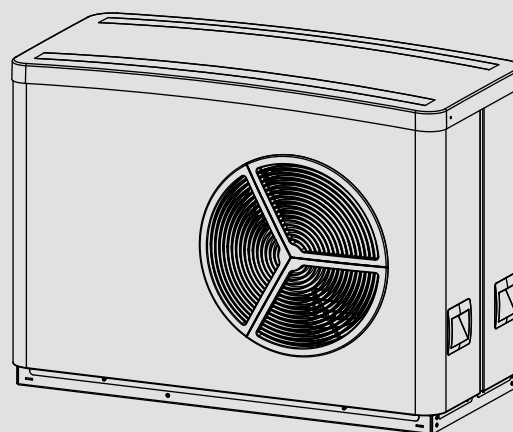


OPERATION AND INSTALLATION

Air source heat pump

- » WPL 15 AS
- » WPL 15 ACS
- » WPL 20 A
- » WPL 20 AC
- » WPL 25 AS
- » WPL 25 ACS
- » WPL 25 A
- » WPL 25 AC



STIEBEL ELTRON

SPECIAL INFORMATION

OPERATION

1. General information	3
1.1 Relevant documents	3
1.2 Safety instructions	3
1.3 Other symbols in this documentation	4
1.4 Units of measurement	4
1.5 Standardised output data	4
2. Safety	4
2.1 Intended use	4
2.2 Safety instructions	4
3. Appliance description	5
3.1 Properties	5
3.2 Function	5
4. Settings	5
5. Maintenance and care	6
6. Troubleshooting	6

INSTALLATION

7. Safety	7
7.1 General safety instructions	7
7.2 Instructions, standards and regulations	7
8. Appliance description	7
8.1 Accessories	7
9. Preparation	7
9.1 Sound emissions	7
9.2 Minimum clearances	8
9.3 Preparing the installation location	9
9.4 Installing the supply lines	9
9.5 Siting	9
9.6 WPM heat pump manager	12
9.7 Buffer cylinder	12
9.8 Preparing the electrical installation	13
10. Installation	13
10.1 Transport	13
10.2 Heating water connection	14
10.3 Flow and return connection	14
10.4 Fitting the push-fit connectors	14
10.5 Oxygen diffusion	15
10.6 Filling the heating system	15
10.7 Condensate drain	16
10.8 External second heat generator	16
10.9 High limit safety cut-out for area heating system	16
11. Electrical connection	16
11.1 Terminal area	16
11.2 Ribbon heater	19
12. Commissioning	20
12.1 Checks before commissioning	20
12.2 Using the appliance with an external second heat generator	21
12.3 Ensuring a minimum flow rate	21
13. Settings	23
13.1 Activating spread control	23
13.2 Heating curve adjustment	23

13.3 Reduced night mode (Silent mode)	23
13.4 Other settings	24
14. Appliance handover	24
15. Appliance shutdown	24
15.1 Standby mode	24
15.2 Power interruption	24
16. Maintenance	25
17. Troubleshooting	25
17.1 Checking the IWS DIP switch settings	25
17.2 Light emitting diodes (LEDs)	27
17.3 Reset button	27
17.4 Resetting the high limit safety cut-out	27
17.5 Fan noise	27
18. Specification	28
18.1 Dimensions and connections	28
18.2 Wiring diagram	29
18.3 Application limit	36
18.4 Output diagrams	37
18.5 Data table	43

GUARANTEE

ENVIRONMENT AND RECYCLING

SPECIAL INFORMATION OPERATION

- The appliance may be used by children aged 8 and older 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 potential risks. Children must never play with the appliance. Children must never clean the appliance or perform user maintenance unless they are supervised.
- The connection to the power supply must be in the form of a permanent connection. Ensure the appliance can be separated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation.
- 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 regular inspection (to establish the current condition of the system), and maintenance by a qualified contractor if required (to return the system to its original condition).
- Following disconnection from the power supply, parts of the appliance may remain energised for 2 minutes until the inverter capacitors have discharged.
- Never interrupt the power supply, even outside the heating season. The system's active frost protection is not guaranteed if the power supply is interrupted.
- If the heat pump is completely switched off and there is a risk of frost, drain the system on the water side.

1. General information

The chapters "Special information" and "Operation" are intended for both users and qualified contractors.

The chapter "Installation" is intended for qualified contractors.



Note

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

1.1 Relevant documents



Instructions for the WPM heat pump manager



Operating and installation instructions for system components



Commissioning checklist for heat pump

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

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

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

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

1.4 Units of measurement



Note

All measurements are given in mm unless stated otherwise.

1.5 Standardised output data

Information on determining and interpreting the specified standardised output data.

1.5.1 EN 14511

The output data specifically mentioned in texts, diagrams and technical datasheets has been calculated according to the test conditions of the standard shown in the heading of this section. However, there is a deviation from this norm in the output data for air/water inverter heat pumps at source temperatures of $> -7^{\circ}\text{C}$, as this concerns partial load values. The associated percentage weighting in the partial load range can be found in EN 14825 and EHPA quality label regulations.

Generally, the test conditions stated above will not fully match the conditions found at the installation site of the system user.

Depending on the chosen test method and the extent to which this method differs from the test conditions defined in the first paragraph of this section, any deviations can be considerable.

Additional 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.

Confirmation of the specified output data can only be obtained if the test conducted for this purpose is also performed in accordance with the test conditions defined in the first paragraph of this section.

2. Safety

2.1 Intended use

Observe the application limits listed in chapter "Specification / Data table".

The appliance is intended for domestic use. It can be used safely by untrained persons. 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 these instructions and of instructions for any accessories used is also part of the correct use of this appliance.

2.2 Safety instructions

Observe the following safety instructions and regulations.

- Only qualified contractors may carry out the electrical work and installation of this appliance.
- The qualified contractor is responsible for adherence to all applicable regulations during installation and commissioning.
- The appliance should only be operated once it is fully installed and all safety equipment has been fitted.
- Protect the appliance from dust and dirt during building work.



WARNING Injury

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



WARNING Injury

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

3. Appliance description

3.1 Properties

This appliance is a heat pump designed for outdoor installation. Heat is extracted from the outdoor air at a low temperature level, and is then transferred to the heating water at a higher temperature. The heating water can be heated up to a flow temperature of 65 °C.

The appliance is equipped with an electric emergency/booster heater (NHZ). To safeguard heating operation and the provision of high DHW temperatures, the electric emergency/booster heater is activated as an emergency heater if the dual mode point is undershot in mono mode operation. If the same thing happens in mono energetic operation, the electric emergency/booster heater is activated as a booster heater.

This appliance has further operational characteristics:

- Suitable for underfloor and radiator heating systems.
- Extracts heat from the outdoor air even at outside temperatures of -20 °C.
- Corrosion-protected, external casing made from hot-dipped galvanised sheet steel plus stove-enamelled finish.
- Comprises all components and safety equipment required for operation.
- Filled with non-combustible safety refrigerant.



Note

For centralised control of the heating system, you would need the WPM heat pump manager.

3.2 Function

3.2.1 Heating

Heat is extracted from the outdoor air via the heat exchanger (evaporator) on the air side. The evaporated refrigerant is compressed by a compressor. This process requires electrical energy. At this point, the refrigerant is at a higher temperature level. A further heat exchanger (condenser) transfers the heat to the heating circuit. The refrigerant then expands again and the cycle restarts from the beginning.

At air temperatures below approx. 7 °C, the humidity in the air condenses as hoarfrost on the evaporator fins. This hoarfrost is automatically defrosted. Water created by this defrosting process collects in the defrost pan and is drained off.



Material losses

During the defrost cycle, the fan is switched OFF and the heat pump circuit is reversed. The heat required for defrosting is drawn from the buffer cylinder. For operation without a buffer cylinder, observe chapter “Menu / Menu description / SETTINGS / HEATING / STANDARD SETTING / BUFFER OPERATION” in the WPM installation instructions. Otherwise the heating water freezes under unfavourable conditions.

The heat pump automatically reverts to heating mode at the end of the defrost cycle.



Material losses

In dual mode operation, return water from the second heat generator may flow through the heat pump. Please note that the return temperature must be no higher than 60 °C.

3.2.2 Cooling



Material losses

The heat pump is not suitable for continuous, year-round cooling.

- Observe the application limits (see chapter “Specification / Data table”).



Material losses

In cooling mode, condensate can form when the dew point temperature is undershot.

- Take suitable measures to prevent the formation of condensate.

Rooms are cooled by reversing the heat pump circuit. Heat is extracted from the heating water and the evaporator transfers this heat to the outdoor air.

Area cooling and fan cooling require the installation of a remote control unit (FET) in a reference room to capture the relative humidity and the room temperature as part of dew point monitoring.

With fan cooling, it is also necessary to install a buffer cylinder.

Heat pump application limit

The heat pump is switched off if the outside temperature falls below the selected lower application limit for cooling (COOLING LIMIT parameter).

4. Settings

The system is operated exclusively via the WPM heat pump manager.

- Please observe the instructions for the heat pump manager.

5. Maintenance and care

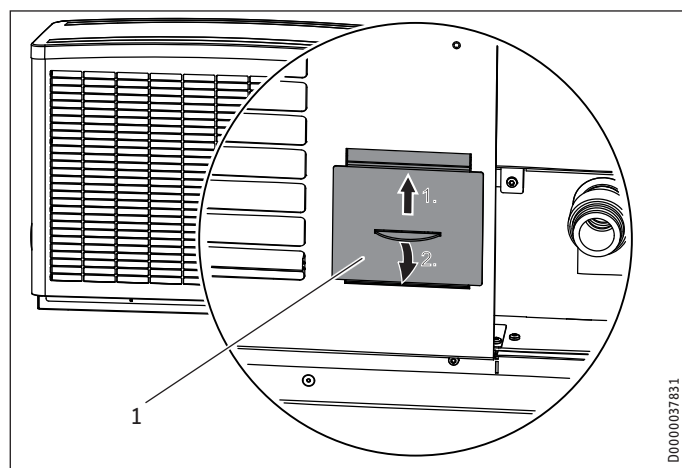


Material losses

Maintenance work, such as checking the electrical safety, may only be carried out by a qualified contractor.

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

Regularly check the condensate drain (visual inspection). Remove any contaminants and blockages immediately.



1 Inspection port



Material losses

Keep the air discharge and intake apertures free from snow and leaves.

Remove any leaves or other foreign bodies from the evaporator fins periodically.

We recommend a regular inspection (to establish the current condition of the system), and maintenance by a qualified contractor as required (to restore the system to the ideal condition).

6. Troubleshooting

Fault	Cause	Remedy
There is no hot water or the heating system remains cold.	No power at the appliance.	Check the fuses/MCBs in your distribution board. Replace the fuses/reset the MCBs if required. Notify your qualified contractor if the fuses/MCBs blow/trip again after switching the system back on.
Water is leaking from the appliance.	The condensate drain may be blocked.	Clean the condensate drain as described in "Maintenance and care".
The heater gets warm, but the rooms are not heated to the required temperature.	The dual mode temperature is set too low.	Increase the dual mode temperature to e.g. 0 °C.
	The building is a new build and is in the screed drying phase.	Increase the dual mode temperature to +5 °C. After 1 to 2 years the dual mode temperature can be reset to e.g. -3 °C.

Fault	Cause	Remedy
Condensate is collecting on the outside of the appliance.	The heat pump extracts heat from the outdoor air in order to heat the building. This can cause the humidity in the outdoor air to accumulate as dew or frost on the cooled heat pump casing. This is not a defect.	
The fan runs when the compressor is switched off.	At outside temperatures below 10 °C, the fan is regularly started at the lowest speed when the compressor is idle. This prevents the evaporator and fan from freezing or icing up due to water draining off. At temperatures above the freezing point, the time between two defrost cycles is increased, thereby improving overall efficiency.	
The appliance produces rhythmic scraping or grinding noises.	Ice has formed on the air grille, on the fan blades or in the air routing.	Call your qualified contractor (see chapter "Installation / Troubleshooting / Fan noise").

