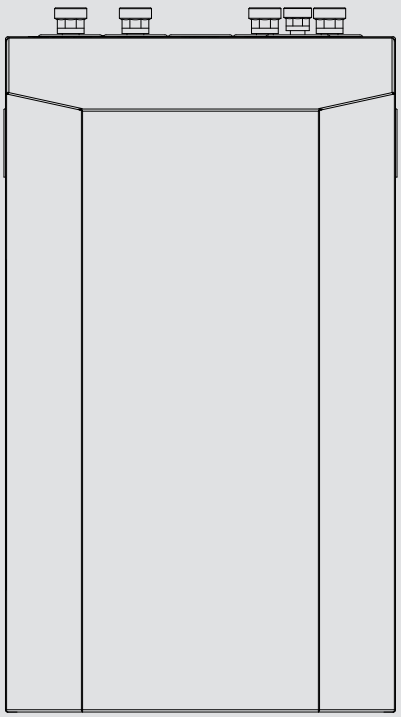
OPERATION AND INSTALLATION

BRINE | WATER HEAT PUMP

- » WPF 10 M
- » WPF 13 M
- » WPF 16 M
- » WPF 7 MS
- » WPF 10 MS



STIEBEL ELTRON

CONTENTS

SPECIAL INFORMATION

- The appliance may be used by children aged 8 and up and persons with reduced physical, sensory or mental capabilities or a lack of experience provided that they are supervised or they have been instructed on how to use the appliance safely and have understood the resulting risks. Children must never play with the appliance. Children must never clean the appliance or perform user maintenance unless they are supervised.
- Only use a permanent connection to the power supply. The appliance must be able to be separated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation.
- Maintain the minimum clearances to ensure trouble-free operation of the appliance and facilitate maintenance work.
- Maintenance work, such as checking the electrical safety, must only be carried out by a qualified contractor.
- We recommend an annual inspection (to establish the current condition of the system), and service by a contractor if required (to return the system into its original condition).
- The heat pump power supply must not be interrupted, even outside the heating season. Otherwise the system is at risk from frost.
- The heat pump manager automatically switches the heat pump to summer or winter mode.
- If the heat pump and frost protection are completely switched off, drain the system on the water side.

OPERATION

1. General information

The chapter “Operation” is intended for appliance users and heating contractors.

The chapter “Installation” is intended for heating contractors.

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

1.1 Further applicable documents

- Operating and installation instructions of the WPM heat pump manager
- Operating and installation instructions of all other components in the system

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

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.

1.3 Other symbols in this documentation

Note
Notes are bordered by horizontal lines above and below the text. General information is identified by the symbol shown on the left.
▶ Read these texts carefully.

Symbol	
	Damage to the appliance and environment
	Appliance disposal

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

1.4 Units of measurement

Note
All measurements are given in mm unless stated otherwise.

1.5 Standardised output data

Explanations to determine and interpret the specified standardised output data.

1.5.1 Standard: EN 14511

The output data specifically mentioned in text, diagrams and technical datasheets has been calculated according to the test conditions of the standard shown in the heading of this section.

Generally, these standardised test conditions will not fully meet the conditions found at the installation site of the system user.

Depending on the chosen test method and the extent to which this method deviates from the conditions defined in the norm shown in the heading of this section, any deviations can have a considerable impact.

Further factors that have an influence on the test values are the measuring equipment, the system configuration, the age of the system and the flow rates.

A confirmation of the specified output data can only be obtained if the test conducted for this purpose is also performed in accordance with the conditions defined in the norm shown in the heading of this section.

2. Safety

2.1 Intended use

The appliance is designed for central heating within the application limits given in the specification.

This appliance is designed for domestic use. It can be safely operated by untrained personnel. The appliance can also be used in a non-domestic environment, e.g. in a small business, as long as it is used in the same way.

Any other use beyond that described shall be deemed inappropriate. Observation of this document is also part of the correct use of the unit. Any changes or conversions to the appliance void any warranty. The appliance is designed to heat buildings.

2.2 Safety instructions

Observe the following safety instructions and regulations.

- The electrical installation and installation of the heating circuit must only be carried out by a recognised, qualified contractor or by our customer service engineers.
- Contractors are responsible for adherence to all currently applicable regulations during installation and commissioning.
- Operate the appliance only when fully installed and with all safety equipment fitted.
- Protect the appliance from dust and dirt ingress during building work.

WARNING Injury
The appliance may be used by children aged 8 and up and persons with reduced physical, sensory or mental capabilities or a lack of experience provided that they are supervised or they have been instructed on how to use the appliance safely and have understood the resulting risks. Children must never play with the appliance. Children must never clean the appliance or perform user maintenance unless they are supervised.

2.3 Test symbols

See type plate on the appliance.

3. Appliance description

The WPF...M is a heating heat pump designed to operate as a ground source heat pump. The heat pump extracts energy from the heat source medium, i.e. brine, at a low temperature level. This extracted energy is then transferred to the heating water at a higher level, enriched with the energy drawn by the compressor. Subject to the heat source temperature, the heating water can be heated up to a flow temperature of 60 °C.

Modular operation is feasible with the WPF..M.

4. Operation

The heat pump is exclusively controlled by the heat pump manager WPM. Therefore, observe the instructions in chapter Operation, in the operating and installation instructions of the heat pump manager WPM.

5. Maintenance and care

Appliance and system damage
Maintenance work, such as checking the electrical safety, must only be carried out by a qualified contractor.

A damp cloth is sufficient for cleaning all plastic and sheet steel parts. Never use abrasive or corrosive cleaning agents.

Protect the appliance from dust and dirt ingress during building work.

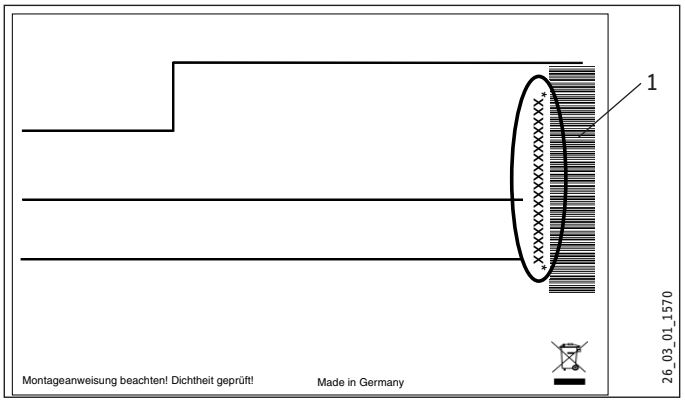
6. Troubleshooting

Fault	Cause	▶ Remedy
There is no hot water or the heating system stays cold.	The fuse/MCB has blown/ responded.	Check the fuse/MCB in your fuse box/distribution panel.

6.1 Other problems

If you cannot remedy the fault, notify your heating contractor. To facilitate and speed up your enquiry, please provide the serial number from the type plate. The type plate is located on the front at the top on the right or left hand side of the casing.

Sample type plate



1 Number on the type plate

INSTALLATION

7. Safety

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

7.1 General safety instructions

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

7.2 Regulations, standards and instructions

Note
Observe all applicable national and regional regulations and instructions.

8. Appliance description

8.1 Mode of operation

Environmental energy is extracted by the heat exchanger on the heat source side (evaporator). Any energy extracted is transferred, together with the energy drawn by the compressor drive, to the heating water by a heat exchanger on the heating water side (condenser). Subject to the heat load, the heating water can be heated to +60 °C. The DHW is heated via the internal indirect coil inside the DHW cylinder.

8.2 Standard delivery

No other components are supplied with the appliance.

9. Preparations

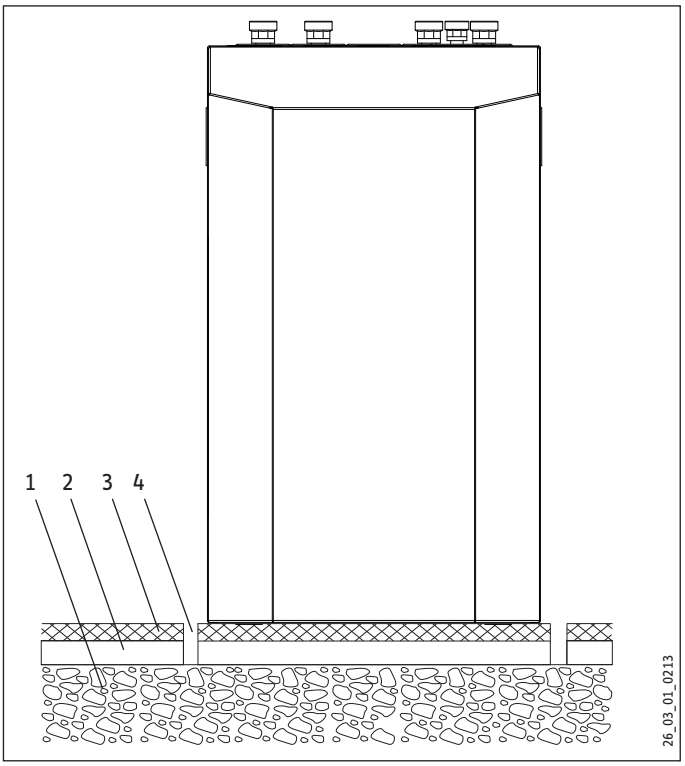
9.1 General information

Note
The heat pump is designed for installation in interiors, except in wet areas.

Never install the heat pump immediately below or adjacent to bedrooms. Insulate pipes through walls and ceilings against structure-borne noise transmission.

The room in which the appliance is to be installed must meet the following conditions:

- No risk from frost.
- Floor of load-bearing strength (for the equipment weight, see specification).
- Horizontal, level and solid floor, as the equipment feet on the heat pump are non-adjustable.
- For a quiet heat pump operation on floating screeds, recess the screed and the anti-vibration insulation around the installation location of the heat pump.



1 Concrete base
2 Impact sound insulation
3 Floating screed
4 Recess

- The room must not be subject to a risk of explosions arising from dust, gases or vapours.
- The floor area of the installation room must be at least 3 m², and the room must provide a volume of at least 6 m³.
- When installing the heat pump in a boiler room together with other heating equipment ensure, that the operation of other heating equipment will not be impaired.

9.2 Electrical installation

WARNING Electrocution
Carry out all electrical connection and installation work in accordance with national and regional regulations.

WARNING Electrocution
Only use a permanent connection to the power supply. The appliance must be able to be isolated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation. This requirement can be met by contactors, circuit breakers, fuses etc.

Appliance damage
The specified voltage must match the mains voltage. Observe the type plate.

Use the following cable cross-sections subject to their fuse protection:

Fuse protection	Cable cross-section
C 16 A	2.5 mm² 1.5 mm² with only two live wires and routing on a wall or in an electrical conduit on a wall.
C 25 A	6.0 mm² when routing in a wall. 4.0 mm² when routing a multi core line on a wall or in an electrical conduit on a wall.

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

The electrical specifications are given in the “Data table”. You require a J-Y (St) 2x2x0.8 mm² cable for the BUS.

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

9.3 Buffer cylinder

A buffer cylinder is recommended to ensure a trouble-free appliance operation.

The buffer cylinder not only provides hydraulic separation of the flow in the heat pump and heating circuit.

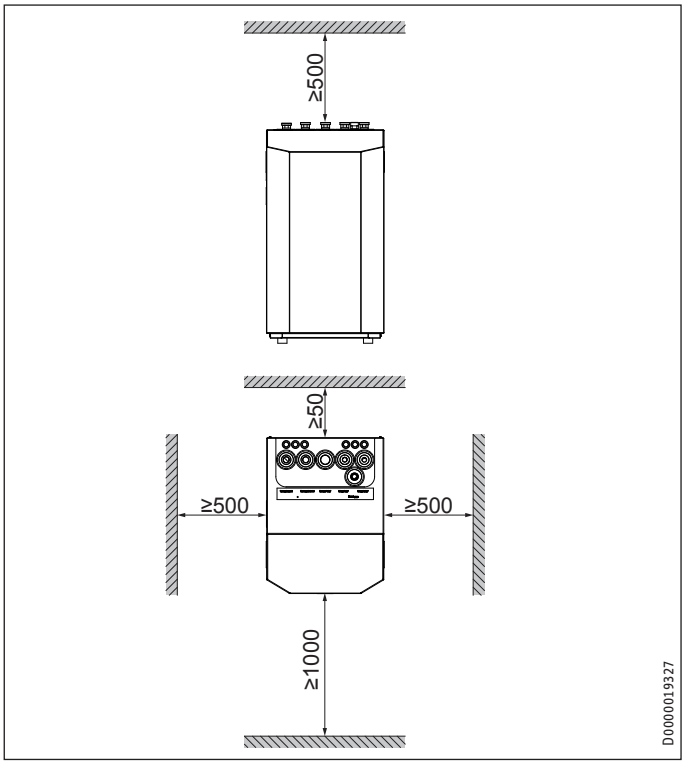
10. Preparing for installation

10.1 Transport

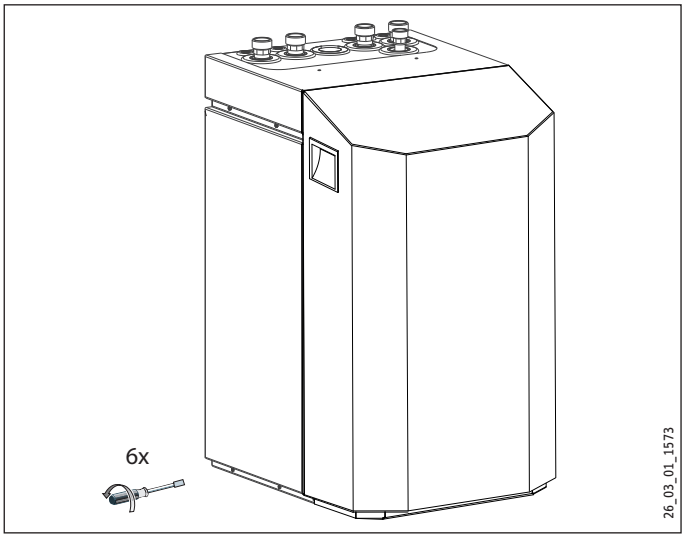
- ▶ Transport the appliance in its packaging to protect it against damage.
- ▶ Protect the appliance against heavy impact during handling.
- Only allow the appliance to be tilted during transport for a short time to one of its longitudinal sides.
  The longer the appliance is tilted, the greater the distribution of refrigerant oil in the system.
- Storage and transport at temperatures below - 20 °C and in excess of + 50 °C are not permissible.

