



BOSCH

Installation instructions

Indoor unit for air to water heat pumps

Compress Hybrid 7000i AW

HC7000iAW 9I

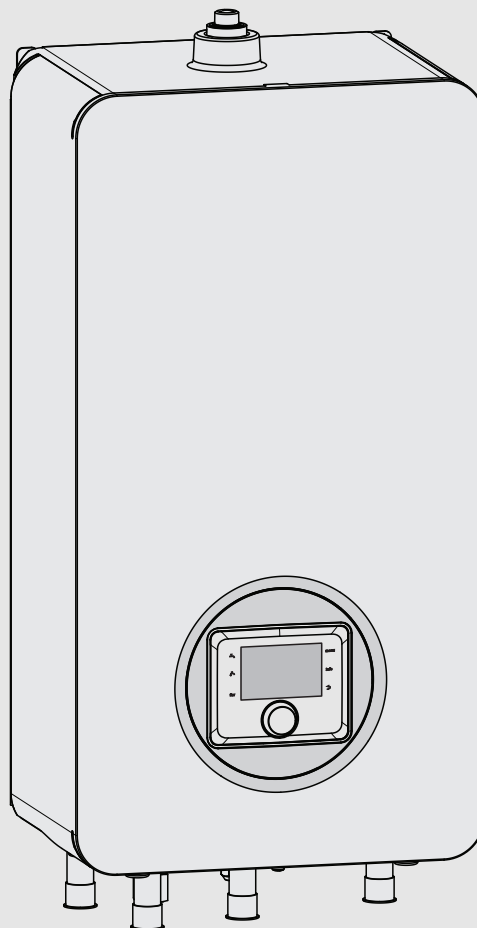


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1 Explanation of symbols and safety instructions


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

1.2 General safety instructions

Notices for the target group

These installation instructions are intended for gas, plumbing, heating and electrical contractors. All instructions must be observed. Failure to comply with instructions may result in material damage and personal injury, including danger to life.

- ▶ Read the installation, service and commissioning instructions (heat source, heating controller, pumps, etc.) before installation.
- ▶ Observe the safety instructions and warnings.
- ▶ Follow national and regional regulations, technical regulations and guidelines.
- ▶ Record all work carried out.

Intended use

This product is intended for use in sealed heating systems in residential buildings.

Any other use is considered unsuitable. Liability will not be assumed for any resulting damage.

Installation, maintenance and repairs

Installation, maintenance and repairs must only be carried out by an approved contractor. A suitable qualification is required, especially when working on electrical parts or on the refrigerant circuit.

- ▶ Do not repair, manipulate or deactivate safety-relevant components.
- ▶ Only install original spare parts.

Commissioning

Commissioning must only be carried out by the service engineer of the manufacturer or the installer.

Establishing the connection to the power supply

A device that safely isolates the appliance from the power supply must be used.

- ▶ Install a safety switch that disconnects all poles from the power supply.

Power cable

To avoid danger, have damaged power cables replaced by the manufacturer, a Service engineer authorised by the manufacturer or by other qualified personnel.

Handover to the user


When handing over, instruct the user how to operate the heating system and inform the user about its operating conditions.

- ▶ Explain how to operate the heating system and draw the user's attention to any safety relevant action.
- ▶ In particular, point out the following:
 - Alterations and repairs must only be carried out by an approved contractor.
 - Safe and environmentally compatible operation requires inspection at least once a year and responsive cleaning and maintenance.
- ▶ Point out the possible consequences (personal injury, including danger to life or material damage) of non-existent or improper inspection, cleaning and maintenance.
- ▶ Point out the dangers of carbon monoxide (CO) and recommend the use of CO detectors.
- ▶ Leave the installation instructions and the operating instructions with the user for safekeeping.

2 Product description

2.1 Declaration of conformity

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

 The CE marking declares that the product complies with all the applicable EU legislation, which is stipulated by attaching this marking.

The complete text of the Declaration of Conformity is available on the Internet: worcester-bosch.co.uk.

2.2 Scope of delivery

- ▶ Upon delivery, check whether the packaging is intact.
- ▶ Check the scope of delivery for completeness:
 - Indoor unit
 - Documentation
 - Drilling template
 - Cable feeds
 - Mounting rail
 - Bag with terminals
 - Bag with screws
 - Outside temperature sensor
 - Pressure-relief valve and corresponding connections
 - Clamping ring fitting

2.3 Product overview

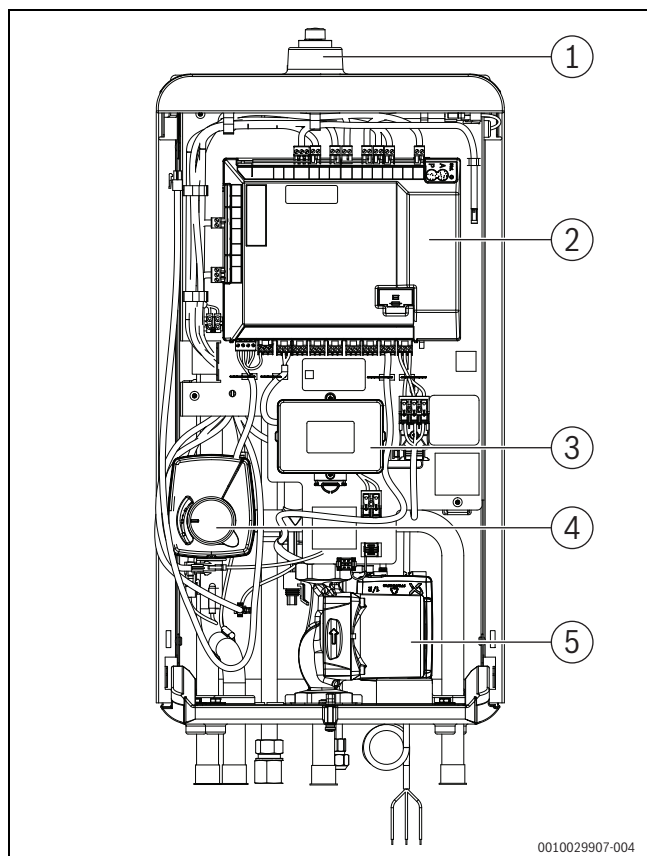


Fig. 1 Components and pipe connections of the indoor unit

- [1] Automatic air vent valve
- [2] Installer module
- [3] Relay box
- [4] Mixing valve
- [5] DHW circulation pump (heat transfer medium)

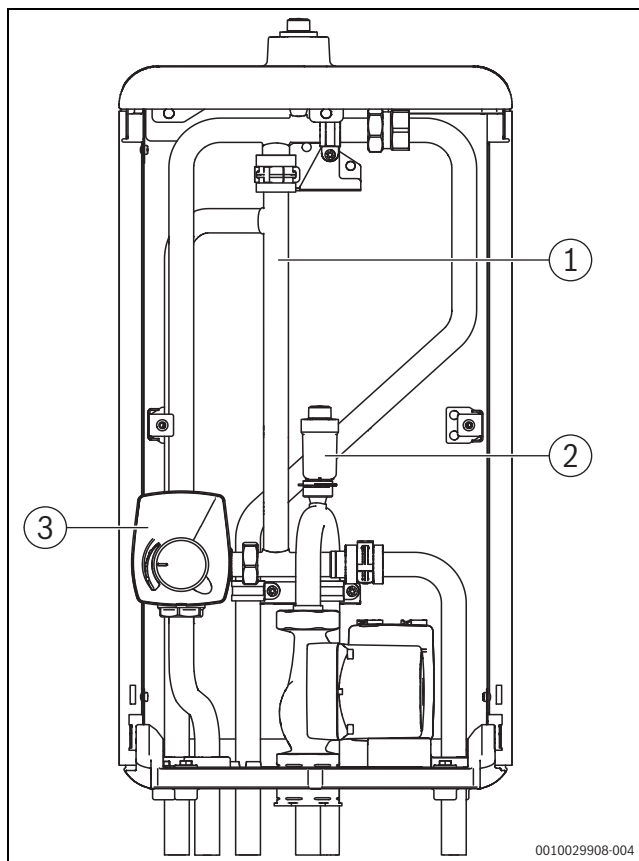


Fig. 2 Low loss header in the indoor unit (shown without electronic components)

- [1] Low loss header
- [2] Automatic air vent valve
- [3] Mixing valve

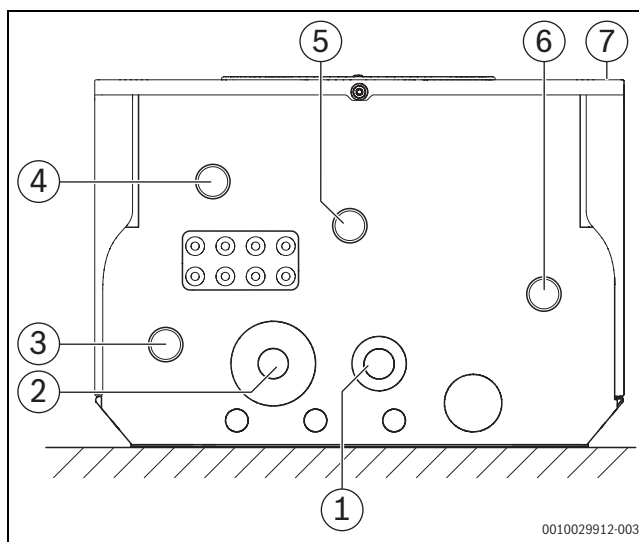


Fig. 3 Underside of indoor unit

- [1] Return to outdoor unit
- [2] Flow from the outdoor unit
- [3] Return to the booster heater
- [4] Flow to heating system
- [5] Return from the heating system
- [6] Flow to the booster heater
- [7] Unit front

2.4 Possible combinations of indoor and outdoor units

The indoor unit is intended for installation inside the building and for connection to heat pump outdoor units installed in the open air.

The indoor unit can be used with the following outdoor units:

- CS7001iAW 5 OR
- CS7001iAW 7 OR
- CS7001iAW 9 OR
- CS7400iAW 5
- CS7400iAW 7

2.5 Possible combinations of indoor unit and external booster heater

The indoor unit can be operated in combination with a gas condensing appliance, providing the gas condensing appliance satisfies the following minimum requirements:

- Minimum modulation: factor 4
- Maximum output: 32 kW
- Integrated heating pump

If the indoor unit is to be operated without a gas condensing appliance, additional safety equipment must be installed in the heating system in compliance with the applicable standards and guidelines.

Single-stage boiler (not modulating), e.g. wall mounted oil condensing boiler may only be used if they are smaller or dimensioned according to the heating load of the building (not dimensioned to continuous DHW output, only exclusively to the building heating load). The additional coverage of the heating load via the heat pump must be considered. Overdimensioning must be ruled out in order to avoid a excess and impermissible cycling of the boiler.



DHW is only provided via the external booster heater (combi boiler) (→ Fig. 22)

2.6 Dimensions and Minimum Clearances



Mount the indoor unit high enough so that the control unit is easy to use. In addition, take pipes and connections under the indoor unit into account.

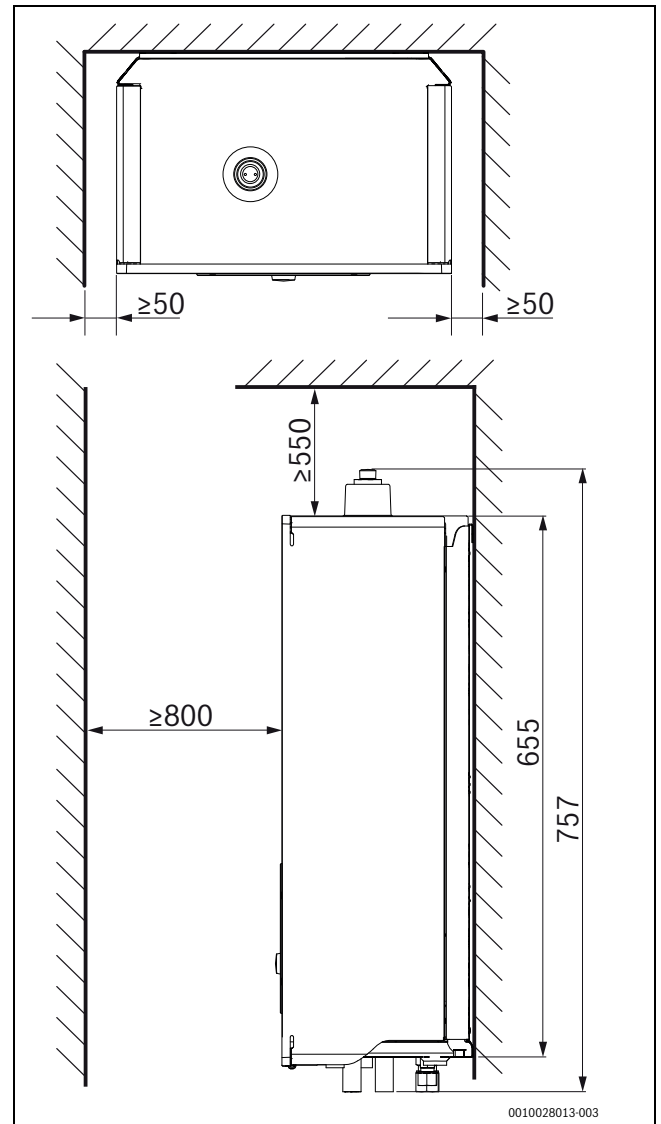


Fig. 4 Minimum distance (mm)

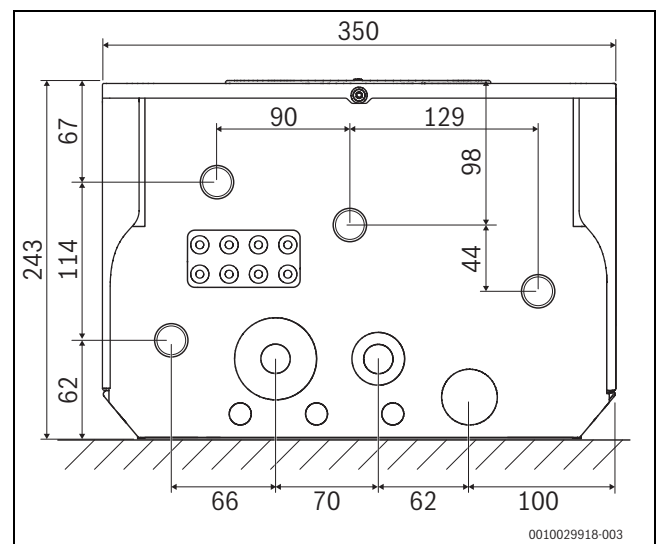


Fig. 5 Clearances between connections (mm)

3 Regulations

Follow the directives and regulations given below:

- Local provisions and regulations of the electricity supplier and corresponding special rules
- National building regulations
- **F-Gas regulation**
- **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)

The document 6720807972 contains further information about the applicable regulations. You can use the document search on our website to display this. You will find the address of the website on the back of these instructions.

4 Preparing for installation

NOTICE

Residue in the pipework can damage the system.

Residue and particles in the heating system impair the flow rate and lead to faults.

- ▶ Before connecting the indoor unit, flush the pipe system to remove any foreign bodies.

4.1 Water quality

Water quality in the heating system

Heat pumps work at lower temperatures than other heating systems, which is why thermal degassing is less effective and the remaining oxygen content is always higher than with electric, oil and gas heaters. This means that the heating system will be more sensitive to rust with aggressive water.

If heating systems have to be regularly refilled or if hot water samples from these systems are inconclusive, corresponding measures such as retrofitting magnetite separators and air vents are needed before installing the heat pump.

Measures during frequent refilling: replacing the expansion vessel, leak test and verifying whether the size of the expansion vessel corresponds to the system volume.

If the limits specified below are not reached, an intermediate heat exchanger may be required to protect the heat pump.

Only use non-poisonous additives to increase the pH value and keep the water clean.

Water quality	Limit values for the heating system
Hardness	<3 °dH
Oxygen content	<1 mg/l
Carbon dioxide, CO ₂	<1 mg/l
Chloride ions, Cl ⁻	<250 mg/l
Sulphate, SO ₄	<100 mg/l
Conductivity	<350 µS/cm
pH	7.5 – 9

Table 2 Water quality in the heating system

Additional water treatment to prevent limescale deposits

A poor quality of the heating water promotes the formation of sludge and limescale. This can lead to malfunctions and damage of the heat exchanger in the heat pump. According to the current guideline VDI 2035 "Avoidance of damage in domestic hot water heating systems" and depending on the degree of hardness of the fill water, the system volume and the total output of the system, water treatment may be required to avoid damage due to the formation of limescale.

NOTICE

Material damage due to contamination in the system!

Dirt particles from the system can damage the unit and impair efficiency.

- ▶ Observe instructions of the guideline BS7593 for the treatment of water in warm water treatment systems.
- ▶ Do not use frost protection/glycol products.

Suitable water treatment products (inhibitors/cleaning agent) are available from the following manufacturers:

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

Table 3

4.2 Install the particulate filter

NOTICE

Pollution in the heating system may damage the indoor unit!

Dirt and pollution in the heating system may damage the indoor unit.

- ▶ Install a particulate filter in the heating return of the indoor unit.

The particulate filter must have the following characteristics:

- Mesh size: max. 0.6 mm
- Flow factor k_{vs} : minimum 7 m³/h
- Magnetite separator

4.3 Minimum volume and design of the heating system

NOTICE

Malfunction due to closed shut-off valves!

Under no circumstances whatsoever should the mass flow rate through the indoor unit of the heat pump and the outdoor unit be blocked or shut off when in operation.

- ▶ Always open all shut-off valves during operation.
- ▶ Never close all thermostatic valves (e.g. of the radiator).

As heating systems are configured in different ways, a minimum water volume is generally not specified. Instead, the system volume is considered to be sufficient if certain conditions are met.

A sufficient amount of energy must be stored in the system to

- ensure the heat pump function.
- prevent an excessive number of start-stop cycles.
- prevent incomplete defrosting of the outdoor unit.
- prevent unnecessary alarms.

Energy is stored in the water volume of the heating system, the components of the system (e.g. radiators) and in the concrete floor (e.g. with underfloor heating system).

Underfloor heating system without buffer cylinder

If the water volume in the heating system is insufficient, this can lead to an excessive number of start-stop cycles.

- ▶ Install a room temperature-dependent control instead of a weather-compensated control.