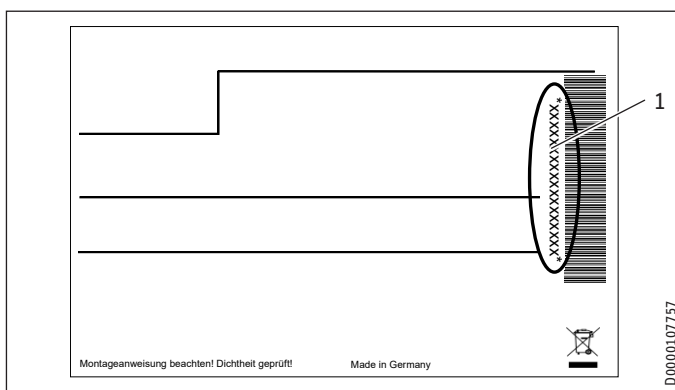


Note

Even when the condensate is draining away correctly, it is not unusual for water to drip from the appliance onto the floor.

If you cannot remedy the fault, contact your qualified contractor. To facilitate and speed up your request, provide the number from the type plate. The type plate is located at the front 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 function and operational reliability only if original accessories and spare parts intended for the appliance are used.

7.2 Instructions, standards and regulations



Note

Observe all applicable national and regional regulations and instructions.

The tested appliance conforms to IEC 61000-3-11.

The tested appliance conforms to IEC 61000-3-12.

The appliance meets the specified standard, as long as it is operated in accordance with EN 61000-3-11:2000 para. 4a.

8. Appliance description

The appliance offers frost protection for the connection lines. The integral frost protection circuit starts the circulation pump in the heat pump circuit automatically at a condenser temperature of 8 °C, and thereby ensures circulation in all water-carrying sections. If the temperature inside the buffer cylinder drops, the heat pump starts automatically no later than when the temperature falls below +5 °C.

8.1 Accessories

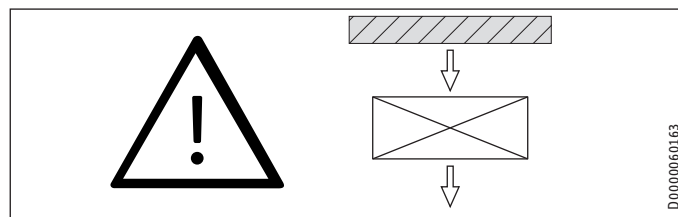
8.1.1 Required accessories

- WPM heat pump manager

8.1.2 Additional accessories

- FET remote control
- FE7 remote control
- HZB 1 ribbon heater
- HZB 2 ribbon heater
- STB-FB high limit safety cut-out for underfloor heating systems
- SK 1 T-support
- WK 2 wall mounting bracket
- MK 1 mounting bracket
- AS-WP 1 connection set
- AS-WP 2 connection set

9. Preparation



The appliance is designed for siting in front of a wall. Observe the minimum clearances. If the appliance is installed in an open space or on a roof, protect the air intake side. Do this by erecting a wall to shield it against the wind.

9.1 Sound emissions

The appliance is louder on the air intake and air discharge sides than on the two enclosed sides. Take the following information into account when selecting the installation location.



Note

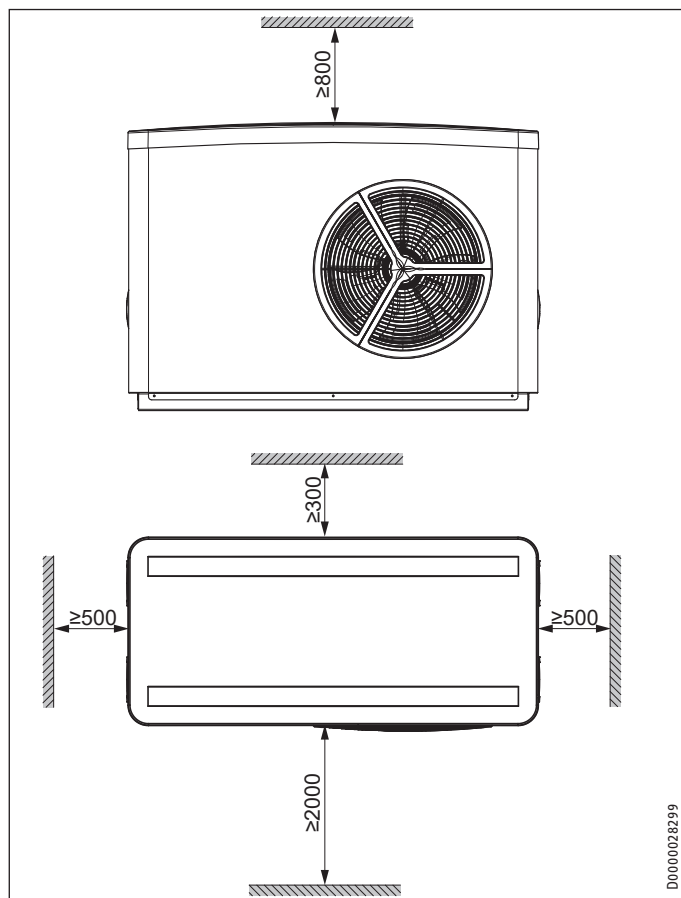
For details regarding the sound power level, see chapter "Specification / Data table".

- Lawn areas and shrubs help reduce the spread of noise.
- Noise propagation can also be reduced through dense palisades or similar.
- Ensure that the entire appliance frame is in full contact with the substrate. Uneven substrates can increase sound emissions.
- Ensure that the air intake direction is the same as the dominant wind direction. Air should not be drawn in against the wind.
- Ensure that the air intake and air discharge are never directed towards noise-sensitive rooms of the house, e.g. bedrooms, or neighbouring houses.
- Avoid installation on large, echoing floor areas, e.g. tiled floors.
- Avoid installation between reflective building walls. Reflecting building walls can increase the noise level.

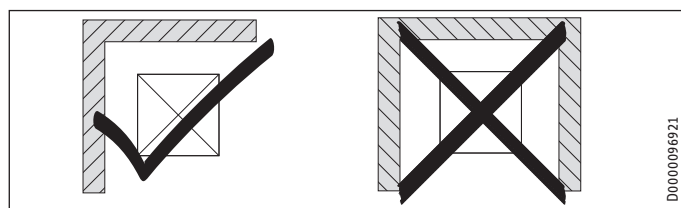
INSTALLATION

Preparation

9.2 Minimum clearances



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



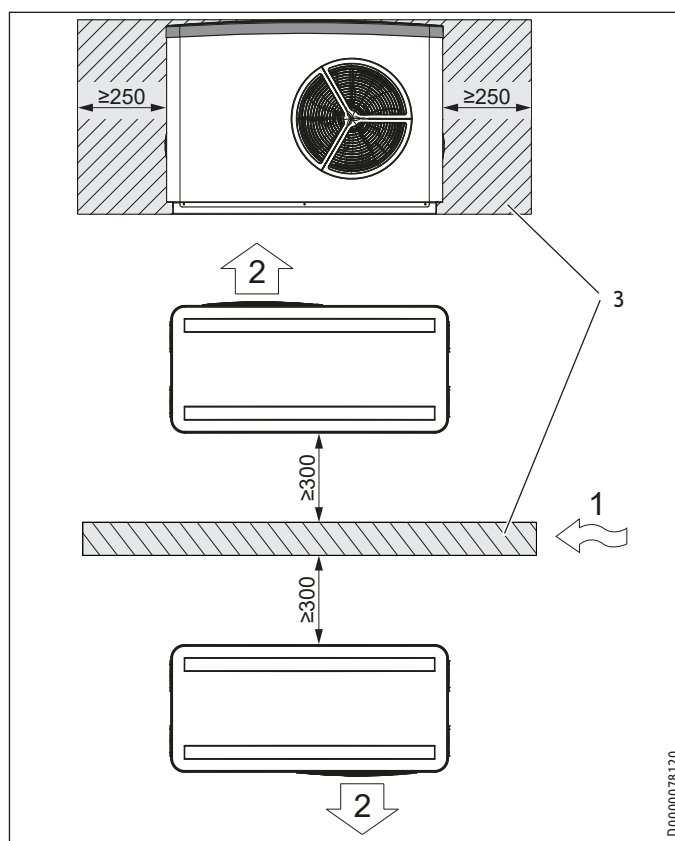
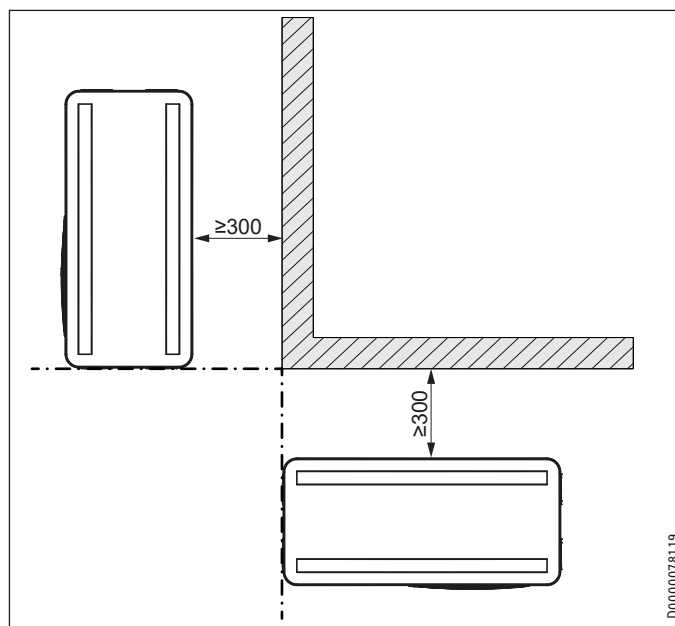
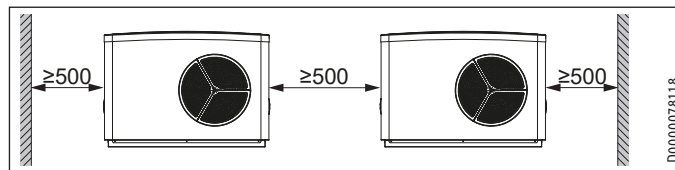
- Never install the appliance in a recess. Two sides of the appliance must remain exposed.



Material losses

Please note that both the flow of outdoor air into the appliance, and the flow of exhaust air from the appliance must be unimpeded. If the air intake and discharge of the appliance are obstructed by surrounding objects, this may cause a thermal short circuit.

9.2.1 Minimum clearances with cascades

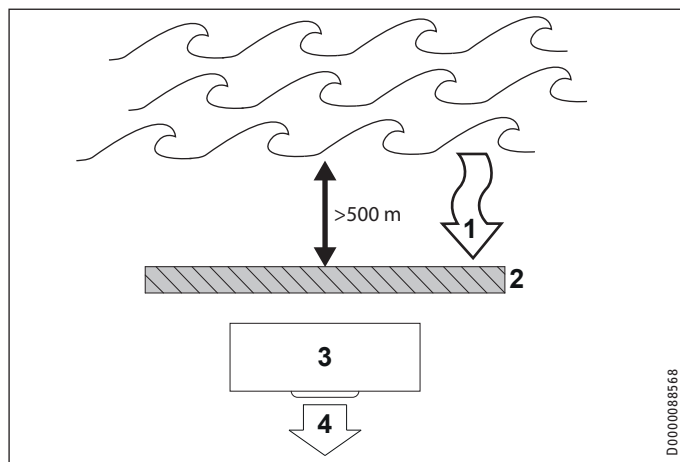


- 1 Main wind direction
- 2 Air discharge
- 3 Wall or wind protection

INSTALLATION

Preparation

9.2.2 Installation in coastal areas



- 1 Main wind direction
- 2 Building, wall or wind protection
- 3 appliance
- 4 Air discharge

- Ensure that the air intake direction is the same as the main wind direction. If the main wind direction is from the sea (> 2 % salinity), ensure that the installation is at least 500 m from the sea.