10.2 Positioning

- ▶ Remove the packaging film and the top and side EPS padding.
- ▶ Tilt the appliance backwards slightly and remove it from the pallet.
- ▶ Position the appliance on the prepared substrate.
- ▶ Observe the minimum clearances (see chapter “Connections and dimensions”).



- ▶ Remove the six screws from the appliance plinth, and set down the casing onto the floor.

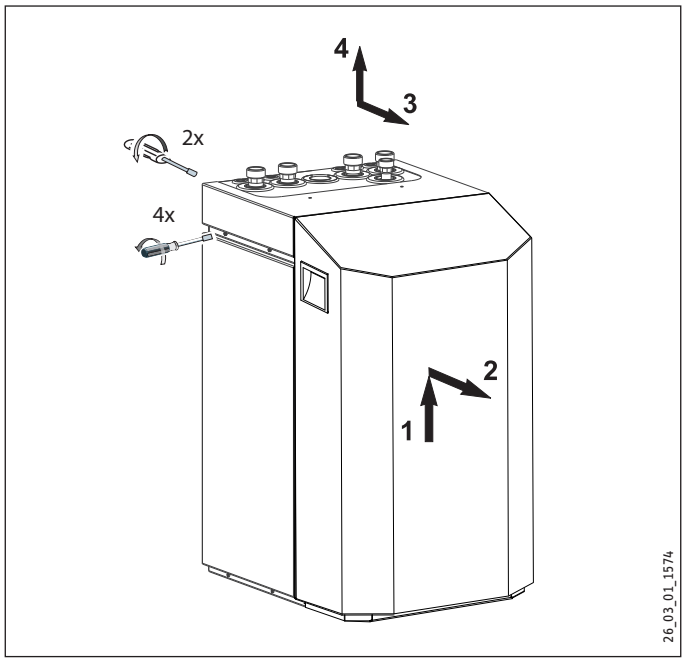


Appliance damage
The casing must stand on the floor free of the refrigeration unit. That means, the six plinth screws must not be refitted.

10.3 Removing the casing panels

When removing the front cover ensure that the cables that connect the heat pump manager to the control panel are not torn off.

The same applies to the earth connection which connects the front cover to the casing electrically.



10.4 Installing the heat source system

Design the heat source system for the ground source heat pump in accordance with the technical guides.

Approved brine:

- Heat transfer medium as concentrate on an ethylene glycol base, part no: 231109
- Heat transfer medium as concentrate on an ethylene glycol base, part no: 16 16 96

10.4.1 Circulation pump and required flow rate

Use a circulation pump with compound-filled windings to supply the brine, to prevent an earth short circuit through condensate in the electrical part of the pump (cold water version).

Size the circulation pump in accordance with the system-specific conditions, i.e. nominal flow rate and pressure drop must be taken into consideration (see “Specification”).

An adequate flow rate must be safeguarded at every possible brine temperature, i.e.:

Nominal flow rate at a brine temperature of 0 °C with a tolerance of +10 %.

10.4.2 Connection and filling with brine

Prior to connecting the heat pump, check the heat source circuit for possible leaks, and flush thoroughly.

Calculate the volume of the heat source circuit. You can determine the brine volume inside the heat pump under specific operating conditions from the following table (see “Specification”).

The overall volume equals that of the required amount of brine that should be mixed from undiluted ethylene glycol and water. The chloride content of the water must not exceed 300 ppm.

Mixing ratio

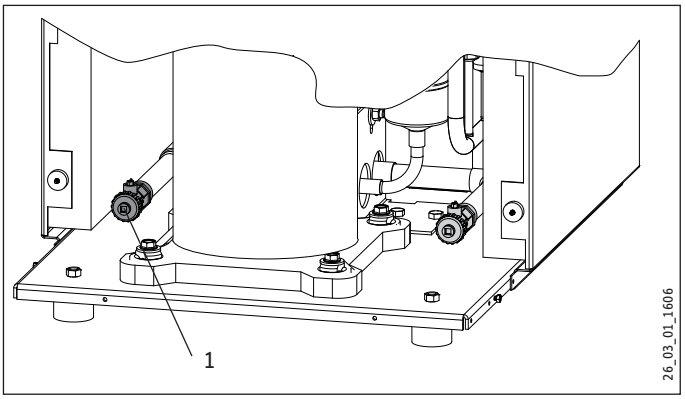
The brine concentration varies when using a geothermal collector or a geothermal probe as a heat source.

The mixing ratio can be found in the table below.

	Ethylene glycol	Water
Geothermal probe	25 %	75 %
Geothermal collector	33 %	67 %

Filling the brine circuit

Fill the brine circuit via the drain.



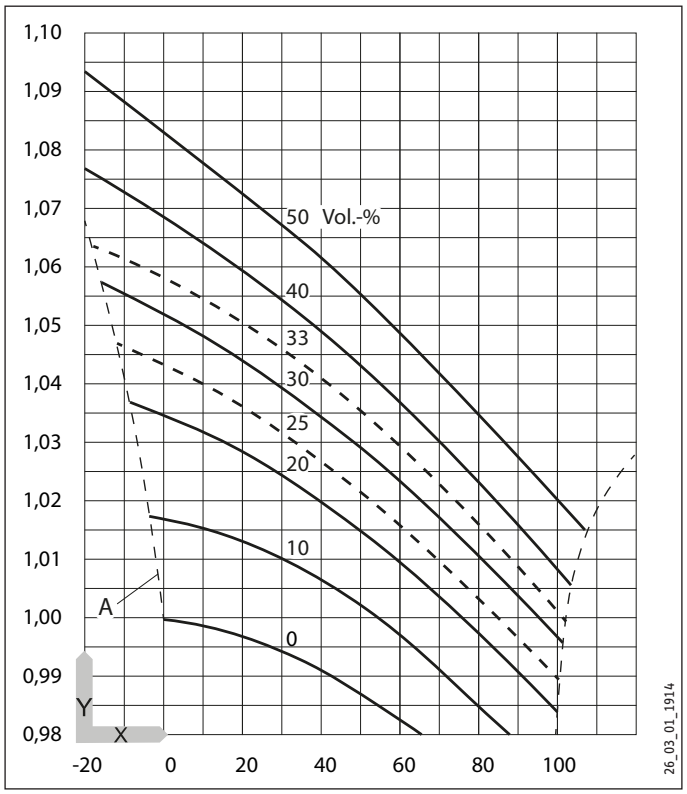
1 Drain, brine side

After filling the system with brine and prior to commissioning, open the drain until brine runs out of it. No water must remain in the pipe run to the drain.

Check the brine concentration:

▶ Determine the density of the ethylene glycol/water mixture, e.g. with a hydrometer.

Using the actual density and temperature, you can check the actual concentration in the diagram.



X Temperature [°C]
Y Density [g/cm³]
A Frost protection [°C]

Note
The quoted details refer to ethylene glycol (see "Specification").

Thermally insulate all brine pipes with diffusion-proof material.

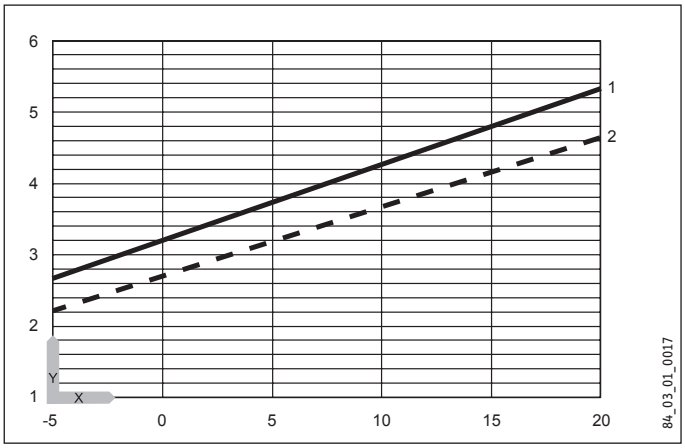
To prevent the transmission of noise, connect the heat source circuit to the heat pump with flexible pressure hoses.

10.4.3 Checking the heat source flow rate

The heat source flow rate is set via the temperature differential of the heat source circuit.

▶ Calculate the temperature differential. For this, operate the appliance in heating mode or DHW mode.

Max. temperature differential of heat source circuit



Y Max. temperature differential [K]
X Source inlet temperature [°C]
1 Heating flow 35 °C
2 Heating flow 50 °C

Note
At the WPM II, the source parameter in the commissioning report must be set to “ethylene glycol” otherwise the frost stat will stop the heat pump at temperatures below 7 °C.

Note
You can check the source outlet temperature on the heat pump manager display under system menu item TEMPERATURES.

10.5 Heating water connection

The heat pump heating system must be installed by a qualified contractor in accordance with the water installation drawings that are part of the technical documents.

▶ Thoroughly flush the pipework before connecting the heat pump. Foreign bodies, such as welding pearls, rust, sand, sealant etc. can impair the operational reliability of the heat pump.

▶ Connect the heat pump on the hot water side. Check for tightness.

Ensure the correct connection of the heating flow and return.

Provide thermal insulation in accordance with applicable regulations.

For sizing the heating circuit, note the maximum available external pressure differential.

10.5.1 Oxygen diffusion

Appliance damage
In underfloor heating systems, avoid open heating systems or the installation of steel pipes in conjunction with plastic pipes that are permeable to oxygen.

Steel components such as internal cylinders, steel heating elements or steel pipes, can corrode as a result of oxygen diffusion in open vented heating systems, of if plastic pipes that are permeable to oxygen are used in underfloor heating systems.

The products of corrosion, e.g. rusty sludge, can settle inside the heat pump condenser and result in a lower output by reducing the cross-section, or in a shutdown being activated by the high pressure switch.

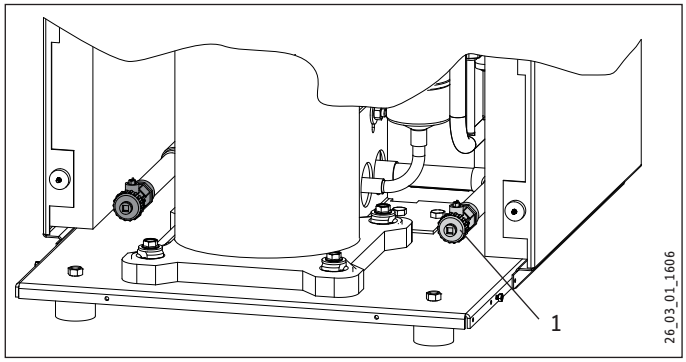
10.5.2 Second external heat generator

For dual mode heating systems, always connect the heat pump into the return of the second heat generator (e.g. oil boiler).

High heating water temperature: In dual mode heating systems, the return water from the second heat generator can flow through the heat pump, immediately after it has been switched off, with a max. temperature of 60 °C. The temperature may be 70 °C no sooner than ten minutes after the heat pump has been shut down.

10.5.3 Filling the heating system

Fill the heating system via the drain valve.



1 Drain, heating side

Water quality

A fill water analysis must be available prior to charging the system. This may, for example, be requested from the relevant water supply utility.

Material losses
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 as part of annual system maintenance.

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

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

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

10.5.4 Venting the heating system

- ▶ Vent the pipework thoroughly.

10.6 Safety temperature controller for underfloor heating system

Material losses
In case of failure, in order to prevent an excessively high flow temperature in the underfloor heating system, we generally recommend the use of a safety temperature controller to limit the system temperature.

10.7 Power supply

Note
Observe the heat pump manager operating and installation instructions

Only qualified electricians must carry out the installation in accordance with these instructions.

Permission to connect the appliance may need to be obtained from your local power supply utility.

- ▶ Observe chapter “Preparing the electrical installation”.

DANGER Electrocution
Before any work, isolate the appliance from the power supply at the control panel.

Note
The terminals are located in the appliance control panel.

Note
If the appliance is sealed, observe chapter “Removing the casing parts”.

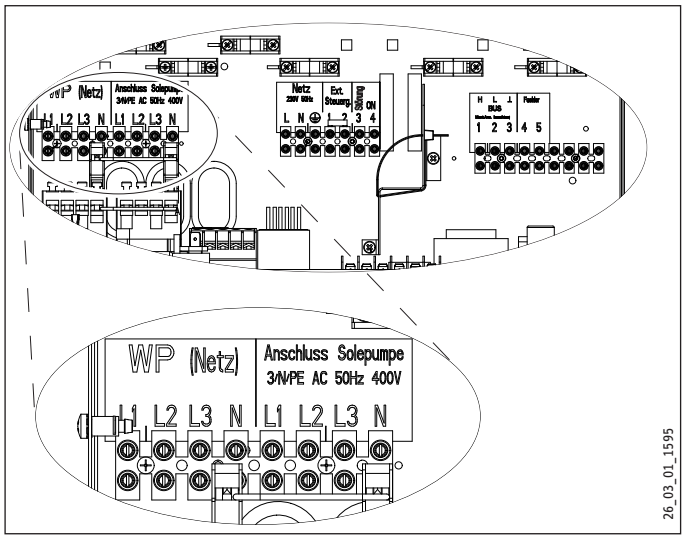
Use appropriate cables in accordance with local regulations for all connections.

