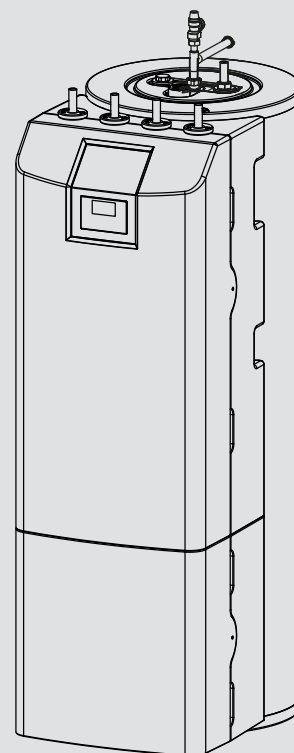


OPERATION AND INSTALLATION

Integral cylinder

- » HSBC 180 Plus (GB)
- » HSBC 180 S Plus (GB)



STIEBEL ELTRON

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GUARANTEE

ENVIRONMENT AND RECYCLING

SPECIAL INFORMATION OPERATION

- The appliance may be used by children over 8 years of age and persons with reduced physical, sensory or mental capabilities or a lack of experience and expertise, provided that they are supervised or they have been instructed on how to use the appliance safely and have understood the potential risks. Children must never play with the appliance. Cleaning and user maintenance must not be carried out by children without supervision.
- The connection to the power supply must be in the form of a permanent connection. Ensure the appliance can be separated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation.
- Observe all applicable national and regional regulations and instructions.
- Observe minimum distances (see chapter “Installation / Preparations / Installation site”).
- Only a qualified contractor should carry out installation, commissioning, maintenance and repair of the appliance.

DHW cylinder

- Drain the appliance as described in chapter “Installation / Maintenance / Draining the DHW cylinder”.
- Observe the maximum permissible pressure (see chapter “Installation / Specification / Data table”).
- The appliance is pressurised. During the heat-up process, expansion water will drip from the safety valve.
- Regularly activate the safety valve to prevent it from becoming blocked, e.g. by limescale deposits.
- The safety valve drain aperture must remain open to atmosphere.

1. General information

The chapters “Special information” and “Operation” are intended for appliance users and qualified contractors.

The chapter “Installation” is intended for qualified contractors.



Note

Read these instructions carefully before using the appliance and retain them for future reference. Pass on these instructions to a new user if required.

1.1 Relevant documents



Operating and installation instructions for the WPM heat pump manager



Operating and installation instructions for the connected heat pump



Operating and installation instructions for all other system components

1.2 Safety instructions

1.2.1 Structure of safety instructions



KEYWORD Type of risk

Here, possible consequences are listed that may result from failure to observe the safety instructions.

► Steps to prevent the risk are listed.

1.2.2 Symbols, type of risk

Symbol	Type of risk
	Injury
	Electrocution
	Burns (burns, scalding)

1.2.3 Keywords

KEYWORD	Meaning
DANGER	Failure to observe this information will result in serious injury or death.
WARNING	Failure to observe this information may result in serious injury or death.
CAUTION	Failure to observe this information may result in non-serious or minor injury.

OPERATION

Safety

1.3 Other symbols in this documentation



Note

General information is identified by the adjacent symbol.
► Read these texts carefully.

Symbol	Meaning
	Material losses (appliance damage, consequential losses and environmental pollution)
	Appliance disposal

► This symbol indicates that you have to do something. The action you need to take is described step by step.

□ □ ■ These symbols show you the software menu level (in this example level 3).

1.4 Information on the appliance

Connections

Symbol	Meaning	
	Inlet / intake	Red arrow: hot Blue arrow: Cold Green arrow: Neutral
	Drain / outlet	Red arrow: hot Blue arrow: Cold Green arrow: Neutral
	Domestic hot water	
	DHW circulation	
	Heat pump	
	Heating	

1.5 Units of measurement



Note

All measurements are given in mm unless stated otherwise.

2. Safety

2.1 Intended use

The appliance is used for heating and seasonal cooling of rooms and for DHW heating. For sub dew point cooling, CDT 180 condensate pump and condensate pan accessories must be used. With the CDT 180 accessories, cooling rooms is only permissible with monitoring of the dew point. Sub dew point cooling is only ever permissible on a seasonal basis with a subsequent heating period.

The appliance is intended for domestic use. It can be used safely by untrained persons. The appliance can also be used in non-domestic environments, e.g. in small businesses, as long as it is used in the same way.

Any other use beyond that described shall be deemed inappropriate. Observation of these instructions and of the instructions for any accessories used is also part of the correct use of this appliance.

2.2 General safety instructions



WARNING Burns

There is a risk of scalding at outlet temperatures in excess of 43 °C.



WARNING Injury

The appliance may be used by children over 8 years of age and persons with reduced physical, sensory or mental capabilities or a lack of experience and expertise, provided that they are supervised or they have been instructed on how to use the appliance safely and have understood the potential risks. Children must never play with the appliance. Cleaning and user maintenance must not be carried out by children without supervision.



WARNING Injury

For safety reasons, only operate the appliance with the front casing closed.



Note

The DHW cylinder is under supply pressure. During the heat-up process, expansion water will drip from the safety valve.

► If water continues to drip when heating is completed, please inform your qualified contractor.

2.3 Test symbols

See type plate on the appliance.

3. Appliance compatibility

The appliance can be operated in conjunction with the following air source heat pumps:

- WPL-A 05/07 HK 230 Premium
- WPL 07-17 ACS classic
- HPA-O 05.1/07.1 CS Premium
- HPA-O 3-8 CS Plus

4. Appliance description

The buffer cylinder and DHW cylinder with indirect coil are arranged one on top of the other.

The appliance has a plastic jacket with foam insulation and is equipped with a removable front casing. The appliance is connected hydraulically and electrically to the heat pump. All hydraulic connections are made at the top.

In addition to the DHW cylinder and the buffer cylinder, further system components are integrated:

- Heat pump manager
- Cylinder primary pump
- Highly efficient circulation pump for a heating circuit without mixer
- Multifunction assembly with safety valve, 3-way diverter valve and emergency/booster heater for mono energetic operation

DHW cylinder

The steel cylinder is equipped with special directly applied enamel coating on the inside and a sacrificial anode. The sacrificial anode protects the cylinder interior from corrosion.

The heating water heated by the heat pump is pumped through an indirect coil inside the DHW cylinder. The heat channelled through the indirect coil is thus transferred to the domestic hot water. The integral heat pump manager regulates the DHW heating to the required temperature.

Buffer cylinder

The steel cylinder provides hydraulic separation between the flow rates of heat pump and heating circuit. The heating water heated by the heat pump is transferred into the buffer cylinder by the cylinder charging pump. When a demand is issued, the integral heating circuit pump delivers the heating water to the heating circuit.

Heat pump manager (WPM)

The system is controlled by means of the integral heat pump manager.

The heat pump manager is suitable for the control of a direct heating circuit and a heating circuit with mixer.

You can set the times and temperatures for heating operation and heating DHW. Remote controls for controlling the direct heating circuit and the heating circuit with mixer are available as accessories.

For detailed information, see the enclosed operating and installation instructions for the WPM heat pump manager.

Multifunction assembly (MFG)

3-way diverter valve: The multifunction assembly switches between heating circuit and DHW heating.

Safety valve: When the pressure is high, the safety valve opens to relieve the pressure in the system.

Air vent valve: Components are vented through air vent valves, e.g. pipes or indirect coil.

Emergency/booster heater: in standard mode, the emergency/booster heater can support the heat pump in mono energetic mode below the dual mode point. Depending on the setting and connected heat pump, the emergency/booster heater can also be used to back up DHW heating or in pasteurisation mode. In the event of a heat pump malfunction, the emergency/booster heater can temporarily ensure DHW heating and the heating of rooms.

5. Settings



Material losses

The system's active frost protection is not guaranteed if the power supply is interrupted.

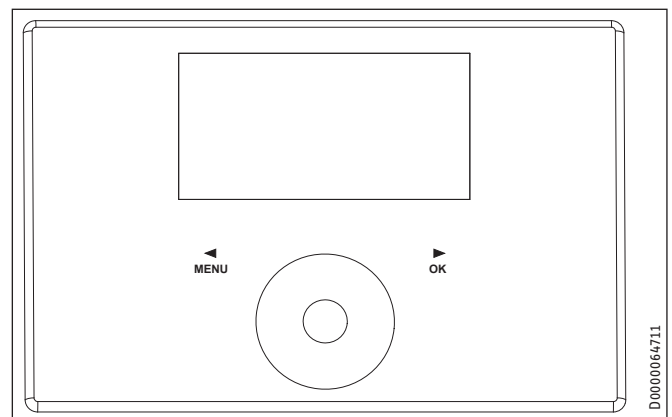
- ▶ Never interrupt the power supply even outside the heating season.



Note

The heat pump manager has an automatic summer/winter changeover so you can leave the system switched on in summer.

The system is controlled by means of the integral heat pump manager. Please observe the heat pump manager operating and installation instructions.



6. Cleaning, care and maintenance

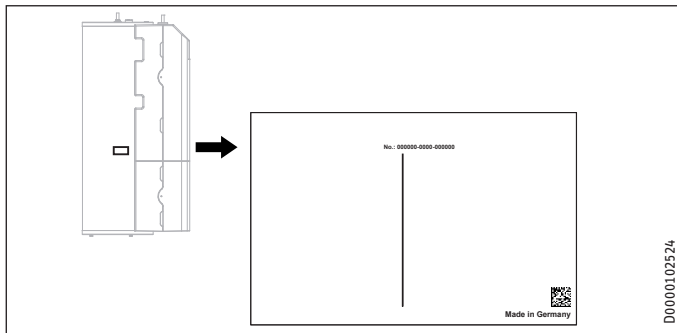
- ▶ Have the electrical safety of the appliance and the function of the safety assembly regularly checked by a qualified contractor.
- ▶ Have the sacrificial anode checked by a qualified contractor after the first two years of use. The qualified contractor will then determine the intervals at which the sacrificial anode should be checked.
- ▶ Never use abrasive or corrosive cleaning agents. A damp cloth is sufficient for cleaning the unit.

7. Troubleshooting

Problem	Cause	Remedy
The water does not heat up. The heating does not work.	There is no power.	Check the fuses / MCBs in your fuse box / distribution board.

Observe the information about troubleshooting in other applicable documents (see chapter “Other applicable documents”).

If you cannot remedy the fault, contact your qualified contractor. To facilitate and speed up your enquiry, please provide the serial number from the type plate (000000-0000-000000).



INSTALLATION

8. Safety

Only a qualified contractor should carry out installation, commissioning, maintenance and repair of the appliance.

8.1 General safety instructions

We guarantee trouble-free function and operational reliability only if original accessories and spare parts intended for the unit are used.

8.2 Instructions, standards and regulations



Note

Observe all applicable national and regional regulations and instructions.

9. Appliance description

9.1 Standard delivery

The following are delivered with the appliance:

- Operating and installation instructions for the WPM heat pump manager
- Outside temperature sensor AF PT
- 3 adjustable feet
- Drain hose
- DHW circulation line and flat gasket union nut
- Expansion vessel (incl. fastening material)
- Installation kit (pressure reducing valve, check valves, expansion relief valve, tundish)

9.2 Accessories

Required accessories

Safety assemblies and pressure reducing valves are available to suit the prevailing supply pressure. These type-tested safety assemblies protect the appliance against impermissible excess pressure.

Required for area cooling:

- Pt1000 temperature sensor
- FET remote control

Additional accessories

- Remote control for heating operation
- High limit safety cut-out STB-FB
- Water softening fitting HZEA
- CDT 180 condensate pump and condensate pan (required for continuous cooling without dew point monitoring)

INSTALLATION

Preparation

10. Preparation

10.1 Installation site

! Material losses
Never install the appliance in wet rooms.