9.3 Preparing the installation location



WARNING Injury

The discharged cold air can cause condensation to be formed in the vicinity of the air outlet.

- Ensure that no risk of slipping due to wet conditions or ice formation occurs on adjacent footpaths and driveways at low temperatures.

- Observe chapter "Sound emissions".
- Ensure that the appliance is accessible from all sides.
- Ensure that the substrate is level, even, solid and permanent.
- Provide a recess (space) in the base to enable supply lines to be routed into the appliance from below.

9.4 Installing the supply lines



WARNING Injury

- Seal all supply line entries into the building to ensure that they are watertight.

The supply lines are all electric cables plus the flow and return lines.

- To facilitate connection to the appliance, we recommend using flexible supply lines in the case of outdoor installation.
- Also protect all supply lines against humidity, damage and UV radiation by means of a conduit.
- Use only weatherproof cables, e.g. NYY.
- Protect the flow and return lines against frost with sufficient thermal insulation. The thermal insulation must be at least twice as thick as the diameter of the pipe. Provide thermal insulation in accordance with applicable regulations.
- Protect all pipe fixings and external wall ducts with anti-vibration insulation.



Note

When routing the condensate hose, observe chapter "Installation / Condensate drain".

9.5 Siting

- When siting the appliance, observe the air discharge direction.
- Position the appliance on the prepared substrate or on a suitable support.

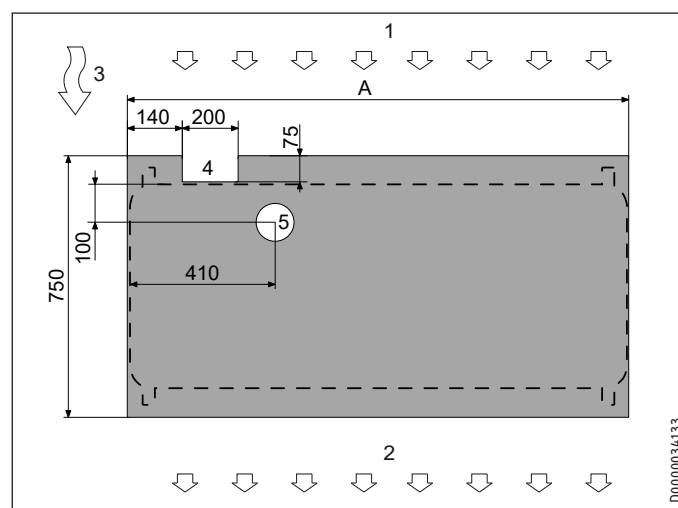
9.5.1 Siting on foundation or MK 1 mounting bracket (mounting bracket WPL 15 AS | WPL 15 ACS only)



Note

Allow the conduits for the supply lines to protrude slightly above the foundations. Ensure that no water can enter the conduits.

Foundations with recess



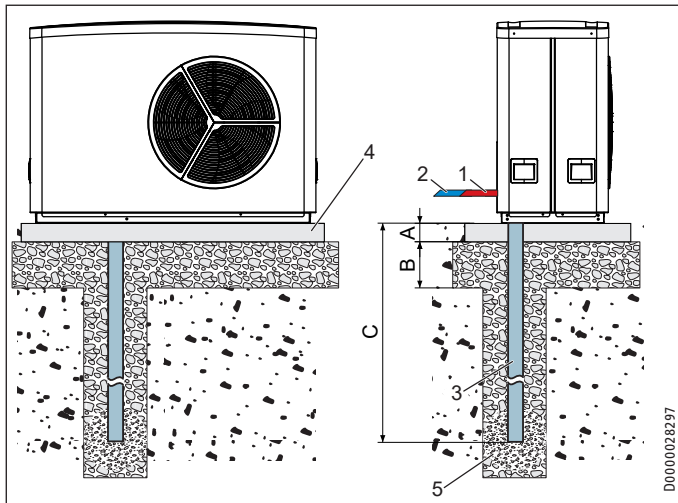
A	WPL 15 A(C)S	1300	mm
	WPL 20 A(C)	1500	mm
	WPL 25 A(C)(S)		

- 1 Air intake
 - 2 Air discharge
 - 3 Main wind direction
 - 4 Supply line recess
 - 5 Condensate drain recess (minimum diameter 70 mm)
- Ensure that the foundations offer the necessary recess.

INSTALLATION

Preparation

Installation on foundations



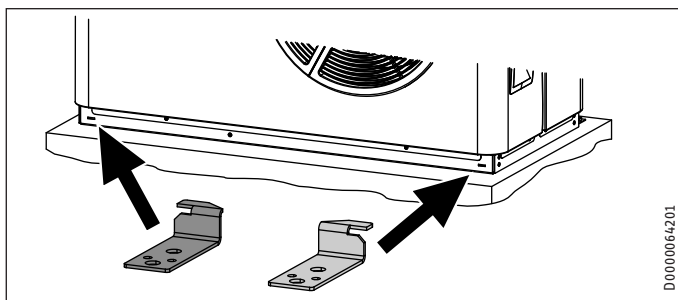
- A 100
- B 300
- C Depth of frost line
- 1 Heating flow
- 2 Heating return
- 3 Condensate drain conduit
- 4 Foundation
- 5 Gravel bed



Note

To secure the appliance against toppling over, it can also be fixed to the foundations with screws.

- Use the accessories with which the appliance was secured to the transport pallet.



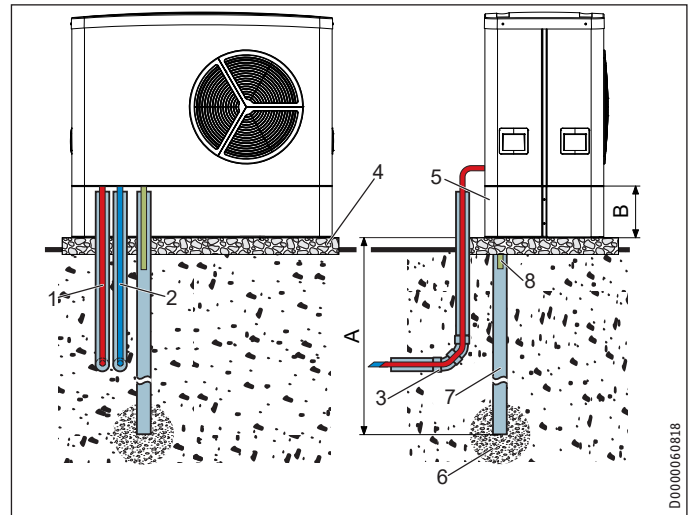
- Hook two brackets respectively into the lateral slots on the front and back. Ensure you are using the correct brackets for the left and right hand slots respectively.
- Position the brackets so that the groove on the bracket is hooked into the appliance.
- Secure the appliance to the foundations using the brackets and suitable rawl plugs and screws. Do not use the screws with which the appliance was secured to the transport pallet.

MK 1 mounting bracket (WPL 15 AS | WPL 15 ACS only)



Note

The mounting bracket cannot be used in combination with the connection sets (AS-WP 1 and AS-WP 2).



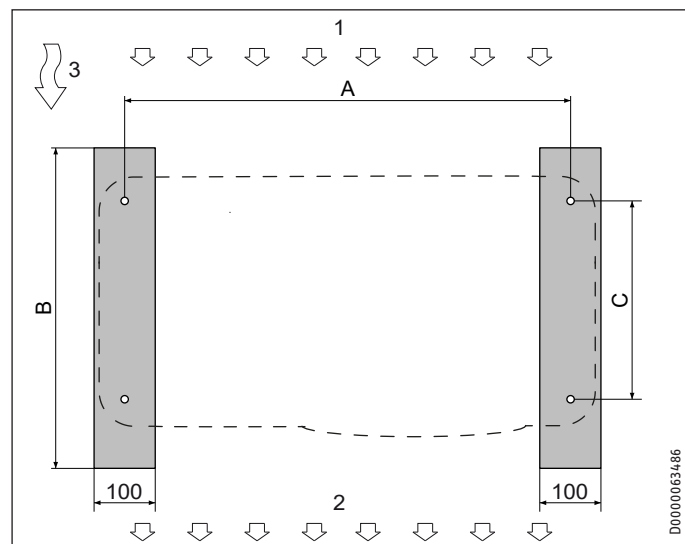
- A Depth of frost line
- B 245
- 1 Heating flow
- 2 Heating return
- 3 Conduit for supply lines
- 4 Foundation
- 5 Mounting bracket
- 6 Gravel bed
- 7 Condensate drain conduit
- 8 Condensate drain

INSTALLATION

Preparation

9.5.2 Installation on strip foundation

Strip foundation



A	WPL 15 A(C)S	1160	mm
	WPL 20 A(C)	1380	mm
	WPL 25 A(C)(S)		

B 650

C 490

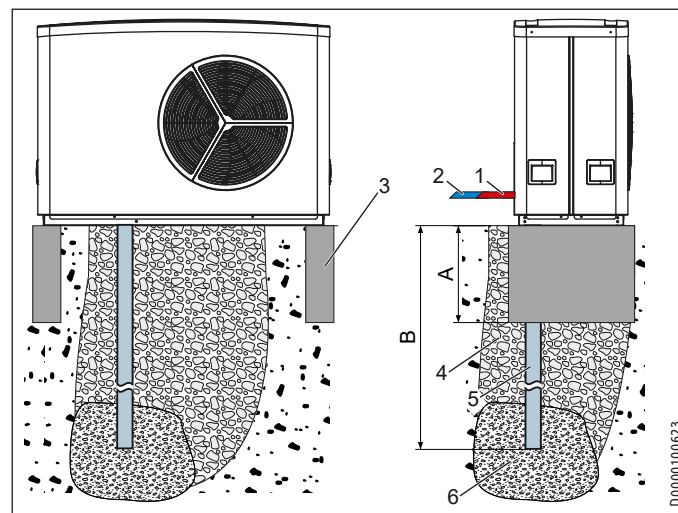
1 Air intake side

2 Air discharge side

3 Main wind direction

- Erect a strip foundation at ground level.
- Lay the condensate drain pipe.
- Fill in with gravel up to the top edge of the strip foundation.

Installation on strip foundation



A 300

B Depth of frost line

1 Heating flow

2 Heating return

3 Strip foundation (edge block)

4 Rubble

5 Condensate drain conduit

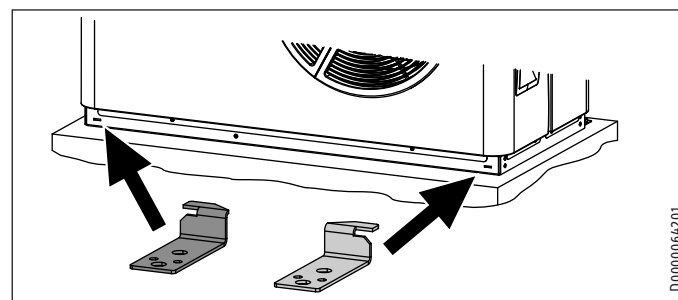
6 Gravel bed



Note

To secure the appliance against toppling over, it can also be fixed to the foundations with screws.

- Use the accessories with which the appliance was secured to the transport pallet.