- ▶ Open the control panel’s cover flap. To do so, remove the fixing screws on the side at the top of the control panel.
- ▶ Route all connecting cables and sensor leads through the entries provided at the top of the back panel (see chapter “Connections and dimensions”).
- ▶ Route all cables and leads through the strain relief fittings.
- ▶ Connect cables according to the following diagrams.
- ▶ Then check the function of the strain relief fittings.

Note
When closing the appliance, observe chapter “Fitting the casing parts”.

10.7.1 Electrical connection WPF (three-phase)

Terminals X3: Appliance and brine pump



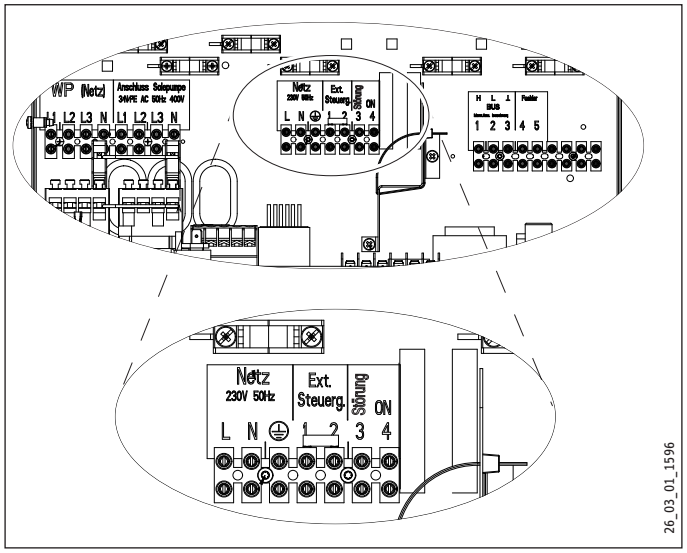
Heat pump power supply (compressor)
L1, L2, L3, N, PE (3/N/PE~400 V 50 Hz)

Please note:
The compressor must only rotate in one direction. Change the direction of rotation by interchanging two phases, if the fault NO POWER appears in the WPM display when the compressor starts.

Brine pump power supply
L1, L2, L3, N, PE (3/N/PE~400 V 50 Hz)

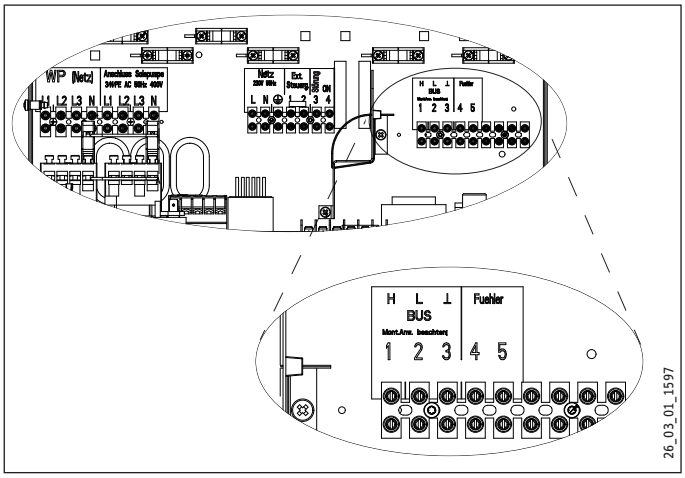
After connecting all electrical cables, refit and seal the cover over the mains terminal strip.

Terminals X4: Control



Mains supply: L, N, PE (1/N/PE ~230 V 50 Hz)

Terminals X2: Low voltage



H	BUS high
L	BUS Low
⊥	BUS ground ⊥
“ + “	BUS “ + “
Sensor	No function

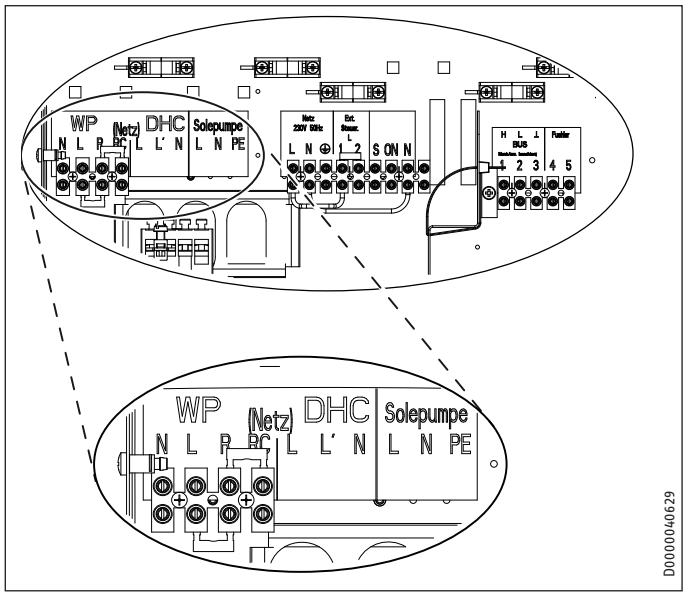
Circulation pumps

Connect the circulation pumps in accordance with the specifications in the technical guides.

Appliance damage
If external high efficiency circulation pumps are used, never switch these directly.
Use an external relay with a breaking capacity of at least 10 A/250 V AC.

10.7.2 Electrical connection WPF MS (single phase)

Terminals X3: Heat pump



Heat pump power supply (compressor)

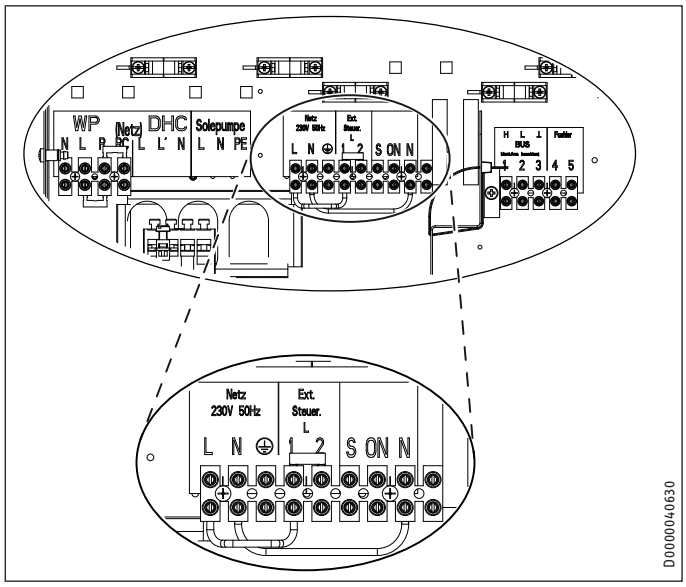
L, N, PE

Power supply, heat pump with WPAB

R, RC, N, PE

After connecting all electrical cables, refit and seal the cover over the mains terminal strip.

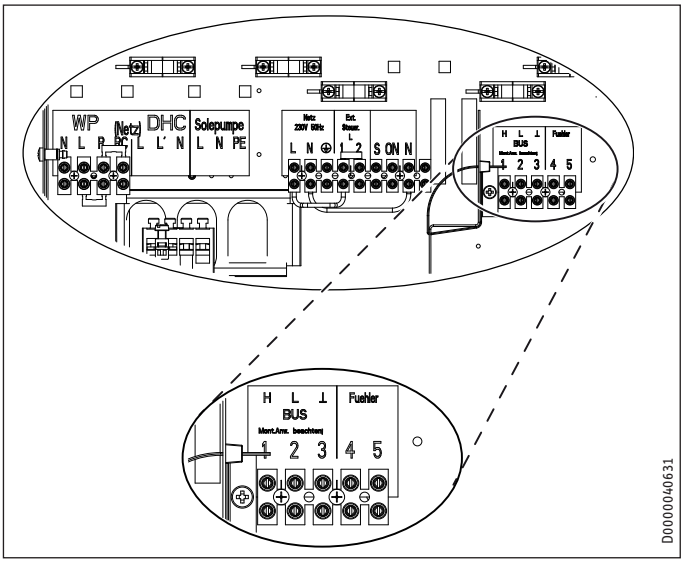
Terminals X4: Control



Mains supply: L, N, PE
Outputs:

S	Control output for the WPAB
ON	Compressor signal

Terminals X2: Low voltage



1	BUS High H
2	BUS Low L
3	BUS ground ⊥
4 and 5	Temperature sensors

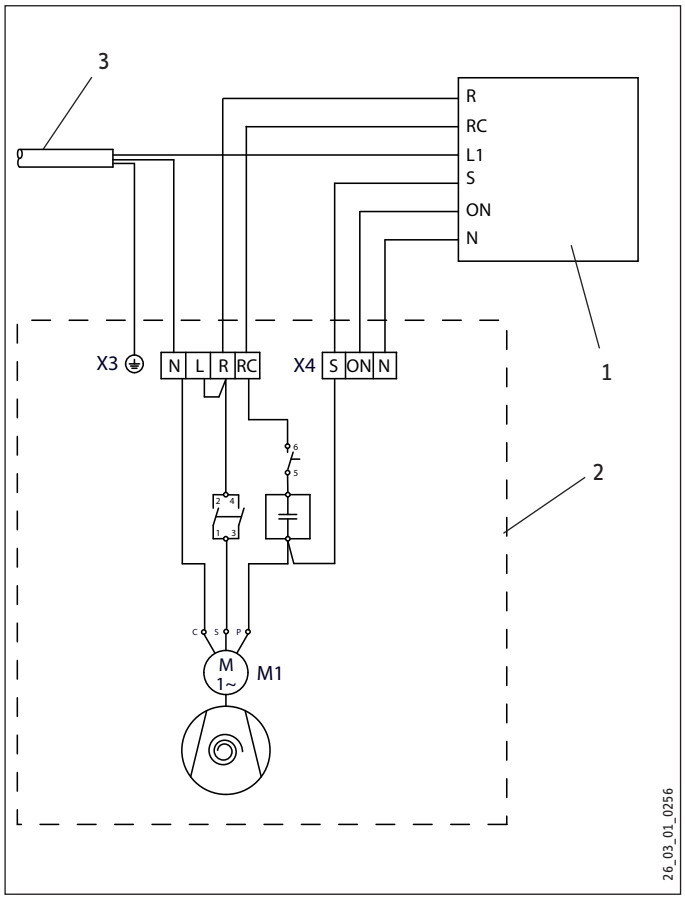
10.7.3 Electrical connection WPF MS (single phase) with WPAB

To limit the starting current of the WPF MS, the WPAB can be installed in the domestic distribution board. The WPAB limits the starting current to the values listed in the specification.

Please note:
When a WPAB is connected to the heat pump, remove the jumper across R and RC at terminal X3.

Please note:
When connecting a WPAB, use the same phase for L (terminal X3) of the compressor and L (terminal X4) of the controller; protect the unit with an RCD.

Wire in accordance with the following diagram.



1 WPAB
2 Heat pump
3 Power supply 1/N/PE 230 V

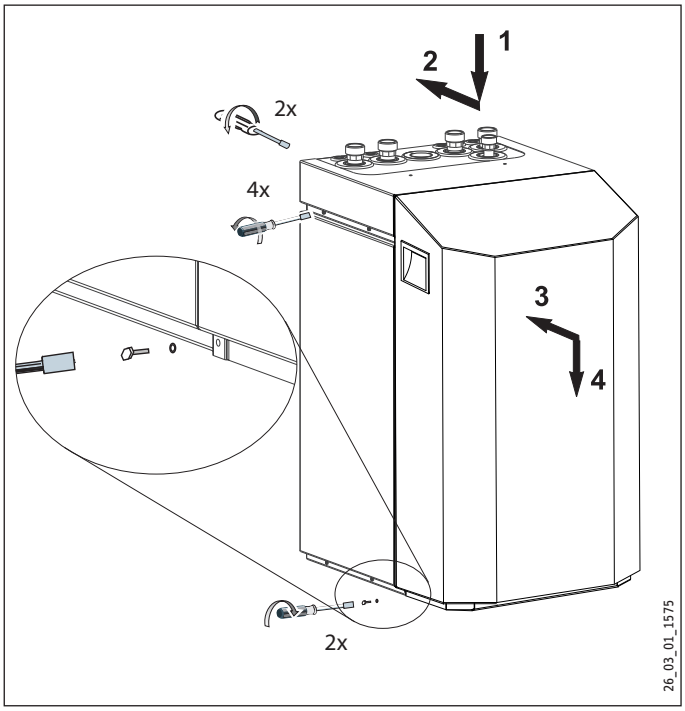
10.7.4 Modules

When using a modular approach, connect the individual heat pumps via terminal BUS 1, 2, 3. Ensure that High, Low and Ground are correctly connected at the WPM as well as at the heat pump.

10.8 Fitting casing components

When fitting the casing parts, proceed as follows:

- ▶ Close the cover of the control panel.
- ▶ Secure the cover by firmly tightening the fixing screws with serrated washers.
- ▶ Fit the cover to the appliance.
- ▶ After attaching the front cover, fix it to the side panels with screws, as shown in the diagram. When attaching the front cover, fit the tab with its screws and serrated washers. The tab, screws and serrated washers can be found in the pack.
- ▶ When attaching the front cover, ensure the earth conductor is correctly connected.



11. Commissioning

A contractor must commission the appliance, make all the settings when commissioning the heat pump manager and instruct the user.

Carry out commissioning in accordance with these installation instructions, the operating and installation instructions for the heat pump manager and the operating and installation instructions for the heat pump.

Our customer service can assist in the commissioning, which is chargeable.

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

After commissioning, complete the commissioning report that is part of these instructions.