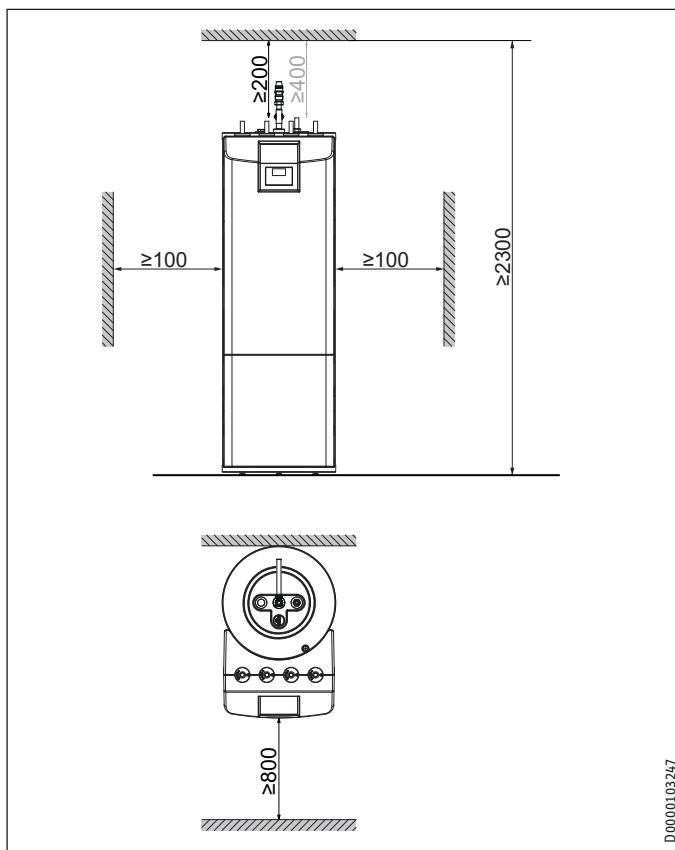
Install the appliance near the draw-off point in a dry room free from the risk of frost. To reduce line losses, keep the distance short between the appliance and the heat pump.

Ensure the floor has sufficient load bearing capacity and evenness (for weight, see chapter "Specification / Data table").

The room must not be subject to a risk of explosions arising from dust, gases or vapours.

If you are installing the appliance in a boiler room together with other heating equipment, ensure that the operation of the other heating equipment will not be impaired.

Minimum clearances



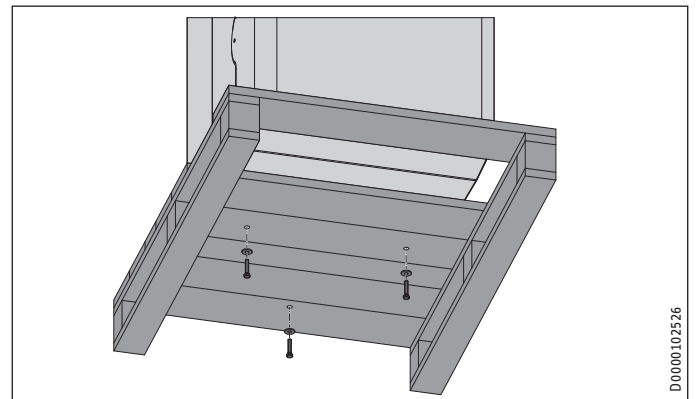
Minimum ceiling clearance: Without DHW circulation 200 mm, with DHW circulation 400 mm.

- Maintain the minimum clearances to ensure trouble-free operation of the appliance and facilitate maintenance work.

10.2 Transport and handling

! Material losses
► Store and transport the appliance at temperatures between -20 °C and +60 °C.

Note
Two people are required when installing the adjustable feet and transporting the appliance.



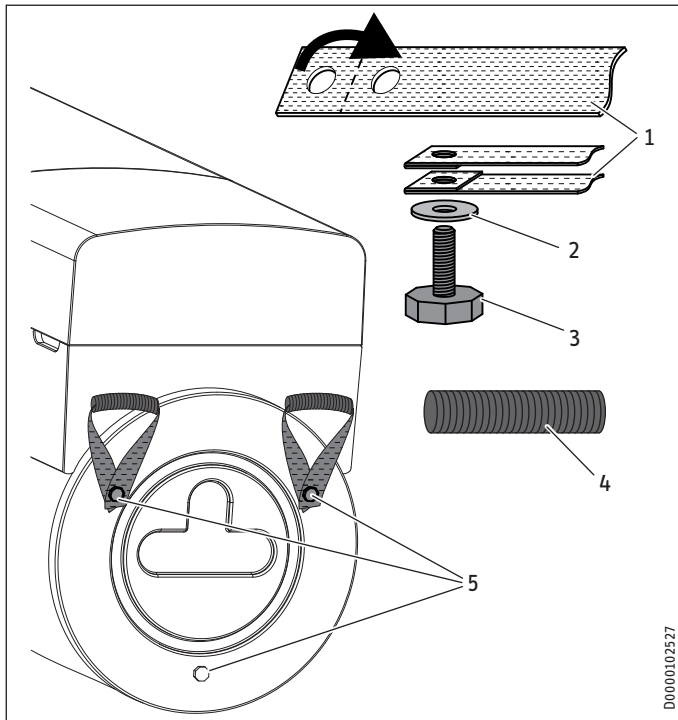
- Undo the 3 screws on the non-returnable pallet.

! Material losses
Never roll the appliance over the edge of the pallet.

INSTALLATION

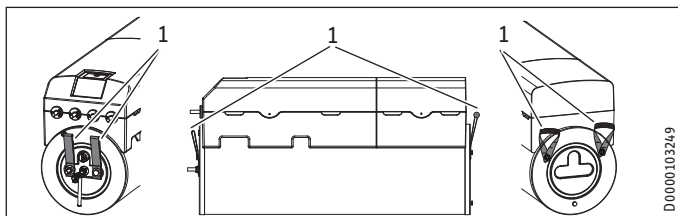
Installation

Installing supplied carrying straps and adjustable feet



- 1 Carrying strap
- 2 Washer
- 3 Adjustable foot
- 4 Pipe
- 5 Threaded hole

- ▶ Slide a pipe over one carrying strap.
- ▶ Fold over the end of the carrying strap with the two holes and insert an adjustable foot with washers into the carrying strap, as shown in the figure.
- ▶ Tilt the appliance.
- ▶ Screw the adjustable foot with the carrying strap into one of the threaded holes (shown in the figure) in the appliance base.
- ▶ Fit the second carrying strap likewise.
- ▶ Screw an adjustable foot without a carrying strap into the threaded hole in the appliance base.



- 1 Carrying straps



Material losses

Always carry the appliance by the carrying straps. Never transport the appliance using a hoist. During transportation, never subject the pipe connectors to any strain. Protect the appliance against heavy impact during transport.

- ▶ Lift the appliance off the pallet by the carrying straps.
- ▶ After transportation, tuck the lower carrying straps under the appliance. You can also cut off the upper and lower carrying straps.

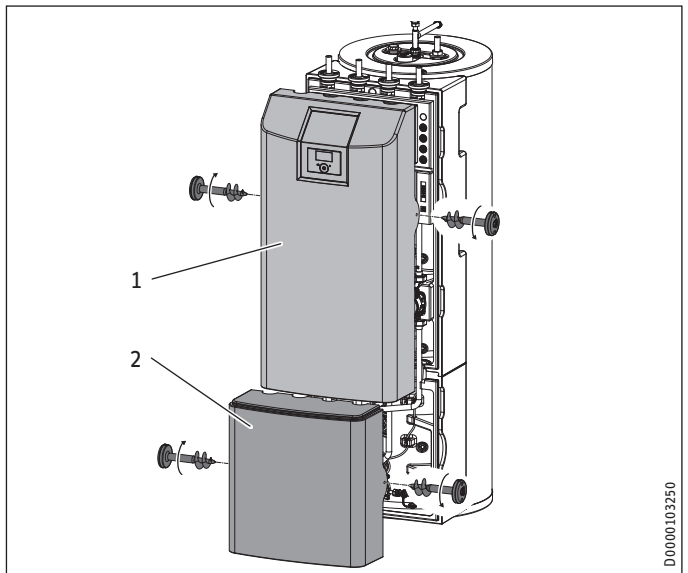
11. Installation

11.1 Positioning the appliance

- ▶ When positioning the appliance, observe minimum clearances (see chapter "Preparations / Installation site").
- ▶ Use the adjustable feet to compensate for any unevenness in the floor.

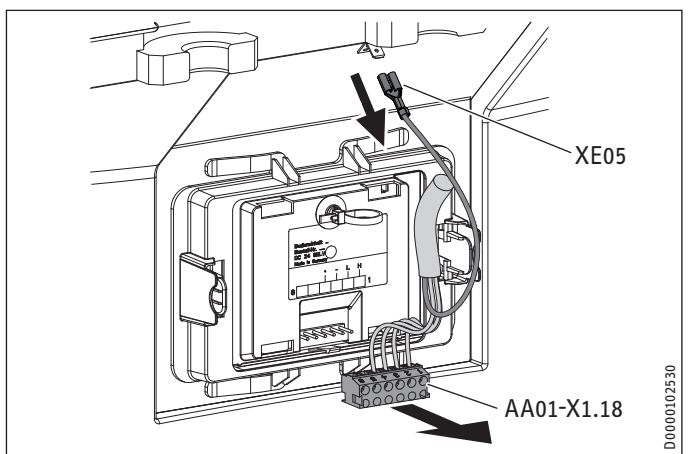
11.2 Removing/fitting the front casing

Removing the front casing



- 1 Upper front panel
- 2 Lower front panel

- ▶ Remove the screws on the left and right of the upper front panel.
- ▶ Carefully pull the upper front panel forwards to remove it from appliance and store it securely so that it cannot tip over, without putting strain on the cable connections.



INSTALLATION

Installation

- ▶ To be able to store the upper front panel at a distance from the appliance, loosen the cable tie, unplug the connector from the electronic assembly for operation (AA01-X1.18) and the earth (XE05) at the heat pump manager and store the front panel securely so that it cannot tip over.
- ▶ Remove the screws on the left and right of the lower front panel.
- ▶ Pull the lower front panel forwards and store it securely so that it cannot tip over.

Fitting the front casing

Fit the front casing in reverse order. Take care to position the connection lines correctly and not to pinch any cables.

11.3 Heating water connection and safety valve

11.3.1 Safety instructions



Material losses

The heating system to which the appliance is connected must be installed by a qualified contractor in accordance with the water installation drawings in the technical guides.



Material losses

When fitting additional shut-off valves, install a further safety valve in an accessible location on the heat generator itself or in the flow line in close proximity to the heat generator.

There must not be a shut-off valve between the heat generator and the safety valve.



Note

The use of non-return valves in the charging circuits between the heat generator and the buffer or DHW cylinder can impair the function of the integral multifunction assembly (MFG) and lead to faults in the heating system.

- ▶ Only use our standard hydraulic solutions for the installation of the appliances.

Oxygen diffusion



Material losses

Avoid open vented heating systems and underfloor heating systems with plastic pipes that are permeable to oxygen.

In underfloor heating systems with plastic pipes that are permeable to oxygen and in open vented heating systems, oxygen diffusion may lead to corrosion on the steel components of the heating system (e.g. on the indirect coil of the DHW cylinder, on buffer cylinders, steel radiators or steel pipes).



Material losses

The products of corrosion (e.g. rusty sludge) can settle in the heating system components, which may result in a lower output or fault shutdowns due to reduced cross-sections.

Supply lines

- ▶ The maximum permissible line length between the appliance and the heat pump will vary, depending on the version of the heating system (pressure drop). As a standard value, assume a maximum line length of 10 m and a pipe diameter of 22-28 mm.
- ▶ Protect the flow and return lines against frost with sufficient thermal insulation.
- ▶ Also protect all supply lines against humidity, damage and UV radiation by means of a conduit.
- ▶ Connect the hydraulic connections with flat gaskets.