- Hook two brackets respectively into the lateral slots on the front and back. Ensure you are using the correct brackets for the left and right hand slots respectively.
- Position the brackets so that the groove on the bracket is hooked into the appliance.
- Secure the appliance to the foundations using the brackets and suitable rawl plugs and screws. Do not use the screws with which the appliance was secured to the transport pallet.

INSTALLATION

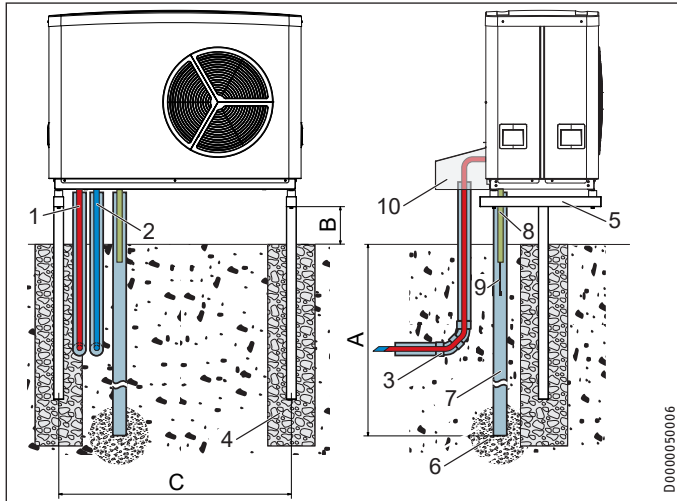
Preparation

9.5.3 T-support SK 1



Note

- Install a ribbon heater when mounting on the wall bracket or T-support (see chapter "Electrical connection / Ribbon heater").



A Depth of frost line
B 300

C	WPL 15 A(C)S	1160	mm
	WPL 20 A(C)	1380	mm
	WPL 25 A(C)(S)		

- 1 Heating flow
- 2 Heating return
- 3 Conduit for supply lines
- 4 Foundation
- 5 T-support
- 6 Gravel bed
- 7 Condensate drain conduit
- 8 Condensate drain
- 9 Ribbon heater
- 10 Cover

- Observe the structural limits of the T-support used.
- See the dimensioned connection drawing for the correct spacing between holes (see chapter "Specification / Dimensions and connections").

9.5.4 WK 2 wall mounting bracket



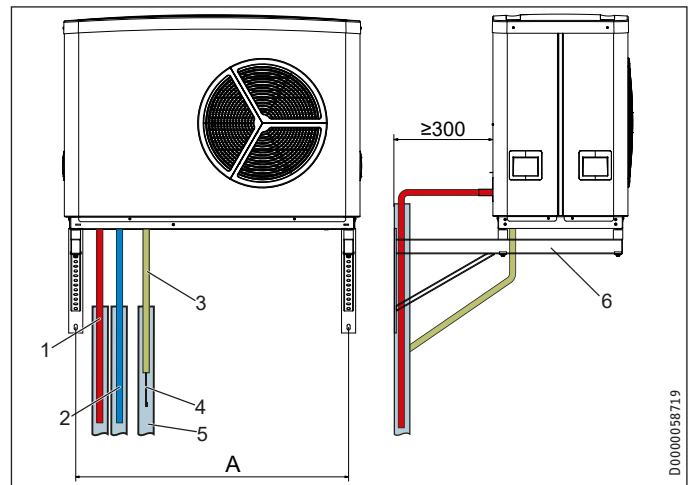
Note

- Install a ribbon heater when mounting on the wall bracket or T-support (see chapter "Electrical connection / Ribbon heater").



Note

- To prevent disturbance due to structure-borne noise transmission, never install the wall mounting bracket on the external walls of living areas or bedrooms.
- Install the wall mounting bracket on a garage wall, for example.



A	WPL 15 A(C)S	1160	mm
	WPL 20 A(C)	1380	mm
	WPL 25 A(C)(S)		

- 1 Heating flow
- 2 Heating return
- 3 Condensate drain
- 4 Ribbon heater
- 5 Condensate drain conduit
- 6 Wall mounting bracket

- Observe the structural limits of the wall mounting bracket used.
- See the dimensioned connection drawing for the correct spacing between holes (see chapter "Specification / Dimensions and connections").

9.6 WPM heat pump manager

A WPM heat pump manager is required to operate the appliance. This controls the entire heating system.

- Observe the WPM installation instructions during installation.

9.7 Buffer cylinder



Material losses

A buffer cylinder with diffusion-proof insulation is essential to enable cooling by means of fan convectors.



Note

If cooling is provided via an area heating system, the buffer cylinder is not required.

We recommend the use of a buffer cylinder to ensure trouble-free appliance operation.

The buffer cylinder provides hydraulic separation of the volume flows in the heat pump circuit and heating circuit, and also serves as an energy source for defrosting.

- If operating without a buffer cylinder, observe the details in the chapter "Commissioning / Ensuring a minimum flow rate".

9.8 Preparing the electrical installation



WARNING Electrocutation

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



WARNING Electrocutation

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



Material losses

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



Material losses

Provide separate fuses/MCBs for the three power circuits, i.e. those of the appliance, the control unit and the electric emergency/booster heater.

- Use cables with the relevant cross-sections. Observe the applicable national and regional regulations.

MCB/fuse rating	Assignment	Cable cross-section
1x B 20 A	Compressor (1-phase) WPL 15 AS WPL 15 ACS	≥ 2.5 mm ²
1x B 35 A	Compressor (1-phase) WPL 25 AS WPL 25 ACS	6.0 mm ² when routing in a wall
3x B 16 A	Compressor (3-phase) WPL 20 A WPL 20 AC WPL 25 A WPL 25 AC	2.5 mm ²
2x B 16 A	Electric emergency/booster heater WPL 15 AS WPL 15 ACS WPL 25 AS WPL 25 ACS	2.5 mm ²
3x B 16 A	Electric emergency/booster heater WPL 20 A WPL 20 AC WPL 25 A WPL 25 AC	2.5 mm ²
1x B 16 A	Control unit	1.5 mm ²

The electrical data can be found in the chapter "Specification". You require a screened J-Y (St) 2x2x0.8 mm² cable as a bus cable.



Note

The appliance includes an inverter for the variable speed compressor. In the event of a fault, inverters can cause DC residual currents. If RCDs are provided, they must be type B AC/DC-sensitive.

A DC residual current can block type A RCDs.

- Ensure that the appliance power supply is disconnected from the distribution board.

10. Installation

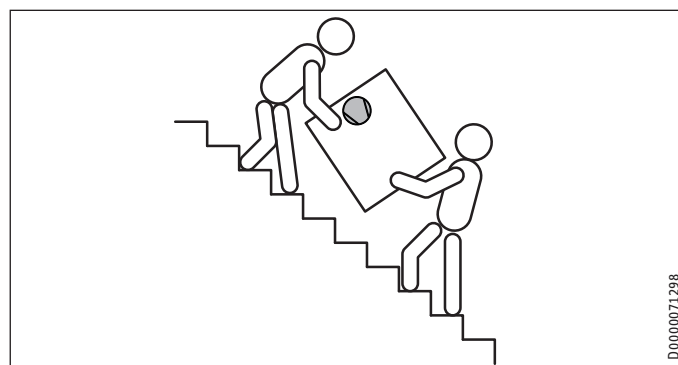


Note

The device is designed in such a way that it can be positioned and connected without removing the cover or side panels.

10.1 Transport

- When transporting the appliance, be aware of its centre of gravity.
- The centre of gravity is in the area where the compressor is located.
- Protect the appliance against heavy impact during transport.
- Use the recessed grips provided at the sides.



- If the appliance needs to be tilted during transport, this must only be for a short time and it must only be tilted on one of its longitudinal sides. When transporting the appliance, ensure the compressor is on the upper appliance side.
- The longer the appliance is tilted, the greater the distribution of refrigerant oil inside the system.
- Wait approximately 30 minutes before starting the appliance after it has been tilted.

10.2 Heating water connection



Material losses

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

To facilitate connection to the heating system, push-fit connectors are enclosed with the appliance (see chapter "Fitting the push-fit connectors").

- ▶ Before connecting the heat pump, flush the pipework thoroughly with suitable water. Foreign bodies, such as welding pearls, rust, sand or sealant can impair the operational reliability of the heat pump.
- ▶ Connect the heat pump on the heating side. Check for tightness.
- ▶ Ensure that the heating flow and return are connected correctly.
- ▶ Provide thermal insulation in accordance with applicable regulations.
- ▶ When sizing the heating circuit, observe the internal pressure differential (see chapter "Specification / Data table").

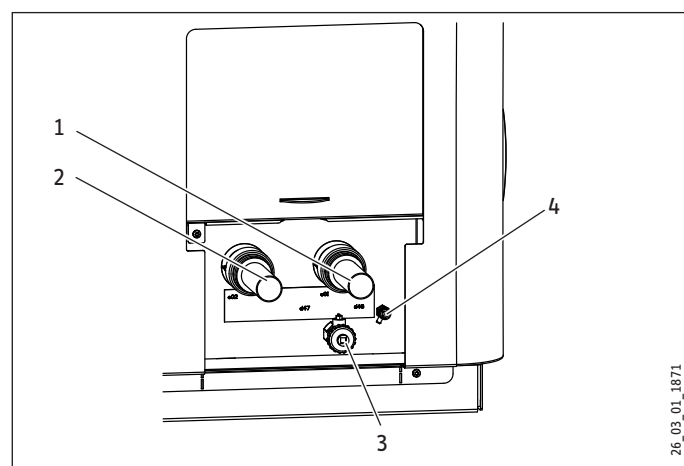
10.3 Flow and return connection



Material losses

In cooling mode, condensate can form when the dew point temperature is undershot.

- ▶ Take suitable measures to prevent the formation of condensate.



- 1 Heating flow
- 2 Heating return
- 3 Drain
- 4 Ventilation

- ▶ Connect the heat pump to the heating circuit. Check for tightness.

10.4 Fitting the push-fit connectors



Note

The plastic push-fit connectors are not suitable for installation in the DHW line or the solar circuit.

- ▶ Install the push-fit connectors only in the heating circuit.



Material losses

Tighten the screw cap of the push-fit connector by hand. Never use a tool.



Material losses

To ensure the push-fit connector is held securely, pipes with a surface hardness > 225 HV (e.g. stainless steel) must have a groove.

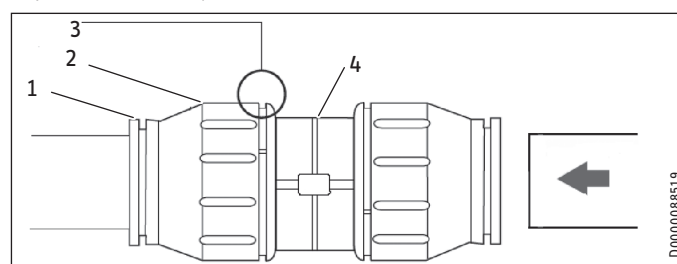
- ▶ Using a pipe cutter, cut a groove (depth approx. 0.1 mm) at a defined distance from the end of the pipe.
- Pipe diameter 22 mm: 17 ± 0.5 mm
- Pipe diameter 28 mm: 21 ± 0.5 mm

How the push-fit connectors work

The push-fit connectors are equipped with a retainer with stainless steel serrations and an O-ring for sealing. The push-fit connectors also have a "twist and secure" function. Simply turning the screw cap by hand will secure the pipe in the connector and push the O-ring against the pipe to seal it.