11.1 Checks prior to commissioning the heat pump manager

Damage to the appliance and environment
Observe the maximum system temperature in underfloor heating systems.

Damage to the appliance and environment
With an underfloor heating system, never use the heat pump to dry the screed as this places such a high demand on the heat source that the frost protection function may respond.

- ▶ Check whether the heating system is charged to the correct pressure and the quick-action air vent valve is open.
- ▶ Check whether the outside temperature sensor is correctly placed and connected.
- ▶ Check whether the power supply is connected correctly.
- ▶ Check whether the connecting cable to the heat pump (BUS cable) is connected correctly.

11.2 Commissioning the heat pump manager

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

11.3 Heating curve adjustment

The efficiency of a heat pump decreases as the flow temperature rises. The heating curve should therefore be adjusted with care. Heating curves that are set too high cause the zone valves and thermostatic valves to close, which may lead to the minimum flow rate required for the heating circuit not being achieved.

- ▶ Observe the WPM operating and installation instructions.

The following steps will help you to adjust the heating curve correctly:

- Fully open thermostatic or zone valves in a lead room (e.g. living room and bathroom).
  We do not recommend installing thermostatic or zone valves in the lead room. Control the temperature for these rooms via remote control.
- At different outside temperatures (e.g. –10 °C and +10 °C), adjust the heating curve so the required temperature is set in the lead room.

Standard values to begin with:

Parameter	Underfloor heating system	Radiator heating system
Heating curve	0.4	0.8
Control response time	5	15
Comfort temperature	20 °C	20 °C

If the room temperature in spring and autumn is too low (approx. 10 °C outside temperature), the value of parameter COMFORT TEMPERATURE must be raised in the heat pump manager menu under SETTINGS / HEATING / HEATING CIRCUIT.

Note
If no remote control is installed, raising the parameter “COMFORT TEMPERATURE” leads to a parallel offset of the heating curve.

Increase the parameter “heating curve” if the room temperature is not high enough when outside temperatures are low.

If the parameter “heating curve” has been raised, adjust the zone valve or thermostatic valve in the lead room to the required temperature at high outside temperatures.

Material losses
Never reduce the temperature in the entire building by closing all zone or thermostatic valves, instead use the setback programs.

When everything has been implemented correctly, the system can be heated to its maximum operating temperature and vented once again.

Material losses
With underfloor heating systems, observe the maximum permissible temperature for the system.

11.4 Appliance handover

Explain the appliance function to users and familiarise them with its operation.

Note
Hand over these operating and installation instructions to the user for safe-keeping. Carefully observe all information in these instructions. They provide information on safety, operation, installation and maintenance of the appliance.

11.5 Operation and control

Appliance and system damage
Never interrupt the power supply, not even outside the heating season. The system’s active frost protection is not guaranteed if the power supply is interrupted.

The system should not be switched off in summer. The heat pump manager has an automatic summer / winter changeover.

12. Shutting down

If the system is taken out of use, set the heat pump manager to standby. This way the safety functions that protect the system remain enabled, e.g. frost protection.

Appliance and system damage
If the heat pump and frost protection are completely switched off, drain the system on the water side.

13. Maintenance and cleaning

If heat meters are installed, clean their strainers frequently as they block easily.

When the heat pump operation is impaired (high pressure limiter trips) through deposits of corrosion by-products (rust sludge) inside the condenser, only dissolving them by means of solvents used by our service department will remove this problem.

14. Troubleshooting

Note
Please observe the heat pump manager operating and installation instructions.

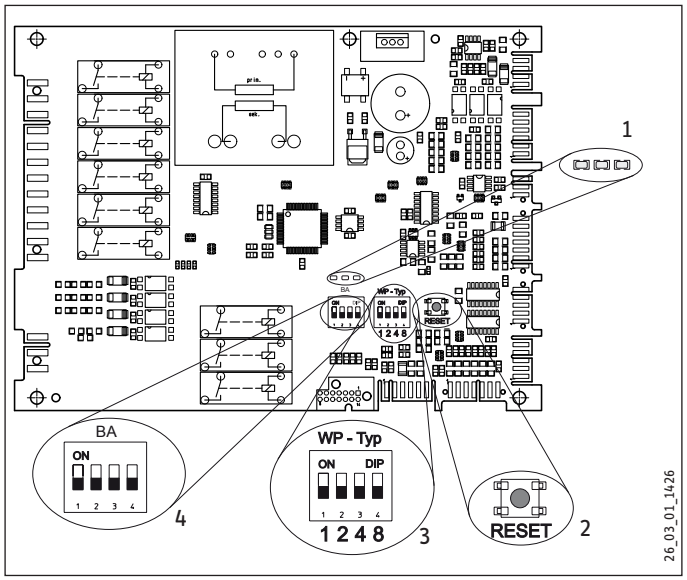
Note
The following inspection instructions may only be carried out by a qualified contractor.

If you cannot locate the fault using the heat pump manager, use the controls on the IWS.

- ▶ Open the control panel.
- ▶ Read the following sections on troubleshooting and carry out the instructions.

14.1 IWS controls

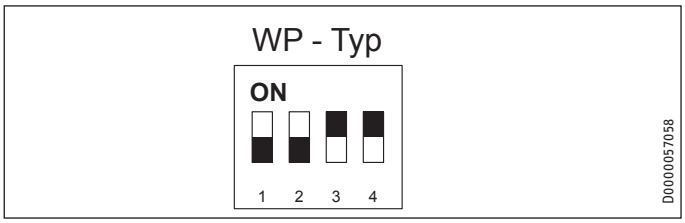
The IWS (integral heat pump controller) helps you to troubleshoot if the fault cannot be identified using the WPM.



1 LEDs
2 Reset button
3 DIP switch (type WP)
4 DIP switch (BA)

14.1.1 Checking the “HP type” DIP switch on the IWS

- ▶ Check whether the “HP type” DIP switch (3) [marked WP-Typ] is set as follows:



If the appliance is to be used as a module together with a further WPF..M, the DIP switch must remain in the same position.

14.1.2 DIP switch “BA”

These DIP switches have no function.

14.1.3 LEDs

Red LED

Fault	Cause	“ Remedy
Appliance stops and restarts after the idle period has expired. Red LED flashes.	Heat pump fault	Check the fault message in the WPM. Find the solution in the WPM instructions (fault list). Perform an IWS reset (see WPM instructions).
Appliance stops permanently. Red LED illuminates.	Five faults within two hours compressor runtime.	Check the fault message in the WPM. Find the solution in the WPM instructions (fault list). Perform an IWS reset (see WPM instructions).

Green LED centre

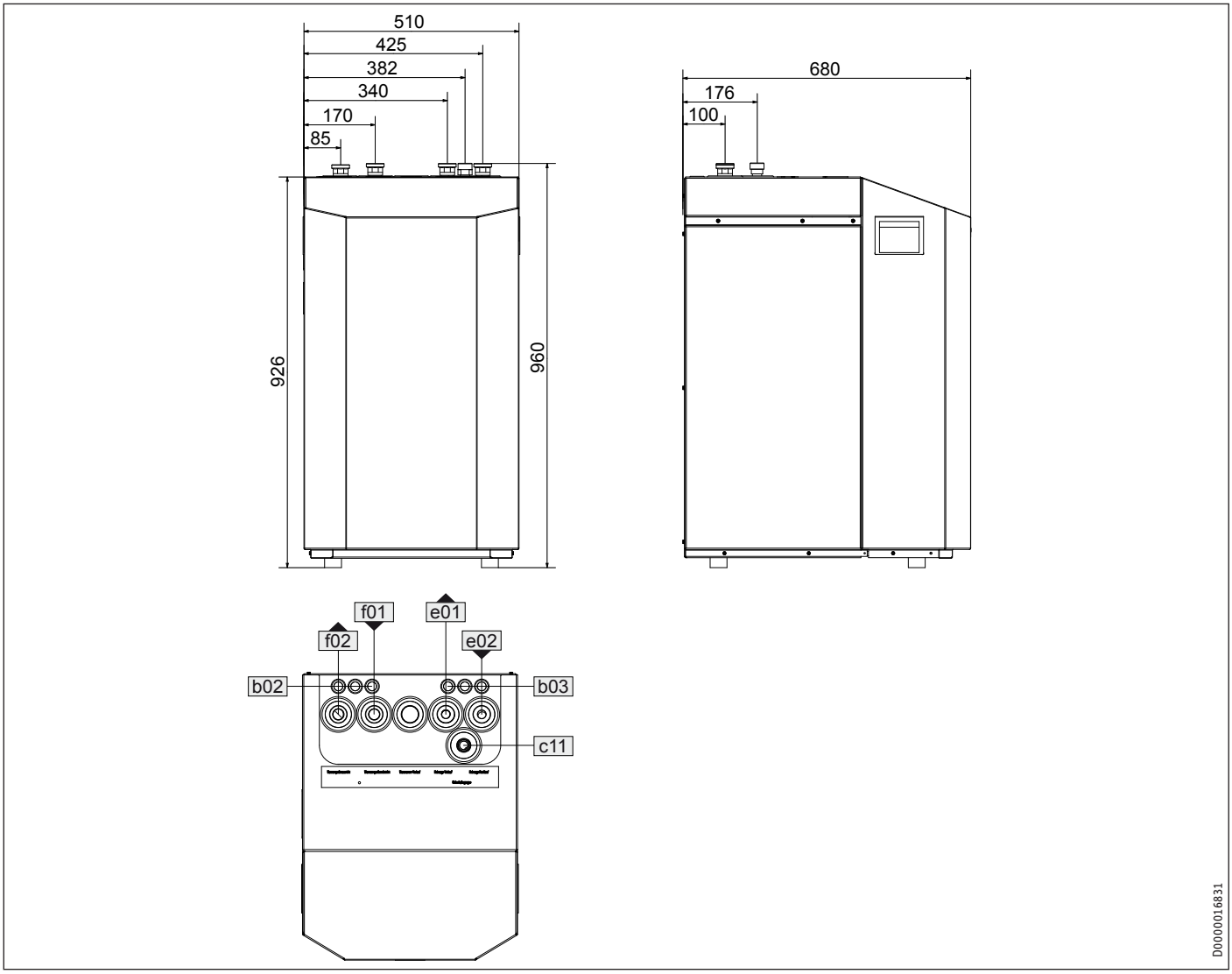
The LED flashes during initialisation, and illuminates constantly after the BUS address has been assigned successfully. Only then is communication with the WPM established.

14.1.4 Reset button

If the IWS was incorrectly initialised, the settings can be reset with this button. For this also observe the chapter “Reinitialising IWS” in the heat pump manager operating and installation instructions.

15. Specification

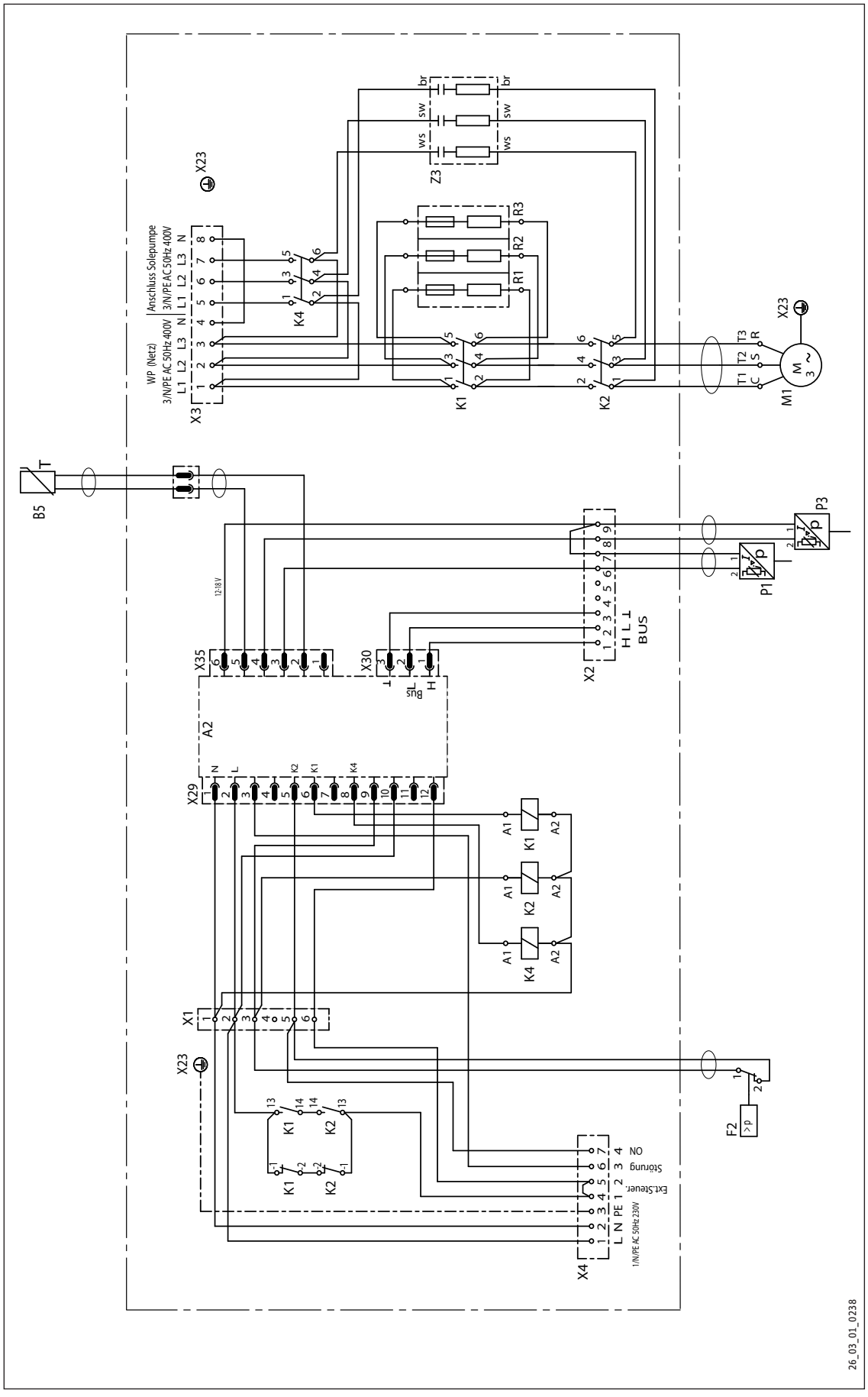
15.1 Connections and dimensions



			WPF 10 M	WPF 13 M	WPF 16 M	WPF 7 MS	WPF 10 MS
b02	Entry electrical cables I						
b03	Entry electrical cables II						
c11	Safety assembly						
e01	Heating flow	Male thread	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4
e02	Heating return	Male thread	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4
f01	Heat source flow	Male thread	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4
f02	Heat source return	Male thread	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4