Small floor areas can lead to the booster heater being activated in the final phase of the defrosting process.

- ▶ The floor area must be at least 6 m².

A larger floor area enables maximum energy savings and avoids booster heater operation.

- ▶ The floor area must be at least 30 m².

System with radiators without mixer and buffer cylinder

If the system only contains a few radiators, the booster heater may be activated in the final phase of the defrosting process.

- ▶ Install at least one radiator with 500 W.
- ▶ Open radiator valves completely.

A larger system fill volume maximises energy savings and avoids booster heater operation.

- ▶ Install at least 4 radiators with 500 W

Heating system with underfloor heating system and radiators in separate heating circuits without buffer cylinders

If the water volume in the heating system is insufficient, this can lead to an excessive number of start-stop cycles.

- ▶ Install a room temperature-dependent control instead of a weather-compensated control.

Small floor areas or only a few radiators in the system can lead to the booster heater being activated in the final phase of the defrosting process.

- ▶ ≥ Install 1 radiator with 500 W.

A minimum floor area is not required for the underfloor heating system. To avoid booster heater operation and achieve optimum energy savings, the radiator valves and several valves of the underfloor heating system must be partially open.

Only heating circuits with mixer

- ▶ Install the buffer cylinder (→ separate installation instructions).
- ▶ Connect T0 flow temperature sensor as shown in connection diagram (→ Fig. 46).
- ▶ The water volume must be at least 50 litres.

Only fan convectors

If the water volume is too low, the booster heater may be activated in the final phase of the defrosting process.

- ▶ Install a buffer cylinder with a volume of at least 10 litres.

⚠ Minimum volume of the heating system

With unknown system volumes, we recommend the installation of a buffer cylinder.

4.4 Installing the piping

NOTICE

Residue in the pipework can damage the system.

Residue and particles in the heating system impair the flow rate and lead to faults.

- ▶ Before connecting the indoor unit, flush the pipe system to remove any foreign bodies.

NOTICE

Danger of faults due to contaminants in pipework!

Solids, metal/plastic filings, flax 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.

- ▶ **Mount connection sets** (accessory) on the pipe as shown in Fig. 6.
- ▶ Push the connector onto the pipe up to the catch.
- ▶ Tighten union nut using a suitable tool.

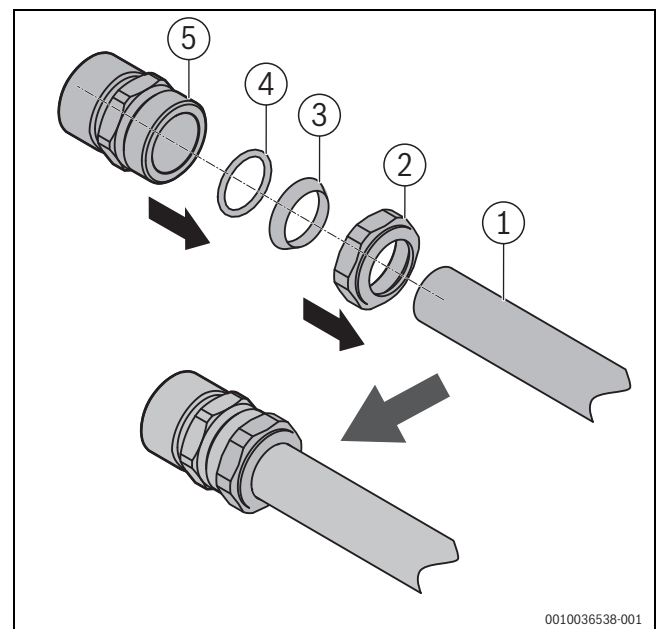


Fig. 6 Assembly of the clamping ring fitting

- [1] Pipe
- [2] Union nut
- [3] Clamping ring
- [4] O-ring (black for hydraulics)
- [5] Connector

- ▶ Install piping for the heating system in the building up to the installation location of the indoor unit.
- ▶ Install insulated piping between the outdoor unit and indoor unit, keeping the length of the piping as short as possible.

4.5 Installing the pressure-relief valve

- ▶ Install the pressure-relief valve in the flow outside the indoor unit.
- ▶ Ensure the pressure relief valve drain pip is not exposed to potential freezing. Insulation may be required.

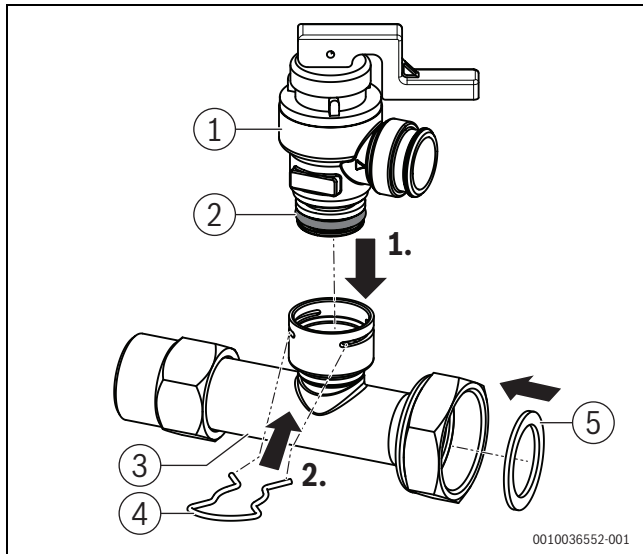


Fig. 7 Assembly of the pressure-relief valve

- [1] Water pressure relief valve
- [2] O-ring
- [3] Pressure-relief valve connector pipe
- [4] Retaining spring
- [5] Gasket

4.6 Installing the heating pump (optional)

(→ Chapter 12.1, page 32)

Whether or not it is necessary to install a heating pump depends on the configuration of the heating system and the amount of system resistance.

- ▶ Select the heating pump based on the required pump flow rate and pressure loss.
- ▶ Install the bypass [1] between the flow [2] and return [3] (→ Fig. 8) to hydraulically uncouple the heating pump from the heating circuit. Observe the prescribed dimensions and clearances during assembly (→ Tab. 4).

Dimensions/clearances	Unit	Value
External diameter D	mm	≥ 22
Minimum bypass length L		
• Straight version A	mm	≥ 200
• U-shaped version B	mm	≥ 100
Maximum clearance between bypass and indoor unit	m	1 – 2

Table 4 Pipe diameter and bypass lengths

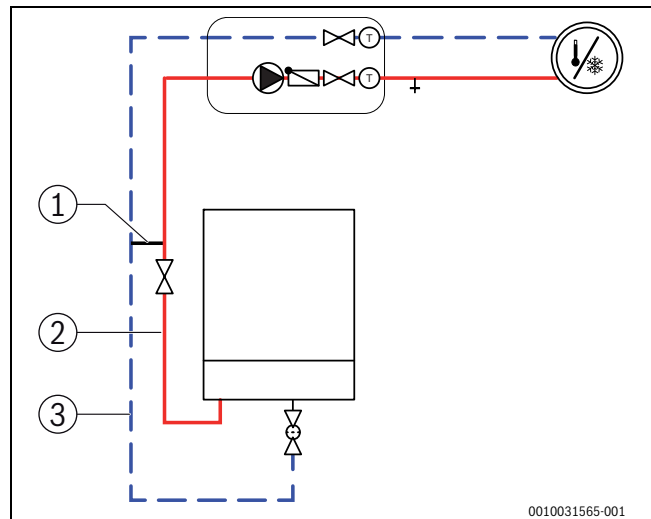


Fig. 8 Indoor unit with heating circuit and bypass

- [1] By-pass
- [2] Flow
- [3] Return

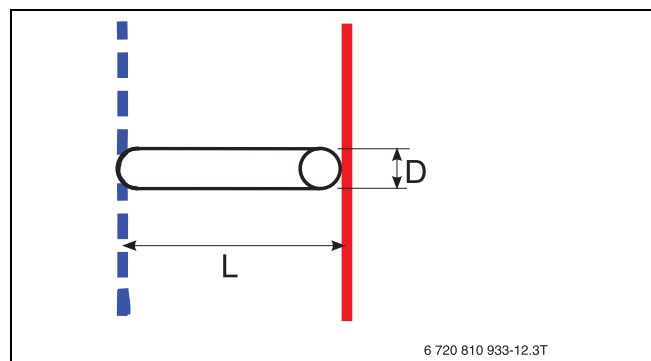


Fig. 9 Detailed view of bypass

- [L] Minimum bypass length
- [D] Pipe size

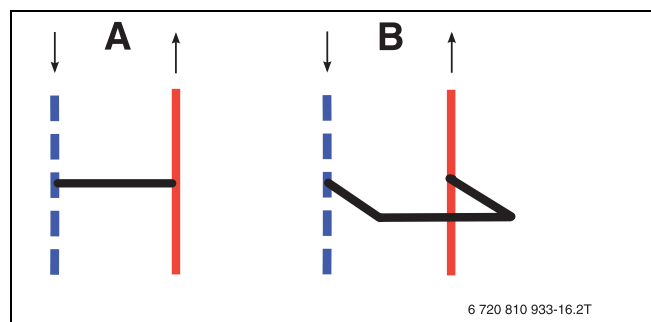


Fig. 10 By-pass

- [A] Bypass, straight design
- [B] Bypass, U-shaped design (total length including the elbow)

4.7 Maximum sensor

In some countries a high limit safety cut-out is required in underfloor heating circuits.

- ▶ Observe country-specific regulations.
- ▶ Establish connection as described in Chapter 6.7.7.

4.8 Insulating the hydraulic pipework

Insulating the pipework inside the building



CAUTION

Risk of burning!

Contact with uninsulated piping can inflict burns to the skin.

- ▶ Insulate all heat-conducting pipework using suitable thermal insulation according to applicable regulations.

Insulating the pipework outside the building

NOTICE

Material damage from frost!

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

- ▶ Use insulation with a thickness of at least 19 mm for pipework outdoors.
- ▶ Use insulation with a thickness of at least 12 mm for pipework indoors.

Insulating the pipework in the indoor unit

If the heating system is used for cooling below the dew point(not recommended):

- ▶ Install vapour-tight insulation on all connections and pipework to prevent condensation.

5 Installation

5.1 Transport and storage

The indoor unit must always be transported in its packaging and stored in an upright position. The indoor unit can be provisionally tilted for transportation purposes if required.

After unpacking the indoor unit, do not place or set it down on the pipes or on the side panel.

- ▶ After unpacking the indoor unit, lay it down on the back panel.

Do not store or transport the indoor unit at temperatures below -10°C .

5.2 Unpacking

- ▶ Remove the packaging according to the instructions on the packaging.
- ▶ Take out enclosed accessories.
- ▶ Check that all package contents are present.

5.3 Indoor unit installation

5.3.1 Removing the cover

To unlock the cover [1]:

- ▶ Unscrew the unlocking screw [2] on the underside of the indoor unit using a suitable tool.

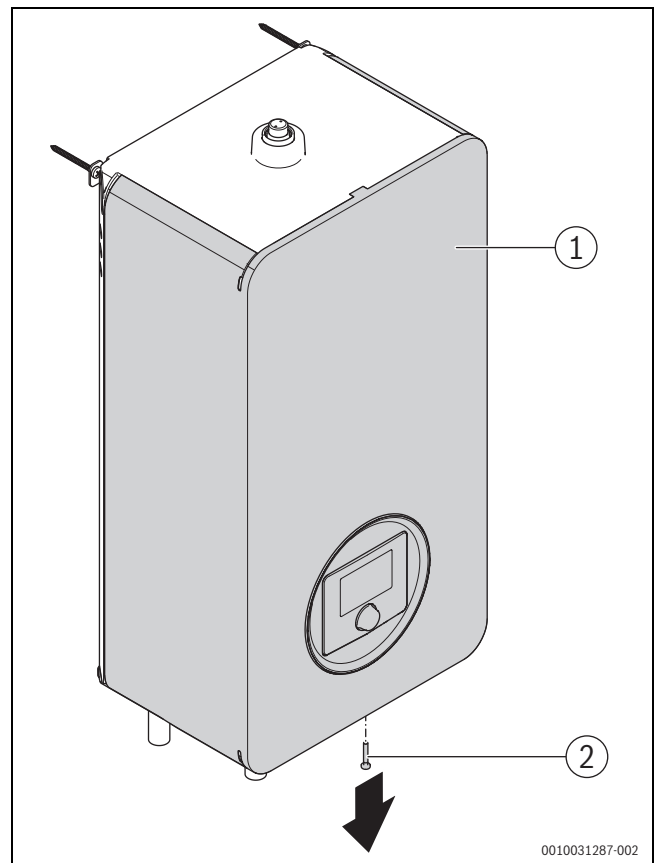


Fig. 11 Unlock the cover

- [1] Cover of the indoor unit
- [2] Unlocking screw

To detach the cover [2] from the bottom fixing [1]:

- ▶ Pull the cover [2] on the underside slightly forwards.

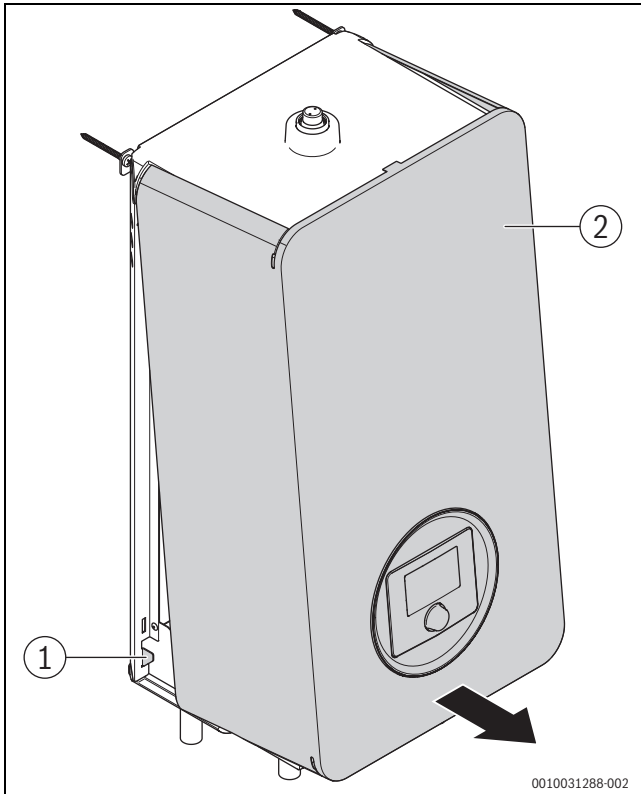


Fig. 12 Detach the cover from the bottom fixing

- [1] Fixing on the underside
- [2] Cover of the indoor unit

To detach the cover [2] from the top fixing [1]:

- ▶ Push the cover [2] slightly up.

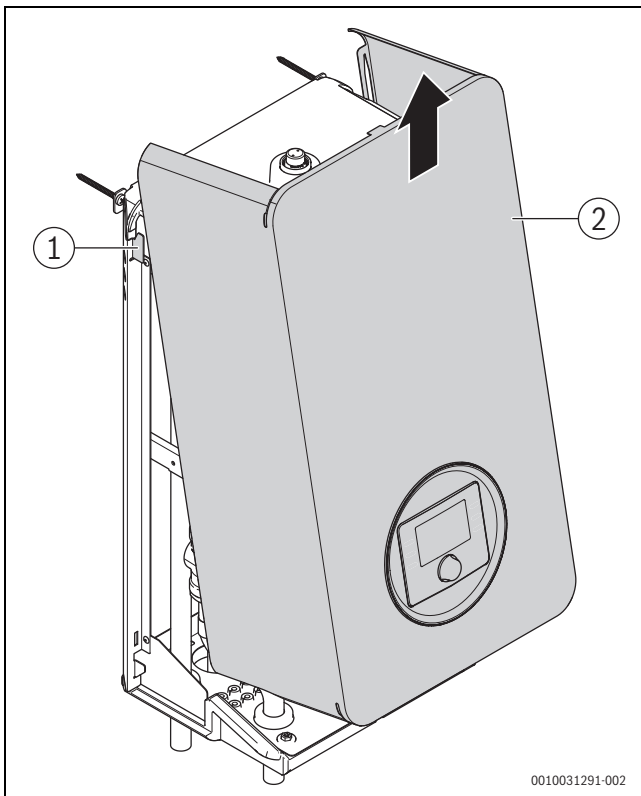


Fig. 13 Detach the cover from the top fixing

- [1] Fixing on the top side
- [2] Cover of the indoor unit

NOTICE

Material damage due to tensile forces on the EMS cable!

The control unit in the cover is connected to the installer module via the EMS cable.

- ▶ Pay attention to the length of the EMS cable when removing the cover.

To remove the cover [1]:

- ▶ Pull the sides of the cover [1] slightly apart at the back (paying attention to the top cover) and pull the cover forwards.
- ▶ Detach the EMS cable from the [2] control unit.

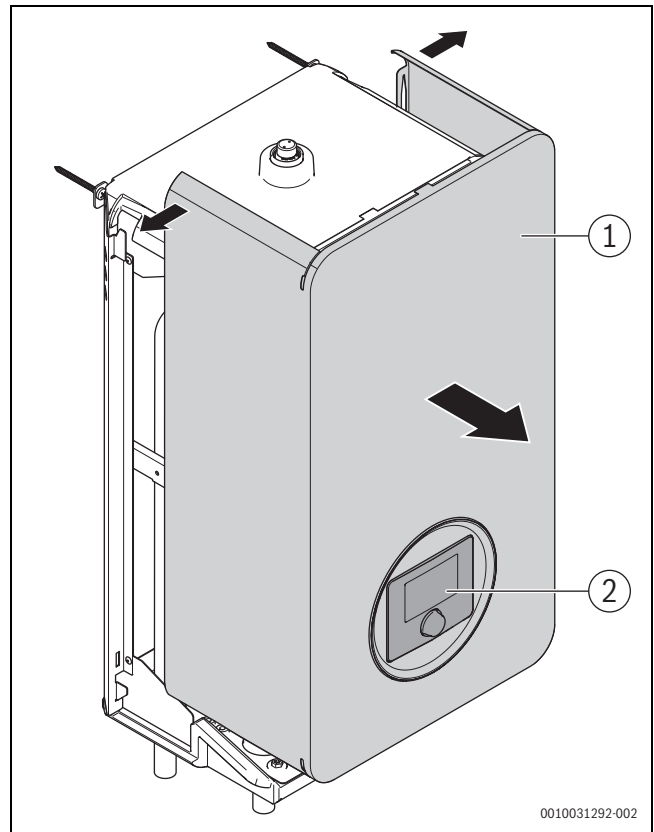


Fig. 14 Removing the cover

- [1] Cover of the indoor unit
- [2] Control unit

5.3.2 Installing the indoor unit

Specifications:

- The pipework between the outdoor unit heat pump and the indoor unit must be as short as possible.

