravel bed

5.3 Connect the heat pump to the indoor unit

NOTICE

Material damage due to excessively high tightening torque!

If connections are tightened too tightly, the heat exchanger may be damaged.

- When installing the connections, the tightening torque should be no more than 150 Nm.

Short connections outside reduce heat loss. Pre-insulated pipes are recommended.

- Connect the flow line to the indoor unit to the heat transfer medium outlet (→ [1], Figure 28).
- Connect the return line from the indoor unit to the heat transfer medium inlet (→ [2], Figure 28).
- Tighten the heat transfer medium pipe connections with a 120 Nm torque. Use a second wrench to apply counter torque while tightening.
  If the connection does not seal properly, the connector can be torque-tightened to a maximum of 150 Nm. If the connection still does not seal properly, this is indicative of damage to a gasket or connecting pipes.

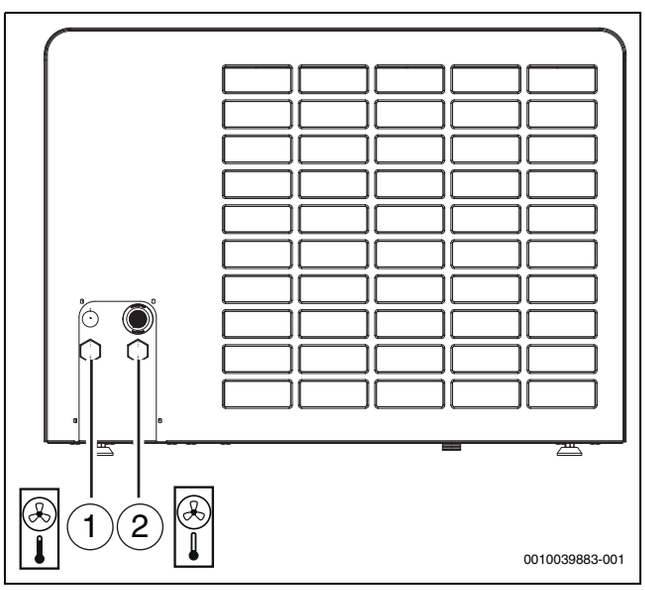

Fig. 28 Heat transfer medium pipe connections; description applies to all sizes

[1] Heat transfer medium outlet (to indoor unit) DN25
[2] Heat transfer medium inlet (from indoor unit) DN25

6 Side cover and transport fitting

▶ Remove the side cover.

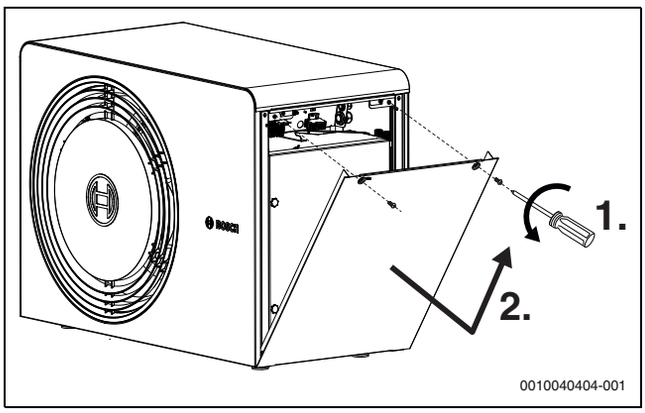

Fig. 29 Side cover

The heat pump is equipped with a transportation screw. The transportation screw prevents the heat pump from being damaged in transit.

▶ Open the refrigerant box.

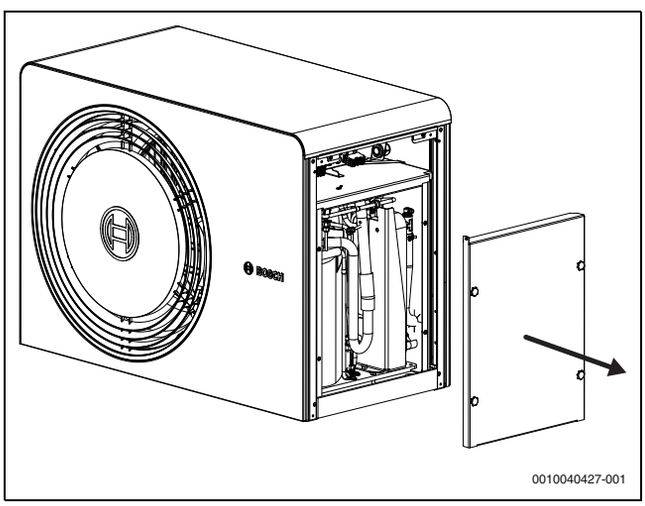

Fig. 30 Refrigerant box cover

▶ Unscrew the transport screw and remove it together with the marking strap.

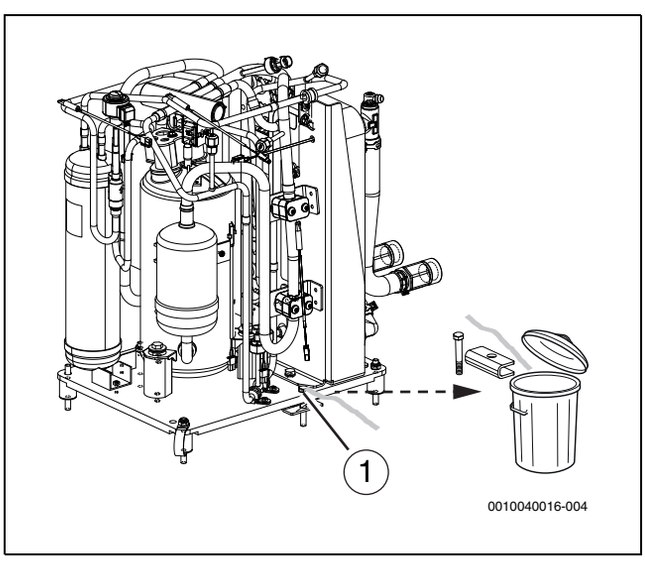

Fig. 31 Transportation screw

[1] Transportation screw, remove at installation

▶ Put back the cover for the refrigerant box.

7 Electrical connection

NOTICE

Malfunction due to faults!

High-voltage lines (230/400 V) in the vicinity of communication lines can cause the heat pump to malfunction.

▶ Route sensor cable and shielded CAN-BUS cable separately to power cables. Maintain a minimum distance of 100 mm. The BUS cable can be routed together with sensor cables.

The unit's electrical connection must be able to be disconnected safely.

▶ Install a separate safety switch that disconnects all power to the heat pump. The safety switch shall be an over voltage category III appliance.

▶ Select the appropriate conductor cross-sections and cable types for the respective fuse protection and routing method.

▶ Connect the heat pump according to the wiring diagram. No more users can be connected.

▶ Install a separate residual current device according to applicable standards in each country. As manufacturer, we recommend a Type B AC/DC sensitive residual current device to be used for the appliance due to an inverter in heat pump.

7.1 CAN-BUS

NOTICE

The system will be damaged if the 24VDC- and the CAN-BUS connections are incorrectly connected!

The communication circuits are not designed for 24VDC constant voltage.

▶ Check to ensure that the cables are connected to the contacts with the corresponding markings on the modules.

NOTICE

Malfunction due to mixed up connections!

If the “High” (H) and “Low” (L) connections are mixed up, there is no communication between the heat pump and the indoor unit.

▶ Check to ensure that the cables are connected to the connections with the corresponding markings in both ends of the CAN-BUS cable.