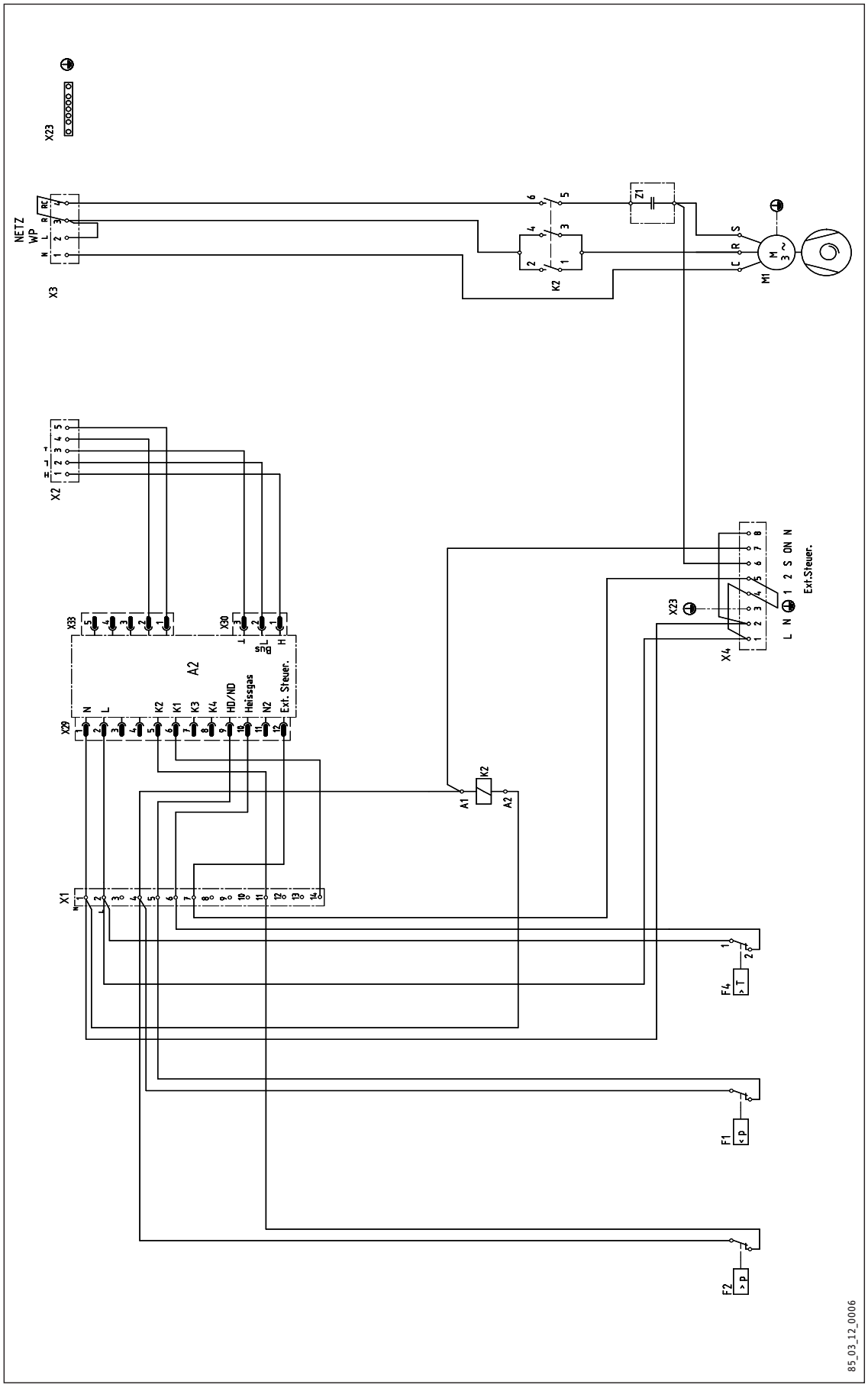
SPECIFICATION

15.2 Wiring diagram WPF 10 M | WPF 13 M | WPF 16 M



A2 Integral heat pump control unit IWS
B5 Hot gas temperature sensor
F2 High pressure switch
K1 Contactor – resistor jumper
K2 Contactor, compressor start
K4 Contactor, brine pump
M1 Compressor motor
P1 High pressure sensor
P3 Low pressure sensor
R1 Start-up resistance
R2 Start-up resistance
R3 Start-up resistance
X1 Terminals
X2 LV terminals
X3 Power terminals
X4 Control terminals
X23 Power supply earth block
X29 Plug-in connector IWS 12-PIN
X30 Plug-in connector IWS 3-PIN
X35 Plug-in connector IWS 6-PIN
Z3 EMI capacitors

15.3 Wiring diagram WPF 7 MS | WPF 10 MS



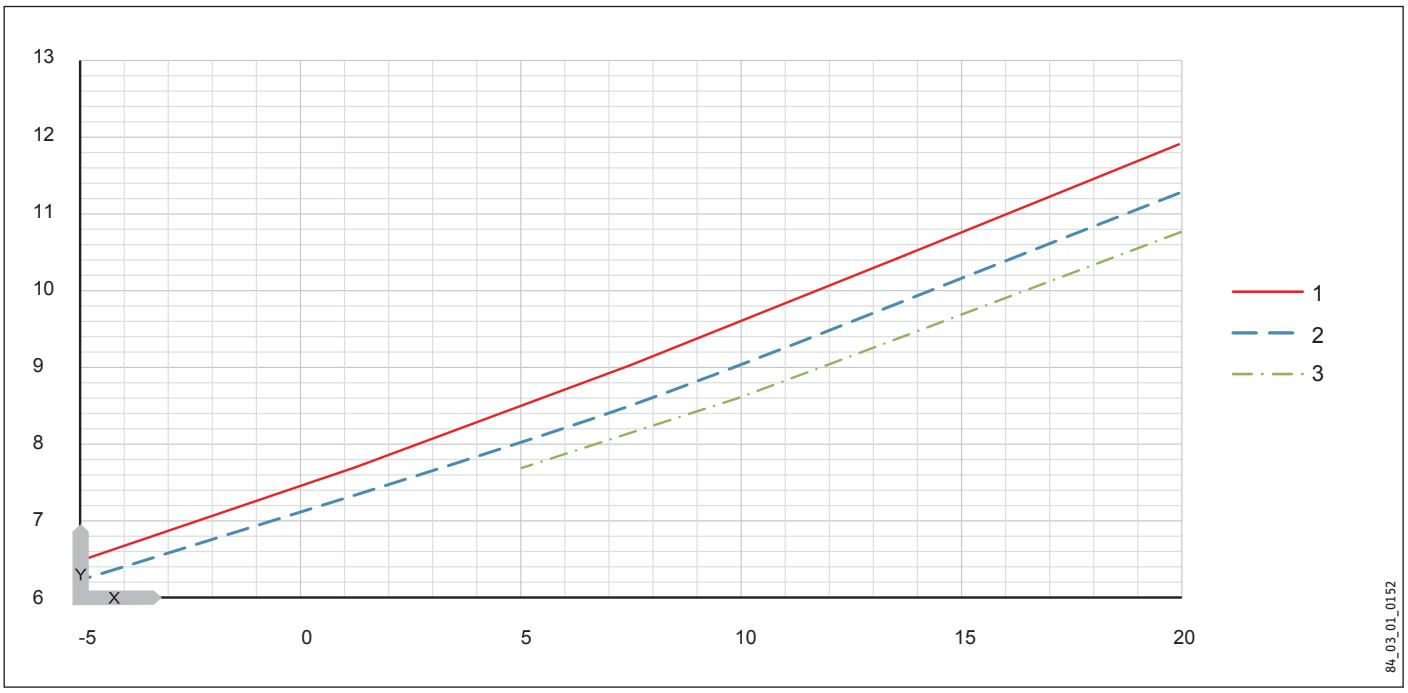
A2 Integral heat pump control unit IWS
F1 Low pressure switch
F2 High pressure switch
F4 Hot gas temperature limiter
K2 Contactor, compressor start
M1 Compressor motor
X1 Terminals
X2 LV terminals
X3 Power terminals
X4 Control terminals
X23 Power supply earth block
X28 Socket terminal strip support point
X29 Plug-in connector IWS 12-PIN
X30 Plug-in connector IWS 3-PIN
X33 Plug-in connector IWS 5-PIN
Y1 Diverter valve - defrost
Z1 Compressor capacitor

15.4 Output diagrams WPF 7 MS

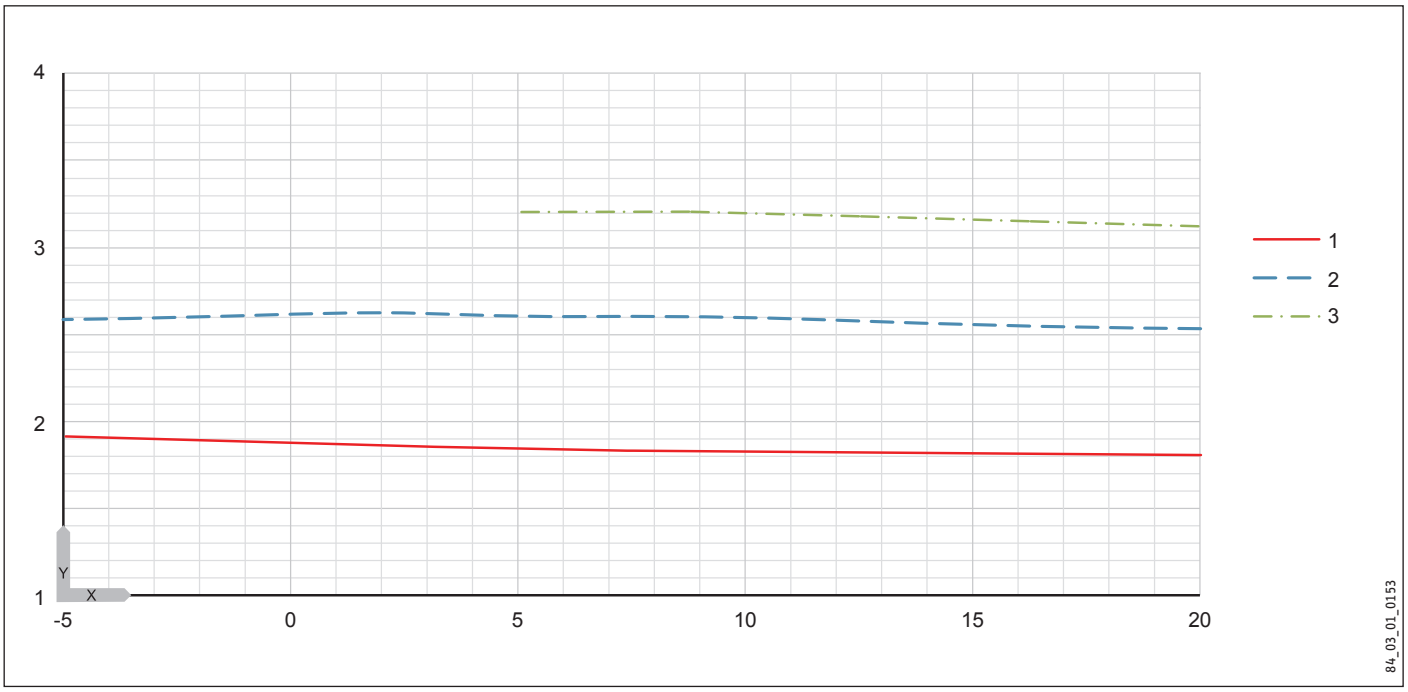
Legend for output diagrams

Y Heating output [kW] / power consumption [kW] / coefficient of performance e [-]
X Inlet temperature of the WQA medium [°C]
1 Flow temperature 35 °C
2 Flow temperature 50 °C
3 Flow temperature 60 °C