CAUTION

Risk of injury and material damage due to unsuitable fixing components!

If the fixing components used are unsuitable for the existing wall construction material, a permanent fixing cannot be guaranteed. The supplied wall plug is suitable for standard masonry and concrete.

- ▶ Use wall plugs that are suitable for the wall construction material.
- ▶ Install the mounting rail (scope of delivery) on a suitable wall using the drilling template (→ Chapter 2.6).
- ▶ Hang the indoor unit centrally onto the mounting rail (→ Fig. 15).

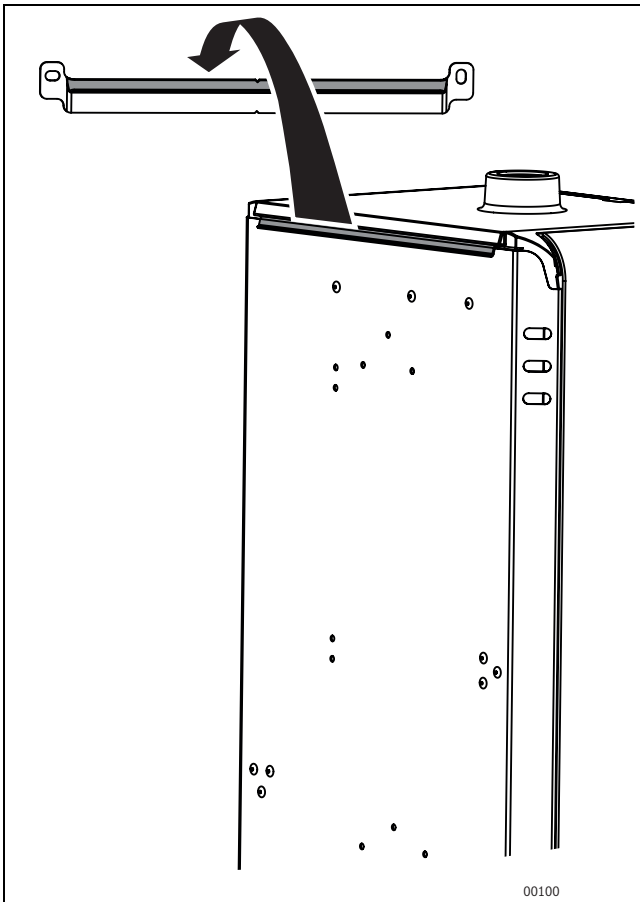


Fig. 15 Hanging the indoor unit

- ▶ Insulate the pipework (→ Chapter 4.8).

5.3.3 Fitting the cover

To fit the top cover [1]:

- ▶ Connect the EMS cable to the control unit [2].
- ▶ Pull the sides of the cover [1] slightly apart at the back (paying attention to the top cover) and push the cover backwards.

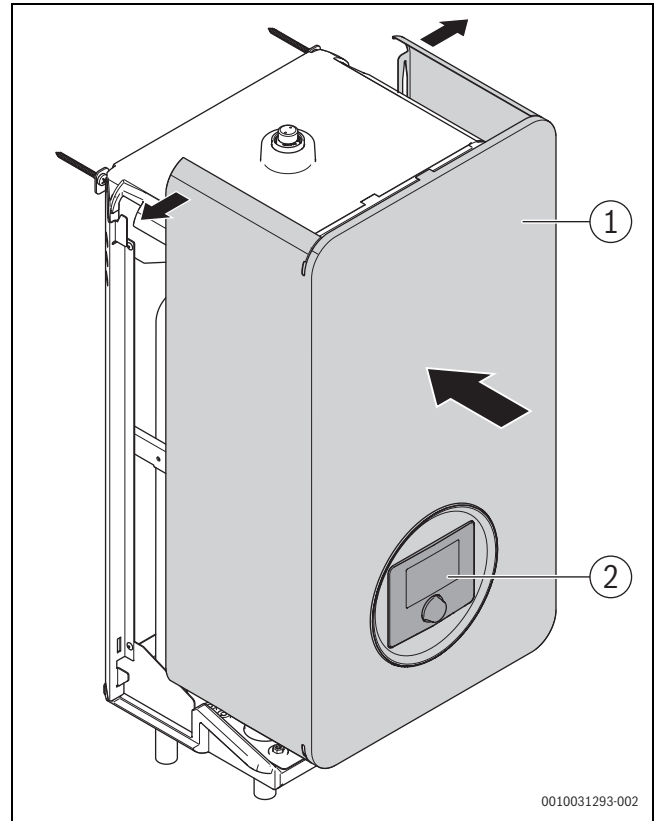


Fig. 16 Fitting the cover

- [1] Cover of the indoor unit
- [2] Control unit

To attach the cover [2] to the top fixing [1]:

- ▶ Push the cover [2] slightly down.

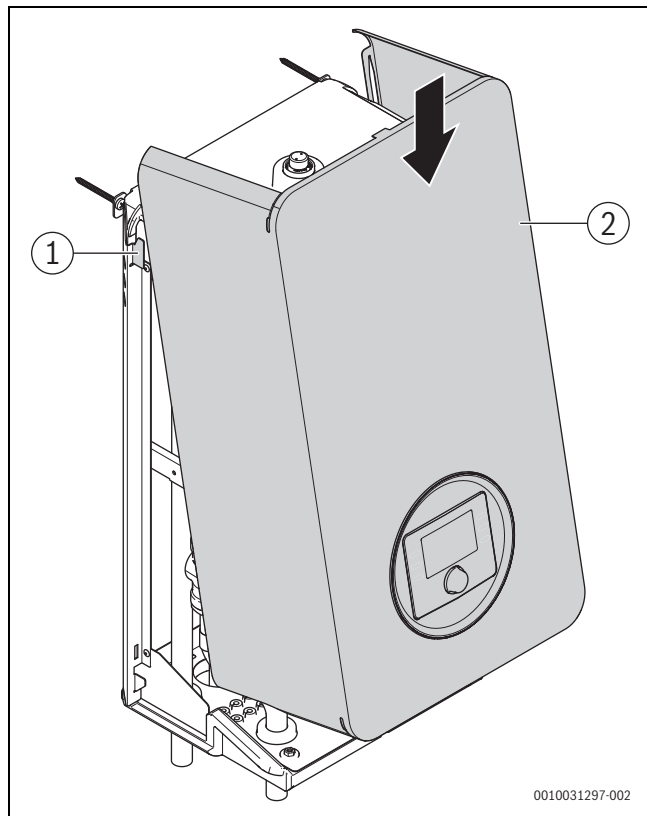


Fig. 17 Attach the cover to the top fixing

- [1] Fixing on the top side
- [2] Cover of the indoor unit

To attach the cover [2] to the bottom fixing [1]:

- ▶ Push the cover [2] on the underside slightly back.

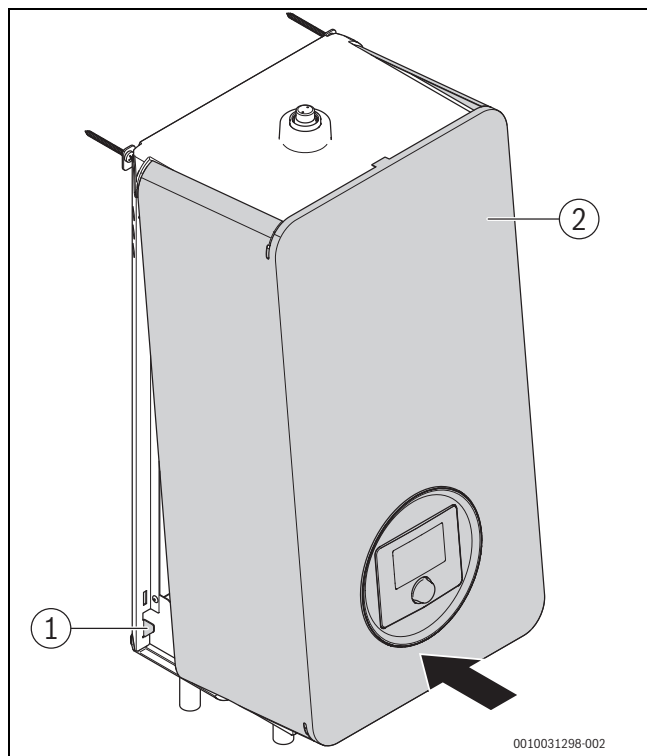


Fig. 18 Attach the cover to the bottom fixing

- [1] Fixing on the underside
- [2] Cover of the indoor unit

To lock the cover [1]:

- ▶ Screw in the locking screw [2] on the underside of the indoor unit using a suitable tool.

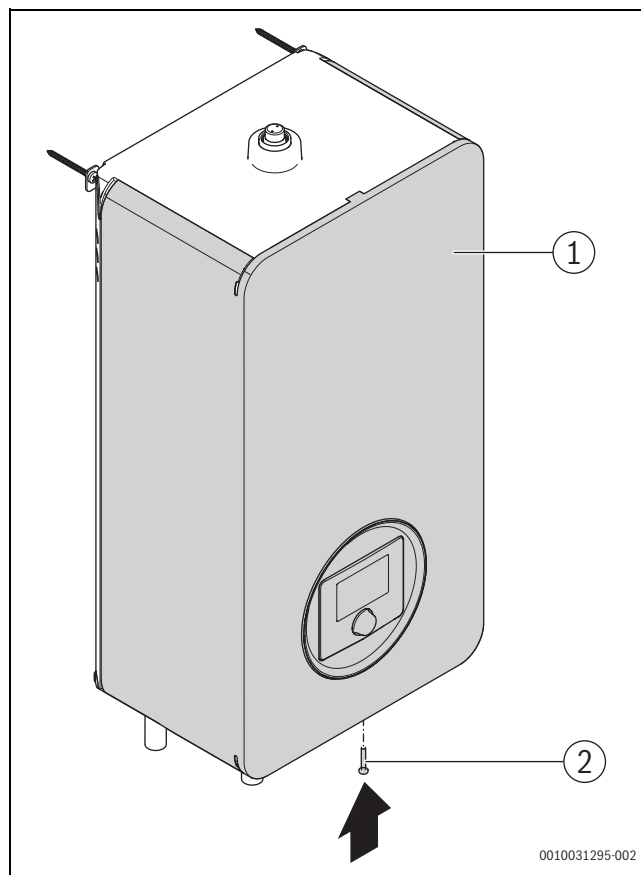


Fig. 19 Locking the cover

- [1] Cover of the indoor unit
- [2] Locking screw

5.4 Connecting the indoor unit to the outdoor unit

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

Deformation due to heat!

If the temperature is too high, the insulation material in the indoor unit deforms.

- ▶ Do not solder the piping to the indoor unit.
 - ▶ Use clamp couplings to connect the pipes to the outdoor unit if available.
-
- ▶ Dimension the pipework as specified in the installation instructions for the outdoor unit.
 - ▶ Connect the flow of the outdoor unit to the heat transfer medium outlet.
 - ▶ Connect return to the outdoor unit to the heat transfer medium inlet.

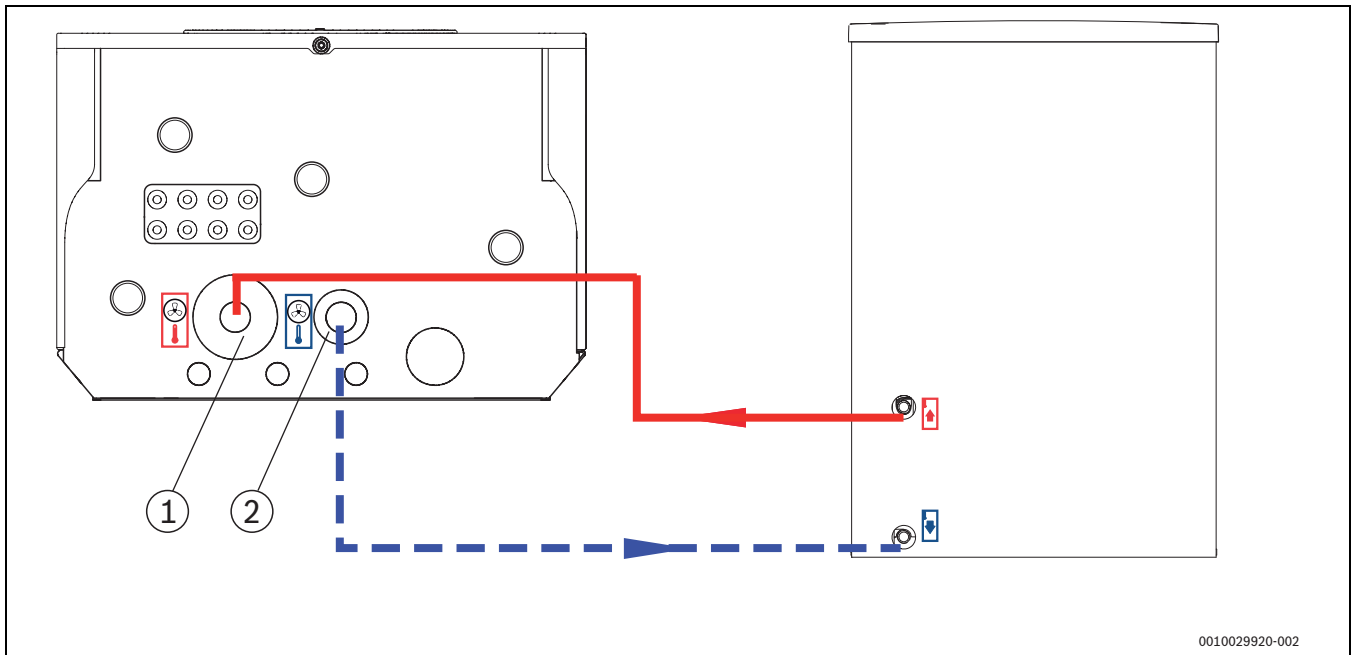


Fig. 20 Connecting the indoor unit to the outdoor unit (schematic representation)

- [1] Flow of the outdoor unit
- [2] Return to outdoor unit

Pump curves and line lengths

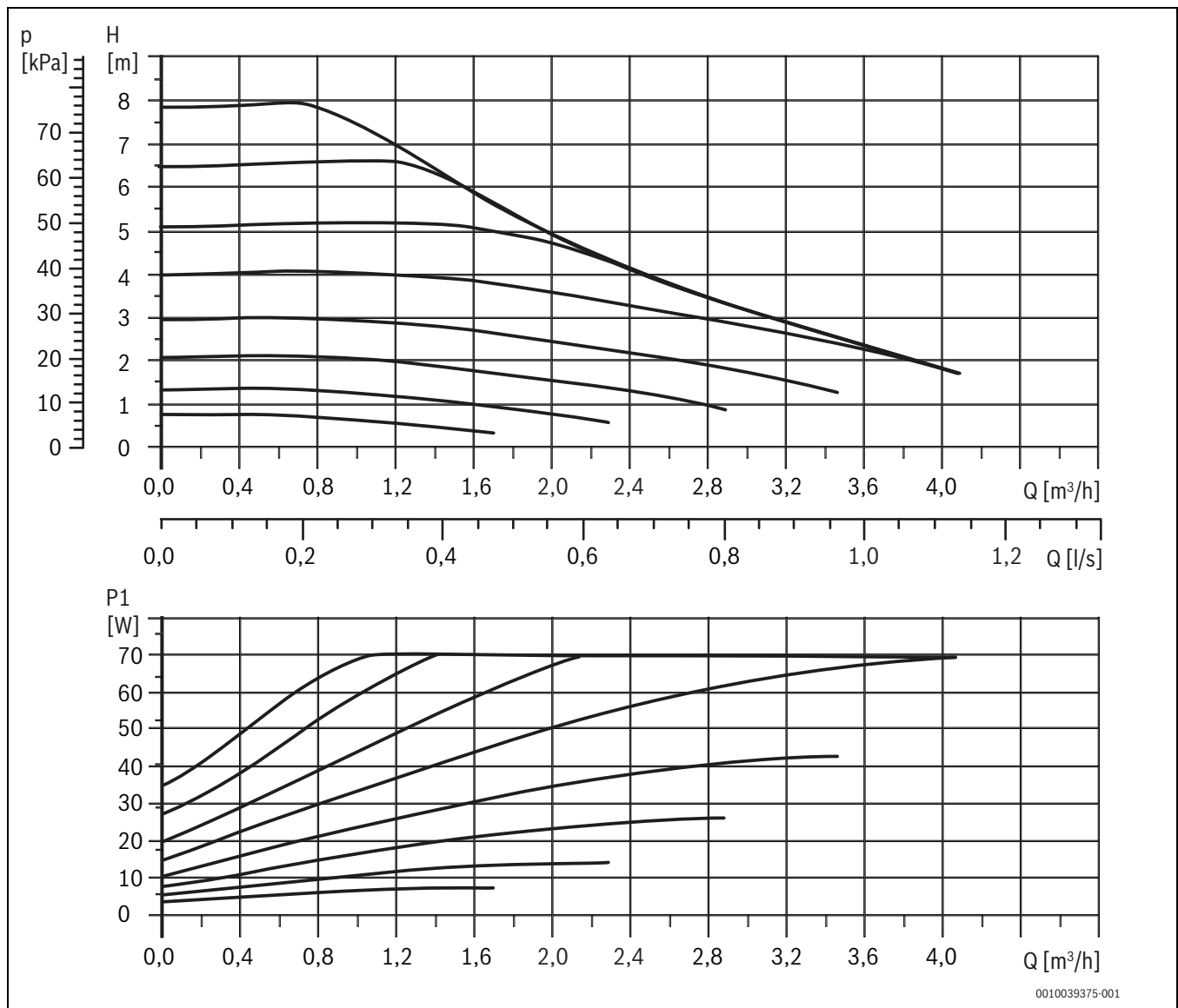


Fig. 21 Pump curves

p Pressure [kPa]
 H Head [m]
 Q Volumetric flow rate [m³/h]
 P1 Power input [W]

Heat Pump	Delta heat transfer medium (K)	Nominal flow rate (l/s)	Maximum pressure reduction (kPa) ¹⁾	AX20 inside Ø 15 (mm)	AX25 inside Ø 18 (mm)	AX32 inside Ø 26 (mm)	AX40 inside Ø 33 (mm)
				Maximum pipe length PEX (m) ²⁾			
5 OR-S	7	0.32	50	8.5	21	30	
7 OR-S	7	0.32	52	8.5	22	30	
9 OR-S	7	0.32	54		22.5	30	

- 1) For pipes and components between the heat pump and indoor unit.
- 2) The installation of a 3-way valve in the DHW circuit of the system was considered in the calculation of the pipe lengths.

