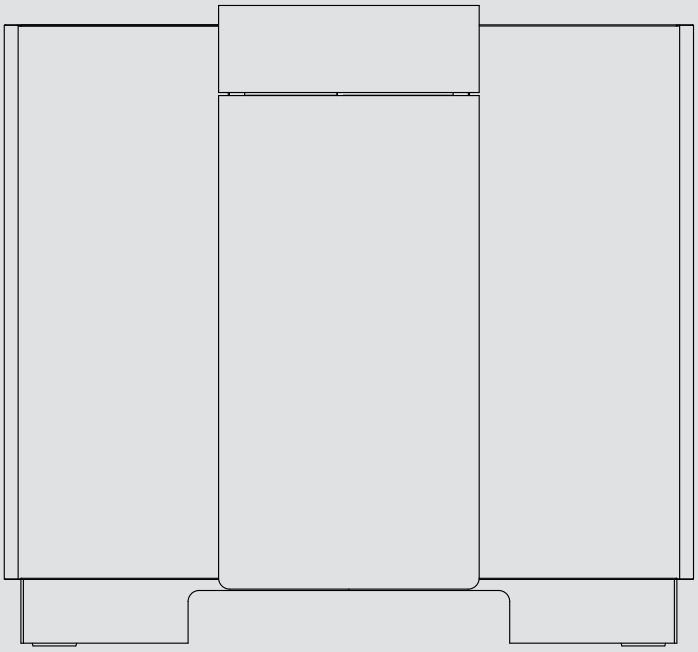
OPERATION AND INSTALLATION

Brine | water heat pumps

- » WPF 20
- » WPF 27
- » WPF 35
- » WPF 40
- » WPF 52
- » WPF 66
- » WPF 27 HT



STIEBEL ELTRON

CONTENTS

SPECIAL INFORMATION OPERATION

- 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 and know-how, 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.
- Use a permanent connection to the power supply. Ensure the appliance can 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.
- At the WPM set parameter COMMISSIONING / SOURCE in the commissioning list to “Ethylene glycol”. otherwise the frost stat would stop the heat pump at temperatures below 7 °C.
- 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 system‘s current condition), and maintenance by a qualified contractor if required (to return the system to the desired condition).
- Never interrupt the power supply, even outside the heating period. The system‘s active frost protection is not guaranteed if the power supply is interrupted.
- There is no need to shut the system down in summer. The heat pump manager has an automatic summer/winter changeover.

1. General information

The chapters „Special Information“ and „Operation“ are intended for both the user and qualified 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 Safety instructions

1.1.1 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.

1.1.2 Symbols, type of risk

Symbol	Type of risk
	Injury
	Electrocution

1.1.3 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.

1.2 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	Meaning
	Material damage (appliance, consequential and environmental damage)
	Appliance disposal

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

1.3 Units of measurement

Note
All measurements are given in mm unless stated otherwise.

1.4 Standardised output data

Explanations to determine and interpret the specified standardised output data.

1.4.1 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 Correct 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.

2.2 Safety instructions

Observe the following safety information and instructions.

The electrical installation and installation of the refrigerant circuit must only be carried out by a recognised. qualified contractor or by qualified Stiebel Eltron customer service engineers.

The recognised contractor is responsible for adherence to all currently applicable instructions during installation and commissioning.

Operate this device only if it is fully installed and all safety equipment is fitted.


Danger to life through electrocution!
Never spray the device with water or other liquids.


Risk of damage!
Prior to maintenance work. isolate the device from its power supply.


DANGER 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.

3. Device description

3.1 Operational characteristics

The WPF is a heating heat pump designed as brine/water 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.

With heat pump type WPF HT. subject to the heat source temperature. the heating water can be heated to a flow temperature of up to 75 °C.

A modular operation is possible with the WPF.

3.2 Function

The heat source medium (brine) enters the heat pump evaporator. There. heat is extracted from the medium. so it exits the heat pump at a lower temperature.

The energy made useful through the heat pump is transferred to the heating water inside the condenser.

Then the heating water transfers its energy to the heating circuit.

4. Control

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

Material losses
Never use the heat pump to dry the screed by means of the underfloor heating system. The heating process and the additional hours run as a consequence expend heat source capacity. As a result, the heat source will not be available for subsequent heating operation.

Never use the heat pump for drying screed, as this places an excessive demand on the heat source and may cause it to be damaged. Use the electric emergency/booster heater for the heat-up program instead. For this, set the LOWER APP LIMIT HZG and DUAL MODE TEMP HZG parameters to 30 °C and start the heat-up program. An exception should only be made if the installer of the heat source system has written permission for screed drying. Our customer service representatives have mobile electric heaters for sale or rental that can be used instead for this purpose.

5. Maintenance and care

Risk of damage!
Maintenance work. such as checking the electrical safety. must only be carried out by a qualified electrician. Protect the equipment from dust and dirt ingress during building work.

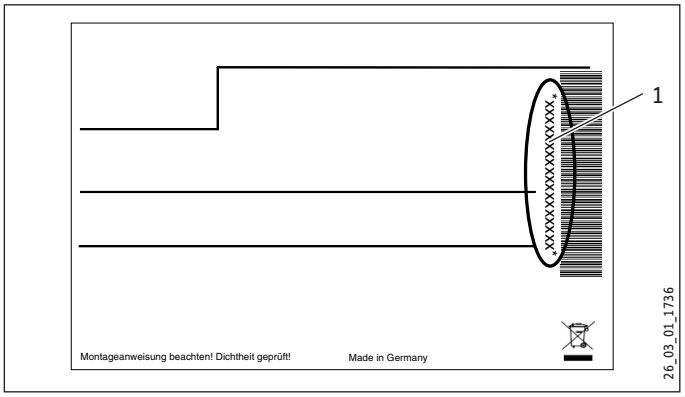
A damp cloth is sufficient for cleaning all plastic and sheet steel parts. Do not use abrasive or corrosive cleaning agents!

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.

If you cannot remedy the fault, notify your qualified contractor. To facilitate and speed up your enquiry, please provide the serial number from the type plate. The type plate is located at the back of the appliance.

Sample type plate



1 Number on the type plate

INSTALLATION

7. Safety

Only qualified contractors should carry out installation. commissioning. maintenance and repair of the appliance.

7.1 General safety instructions

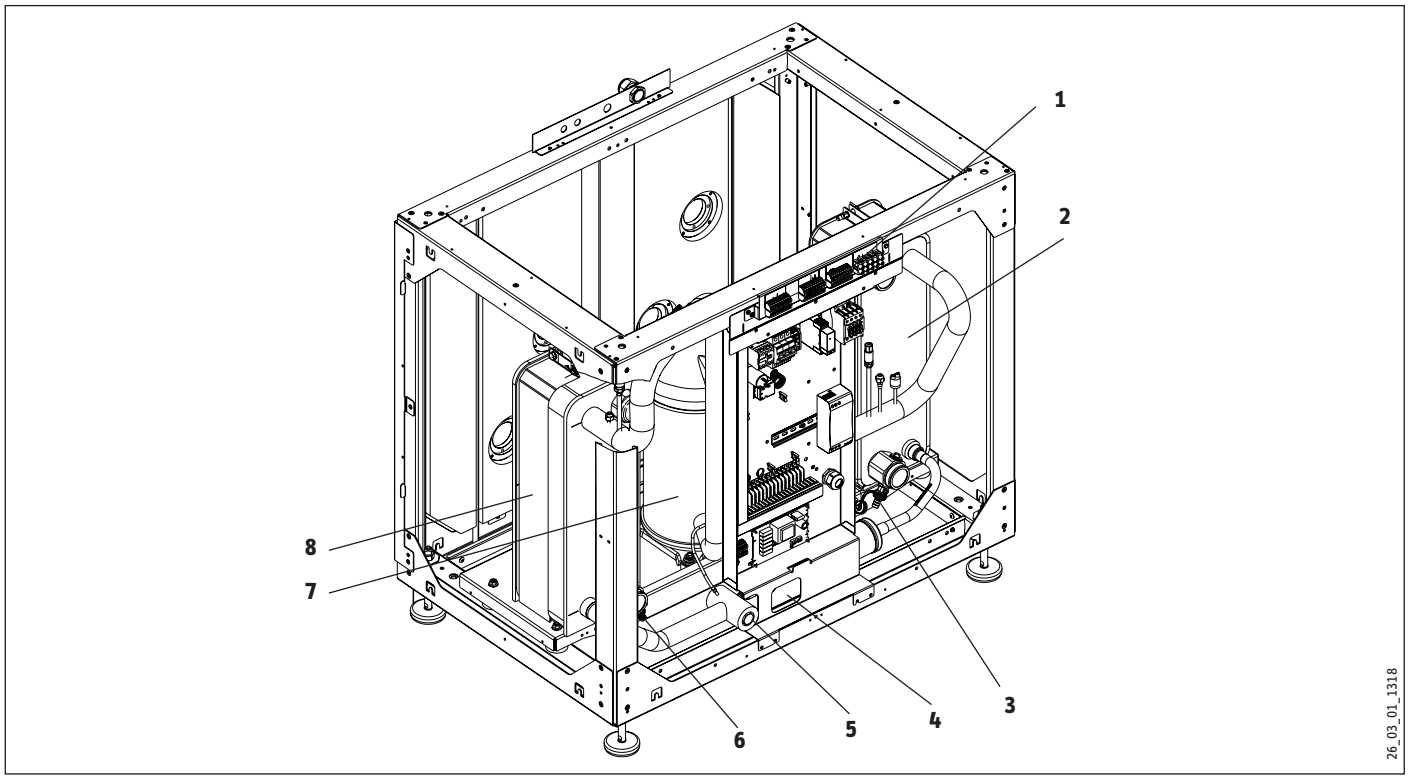
We guarantee trouble-free operation and operational reliability only if the original accessories and spare parts intended for the appliance are used.

7.2 Instructions. standards and regulations

Observe all applicable national and regional regulations and instructions.

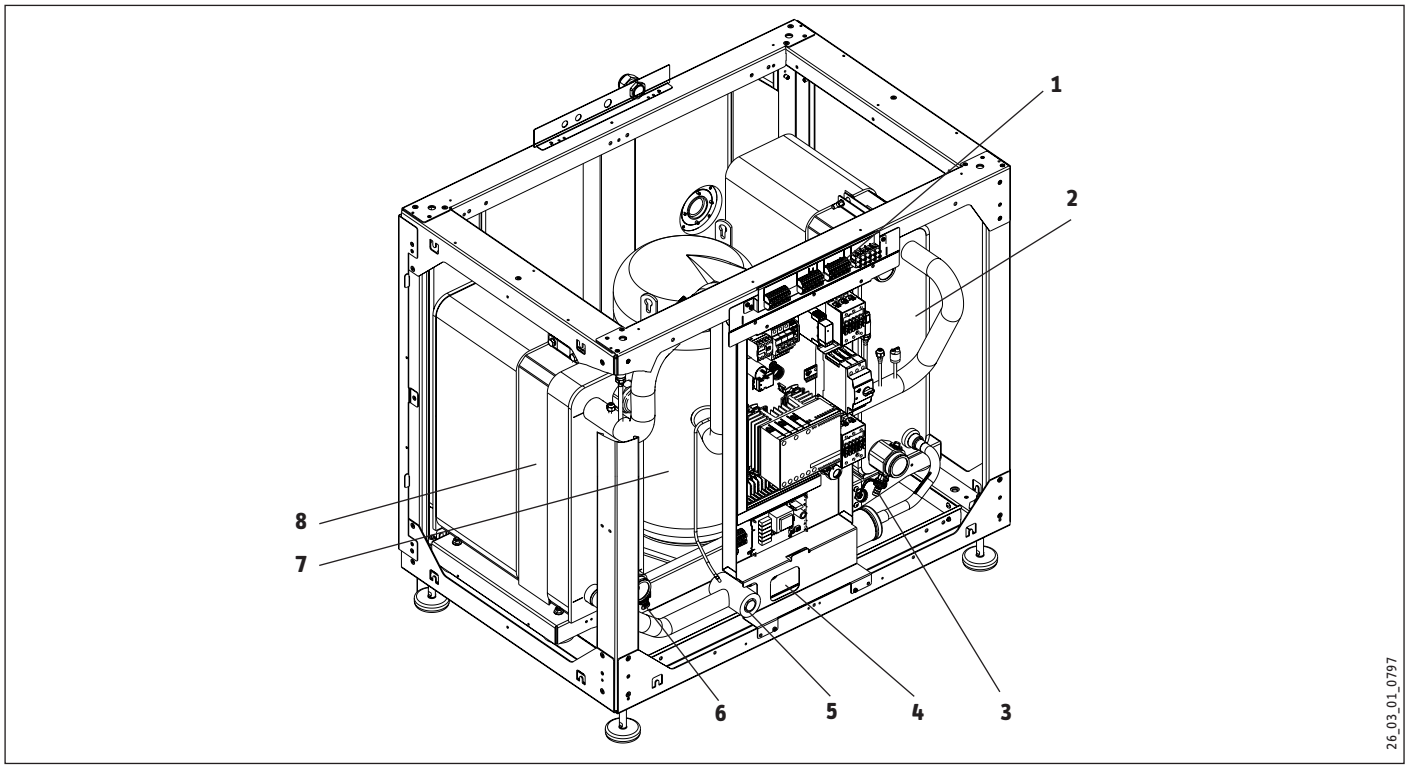
8. Device description

8.1 WPF 20 | 27



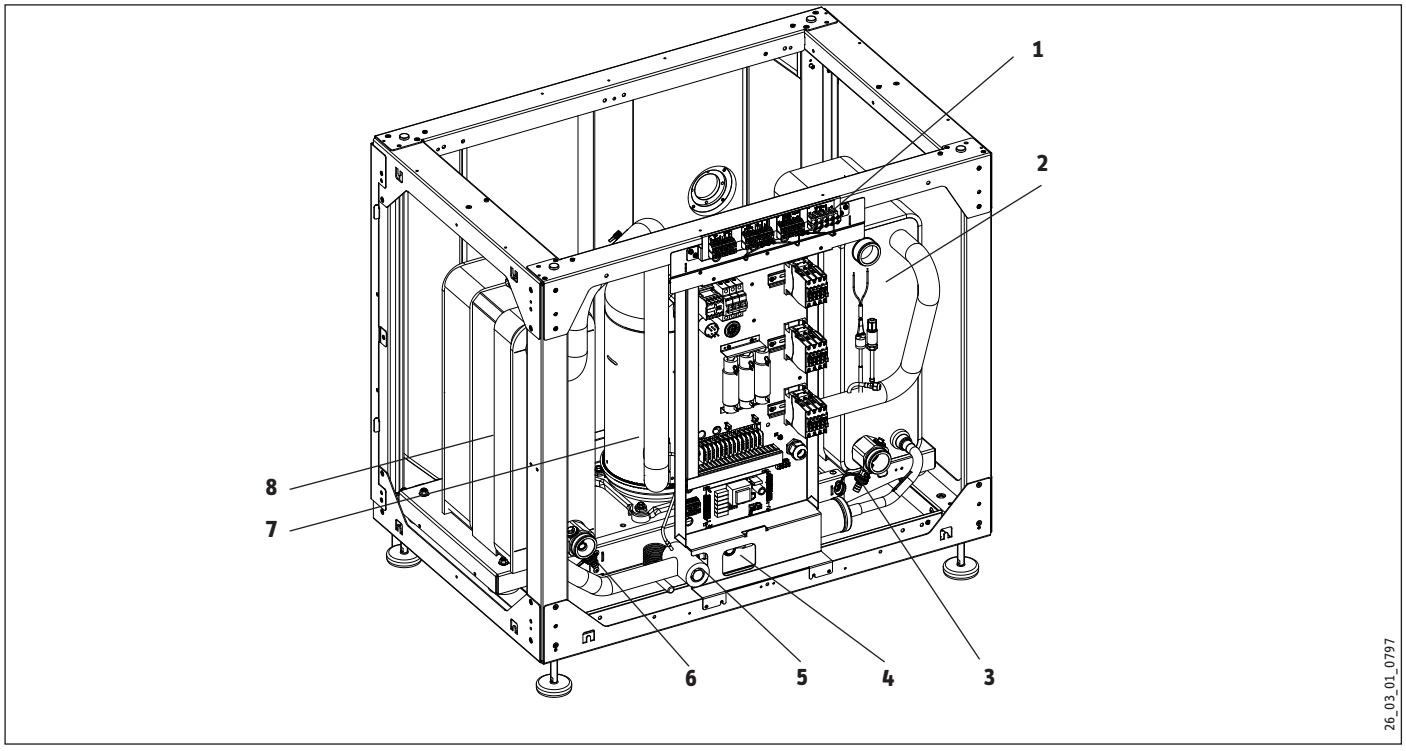
1 Electrical terminals
2 Condenser
3 Fill & drain valve (heating)
4 Sight glass
5 Expansion valve
6 Fill & drain valve (brine)
7 Compressor
8 Evaporator

8.2 WPF 35 | 40 | 52 | 66



1 Electrical terminals
2 Condenser
3 Fill & drain valve (heating)
4 Sight glass
5 Expansion valve
6 Fill & drain valve (brine)
7 Compressor
8 Evaporator

8.3 WPF 27 HT



1 Electrical terminals
2 Condenser
3 Fill & drain valve (heating)
4 Sight glass
5 Expansion valve
6 Fill & drain valve (brine)
7 Compressor
8 Evaporator

9. Standard delivery

Heat pumps are delivered in two shipping units.

- Standard heat pump device
- Casing parts

9.1 Accessories

- Heat pump manager with wall mounting enclosure, WPMW
- Heat pump manager as control panel mounted version, WPMS
- Mixer module with wall mounting enclosure, MSMW
- Mixer module as control panel mounted version, MSMS
- Cylinder SBP 700 E
- Cylinder SBP 700 E SOL
- Kit WPVB
- Heating system remote control FE 7
- Contact sensor AVF 6
- Immersion sensor TF 6
- Heat transfer medium (concentrate) (10 litre can)
- Heat transfer medium (concentrate) (30 litre can)

10. Installation

10.1 Transport

To protect the equipment against damage. transport it vertically inside its packaging. Storage and transport at temperatures below – 20 °C and in excess of + 50 °C are not permissible.

In the top of the frame are four holes for fitting lifting eyes M 12 where the equipment can be lifted.

The casing parts are delivered in a separate package. and these are fitted to the device at the place of installation.