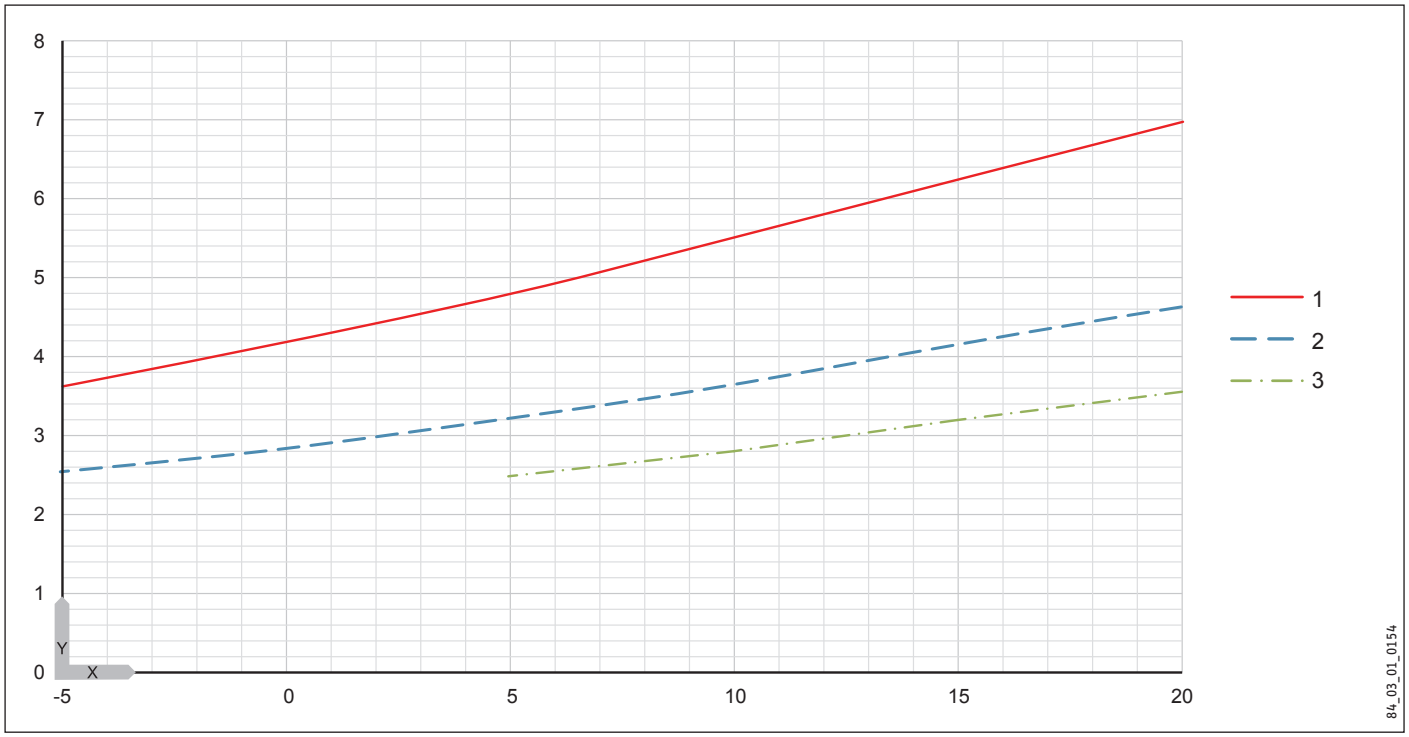
Heating output



Power consumption



Coefficient of performance (COP)

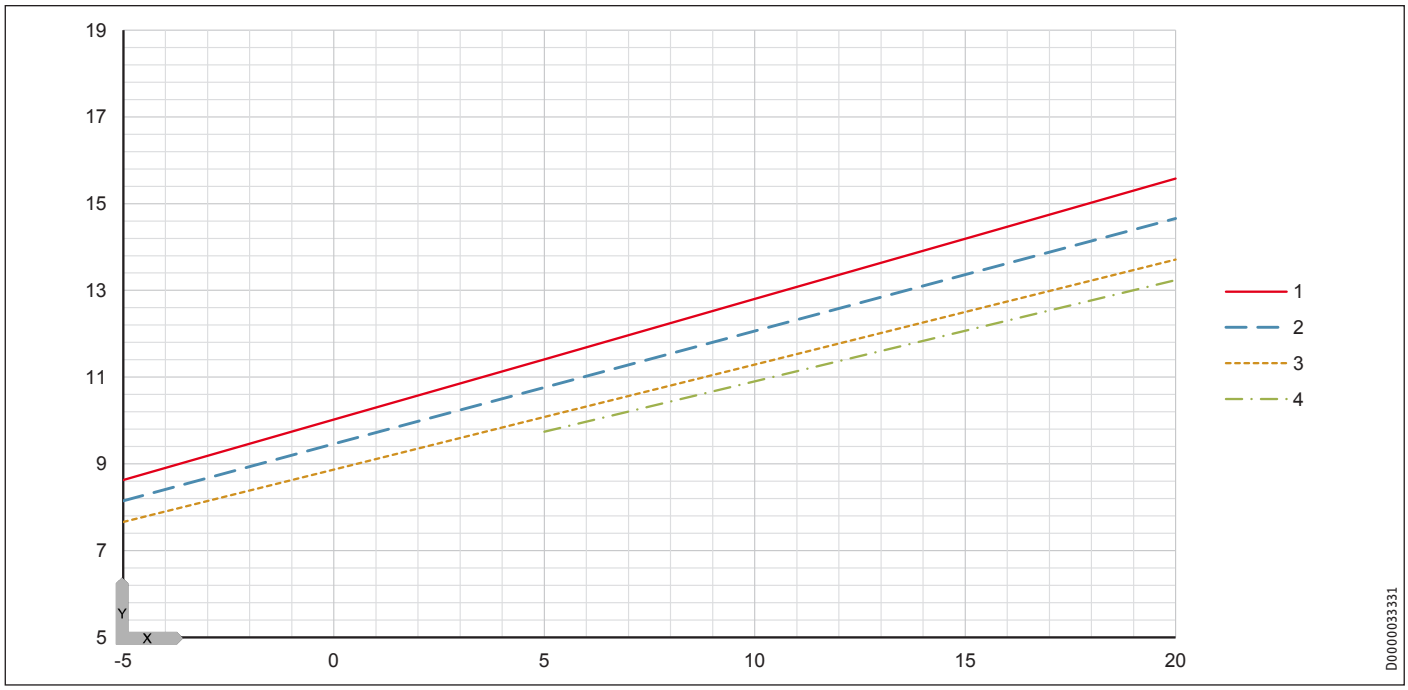


15.5 Output diagrams WPF 10 M | WPF 10 MS

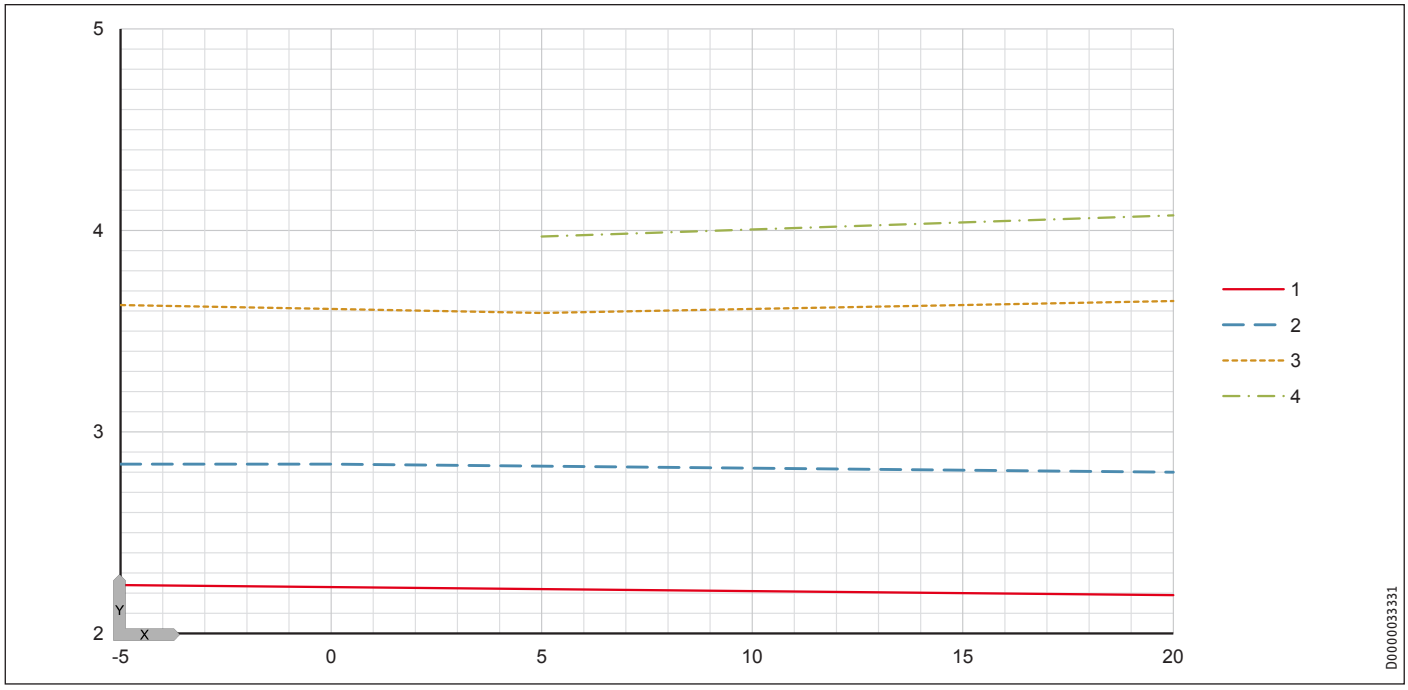
Legend for output diagrams

Y Heating output [kW] / power consumption [kW] / coefficient of performance e [-]
X Inlet temperature of the WQA medium [°C]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C
4 Flow temperature 60 °C

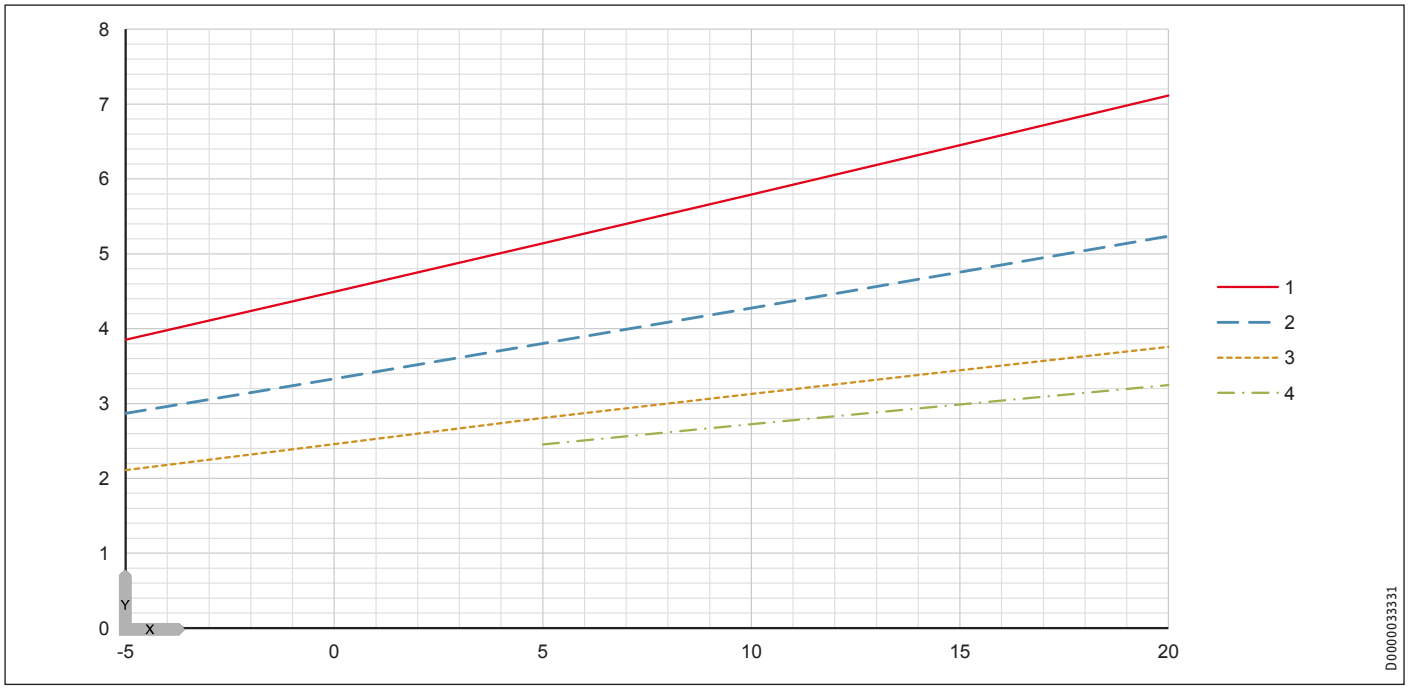
Heating output



Power consumption



Coefficient of performance (COP)