Table 5 Pipe dimensions and maximum pipe lengths (single section) for the heat pump - outdoor unit

5.5 Connecting the indoor unit to the external booster heater and heating system

NOTICE

Deformation due to heat!

If the temperature is too high, the insulation material in the indoor unit deforms.

- ▶ Do not solder the piping to the indoor unit.
- ▶ Use clamp couplings to connect the pipes to the outdoor unit if available.

NOTICE

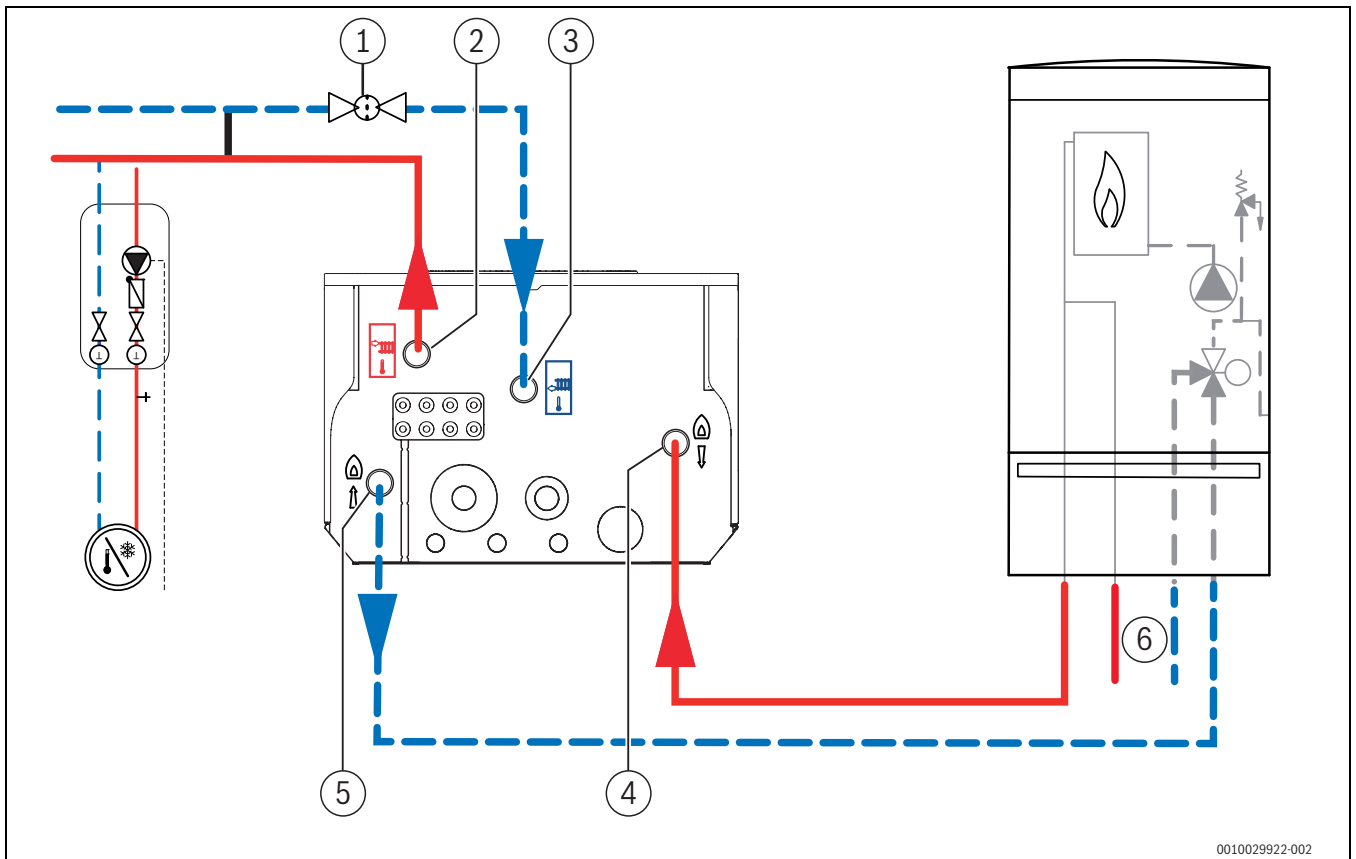
Risk of material damage due to leaking connections!

Mechanical stresses in connecting pipework can result in leaks.

- ▶ Install connecting pipework without mechanical stresses at the connections on the boiler.
- ▶ Ensure that all connections are tight.

Establish the following connections at the indoor unit:

- Connect the return [3] from the heating system with particulate filter [1].
- Connect the flow [2] to the heating system.
- Connect the pipework from the external booster heater [4].
- Connect the pipework to the external booster heater [5].
- Route a drain hose on a slope to a frost-free drain.



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Fig. 22 Connection of the indoor unit to the heating system and the booster heater (example representation with bypass and additional heating pump)

- [1] Particle filter
- [2] Flow to heating system
- [3] Return from the heating system
- [4] Flow to the auxiliary heater
- [5] Return to the auxiliary heater
- [6] DHW connection (combi boiler)

5.6 Fitting the outside temperature sensor



If the length of the temperature sensor cable outdoors is more than 15 m:

- ▶ Use screened cable.

A temperature sensor cable that runs outdoors must satisfy the following requirements:

- Cable diameter: 0.5 mm²
- Resistance: max. 50 Ohm/km
- Number of conductors: 2
- Maximum length: 50 m
- ▶ Mount the sensor on the coldest side of the house (normally facing north).
 - Protect the sensor from direct solar radiation, draughts, etc.
 - In addition, the sensor must not be installed directly under the ceiling.

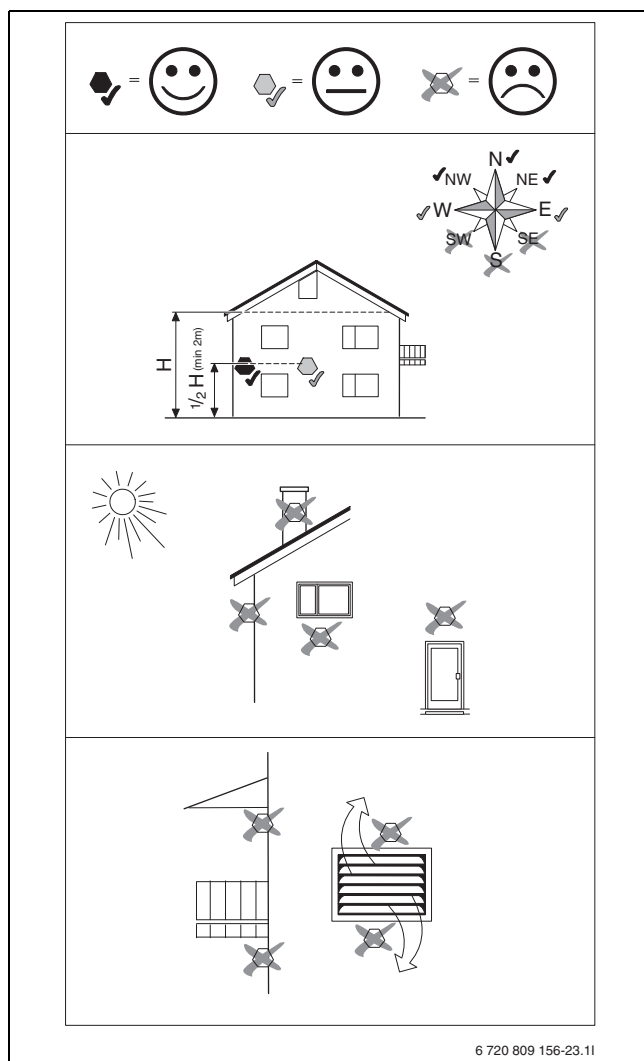


Fig. 23 Positioning the outside temperature sensor

5.7 Accessories

5.7.1 Mounting the flow temperature sensor

The installation of the flow temperature sensor T0 depends on the design of the heating system.

No additional measures are required when the heating system is not equipped with a buffer cylinder or low loss header as the flow temperature sensor is already integrated into the indoor unit.

If the heating system is equipped with a buffer cylinder:

- ▶ Install the flow temperature sensor T0 at the buffer cylinder.
- ▶ Electrical power connection (→ Chapter 6.7.2).

Assembly downstream of the bypass or at the buffer cylinder

If the flow temperature sensor is installed outside the indoor unit on the buffer cylinder or downstream of the bypass (e.g. when using a heating circuit set), it must be removed from the indoor unit and extended using a suitable extension cable of corresponding length (H03VV-F 2x0.5 mm²) (→ Chapter 6.7.2).

5.7.2 Installing the heating circuit module

In the delivery scope a heating circuit without mixer can be controlled via the controller.

If other heating circuits are to be installed, a heating circuit module is required for each heating circuit.

- ▶ Install the heating circuit module, mixer, heating pump and other components according to the selected system solution.
- ▶ Observe the relevant separate installation and operating instructions when installing and adjusting the components.
- ▶ Electrical connection (→ Chapter 6.7.3).

5.7.3 Room temperature-dependent controller

In the default setting, the controller automatically regulates the flow temperature depending on the outside temperature. A room temperature-dependent controller can be installed for greater comfort.

- ▶ Electrical connection (→ Chapter 6.7.4).

5.7.4 Installing the accessories for the cooling mode

NOTICE

Damage to the indoor unit due to condensation

The indoor unit with mixer is not designed to be used in cooling mode below the dew point.

- ▶ Only use the indoor unit in cooling mode above the dew point.

A prerequisite for using the heating system in cooling mode is that a room sensor is installed in the heating system to prevent condensate formation.

There are two installation options:

- Room sensor with integrated humidity sensor (CR10H or ModuLine 1010H).
- Room sensor (CR10 or ModuLine 1010) in combination with humidity sensor in the heating system.



Use of a CR10H or ModuLine 1010H room sensor is recommended for non-condensing cooling mode.

Installing a room sensor with integrated humidity sensor increases the reliability of cooling mode since the flow temperature in this case is automatically controlled via the control unit with reference to the current dew point.

- ▶ Installing the room sensor with integrated humidity sensor (→ instructions of the room thermostat).
- ▶ Electrical connection (→ Chapter 6.7.4).

If a room sensor is used without an integrated humidity sensor, an additional humidity sensor must be installed in the heating system.

- ▶ Fit the room sensor in order to adjust the cooling mode of the heating system (→ observe instructions for the room thermostat).
- ▶ Fit the humidity sensor on the pipes of the heating system (→ observe instructions of the humidity sensor).
- ▶ Electrical connection (→ Chapter 6.7.4).

5.7.5 Installation with swimming pool

NOTICE

Danger of faults!

If the swimming pool mixer is installed in the wrong location in the system, faults may occur. The swimming pool mixer must not be installed in the flow where it could block the pressure relief valve.

- ▶ Assemble the swimming pool mixer in the return to the indoor unit (as shown in the example image for swimming pool installation).
- ▶ Mount the tee in the flow from the indoor unit upstream of the bypass.
- ▶ Do not install the swimming pool mixer as heating circuit in the system.



A prerequisite for using the swimming pool heating is the installation of a swimming pool module (accessory).

- ▶ Installing the swimming pool (→ swimming pool instructions).
- ▶ Installing the swimming pool mixer.
- ▶ Insulate all pipes and connections.
- ▶ Install the pool module (→ Instructions for the pool module).
- ▶ Electrical connection (→ Chapter 6.7.5).
- ▶ Set the elapsed time of the swimming pool diverter valve during commissioning (→ instructions of control unit).

- ▶ Make the necessary settings for the swimming pool mode (→ instructions for control unit).

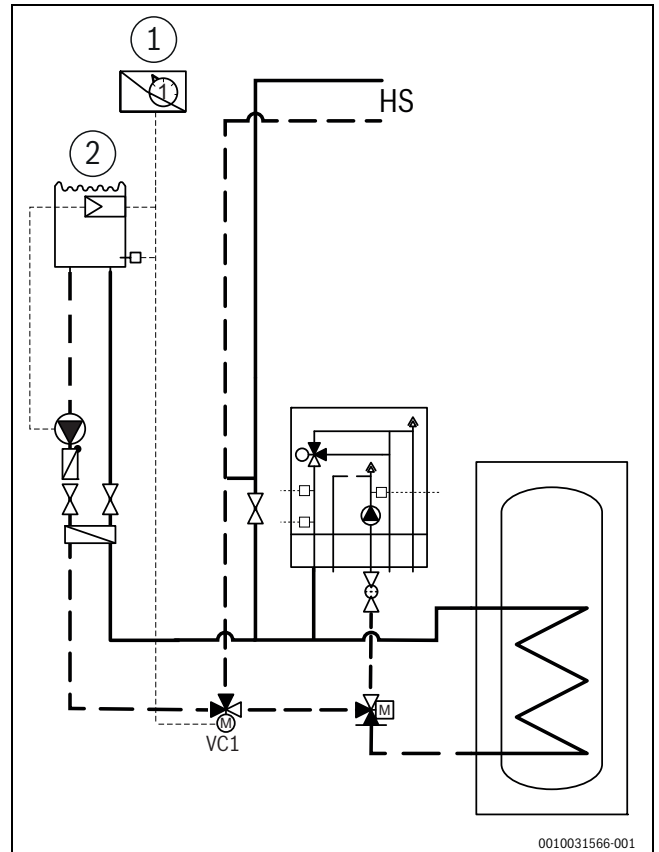


Fig. 24 Example showing swimming pool installation

- [1] Swimming pool module
- [2] Pool
- [VC1] Swimming pool mixer
- [HS] Heating system

6 Electrical connection



WARNING

Risk to life from electric shock!

Touching live electrical parts can cause an electric shock.

- ▶ Before working on electrical parts, disconnect all phases of the power supply (fuse/circuit breaker) and lock the isolator switch to prevent unintentional reconnection.



WARNING

Danger to life from electric current!

Incorrectly connected electrical cables can result in faulty operation with potentially dangerous consequences.

- ▶ When making the electrical connections, refer to the connection diagrams for the individual devices and components.
- ▶ When performing maintenance, label all power cables before disconnecting them.

NOTICE

Material damage if the maximum current consumption is exceeded!

Short-term high (start-up) currents can damage electrical components.

- ▶ When connecting external components to the control unit, make sure that the sum of the individual currents consumed by these components does not exceed the maximum current consumption (→ data plate).



Note the following when making electrical connections:

- ▶ Electrical work on heating systems must only be carried out by qualified electricians. If you are not suitably qualified, ask a licensed heating contractor/electrician to establish the electrical connection.
- ▶ Make sure that all system components are earthed (earthing is a constituent part of the control unit used).
- ▶ Observe all local regulations!



Connect cables as shown in the connection diagrams (→ Chapter 12.2, page 36).

6.1 Connecting the device

Due to the IP rating IPX1D, the appliance must not be installed in protection zones 1 and 2.

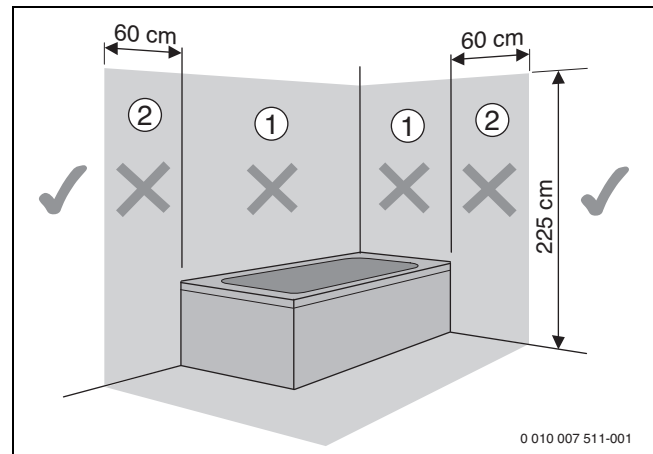


Fig. 25 Protection zones

- [1] Protection zone 1, directly above the bath
- [2] Protection zone 2, within a radius of 60 cm from the bath/shower

6.2 Routing cables

NOTICE

Material damage due to damaged cables!

System damage may occur if cables are installed incorrectly or next to hot system components.

- ▶ Make sure cables are not pinched.
- ▶ Route all cables through cable feeds.

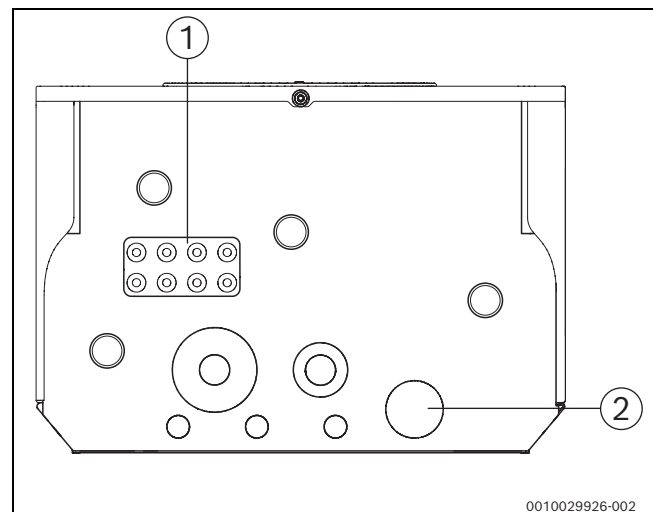


Fig. 26 Cable feeds

- [1] Cable feed for sensor, CAN BUS and EMS bus
- [2] Cable feed for mains power supply (230 V)

NOTICE

Material damage due to induced overvoltage!

Incorrectly installed cables can lead to induced overvoltages which can cause the control unit to malfunction or be damaged.

- ▶ Route 230 V cables and extra-low voltage cables separately.

i EMS-BUS and CAN-BUS are not compatible.

- ▶ Do not connect EMS-BUS units to CAN-BUS units.

i It must be possible to safely interrupt the power supply to the appliance.