Making the push-fit connection

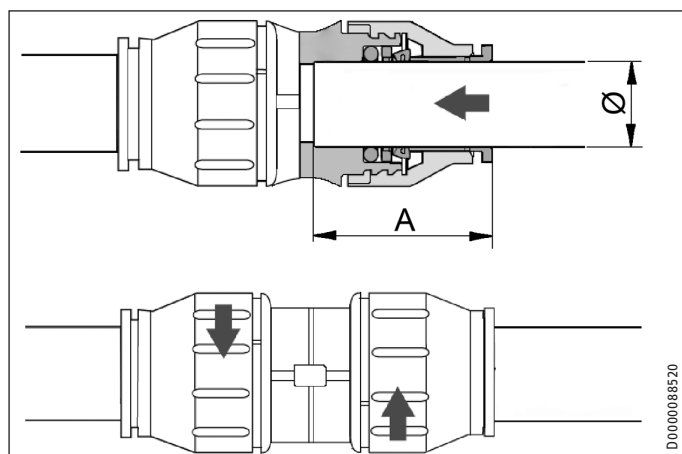
The connector must be in its relaxed position before the pipe is inserted. In this position, there is a small gap between the screw cap and main body.



- 1 Retainer
- 2 Screw cap
- 3 Gap between screw cap and main body
- 4 Main body

INSTALLATION

Installation



Pipe Ø	28 mm
Depth of insertion A	max. 44 mm



Material losses

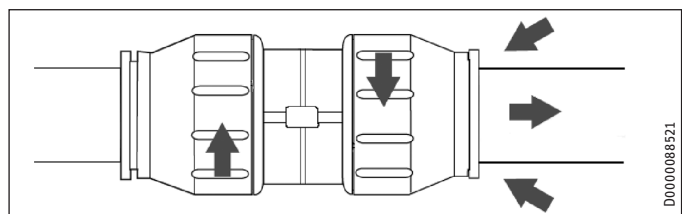
- Pipe ends must be deburred.
- Always use a pipe cutter to trim pipes.

- Push the pipe past the O-ring into the push-fit connector until it reaches the prescribed insertion depth.
- Tighten the screw cap by hand against main body as far as it will go. This secures the push-fit connection.

Undoing the push-fit connection

If the push-fit connectors later need to be undone, proceed as follows:

- Turn the screw cap anti-clockwise until there is a narrow gap of approx. 2 mm. Press the retainer back with your fingers and hold on to it.
- Pull out the inserted pipe.



10.5 Oxygen diffusion



Material losses

Do not use open vented heating systems. Use oxygen diffusion-proof pipes in underfloor heating systems with plastic pipework.

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

- With heating systems that are permeable to oxygen, separate the heating system between the heating circuit and the buffer cylinder.



Material losses

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

10.6 Filling the heating system

10.6.1 Heating water quality

The heating system is filled with drinking water. To prevent damage to the heating system, comply with the following limits.

	Unit	Value
Water hardness	°dH	≤ 3
pH value		6.5-8.5
Chloride	mg/l	< 30

You can find out the water hardness and the chloride value of the fill water from the local water supplier.

- Observe local requirements (e.g. VDI 2035 in Germany).

We do not recommend desalinating the fill water, as this may cause a negative change in the pH value. If you desalinate the fill water, check the pH value 8-12 weeks after installation and after each refill.

- Do not add inhibitors or additives to the filling water.

Accessories for water softening

If you need to soften the fill water, you can use the following product.

- Heating water softener HZEA
- HZEN replacement cartridge
- Recheck these limits 8-12 weeks after commissioning, every time the system is topped up and during the annual service.

Appliance in low-occupancy buildings

During regular operation, the connection lines and the system are protected by the frost protection function of the appliance.

If the appliance is disconnected from the power supply for a longer period of time (decommissioning, prolonged power failure), drain the appliance on the water side. Otherwise the appliance is not protected against frost.

If it is not possible to detect power failures (for example if the system is in a holiday home left vacant for extended periods of time), the following protective measure can be taken.

- Add a suitable concentration of ethylene glycol to the fill water. Observe the instructions for the antifreeze. Only use antifreeze products which have been approved by us.
- Please note that antifreeze changes the density and viscosity of the fill water.

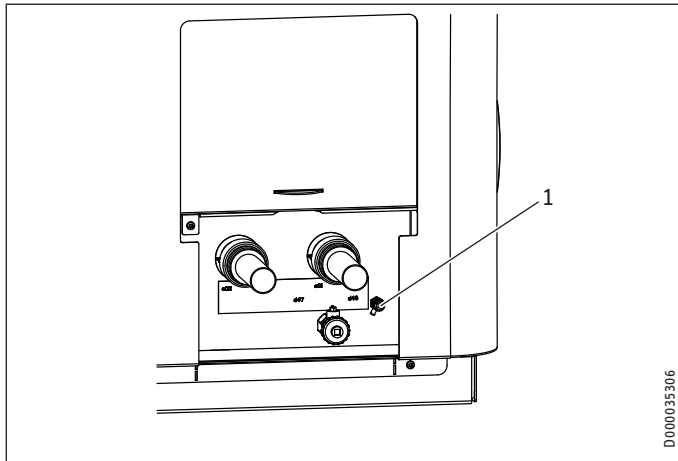
		Part number
MEG 10	Heat transfer medium as concentrate on an ethylene glycol base	231109
MEG 30	Heat transfer medium as concentrate on an ethylene glycol base	161696

10.6.2 Filling the heating system

- Fill the heating system via the drain (see chapter "Specification / Dimensions and connections").
- After filling the heating system, check the connections for leaks.

10.6.3 Venting the heating system

- Vent the pipework carefully.

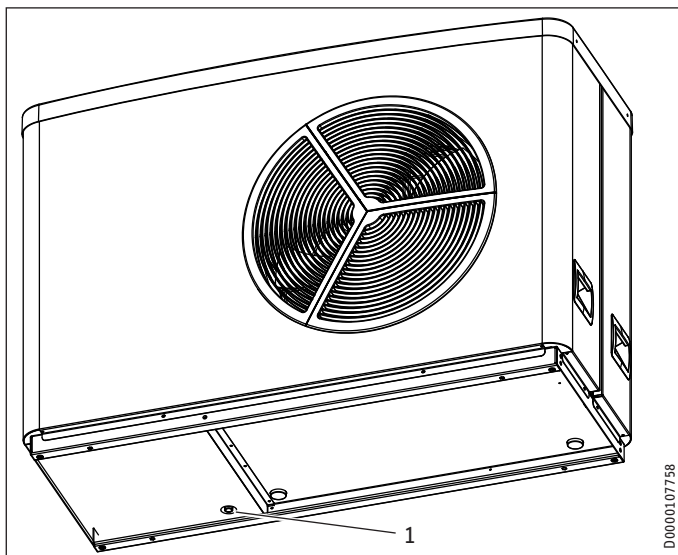


1 Ventilation

- Vent the pipework by activating the ventilation.

10.7 Condensate drain

A condensate drain connector is factory-fitted to the defrost pan to enable any condensate to drain off.



1 Condensate drain

- Observe chapter "Electrical connection / Ribbon heater".
- If the appliance is sited on foundations, the condensate drips freely into the condensate drain pipe.
- If the appliance is mounted on a bracket or T-support, attach a condensate hose to the condensate drain.
- Protect the condensate hose against frost with sufficient thermal insulation.



Material losses

Ensure the condensate hose is not kinked. Route the hose with a slope.

- After routing the condensate hose, check that the condensate can drain correctly.

10.8 External second heat generator

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

10.9 High limit safety cut-out for area heating system



Material losses

In order to prevent excessively high flow temperatures in the area heating system causing damage in the event of a fault, install a high limit safety cut-out to limit the system temperature.

11. Electrical connection



Note

The leakage current of this appliance can be $> 3.5 \text{ mA}$. Since the unit is connected to the distribution board, the leakage current from the unit and the residual currents of the installation are recorded together during a residual current test.

- Evaluate the percentage of leakage current from the unit and the residual currents in the test result.
- Take into account the local and unit-specific conditions at the test location, as well as any insulation faults or other influencing factors.



Note

Please observe the instructions for the heat pump manager.

The connection must only be made by a qualified contractor and in accordance with these instructions.

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

11.1 Terminal area



WARNING Electrocutation

- Before working on the appliance, isolate it from the power supply at the control panel.



Note

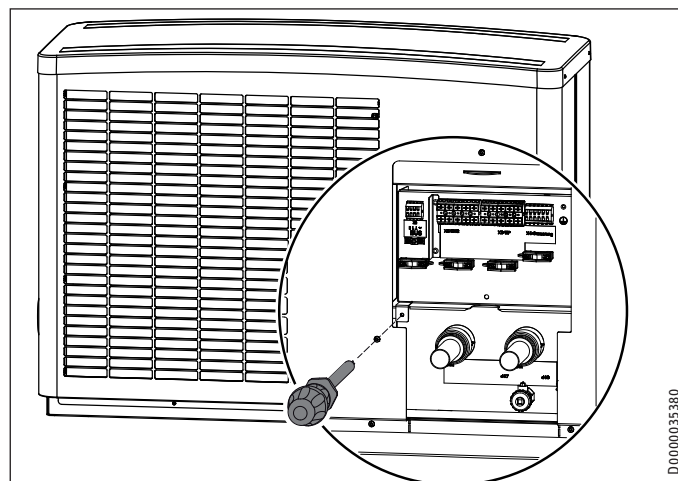
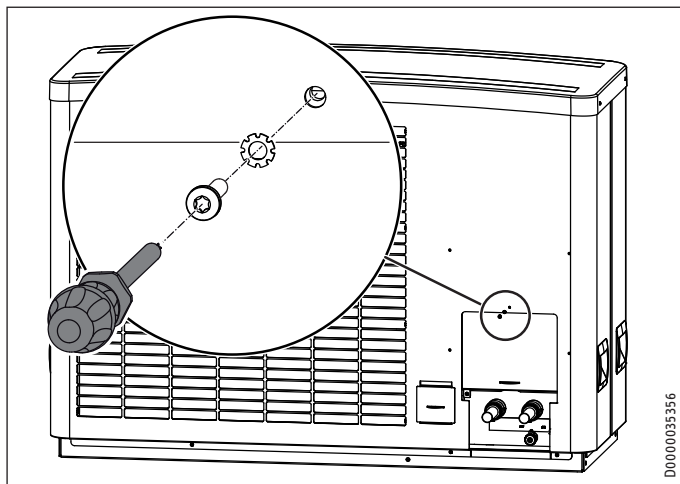
The terminals are located in the terminal area of the appliance.

- Follow the instructions in the chapter "Preparation / Preparing the electrical installation".
- For all connections, use appropriate cables in accordance with local regulations.