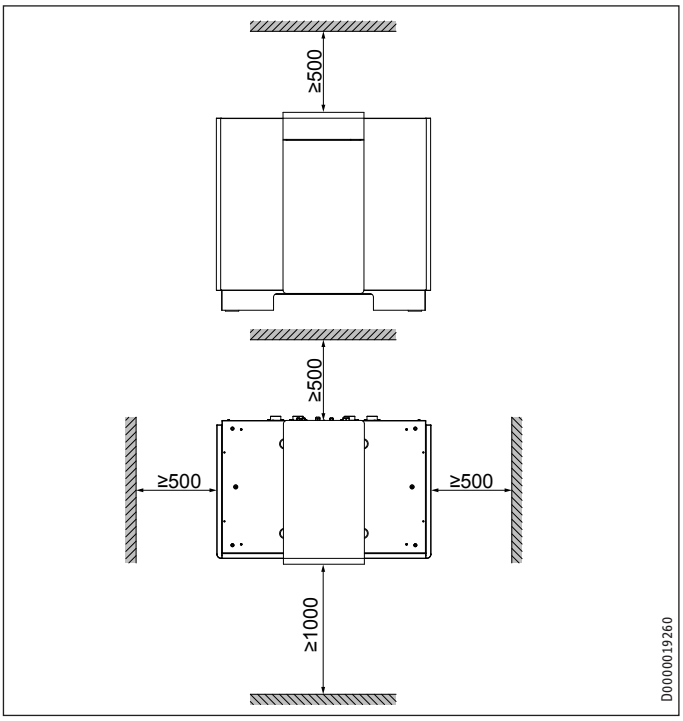
10.2 Positioning

10.2.1 General

Level the device horizontally by adjusting the equipment feet.

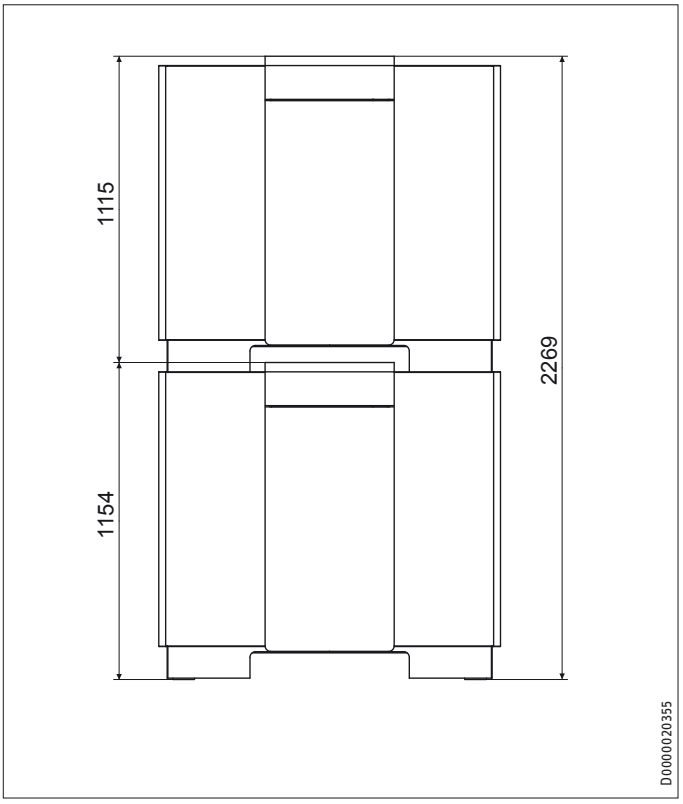
To prevent the heat pump from being damaged by frost in case of external installation. fit and electrically connect the contact sensor **AVF 6** into the heating return as frost protection. Electrical connection and sensor installation. see chapter „Power supply“.

► Observe the minimum clearances.



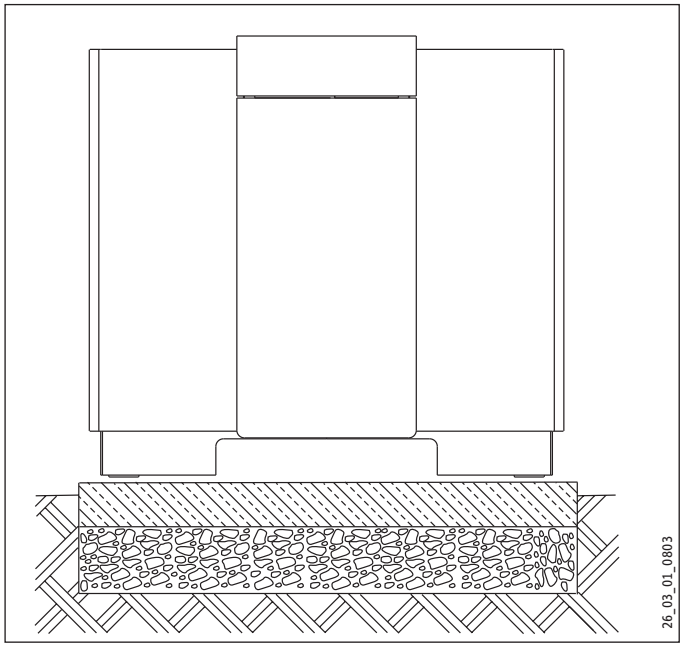
2 heat pumps may also be stacked.

► For this, use the WPVB joining set.



10.2.2 External installation

We recommend foundations as base for the device.



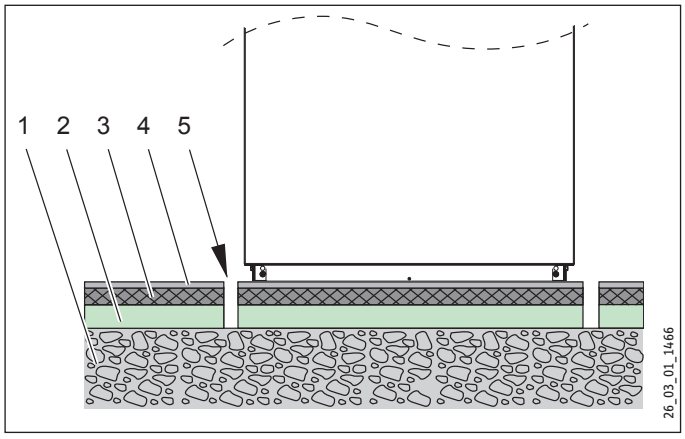
Route all supply lines inside a conduit that is free from frost (protective pipe).

Protect the connection area at the back panel against all weather and solar influences.

10.2.3 Internal installation

The room where the WPF is to be installed must meet the following conditions:

- Load-bearing floor. For the weight of the WPF. see “Specification”.
- 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 ceiling
2 Impact sound insulation
3 Floating screed
4 Floor covering
5 Recess

- The room must not be subject to a risk of explosions arising from dust. gases or vapours. Never allow the floor area and the volume of the installation room to be less than the minimum values listed in the table.

Typ	Volume	Floor area
WPF 20	14 m³	5 m²
WPF 27 | WPF 27 HT	16 m³	7 m²
WPF 35	23 m³	9 m²
WPF 40	23 m³	9 m²
WPF 52	28 m³	11 m²
WPF 66	33 m³	13 m²

- When installing the WPF in a boiler room together with other heating equipment ensure. that the operation of other heating equipment will not be impaired.

10.2.4 Sound emission.

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

10.3 Installation of the heat pump system

The layout of the connection material on the soruce side has to be done according to the evaporator and condensator materials (Technical Datas) to avoide corrosion.

Design the heat source system for the brine/water heat pump in accordance with Stiebel Eltron technical guides.

Permitted 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: 161696

10.3.1 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 condensation 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.:

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

10.3.2 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 obtain the brine volume inside the heat pump from the “Specification” table.

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 ground collector or a geothermal probe as a heat source.

The mixing ratio can be found in the table below.

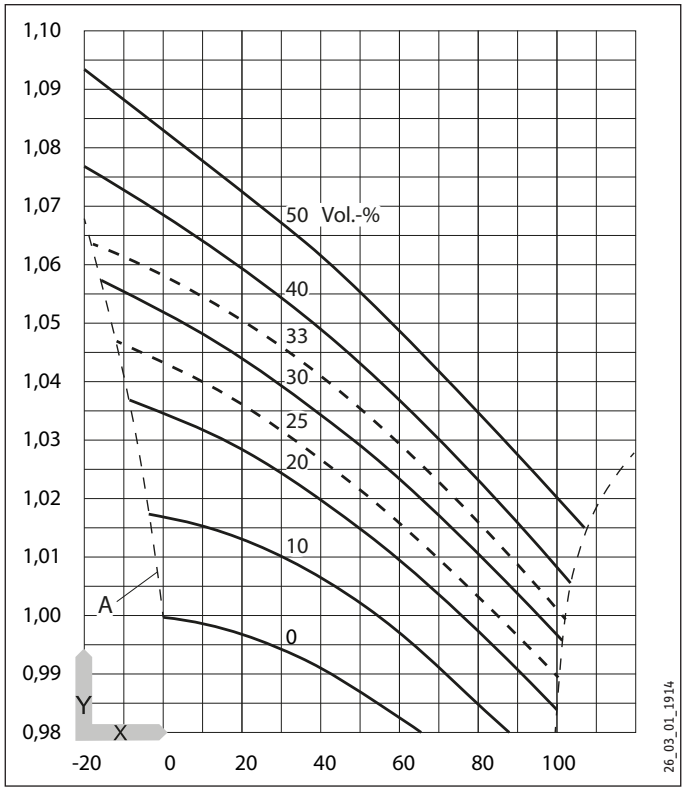
	Ethylene glycol	Water
Geothermal probe	25%	75%
Geothermal collector	33%	67%

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

10.3.3 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.



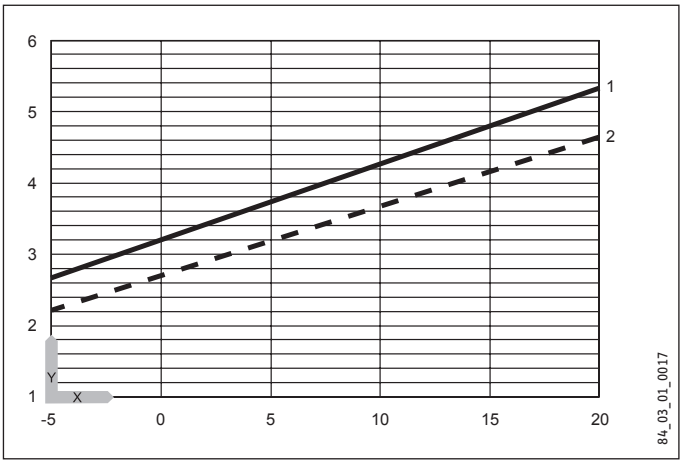
X Temperature [°C]
Y Density [g/cm³]
A Frost protection [°C]

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

10.3.4 Checking the flow rate (during heat pump commissioning)

Check the flow and return temperatures of the heat source. For this. determine the temperature differential by measuring the temperature under the thermal insulation on both flow and return pipes of the heat pump.

The diagram shows the temperature spread at the nominal flow rate.



Y Temperature differential
X Source inlet temperature
1 Brine = heating flow 35 °C
2 Brine = heating flow 50 °C

Risk of damage!
At the WPM set parameter COMMISSIONING / SOURCE in the commissioning list to “Ethylene glycol”. otherwise the frost stat would stop the heat pump at temperatures below 7 °C. The source inlet temperature can be checked on the display of the WPM under the INFO / SYSTEM / SOURCE system parameter.

10.4 Installation of the heat consumer system

The layout of the connection material on the heating side has to be done according to the evaporator and condensator materials (Technical Datas) to avoide corrosion.

Implement the heat consumer system (heating circuit) in accordance with current technical rules. For safety equipment in heating systems. consult the DIN EN 12828.

Ensure the correct connection of the heating flow and return.

Protect the heating water lines against frost and moisture (only in case of external installation). Protect flow and return lines in external installations with an adequate amount of thermal insulation against frost and by routing them inside a conduit against moisture.

Maintain the required insulation thickness in accordance with the Heating System Order [or local regulations].

The integral frost protection control (inside the heat pump). that automatically starts the circulation pump in the heat pump circuit at + 8 °C and thereby safeguards circulation in all water-bearing components. offers additional frost protection. The heat pump is started automatically no later than when the temperature inside the buffer cylinder drops below + 5 °C.

Prior to connecting the heat pump. check the heating system for leaks. flush it thoroughly. fill and carefully vent it.

10.4.1 Oxygen diffusion

Material losses
Avoid open heating systems and plastic pipes in underfloor heating systems which 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 heating elements or steel pipes).

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

10.4.2 Filling the heating system

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.

10.4.3 Buffer cylinder

A buffer cylinder is recommended to ensure a trouble-free heat pump operation. The buffer cylinder provides hydraulic separation of the volume flow in the heat pump circuit and the heating circuit. The flow rate in the heat pump remains constant if. for example. the flow rate in the heating circuit is reduced by thermostatic valves.

10.4.4 Circulation pump (cylinder primary pump)

When using a buffer cylinder. observe the pressure drop of the evaporator. of the connecting lines. bends. valves etc. in sizing the circulation pump to be installed.

10.4.5 Circulation pump (heating circuit pump)

Where no buffer cylinder is used. size the circulation pump on the heating side taking the condenser pressure drop into consideration. The flow rate at ΔT = 10 K (see “Specification”) of the heat pump must be assured under all operating conditions of the heating system through the installation of an overflow valve.

10.4.6 Second external heat source

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

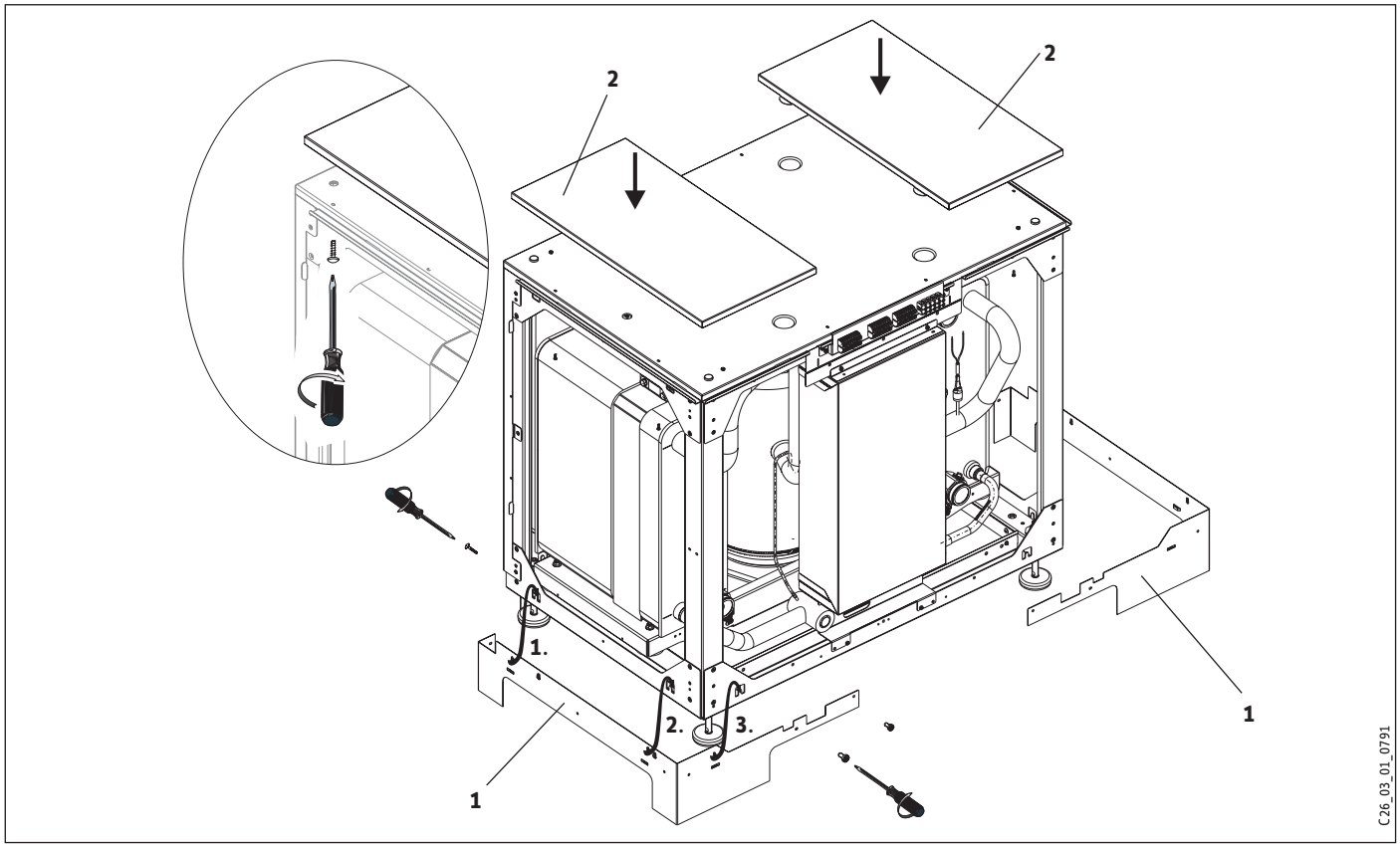
High heating water temperature: In dual-mode heating systems. the return water from the second heat source can flow through the heat pump. immediately after it has been switched off. with a max. temperature of 60 °C. The temperature may be 70 °C no earlier than ten minutes after the heat pump has been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

10.4.7 Heat meter

Observe the additional pressure drop when installing heat meters on the heating side. The sieves inside the heat meters are easily blocked by dirt particles in the heating circuit. further increasing the pressure drop.