- ▶ Install a separate safety switch that completely de-energizes the indoor unit.
- ▶ For a separate power supply, a safety switch is required for each supply line.
- ▶ In case a fixed appliance is not equipped with a power cable and plug or other means to shutdown from the power supply that has a contact opening width at each pole according to the conditions of overvoltage category III for full disconnection: Install the respective disconnecting device in the fixed electrical installation in accordance with the installation regulations.

- ▶ Select the appropriate conductor cross-sections and cable types for the respective fuse protection and routing method.
- ▶ Mount the enclosed terminals on the installation PCB.
- ▶ Connect the unit as shown in the connection diagram. No additional consumers may be connected.
- ▶ When changing the PCB, note the colour coding.

When extending temperature sensor cables, use the following conductor diameters:

- up to 20 m long cable: 0.75 to 1.50 mm²
- up to 30 m long cable: 1.0 to 1.50 mm²

6.3 Connecting the power supply

i A cable of the type H05V2V2 F, 3x1.5 mm² which is 2.5 m in length is connected as standard to the mains power supply terminal (→ Fig. 27). Alternatively an on-site connection can be established using a suitable cable.

- ▶ Remove the cover (→ Chapter 5.3.1, page 9).
- ▶ Feed connecting lead through the cable feed [2] into the appliance.
- ▶ Establish a permanent connection to the mains power supply in accordance with the locally applicable regulations.
- ▶ Connect the mains power supply via the mains power supply terminal on the retaining plate (→ Fig. 27, [2]).

! WARNING

Danger to life from electrical shock in the event of incorrectly connected cables!

Ensure correct polarity of the N and L cables.

- ▶ Establish clamp connection correctly.
- ▶ Fully tighten clamp connection.
- ▶ Do not use an adapter plug (push fit connections).

- ▶ Make sure the potentiometer setting is correct for hybrid application (**P=3 and A=0**) as shown in Fig. 27, [1]. If necessary, turn the direction arrow to the corresponding position with a screwdriver.

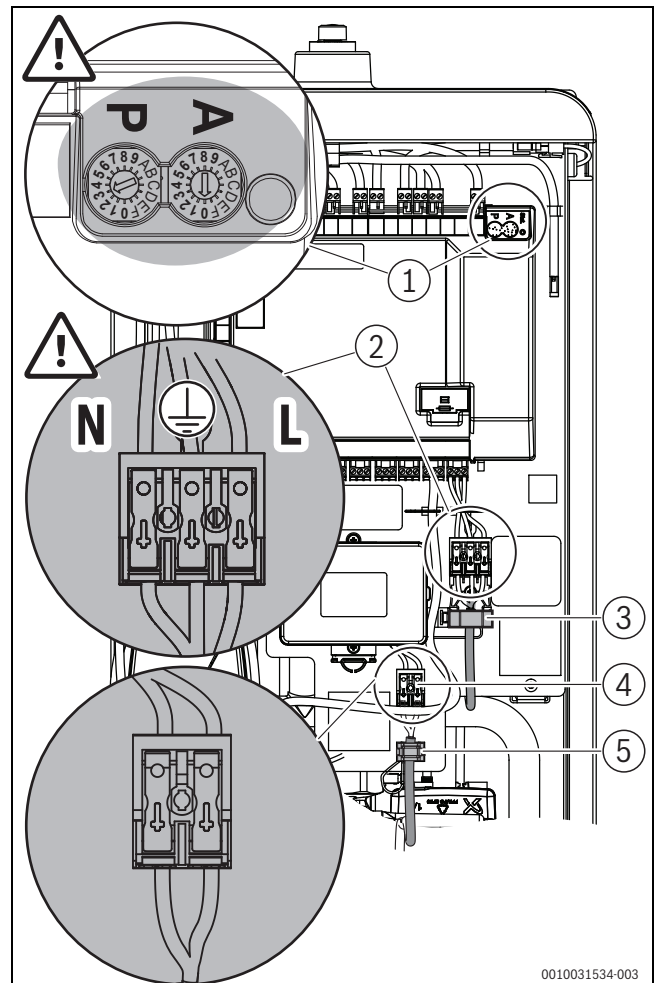


Fig. 27 Connecting the mains power supply and booster heater control cable

- [1] Rotary selector
- [2] Mains power supply terminal
- [3] Strain relief
- [4] External booster heater control cable terminal (volt free)
- [5] Strain relief

6.4 CAN-BUS

NOTICE

The system will be damaged if the 12 V- and the CAN-BUS connections are incorrectly connected!

The communication circuits are not designed for 12 V constant voltage.

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



Accessories such as power guards which are to be connected to the CAN-BUS are connected to the installation module of the indoor unit parallel to the CAN-BUS connection for the outdoor unit. Accessories can also be connected in series with other units connected to the CAN-BUS.

The indoor and outdoor units are connected by a communication line, the CAN-BUS.

A LIYCY cable (TP) 2 x 2 x 1.5 mm² (or equivalent) is a suitable for use as an **extension cable outside the appliance**. Alternatively, twisted pair cables approved for outdoor use with a minimum cross-section of 0.75 mm² can be used. In doing so, only earth the shielding on one side (indoor unit) and to the casing.

The maximum permissible cable length is 30 m.

The connection is made with four wires, as the 12 V supply is also connected. The 12 V and CAN-BUS connections are marked on the modules.

The **"Term" changeover switch** identifies the start and end of CAN-BUS loops. Ensure that the correct modules are terminated and that all other modules are not terminated.

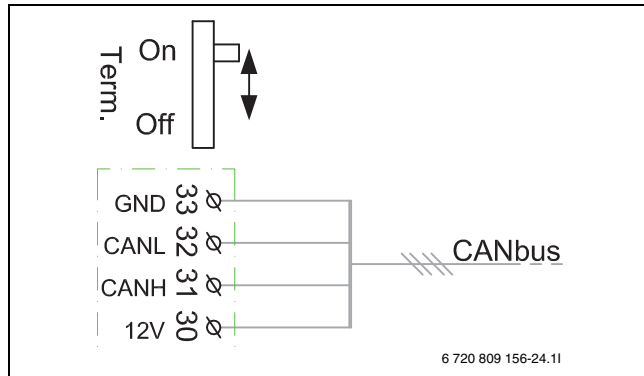


Fig. 28 Termination CAN-BUS

- On CAN-BUS completed
- Off CAN-BUS not completed

6.5 Connecting the outside temperature sensor

If the length of the temperature sensor cable outdoors is more than 15 m, use a screened cable. The screened cable must be earthed in the indoor unit. The maximum length of screened cable is 50 m.

A temperature sensor cable that runs outdoors must satisfy the following requirements:

- Cable diameter: 0.5 mm²
- Resistance: max. 50 ohm / km
- Number of conductors: 2
- Maximum length: 50 m

- ▶ Connect outside temperature sensor to terminal **T1** (→ Chapter 12.2).

6.6 External booster heater (uncommon in UK market)

6.6.1 Connect the actuator of the external booster heater (e.g. floor standing boiler)

The external booster heater can be connected in two different ways:

Power control via 0-10 V output:

- ▶ Connect the external booster heater to the installer module at terminal **EMO 0-10 V** (→ Chapter 12.2, page 36 [29]).



With some heat generators, an additional module (e.g. MU100, accessory) must be installed to provide a 0-10 V input.

- or -

On/Off control (volt free output):

- ▶ Route the control cable of type H05V2V2 F, 2x0.75 mm² [4] from the external booster heater through a free cable feed in the bottom panel (→ Fig. 26) to terminal [2].
- ▶ Connect the stripped ends of the cable to the terminal of the relay box and lock the terminal (→ Fig. 29 [2], [1] and Chapter 12.2, page 36).
- ▶ Secure the cable [4] via the strain relief [3].

When there is heat demand from the external booster heater, the relay box establishes a zero volt connection between the contacts of the terminal.

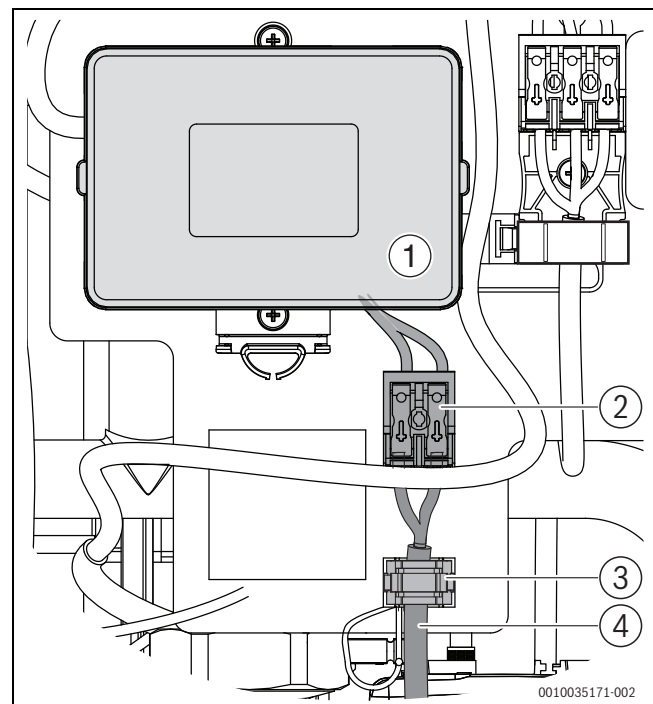


Fig. 29 Terminal on the relay box

- [1] Relay box
- [2] External booster heater control cable terminal (volt free)
- [3] Strain relief
- [4] External booster heater control cable

The mixing valve does not open immediately after the external booster heater is activated. A delay time for opening the mixing valve can be set at the control unit (→ Chapter 8.5.2).



Always set the delay time to 0 min for hybrid applications.

Possible cycling of the boiler is a normal procedure. A buffer cylinder can be installed if problems occur with the external auxiliary heater because the elapsed time is too short.

- ▶ For more information, contact the manufacturer of the external booster heater.

6.6.2 Connect the alarm signal for the external booster heater

Connection of the alarm signal depends on whether or not the external booster heater has a 230 V alarm output.

If the external booster heater is equipped with a 230 V alarm output:

- ▶ Remove jumper between terminal 61 and 64 (→ Chapter 12.2, page 36).
- ▶ Connect 230 V alarm signal (AC) as shown in figure 30 to the installer module at terminal **FMO** (→ Chapter 12.2, page 36 [26]).

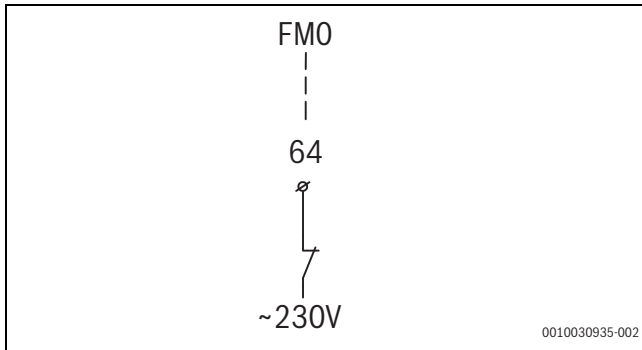


Fig. 30 Connection for external booster heater with 230 V alarm output

If the external booster heater is not equipped with a 230 V alarm output:

- ▶ Connect alarm signal as shown in Fig. 31 to the installer module at terminal **FMO**.

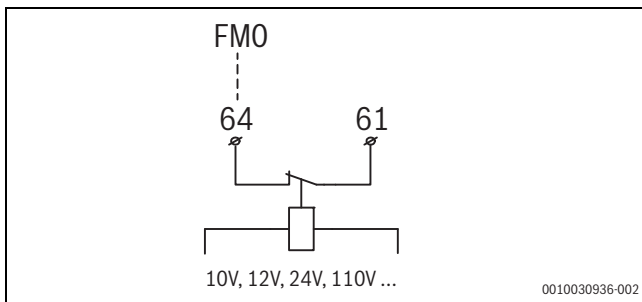


Fig. 31 Connection for external booster heater without 230 V alarm output

6.7 Accessories

6.7.1 EMS BUS

EMS-BUS for accessories

The following applies to accessories that are connected to the EMS-BUS (see also the installation instructions for the respective accessories):

- ▶ If several BUS units are installed, there must be a minimum spacing of 100 mm between them.
- ▶ If several BUS units are installed, connect them in series or in a star configuration.
- ▶ Use cable with a minimum cross-section of 0.5 mm².
- ▶ In case of external inductive interferences (e.g. from PV systems), use screened cables. Only earth the shielding to the casing on one side.
- ▶ Connect the cable on the installation module to terminal EMS-BUS.

If a component is already connected to the EMS terminal, establish the connection in parallel to the same terminal according to Fig. 32.

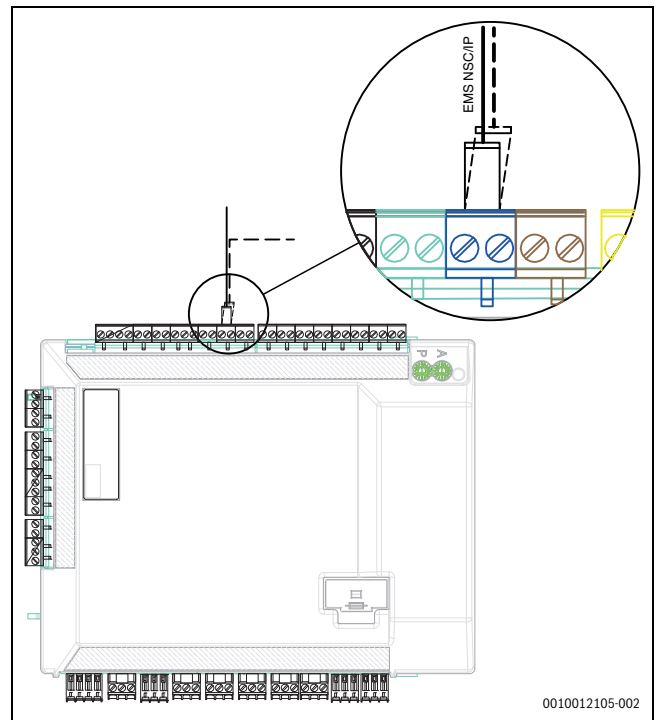
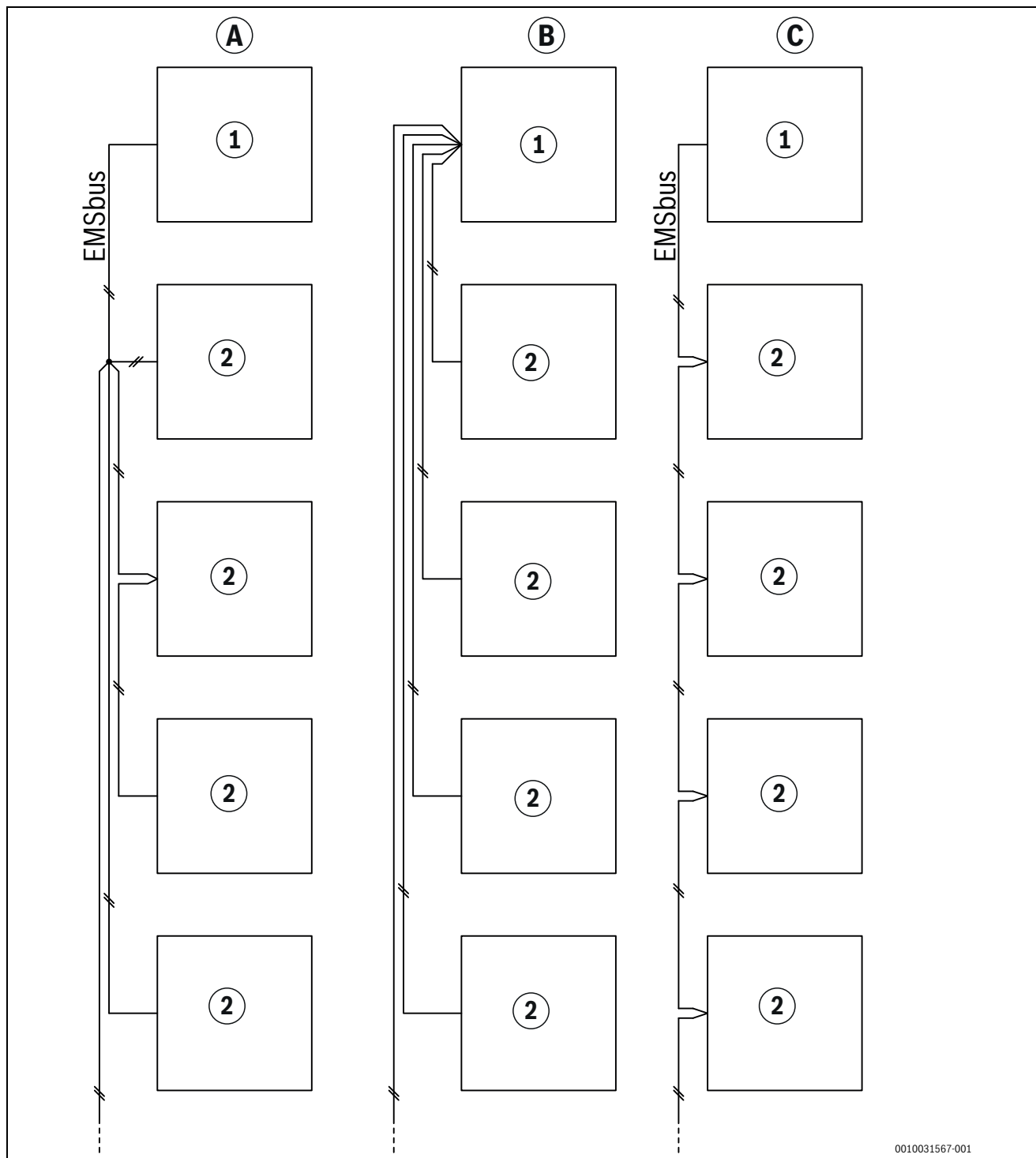


Fig. 32 EMS connection on the installer module

Connection alternative for EMS bus


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Fig. 33 Connection alternative for EMS bus

- [A] Star configuration and connection in series with external junction box
- [B] Star configuration
- [C] Serial connection
- [1] Installation circuit board
- [2] Accessory modules (room temperature-dependent controller, heating circuit module and solar module)

6.7.2 Connect the flow temperature sensor

The connection of the flow temperature sensor depends on the design of the heating system.