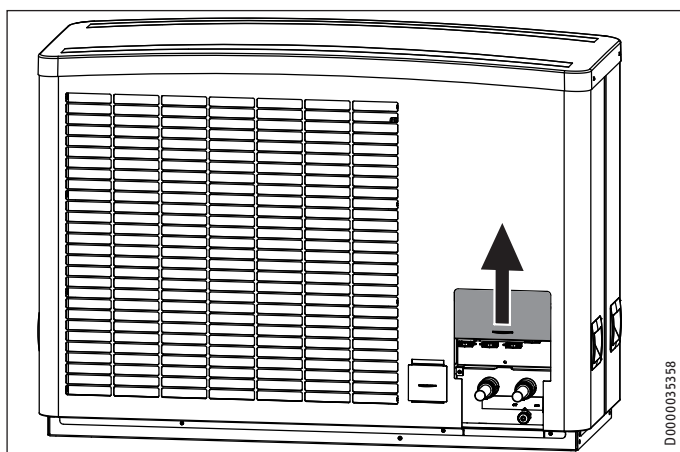
INSTALLATION

Electrical connection

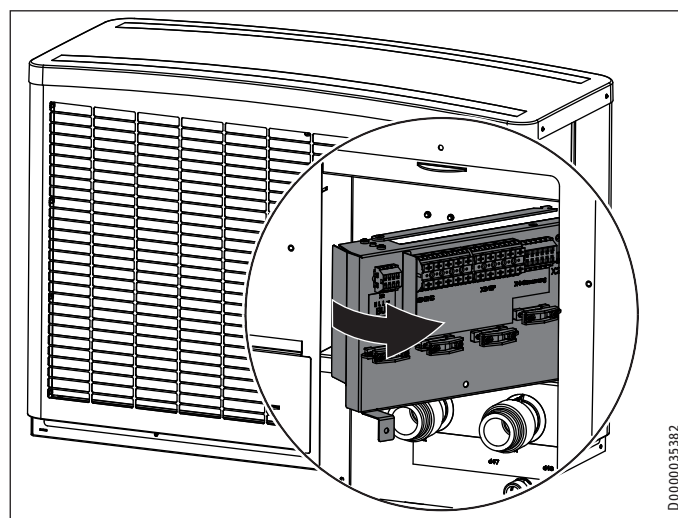
Access to the terminal area



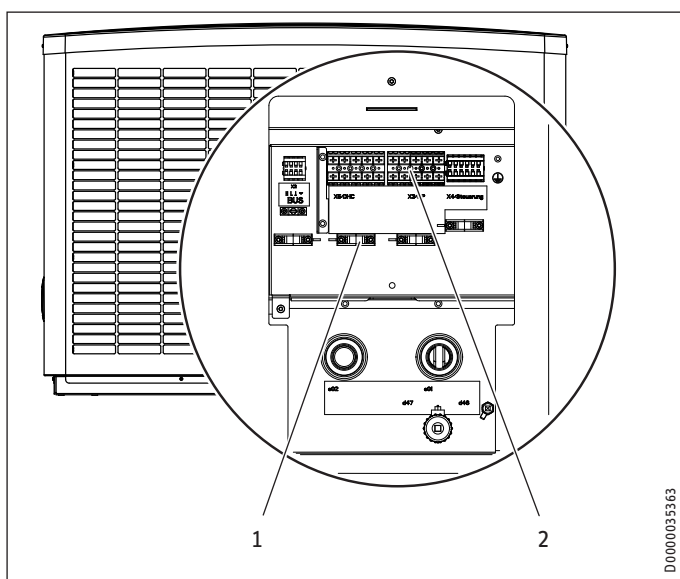
► Undo the screw on the terminal area.



► Push the cover upwards.



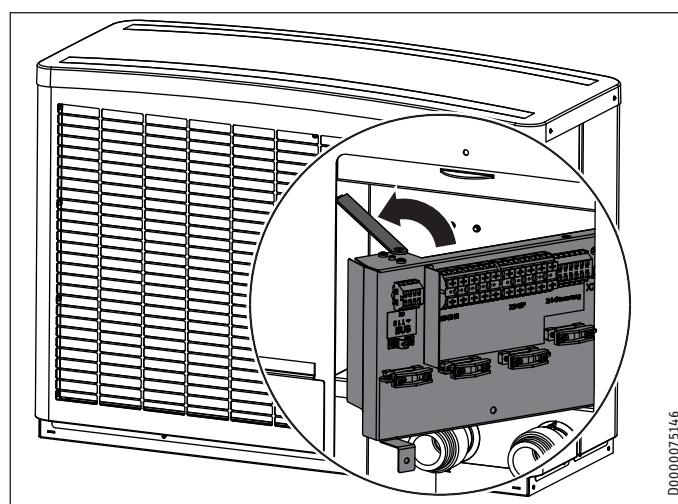
► Pivot the terminal area to the side.



- 1 Strain relief
- 2 Terminal area

► Route cables and leads through the strain relief fittings.

If space behind the appliance is limited, the terminal area can be folded out.



► Fix the terminal area in place with the locking mechanism.

X5 connection: Electric emergency/booster heater (BH)

- Connect the electric emergency/booster heater.

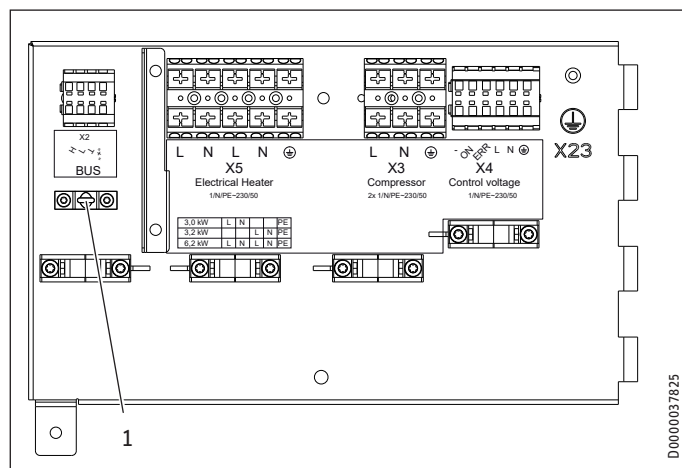
If the heating water temperature falls below 15 °C while defrosting, the emergency/booster heater is switched on. If on special systems you can ensure that no defrosting will occur, you need not connect the emergency/booster heater.

Additional functions of the emergency/booster heater:

Appliance function	Effect of the electric emergency/booster heater
Mono energetic operation	If the dual mode point is undershot, the electric emergency/booster heater safeguards both the heating operation and the provision of high DHW temperatures.
Emergency mode	If the heat pump shuts down due to a fault, the heating output is covered by the electric emergency/booster heater.
Heat-up program (only for underfloor heating systems)	Where return temperatures are <25 °C, the electric emergency/booster heater must provide the necessary heat for screed drying. With such low system temperatures, the heat for screed drying must not be provided by the heat pump, otherwise the frost protection of the appliance can no longer be guaranteed during the defrost cycle. When the heat-up program has ended, the electric emergency/booster heater can be disconnected if it is not required for appliance operation. Please note that during the heat-up program, emergency mode is not available.
Pasteurisation mode	The electric emergency/booster heater starts automatically when pasteurisation mode is active. The DHW is then regularly heated to 60 °C to protect it against the growth of legionella bacteria.

WPL 15 AS | WPL 15 ACS

- Strip 10-11 mm of insulation from the strands of the cables for the electric emergency/auxiliary heater.
- Connect the cables according to the following diagram.



1 Earth terminal for screening the LV lead

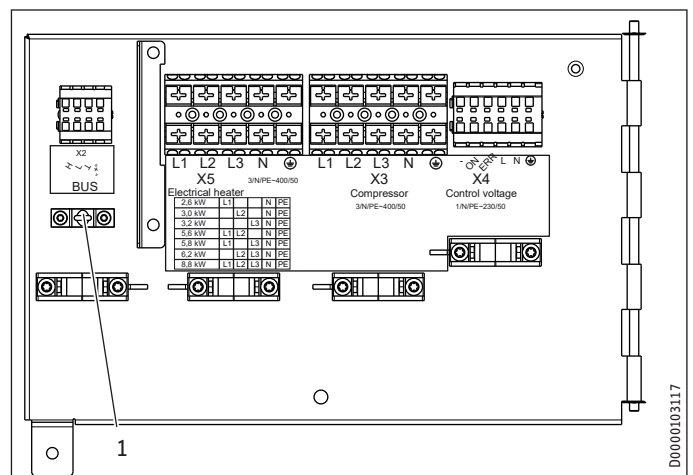
X2	Safety extra low voltage (BUS)
	BUS High H
	BUS Low L
	BUS earth $\perp$
	BUS "+" (is not connected)
X3	Compressor (inverter)
	L, N, PE
X4	Control voltage
	-
	Compressor output signal: ON

X2	Safety extra low voltage (BUS)
	Output signal fault: ERR
	Power supply: L, N, PE
X5	Electric emergency/booster heater (NHZ)
	L, N, L, N, PE
Connected load	Terminal assignment
3.0 kW	L N PE
3.2 kW	L N PE
6.2 kW	L N L N PE

- Earth the LV lead by inverting the screen over the cable sheath and clamping it under the earth terminal.
- Then check that the strain relief fittings are working as intended.

WPL 20 A | WPL 20 AC | WPL 25 A | WPL 25 AC

- Strip 10-11 mm of insulation from the strands of the cables for the electric emergency/auxiliary heater.
- Connect the cables according to the following diagram.



1 Earth terminal for screening the LV lead

X2	Safety extra low voltage (BUS)
	BUS High H
	BUS Low L
	BUS earth $\perp$
	BUS "+" (is not connected)
X3	Compressor (inverter)
	L1, L2, L3, N, PE
X4	Control voltage
	-
	Compressor output signal: ON
	Output signal fault: ERR
	Power supply: L, N, PE
X5	Electric emergency/booster heater (NHZ)
	L1, L2, L3, N, PE
Connected load	Terminal assignment
2.6 kW	L1 PE
3.0 kW	L2 PE
3.2 kW	L3 PE
5.6 kW	L1 L2 PE
5.8 kW	L1 L3 PE
6.2 kW	L2 L3 PE
8.8 kW	L1 L2 L3 PE

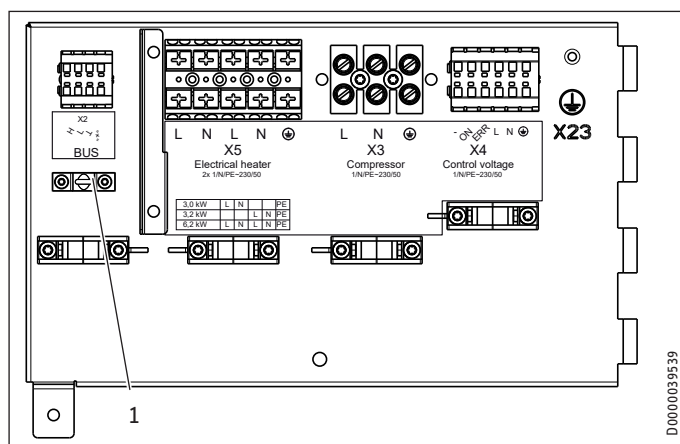
- Earth the LV lead by inverting the screen over the cable sheath and clamping it under the earth terminal.
- Then check that the strain relief fittings are working as intended.

INSTALLATION

Electrical connection

WPL 25 AS | WPL 25 ACS

- Strip 10-11 mm of insulation from the strands of the cables for the electric emergency/auxiliary heater.
- Connect the cables according to the following diagram.

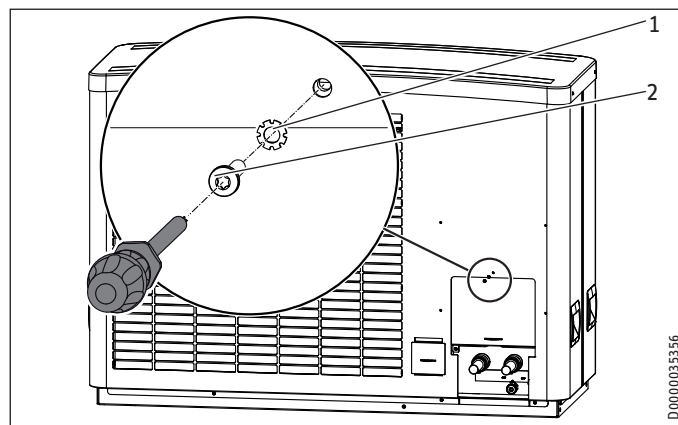


1 Earth terminal for screening the LV lead

X2	Safety extra low voltage (BUS)																								
	BUS High H																								
	BUS Low L																								
	BUS earth $\perp$																								
	BUS "+" (is not connected)																								
X3	Compressor (inverter)																								
	L, N, PE																								
X4	Control voltage																								
	-																								
	Compressor output signal: ON																								
	Output signal fault: ERR																								
	Power supply: L, N, PE																								
X5	Electric emergency/booster heater (NHZ)																								
	L, N, L, N, PE																								
	<table><tr><th>Connected load</th><th colspan="5">Terminal assignment</th></tr><tr><td>3.0 kW</td><td>L</td><td>N</td><td></td><td></td><td>PE</td></tr><tr><td>3.2 kW</td><td></td><td></td><td>L</td><td>N</td><td>PE</td></tr><tr><td>6.2 kW</td><td>L</td><td>N</td><td>L</td><td>N</td><td>PE</td></tr></table>	Connected load	Terminal assignment					3.0 kW	L	N			PE	3.2 kW			L	N	PE	6.2 kW	L	N	L	N	PE
Connected load	Terminal assignment																								
3.0 kW	L	N			PE																				
3.2 kW			L	N	PE																				
6.2 kW	L	N	L	N	PE																				

- Earth the LV lead by inverting the screen over the cable sheath and clamping it under the earth terminal.
- Then check that the strain relief fittings are working as intended.