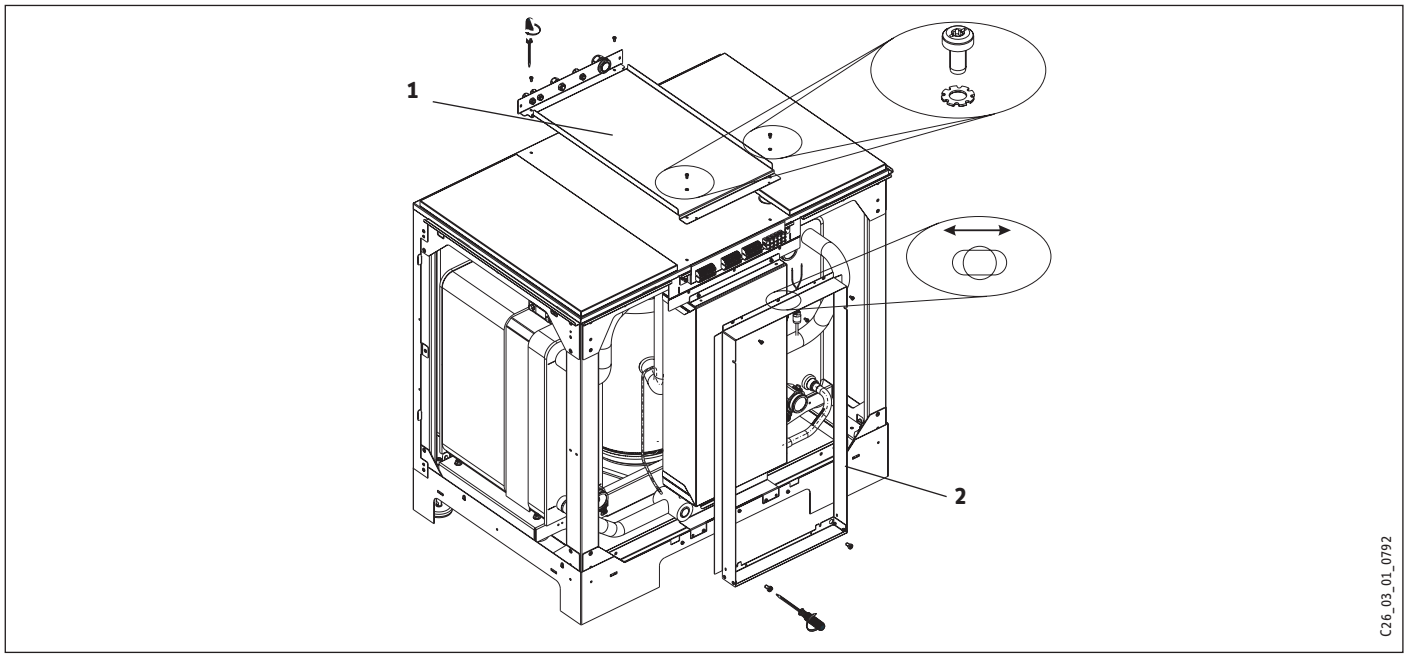
10.5 Fitting the casing parts

Fitting the plinth facia and control panel frame



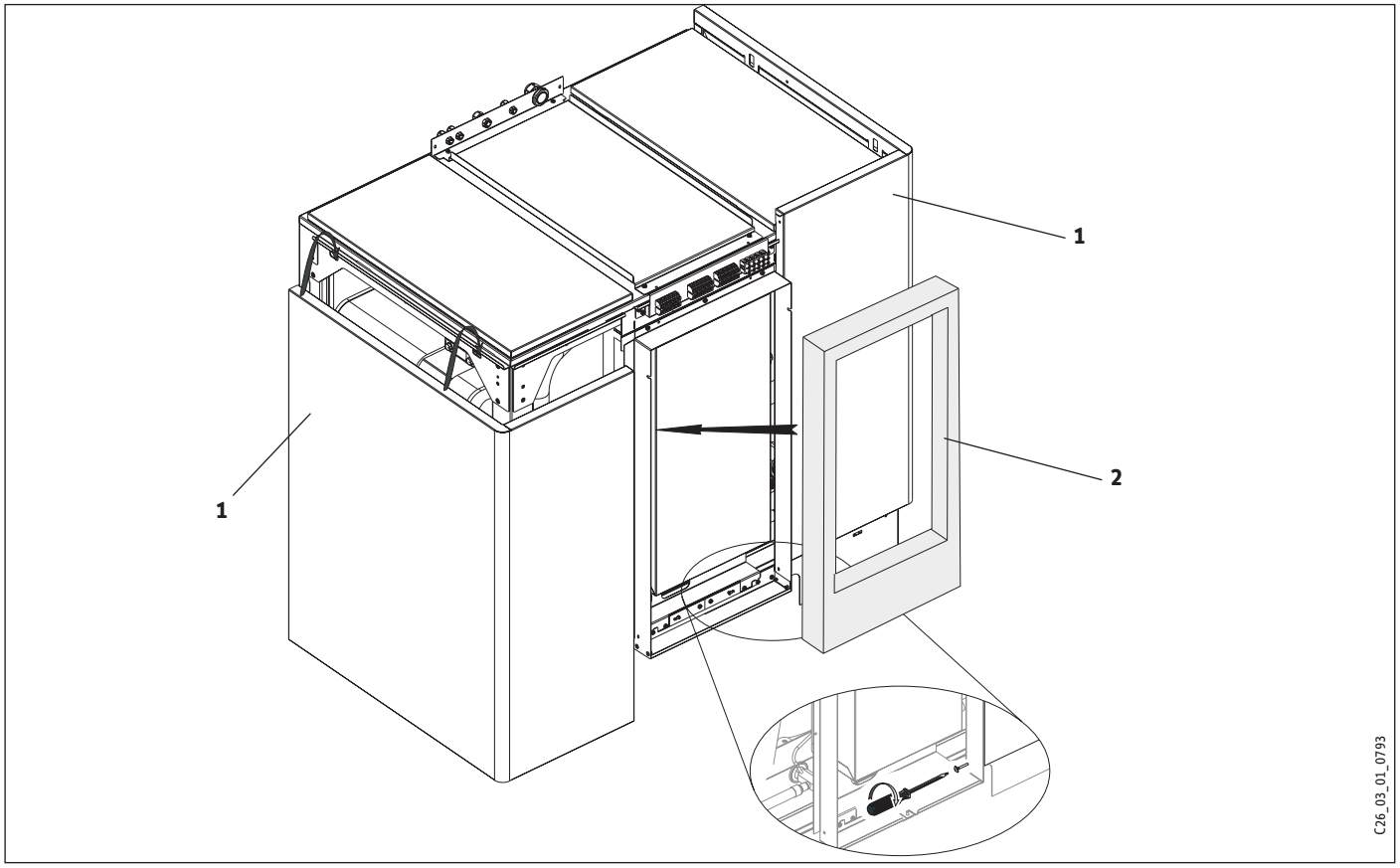
- ▶ Hook the plinth facia **1** into the device frame and secure each with three screws
- ▶ Position the covers **2** and secure each with two screws to the sides.

Fitting the side covers



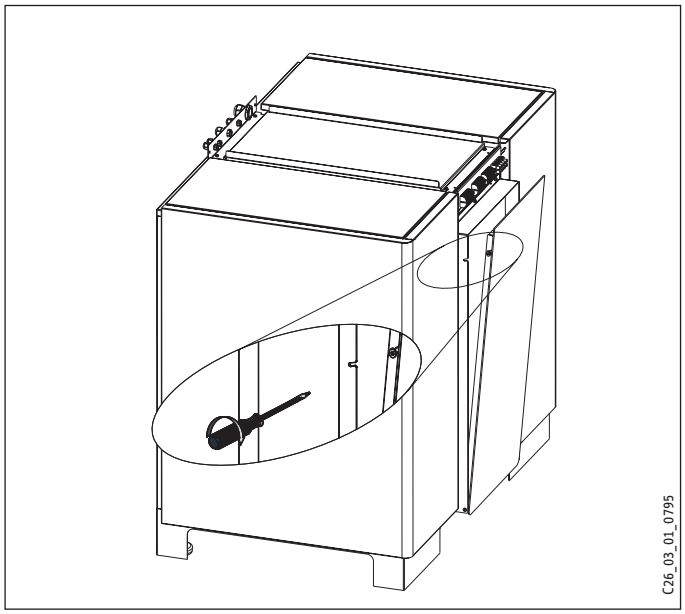
- ▶ Fix the guard plate **1** with four screws. The both in the front with the toothed locked washer.
- ▶ Secure the control panel frame **2** with five screws.

Fitting the side panels



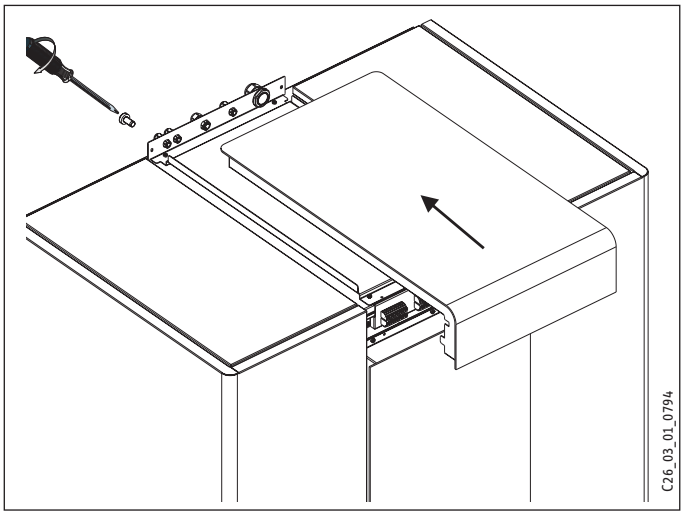
- ▶ Hook the side panels **1** from the top into the slots and hooks provided and secure with one screw each at the bottom of the control panel frame.
- ▶ Install sound insulation **2** in the control panel frame

Fit front panel



- ▶ Hook the bottom of the front panel into the control panel frame. pivot it towards the frame and secure with one screw on each side.

Fit centre cover



- ▶ Position the cover at the front of the device and push it back; then secure it with two screws.

Note
Make the power supply before the centre cover and front panel are fitted.

10.6 Removing the casing parts

The casing parts are removed in reverse order.

10.7 Power supply

Notify your local power supply utility of the electrical connection.

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

Danger to life through electrocution!
Before any work. isolate the equipment from the power supply at the control panel.

Observe VDE 0100 [or local regulations] and the regulations of your local power supply utility.

The heat pump must be able to be separated from the mains power supply by an additional isolator. that disconnects all poles with at least 3 mm contact separation. For this purpose. use contactors. main isolators. fuses. etc. on site.

The terminals are located above the control panel. Remove the lid to enable the equipment to be connected.

The following are connected at the terminals:

- the power supply of the IWS heat pump control unit
- the compressor power supply
- the brine pump power supply
- the BUS cable (J-Y (St) 2x2x0.8)
  Ensure that High. Low and Ground are correctly connected.
- the enable signal for the stand-alone operation at terminal X4/2. For this. remove the jumper between X4/L and X4/2.

The IWS (integral heat pump controller) is a PCB that is fitted as standard into the heat pump control panel. The IWS controls the contactors of the compressors and the starting current limiter. receives the signal inputs for high pressure. low pressure and central faults and contains the BUS interface to the WPM.

Use appropriate cables in accordance with local regulations for all connections. For this. observe the **Electrical details** in “Specification” and the **Electrical connection diagram**.

Check the strain relief function.

Observe the operating instructions for the WPM heat pump manager.

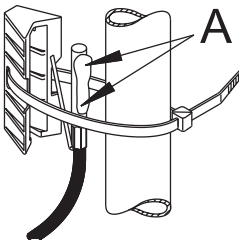
Connect the circulation pump for the heat consumers in accordance with the electrical connection diagram or the engineering documentation.

In case of external installation. use only weather-proof connecting cables to VDE 0100 [or local regulations]. As a minimum requirement. use cables with rubber sheathing with the identification 60245 IEC 57. Route all lines inside a conduit (protective pipe).

To prevent the heat pump from being damaged by frost in case of external installation or when installing it in a room that is not free from the risk of frost. fit and electrically connect the contact sensor **AVF 6** at the heating-return. The contact sensor is electrically connected at terminals X2/4 and X2/5.

The heating circuit pumps are started when the heating-return temperature falls to +8 °C. The reverse switching hysteresis is 4 K.

Sensor installation:



- ▶ Thoroughly clean the pipe.
- ▶ Apply heat conducting paste **A**.
- ▶ Secure the sensor with a tie.

STAND-ALONE operation

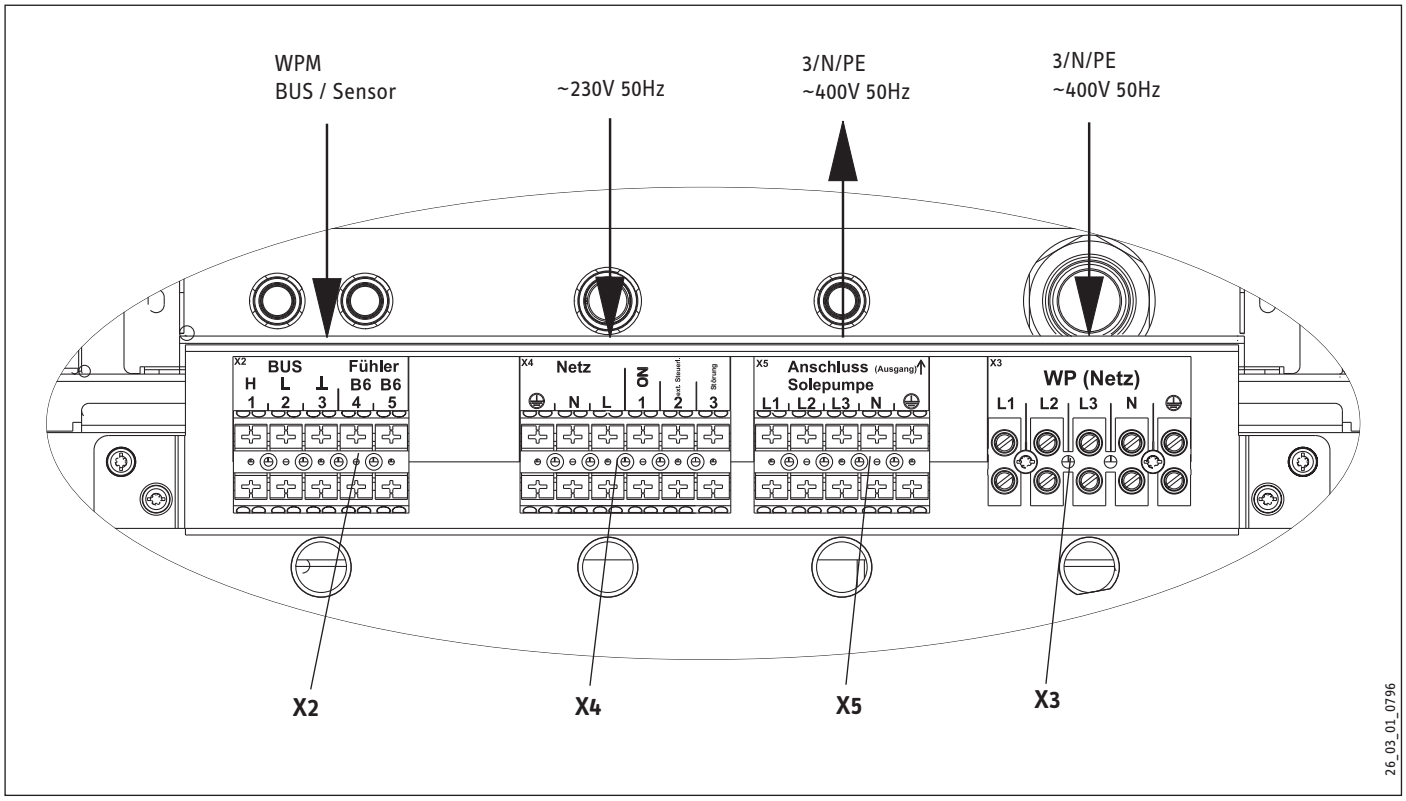
In emergencies. this heat pump can also operate without the heat pump manager (see troubleshooting).

Route all connecting cables and sensor leads through the apertures in the back panel.

10.8 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.

Power supply WPF 20, WPF 27, WPF 35, WPF 40, WPF 52, WPF 66, WPF 27 HT



X3	Compressor (HP)	
	L1, L2, L3, N, PE	Power supply
X2	Low voltage	
	B6	Temperature sensor
	B6	Temperature sensor
	⊥	BUS earth
	L	BUS Low
	H	BUS High
X4	Control voltage	
	L, N, PE	Power supply
	Externe Steuerung	Stand-alone mode
	ON	compressor output signal
	Störung	output signal
X5	Brine pump	
	L1, L2. L3, N, PE	Power supply

11. Commissioning

Only approved contractors may commission this equipment and instruct the owner in its use.

Commission the WPF in accordance with these installation instructions and the operating and installation instructions of the heat pump manager WPM. Our customer service can assist in the commissioning. which is chargeable.

Where this heat pump is used in an installation that is intended for commercial use. the rules of the relevant Health & Safety at Work Act may come into play. For further details. check your local authorising body. The function of the device. including those of any safety equipment fitted is tested at the factory.

After commissioning. the installer should complete the commissioning report contained in these instructions.

Check the following prior to commissioning:

Heating system

- Was the heating system filled to the correct pressure. and was the quick-acting air vent valve opened?

Temperature sensor

- Were the outside temperature and the return temperature sensor (in conjunction with a buffer cylinder) correctly positioned and connected?

Power supply

- Was the mains power supply properly connected?

Please note:
The compressor in the appliance can only turn in one direction. If the appliance is not connected correctly. the compressor remains in operation for 30 seconds then switches off.

In this case the heat pump manager displays the fault message „no output“. Two phases should then be interchanged to alter the direction of rotation.

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

Risk of damage!
Observe the maximum system temperature in underfloor heating systems.

11.1 Operation and control

A WPM heat pump manager is required to operate the heat pump. It regulates the entire heating system. All necessary adjustments prior and during operation are made on this device.

Only qualified contractors must make adjustments listed in the commissioning report of the WPM heat pump manager.

Risk of damage!
The system does not need to be shut down during summer. as the WPM implements an automatic summer/ winter changeover. If the system is. nevertheless. to be shut down. set the WPM to standby. That way the safety functions that protect the system remain enabled (e.g. frost protection).

Drain the water side of the equipment. if the heat pump is taken out of use at a location subject to a risk of frost or if it is installed externally.

Drain the liquid contained inside the evaporator via the fill & drain valve that becomes accessible after removing the r.h. side panel.

12. Maintenance

Danger to life through electrocution!
Before any work. isolate the equipment from the power supply at the control panel.

Risk of damage!
Check the refrigerant circuit of the heat pump WPF 20, 27, 35, 40, 52, 66 annually for tightness in accordance with EU Directive 517/2014.
Document tightness tests in the service record.

If heat meters are installed. frequently clean their sieves. which block easily.

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

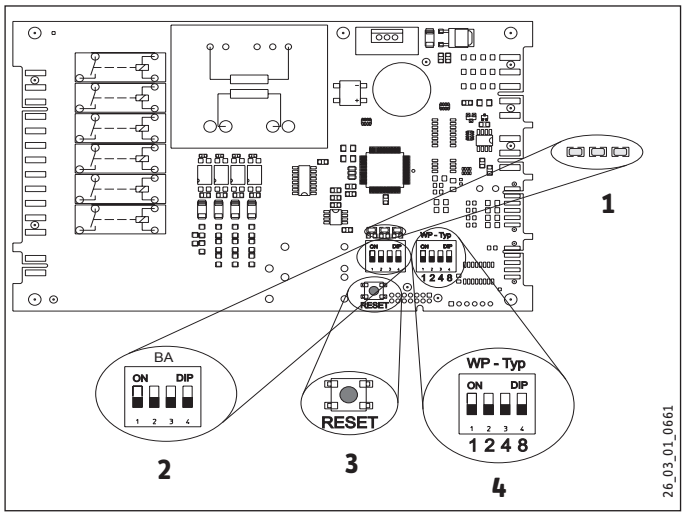
Risk of damage!
Never change the factory setting of the rotary selector on the overcurrent circuit breaker.

Factory setting	
WPF 52	35 A
WPF 66	45 A

A permanently set overcurrent circuit breaker is installed inside the compressor of the WPF 20. 27 and 40.