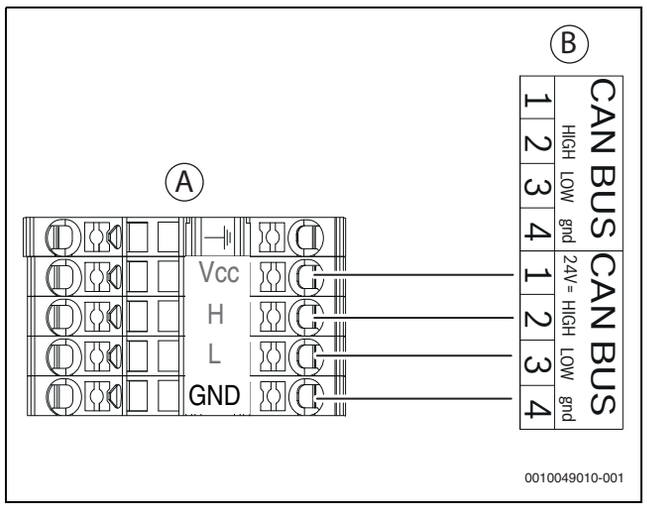

Fig. 32 CAN-BUS heat pump - indoor unit

[A] Heat pump
[B] Indoor unit
[Vcc] 24V= (24VDC)
[H] HIGH
[L] LOW
[GND] gnd

The heat pump and indoor unit are connected to each other by a communication line, the CAN-BUS [24VDC, class III (SELV)].

A LIYCY cable (TP) 2 x 2 x 0.75 (or equivalent) **is suitable as an extension cable outside of the unit.** Alternatively, twisted pair cables approved for outdoor use with a minimum cross-section of 0.75 mm^2 can be used.

The maximum permissible cable length is 30 m.

The connection is made with four wires, as the 24VDC supply is also connected. The 24VDC and CAN-BUS connections are marked on the module.

The CANBUS cable has two pairs of twisted wires. Vcc and GND is one pair, H and L is the second pair. Maximum cable insulation striping length for all cables is 120mm. Maximum wire striping is between 8-10mm.

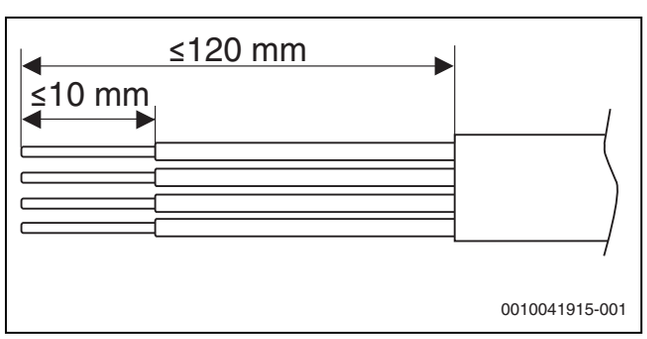

Fig. 33 Wire striping CAN-BUS

7.2 Connect the heat pump

Proper strain-relief of the electric cables must be ensured. Use cable-ties to fasten the cables on the back plate of the electric box.

- Route the connection cables through the cable ducts.
  - Remove the rubber grommet from the outdoor unit for the respective cable.
  - Pierce the rubber grommet and place it on the cable.
  - Feed the cable through the cable channel so that a sufficient part of it comes through.
  - Remount the rubber grommet in the hole on the outdoor unit.
- Connect the cables according to the wiring diagram.
- Tighten the cable-ties firmly.
- Reattach the side cover.