Closing the terminal area



- 1 Serrated washer
- 2 Screw

- Secure the cover with the screw and serrated washer.
- Connect the following components to the heat pump manager in accordance with the technical guides:
 - Circulation pump for the heat consumer side
 - Outside temperature sensor
 - Return sensor (only for operation with buffer cylinder)

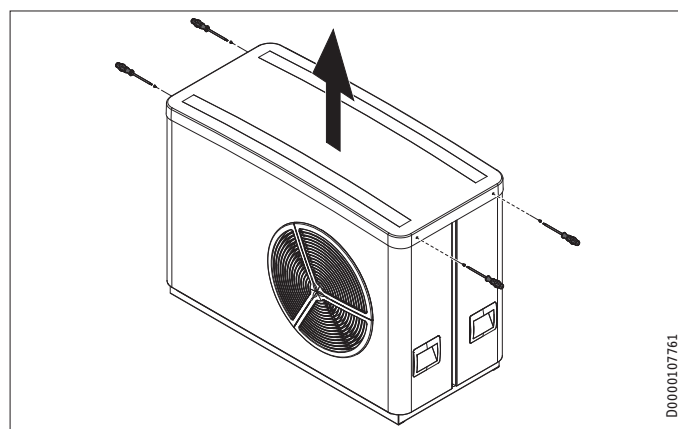
11.2 Ribbon heater

A ribbon heater (see chapter "Installation / Appliance description / Accessories / Further accessories") can be fitted to the condensate pan and the condensate hose.

- Install a ribbon heater when mounting on the wall bracket or T-support.

When installing on foundations or the mounting bracket, we recommend installing a ribbon heater if the routing of the condensate hose means it is at risk of frost or is fully exposed to the elements.

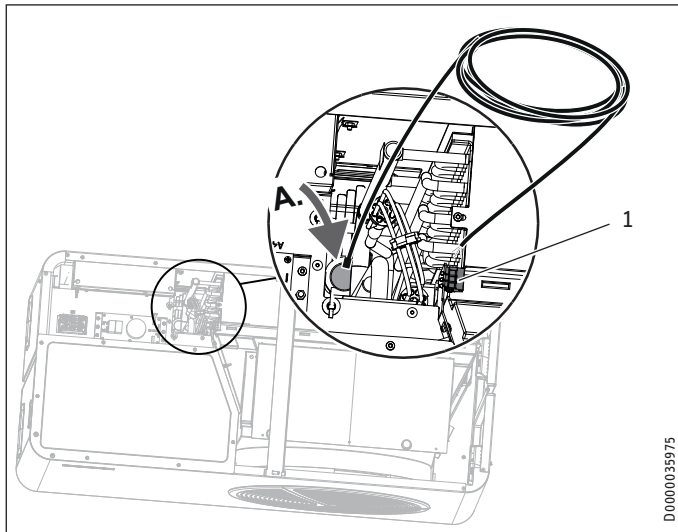
Access to the terminal area



- Remove the cover.

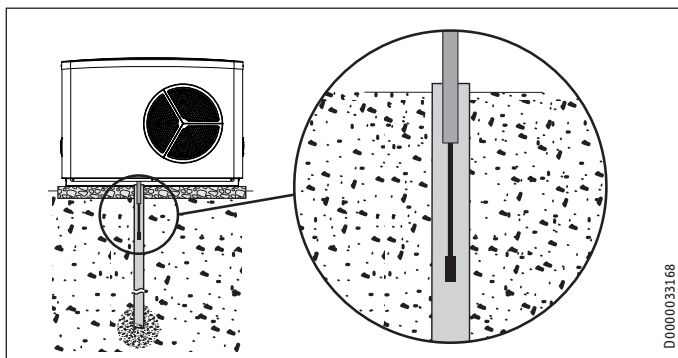
INSTALLATION

Commissioning

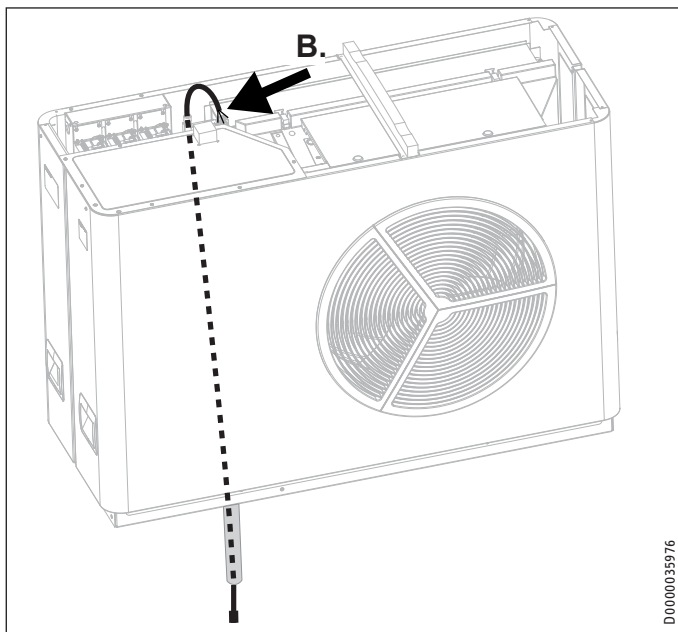


1 Electrical connection for ribbon heater

- Guide the ribbon heater through the appliance.



- Guide the ribbon heater into the condensate drain pipe.

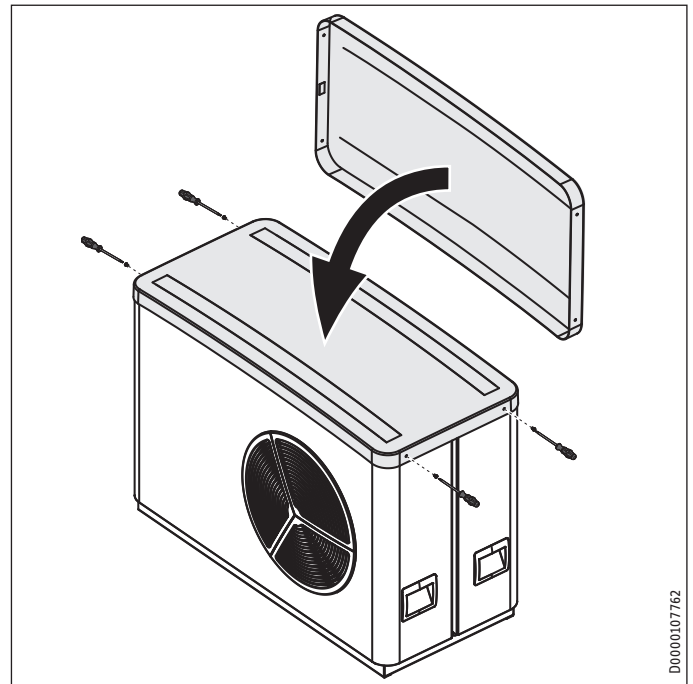


- Make the electrical connection for the ribbon heater.

Electrical connection for ribbon heater

Output: L, N, PE

Closing the terminal area



- Position the cover on the appliance.
- Secure the cover with the four screws.

12. Commissioning

A WPM heat pump manager is required to operate the appliance. All necessary adjustments prior to and during operation are made on this device.

Only qualified contractors may make the settings in the heat pump manager commissioning report, commission the appliance and instruct the owner in its use.

Carry out commissioning in accordance with these operating and installation instructions, and the instructions for the heat pump manager. Our customer support can assist with commissioning, which is a chargeable service.

- Observe the accompanying commissioning checklist.

Where this appliance is intended for commercial use, the rules of the relevant Operational Safety Ordinance must be observed at commissioning. For further details, check with your local authorising body (e.g. TÜV).

12.1 Checks before commissioning

Before commissioning, check the following:

12.1.1 Heating system

- Have you filled the heating system to the correct pressure and opened the quick-action air vent valve?

12.1.2 Temperature sensors

- Have you correctly positioned and connected the outside temperature sensor and the return temperature sensor (in connection with a buffer cylinder)?

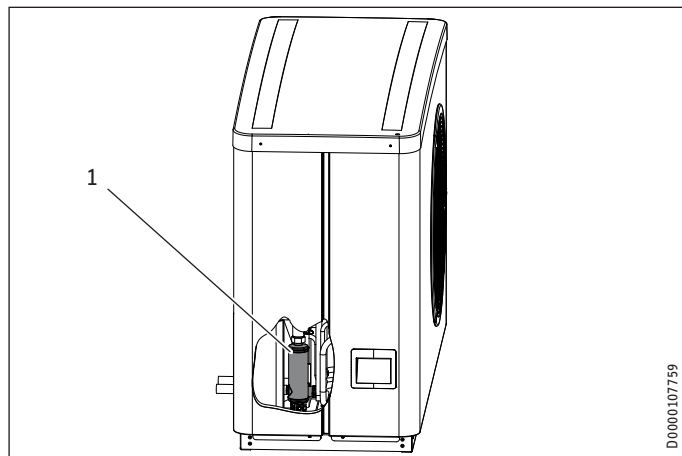
INSTALLATION

Commissioning

12.1.3 High limit safety cut-out

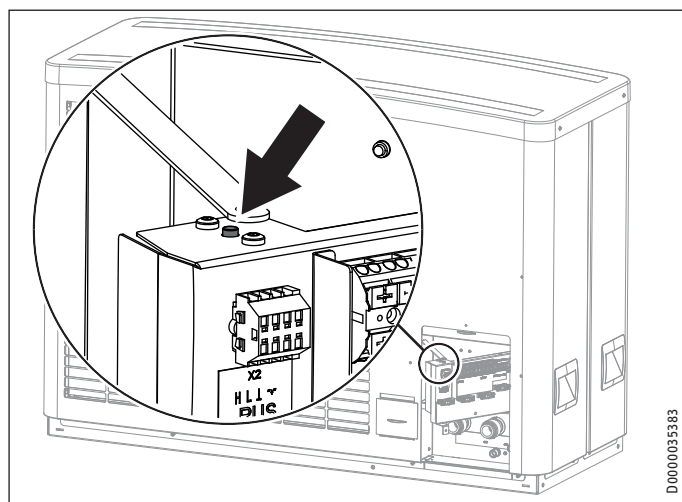
At ambient temperatures below -15 °C it is possible that the high limit safety cut-out of the electric emergency/booster heater may trip.

- Check whether the high limit safety cut-out has tripped.



1 Electric emergency/booster heater

- Remove the cause of the fault.



- Reset the high limit safety cut-out by pressing the reset button.

12.1.4 Power supply

- Have you correctly connected the power supply?

12.2 Using the appliance with an external second heat generator

The appliance is factory set for compressor operation with an electric emergency/booster heater. If the appliance is operated in dual mode with an external second heat generator, set the DIP switch to compressor mode with an external second heat generator (see chapter "Troubleshooting / Checking the IWS DIP switch settings").