If the heating system is equipped with a buffer cylinder:

- ▶ Disconnect the flow temperature sensor in the indoor unit from connection **T0** (→ Chapter 12.2).
- ▶ Connect flow temperature sensor of the buffer cylinder to connection **T0** (→ Chapter 12.2).

No additional measures are required when the heating system is not equipped with a buffer cylinder as the flow temperature sensor has already been connected in the indoor unit.

Assembly downstream of the bypass or at the buffer cylinder

If the flow temperature sensor is installed outside the indoor unit on the buffer cylinder or downstream of the bypass, it must be completely removed from the indoor unit (→ Fig. 34) and if necessary extended using a suitable extension cable (H03VV-F 2x0.5 mm²) of corresponding length, as described below (→ Fig. 35).

- ▶ Removing the front panel
- ▶ Unplug the plug on the T0 connection
- ▶ Remove the clip on the flow pipe
- ▶ Take the flow temperature sensor with cable out of the wiring harness in the enclosure.
- ▶ Remove the plug from the cable (→ Fig. 35).
- ▶ Install the plug on the extension cable (→ Fig. 35) and plug into the T0 connection.
- ▶ Route the extension cable through the cable feeds in the enclosure and through an available cable feed in the base of the enclosure to the outside (→ Chapter 6.2).
- ▶ Connect the extension cable to the cable of the temperature sensor using a connection terminal (→ Fig. 35).

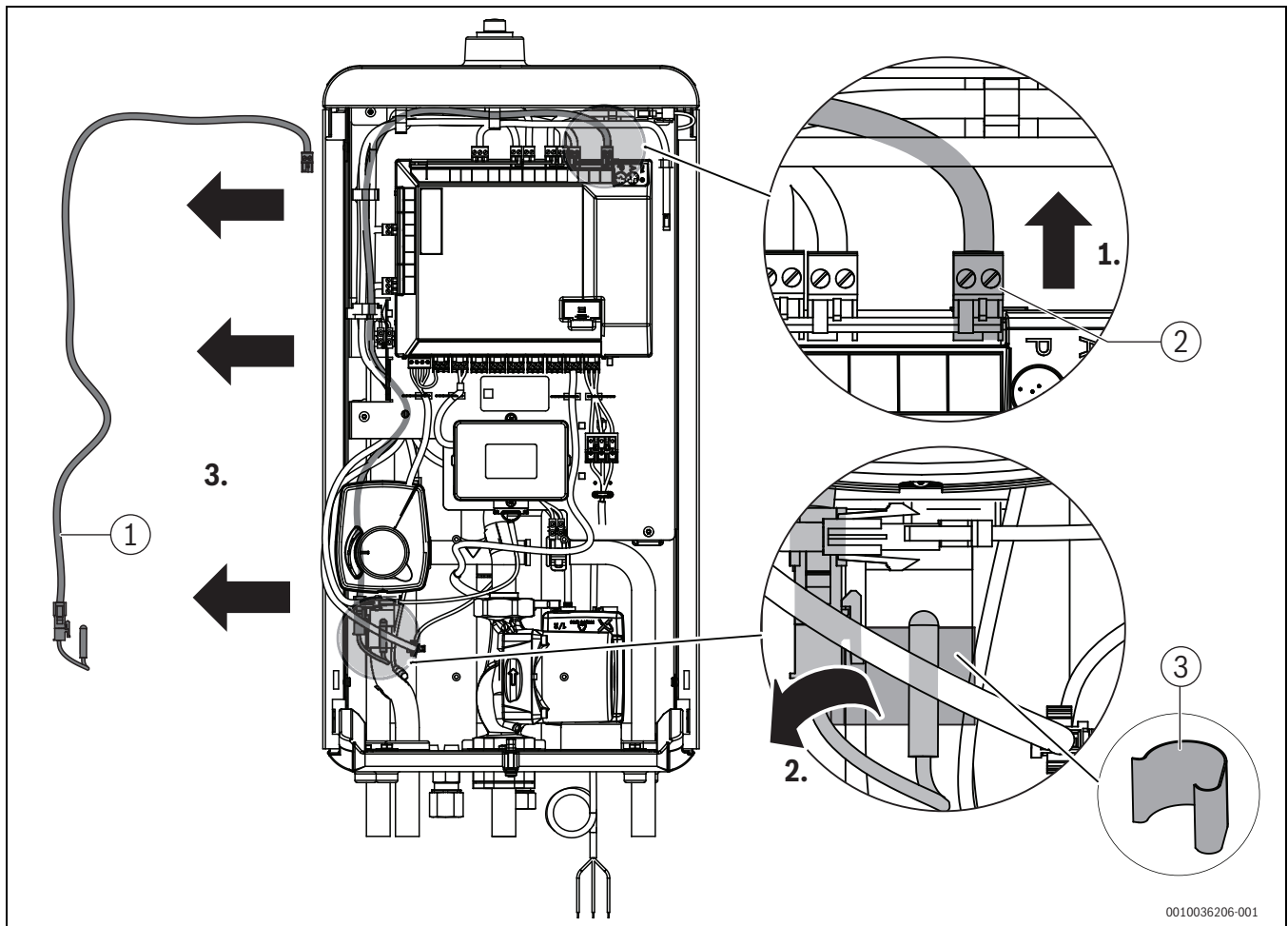


Fig. 34 Remove the flow temperature sensor with cable

- [1] Flow temperature sensor with cable
- [2] Plug on the T0 connection
- [3] Clip on the flow pipe

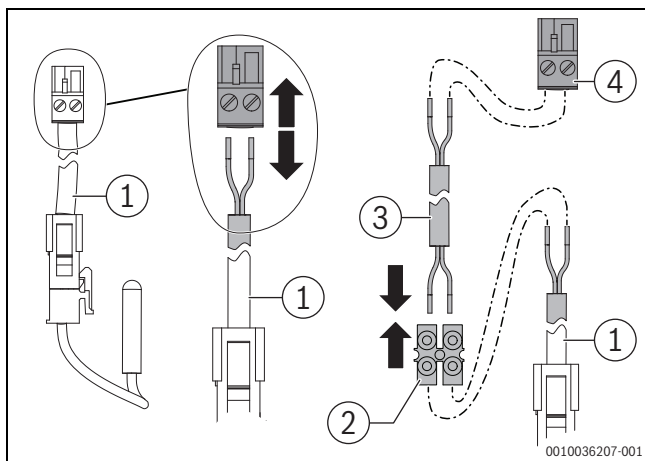


Fig. 35 Extending the flow sensor cable

- [1] Flow temperature sensor with cable
- [2] Connection terminal
- [3] Extension cable
- [4] Plug, T0 connection

6.7.3 Connecting the heating circuit module

- ▶ Connect the heating circuit module to the connection **EMS** (→ Chapter 12.2 on page 36).

If an accessory is already connected at the EMS connection:

- ▶ Connect heating circuit modules at the **EMS** connection parallel to the accessory which is already installed (→ Chapter 6.7.1 on page 21).

6.7.4 Room temperature-dependent controller



As an option, underfloor heating circuits in damp areas (e.g. bathroom or kitchen) can be controlled via the indoor unit.

- ▶ Connect the control of the underfloor heating circuit to connection **PK2** (→ Chapter 12.2 on page 36).

Room sensor with integrated humidity sensor (CR10H or ModuLine 1010H)

When installing a room sensor with integrated humidity sensor:

- ▶ Connect the room sensor to the connection **EMS** (→ Chapter 12.2 on page 36).

If an accessory is already connected at the EMS connection:

- ▶ Connect the room sensor at the connection **EMS** parallel to the accessory which is already installed (→ Chapter 6.7.1 on page 21).

Room sensor without integrated humidity sensor (CR10 or ModuLine 1010)

When installing a room sensor without integrated humidity sensor:

- ▶ Connect the room sensor to the connection **EMS** (→ Chapter 12.2 on page 36).

If an accessory is already connected at the EMS connection:

- ▶ Connect the room sensor at the connection **EMS** parallel to the accessory which is already installed (→ Chapter 6.7.1 on page 21).
- ▶ Connect humidity sensor to the **MK2** connection (→ Chapter 12.2 on page 36).

6.7.5 Connecting the swimming pool mixer

- ▶ Connect the swimming pool mixer to the **EMS** connection (→ Chapter 12.2 on page 36 [6]).

If an accessory is already connected at the EMS connection:

- ▶ Connect the swimming pool mixer to the **EMS** connection parallel to the accessory which is already installed (→ Chapter 6.7.1 on page 21).

6.7.6 Connecting MB LAN 2

The MB LAN 2 serves as interface between the heating system and a network (LAN).

The MB LAN 2 can be used to control and monitor the heating system via a mobile phone.

To be able to use the MB LAN 2, the following prerequisites must be met:

- Internet access is available.
- The RJ45 output of the router is available.
- The corresponding app is installed on the mobile phone.



Additional costs may be incurred when using the Internet access for the MB LAN 2.

- ▶ Connect the MB LAN 2 to the following connections:
 - **Power supply for MB LAN 2 12 V**
 - **EMS**

(→ Chapter 12.2 on page 36 [3 and 6])

If an accessory is already connected at the EMS connection:

- ▶ Connect the MB LAN 2 to the **EMS** connection parallel to the accessory which has already been installed (→ Chapter 6.7.1 on page 21).

6.7.7 External inputs

NOTICE

Damage due to incorrect connection!

Connections intended for a different voltage or current can damage electrical components.

- ▶ Only perform connections to the heat pump's external inputs which are designed for 5 V and 1 mA.
- ▶ If an intermediate relay is required, use only relays with gold-plated terminals.

The external inputs can be used for the remote control of certain functions in the user interface.

Those functions which are activated by the external inputs are described in the operating manual for the user interface.

The external inputs are connected either to a circuit breaker for manual activation or a control device with a relay output for 5 V.

7 Commissioning

7.1 Filling and venting the heating system

NOTICE

The system will be damaged if it is turned on without water.

The system may be damaged if it is turned on without water.

- ▶ Fill the DHW cylinder and heating system **before** turning on the heating system, and establish the correct pressure.



Hydraulic diagram of the indoor unit → Chapter 12.1, page 32

Filling the heating system

- ▶ Interrupt the power supply to the outdoor unit, indoor unit and external booster heater.
- ▶ Activate automatic air vent valve by unscrewing the screw a couple of turns to loosen it, without completely removing it.
- ▶ Open all valves in the heating system.
- ▶ If installed, activate the other automatic air vent valves in the heating system.
- ▶ Ensure flow rate at the particulate filter, open ball valve if required.
- ▶ Slowly fill the heating system via an external booster heater.

Operating pressure

1.2-1.5 bar	Minimum charge pressure. Fill the system to a pressure of 0.2–0.5 bar above the pre-charge pressure of the expansion vessel when the heating system is cold.
3 bar	Maximum charge pressure at maximum heating water temperature: must not be exceeded (the pressure relief valve will open).

Table 6 Operating pressure

- ▶ If the pressure does not remain constant, check whether the heating system and the expansion vessel are tight.
- ▶ Reconnect the power supply to the outdoor unit, indoor unit and external booster heater.

Venting the heating system

- ▶ Select the menu item **Activating function checks** in the service menu of the indoor unit to start the ventilation program.



Alternative:

- ▶ Select the menu item **DHW circ. pump**: ON/OFF in the service menu.
- ▶ Switch the DHW circulation pump of the indoor unit on and off cyclically with a speed of 100%.
- ▶ If installed, switch other DHW circulation pumps in the heating system cyclically on and off.
- ▶ Check the operating pressure and top up water if necessary until the required pressure in the heating system has been reached.
- ▶ Vent the system via other air vent valves of the heating system (e.g. radiators).
- ▶ Repeat steps 1 to 4 until the heating system has been vented.
- ▶ Clean the particulate filter.

7.2 Operation without outdoor unit (Stand-alone mode and chimney sweep mode)

The indoor unit can be brought into operation without the outdoor unit connected, for example when the outdoor unit is installed later. This is referred to as **Stand-alone mode** or stand-alone operation.

In **Stand-alone mode**, the indoor unit uses the external booster heater exclusively for heating and for DHW heating.

If the indoor unit and the heating system are filled before the outdoor unit is connected, circulation of the heat transfer medium must be ensured:

- ▶ Connect the heat transfer medium input and output.
- ▶ Open all shut-off valves in the heat transfer medium circuit.

Commissioning in individual operation:

- ▶ In the service menu **Heat pump**, set the option **Stand-alone mode** (→ Control unit manual).



The setting **Stand-alone mode** is also required for **chimney sweep mode!**

- ▶ In the service menu **Heat pump**, set the option **Stand-alone mode** (→ Control unit manual).
- ▶ Once the work in chimney sweep mode is complete, reset the setting.

7.3 Function test

7.3.1 Operating temperatures



The operating temperature check must be performed in heating mode (not in DHW or cooling mode).

For optimum system operation, the flow rate in the heat pump and heating system must be monitored. This check should be performed after 10 minutes heat pump operating time and during high compressor heating output.

The temperature differential for the heat pump must be set for the different heating systems.

- ▶ With underfloor heating system: set a temperature difference of 5 K.
- ▶ With radiators: set a temperature difference of 8 K.

These settings are optimal for the heat pump.

Check the temperature differential at high compressor heating output:

- ▶ Open the diagnosis menu.
- ▶ Select Monitored values.
- ▶ Select Heat pump.
- ▶ Select Temperatures.
- ▶ Read the primary flow temperature (heat transfer medium off, sensor TC3) and return temperature (heat transfer medium on, sensor TC0) in heating mode. The flow temperature must be higher than the return temperature.
- ▶ Calculate the difference TC3–TC0.
- ▶ Check whether the difference corresponds to the delta value set for heating mode.

If the temperature differential is too large:

- ▶ Vent the heating system.
- ▶ Clean filters / strainers.
- ▶ Check pipe dimensions.



The compressor is preheated before starting. This can take up to 2 hours, depending on the outdoor temperature. The prerequisite for starting is that the value recorded by the temperature sensor of the compressor (TR1) is 10 K higher than the temperature sensor at the supply air terminal device (TL2). The temperatures are displayed in the diagnosis menu of the control unit.

- ▶ Test active components of the system.
- ▶ Check whether the start condition for the heat pump has been satisfied.
- ▶ Check if there is a heating or hot water demand.

-or-

- ▶ Draw off DHW or increase the heating curve to generate demand (→ instructions for control unit).
- ▶ Check whether the heat pump starts.
- ▶ Make sure that no alarms are currently active.

-or-

- ▶ Troubleshooting.
- ▶ Check the operating temperatures (→ instructions for the control unit).

8 Settings



The user guide for the control unit contains a comprehensive description of all functions and settings

8.1 Overview of control elements and symbols

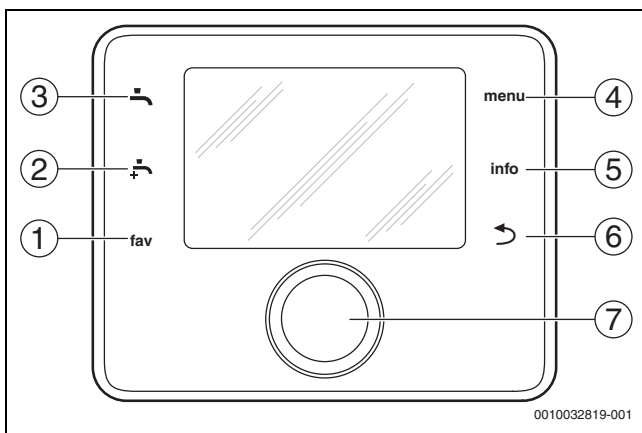


Fig. 36 Control elements

- [1] **fav** key: calls up the favourites menu
- [2] **extra DHW** key: starts extra DHW charging
- [3] **DHW** key: set the operating mode for DHW heating
- [4] **menu** key: main menu (press briefly)
- [5] **info** key: info menu or further information about the current selection
- [6] **↶** key: returns to previous menu or discards a value (press briefly); returns to the standard display (hold down)
- [7] **Selector**: select (turn) and confirm (press)



If the display lighting is off, only the lighting goes on when the selector is pressed for the first time. When the selector is turned and another control element is pressed at the same time, the lighting is switched on in addition to the effect described. The descriptions of the steps to be carried out by the operator in these instructions always assume that the lighting is activated. If no control element is actuated, the lighting turns off automatically (after approx. 30 s with the standard display, after approx. 30 min in the menu, after 24 h in the event of a fault).

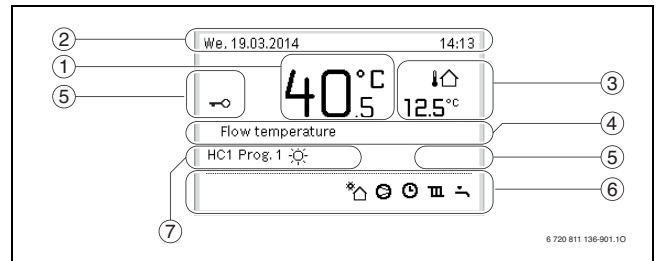


Fig. 37 Symbols in the standard display (example display)



The standard display refers only to the displayed heating circuit. Changing the required room temperature in the standard display only affects the heating circuit displayed.

Item	Symbol	Explanation
1	20.5 °C	Value display (current temperature): <ul style="list-style-type: none"> • Room temperature if a remote control is installed for the actual heating circuit. • Heat source temperature if there are no remote control installed.
2	-	Info line: display of time of day, day of the week and date.
3	8.0 °C	Additional temperature display: outside temperature, temperature of the solar collector or a DHW system.
		For ventilation: display of the ventilation level.
		For ventilation: frost protection (reduced ventilation).
4	-	Text information: e.g. the designation of the temperature currently displayed (→ Fig. 37, [1]). If a fault is present, corresponding information will be displayed here until the fault has been rectified.
5		The key block is active (hold down the DHW key and selector to activate or deactivate the key block).






















Item	Symbol	Explanation
6		Solar circulation pump is in operation.
		DHW heating is active
		DHW thermal disinfection active
		Extra DHW active
		Pool heating active
		Heating active
		Cooling active
		Energy supplier interruption
		External input active (remote)
		Holiday mode active
		Time program active
		Smart grid function active
		Screed drying active
		Electric booster heater active
		Power guard active
		Additional heat source active
		Defrost function active
		Compressor (Heat pump) active
	An IP-module is installed and communication to the server is active.	
7	Op. mode	Operating mode: [Optimised operation] no time program active. Operating mode: [Program 1] [Program 2] automatic mode active (according to time program) for displayed heating circuit.
		Operating mode: heating mode active.
		Operating mode: setback mode active.