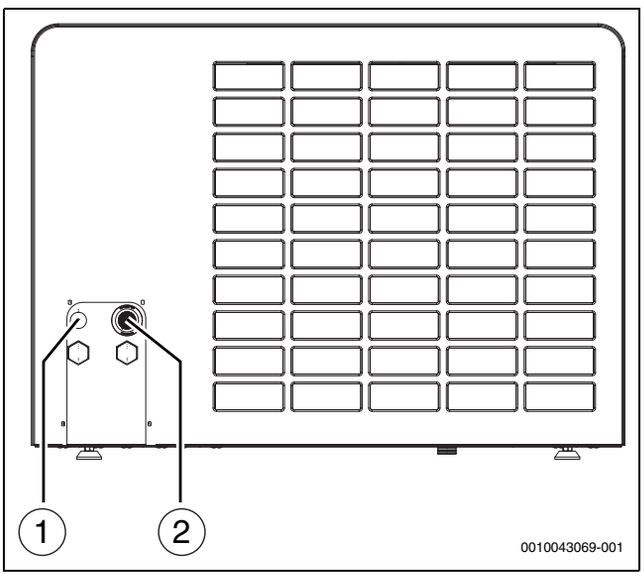

Fig. 34 Cable channels

[1] CAN-BUS
[2] Mains feed

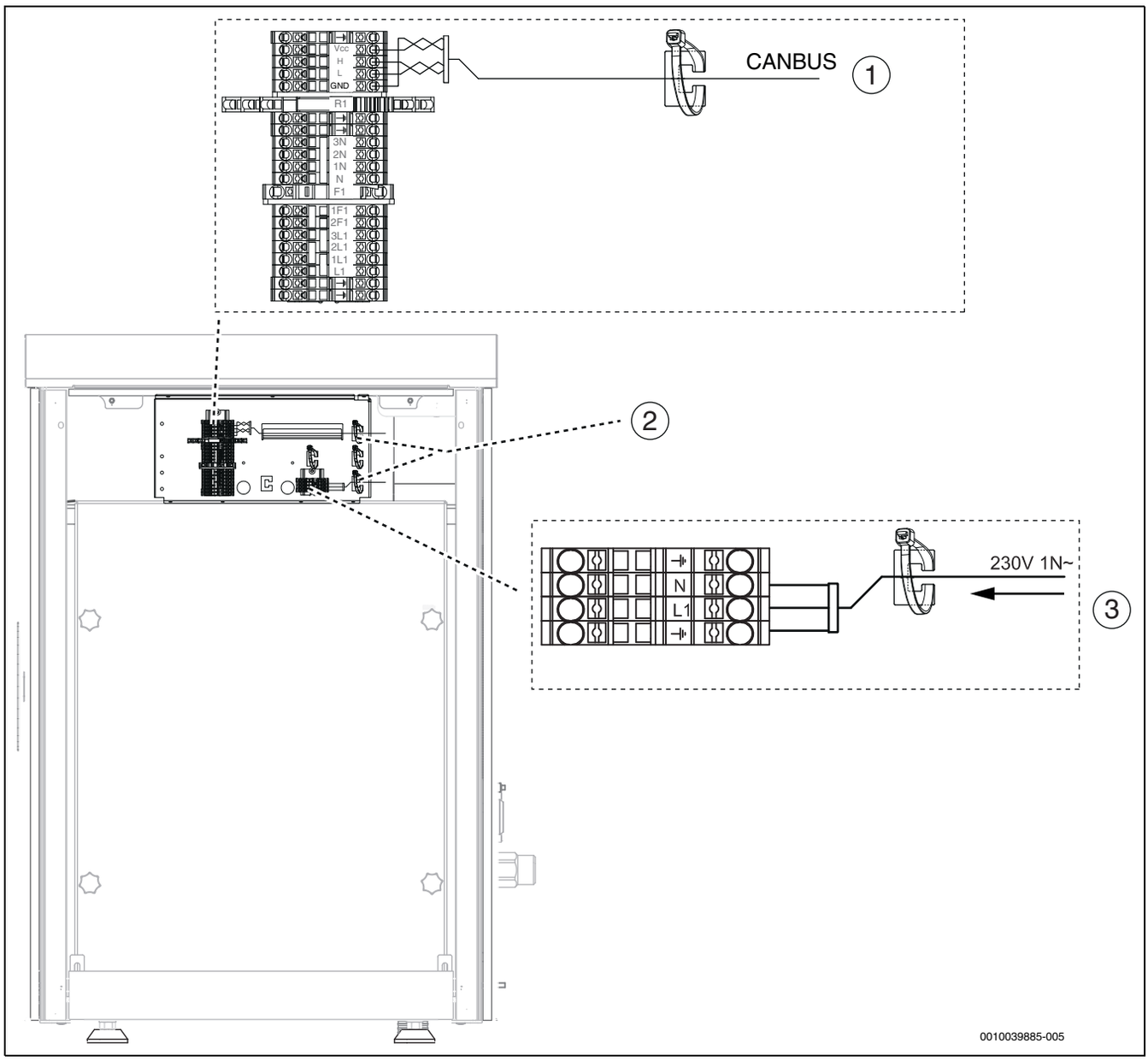

Fig. 35 Electrical box

[1] CAN-BUS connection
[2] Cable ties for the cables
[3] Mains feed connection

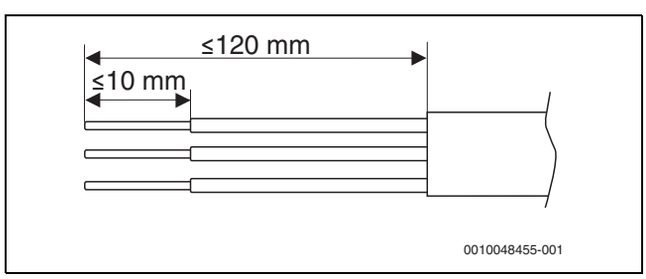

Fig. 36 Wire striping mains feed connection

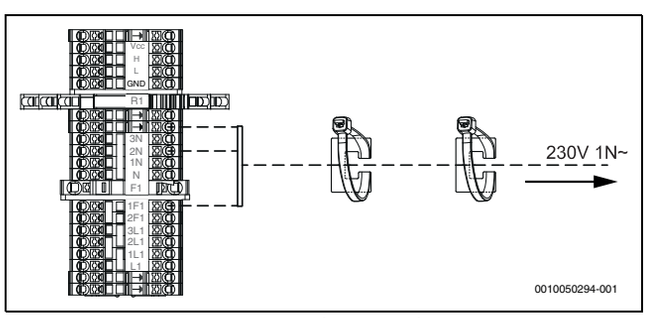

Fig. 37 Heating cable connection (accessory)

8 Maintenance

DANGER

Danger to life due to fire!

The product contains the flammable refrigerant R290. If a leak occurs, the refrigerant may form a combustible gas due to mixing with air. There is a risk of fire and explosion.

- ▶ Only personnel with special training for refrigerant R290 may perform work on the refrigerant circuit.
- ▶ Wear personal protective equipment.
- ▶ Have access to a fire extinguisher.
- ▶ Check that tools and equipment are faultless and approved for refrigerant R290.

DANGER

Electrical shock!

The heat pump contains current-carrying components and the heat pump capacitor must be discharged once the power supply has been disconnected.

- ▶ Isolate the system from the supply.
- ▶ Wait at least five minutes before carrying out electrical work.

NOTICE

Malfunction due to damage!

The electronic expansion valves are highly sensitive to impacts.

- ▶ Always protect the expansion valve from impacts and shock.

NOTICE

Deformation due to heat!

If the temperature is too high, the insulation material (EPP) in the heat pump deforms.

- ▶ Remove as much insulation (EPP) as possible before carrying out soldering work.
- ▶ When carrying out soldering work in the heat pump, protect the insulation material with heat-resistant materials or a moist cloth.

- ▶ Use only original spare parts!
- ▶ Order spare parts using the spare parts list.
- ▶ Remove and replace old seals and O-rings with new ones.

During service, the activities described below should be performed.

Show activated alarms

- ▶ Check the alarm log (→ control unit manual).

Function check

- ▶ Perform function check (→ indoor unit manual).

Power cable routing

- ▶ Check whether the electrical cable has mechanical damage.
- ▶ Replace damaged cables.

Evacuate refrigerant

- ▶ This action may only be carried out by trained personnel with knowledge of the properties of and risks associated with the refrigerant R290.
- ▶ Wear personal protective equipment and have a fire extinguisher to hand.
- ▶ Only use tools and equipment approved for refrigerant R290.
- ▶ Follow the safety instructions [6721836841] on how the refrigerant is to be evacuated from the product.
- ▶ Recycle the refrigerant according to applicable regulations.

8.1 Cleaning of the drip tray

Use a brush and a cloth with a mild detergent when cleaning. Do not use a water hose.

1. Take off the left side cover.
2. Unscrew the screw holding the EPP parts together.

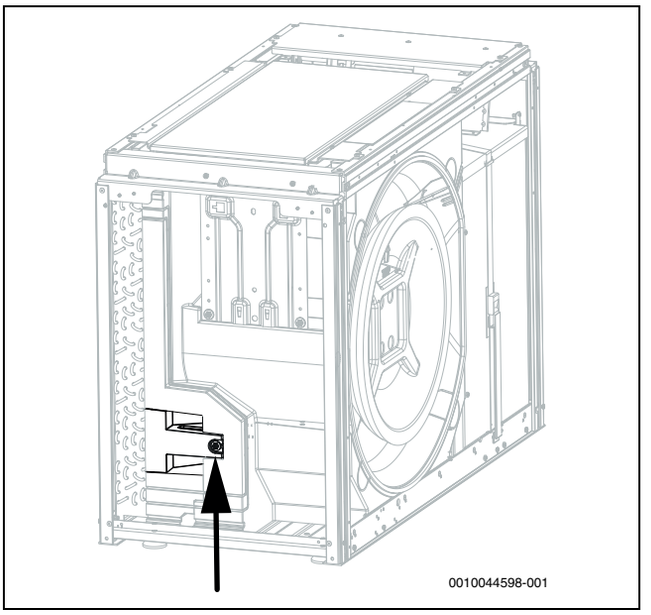

Fig. 38 Unscrew

3. Take out the two EPP parts.

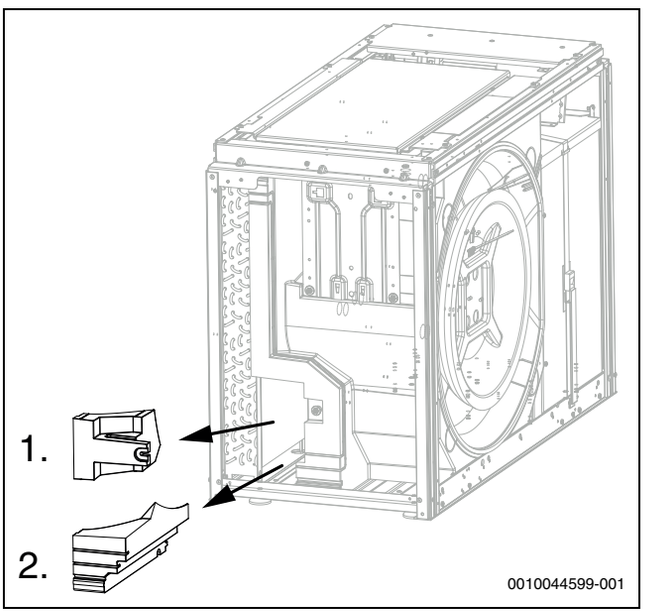

Fig. 39 EPP parts

4. Clean the drip tray.

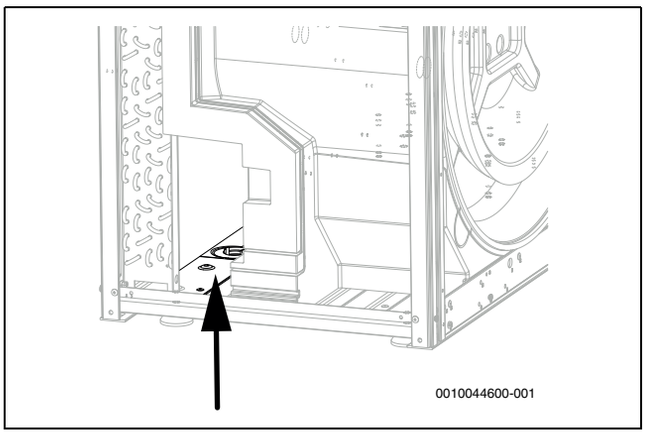

Fig. 40 Clean the tray

5. Remount the EPP parts with the screw.
6. Remount the side cover.

9 Environmental protection and disposal

Environmental protection is a fundamental corporate strategy of the Bosch Group.
The quality of our products, their economy and environmental safety are all of equal importance to us and all environmental protection legislation and regulations are strictly observed.
We use the best possible technology and materials for protecting the environment taking account of economic considerations.