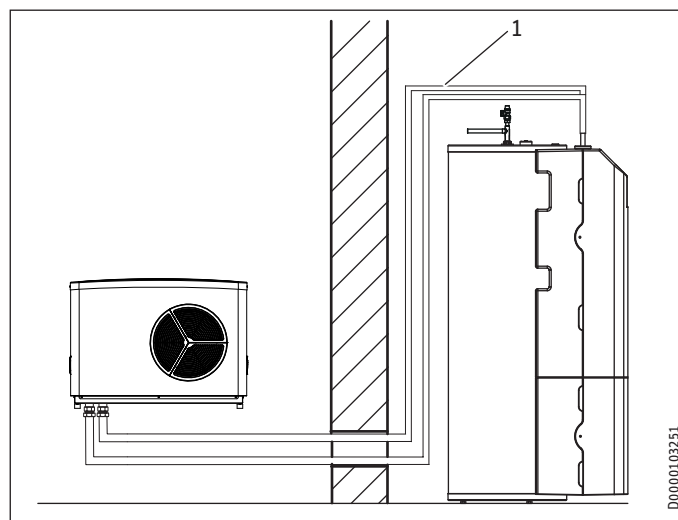
Pressure differential

If the available external pressure difference is exceeded, the pressure drop in the heating system could result in a reduced heating output.

- ▶ When sizing the pipes, ensure that the available external pressure differential is not exceeded (see chapter "Specification / Data table").
- ▶ When calculating the pressure drop, take account of the flow and return lines and the pressure drop of the heat pump. The pressure drop must be covered by the available pressure differential.

11.3.2 Heating water connection

Installation example:



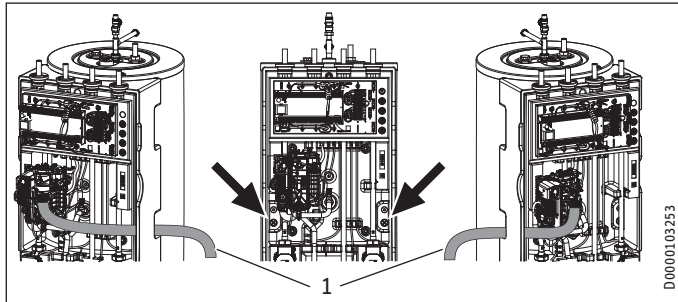
1 Pipes carrying heating water

- ▶ Thoroughly flush the pipes before connecting the heat pump. Foreign bodies (e.g. welding pearls, rust, sand, sealant, etc.) can impair the operational reliability of the heat pump.
- ▶ Install the heating water pipes (see chapter "Specification / Dimensions and connections").

INSTALLATION

Installation

Safety valve drain hose



1 Safety valve drain hose

- ▶ Unroll the safety valve drain hose connected to the multi-function assembly.
- ▶ On one of the lower prepared openings on the left or right, remove just enough insulating material as necessary for the drain hose, in order to minimise the exchange of air.
- ▶ Route the drain hose through the prepared opening from the appliance.
- ▶ Route the drain hose with a constant fall to a drain.
- ▶ Ensure that the drain hose is open to the outside.
- ▶ Secure the drain hose above the drain to prevent any hose movement in the event of water being discharged.



Material losses

Route the drain hose to a drain to enable water to drain freely when the safety valve is open.

11.4 DHW connection and safety assembly

11.4.1 Safety instructions



Material losses

The maximum permissible pressure must not be exceeded (see chapter "Specification / Data table").



Material losses

Operate the appliance only with pressure-tested taps.



Note

The use of non-return valves in the charging circuits between the heat generator and the buffer or DHW cylinder can impair the function of the integral multifunction assembly (MFG) and lead to faults in the heating system.

- ▶ Only use our standard hydraulic solutions for the installation of the appliances.

Cold water line

Galvanised steel, stainless steel, copper and plastic are approved materials.



Material losses

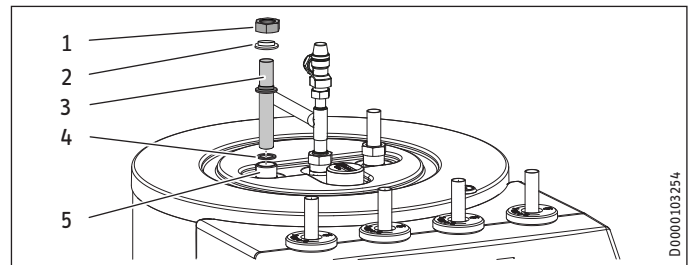
A safety valve is required.

DHW line, DHW circulation line

Stainless steel, copper and plastic are approved materials.

11.4.2 Fitting the DHW circulation line (optional)

A DHW circulation line with external DHW circulation pump can be fitted to the "DHW circulation" connection (see chapter "Specification / Dimensions and connections").



- 1 Union nut
- 2 Insulating sleeve
- 3 DHW circulation line
- 4 Gasket
- 5 "DHW circulation" connection

- ▶ Remove the sealing cap from the DHW circulation connection (see chapter "Specification / Dimensions and connections").
- ▶ Connect the DHW circulation line with the gasket, the insulating bushing and the flat gasket union nut.

11.4.3 DHW connection and safety assembly

- ▶ Flush the pipes thoroughly.
- ▶ Install the DHW outlet line and the cold water inlet line (see chapter "Specification / Dimensions and connections"). Connect the hydraulic connections.
- ▶ Install a type-tested safety valve in the cold water supply line. Please note that, depending on the supply pressure, you may also need a pressure reducing valve.
- ▶ Size the drain pipe so that water can drain off unimpeded when the safety valve is fully opened.
- ▶ The safety valve drain aperture must remain open to atmosphere.
- ▶ Install the safety valve drain pipe with a constant fall to the drain.

11.5 Filling the system

Heating circuit water quality

Carry out a fill water analysis before filling the system. This analysis may, for example, be requested from the relevant water supply utility.

To avoid damage as a result of scaling, it may be necessary to soften or desalinate the fill water. The fill water limits specified in chapter "Specification / Data table" must always be observed.

- ▶ Recheck these limits 8-12 weeks after commissioning and during the annual system service.



Material losses

Never switch on the power before filling the system.



Note

With a conductivity >1000 µS/cm, desalination treatment is recommended in order to avoid corrosion.

INSTALLATION

Installation



Note
If you treat the fill water with inhibitors or additives, the same limits apply as for desalination.



Note
Suitable appliances for water softening, as well as for filling and flushing heating systems, can be obtained via trade suppliers.

11.5.1 Flushing out the hot water system

- ▶ Before turning on the water supply, open all taps. Allow the system to fill and flush out all flux and debris from the installation.

11.5.2 Filling the heating system



Note
Fill the heating system exclusively via the lower drain & fill valve on the buffer cylinder.

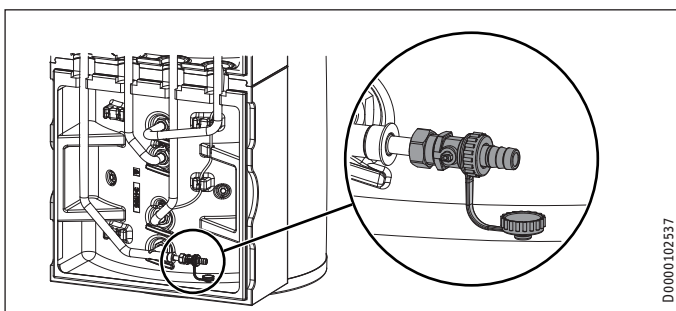
In the delivered condition, the 3-way diverter valve of the multifunction assembly is in its centre position, so that the heating circuit and the heat exchanger for DHW heating are filled evenly. When power is switched on, the 3-way diverter valve automatically switches to heating mode.

To fill or drain the system later, you must first place the 3-way diverter valve into its centre position.

To set the heat pump manager:

- ▶ With the MENU key, call up the main menu.
- ▶ Select the menu or value and confirm with OK:

- DIAGNOSIS
- ■ RELAY TEST SYSTEM
- □ ■ DRAIN HYD



- ▶ Fill the heating system via the lower drain & fill valve on the buffer cylinder.
- ▶ Vent the pipework.

11.5.3 DHW cylinder filling

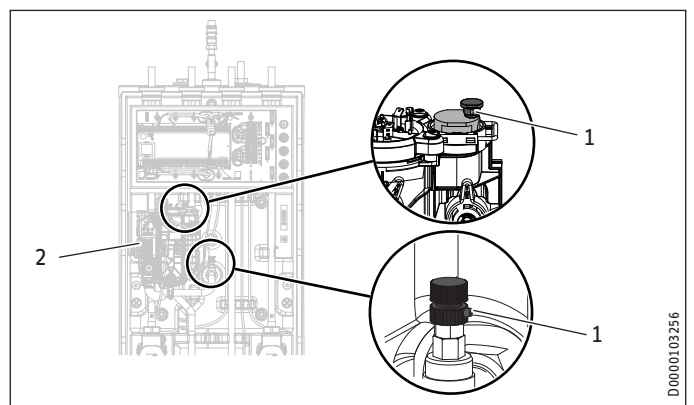


Material losses
Some fluxes used to solder pipes and fittings need to be flushed out with hot water.

- ▶ Heat the cylinder to its normal operating temperature and flush all pipe work with hot water to ensure all flux and debris is removed from the system.

- ▶ Fill the DHW cylinder via the cold water connection in compliance with the UK Water Supply (Water Fittings) Regulations 1999, Section 8 G24.
- ▶ Open all downstream draw-off valves until the appliance is full and the pipework is free of air.
- ▶ Adjust the flow rate. For this, observe the maximum permissible flow rate with a fully opened tap (see chapter "Specification / Data table"). If necessary reduce the flow rate at the butterfly valve of the safety assembly.
- ▶ Carry out a tightness check.
- ▶ Check the safety valve.

11.6 Venting the appliance



- 1 Air vent valve
- 2 PCB

- ▶ Vent the pipework and indirect coil by pulling up the red cap on the air vent valves.
- ▶ Close the air vent valves after the venting process.



Material losses

Close the air vent valves again after venting.

12. Electrical connection



WARNING Electrocutation

Carry out all electrical connection and installation work in accordance with relevant regulations.

- ▶ Before any work on the appliance, disconnect all poles from the power supply.



WARNING Electrocutation

The connection to the power supply must be in the form of a permanent connection. Ensure the appliance can be separated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation. This requirement can be met by using contactors, circuit breakers, fuses/MCBs, etc.



Material losses

Provide separate fuses for the two power circuits of the appliance and the control unit.



Material losses

Provide separate fuses/MCBs for the two power circuits, i.e. for the compressor and the electric emergency/booster heater circuits.