13. Troubleshooting

Checking the IWS settings

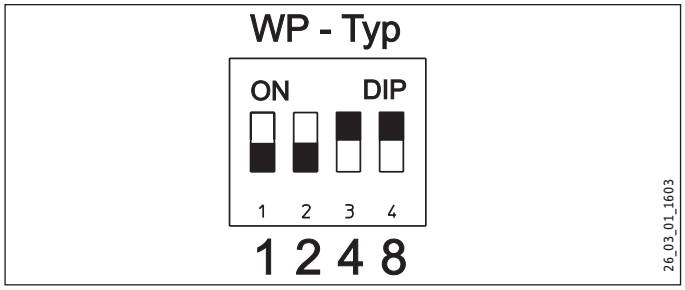


1 LEDs
2 DIP switch (BA)
3 Reset button
4 DIP switch (heat pump)

The control panel with the “Internal heat pump controller” (IWS) becomes accessible after removing the front hood. The following list the adjustments of the IWS required for the WPF:

13.1 DIP switch (WP-Typ)

Factory setting



▶ Check whether the DIP switch is set correctly.

13.2 DIP switch (BA)

Switches 1, 2 and 3 have no relevance to the WPF.

Position switch 4

Switch ON : STAND-ALONE operation

STAND-ALONE operation is only possible if a heat pump type has been allocated to the WPM under parameter DIAGNOSIS / SYSTEM / HEAT PUMP TYPES.

Should the WPM heat pump manager develop a fault. the heat pump can be operated in STAND-ALONE mode in an emergency. In this operating mode. there is no communication with the WPM. The heat pump regulates to a fixed temperature: it starts up at 50 °C and shuts down at 55 °C. For this. 230 V must be applied to terminal X4/2. and a contact sensor AVF 6 connected as a return temperature sensor at sensor terminals X2/4 and X2/5. The sensor must be connected to the heating return (chapter Device description). The operating mode is indicated by the green LED on the right.

Risk of damage!
For STAND-ALONE operation remove the jumper between X4/1 and X4/2.

13.3 LEDs

Red LED:

The LED **flashes** when a heat pump fault occurs once. The system will be shut down.

The red LED illuminates steady if more than **5 heat pump faults** occur within 2 hours. The system will be shut down permanently.

If the red LED is flashing or illuminated steadily, voltage of 230 V is present at the fault output (terminal X4/3).

To delete the faults from the IWS select COMMISSIONING / HEAT PUMP RESET and reset by pressing PRG on the IWS. The internal counter will then be returned to zero.

Heat pump faults displayed by the LED: High pressure fault / low pressure fault. central fault message and hardware faults at the IWS (see fault list).

Green centre LED: Flashes during the initialisation and becomes **steady** after the BUS address has been allocated. Communication to the WPM is only then established. This is only relevant for the WPF. if the control unit is replaced. otherwise the unit is initialised at the factory.

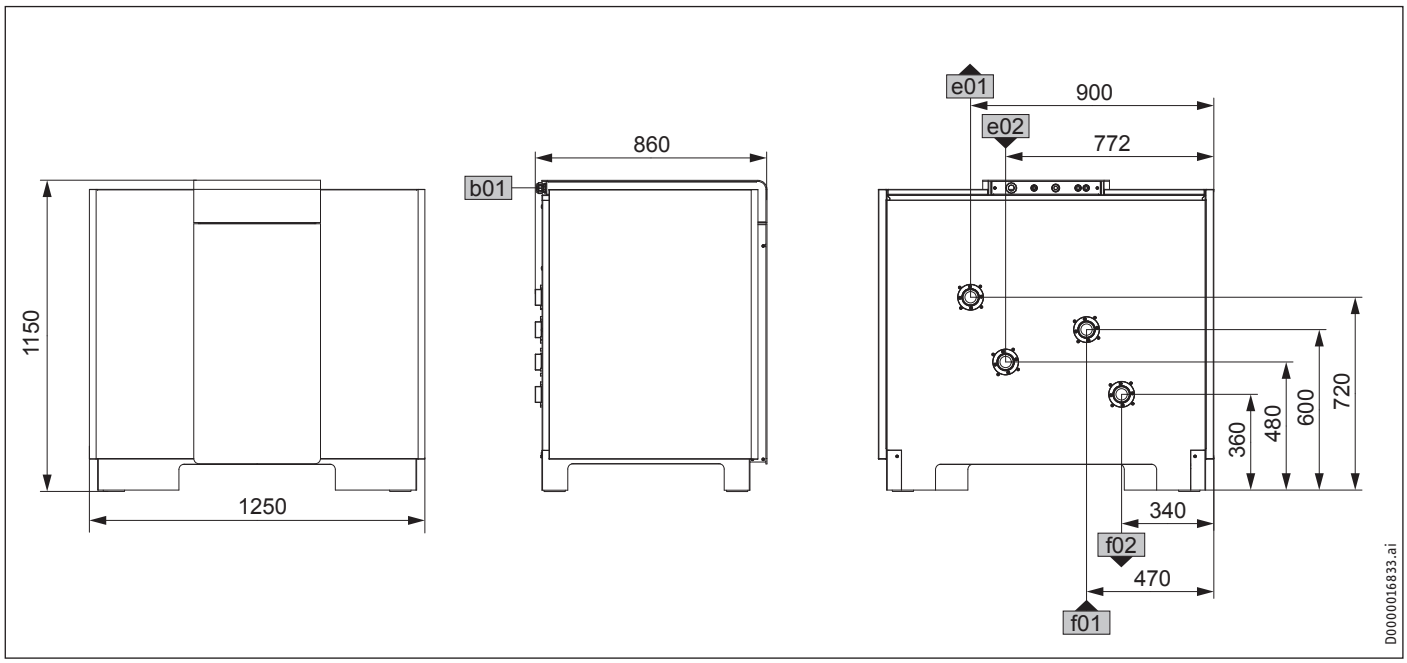
Green r.h. LED: Illuminates steady if STAND-ALONE operation has been selected.

Reset button

If initialised in error, please refer to “Commissioning / Reset options IWS” in the heat pump manager operating and installation instructions.

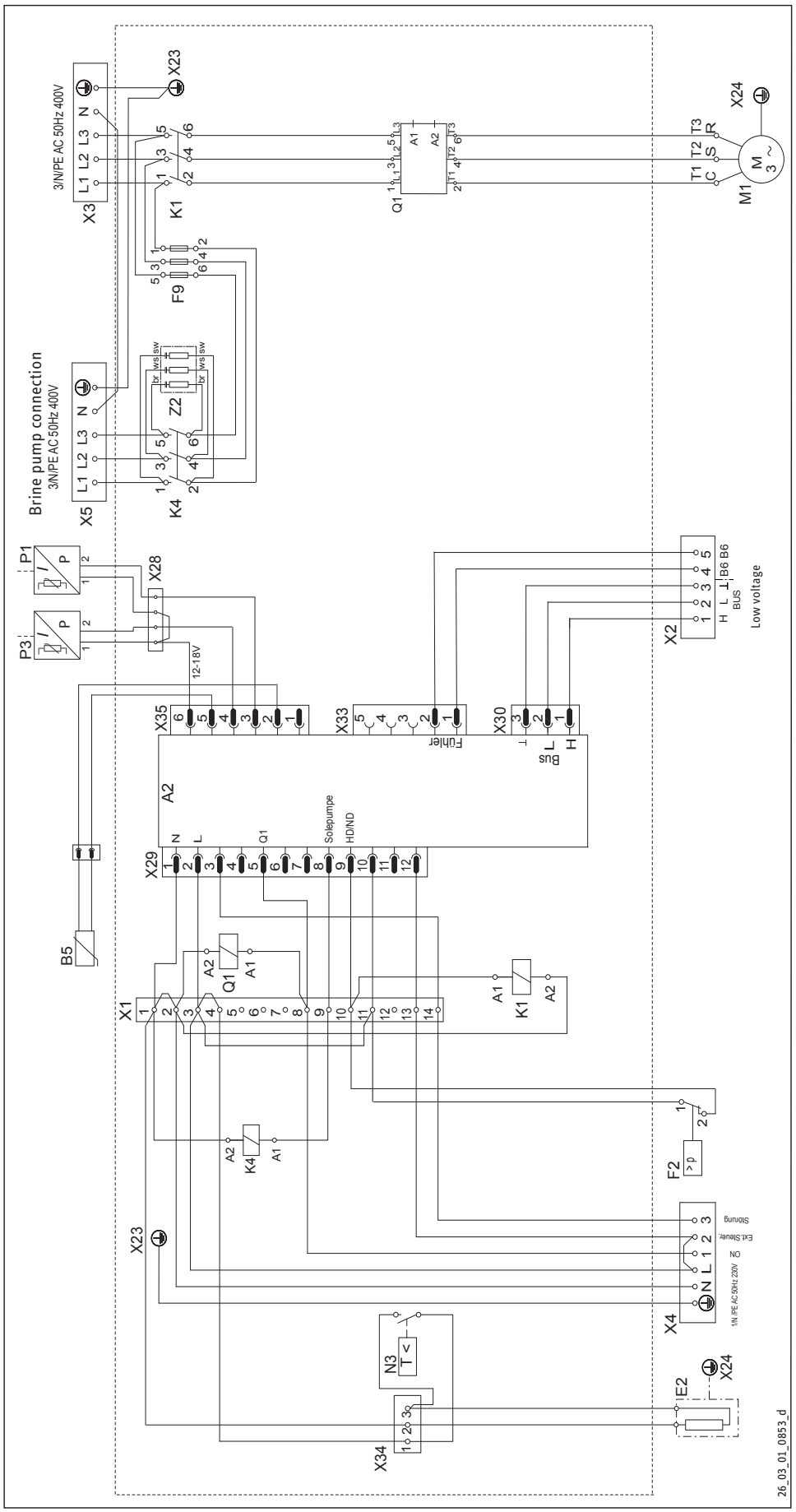
14. Specification

14.1 Water and brine connection



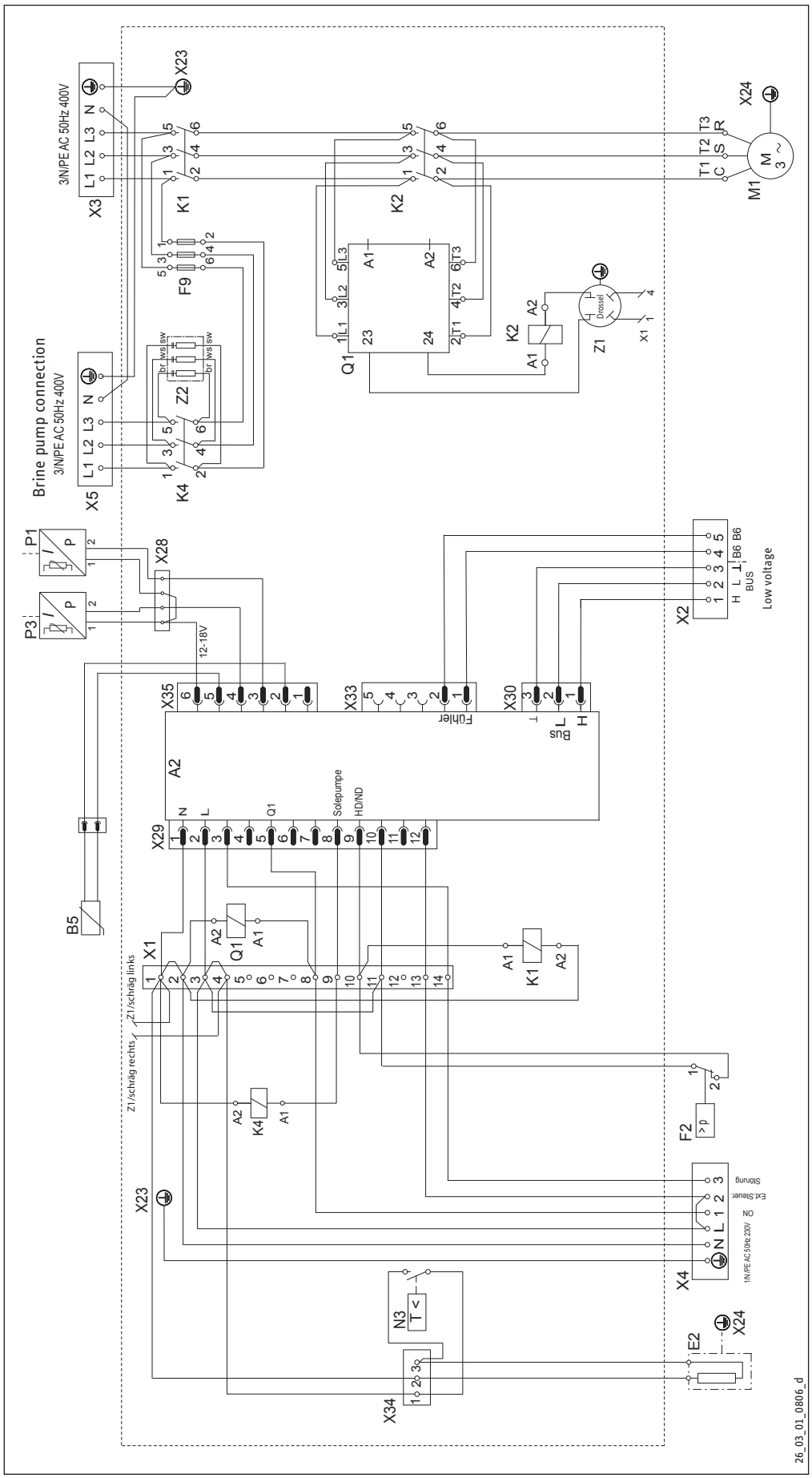
			WPF 20	WPF 27	WPF 35	WPF 40	WPF 52	WPF 66	WPF 27 HT
b01	Entry electrical cables								
e01	Heating flow	Male thread	G 2	G 2	G 2	G 2	G 2	G 2	G 2
e02	Heating return	Male thread	G 2	G 2	G 2	G 2	G 2	G 2	G 2
f01	Heat source flow	Male thread	G 2	G 2	G 2	G 2	G 2	G 2	G 2
f02	Heat source return	Male thread	G 2	G 2	G 2	G 2	G 2	G 2	G 2

14.2 Wiring diagrams for heat pump WPF 20 | 27



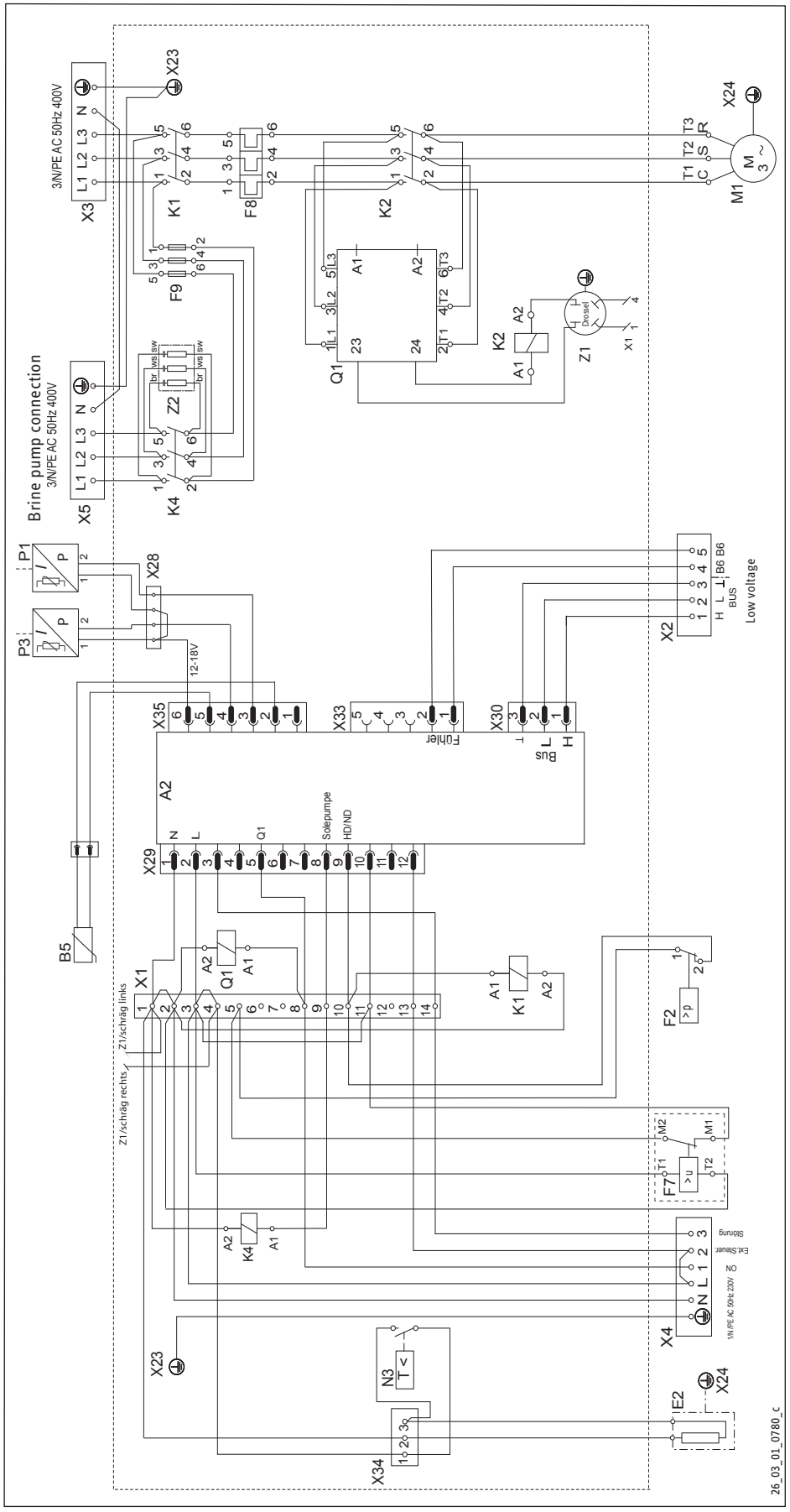
A2 Integral heat pump controller IWS
B5 Hot gas temperature sensor
B6 Frost sensor (only for ext. inst. or inst. in a room not free from the risk of frost)
E2 Oil sump heater
F2 High pressure limiter
F9 Solar pump MCB
K1 Safety contactor
K4 Brine pump contactor
M1 Compressor motor
N3 Temp. controller - oil sump heater
P1 High pressure transducer
P3 Low pressure transducer
Q1 Softstart contactor
X1 Terminals
X2 LV terminal
X3 Heat pump - mains
X4 Control voltage terminals
X5 Brine pump terminals
X23 Power supply earth terminal block
X24 Power supply earth screw
X28 Plug-in connector terminal strip
X29 Plug-in connector IWS 12-PIN
X30 Plug-in connector IWS 3-PIN
X33 Plug-in connector IWS 5-PIN
X34 Plug-in connector terminal strip - oil sump heater
X35 Plug-in connector IWS 6-PIN
Z2 Supressor elemen