Packaging

Where packaging is concerned, we participate in country-specific recycling processes that ensure optimum recycling.

All of our packaging materials are environmentally compatible and can be recycled.

Used appliances

Used appliances contain valuable materials that can be recycled.
The various assemblies can be easily dismantled. Synthetic materials are marked accordingly. Assemblies can therefore be sorted by composition and passed on for recycling or disposal.

Old electrical and electronic appliances

This symbol means that the product must not be disposed of with other waste, and instead must be taken to the waste collection points for treatment, collection, recycling and disposal.

The symbol is valid in countries where waste electrical and electronic equipment regulations apply, e.g. "(UK) Waste Electrical and Electronic Equipment Regulations 2013 (as amended)". These regulations define the framework for the return and recycling of old electronic appliances that apply in each country.

As electronic devices may contain hazardous substances, it needs to be recycled responsibly in order to minimize any potential harm to the environment and human health. Furthermore, recycling of electronic scrap helps preserve natural resources.

For additional information on the environmentally compatible disposal of old electrical and electronic appliances, please contact the relevant local authorities, your household waste disposal service or the retailer where you purchased the product.

You can find more information here:
www.weee.bosch-thermotechnology.com/

Batteries

Batteries must not be disposed together with your household waste.
Used batteries must be disposed of in local collection systems.

10 Technical information and reports

10.1 Specifications – heat pump

	Unit	4 OR-S	5 OR-S	7 OR-S
Rating according to EN 14511				
Max. power output at A -10/W35	kW	3,63	5,45	5,86
COP at A -10/W35		2,70	2,59	2,23
Max. power output at A -7/W35	kW	3,92	5,42	6,71
COP at A -7/W35		2,89	2,51	2,36
Max. power output at A+2/W35	kW	4,31	6,43	7,09
COP at A+2/W35		3,21	2,91	2,83
Modulation range at A+2/W35	kW	1,8 - 4,3	1,8 - 6,4	1,8 - 7,1
Max. power output at A+7/W35	kW	4,99	6,80	7,97
COP at A+7/W35		3,59	3,16	3,07
Power output at A+7/W35 nominal	kW	2,84	2,84	2,84
COP at A+7/W35 nominal		4,85	4,85	4,85
Power output at A+2/W35 nominal	kW	2,09	2,41	2,87
COP at A+2/W35 nominal		3,94	3,92	4,06
Max. power output at A+7/W55	kW	4,53	6,18	7,45
COP at A+7/W55		2,42	2,28	2,64
SCOP average climate W55		3,32	3,50	3,52
SCOP average climate W35		4,58	4,65	4,58
SCOP cold climate W55		2,76	3,17	3,01
SCOP cold climate W35		3,93	4,25	4,13
SCOP warm climate W55		3,66	4,00	4,09
SCOP warm climate W35		5,33	5,56	5,25

	Unit	4 OR-S	5 OR-S	7 OR-S
Max. cooling capacity at A35/W7	kW	3,03	3,67	3,88
EER at A35/W7		2,56	2,49	2,44
Max. cooling capacity at A35/W18	kW	4,36	5,25	5,50
EER at A35/W18		3,37	3,20	3,11
Cooling capacity at A35/W18, nominal	kW	2,93	3,47	3,82
EER at A35/W18, nominal		3,74	3,74	3,70
Electrical details				
Power supply		230V 1N AC 50Hz	230V 1N AC 50Hz	230V 1N AC 50Hz
Protection index		IPX4D	IPX4D	IPX4D
Fuse size[1)]	A	16	16	16
Maximum power consumption A+2/W35	kW	1,34	2,21	2,51
Maximum power consumption A35/W7	kW	1,18	1,47	1,54
Maximum power consumption A35/W18	kW	1,29	1,64	1,77
Performance factor cos phi with maximum output		>0,99	>0,99	>0,99
Max. number of compressor starts		6	6	6
Max. current	A	7,5	12	13,1
Starting current	A	7,5	12	13,1
Air and noise generation[2)]				
Maximum air flow	m^3/h	1160	1320	1670
Nominal air flow	m^3/h	1160	1320	1670
Sound pressure level at a distance of 1 m[3)]	dB(A)	32	34	34
Sound power (ErP)[4)]	dB(A)	40	42	42
Max. sound power - day	dB(A)	51,2	53	57,7
Max. sound power - Low-noise operation 1, A7/W55	dB(A)	46	50	50
COP - Low-noise operation 1, A-7/W35		3,02	2,64	2,62
Power output - Low-noise operation 1, A-7/W35	kW	2,61	4,20	4,40
Max. sound power - Low-noise operation 2, A7/W55	dB(A)	43	48	48
COP - Low-noise operation 2, A-7/W35		2,92	2,66	2,70
Power output - Low-noise operation 2, A-7/W35	kW	2,34	3,53	3,83
Max. sound power - Low-noise operation 3, A7/W55	dB(A)	43	46	46
COP - Low-noise operation 3, A-7/W35		2,97	3,06	3,12
Power output - Low-noise operation 3, A-7/W35	kW	2,20	3,22	3,39
Max. sound power - Low-noise operation 4, A7/W55	dB(A)	40,5	41,6	43,8
COP - Low-noise operation 4, A-7/W35		2,89	2,91	3,15
Power output - Low-noise operation 4, A-7/W35	kW	1,98	2,32	2,64
Tonality addition - day[5)]	dB	0	0	0
Tonality addition - Low-noise operation 3[5)]	dB	0	0	0
General details				
Refrigerant[6)]		R290	R290	R290
Refrigerant charge	kg	0,95	0,95	0,95
CO_2(e)	ton	0,003	0,003	0,003
Maximum temperature of flow, heat pump only	°C	75	75	75
Installation altitude above sea level		Up to 2000 m above sea level		
Dimensions (W x H x D)	mm	1100x800x540	1100x800x540	1100x800x540
Weight	kg	143	143	143

1) Fuse class gL/C

2) Low-noise operation 1 - 4 is selected on the system controller

3) EU No 811/2013

4) Sound power level in accordance with EN 12102 (Nominal A7/W55), tolerance +/- 2dB

5) DIS47315/150257, April 2004 and following requirements of TA Lärm

6) GWP100 = 3

Table 7 Technical data single phase heat pump

Detailed sound pressure level (Max) 4 OR-S													
	Clearance	m	1	2	3	4	5	6	8	10	12	14	16
Day	>3 m[1)]	dB (A)	42	36	33	30	28	26	24	22	20	19	18
	<3 m[2)]	dB (A)	45	39	36	33	31	29	27	25	23	22	21
Night	>3 m[1)]	dB (A)	38	32	29	26	24	22	20	18	16	15	14
Silent mode 1	<3 m[2)]	dB (A)	41	35	32	29	27	25	23	21	19	18	17
Night	>3 m[1)]	dB (A)	35	29	26	23	21	19	17	15	13	12	11
Silent mode 2	<3 m[2)]	dB (A)	38	32	29	26	24	22	20	18	16	15	14
Night	>3 m[1)]	dB (A)	34	28	25	22	20	18	16	14	12	11	10
Silent mode 3	<3 m[2)]	dB (A)	37	31	28	25	23	21	19	17	15	14	13
Night	>3 m[1)]	dB (A)	32	26	23	20	18	16	14	12	10	9	8
Silent mode 4	<3 m[2)]	dB (A)	35	29	26	23	21	19	17	15	13	12	11