Material losses

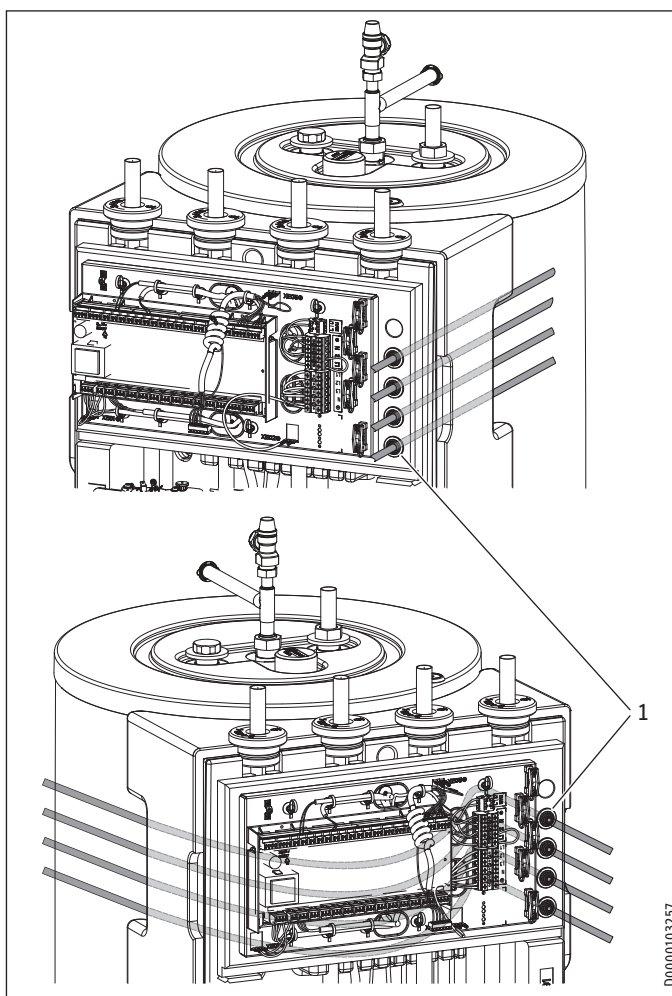
Observe the type plate. The specified voltage must match the mains power supply.



Note

You must have permission to connect the appliance from the relevant power supply utility.

The terminal box of the appliance is located behind the front casing (see chapter “Preparations / Transport and handling / Removing/fitting the front casing”).



1 Cable entry plug

- ▶ Cut the 4 cable entry plugs only as much as required for the cable diameter in order to minimise the exchange of air.
- ▶ Route all power supply cables and sensor leads into the appliance through the cable entry from the left or right. From the left, route the cables behind the terminal box to the right-hand side. Lay the lines on the right-hand side through the empty conduits and cable entry plugs.
- ▶ Connect the power cables and sensor leads as detailed below.

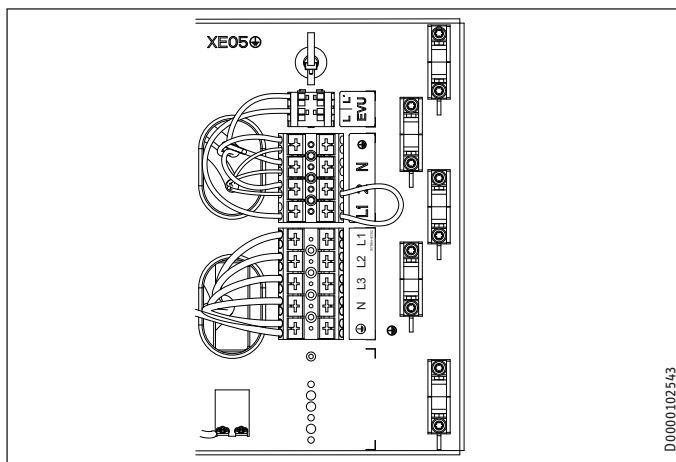
Install cables with the following cross-sections in accordance with the respective fuse protection:

Fuse protection	Assignment	Cable cross-section
B 16 A	Electric emergency/ booster heater (DHC) Three-phase	2.5 mm ² 1.5 mm ² with only two live wires, routing according to applicable regulations
B 16 A	Electric emergency/ booster heater (DHC) Single phase	2.5 mm ² 1.5 mm ² when routing a multi-core cable on a wall or in an electrical conduit on a wall
B 16 A	Control unit	1.5 mm ²

12.1 Electric emergency/booster heater and control voltage

Appliance function	Effect of the electric emergency/booster heater
Mono energetic operation	If the dual mode point is undershot, the electric emergency/booster heater safeguards both the heating operation and the provision of high DHW temperatures.
Emergency mode	Should the heat pump suffer a fault that prevents its continued operation, the heating output will be covered by the electric emergency/booster heater.

HSBC 180 Plus: Electrical connection three-phase



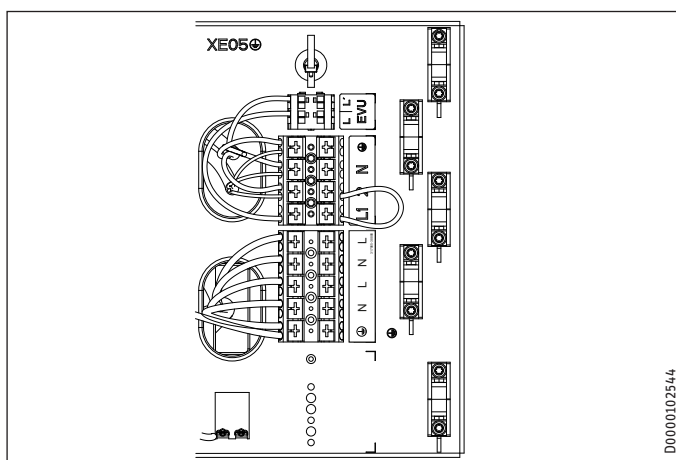
D0000102543

XD02 Electric emergency/booster heater (DHC)

Connected load	Terminal assignment
2.9 kW	PE N L1
5.9 kW	PE N L2 L1
8.8 kW	PE N L3 L2 L1

- ▶ Connect the electrical emergency/booster heater with the desired rating as detailed in the table.

HSBC 180 S Plus: Electrical connection single phase



D0000102544

XD02 Electric emergency/booster heater (DHC)

Connected load	Cable cross-section	Terminal assignment
2.9 kW	2.5 mm ²	PE N L
5.9 kW	2.5 mm ²	PE N L
	2.5 mm ²	PE N L

- ▶ Connect the cables for the electrical emergency/booster heater with the desired rating as in the table.

Control voltage



Material losses

- ▶ Only connect energy efficient circulation pumps approved by us to the pump connections.

XD01.2 Heat pump enable signal

EVU	Enable signal, bus cable to the WPM screened with strain relief in terminal.
-----	--

Heat pump manager terminal assignment

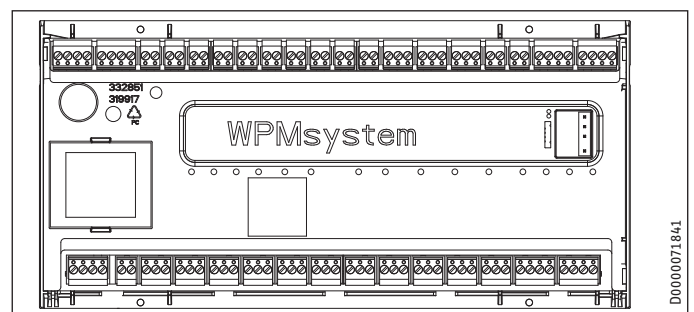


WARNING Electrocutation

Only components that operate with safety extra low voltage (SELV) and that ensure secure separation from the mains voltage supply may be connected to the low voltage terminals of the appliance.

Connecting other components can make parts of the appliance and connected components live.

- ▶ Only use components which have been approved by us.



D0000071841

INSTALLATION

Electrical connection

Safety extra low voltage

X1.1	+	+	CAN (connection for heat pump and WPE heat pump extension)
CAN A	-	-	
	L	L	
	H	H	
X1.2	+	+	CAN (connection for FET remote control and ISG Internet Service Gateway)
CAN B	-	-	
	L	L	
	H	H	
X1.3	Signal	1	Outside sensor
	Earth	2	
X1.4	Signal	1	Buffer sensor (heating circuit sensor 1)
	Earth	2	
X1.5	Signal	1	Flow sensor
	Earth	2	
X1.6	Signal	1	Heating circuit sensor 2
	Earth	2	
X1.7	Signal	1	Heating circuit sensor 3
	Earth	2	
X1.8	Signal	1	DHW cylinder sensor
	Earth	2	
X1.9	Signal	1	Source sensor
	Earth	2	
X1.10	Signal	1	2nd heat generator (2.WE)
	Earth	2	
X1.11	Signal	1	Cooling flow
	Earth	2	
X1.12	Signal	1	DHW circulation sensor
	Earth	2	
X1.13	Signal	1	FE7 remote control / telephone remote switch / heating curve optimisation / SG Ready
	Earth	2	
	Signal	3	
X1.14	Constant 12 V Input	+	Analogue input 0-10 V
	GND	IN	
		⊥	
X1.15	Constant 12 V Input	+	Analogue input 0-10 V
	GND	IN	
		⊥	
X1.16	Signal	1	PWM output 1
	Earth	2	
X1.17	Signal	1	PWM output 2
	Earth	2	
X1.18	+	+	CAN (FES)
CAN B	-	-	
	L	L	
	H	H	
X1.19	+	+	CAN (connection for heat pump and WPE heat pump extension)
CAN A	-	-	
	L	L	
	H	H	

Mains power supply

X2.1	L	L	Power supply
	L	L	
	N	N	
	PE	⊕ PE	
X2.2	L' (power supply utility input)	L'	L' (power supply utility input)
	L* (pumps L)	L* (pumps L)	L* (pumps L)
X2.3	L	L	Heating circuit pump 1
	N	N	
	PE	⊕ PE	
X2.4	L	L	Heating circuit pump 2
	N	N	
	PE	⊕ PE	
X2.5	L	L	Heating circuit pump 3
	N	N	
	PE	⊕ PE	
X2.6	L	L	Buffer charging pump 1
	N	N	
	PE	⊕ PE	

Mains power supply

X2.7	L	L	Buffer charging pump 2
	N	N	
	PE	⊕ PE	
X2.8	L	L	DHW charging pump
	N	N	
	PE	⊕ PE	
X2.9	L	L	Source pump / defrost
	N	N	
	PE	⊕ PE	
X2.10	L	L	Fault output
	N	N	
	PE	⊕ PE	
X2.11	L	L	DHW circulation pump / 2nd heat source DHW
	N	N	
	PE	⊕ PE	
X2.12	L	L	2nd heat source heating
	N	N	
	PE	⊕ PE	
X2.13	L	L	Cooling
	N	N	
	PE	⊕ PE	
X2.14	Mixer OPEN	▲	Not assigned
	N	N	
	PE	⊕ PE	
	Mixer CLOSE	▼	
X2.15	Mixer OPEN	▲	Not assigned
	N	N	
	PE	⊕ PE	
	Mixer CLOSE	▼	



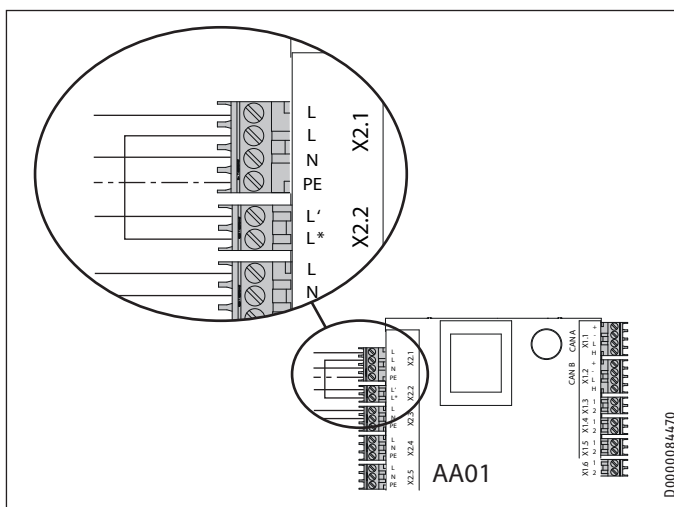
Note

For every appliance fault, output X2.10 issues a 230 V signal.

In the case of temporary faults, the output switches the signal through for a specific time.

In the case of faults that result in a permanent appliance shutdown, the output switches through permanently.

Accessories, STB-FB high limit safety cut-out for underfloor heating systems (optional)



- ▶ Remove the jumper at AA01 between X2.1 (L) and X2.2 (L*).
- ▶ Connect the STB-FB high limit safety cut-out to AA01 between X2.1 (L) and X2.2 (L*).