14.3 Wiring diagrams for heat pump WPF 35 | 40



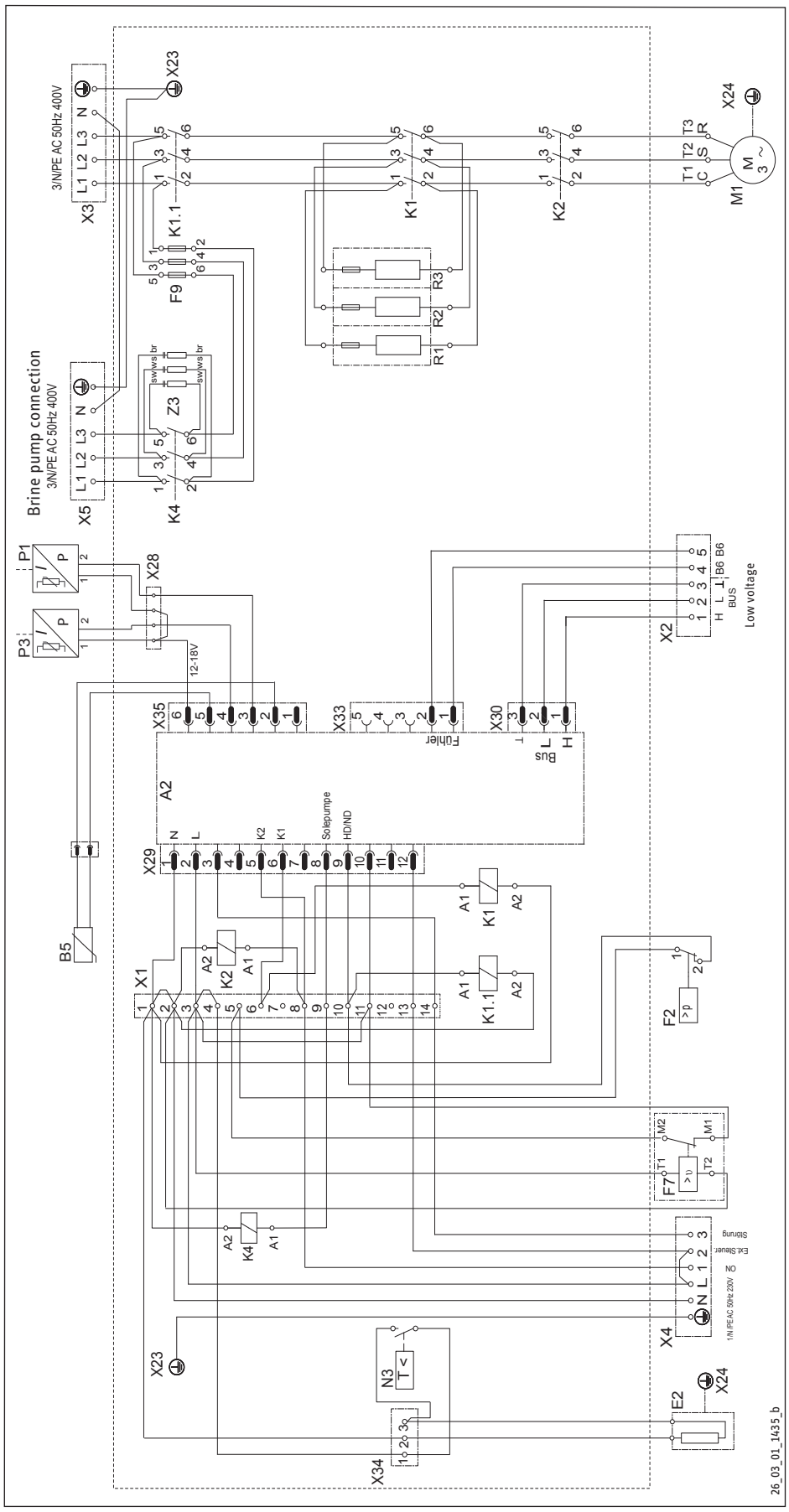
A2	Integral heat pump controller IWS	P3	Low pressure transducer
B5	Hot gas temperature sensor	Q1	Softstart contactor
B6	Frost sensor (only for ext. inst. or inst. in a room not free from the risk of frost)	X1	Terminals
		X2	LV terminal
E2	Oil sump heater	X3	Heat pump - mains
F2	High pressure limiter	X4	Control voltage terminals
F9	Solar pump MCB	X5	Brine pump terminals
K1	Safety contactor	X23	Power supply earth terminal block
K2	Compressor contactor	X24	Power supply earth screw
K4	Brine pump contactor	X28	Plug-in connector terminal strip
M1	Compressor motor	X29	Plug-in connector IWS 12-PIN
N3	Temp. controller - oil sump heater	X30	Plug-in connector IWS 3-PIN
P1	High pressure transducer	X33	Plug-in connector IWS 5-PIN
X34	Plug-in connector terminal strip - oil sump heater		
X35	Plug-in connector IWS 6-PIN		
Z1	Supressor elemen		
Z2	Supressor elemen		

14.4 Wiring diagrams for heat pump WPF 52 | 66



A2	Integral heat pump controller IWS	P3	Low pressure transducer	Z1	Supressor elemen
B5	Hot gas temperature sensor	Q1	Softstart contactor	Z2	Supressor elemen
B6	Frost sensor (only for ext. inst. or inst. in a room not free from the risk of frost)	X1	Terminals		
E2	Oil sump heater	X2	LV terminal		
F2	High pressure limiter	X3	Heat pump - mains		
F7	Protective motor switch. internal	X4	Control voltage terminals		
F8	Protective motor switch. external	X5	Brine pump terminals		
F9	Solar pump MCB	X23	Power supply earth terminal block		
K1	Safety contactor	X24	Power supply earth screw		
K2	Compressor contactor	X28	Plug-in connector terminal strip		
K4	Brine pump contactor	X29	Plug-in connector IWS 12-PIN		
M1	Compressor motor	X30	Plug-in connector IWS 3-PIN		
N3	Temp. controller - oil sump heater	X33	Plug-in connector IWS 5-PIN		
P1	High pressure transducer	X34	Plug-in connector terminal strip - oil sump heater		
		X35	Plug-in connector IWS 6-PIN		

14.5 Wiring diagrams for heat pump WPF 27 HT



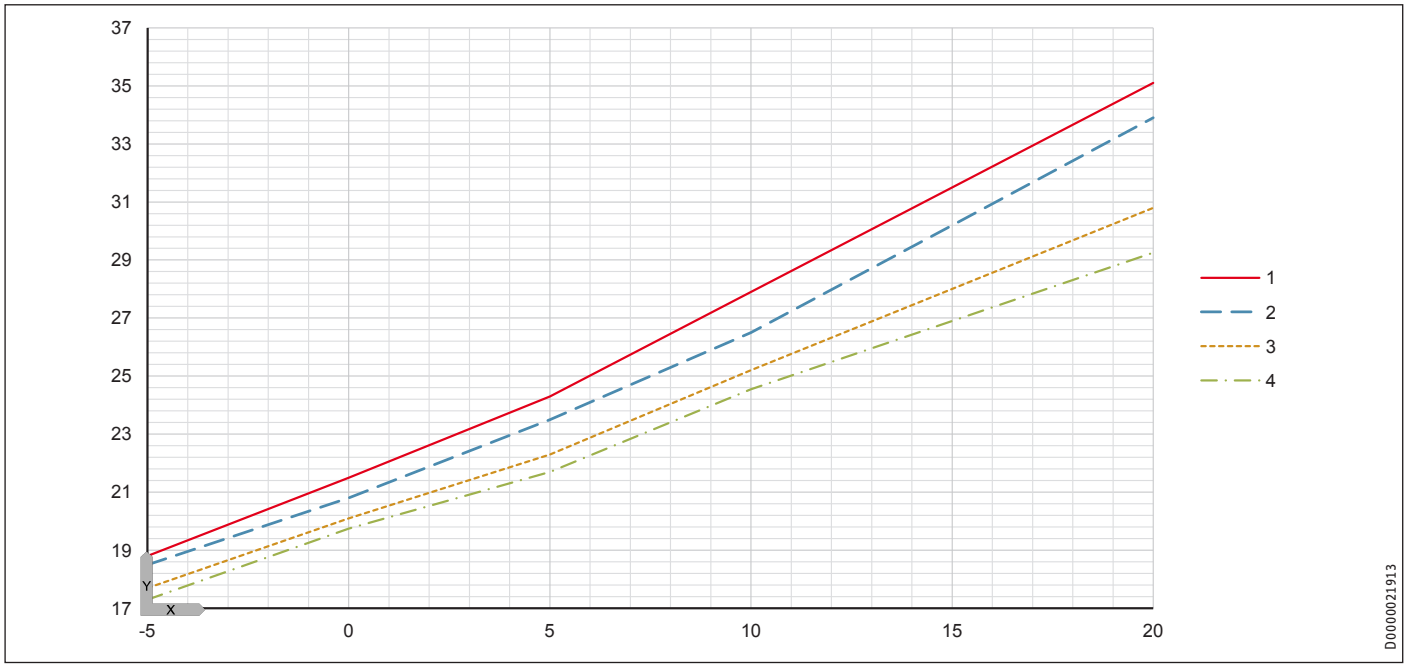
A2 Integral heat pump controller IWS
B5 Hot gas temperature sensor
B6 Frost sensor (only for ext. inst. or inst. in a room not free from the risk of frost)
E2 Oil sump heater
F2 High pressure limiter
F7 Protective motor switch. internal
F9 Solar pump MCB
K1 Relay. resitor bridge
K1.1 Safety contactor
K2 Compressor contactor
K4 Brine pump contactor
M1 Compressor motor
N3 Temp. controller - oil sump heater
P1 High pressure transducer
P3 Low pressure transducer
R1 Sart-Resistor
R2 Sart-Resistor
R3 Sart-Resistor
X1 Terminals
X2 LV terminal
X3 Heat pump - mains
X4 Control voltage terminals
X5 Brine pump terminals
X23 Power supply earth terminal block
X24 Power supply earth screw
X28 Plug-in connector terminal strip
X29 Plug-in connector IWS 12-PIN
X30 Plug-in connector IWS 3-PIN
X33 Plug-in connector IWS 5-PIN
X34 Plug-in connector terminal strip - oil sump heater
X35 Plug-in connector IWS 6-PIN
Z3 Supressor elemen

14.6 Output diagrams WPF 20

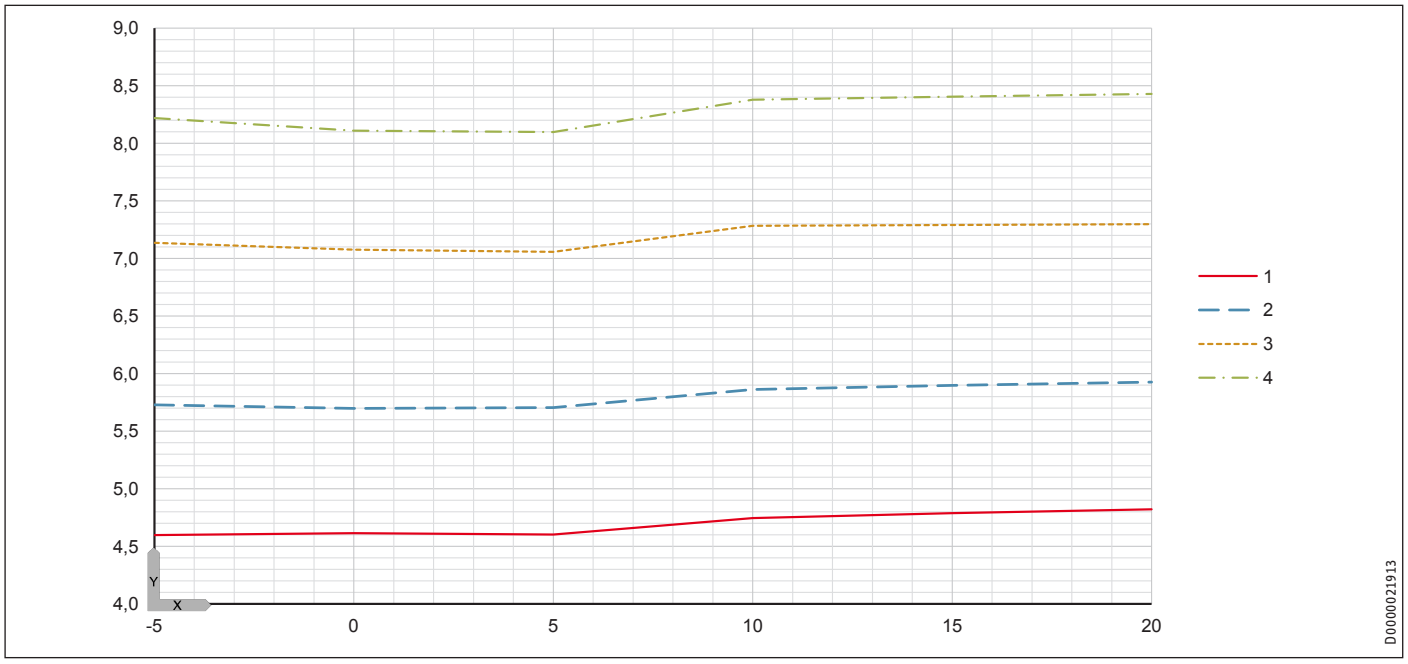
Key to output diagrams

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



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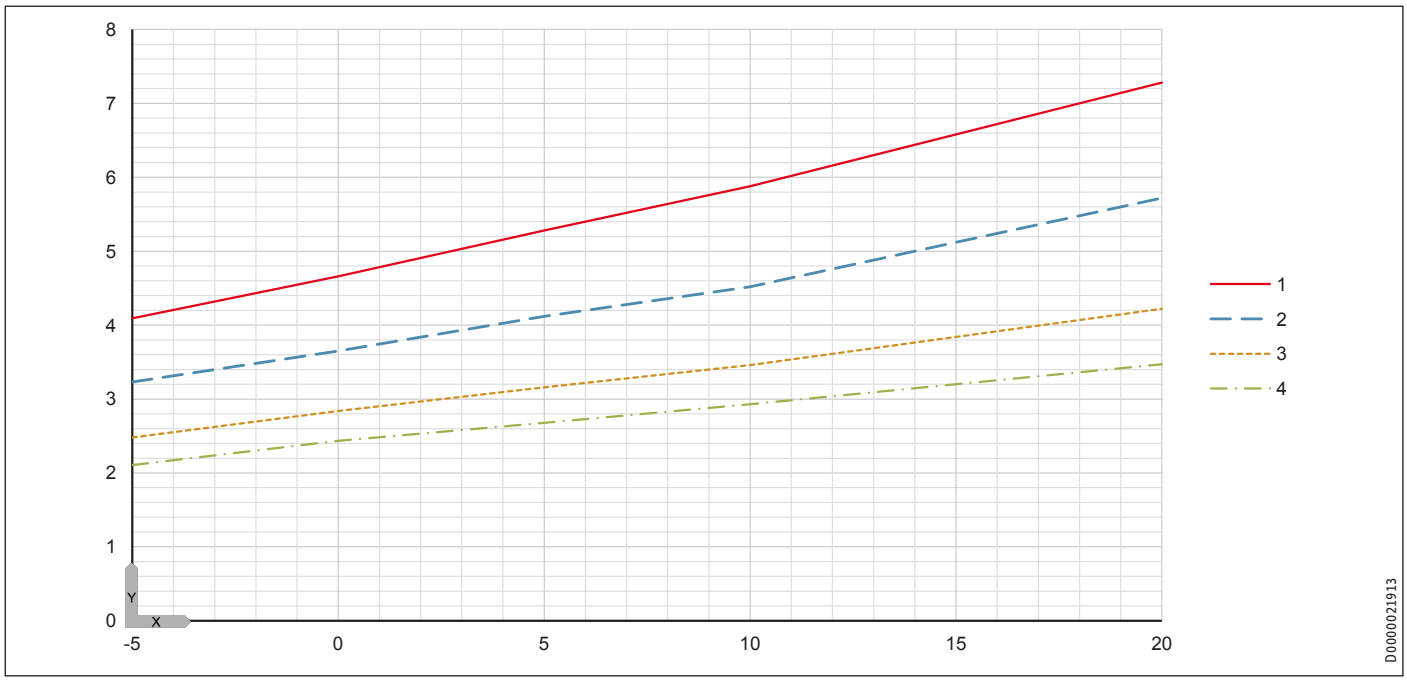
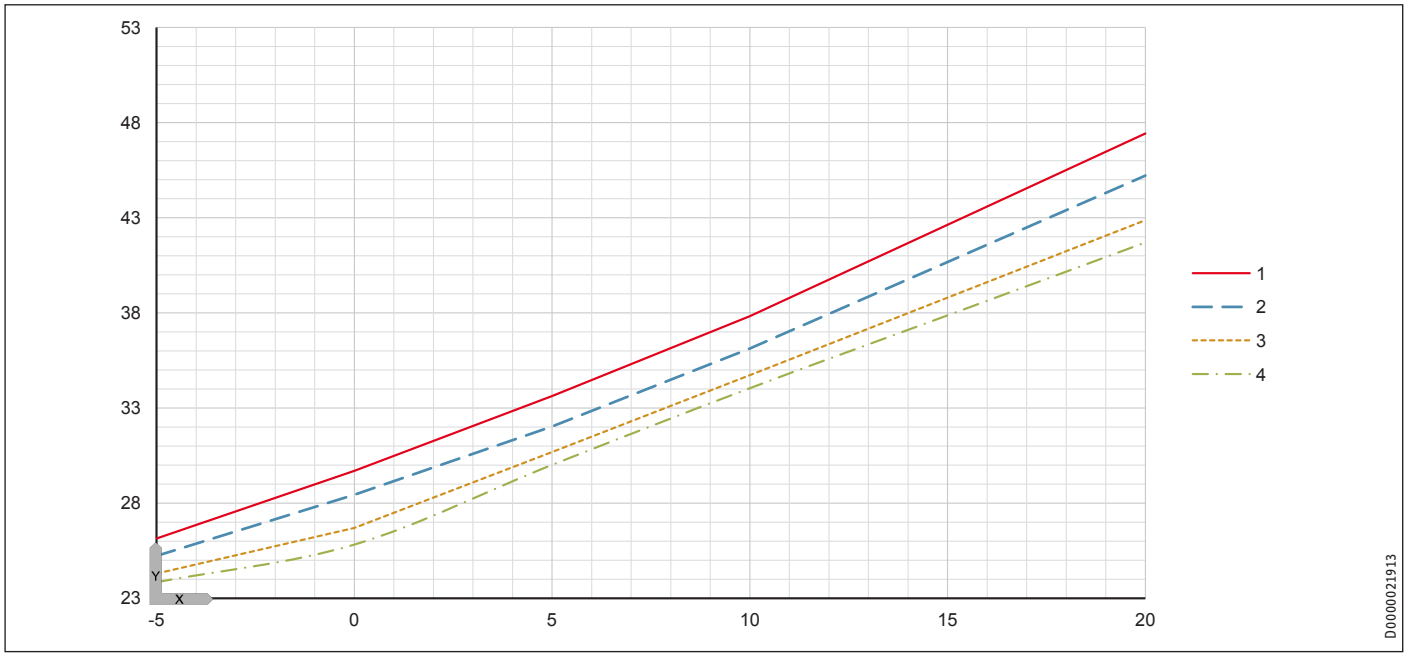