1) Heat pump more than 3 m from the wall

2) Heat pump closer than 3 m to the wall

Table 8 Detailed sound pressure level, heat pump

Detailed sound pressure level (Max) 5 OR-S													
	Clearance	m	1	2	3	4	5	6	8	10	12	14	16
Day	>3 m[1)]	dB (A)	45	39	36	33	31	29	27	25	23	22	21
	<3 m[2)]	dB (A)	48	42	39	36	34	32	30	28	26	25	24
Night	>3 m[1)]	dB (A)	42	36	33	30	28	26	24	22	20	19	18
Silent mode 1	<3 m[2)]	dB (A)	45	39	36	33	31	29	27	25	23	22	21
Night	>3 m[1)]	dB (A)	40	34	31	28	26	24	22	20	18	17	16
Silent mode 2	<3 m[2)]	dB (A)	43	37	34	31	29	27	25	23	21	20	19
Night	>3 m[1)]	dB (A)	38	32	29	26	24	22	20	18	16	15	14
Silent mode 3	<3 m[2)]	dB (A)	41	35	32	29	27	25	23	21	19	18	17
Night	>3 m[1)]	dB (A)	34	28	25	22	20	18	16	14	12	11	10
Silent mode 4	<3 m[2)]	dB (A)	37	31	28	25	23	21	19	17	15	14	13

1) Heat pump more than 3 m from the wall

2) Heat pump closer than 3 m to the wall

Table 9 Detailed sound pressure level, heat pump

Detailed sound pressure level (Max) 7 OR-S													
	Clearance	m	1	2	3	4	5	6	8	10	12	14	16
Day	>3 m[1)]	dB (A)	50	44	41	38	36	34	32	30	28	27	26
	<3 m[2)]	dB (A)	53	47	44	41	39	37	35	33	31	30	29
Night	>3 m[1)]	dB (A)	42	36	33	30	28	26	24	22	20	19	18
Silent mode 1	<3 m[2)]	dB (A)	45	39	36	33	31	29	27	25	23	22	21
Night	>3 m[1)]	dB (A)	40	34	31	28	26	24	22	20	18	17	16
Silent mode 2	<3 m[2)]	dB (A)	43	37	34	31	29	27	25	23	21	20	19
Night	>3 m[1)]	dB (A)	38	32	29	26	24	22	20	18	16	15	14
Silent mode 3	<3 m[2)]	dB (A)	41	35	32	29	27	25	23	21	19	18	17
Night	>3 m[1)]	dB (A)	36	30	27	24	22	20	18	16	14	13	12
Silent mode 4	<3 m[2)]	dB (A)	39	33	30	27	25	23	21	19	17	16	15

1) Heat pump more than 3 m from the wall

2) Heat pump closer than 3 m to the wall

Table 10 Detailed sound pressure level, heat pump

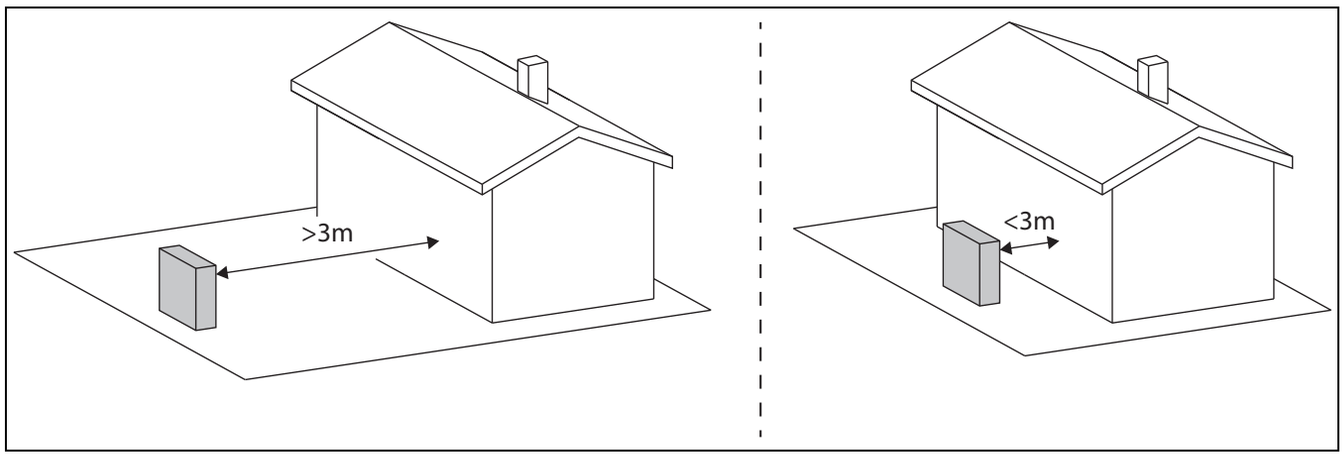

Fig. 41 Distance to wall

10.2 Range for heat pump without booster heater

In heating mode the heat pump switches off at approx. – 23 °C or +45 °C outdoor temperature. The indoor unit or an external heat source then takes over the heating and domestic hot water production. The heat pump restarts if the outdoor temperature exceeds roughly – 17 °C or falls below +42 °C.
In cooling mode, the heat pump switches off at roughly +45 °C and restarts at roughly +42 °C.

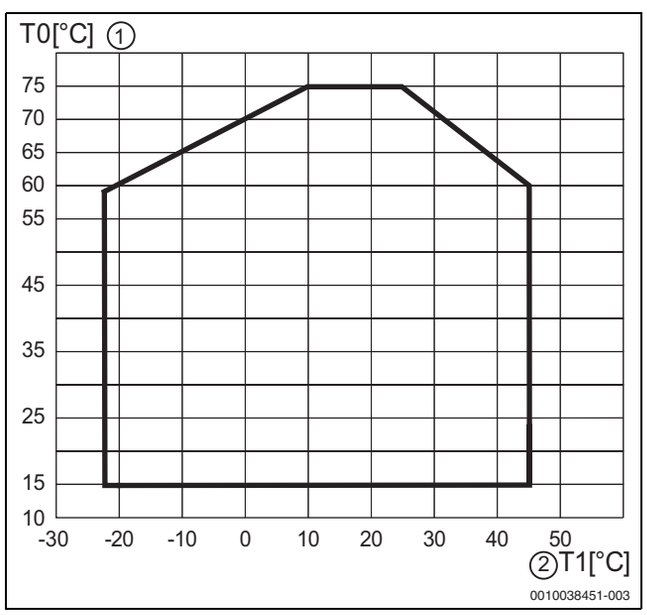

Fig. 42 Heat pump in heating mode without booster heater

[1] Flow temperature (T0)
[2] Outdoor temperature (T1)