INSTALLATION

Commissioning

12.2 Sensor installation

12.2.1 Outside temperature sensor AF PT

The outside temperature sensors have a significant influence on the function of your heating system. Therefore ensure that the outside temperature sensors are correctly positioned and well insulated.

- Install the outside temperature sensor on a north or north-eastern wall.
- Ensure that the outside temperature sensor is freely exposed to the elements but not placed in direct sunlight.
- Never mount the outside temperature sensor above windows, doors or air ducts.
- Observe the following minimum clearances: 2.5 m above the ground and 1 m to the side of windows and doors

Installation

- ▶ Remove the cover.
- ▶ Secure the base with the screw supplied.
- ▶ Connect the cable.
- ▶ Connect the outside temperature sensor to AA01-X1.3.
- ▶ Replace the cover. The cover must audibly click into place.

12.3 Remote control

- ▶ Please observe the commissioning instructions for the heat pump manager.

The FET remote control is required to record humidity in the case of cooling via an area heating system.

13. Commissioning

Our customer support can assist with commissioning, which is a chargeable service.

If the appliance is intended for commercial use, observe the rules of the relevant Health & Safety at Work Act during commissioning. For further details, check with your local authorising body (in Germany, for example, this is the TÜV).

13.1 Checks before commissioning the heat pump manager



Material losses

Observe the maximum system temperature in underfloor heating systems.

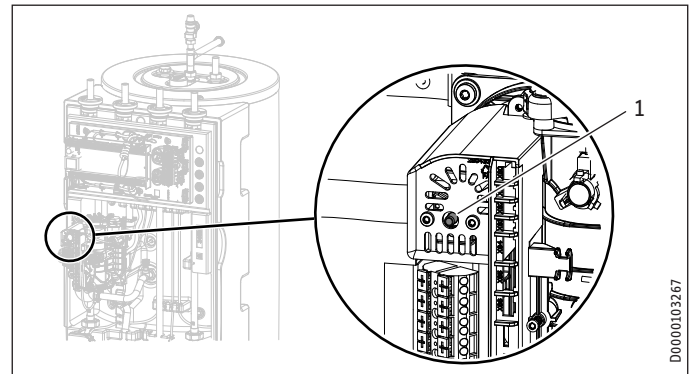
- ▶ Check that the heating system is filled to the correct pressure and the quick-action air vent valve is closed.
- ▶ Check whether the outside temperature sensor is correctly placed and connected.
- ▶ Check whether the power supply is connected correctly.
- ▶ Check whether the signal cable to the heat pump (bus cable) is correctly connected.

High limit safety cut-out



Note

At temperatures below $-15\text{ }^{\circ}\text{C}$ the high limit safety cut-out may respond. The appliance may be subjected to these temperatures during storage or transport.



- 1 High limit safety cut-out reset button
- ▶ Check whether the high limit safety cut-out has tripped.
- ▶ If the high limit safety cut-out has triggered, reset it with the reset button.

13.2 Commissioning the heat pump manager

Commission the heat pump manager and make all settings in accordance with the heat pump manager operating and installation instructions.



Note

For DHW mode, ensure that the PARALLEL OPERATION option is set in the heat pump manager. With this setting the primary pump is also active in DHW mode.

To set the heat pump manager:

- ▶ With the MENU key, call up the main menu.
- ▶ Select the menu or value and confirm with OK:

SETTINGS	Value
<input type="checkbox"/> <input checked="" type="checkbox"/> DHW	
<input type="checkbox"/> <input checked="" type="checkbox"/> STANDARD SETTING	
<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> DHW MODE	PARALLEL OPERATION



Note

On appliances with a single phase connection, set the heat pump manager as follows for calculating the amount of heat.

To set the heat pump manager:

- ▶ With the MENU key, call up the main menu.
- ▶ Select the menu or value and confirm with OK:

SETTINGS	Value
<input type="checkbox"/> <input checked="" type="checkbox"/> HEATING	
<input type="checkbox"/> <input checked="" type="checkbox"/> ELECTRIC BOOSTER HEATER	
<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> NUMBER OF STAGES	2

INSTALLATION

Commissioning

Cooling settings



Material losses

Condensation caused by the temperature falling below the dew point can lead to material losses. The appliance is therefore approved exclusively for area cooling. For dew point independent cooling, additional accessories (CDT 180) are required to ensure that any condensate is reliably drained away.

- ▶ Observe the instructions for the heat pump manager.

Adjusting the heat pump manager settings for area cooling:

- ▶ With the MENU key, call up the main menu.
- ▶ Select the menu or value and confirm with OK:

SETTINGS	Value
COOLING	
COOLING	ON
STANDARD SETTING	
COOLING CAPACITY	system specific
ACTIVE COOLING	
AREA COOLING	ON
SET FLOW TEMPERATURE	system specific
FLOW TEMP HYSTERESIS	system specific
SET ROOM TEMPERATURE	system specific

13.3 Wilo-Para .../Sc circulation pumps

- ▶ Select the appropriate pump control mode for the heating system.

LED indicators

	Operation indicator: LED illuminates green in normal operation LED illuminates/flashes when there is a fault
	Display of selected control mode $\Delta p-v$, $\Delta p-c$ and constant speed
	Display of selected curve (I, II, III) within the control mode
	Combinations of LED displays for venting function, manual re-start and key lock

Operating button

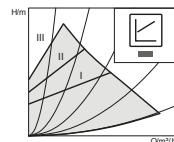
	Press To select control mode To select curve (I, II, III) within the control mode
	Press and hold To activate venting function (press for 3 seconds) For manual restart (press for 5 seconds) To lock/unlock buttons (press for 8 seconds)

Control modes and functions

Variable differential pressure $\Delta p-v$ (I, II, III)

Recommended for two-pipe heating systems with radiators to reduce flow noise at thermostatic valves

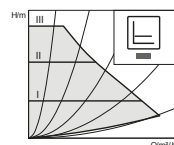
The pump reduces the delivery head by a half when the flow rate drops in pipework. Saves energy by matching the delivery head to the flow rate demand and the lower flow velocities. Choice of three pre-defined curves (I, II, III).



Constant pressure differential $\Delta p-c$ (I, II, III)

Recommended for underfloor heating systems or with large-diameter pipework and for all applications with a non-varying pipework curve (e.g. cylinder charging pumps) and single-pipe heating systems with radiators

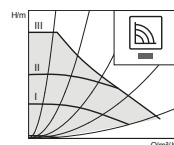
The control system keeps the set delivery head constant, irrespective of delivered flow rate. Choice of three pre-defined curves (I, II, III).



Constant speed (I, II, III)

Recommended for systems with unchanging system resistance which require a constant throughput.

The pump runs at three preset fixed speed levels (I, II, III).



Note

Factory setting: Constant speed, curve III

Venting



Fill the system properly and ventilate it
If the pump is not ventilated automatically:
Activate venting function via the operating button:
Press for 3 seconds then release.
Venting function starts (duration 10 minutes).
The top and bottom rows of LEDs flash alternately every second.

To cancel, press the operating button for 3 seconds.



Note

After venting, the LED indicator displays the previously set pump values.

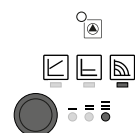
Setting control modes

Selecting the control mode

The LEDs for the control modes and associated curves illuminate one after the other.

Briefly press the operating button (for approx. 1 second).

LEDs indicate the current selected control mode and curve (see following table).



INSTALLATION

Shutting down the system

Operating button	LED indicator	Control mode	Curve
1x		Constant speed	II
2x		Constant speed	I
3x		Variable differential pressure $\Delta p-v$	III
4x		Variable differential pressure $\Delta p-v$	II
5x		Variable differential pressure $\Delta p-v$	I
6x		Constant differential pressure $\Delta p-c$	III
7x		Constant differential pressure $\Delta p-c$	II
8x		Constant differential pressure $\Delta p-c$	I
*9x		Constant speed	III

(*) Pressing the button for the 9th time in succession returns the system to the factory setting (constant speed, curve III).

13.4 Appliance handover

- ▶ Explain the appliance function to users and familiarise them with how it works.
- ▶ Make users aware of potential dangers.
- ▶ Hand over these instructions.

14. Shutting down the system



Material losses

Observe the temperature application limits and the minimum circulation volume on the heat consumer side (see chapter "Specification / Data table").



Material losses

Drain the system when there is a risk of frost and the heat pump is completely switched off (see chapter "Maintenance / Draining the DHW cylinder").

- ▶ If you take the system out of use, set the heat pump manager to standby so that the safety functions that protect the appliance (e.g. frost protection) remain active.

15. Maintenance



WARNING Electrocutation

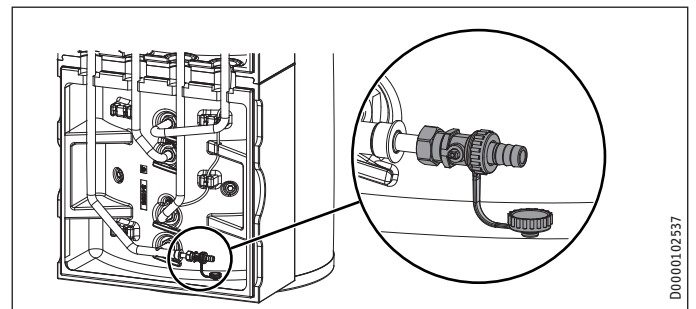
Carry out all electrical connection and installation work in accordance with relevant regulations.



WARNING Electrocutation

▶ Before any work on the appliance, disconnect all poles of the appliance from the power supply.

Draining the buffer cylinder



- ▶ Drain the buffer cylinder via the lower drain & fill valve.

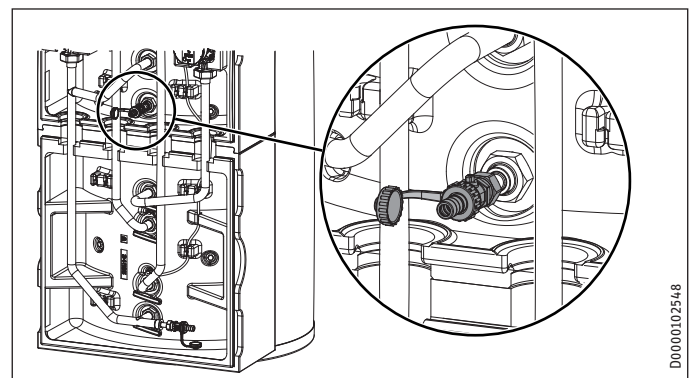
Draining the DHW cylinder



CAUTION Burns

Hot water may escape during draining.

- ▶ Close the shut-off valve in the cold water supply line.
- ▶ Open the hot water taps on all draw-off points.



- ▶ Drain the DHW cylinder via the upper drain & fill valve.