14.7 Output diagrams WPF 27

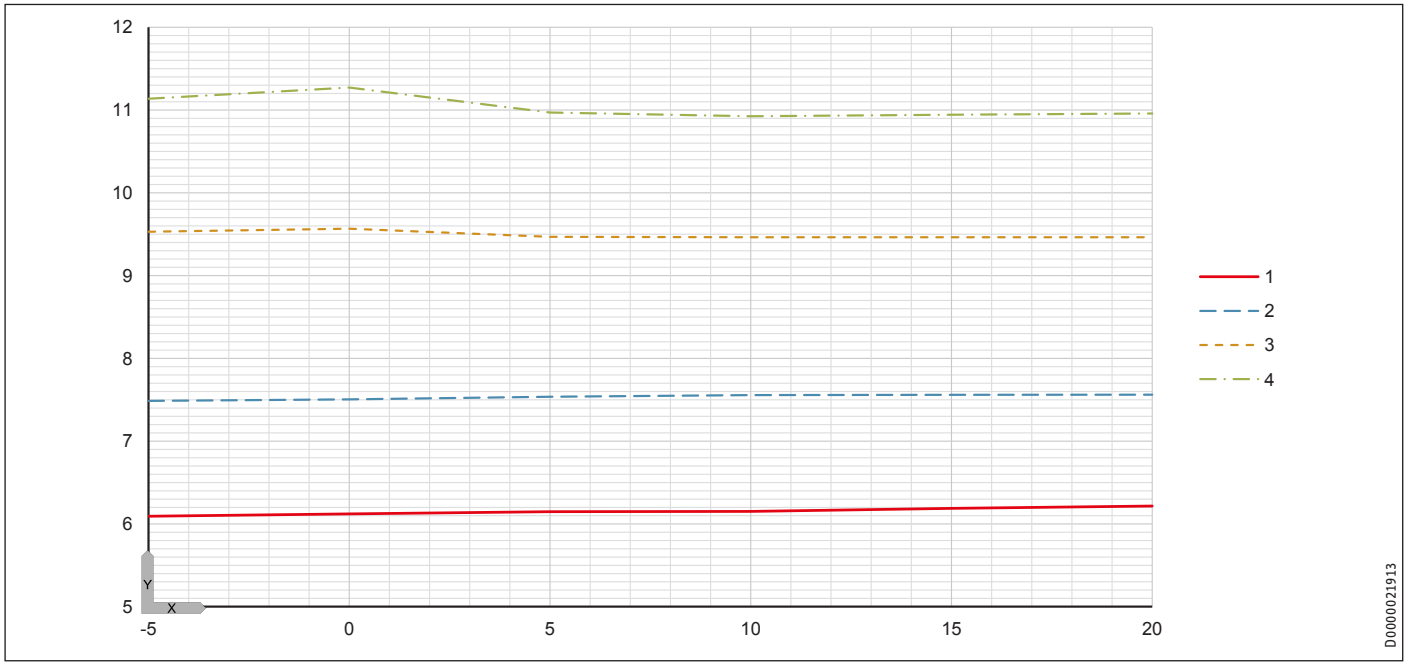
Key to output diagrams

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



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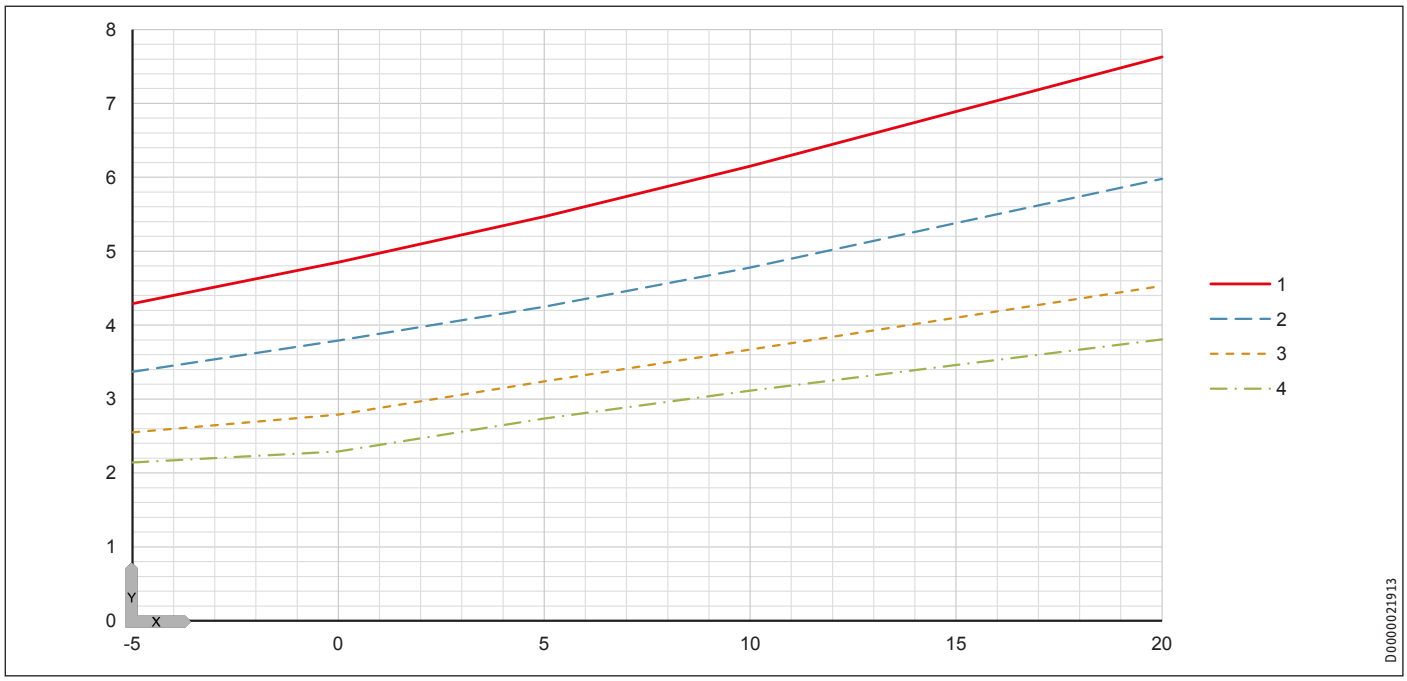
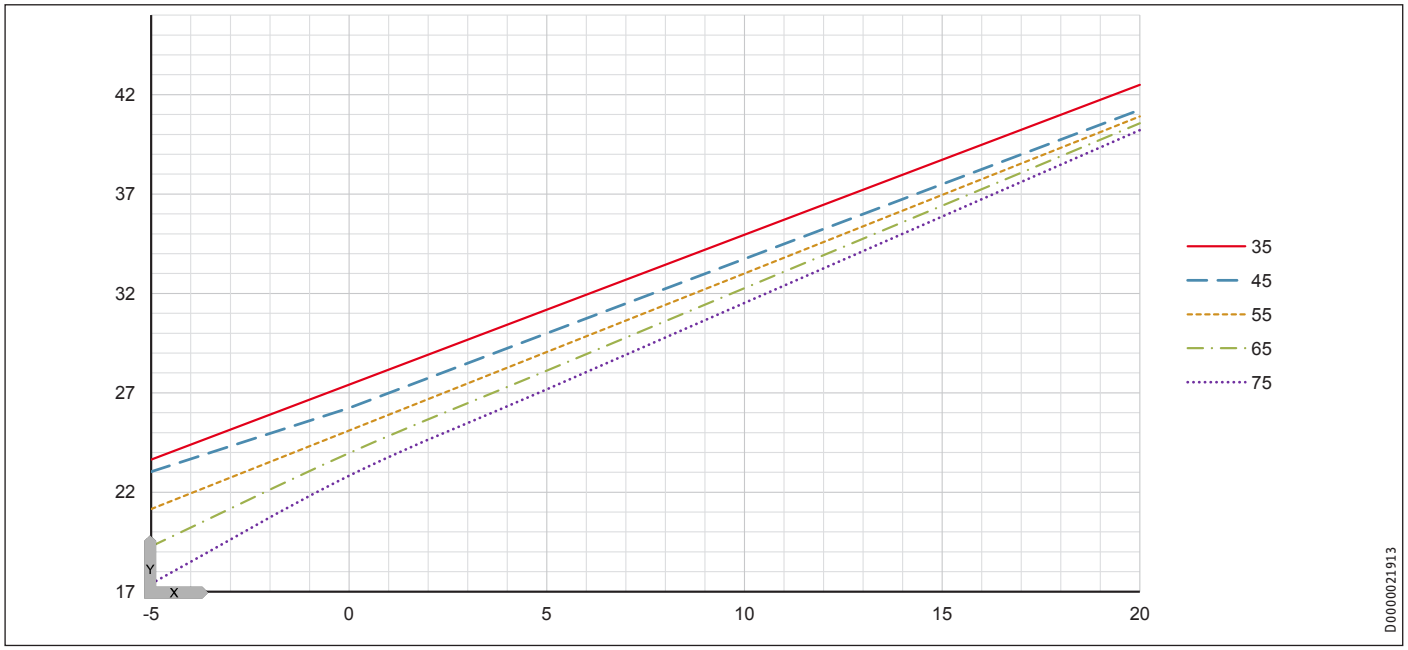


14.8 Output diagrams WPF 27 HT

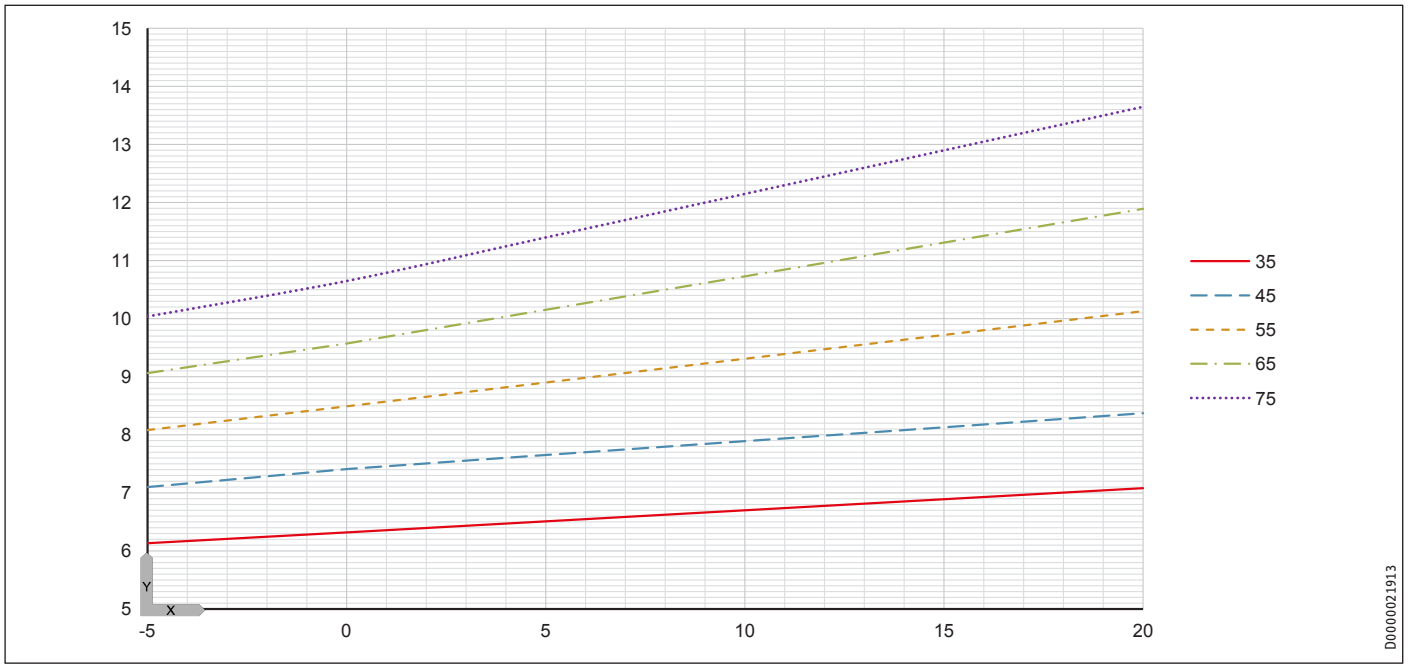
Key to output diagrams

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



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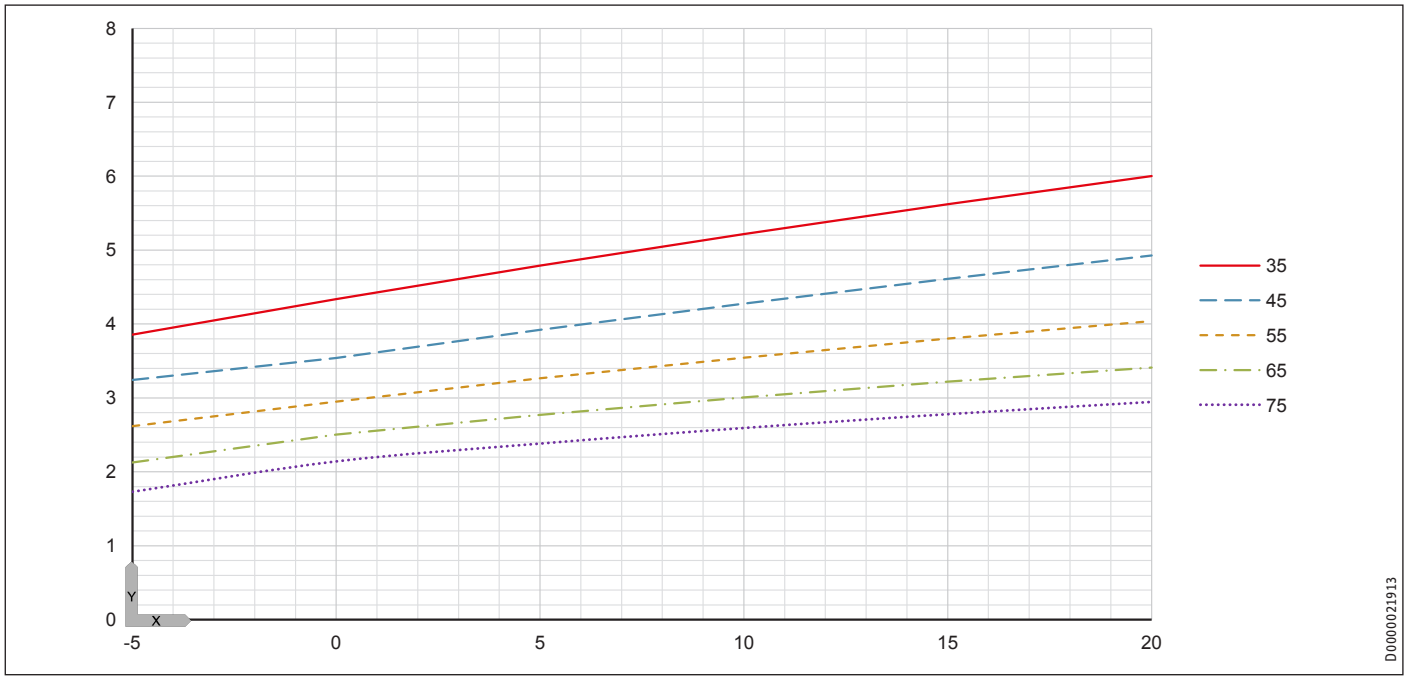
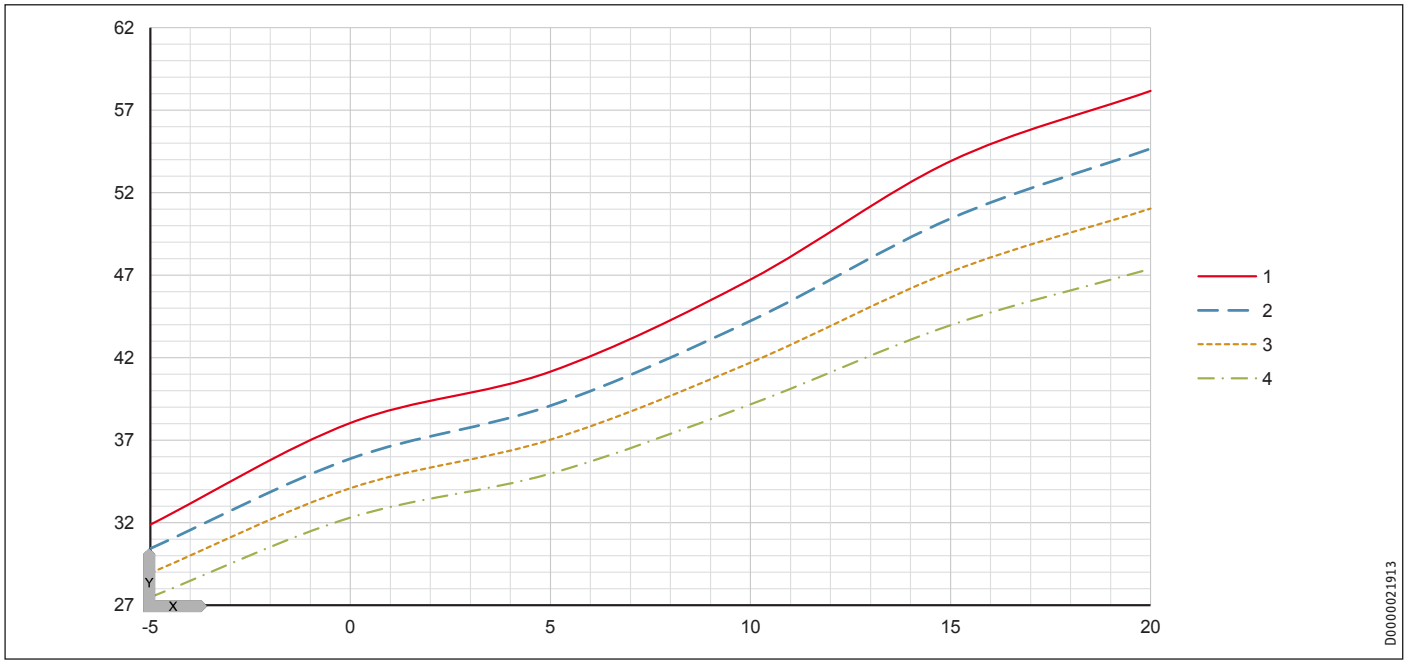