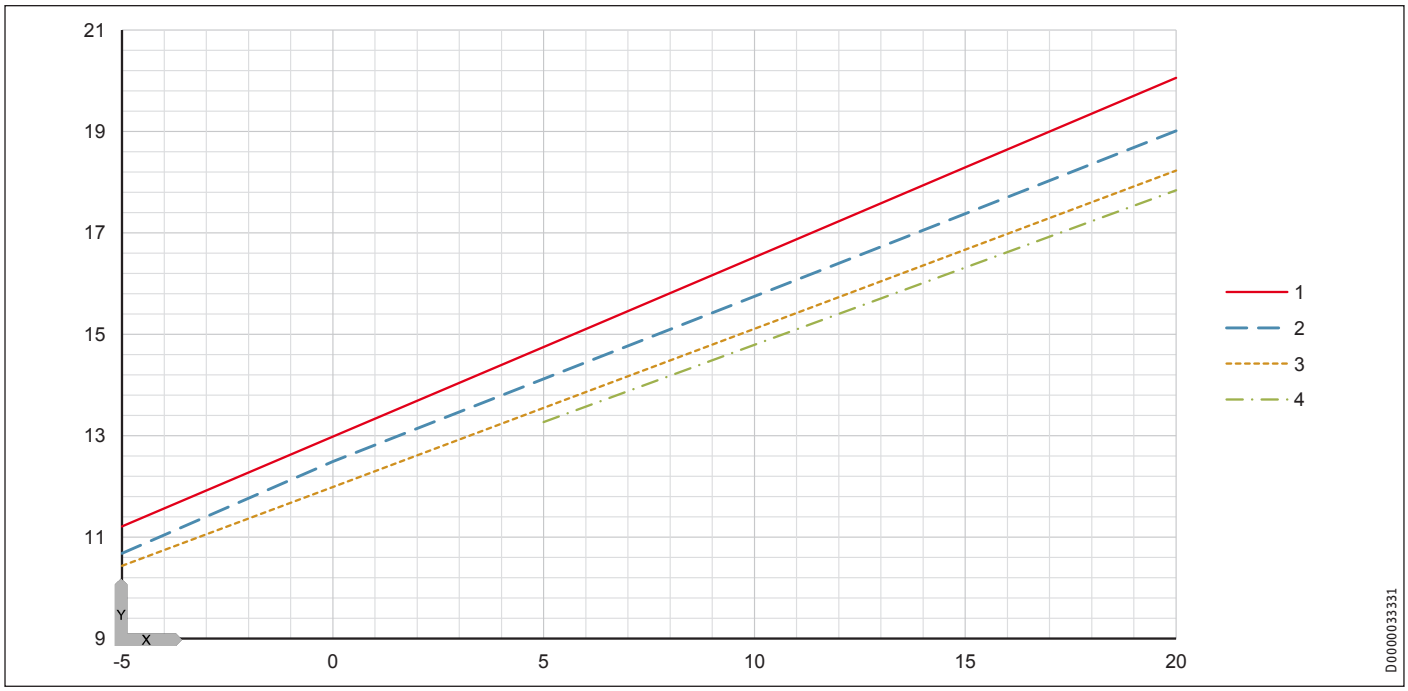


15.6 Output diagrams WPF 13 M

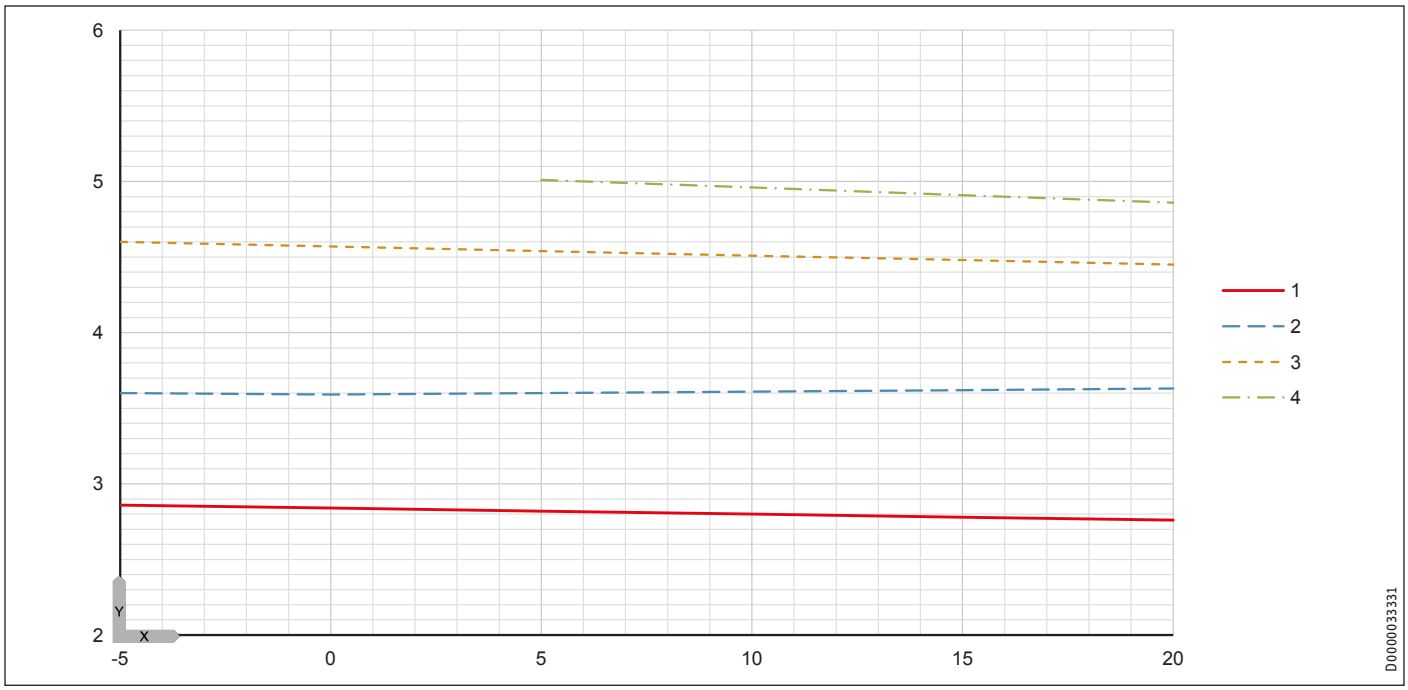
Legend for output diagrams

Y Heating output [kW] / power consumption [kW] / coefficient of performance e [-]
X Inlet temperature of the WQA medium [°C]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C
4 Flow temperature 60 °C

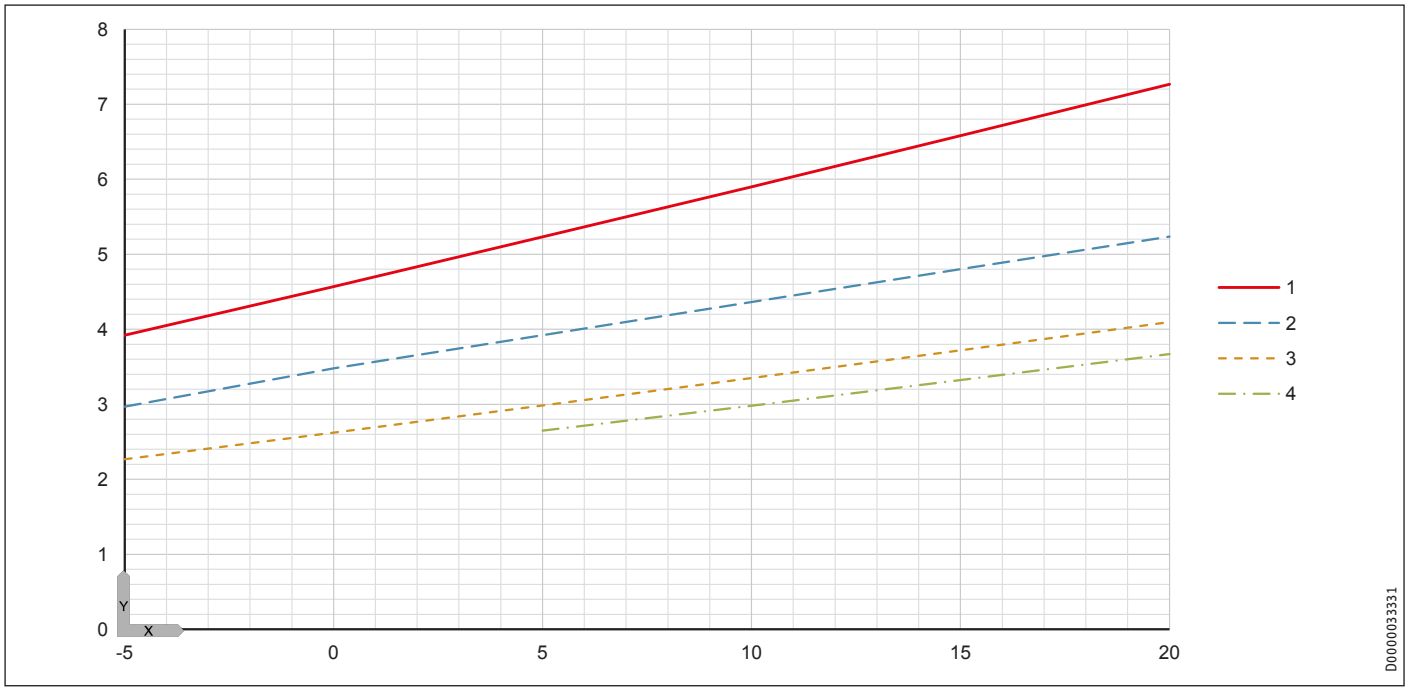
Heating output



Power consumption



Coefficient of performance (COP)

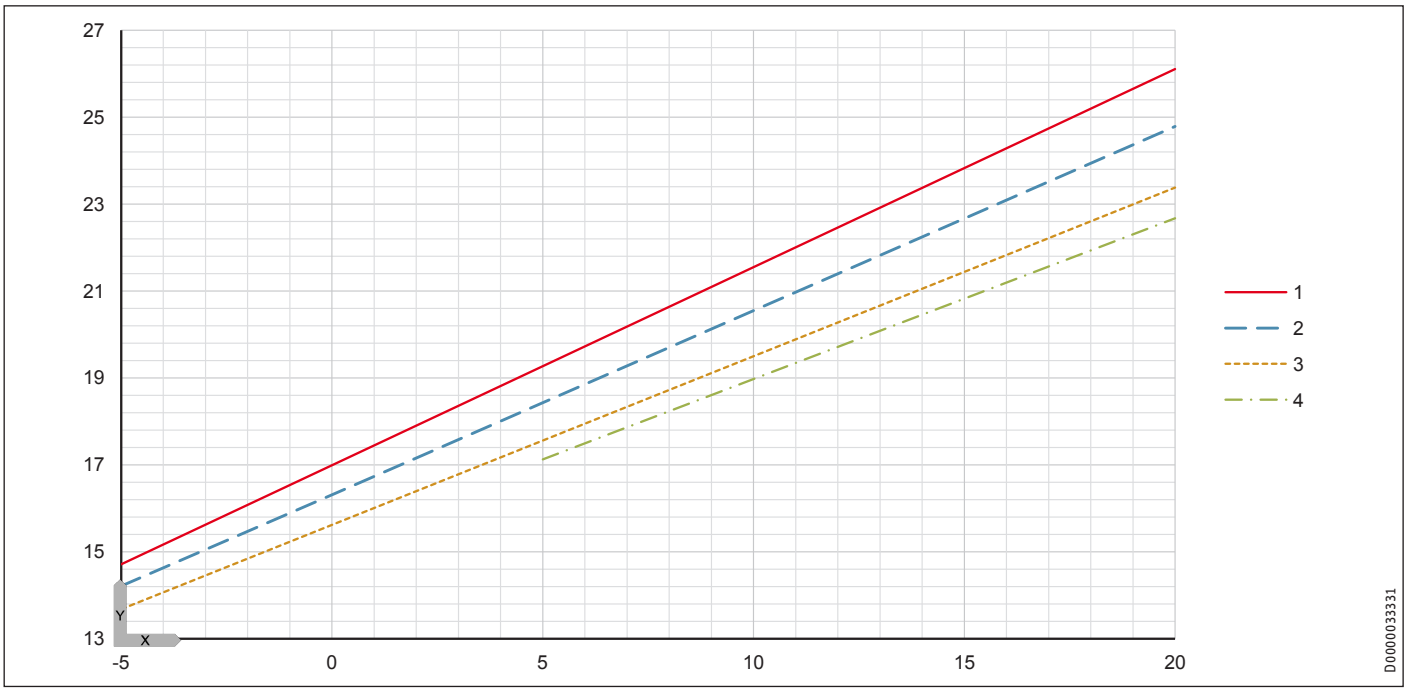


15.7 Output diagrams WPF 16 M

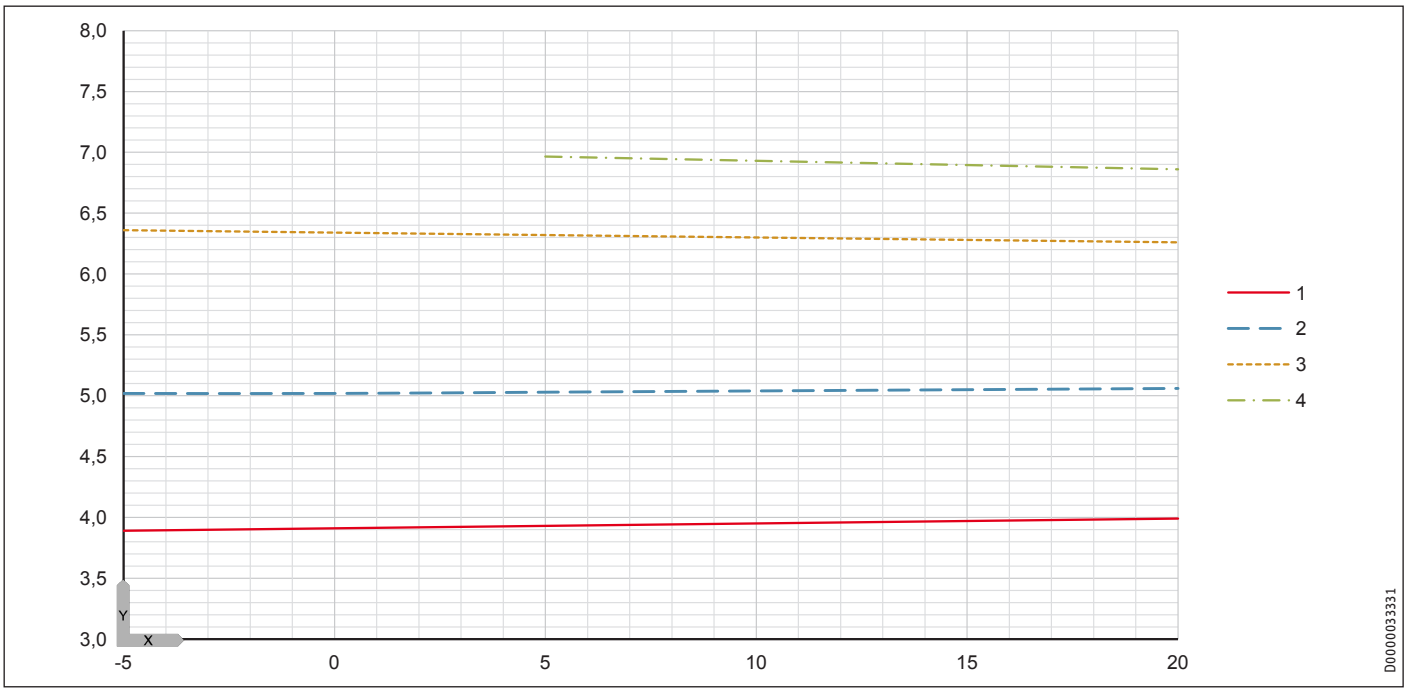
Legend for output diagrams

Y Heating output [kW] / power consumption [kW] / coefficient of performance e [-]
X Inlet temperature of the WQA medium [°C]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C
4 Flow temperature 60 °C