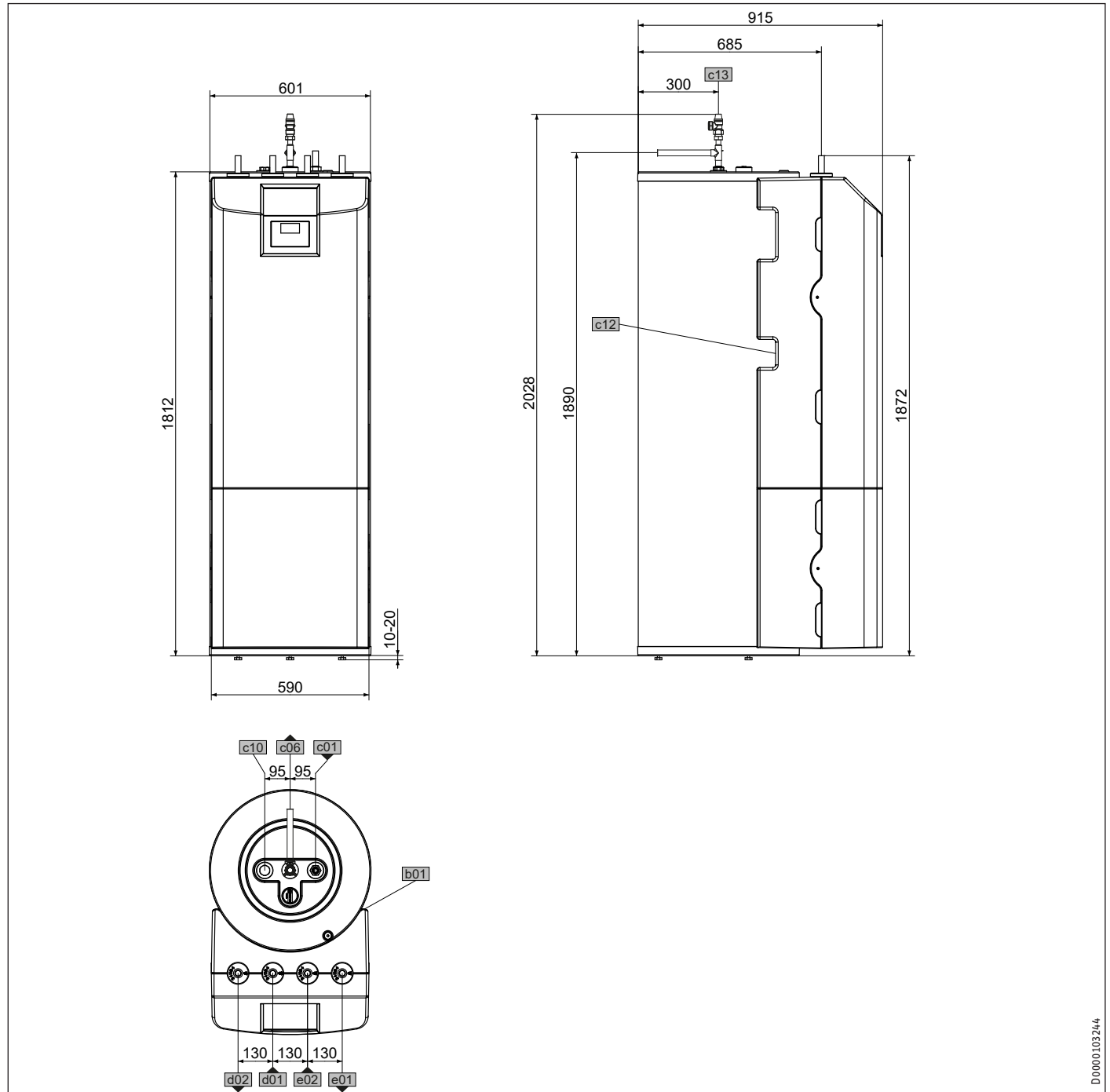
Testing the sacrificial anode

- ▶ Arrange for the sacrificial anode to be tested at least every two years and replace immediately if it becomes depleted. For this, observe the maximum transition resistance between the sacrificial anode and the cylinder of 0.3 Ω . If it is not possible to insert the sacrificial anode from above, install a segmented anode.

The intervals at which subsequent testing should be carried out depends on the wear of the sacrificial anode.

16. Specification

16.1 Dimensions and connections

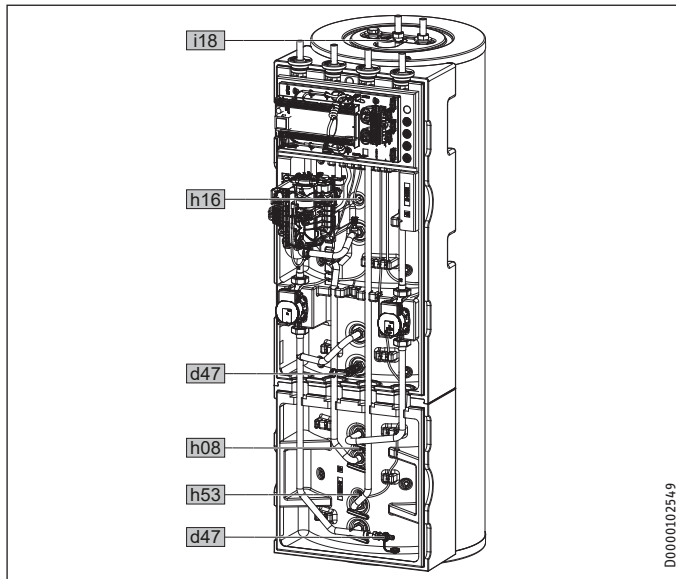


D0000103244

			HSBC 180 plus (GB)	HSBC 180 S Plus (GB)
b01	Entry electrical cables			
c01	Cold water inlet	Diameter	mm	22
c06	DHW outlet	Diameter	mm	22
c10	DHW circulation	Diameter	mm	15
c12	Safety valve drain			
c13	T&P valve			
d01	Heat pump flow	Diameter	mm	22
d02	Heat pump return	Diameter	mm	22
e01	Heating flow	Diameter	mm	22
e02	Heating return	Diameter	mm	22

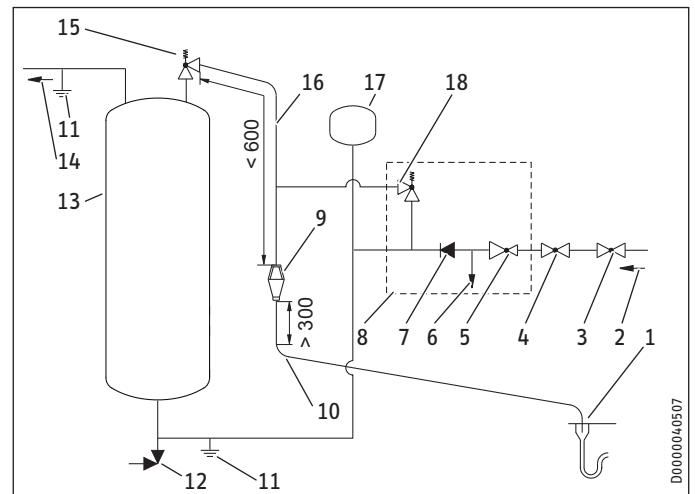
INSTALLATION Specification

Other dimensions and connections



				HSBC 180 plus (GB)	HSBC 180 S Plus (GB)
h08	Sensor heat pump cooling	Diameter	mm	9.5	9.5
h16	Sensor DHW	Diameter	mm	9.5	9.5
h53	Sensor heating	Diameter	mm	9.5	9.5
i18	Sacrificial anode	Female thread		G 1 1/4	G 1 1/4
		Torque	Nm	120	120
d47	Drain & fill valve				

16.2 Hydraulic diagram



- 1 Discharge below fixed grate
- 2 Cold water supply
- 3 Shut-off valve
- 4 Line strainer
- 5 Pressure reducing valve
- 6 Balanced pressure; cold water outlet
- 7 Check valve
- 8 Safety assembly
- 9 Tundish
- 10 Metal discharge pipe (D2) from tundish, with continuous fall
- 11 Equipotential bond
- 12 Drain valve
- 13 Cylinder
- 14 DHW outlet
- 15 T&P valve
- 16 Metal discharge pipe (D1) from T&P valve to tundish
- 17 Expansion vessel
- 18 Expansion relief valve



Material losses

The tundish should be installed away from electrical devices.



Note

If secondary return circuits are used then an additional expansion vessel may be required.

Data table

Minimum size of discharge pipe D1	mm			15
Minimum size of discharge pipe D2 from tundish	mm	22	28	35
Maximum permissible pressure drop, expressed as a length of straight pipe (i.e. no elbows or bends)	m	9	18	27
Pressure drop of each elbow or bend	m	0.8	1.0	1.4

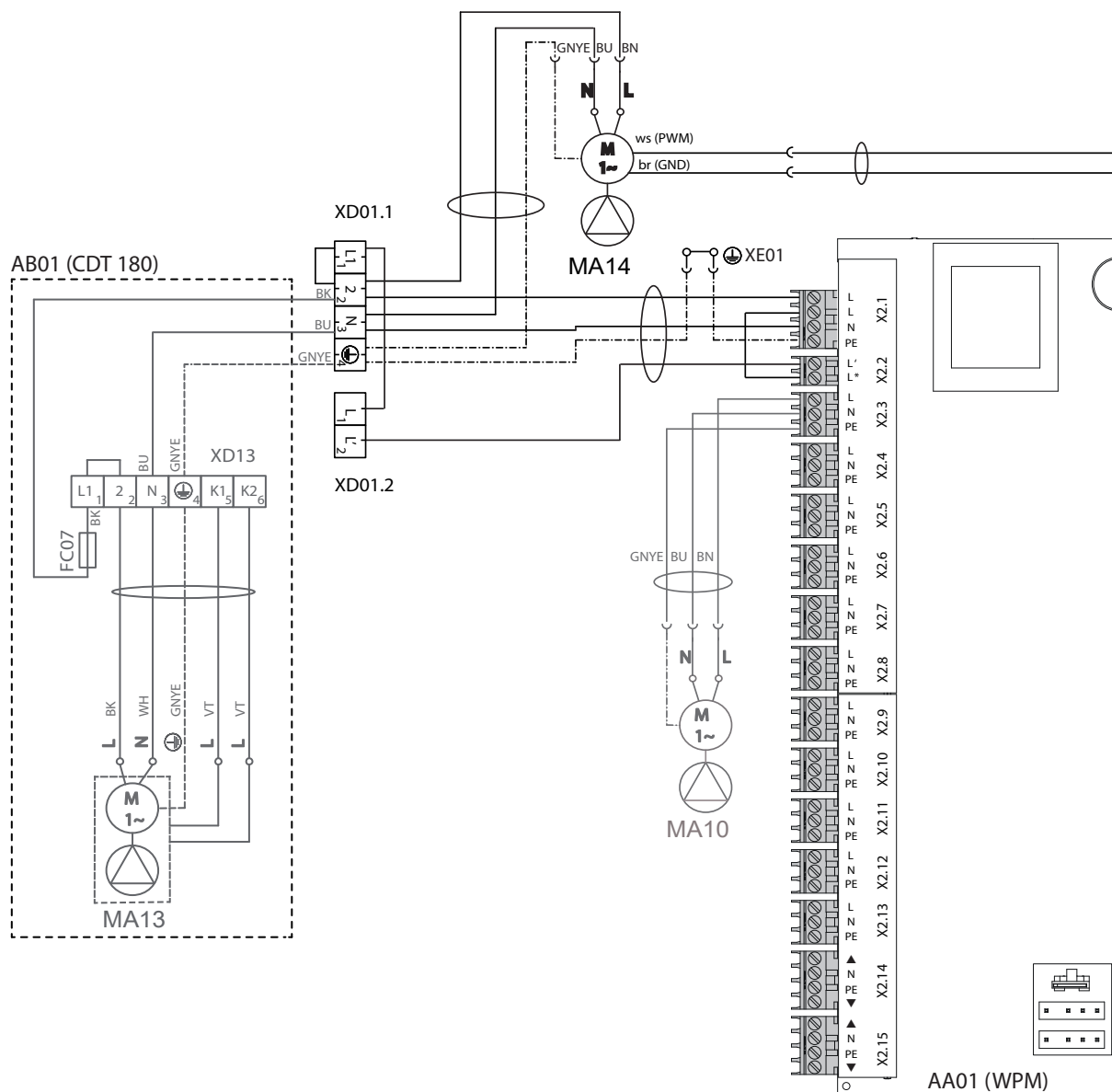
Connection dimensions

Safety assembly connection	mm	22
Expansion valve end connection	mm	15
Expansion vessel connection, male, BSP		G 1 A
Tundish inlet connection	mm	22
Tundish outlet connection		G 1