14.9 Output diagrams WPF 35

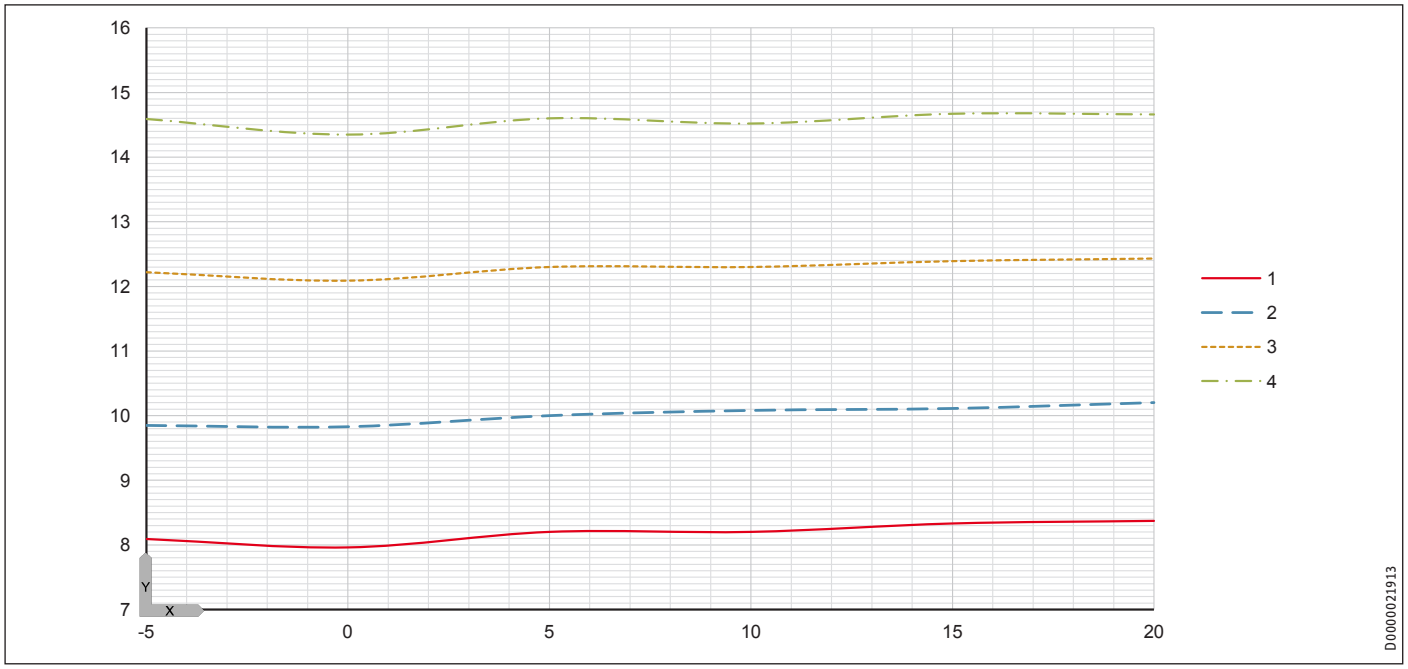
Key to output diagrams

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



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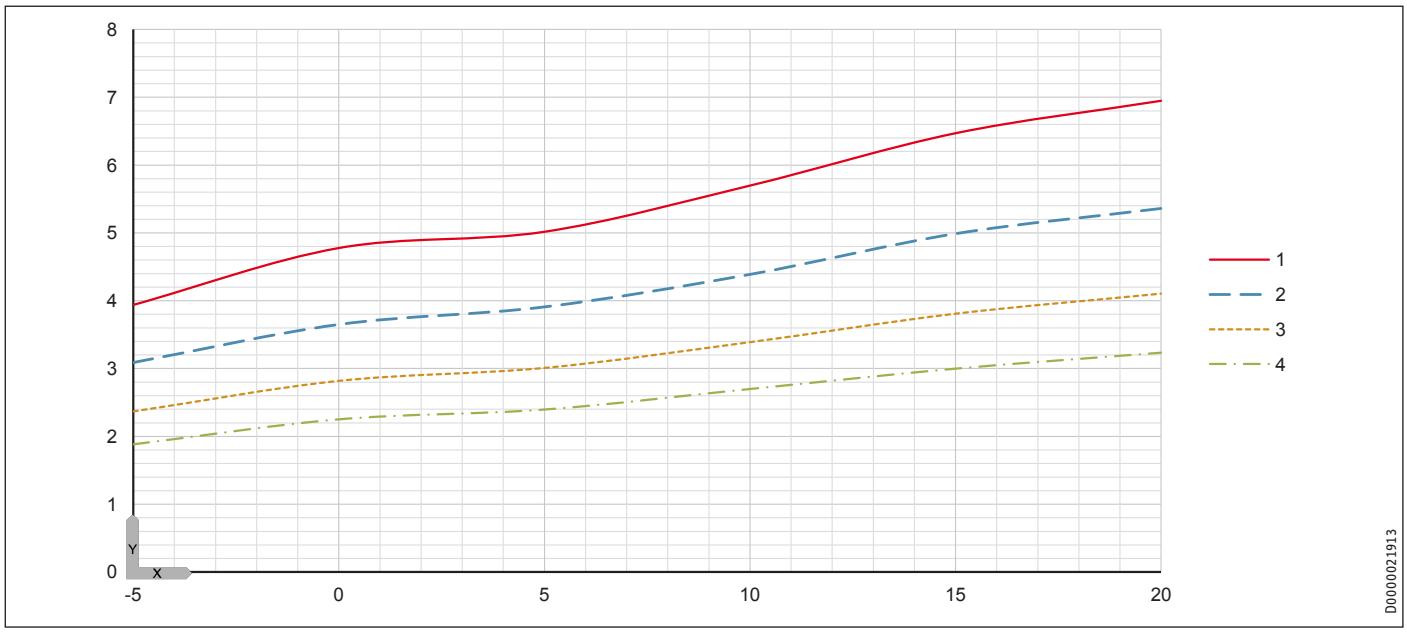
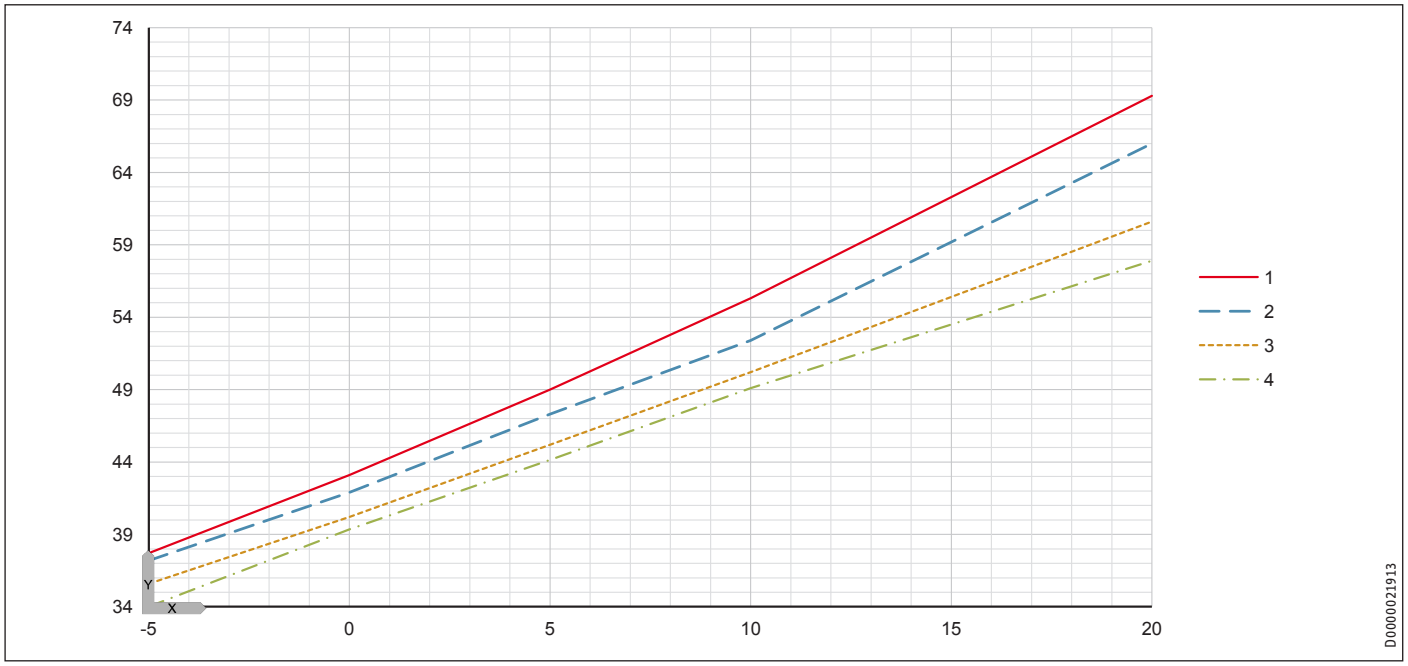


14.10 Output diagrams WPF 40

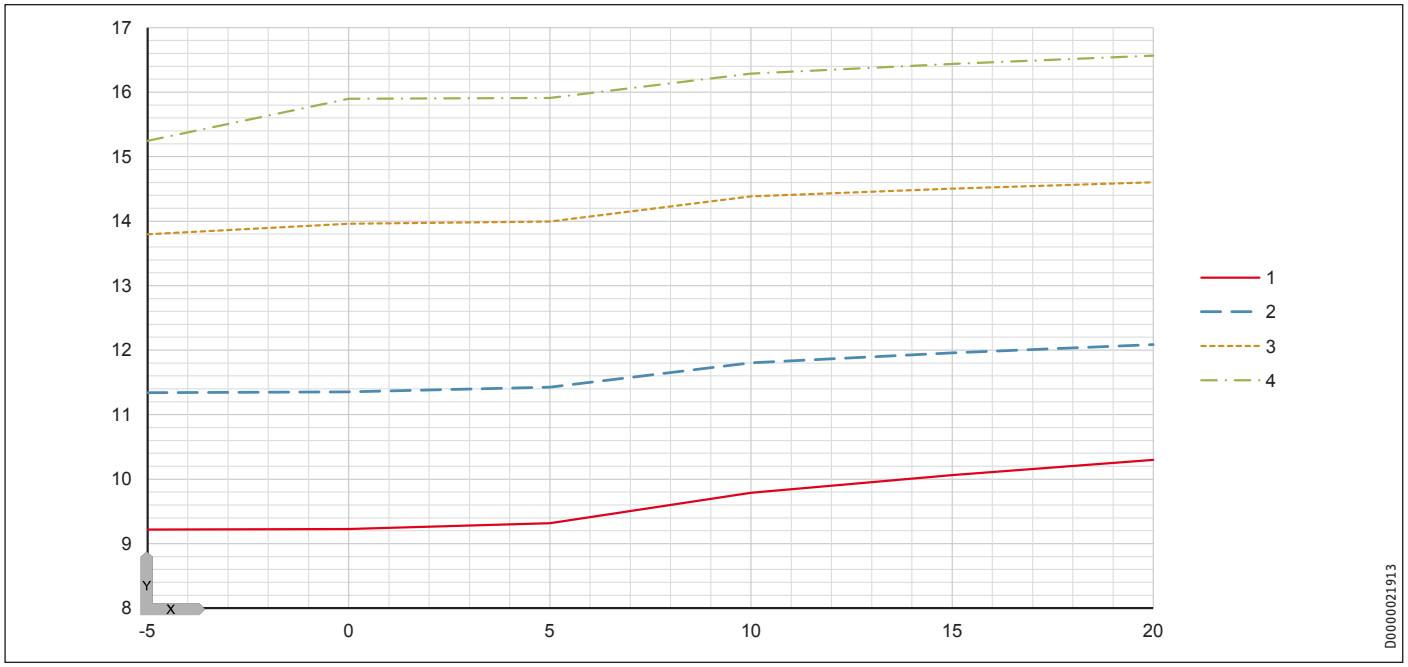
Key to output diagrams

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



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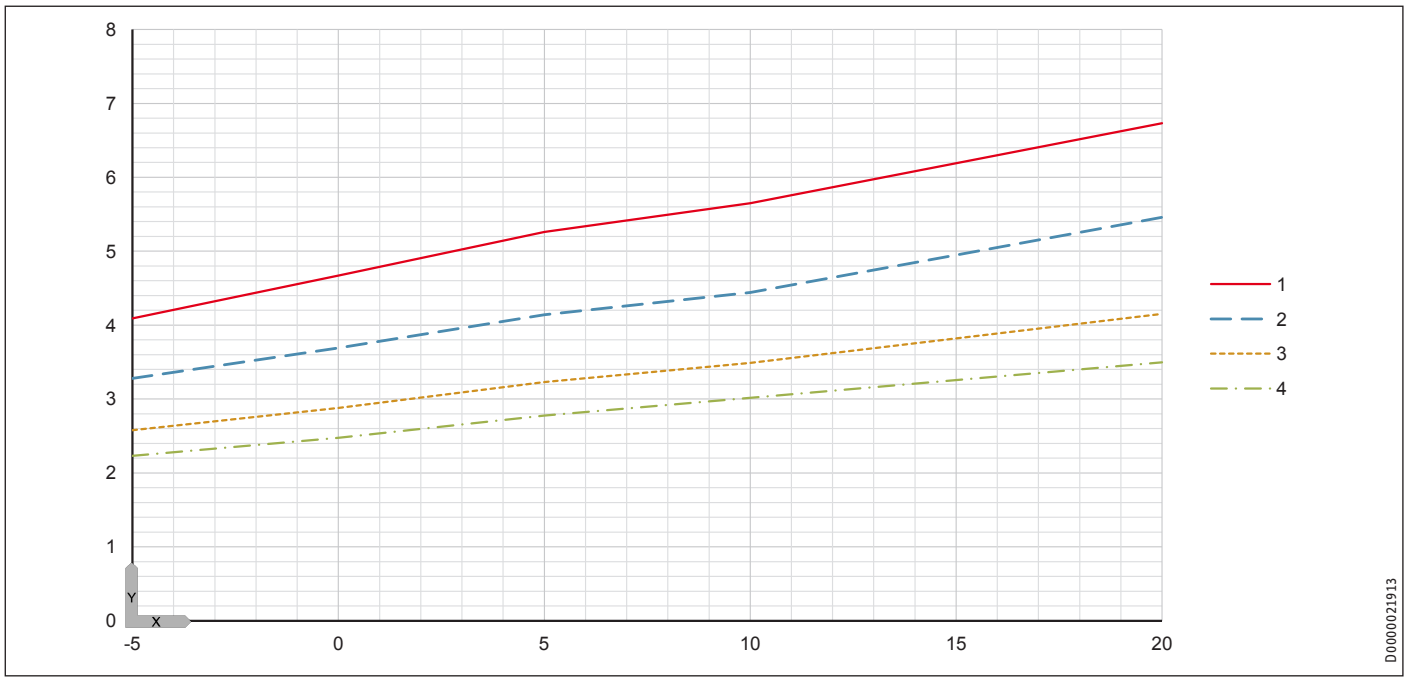
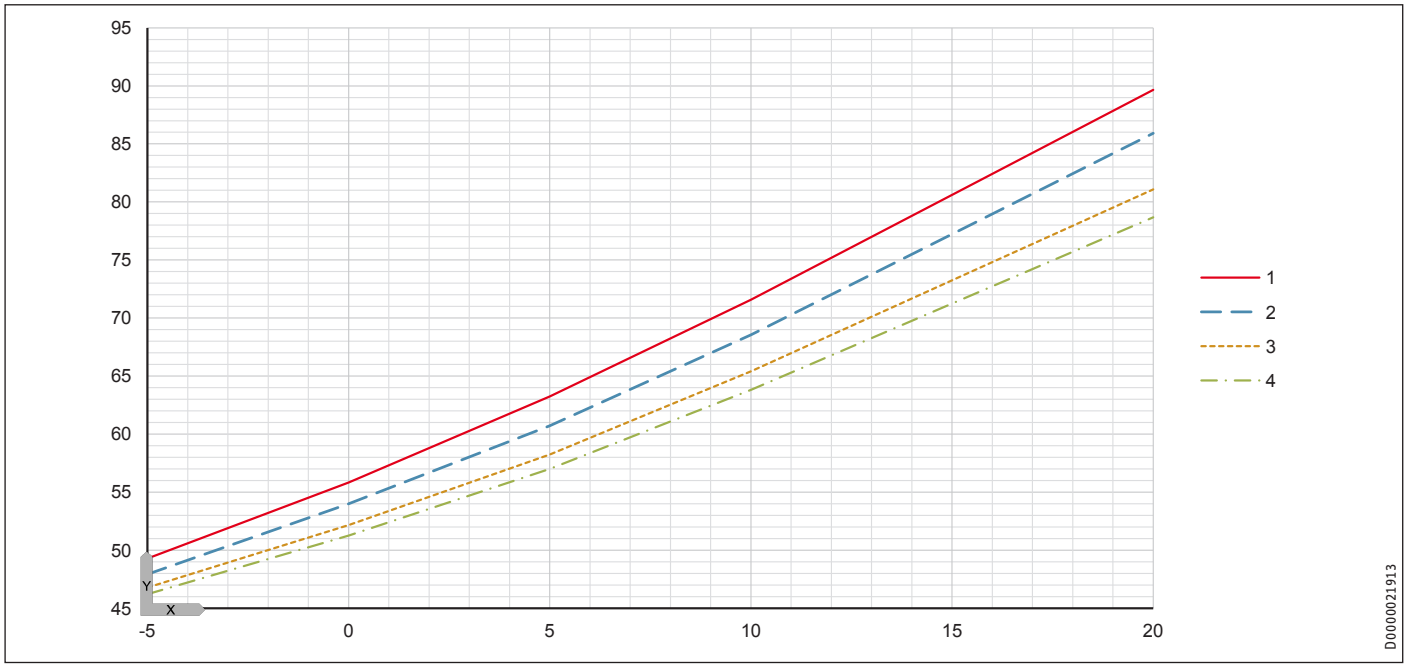