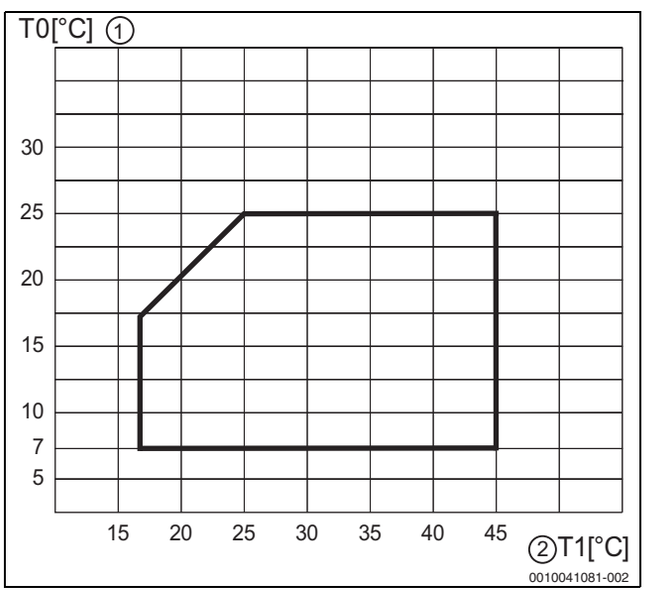

Fig. 43 Heat pump in cooling mode

[1] Flow temperature (T0)
[2] Outdoor temperature (T1)

10.3 Refrigerant circuit

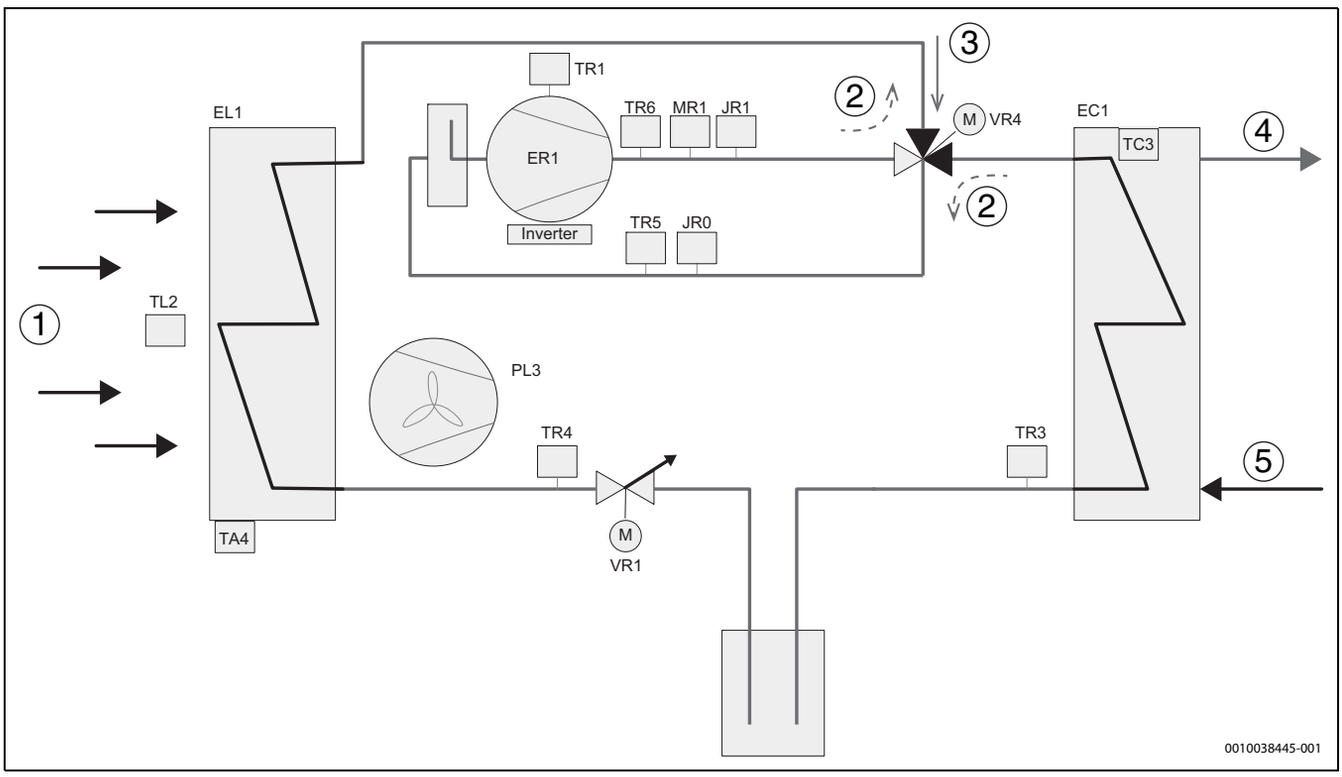

Fig. 44 Refrigerant circuit

[1] Air flow
[2] Refrigerant flow, defrosting and cooling mode
[3] Refrigerant flow, heating mode
[4] To indoor unit (IDU)
[5] From indoor unit (IDU)
[EC1] Heat exchanger (condenser)
[EL1] Evaporator
[ER1] Compressor
[JR0] Low pressure sensor
[JR1] High pressure sensor
[MR1] High pressure switch
[PL3] Fan
[TA4] Temperature sensor collection tray
[TC3] Temperature sensor heat transfer medium out
[TL2] Temperature sensor air intake
[TR1] Temperature sensor compressor
[TR3] Temperature sensor condenser return (fluid) heating mode
[TR4] Temperature sensor evaporator return (fluid) cooling mode
[TR5] Temperature sensor suction gas
[TR6] Temperature sensor hot gas
[VR1] Electronic expansion valve
[VR4] 4-way valve