INSTALLATION Specification

16.3 Wiring diagram

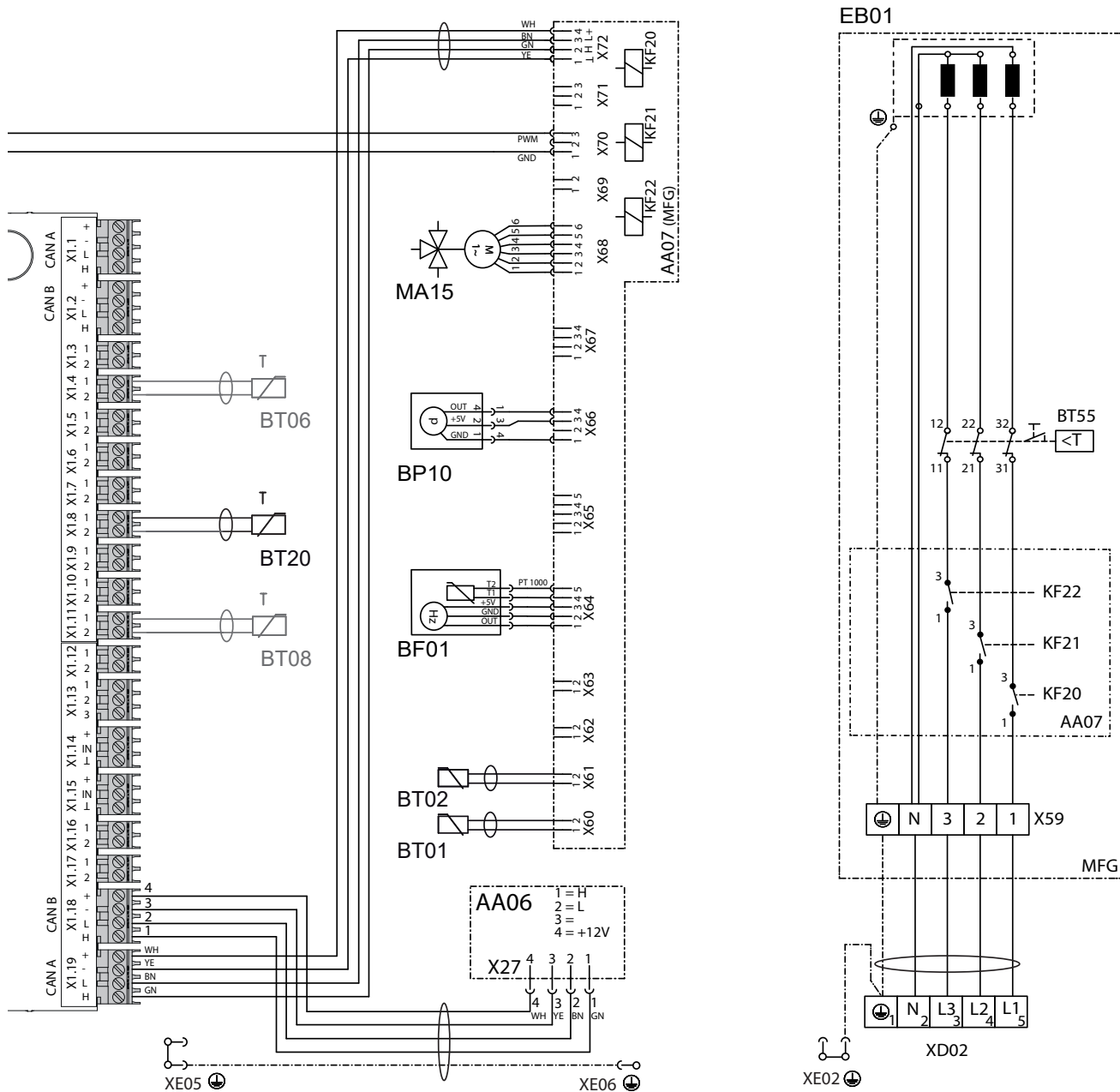
HSBC 180 plus



AA01	Extra low voltage (WPM 4 heat pump manager)
AA06	Programming unit
AA07	PCB, booster heater MFG
EB01	Booster heater MFG
BF01	Flow rate and temperature, heating circuit
BP10	Heating circuit pressure sensor
BT01	Temperature sensor, heat pump flow
BT02	Temperature sensor, heat pump return
BT06	Temperature sensor, heat pump buffer cylinder
BT08	Temperature sensor, HP cooling
BT20	Temperature sensor, DHW cylinder
BT55	High limit safety cut-out MFG (manual reset)
FC07	Condensate pump fuse
MA10	Motor, pump, heating circuit
MA13	Condensate pump motor

MA14	Motor, buffer charging pump (PWM/1-10V)
MA15	Motor, diverter valve, heating/DHW
KF20	Relay, booster heater MFG
KF21	Relay, booster heater MFG
KF22	Relay, booster heater MFG
XD01.1	Terminal, power supply
XD01.2	Terminal, power-OFF contact
XD02	Terminal, MFG power supply
XD13	Terminal, condensate pump
XE01	Power supply earth terminal
XE02	Earth terminal MFG/DHC
XE05	Earth stud, front panel
XE06	Earth, front panel
AA01-X1.1	Connector, CAN A (heat pump connection)
AA01-X1.2	Connector, CAN B (FET/ISG connection)

INSTALLATION Specification

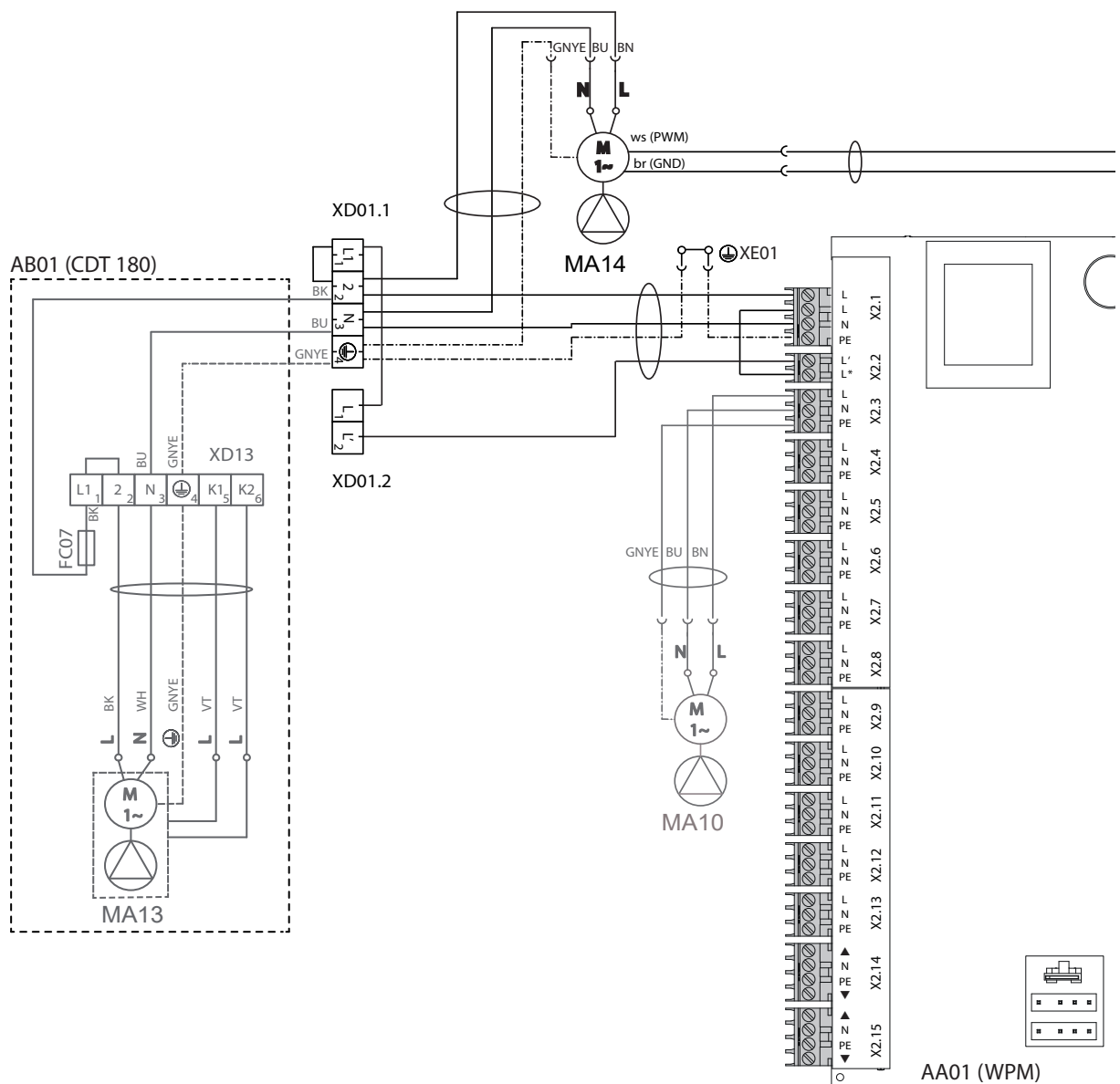


- AA01-X1.3 Connector, outside temperature sensor
- AA01-X1.4 Connector, buffer temperature sensor BT06
- AA01-X1.5 Connector, flow temperature sensor
- AA01-X1.6 Connector, heating circuit temperature sensor 2
- AA01-X1.7 Connector, heating circuit temperature sensor 3
- AA01-X1.8 Connector, DHW cylinder sensor BT20
- AA01-X1.9 Connector, source sensor
- AA01-X1.10 Connector, 2nd heat generator
- AA01-X1.11 Connector, flow, cooling
- AA01-X1.12 Connector, DHW circulation sensor
- AA01-X1.13 Connector, remote control FE7
- AA01-X1.14 Connector, analogue input 0-10 V
- AA01-X2.14 Connector, mixer, heating circuit 2 (X2.14.1 Mixer OPEN/X2.14.2 Mixer CLOSE)
- AA01-X2.15 Connector, mixer, heating circuit 3 (X2.15.1 Mixer OPEN/X2.15.2 Mixer CLOSE)
- AA06-X27 Terminal, programming unit

- AA07-X60 Connector, temperature sensor, heat pump flow BT01
- AA07-X61 Connector, temperature sensor, heat pump return BT02
- AA07-X62 Not assigned - connector, temperature sensor, heat pump return
- AA07-X63 Not assigned - connector, temperature sensor, DHW cylinder, internal
- AA07-X64 Connector, temperature and flow rate, heating circuit, BF01
- AA07-X65 Not assigned
- AA07-X66 Rast 2.5 connector (heating system pressure) BP10
- AA07-X67 Not assigned
- AA07-X68 Connector, switching, motor, diverter valve central heating / DHW
- AA07-X69 Not assigned
- AA07-X70 Connector, switching, pump, heating circuit PWM/1-10V
- AA07-X71 Not assigned
- AA07-X72 Connector, CAN bus
- EB01-X59 Terminal, MFG