14.11 Output diagrams WPF 52

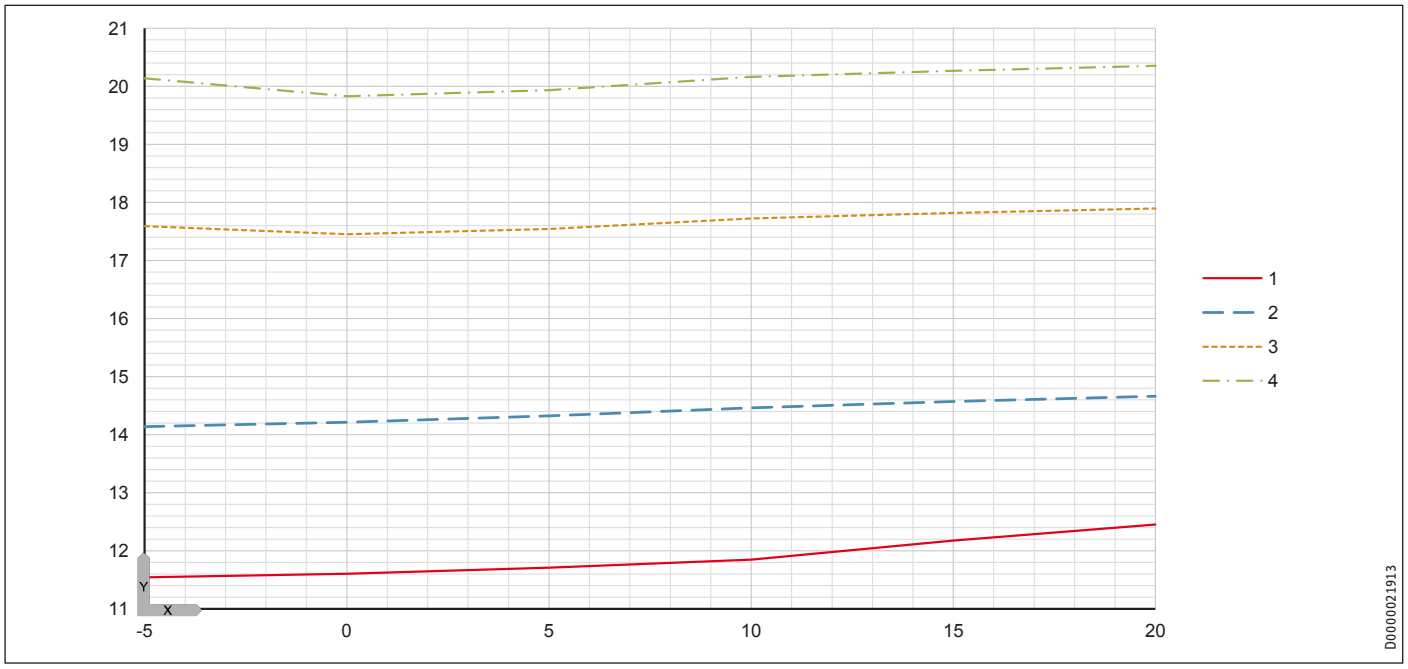
Key to output diagrams

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

Power consumption



Power consumption



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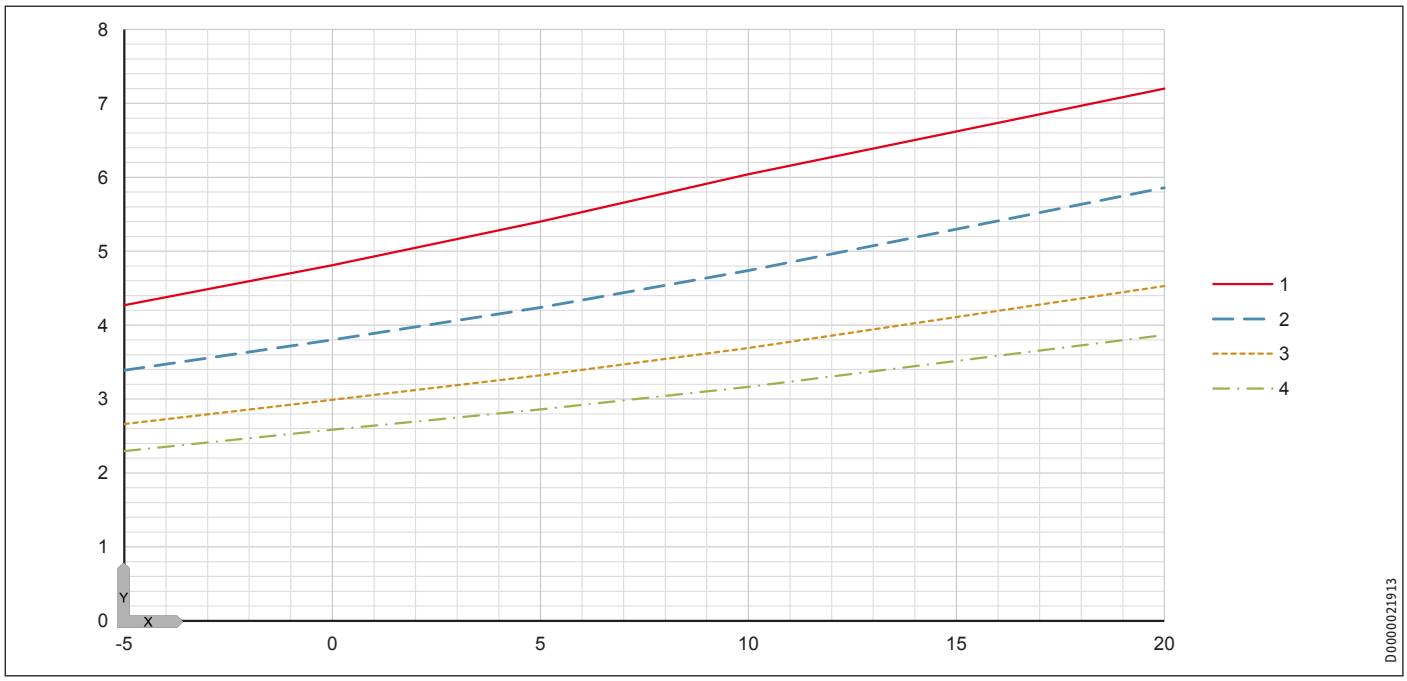
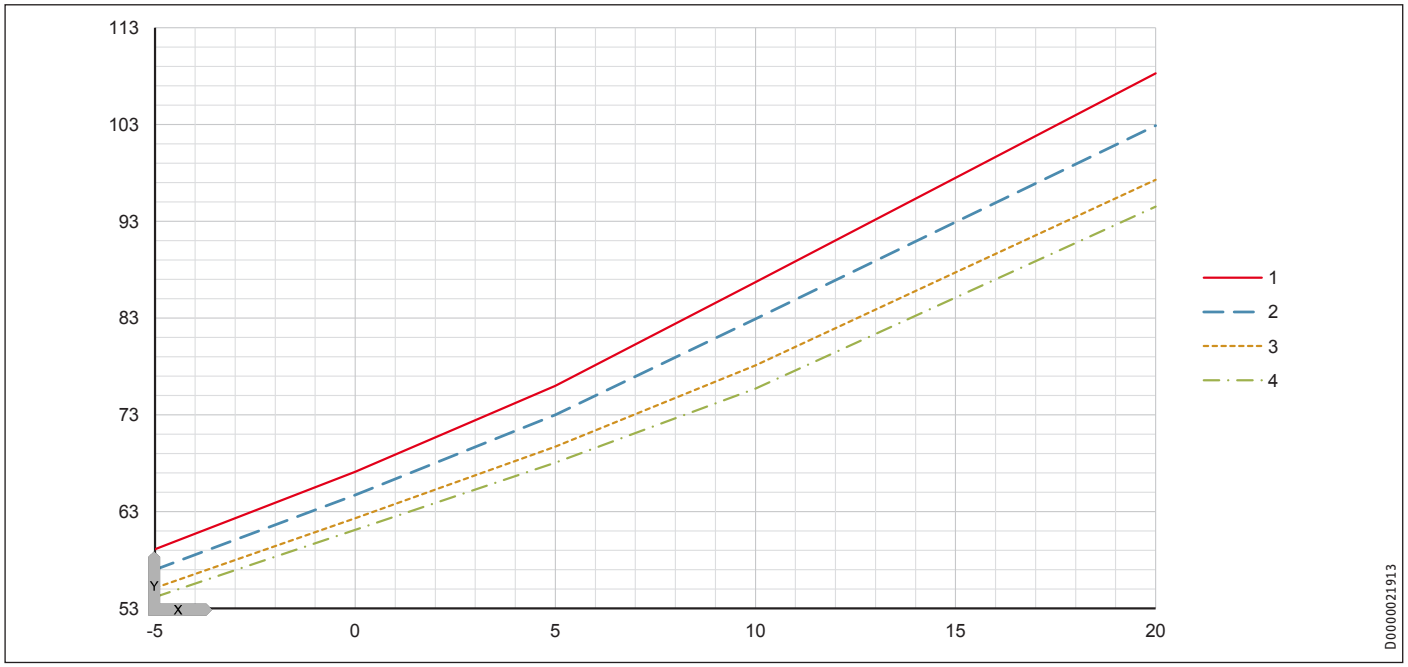


14.12 Output diagrams WPF 66

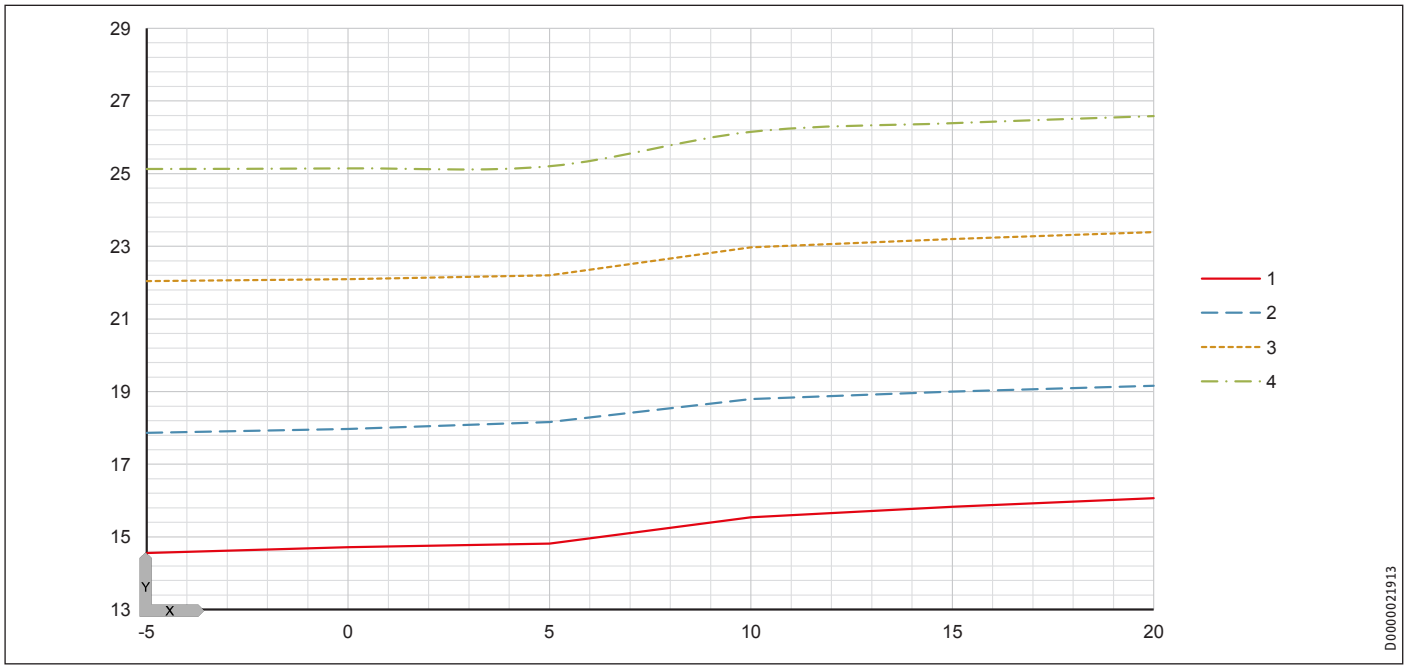
Key to output diagrams

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



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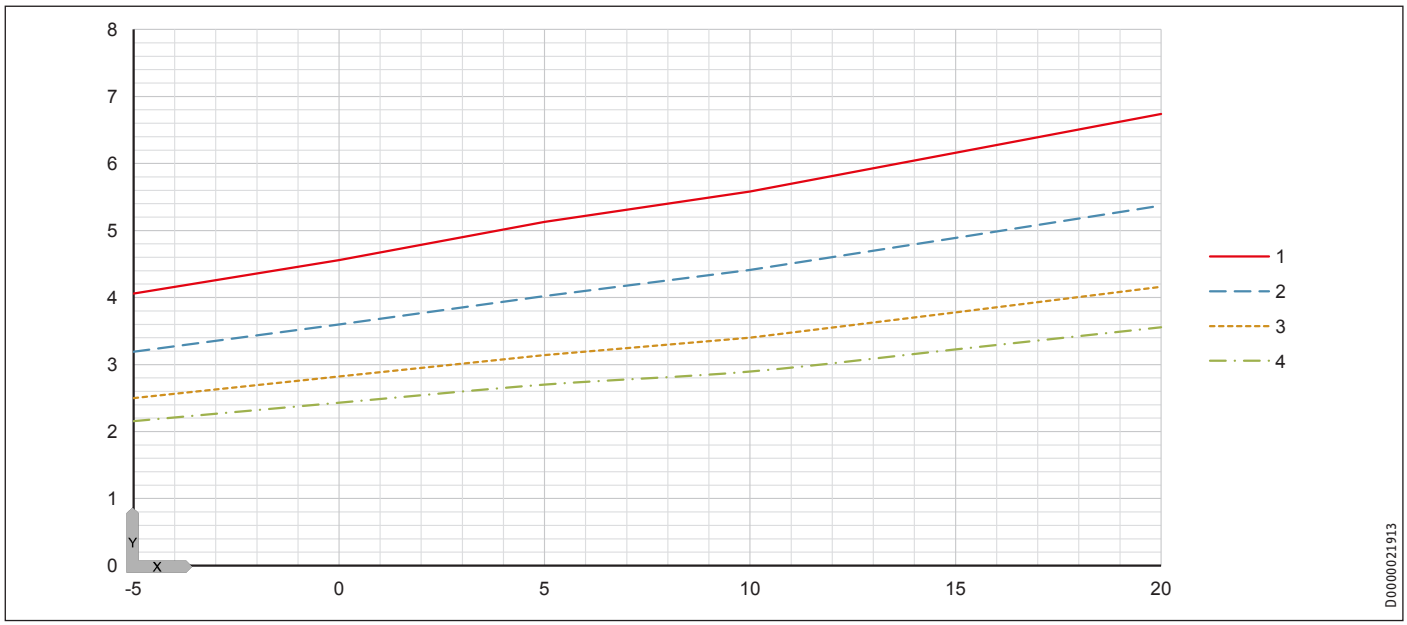

14.13 Data table

The performance data apply for new appliances with clean heat exchangers.

		WPF 20	WPF 27	WPF 27 HT	WPF 35	WPF 40	WPF 52	WPF 66
		233003	233004	233009	233005	233006	233007	233008
Heating output to EN 14511								
Heating output at B0/W35 (EN 14511)	kW	21.5	29.69	27.41	38.04	43.1	55.83	67.10
Power consumption to EN 14511								
Power consumption at B0/W35 (EN 14511)	kW	4.61	6.12	6.32	7.96	9.23	11.61	14.71
COP to EN 14511								
COP at B0/W35 (EN 14511)		4.66	4.85	4.34	4.78	4.67	4.81	4.56
Sound data								
Sound power level (EN 12102)	dB(A)	54	55	55	56	58	58	61
Sound pressure level at 1 m distance in a free field	dB(A)	47	47	47	48	49.9	50	53.5
Sound pressure level at 5 m distance in a free field	dB(A)	33	33	33	34	35.9	36	39.5
Application limits								
Min. installation room volume	m³	14	16	24	20	23	27	33
Max. permissible pressure	MPa	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Min. application limit on the heating side	°C	15	15	15	15	15	15	15
Max. application limit on the heating side	°C	60	60	75	60	60	60	60
Min. application limit, heat source	°C	-5	-5	-5	-5	-5	-5	-5
Max. application limit, heat source	°C	20	20	20	20	20	20	20
Water hardness	°dH	≤3	≤3	≤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	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	8.0-10.0	8.0-10.0
Chloride	mg/l	<30	<30	<30	<30	<30	<30	<30
Conductivity (softening)	µS/cm	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Conductivity (desalination)	µS/cm	20-100	20-100	20-100	20-100	20-100	20-100	20-100
Oxygen 8-12 weeks after filling (softening)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Oxygen 8-12 weeks after filling (desalination)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Energy data								
Energy efficiency class		A++/A++	A++/A++	A++/A++	A++/A++	A++/A++	A++/A++	A++/A++
Energy efficiency class, average climate, W55/W35		A++/A++	A++/A++	A++/A++	A++/A++	A++/A++	A++/A++	A++/A++
Electrical data								
Frequency	Hz	50	50	50	50	50	50	50
MCB/fuse protection, controller	A	1x B 16	1 x B 16	1 x B 16	1 x B 16	1 x B 16	1 x B 16	1 x B 16
Compressor fuse/MCB	A	3 x C 32	3 x C 32	3 x C 32	3 x C 32	3 x C 35	3 x C 50	3 x C 50
Phases, controller		1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE
Phases, compressor		3/PE	3/PE	3/PE	3/PE	3/PE	3/PE	3/PE
Rated voltage, controller	V	230	230	230	230	230	230	230
Rated voltage, compressor	V	400	400	400	400	400	400	400
Starting current (with/without starting current limiter)	A	55/-	60/-	90/-	60/-	60/-	65/-	80/-
Max. operating current	A	15	19	23.3	23.5	30	32	41
Max. phase angle cos(phi)		0.83	0.83	0.82	0.82	0.79	0.87	0.88
Versions								
Refrigerant		R410 A	R410 A	R134a	R410 A	R410 A	R410 A	R410 A
Refrigerant charge	kg	5.99	7.2	5.99	10.0	10	12	14.5
Compressor oil		Emkarate RL 32 3MAF	Emkarate RL 32 3MAF	Emkarate RL 32 3MAF	Emkarate RL 32 3MAF	Emkarate RL 32 3MAF	Emkarate RL 32 3MAF	Emkarate RL 32 3MAF
Condenser material		1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu
Evaporator material		1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu
IP rating		IP34 D	IP34 D	IP34 D	IP34 D	IP34 D	IP34 D	IP34 D
Dimensions								
Height	mm	1154	1154	1154	1154	1154	1154	1154
Width	mm	1242	1242	1242	1242	1242	1242	1242
Depth	mm	860	860	860	860	860	860	860
Weights								
Weight	kg	345	367	409	391	415	539	655
Connections								
Connection on the heating side		G 2	G 2	G 2	G 2	G 2	G 2	G 2
Connection on the heat source side		G 2	G 2	G 2	G 2	G 2	G 2	G 2
Connecting cable	mm²	5 x 6.0	5 x 6.0	5 x 6.0	5 x 6.0	5 x 6.0	5 x 10.0	5 x 10.0

Specification

		WPF 20	WPF 27	WPF 27 HT	WPF 35	WPF 40	WPF 52	WPF 66
Values								
Permissible refrigerant pressure	MPa	4.3	4.3	2.4	4.3	4.3	4.3	4.3
Brine volume	l	11.2	13	13	16.6	16.6	20.2	23.8
Pressure differential on the heat source side	hPa	150	140	140	160	160	150	160
Pressure differential, heating side	hPa	60	52	52	80	80	60	80
Flow rate, heat source side	m³/h	5	7	6.75	8.8	10.5	13	16.1
Nominal heating flow rate at A2/W35, B0/W35 and 7 K	m³/h	2.65	3.65	3.29	4.48	5.3	6.86	8.26
Min heating flow rate	m³/h	1.85	2.56	2.3	3.14	3.71	4.81	5.78
Heating flow rate (EN 14511) at A7/W35, B0/W35 and 5 K	m³/h	3.7	5.12	4.61	6.5	7.42	9.61	11.56

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 | R134a

This device is filled with refrigerant R134a.

Refrigerant R134a is a CFC greenhouse gas mentioned in the Kyoto protocol with a global greenhouse potential (GWP) = 1300.

Never release refrigerant R134a to atmosphere.

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.

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