Table 7 Symbols in the display

8.2 Faults

You can find an overview of the faults that can appear on the display on our Internet page, which can be found at the address on the back of these instructions.

8.3 General commissioning of the user interface

- Do proper coding of the modules (observe instructions of the modules).
- Switch on the system.
- Commission the remote room control (observe the operating instructions of the remote room control).
- Once the user interface HPC 400 is connected to the power supply, the **Language** menu appears on the display. Make adjustments by turning and pressing the selector.
- Set the language.
The display changes to the **Date** menu.
- Set the date and confirm with **Next**.
The display changes to the **Time** menu.
- Set the time and confirm with **Next**.
The display changes to the **Country information** menu.
- Set the country and confirm.
The display changes to the **Buffer cyl.** menu.
- Select **Yes** if a buffer cylinder is installed and confirm. Otherwise select **No** and confirm¹⁾.
The display changes to the **Configuration wizard** menu.
- Start the configuration wizard with **Yes** (or skip with **No**).
- Check and, if necessary, adjust the settings in the service menu and perform configuration of specific modules (e.g. solar).
- Remedy warning and fault displays, if necessary, and reset fault history.
- Name heating circuits (→ operating instructions).
- System handover (→ Chapter 8.4).

8.4 System handover

- Enter the contact details of the responsible contractor in the **Diagnosis > Maintenance > Contact addr.** menu, e.g. company name, phone number and address or e-mail address.
- Explain to the customer how the user interface and the accessories work and how to operate them.
- Inform the customer about the selected settings.

1) The buffer cylinder option is not available for Air/Water indoor units with integrated buffer cylinder (AWMB).

8.5 Service menu

8.5.1 Menu: Set additional heater

Make the additional heater general settings in this menu. These settings are only available if the system is designed and configured accordingly and the type of appliance used supports this setting.

Menu item	Control range: Function description
Gen. additional heater settings	<p>These settings are valid for all types of additional heaters.</p> <p>[Additional heater on delay]: 10...300...1000 K x min</p> <p>The additional heater is switched on after a set delay. The delay is depending on time and deviation from desired flow temperature.</p> <p>[Mode after EVU block]: [Comfort]: The heat pump is allowed to start immediately after the blocking period. [ECO]: The heat pump is allowed start with a delay after the blocking period.</p> <p>[Auxiliary heater only]: [Yes] [No]: This setting specifies whether the additional heater should be the only heat source or not.</p> <p>[Switch off add. heater]: [Yes] [No]: This setting specifies whether the heat pump should be the only heat source or not. If blocking is selected the additional heater will still be available during extra DHW, thermal disinfection or alarm operation.</p>
	<p>[Max. add. heater temp.]: This setting specifies whether the additional heater should be blocked or limited while the heat pump is running close to its maximum flow temperature. The setting is activated by selecting and setting the offset.</p> <p>[Maximum limit]: Below this offset from the flow temperature the additional heater is blocked.</p> <p>[Limit start]: Below this offset from the flow temperature the additional heater is limited.</p>

Table 8 Settings in the additional heater data menu

8.5.2 Menu: Auxiliary heater with mixer

Make the mixed auxiliary heater specific settings in this menu. These settings are only available if the system is designed and configured accordingly and the type of appliance used supports this setting.

Menu item	Control range: Function description
Mixed aux. heat. conn	<p>[230V] The mixed additional heater is controlled by on/off signal.</p> <p>[0-10V] The mixed additional heater is controlled based on power demand.</p>
Delay time for mixer	[0...120] min: Set the delay for opening of the mixing valve to allow the auxiliary heater to preheat.
Mixer run time	[1... 120 ...6000] s: Set the runtime for the mixing valve to go from one end point to the other.
Alarm input logic	[Open contact] [Closed contact]: Set if the auxiliary heater has a "NO" or "NC" output for the alarm.
Outs. temp par. mode ¹⁾	[-20...20] °C: The auxiliary heater is allowed to start in parallel operation below the set outdoor temperature.
Bival. pt. parallel mode ²⁾	
Outdr temp switch mod ¹⁾	[-20...20] °C: The auxiliary heater is allowed to start and the heat pump is blocked below the set outdoor temperature (Alternating operation).
Bival. pt. switch mode ²⁾	
Add. heater DHW cylinder	[Yes] [No]: Choose if the DHW cylinder has an electric additional heater installed.

1) Not available if Germany is set as country.

2) Only available if Germany is set as country.

Table 9 Settings in the auxiliary heater data menu

8.6 Cooling mode

NOTICE

Damage to the indoor unit due to condensation

The indoor unit with mixer is not designed to be used in cooling mode below the dew point.

- ▶ Only use the indoor unit in cooling mode above the dew point.
- ▶ Set the minimum set flow temperature to at least 17 °C.

- ▶ Make the necessary settings for cooling mode in the service menu (→ instructions for control unit, **Heating circuit settings** section).

8.7 Adjusting the room temperature-dependent controller

- ▶ Install the room temperature-dependent controller according to the instructions (→ separate Installation and Operating Instructions).
- ▶ Set the room temperature-dependent controller as remote control **Fb** (→ separate Installation and Operating Instructions).
- ▶ Set the room temperature-dependent controller as control unit for heating circuit 1 (→ separate Installation and Operating Instructions).
- ▶ Make the room temperature settings (→ separate Installation and Operating Instructions).

9 Maintenance



WARNING

Risk to life from electric shock!

Touching live electrical parts can cause an electric shock.

- ▶ Before working on electrical parts, disconnect all phases of the power supply (fuse/circuit breaker) and lock the isolator switch to prevent unintentional reconnection.

NOTICE

Deformation due to heat!

If the temperature is too high, the insulation (EEP) in the indoor unit deforms.

- ▶ When carrying out welding work in the heat pump, protect the insulation with a heat resistant cloth or damp cloth.

- ▶ Only use genuine spare parts!
- ▶ Refer to the spare parts list when ordering spare parts.
- ▶ Replace removed gaskets and O-rings with new ones.

The tasks described below must be carried out during an inspection.

Display activated alarm

- ▶ Check the alarm log (→ instructions for the control device).

General work

- ▶ Check that the heating system is generally in proper working order.
- ▶ Perform a visual inspection and function check of the heating system.
- ▶ Check all pipes for signs of corrosion and leaks.
- ▶ Replace any corroded pipework.
- ▶ Check the system for unusual noises.
- ▶ During the annual inspection, check the correct function of all regulating, control and safety equipment and, where applicable, for correct settings.

Function test

- ▶ Carry out function check (→ Chap. 7.3).

9.1 Draining the heating system

The heating system must be drained when replacing hydraulic components (e.g. DHW circulation pump) (→ Chapter 2.3).

- ▶ Interrupt the power supply to the outdoor unit, indoor unit and external booster heater.
- ▶ Close all valves in the heating system.
- ▶ Close all automatic air vent valves in the heating system.
- ▶ Interrupt the flow at the particulate filter, close ball valve if necessary.
- ▶ Connect a hose to the drain valve of the heating system and route the other end to a drain.
- ▶ Open the drain valve.
- ▶ Wait until no more water flows into the drain.
When water no longer flows, the indoor unit is empty.

9.2 Replacing components

- ▶ De-energise the indoor unit and outdoor unit.
- ▶ Drain the heating system (→ Chapter 9.1).
- ▶ When replacing temperature sensors, make sure they are connected correctly during installation (→ Chapter. 12.1, page 32).
- ▶ Replace component (→ instructions for component).
- ▶ Fill and vent heating system (→ Chapter 7.1).
- ▶ Restore the power supply to the indoor and outdoor unit.

9.2.1 Replacing the pump

- ▶ De-energise the indoor unit and outdoor unit.
- ▶ Drain the heating system (→ Chapter 9.1).
- ▶ Remove the cover (→ Chapter 5.3.1).
- ▶ Allow the system to cool and depressurise it.
- ▶ Pull off 2 plugs (power supply and signal) on the pump (→ Fig. 38).
- ▶ Remove the lock screw and pull the locking plate forwards and out (→ Fig. 39).

NOTICE

Damaged and leaking connector pipes!

The screw fittings and connector pipes may be damaged if excessive torques are applied when loosening and tightening the union nuts.

- ▶ Use a suitable tool.
 - ▶ Counterhold at the coupling points.
 - ▶ Perform the disassembly and assembly correctly.
-
- ▶ Undo union nuts at the pump then remove the pump and gaskets (→ Fig. 40). As you do so, counterhold at the coupling points using a suitable tool.
 - ▶ Insert new pump with new gaskets and fit union nuts on the pump.



Tighten the union nuts by hand then use a tool to turn them by approx. ¼ revolution.

- ▶ Fit locking plate.
- ▶ Connect cables.
- ▶ Fill and vent heating system (→ Chapter 7.1).
- ▶ Carry out tightness test.
- ▶ Restore the power supply to the indoor and outdoor unit.

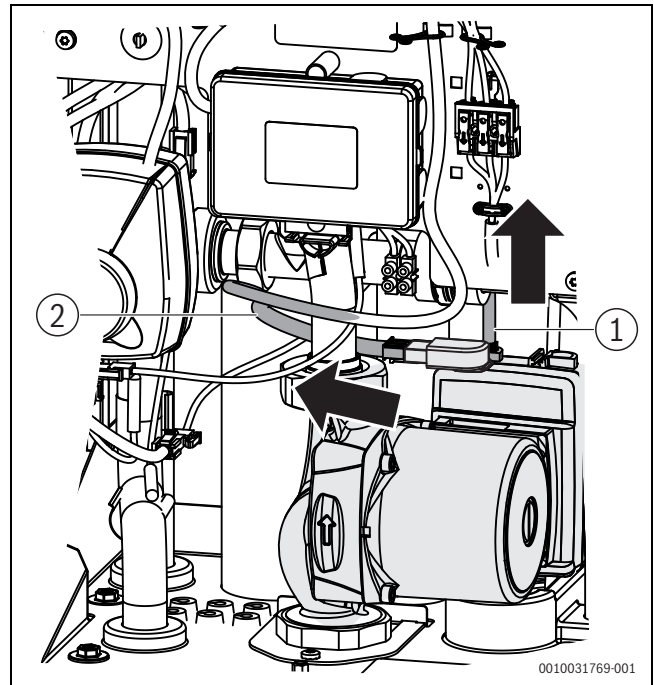


Fig. 38 Unplug the plug

- [1] Plug for PWM signal
- [2] Plug for power supply

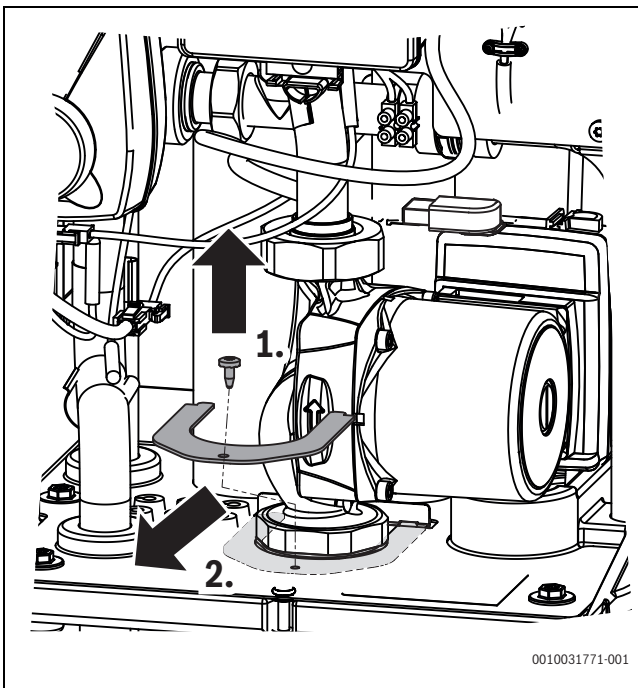


Fig. 39 Remove locking plate

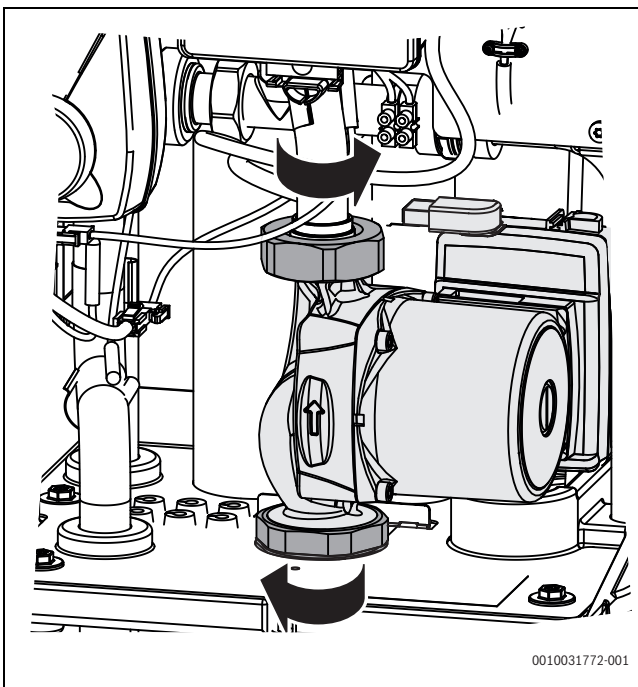


Fig. 40 Undo union nuts

9.2.2 Replacing the temperature sensor

- ▶ De-energise the indoor unit and outdoor unit.

NOTICE

Malfunction of the system!

The heating system could malfunction if the temperature sensor is connected incorrectly or swapped round.

- ▶ Do not swap the temperature sensor round (→ Chapter 12.1).
- ▶ Establish electrical connection correctly (→ Chapter 12.2).

10 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. "European Directive 2012/19/EC on old electronic and electrical appliances". 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-thermotechnolgy.com/

Batteries

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

11 Data Protection Notice



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12 Appendix

12.1 Hydraulic diagram

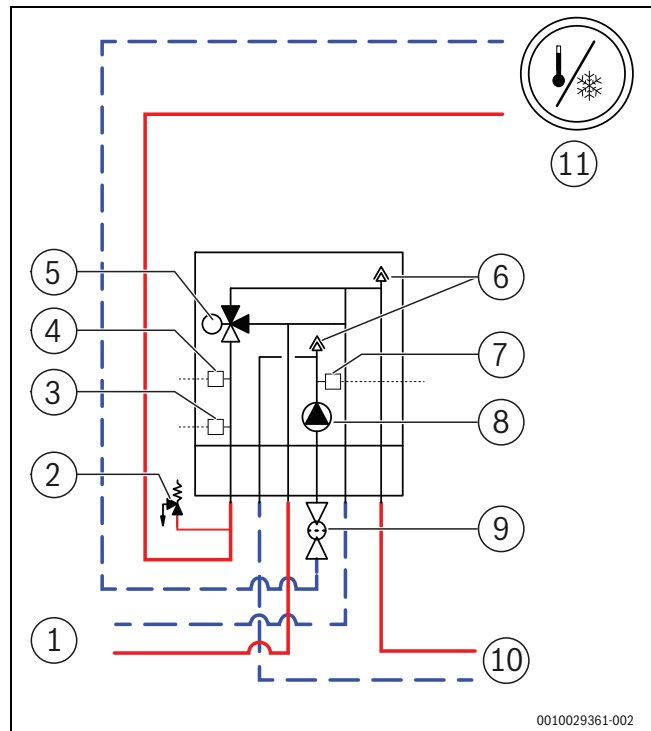


Fig. 41 Hydraulic diagram of the indoor unit

- [1] External booster heater
- [2] Water pressure relief valve
- [3] TO Flow temperature sensor at the outlet of the buffer cylinder (installed here instead of on buffer cylinder if buffer cylinder is not installed)
- [4] TC1 Flow temperature sensor
- [5] Mixing valve
- [6] Automatic air vent valve
- [7] TCO Return temperature sensor
- [8] PCO DHW circulation pump, heating circuit
- [9] Particulate filter (filter shut-off valve; accessory)
- [10] Outdoor unit
- [11] Heating system

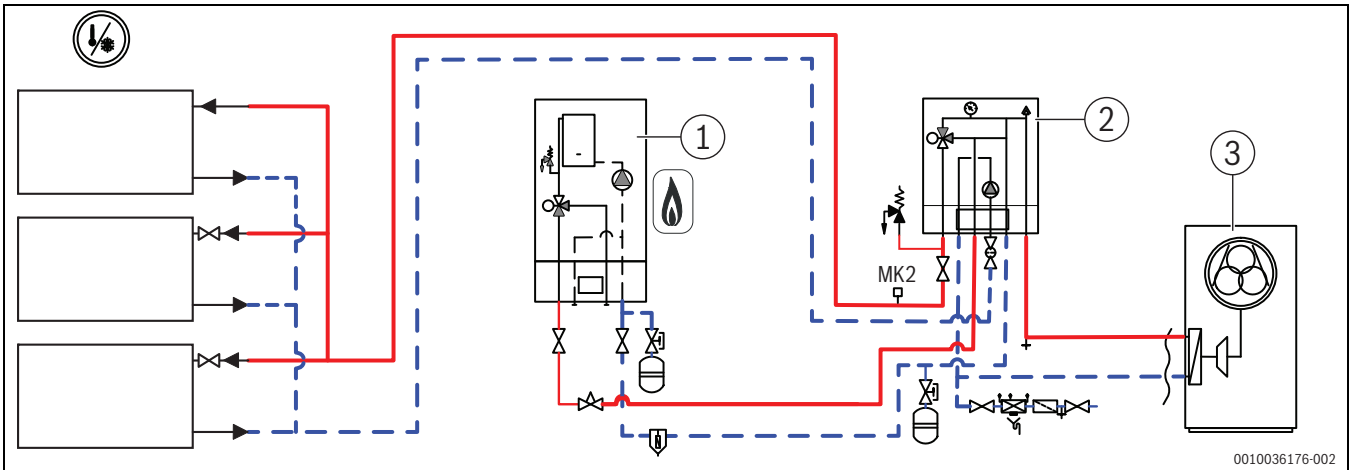


Fig. 42 Hydraulic diagram of a system (1 heating circuit, without bypass; example)