INSTALLATION Specification

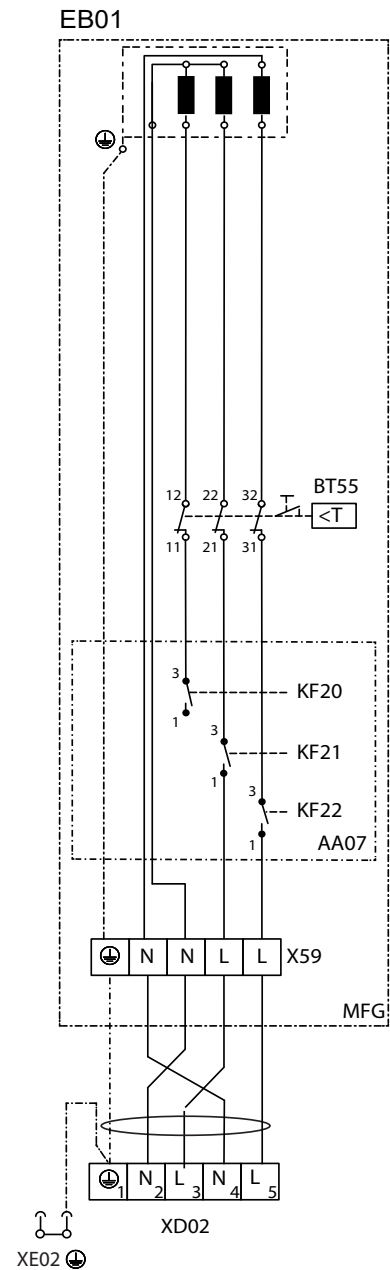
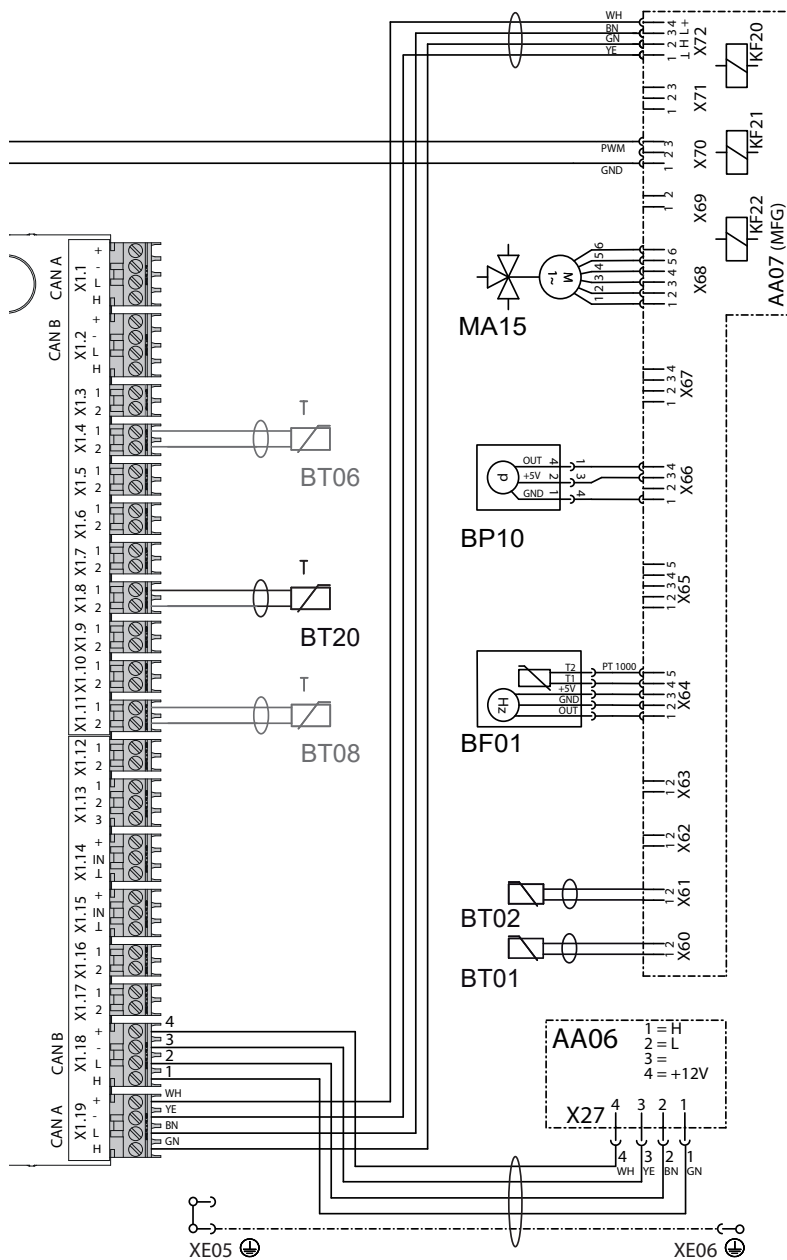
HSBC 180 S Plus



AA01	Extra low voltage (WPM 4 heat pump manager)
AA06	Programming unit
AA07	PCB, booster heater MFG
EB01	Booster heater MFG
BF01	Flow rate and temperature, heating circuit
BP10	Heating circuit pressure sensor
BT01	Temperature sensor, heat pump flow
BT02	Temperature sensor, heat pump return
BT06	Temperature sensor, heat pump buffer cylinder
BT08	Temperature sensor, HP cooling
BT20	Temperature sensor, DHW cylinder
BT55	High limit safety cut-out MFG (manual reset)
FC07	Condensate pump fuse
MA10	Motor, pump, heating circuit
MA13	Condensate pump motor

MA14	Motor, buffer charging pump (PWM/1-10V)
MA15	Motor, diverter valve, heating/DHW
KF20	Relay, booster heater MFG
KF21	Relay, booster heater MFG
KF22	Relay, booster heater MFG
XD01.1	Terminal, power supply
XD01.2	Terminal, power-OFF contact
XD02	Terminal, MFG power supply
XD13	Terminal, condensate pump
XE01	Power supply earth terminal
XE02	Earth terminal MFG/DHC
XE05	Earth stud, front panel
XE06	Earth, front panel
AA01-X1.1	Connector, CAN A (heat pump connection)
AA01-X1.2	Connector, CAN B (FET/ISG connection)

INSTALLATION Specification



- AA01-X1.3 Connector, outside temperature sensor
- AA01-X1.4 Connector, buffer temperature sensor BT06
- AA01-X1.5 Connector, flow temperature sensor
- AA01-X1.6 Connector, heating circuit temperature sensor 2
- AA01-X1.7 Connector, heating circuit temperature sensor 3
- AA01-X1.8 Connector, DHW cylinder sensor BT20
- AA01-X1.9 Connector, source sensor
- AA01-X1.10 Connector, 2nd heat generator
- AA01-X1.11 Connector, flow, cooling
- AA01-X1.12 Connector, DHW circulation sensor
- AA01-X1.13 Connector, remote control FE7
- AA01-X1.14 Connector, analogue input 0-10 V
- AA01-X2.14 Connector, mixer, heating circuit 2 (X2.14.1 Mixer OPEN/X2.14.2 Mixer CLOSE)
- AA01-X2.15 Connector, mixer, heating circuit 3 (X2.15.1 Mixer OPEN/X2.15.2 Mixer CLOSE)
- AA06-X27 Terminal, programming unit

- AA07-X60 Connector, temperature sensor, heat pump flow BT01
- AA07-X61 Connector, temperature sensor, heat pump return BT02
- AA07-X62 Not assigned - connector, temperature sensor, heat pump return
- AA07-X63 Not assigned - connector, temperature sensor, DHW cylinder, internal
- AA07-X64 Connector, temperature and flow rate, heating circuit, BF01
- AA07-X65 Not assigned
- AA07-X66 Rast 2.5 connector (heating system pressure) BP01
- AA07-X67 Not assigned
- AA07-X68 Connector, switching, motor, diverter valve central heating / DHW
- AA07-X69 Not assigned
- AA07-X70 Connector, switching, pump, heating circuit PWM/1-10V
- AA07-X71 Not assigned
- AA07-X72 Connector, CAN bus
- EB01-X59 Terminal, MFG

INSTALLATION Specification

16.4 Energy consumption data

Product datasheet: DHW cylinder to Regulation (EU) No 812/2013 (S.I. 2019 No. 539 / Programme 2)

		HSBC 180 plus (GB)	HSBC 180 S Plus (GB)
		202927	203082
Manufacturer		STIEBEL ELTRON	STIEBEL ELTRON
Supplier's model identifier		HSBC 180 plus (GB)	HSBC 180 S Plus (GB)
Energy efficiency class		B	B
Standby losses S	W	53.9	53.9
Cylinder capacity V	l	195	195

16.5 Data table

		HSBC 180 plus (GB)	HSBC 180 S Plus (GB)
		202927	203082
Hydraulic data			
Nominal capacity, DHW cylinder	l	178	178
Nominal capacity, buffer cylinder	l	80	80
Surface area, heat exchanger	m ²	1.59	1.59
Capacity, heat exchanger	l	10	10
External available pressure differential, circulation pump, heat pump at 1.0 m ³ /h	hPa	656	656
External available pressure differential, circulation pump, heat pump at 1.5 m ³ /h	hPa	527	527
External available pressure differential, circulation pump, heat pump at 2.0 m ³ /h	hPa	210	210
External available pressure differential, circulation pump, heating circuit 1 at 1.0 m ³ /h	hPa	725	725
External available pressure differential, circulation pump, heating circuit 1 at 1.5 m ³ /h	hPa	663	663
External available pressure differential, circulation pump, heating circuit 1 at 2.0 m ³ /h	hPa	444	444
Application limits			
Max. permissible pressure, DHW cylinder	MPa	1	1
Test pressure, DHW cylinder	MPa	1.5	1.5
Max. flow rate	l/min	25	25
Max. permissible pressure, buffer cylinder	MPa	0.3	0.3
Test pressure, buffer cylinder	MPa	0.45	0.45
Max. permissible temperature	°C	95	95
Max. permissible temperature, primary side	°C	75	75
Heating water quality requirements			
Water hardness	°dH	≤3	≤3
pH value (with aluminium fittings)		8.0-8.5	8.0-8.5
pH value (without aluminium fittings)		8.0-10.0	8.0-10.0
Conductivity (softening)	µS/cm	<1000	<1000
Conductivity (desalination)	µS/cm	20-100	20-100
Chloride	mg/l	<30	<30
Oxygen 8-12 weeks after filling (softening)	mg/l	<0.02	<0.02
Oxygen 8-12 weeks after filling (desalination)	mg/l	<0.1	<0.1
Power consumption			
Power consumption, emergency/booster heater	kW	8.8	5.9
Max. power consumption, charging pump	W	60	60
Max. power consumption, circulation pump, heating side	W	60	60
Energy data			
Standby energy consumption/ 24 h at 65 °C	kWh	1.29	1.29
Energy efficiency class		B	B
Electrical data			
Rated voltage, control unit	V	230	230
Phases, control unit		1/N/PE	1/N/PE
Control unit fuse protection	A	1 x B 16	1 x B 16
Rated voltage, emergency/booster heater	V	400	230
Phases, emergency/booster heater		3/N/PE	2/N/PE
Emergency/booster heater fuse protection	A	3 x B 16	2 x B 16
Frequency	Hz	50	50
Versions			
IP rating		IP20	IP20

INSTALLATION

Specification

		HSBC 180 plus (GB)	HSBC 180 S Plus (GB)
Dimensions			
Height	mm	1892	1892
Width	mm	605	605
Depth	mm	917	917
Height when tilted	mm	2007	2007
Weights			
Weight, full	kg	415	415
Weight, empty	kg	145	145

Further details

		HSBC 180 plus (GB)	HSBC 180 S Plus (GB)
		202927	203082
Maximum height for installation	m	2000	2000

Guarantee

The guarantee conditions of our German companies do not apply to appliances acquired outside of Germany. In countries where our subsidiaries sell our products a guarantee can only be issued by those subsidiaries. Such guarantee is only granted if the subsidiary has issued its own terms of guarantee. No other guarantee will be granted.

We shall not provide any guarantee for appliances acquired in countries where we have no subsidiary to sell our products. This will not affect warranties issued by any importers.

Environment and recycling

We would ask you to help protect the environment. After use, dispose of the various materials in accordance with national regulations.

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STIEBEL ELTRON



Irrtum und technische Änderungen vorbehalten! | Subject to errors and technical changes! | Sous réserve d'erreurs et de modifications techniques! | Onder voorbehoud van vergissingen en technische wijzigingen! | Salvo error o modificación técnica! | Excepto erro ou alteração técnica | Zastrzeżone zmiany techniczne i ewentualne błędy | Omyly a technické změny jsou vyhrazeny! | A muszaki változtatások és tévedések jogát fenntartjuk! | Отсутствие ошибок не гарантируется. Возможны технические изменения. | Chyby a technické zmeny sú vyhradené!

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