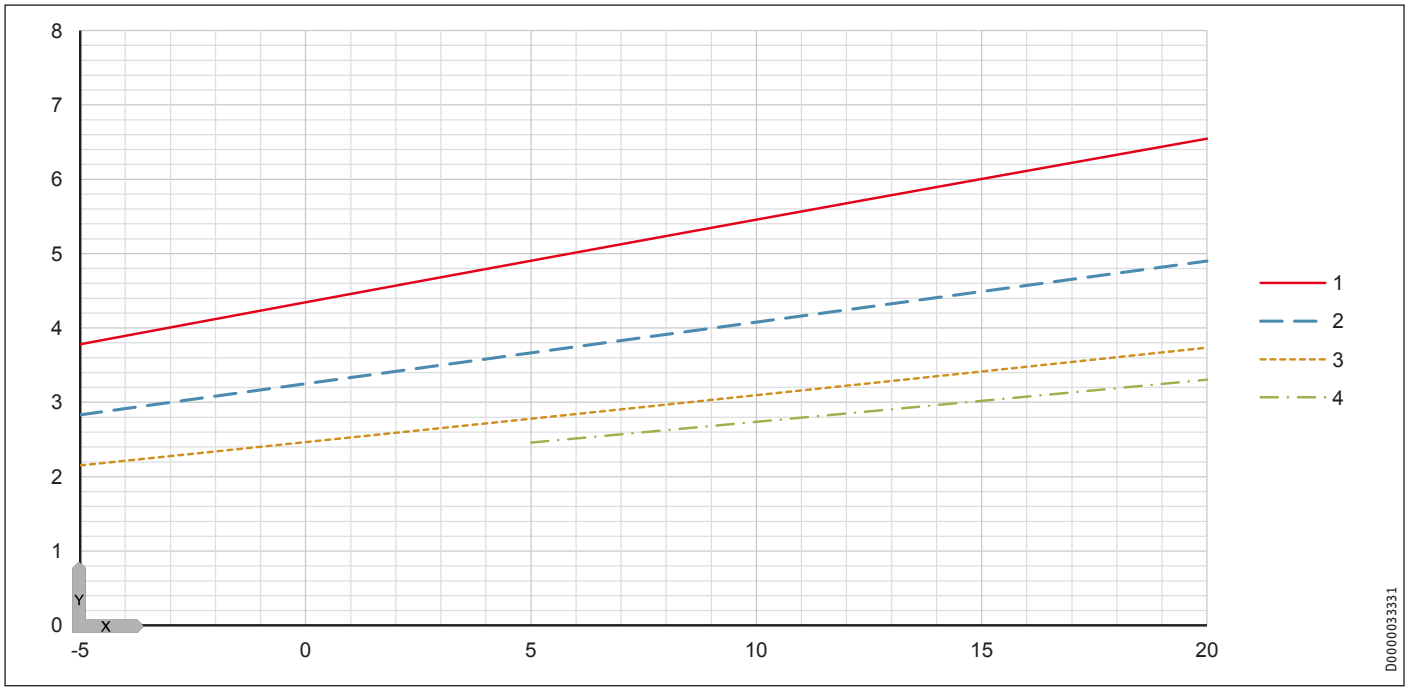
Heating output



Power consumption



Coefficient of performance (COP)



15.8 Data table

Output details apply to new appliances with clean heat exchangers.

		WPF 7 MS	WPF 10 MS	WPF 10 M	WPF 13 M	WPF 16 M
		222553	222552	185349	182135	220894
Heating output to EN 14511						
Heating output at B0/W35 (EN 14511)	kW	7.80	9.90	10.02	12.98	16.99
Power consumption to EN 14511						
Power consumption at B0/W35 (EN 14511)	kW	1.78	2.20	2.23	2.84	3.91
COP to EN 14511						
COP at B0/W35 (EN 14511)		4.40	4.50	4.49	4.57	4.35
Sound data						
Sound power level (EN 12102)	dB(A)	47		51	51	51
Sound pressure level at 1 m distance in a free field	dB(A)	39	43	43	43	43
Sound pressure level at 5 m distance in a free field	dB(A)	39	43	29	29	29
Application limits						
Max. permissible pressure	MPa	0.3	0.3	0.3	0.3	0.3
Min. application limit on the heating side	°C	15	15	15	15	15
Max. application limit on the heating side	°C	60	60	60	60	60
Min. application limit, heat source	°C	-5	-5	-5	-5	-5
Max. application limit, heat source	°C	20	20	20	20	20
Water hardness	°dH	≤3	≤3	≤3	≤3	≤3
pH value (with aluminium compounds)		8.0-8.5	8.0-8.5	8.0-8.5	8.0-8.5	8.0-8.5
pH value (without aluminium compounds)		8.0-10.0	8.0-10.0	8.0-10.0	8.0-10.0	8.0-10.0
Chloride	mg/l	<30	<30	<30	<30	<30
Conductivity (softening)	µS/cm	<1000	<1000	<1000	<1000	<1000
Conductivity (desalination)	µS/cm	20-100	20-100	20-100	20-100	20-100
Oxygen 8-12 weeks after filling (desalination)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Oxygen 8-12 weeks after filling (softening)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02
Mono ethylene glycol concentration, heat transfer medium	% vol.	25-35	25-35	25-35	25-35	25-35
Energy data						
Energy efficiency class, average climate, W55/W35		A+/A++	A+/A++	A+/A++	A++/A++	A+/A++
Electrical data						
Frequency	Hz	50	50	50	50	50
MCB/fuse protection, controller	A	1 x B 16	1 x B 16	1 x B 16	1 x B 16	1 x B 16
Compressor fuse/MCB	A	1 x C 25	1 x C 25	3 x C 16	3 x C 16	3 x C 16
Rated voltage, controller	V	230	230	230	230	230
Rated voltage, compressor	V	230	230	400	400	400
Phases, controller		1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE
Phases, compressor		1/N/PE	1/N/PE	3/PE	3/PE	3/PE
Starting current (with/without starting current limiter)	A	32/88	41/97	27/-	28/-	29/-
Versions						
Refrigerant		R410 A	R410 A	R410 A	R410 A	R410 A
Refrigerant charge	kg	2	2.5	2.6	2.5	3.35
Compressor oil		Emkarate RL 32 3MAF	Emkarate RL 32 3MAF	Emkarate RL 32 3MAF	Emkarate RL 32 3MAF	Emkarate RL 32 3MAF
Evaporator material		1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu
Condenser material		1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu
Dimensions						
Height	mm	971	960	960	960	960
Width	mm	510	510	510	510	510
Depth	mm	640	640	680	680	680
Weights						
Weight	kg	107	120.5	112	120	125
Connections						
Connection on the heating side		G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4
Connection on the heat source side		G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4
Values						
Nominal heating flow rate at A2/W35, B0/W35 and 7 K	m³/h	0.96	1.22	1.22	1.65	2.01
Min heating flow rate	m³/h	0.67	0.85	0.85	1.15	1.4
Heating flow rate (EN 14511) at A7/W35, B0/W35 and 5 K	m³/h	1.34	1.71	1.71	2.31	2.81
Flow rate, heat source side	m³/h	1.9	2.2	2.2	3.1	3.8
Internal volume, heating side	l	2.8	3.4	3.4	3.4	4.4
Internal volume, heat source side	l	3.5	4.1	4.1	4.1	4.8
Pressure differential, heating side	hPa	100	100	100	100	100
Pressure differential on the heat source side	hPa	110	120	120	230	250

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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.

KYOTO | R410A

This device is filled with refrigerant R410A.

Refrigerant R410A is a CFC greenhouse gas mentioned in the Kyoto protocol with a global greenhouse potential (GWP) = 1925.

Never release refrigerant R410A to atmosphere.

Deutschland
STIEBEL ELTRON GmbH & Co. KG
Dr.-Stiebel-Straße 33 | 37603 Holzminden
Tel. 05531 702-0 | Fax 05531 702-480
info@stiebel-eltron.de
www.stiebel-eltron.de

Verkauf Tel. 05531 702-110 | Fax 05531 702-95108 | info-center@stiebel-eltron.de
Kundendienst Tel. 05531 702-111 | Fax 05531 702-95890 | kundendienst@stiebel-eltron.de
Ersatzteilverkauf Tel. 05531 702-120 | Fax 05531 702-95335 | ersatzteile@stiebel-eltron.de

Australia
STIEBEL ELTRON Australia Pty. Ltd.
6 Prohasky Street | Port Melbourne VIC 3207
Tel. 03 9645-1833 | Fax 03 9645-4366
info@stiebel.com.au
www.stiebel.com.au

Austria
STIEBEL ELTRON Ges.m.b.H.
Eferdinger Str. 73 | 4600 Wels
Tel. 07242 47367-0 | Fax 07242 47367-42
info@stiebel-eltron.at
www.stiebel-eltron.at

Belgium
STIEBEL ELTRON bvba/sprl
't Hofveld 6 - D1 | 1702 Groot-Bijgaarden
Tel. 02 42322-22 | Fax 02 42322-12
info@stiebel-eltron.be
www.stiebel-eltron.be

China
STIEBEL ELTRON (Guangzhou) Electric Appliance Co., Ltd.
Rm 102, F1, Yingbin-Yihao Mansion, No. 1 Yingbin Road
Panyu District | 511431 Guangzhou
Tel. 020 39162209 | Fax 020 39162203
info@stiebeleltron.cn
www.stiebeleltron.cn

Czech Republic
STIEBEL ELTRON spol. s r.o.
K Hájům 946 | 155 00 Praha 5 - Stodůlky
Tel. 251116-111 | Fax 235512-122
info@stiebel-eltron.cz
www.stiebel-eltron.cz

Finland
STIEBEL ELTRON OY
Kapinakuja 1 | 04600 Mäntsälä
Tel. 020 720-9988
info@stiebel-eltron.fi
www.stiebel-eltron.fi

France
STIEBEL ELTRON SAS
7-9, rue des Selliers
B.P 85107 | 57073 Metz-Cédex 3
Tel. 0387 7438-88 | Fax 0387 7468-26
info@stiebel-eltron.fr
www.stiebel-eltron.fr

Hungary
STIEBEL ELTRON Kft.
Gyár u. 2 | 2040 Budaörs
Tel. 01 250-6055 | Fax 01 368-8097
info@stiebel-eltron.hu
www.stiebel-eltron.hu

Japan
NIHON STIEBEL Co. Ltd.
Kowa Kawasaki Nishiguchi Building 8F
66-2 Horikawa-Cho
Saiwai-Ku | 212-0013 Kawasaki
Tel. 044 540-3200 | Fax 044 540-3210
info@nihonstiebel.co.jp
www.nihonstiebel.co.jp

Netherlands
STIEBEL ELTRON Nederland B.V.
Daviottenweg 36 | 5222 BH 's-Hertogenbosch
Tel. 073 623-0000 | Fax 073 623-1141
info@stiebel-eltron.nl
www.stiebel-eltron.nl

Poland
STIEBEL ELTRON Polska Sp. z O.O.
ul. Działkowa 2 | 02-234 Warszawa
Tel. 022 60920-30 | Fax 022 60920-29
biuro@stiebel-eltron.pl
www.stiebel-eltron.pl

Russia
STIEBEL ELTRON LLC RUSSIA
Urzhumskaya street 4,
building 2 | 129343 Moscow
Tel. 0495 7753889 | Fax 0495 7753887
info@stiebel-eltron.ru
www.stiebel-eltron.ru

Slovakia
TATRAMAT - ohrievače vody s.r.o.
Hlavná 1 | 058 01 Poprad
Tel. 052 7127-125 | Fax 052 7127-148
info@stiebel-eltron.sk
www.stiebel-eltron.sk

Switzerland
STIEBEL ELTRON AG
Industrie West
Gass 8 | 5242 Lupfig
Tel. 056 4640-500 | Fax 056 4640-501
info@stiebel-eltron.ch
www.stiebel-eltron.ch

Thailand
STIEBEL ELTRON Asia Ltd.
469 Moo 2 Tambol Klong-Jik
Amphur Bangpa-In | 13160 Ayutthaya
Tel. 035 220088 | Fax 035 221188
info@stiebeleltronasia.com
www.stiebeleltronasia.com

United Kingdom and Ireland
STIEBEL ELTRON UK Ltd.
Unit 12 Stadium Court
Stadium Road | CH62 3RP Bromborough
Tel. 0151 346-2300 | Fax 0151 334-2913
info@stiebel-eltron.co.uk
www.stiebel-eltron.co.uk

United States of America
STIEBEL ELTRON, Inc.
17 West Street | 01088 West Hatfield MA
Tel. 0413 247-3380 | Fax 0413 247-3369
info@stiebel-eltron-usa.com
www.stiebel-eltron-usa.com

STIEBEL ELTRON

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A 273013-39033-9066
B 308838-39033-9066

Stand 9046