- [1] External booster heater
- [2] Indoor unit
- [3] Outdoor unit

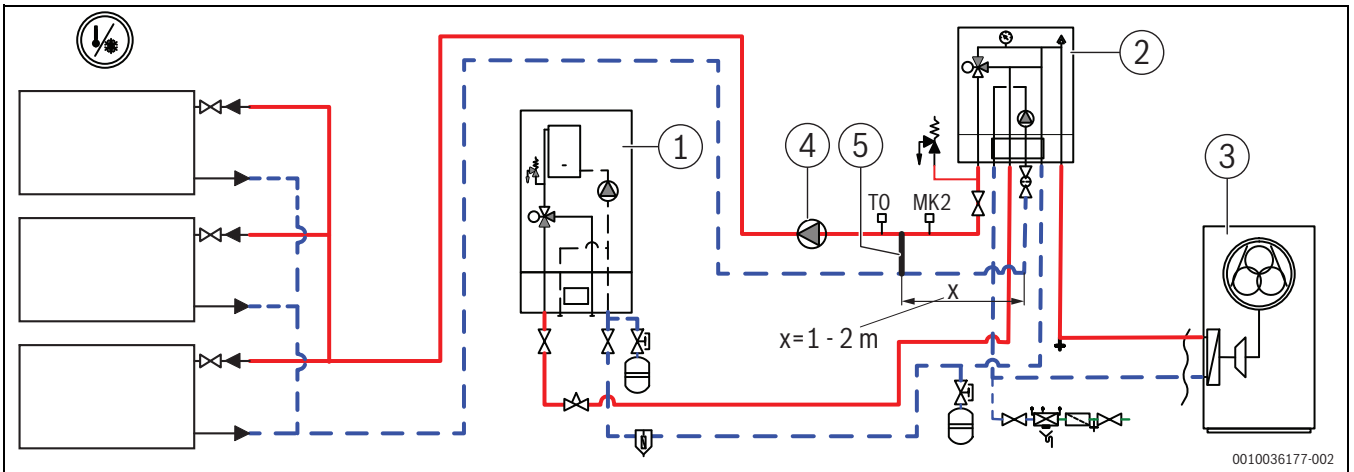


Fig. 43 Hydraulic diagram of a system (1 heating circuit, with bypass and heating pump), with bypass and heating pump; example)

- [1] External booster heater
- [2] Indoor unit
- [3] Outdoor unit
- [4] Additional heating pump
- [5] Bypass (→ Chapter 4.6, page 8)

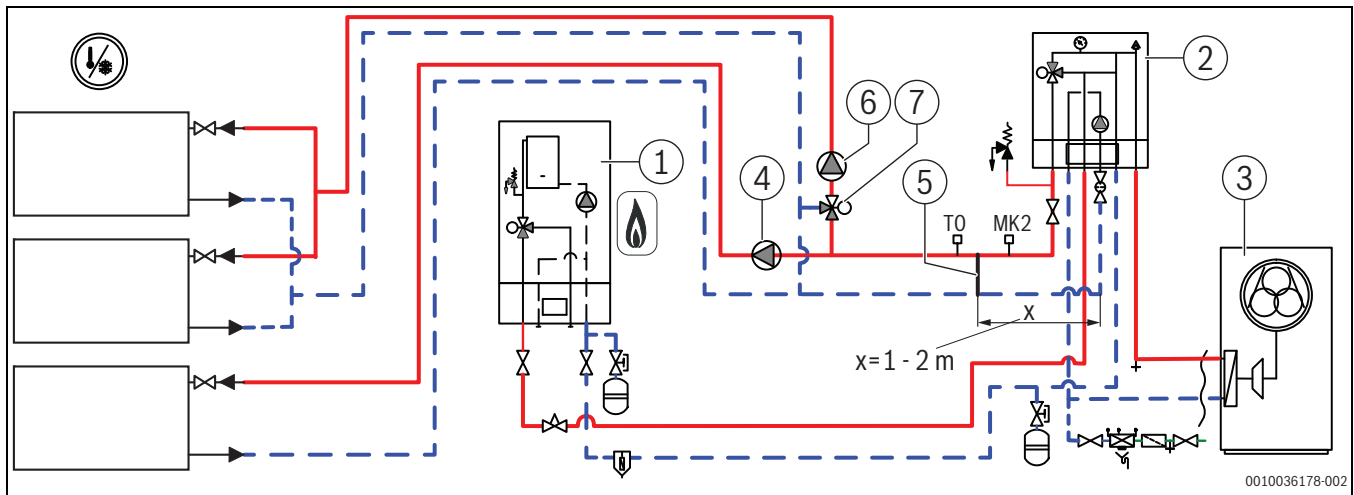
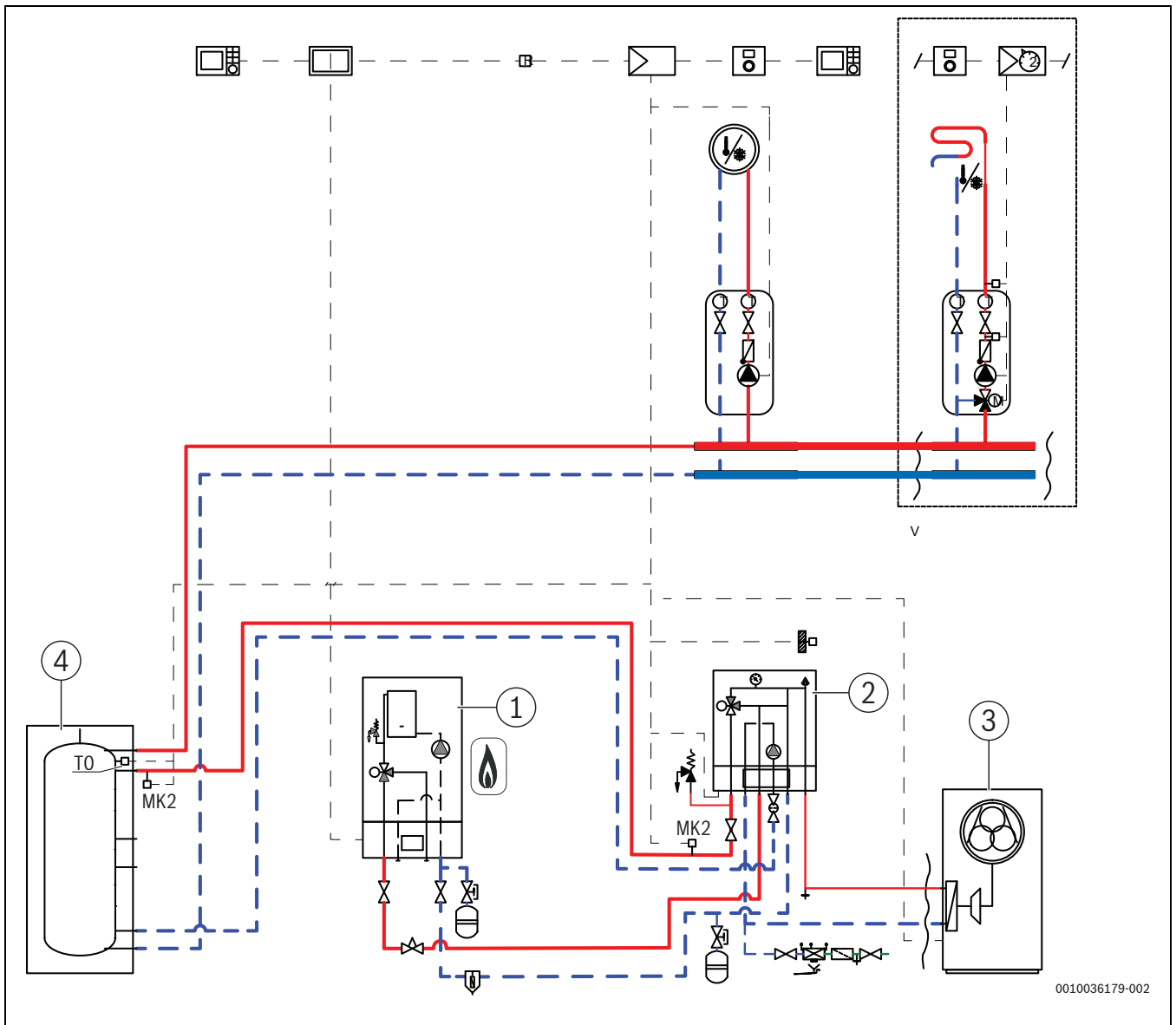


Fig. 44 Hydraulic diagram of a system (2 heating circuits, with bypass and heating pump; example)

- [1] External booster heater
- [2] Indoor unit
- [3] Outdoor unit
- [4] Additional heating pump (heating circuit 1)
- [5] Bypass (→ Chapter 4.6, page 8)
- [6] Heating pump (heating circuit 2)
- [7] Mixing valve (heating circuit 2)



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Fig. 45 Hydraulic diagram of a system (2 heating circuits, with cylinder; example)

- [1] External booster heater
- [2] Indoor unit
- [3] Outdoor unit
- [4] Buffer cylinder

12.2 Installer module

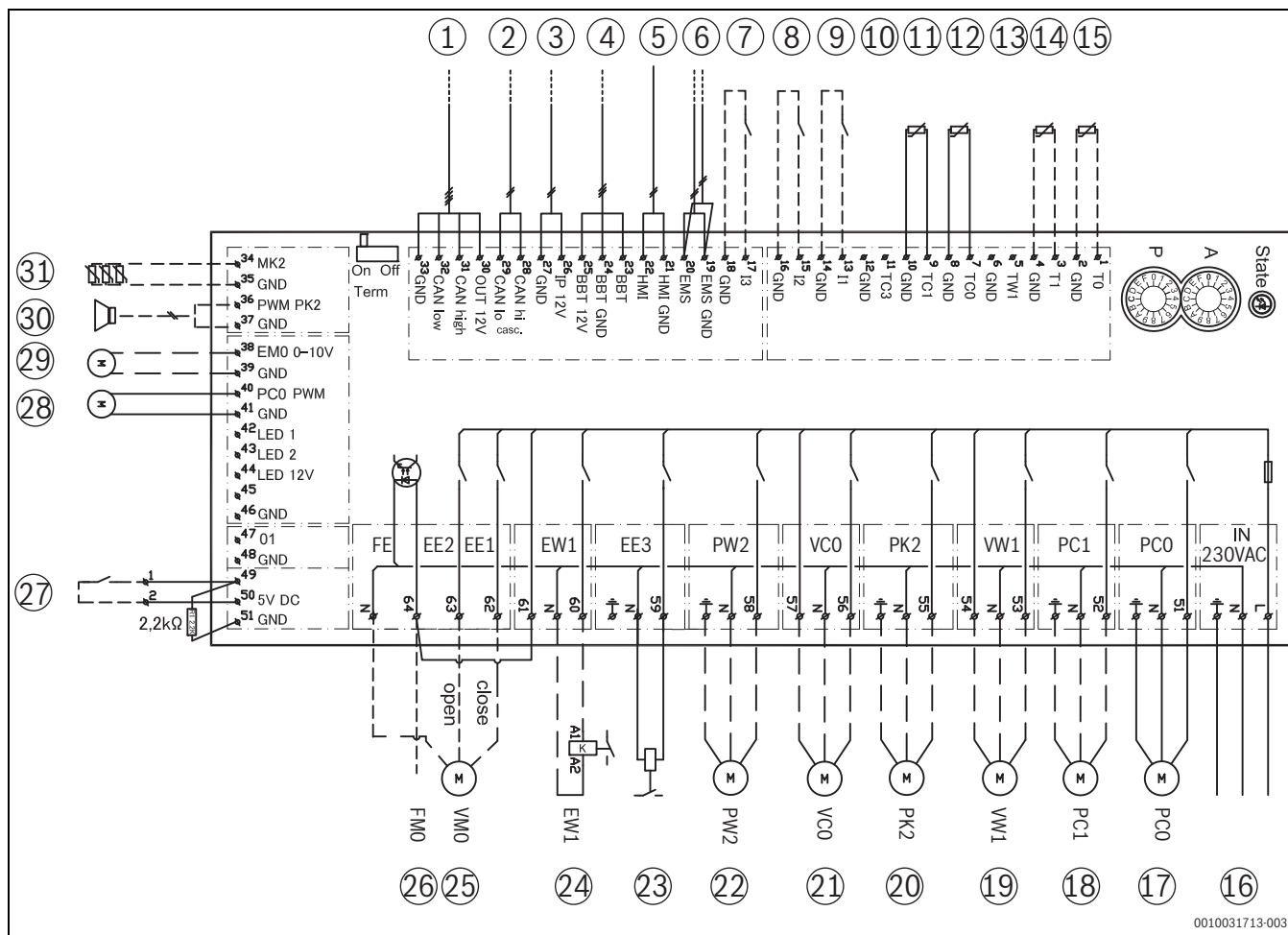


Fig. 46 Connection diagram of installer module

Solid line = factory connection

Dotted line = external connection

- | | |
|---|---|
| <ul style="list-style-type: none"> [1] CAN-BUS Connection to outdoor unit [2] CAN-BUS Connection for cascade [3] Power supply for MB LAN 2 12 V (accessory) [4] BBT Tool connection [5] EMS Connection for HMI [6] EMS Connection for accessory [7] External input 3 [8] External input 2 [9] External input 1 (energy supplier) [10] Not used [11] TC1 Flow temperature sensor [12] TCO Return temperature sensor [13] DHW temperature sensor for cylinder (not used, as DHW is supplied via external booster heater) [14] T1 Outside temperature sensor [15] T0 Flow temperature sensor at the outlet of the buffer cylinder (installed here instead of on buffer cylinder if buffer cylinder is not installed) [16] 230 V power supply [17] Power supply to the DHW circulation pump in the indoor unit [18] Power supply to the external heating circuit pump [19] Relay output for heating/DHW diverter valve (not used, as DHW is supplied via external booster heater) [20] Relay output for cooling mode, 230 V [21] Relay output for recirculation diverter valve, 230 V [22] Relay output for DHW circulation pump (not used, as DHW is supplied via external booster heater) | <ul style="list-style-type: none"> [23] Volt free output (connection terminal) on relay box for external booster heater [24] Relay output for 230 V electric booster heater in DHW cylinder (not used, as DHW is supplied via external booster heater) [25] Mixer of the external booster heater [26] Alarm for 230 V external booster heater [27] External input (smart grid) [28] PWM signal for the DHW circulation pump of the indoor unit [29] 0-10 V actuation for external booster heater [30] Alarm buzzer (accessory) [31] MK2 Humidity sensor (accessory for cooling mode) |
|---|---|

12.3 Tech data

	Unit	HC7000iAW 9l
Electrical data		
Power infeed	V	230 ¹⁾
Fuse size (recommended), class gL/C	A	10
Connected load	kW	0.5
Heating system		
Type of connection (heating flow, heat pump and flow/return of the auxiliary heater)	inch	3/4" (external thread)
Type of connection (heating return)	inch	3/4" (external thread)
Maximum operating pressure	bar	3
Expansion Vessel	l	Not integrated
Heat transfer medium		
Minimum flow (when defrosting)	l/s	0.32
Pump type PC0		Grundfos UPM2K 25-75 PWM
General		
Waste water connection	mm	Ø 32
Protection index		IPX1D
Dimensions (width x depth x height)	mm	350 x 246 x 706
Weight	kg	18
Sound pressure level	dB(A)	36
Maximum possible installation altitude of boiler above sea level	m	2000

1) 1NAC, 50 Hz

12.4 System commissioning report

Commissioning date:	
Customer address:	Last name, first name:
	Postal address:
	Town:
	Telephone number:
Installation company:	Last name, first name:
	Street:
	Town:
	Telephone number:
Product information:	Product type:
	TTNR:
	Serial number:
	FD-no.:
System components:	Receipt/value
Room control	<input type="checkbox"/> Yes <input type="checkbox"/> No
Room temperature-dependent control unit with humidity sensor	<input type="checkbox"/> Yes <input type="checkbox"/> No
Solar integration	<input type="checkbox"/> Yes <input type="checkbox"/> No
Buffer cylinder	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type/Volume (l):	
Domestic Hot Water Tank	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type/Volume (l):	
Other components	<input type="checkbox"/> Yes <input type="checkbox"/> No
Which?	
Minimum clearances of the outdoor unit:	
Is the outdoor unit on a solid, flat surface?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the outdoor unit securely anchored?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the outdoor unit standing in a location where snow cannot slide off the roof onto it?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Minimum wall clearance?mm	
Minimum clearances at sides?mm	
Minimum distance to roof?mm	
Minimum distance in front of the outdoor unit?mm	
Outdoor unit condensate hose	
Does the condensate hose have a heating cable?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Connections on the outdoor unit	
Were the connections established correctly?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Who installed/prepared the connecting pipework?	
Minimum clearances, indoor unit:	
Minimum wall clearance?mm	
Minimum distance in front of the unit?mm	
Heating:	
Pressure determined in the expansion vessel? bar	
The heating system has been filled according to the pressure determined in the expansion vessel to bar	
Has the heating system been flushed before installation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Has the particle filter been cleaned?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Electric connection:	
Were the low voltage cables installed with a minimum distance of 100 mm from 230 V/400 V cables?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Were the CAN-BUS connections established as specified in the instructions?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Has a power guard been connected?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the outside temperature sensor T1 on the coldest side of the house?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Power supply:	
Is the phase sequence of L1, L2, L3, N and PE in the outdoor unit correct?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the phase sequence of L1, L2, L3, N and PE in the indoor unit correct?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does the power supply correspond to the installation instructions?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Fuse for outdoor unit and electric booster heater, tripping characteristics?	
Manual operation:	
Was a function check of individual component groups performed (pump, mixing valve, diverter valve, compressor, etc.)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:	
Have the temperatures in the menu been checked and documented?	<input type="checkbox"/> Yes <input type="checkbox"/> No
T0	_____ °C
T1	_____ °C
TW1	_____ °C
TC0	_____ °C
TC1	_____ °C
Settings for auxiliary heater:	
Time delay, booster heater, target setting 0 min	
Block auxiliary heater	<input type="checkbox"/> Yes <input type="checkbox"/> No
Electric booster heater connected load settings	
Auxiliary heater, maximum temperature	_____ °C
Safety functions:	
Block outdoor unit at low outside temperatures	
Has the commissioning been performed correctly?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does the installer have to perform additional measures?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:	
Installer signature:	
Customer or installer signature:	

Table 10 System commissioning report

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