10.4 Wiring diagram

10.4.1 Circuit diagram

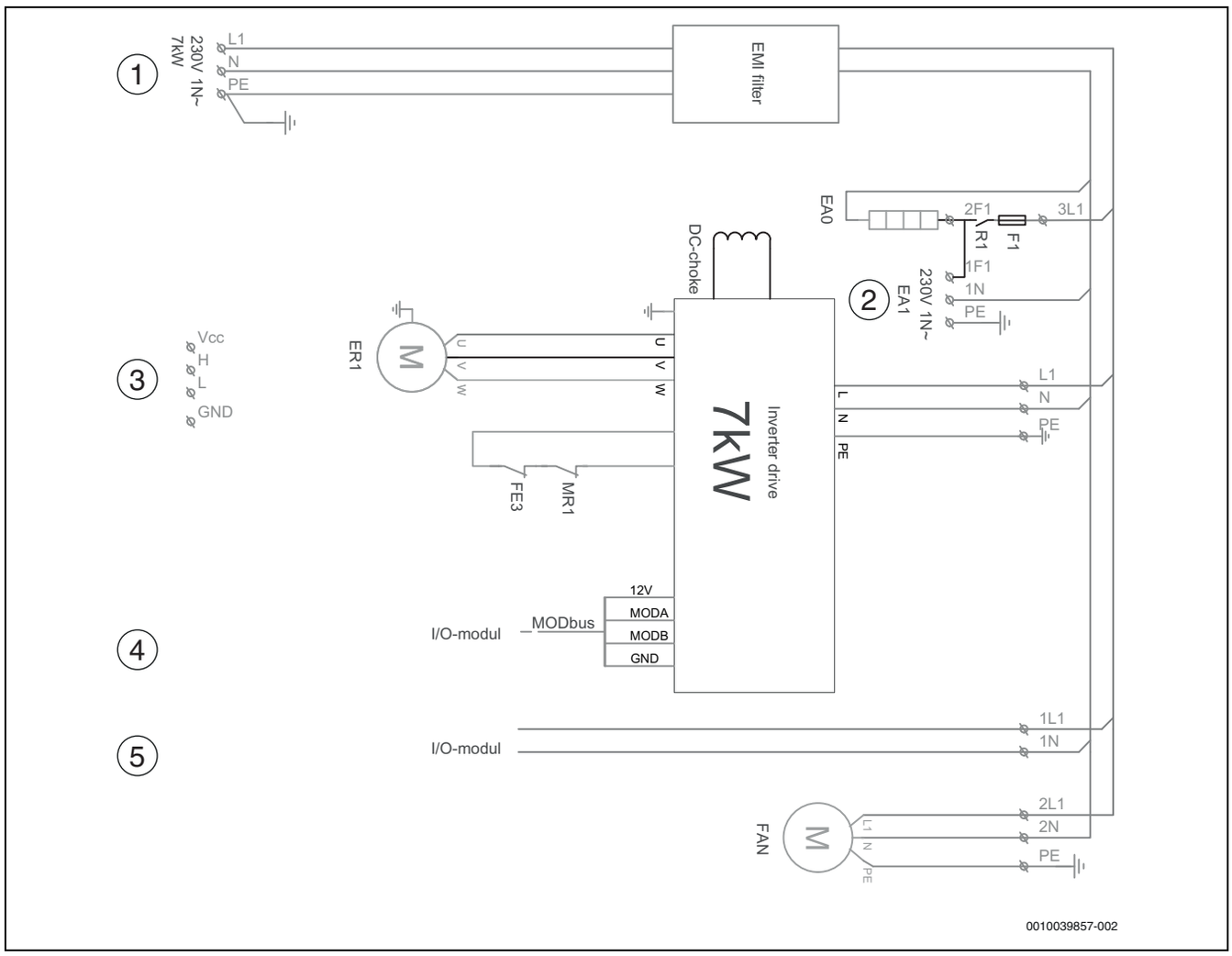

Fig. 45 Circuit diagram inverter

[EA0] Drip tray heater
[EA1] Heating cable (accessory)
[ER1] Compressor
[MR1] High pressure switch
[F1] Fuse 2A
[FE3] Temperature switch
[R1] Relay for drip tray heater and heating cable
[1] Power supply 230 V 1N~
[2] Power supply to heating cable
[3] CANBUS from IDU
[4] Modbus from I/O module XCU-SRH (XCU-HP)
[5] Power supply to I/O-module XCU-SRH (XCU-HP) 230V 1N~

10.4.2 Circuit diagram XCU-SRH (XCU-HP)

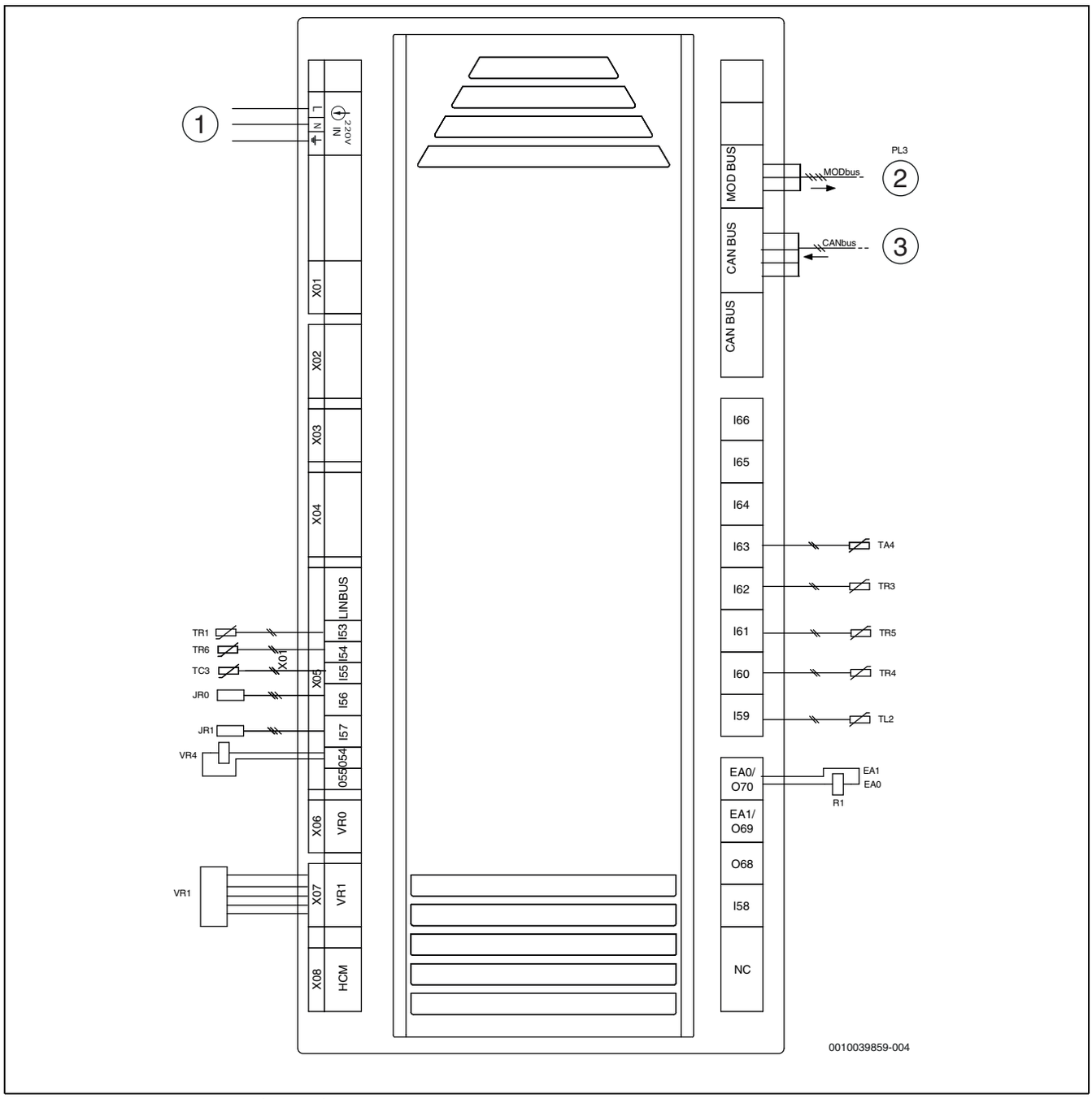

Fig. 46 Circuit diagram XCU-SRH (XCU-HP)

[JR0] Low pressure sensor
[JR1] High pressure sensor
[TA4] Drip tray temperature sensor
[TC3] Heat transfer medium temperature sensor flow
[TL2] Air inlet temperature sensor
[TR3] Condenser temperature sensor return (liquid pipe in heating mode)
[TR4] Liquid pipe in cooling mode
[TR5] Suction gas temperature sensor
[TR6] Temperature sensor, discharge hot gas
[VR1] Electronic expansion valve
[EA0] Drip tray heater
[EA1] Heating cable (accessory)
[PL3] Fan
[VR4] 4-way valve
[R1] Relay that controls EA0 and EA1
[1] Power supply, ~230 V
[2] Modbus to Inverter and fan
[3] CAN-BUS from IDU

10.4.3 Measurements for temperature sensor

°C	Ωr..	°C	Ωr...	°C	Ωr...
– 40	162100	10	9352	60	1169
– 35	116600	15	7384	65	979
– 30	92510	20	5870	70	823
– 25	62370	25	4699	75	695
– 20	45608	30	3786	80	590
– 15	34275	35	3068	85	503
– 10	25994	40	2503	90	430
– 5	19888	45	2053	95	370
± 0	15344	50	1693	100	320
5	11934	55	1403	105	278

Table 11 Sensor TA4, TL2, TR5

°C	Ω	°C	Ω	°C	Ω
– 40	344500	10	19901	60	2488
– 35	247300	15	15712	65	2083
– 30	179700	20	12492	70	1752
– 25	132000	25	9999	75	1480
– 20	97050	30	8055	80	1255
– 15	72933	35	6529	85	1070
– 10	55313	40	5329	90	915
– 5	42320	45	4370	95	787
± 0	32651	50	3603	100	680
5	25393	55	2986	105	592

Table 12 Sensor TC3, TR4, TR3

°C	Ω	°C	Ω	°C	Ω	°C	Ω
– 10	–	25	20000	60	4976	95	1574
– 5	–	30	16112	65	4166	100	1360
± 0	65308	35	13060	70	3504	105	1184
5	50792	40	10654	75	2960	110	1034
10	39806	45	8740	80	2510	115	900
15	31428	50	7206	85	2140	120	780
20	24986	55	5972	90	1830	125	680

Table 13 Sensor TR1, TR6

Benchmark Commissioning & Warranty Validation Service Record

It is a requirement that the heat pump is installed and commissioned to the manufacturers' instructions and the data fields on the commissioning checklist completed in full.

To instigate the warranty the heat pump needs to be registered with the manufacturer within one month of the installation. The warranty rests with the end-user (consumer), and they should be made aware it is ultimately their responsibility to register with the manufacturer, within the allotted time period.

It is essential that the heat pump is serviced in line with the manufacturers' recommendations, at least annually. This must be carried out by a competent, certified operative. The service details should be recorded on the Benchmark Service and Interim Heat Pump Work Record and left with the householder. Failure to comply with the manufacturers' servicing instructions and requirements will invalidate the warranty.

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This Commissioning Checklist is to be completed in full by the competent person who commissioned the heat pump and associated equipment as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission according to the manufacturers' instructions and complete this Benchmark Commissioning Checklist will invalidate the warranty. This does not affect the customer's statutory rights.

* All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

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AIR TO WATER HEAT PUMP COMMISSIONING CHECKLIST

Address:			
Heat Pump make and model:			
Heat Pump serial number:			
Commissioned by (PRINT NAME):		Certified Operative Reg number (1):	
Company name:		Telephone number:	
Company email:		Company address:	
		Commissioning date:	
Heating and hot water system complies with the appropriate Building Regulations?			Yes
DNO notification?			Yes
Building Regulations Notification Number (if applicable) (2)			
MCS installer registration Number (if applicable)		MCS product certification number (if applicable)	
F-gas certification number (split heat pump only)			
G3 certification number (if applicable)			

Heat Pump Type (Tick)	Split	Monoblock	Peak heat loss of building kW	
Is Heat Pump Installed as part of a cascade?	Yes		Cascade Heat Pump Series	( ) of ( )
Heat Pump Refrigerant Type			Refrigerant weight (total)	kg

Electrical and Hydronic Controls – SYSTEM AND HEAT PUMP (Tick the appropriate boxes)					
Time and temperature control to heating	Room thermostat and programmer/timer		Programmable Roomstat	
	Load/weather compensation		Optimum start control	
Time and temperature control to hot water	Cylinder thermostat and programmer/timer		Combined with Heat pump main controls	
Hybrid system – synchronised control of boiler and heat pump fitted			Yes	
If Yes – boiler model switching point – (Quote Tariff or Temperature Level)				

Heating zone valves (including underfloor loops)	pre-existing		Fitted		Not required	
Hot water zone valves	pre-existing		Fitted		Not required	
Thermostatic radiator valves	pre-existing		Fitted		Not required	
Outdoor Sensor	pre-existing		Fitted		Not required	
Heat Pump Safety Interlock (3)	pre-existing		Fitted		Not required	
Automatic bypass to system	pre-existing		Fitted		Not required	
Buffer Vessel Fitted	Yes		No		If yes volume:	Litres
Plate Heat Exchanger fitted to give hydronic separation of the heat pump circuit to the heating circuit	Yes		No			
Expansion vessel for heating is sized, fitted & charged in accordance with manufacturer's instructions					Yes	
Legionella protection for stored hot water provided by timed temperature control?					Yes	

Water Treatment – SYSTEM AND HEAT PUMP (Tick the appropriate boxes/Measure and Record)						
System has been cleaned and treated in accordance with BS 7593:2019 and heat pump manufacturers' instructions?					Yes	
What system cleaner was used?	Brand:		Product:			
What heating system inhibitor was used?	Brand:		Product:			
What heat pump system anti-freeze/inhibitor was used? (monoblock only)	Brand:		Product:		% concentration	
System filter fitted in accordance with BS7593 : 2019?					Yes	

Heat Pump outdoor unit (Tick the appropriate boxes/Measure and Record)		
Is the heating system adequately frost protected and pipes insulated to prevent heat loss?	Yes	
Split only: The refrigerant circuit has been evacuated and charged in accordance with manufacturer's instructions	Yes	
The heat pump is fitted on a solid/stable surface capable of taking its weight	Yes	
The necessary heat pump defrost provision been put in place	Yes	
The heat pump fan free from obstacles and operational	Yes	
Condensate drain installed to manufacturer's instructions	Yes	

CENTRAL HEATING MODE (Tick the appropriate boxes/Measure and Record)					
The heating system has been filled and pressure tested				Yes	
Heating Flow Temperature		ºC	Heating Return Temperature		ºC
System correctly balance/rebalanced				Yes	

DOMESTIC HOT WATER MODE (Tick the appropriate boxes)								
Is the heat pump connected to a hot water cylinder?		Unvented		Vented		Thermal Store		Not connected
Hot water cylinder size		Litres	Stored hot water temperature					ºC
Hot water has been checked at all outlets		Yes	Have Thermostatic Blending Valves been fitted?		Yes		Not required	

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ADDITIONAL SYSTEM INFORMATON (Tick the appropriate boxes/Measure and Record)											
Water flow rate setting of the heat pump at commissioning (l/min):											
Additional heat sources connected:		Gas Boiler		Oil Boiler		Electric Heater		Solar Thermal		Other:	
ALL INSTALLATIONS											
All electrical work complies with the appropriate Regulations										Yes	
The heat pump and associated products have been installed and commissioned in accordance with the manufacturer's instructions										Yes	
The operation of the heat pump and system controls have been demonstrated to and understood by the customer										Yes	
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer										Yes	
Commissioning Engineer's signature:											
Customer's signature (To confirm satisfactory demonstration and receipt of manufacturers' literature)											

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SERVICE RECORD

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

Service provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions.
Always use the manufacturer's specified spare part when replacing controls.
*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK	Date:	
Engineer name:		
Company name:		
Telephone No:		
Operative ID No:		
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *	Yes	N/a
Comments:		
Signature:		

SERVICE/INTERIM WORK	Date:	
Engineer name:		
Company name:		
Telephone No:		
Operative ID No:		
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *	Yes	N/a
Comments:		
Signature:		

SERVICE/INTERIM WORK	Date:	
Engineer name:		
Company name:		
Telephone No:		
Operative ID No:		
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *	Yes	N/a
Comments:		
Signature:		

SERVICE/INTERIM WORK	Date:	
Engineer name:		
Company name:		
Telephone No:		
Operative ID No:		
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *	Yes	N/a
Comments:		
Signature:		

SERVICE/INTERIM WORK	Date:	
Engineer name:		
Company name:		
Telephone No:		
Operative ID No:		
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *	Yes	N/a
Comments:		
Signature:		

SERVICE/INTERIM WORK	Date:	
Engineer name:		
Company name:		
Telephone No:		
Operative ID No:		
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *	Yes	N/a
Comments:		
Signature:		

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*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK	Date:	
Engineer name:		
Company name:		
Telephone No:		
Operative ID No:		
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *	Yes	N/a
Comments:		
Signature:		

SERVICE/INTERIM WORK	Date:	
Engineer name:		
Company name:		
Telephone No:		
Operative ID No:		
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *	Yes	N/a
Comments:		
Signature:		

SERVICE/INTERIM WORK	Date:	
Engineer name:		
Company name:		
Telephone No:		
Operative ID No:		
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *	Yes	N/a
Comments:		
Signature:		

SERVICE/INTERIM WORK	Date:	
Engineer name:		
Company name:		
Telephone No:		
Operative ID No:		
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *	Yes	N/a
Comments:		
Signature:		

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