12.3 Ensuring a minimum flow rate



Note

The minimum flow rate and the defrost energy must always be assured (see chapter "Specification / Data table"). When heating circuit temperatures are very low, in exceptional circumstances it is possible that the electric emergency/booster heater will be activated during a defrost operation in order to provide the required defrost energy.

The appliance is designed in such a way that no buffer cylinder is required in conjunction with appropriately sized area heating systems.

Installations with several heating circuits require a buffer cylinder to be used.

12.3.1 Sizing the heating circuits

For systems with a buffer cylinder, we recommend checking the sizing of the heating circuits in order to ensure that the system operates efficiently.

For systems without a buffer cylinder, you will need to check the sizing of the heating circuits in order to ensure that the flow rate is sufficient for defrosting and to avoid system failures due to defrosting faults.

The design of the underfloor heating system determines the possible flow rate through the permanently open heating circuits.

If the flow rate of the permanently open heating circuits is less than the minimum flow rate of the heat pump, check whether the available external delivery head of the heating circulation pump is sufficient.

Delivery head test

$$\Delta p_{UP}^* \geq (V_{min} / V_{HK0})^2 \times (\Delta p_{HK} + \Delta p_v) + \Delta p_{WP}$$

Δp_{UP} External delivery head of the circulation pump at V_{min}

* If the circulation pump is integrated in an indoor unit, the available external head can be found in the specification for the indoor unit.

V_{min} Minimum flow rate of heat pump

V_{HK0} Design flow rate of the permanently open heating circuits

Δp_{HK} Design pressure drop of the permanently open heating circuits

Δp_v Design pressure drop to and from floor distributors

Δp_{WP} Pressure drop in the heat pump at V_{min}

For heat pumps with an integral circulation pump, the pressure drop of the heat pump (Δp_{WP}) is not taken into account.

If the external delivery head is not sufficient for the minimum flow rate, additional heating circuits for the underfloor heating must be permanently opened.

Checking the minimum flow rate

The setting is made in heat pump mode. In order to do this, firstly make the following settings:

INSTALLATION

Commissioning

- ▶ Temporarily remove the fuse from the electric emergency/booster heater to isolate the emergency/booster heater from the power supply. Alternatively, switch OFF the second heat generator.
- ▶ Ensure that hydronic balancing has been performed.
- ▶ Check the connected pumps against the hydraulic diagram.

12.3.2 Systems without a buffer cylinder



Note

If the appliance is operated solely through the WPM heat pump manager, and an external pump that is not controlled by the WPM is used as a heating circuit pump, you will have to adjust the heating circuit pump manually.

For systems without a buffer cylinder, one or more heating circuits in the system must remain open. The open heating circuit(s) must be installed in the lead room (room in which the external programming unit is installed, e.g. living room or bathroom). The lead room can be individually controlled using the external programming unit, or indirectly by adjusting the heating curve or activating room influence.

- ▶ Operate the appliance in heating mode.
- ▶ When designing underfloor heating in the lead room, observe our recommendations. The table applies if individual room control is installed.

	WPL 15 AC(S)	WPL 20 AC(C)	WPL 25 AC(C) (S)
Minimum flow rate of heat pump			
l/h	700	1000	1000
Minimum water content of the open heating circuits during operation without buffer cylinder			
l	16	29	29
Composite pipework 16 x 2 mm / installation spacing 10 cm			
Lead room floor area			
m ²	21	28	28
Number of circuits			
n x m	3x70	4x70	4x70
Composite pipework 20 x 2.25 mm / installation spacing 15 cm			
Lead room floor area			
m ²	21	32	32
Number of circuits			
n x m	2x70	3x70	3x70
Buffer cylinder always required			
	no	no	no
Buffer cylinder volume in relation to product range			
l	80-200	100-400	100-400
Activate the integral emergency/booster heater			
	yes	yes	yes

- ▶ Fully open the heating circuit(s) in the lead room.
- ▶ Close all other heating circuits.
- ▶ If an overflow valve is installed in the heating system, close this valve.
- ▶ Adjust the parameters.

Parameter	Setting
MINIMUM PUMP RATE (COMMISSIONING / CHARGING PUMP CONTROL / STANDBY / TYPE OF CONTROL)	OFF
MAXIMUM PUMP RATE (COMMISSIONING / CHARGING PUMP CONTROL / STANDBY / TYPE OF CONTROL)	ON

- ▶ Check the current flow rate.

Parameter
WP WATER FLOW RATE (INFO / HEAT PUMP / PROCESS DATA)

- ▶ Compare the value with the minimum flow rate (see chapter "Specification / Data table").

Minimum flow rate has been reached

No further measures required.

- ▶ Reset the parameters to their original values.

Parameter	Setting
MINIMUM PUMP RATE (COMMISSIONING / CHARGING PUMP CONTROL / STANDBY / TYPE OF CONTROL)	ON
MAXIMUM PUMP RATE (COMMISSIONING / CHARGING PUMP CONTROL / STANDBY / TYPE OF CONTROL)	OFF

Minimum flow rate has not been reached

If the specified flow rate is not met, take suitable measures to achieve the flow rate.

- ▶ Open the heating circuit permanently in another room.
- ▶ Check the current flow rate.
- ▶ If the minimum flow rate is not reached, repeat these steps.
- ▶ Set the overflow valve correctly.

12.3.3 Systems with a buffer cylinder

- ▶ Operate the appliance in heating mode.
- ▶ Adjust the parameters.

Parameter	Setting
MINIMUM PUMP RATE (COMMISSIONING / CHARGING PUMP CONTROL / STANDBY / TYPE OF CONTROL)	OFF
MAXIMUM PUMP RATE (COMMISSIONING / CHARGING PUMP CONTROL / STANDBY / TYPE OF CONTROL)	ON

- ▶ Check the current flow rate.

Parameter
WP WATER FLOW RATE (INFO / HEAT PUMP / PROCESS DATA)

- ▶ Compare the value with the minimum flow rate (see chapter "Specification / Data table").

Minimum flow rate has been reached

No further measures required.

- ▶ Reset the parameters to their original values.

Parameter	Setting
MINIMUM PUMP RATE (COMMISSIONING / CHARGING PUMP CONTROL / STANDBY / TYPE OF CONTROL)	ON
MAXIMUM PUMP RATE (COMMISSIONING / CHARGING PUMP CONTROL / STANDBY / TYPE OF CONTROL)	OFF

Minimum flow rate has not been reached

- ▶ Check the technical guide to the heating system.

12.3.4 In cooling mode

If the buffer cylinder is bypassed in cooling mode, the flow rate must be checked for cooling mode in the same way as for heating mode.

- ▶ Observe the chapter "Systems without a buffer cylinder".

13. Settings

13.1 Activating spread control

- To adapt the appliance to your requirements, activate spread control.

Parameter	Setting
SPREAD CONTROL (COMMISSIONING / CHARGING PUMP CONTROL / HEATING / TYPE OF CONTROL)	ON
SPREAD CONTROL (COMMISSIONING / CHARGING PUMP CONTROL / DHW / TYPE OF CONTROL)	ON

PWM pump without internal module

- Connect the pump.

Mains power supply	
X2.6	Buffer charging pump 1
X2.8	DHW charging pump

- Adjust the parameters.

Parameter
PWM 100%...0% (I/O CONFIGURATION / OUTPUT X 1.16)
PWM 100%...0% (I/O CONFIGURATION / OUTPUT X 1.17)
CHARGING PUMP CONTROL HEATING (I/O CONFIGURATION / OUTPUT X 1.16 / OUTPUT)
CHARGING PUMP CONTROL DHW (I/O CONFIGURATION / OUTPUT X 1.17 / OUTPUT)

13.2 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 or thermostatic valves to close, which may lead to the minimum flow rate required for the heating circuit not being achieved.

- Observe the instructions for the WPM.

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 a remote control.
- At different outside temperatures (e.g. -10 °C and +10 °C), adjust the heating curve so that the required temperature is set in the lead room.

Standard values to begin with:

Parameter	Underfloor heating systems	Radiator heating system
Heating curve	0.4	0.8
Control dynamic	25	50
Comfort temperature	21 °C	23 °C

If the room temperature is too low in spring and autumn (approx. 10 °C outside temperature), go to heat pump manager menu SETTINGS / HEATING / HEATING CIRCUIT and raise the parameter COMFORT TEMPERATURE".



Note

If no remote control is installed, raising the "COMFORT TEMPERATURE" parameter will lead to a parallel offset of the heating curve.

If the room temperature is too low at low outside temperatures, increase parameter "HEATING CURVE".

If the "HEATING CURVE" parameter has been raised and outside temperatures relatively high, adjust the zone valve or thermostatic valve in the lead room to the required temperature.



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

For underfloor heating systems, observe the maximum permissible system temperature for that particular underfloor heating.

13.3 Reduced night mode (Silent mode)

- Look up the sound power level in the data table (see chapter "Specification / Data table").

To reduce the sound power level of the appliance for a specified period, you can set the appliance to night mode if required.

You can specify the times during which the appliance is set to night mode using the time programs.

Parameter	Meaning
PROGRAMS (SILENT PROGRAM 1)	reduced night mode
PROGRAMS (SILENT PROGRAM 2)	Appliance switched off

Two versions of night mode are available for you to use.

Version 1: reduced night mode

You can reduce the sound power level of the appliance through its output or through the fans. If the emergency/booster heater cuts in, this will result in higher running costs.

Version 2: appliance switched off

You can switch the appliance off. If the appliance is switched off, central heating and DHW heating will be supplied solely through the emergency/booster heater. If the emergency/booster heater cuts in, this will result in higher running costs.

13.3.1 Reduced night mode



Note

When reduced night mode is active, this may result in higher running costs.

The output and fan control are infinitely variable.

The table will tell you how the sound power level of the appliance changes as output and fan control are changed.

	Meaning
max. reduced night mode	Output and fans cannot be reduced below these levels.
reduced night mode	The appliance operates at the set reduced output or fan control.

		WPL 15 A(C)S	WPL 20 A(C)	WPL 25 A(C)S
max. reduced night mode				
W55				
Sound power level	dB(A)	50	55	55
Compressor speed	Hz	50	50	50
Fan control	%	45	40	40
Heating output	kW	4.30	7.10	7.85
reduced night mode 50 %				
W55				
Sound power level	dB(A)	52	55	57
Compressor speed	Hz	80	50	55
Fan control	%	47	40	42
Heating output	kW	4.80	7.10	9.00

- Adjust the fan control and compressor output in the heat pump manager.

Parameter

OUTPUT (COMMISSIONING / SILENT MODE / OUTPUT REDUCTION)

FAN (COMMISSIONING / SILENT MODE / OUTPUT REDUCTION)

13.3.2 Appliance switched off



Note

If the appliance is switched off, central heating and DHW heating will be supplied solely through the emergency/booster heater. This will result in higher running costs.

- Switch the appliance off in the heat pump manager.

Parameter

HEAT PUMP OFF (COMMISSIONING / SILENT MODE)

13.4 Other settings

- For operation with or without a buffer cylinder, observe the information in the instructions for the WPM and parameter BUFFER OPERATION in menu SETTINGS / STANDARD SETTING.

Using the heat-up program

If you use the heat-up program, make the following settings on the WPM:

- Initially set the "DUAL MODE TEMP HZG" parameter to 30 °C.
- Then set the "LOWER APP LIMIT HZG" parameter to 30 °C.



Note

After completing the heat-up process, reset the "DUAL MODE TEMP HZG" and "LOWER APP LIMIT HZG" parameters to their respective standard values or to the respective system values.

14. Appliance handover

Explain the appliance function to users and familiarise them with how it works.



Note

Hand over these operating and installation instructions to users for safekeeping. All information in these instructions must be closely observed. The instructions provide information on safety, operation, installation and maintenance of the appliance.

15. Appliance shutdown



Material losses

Never interrupt the heat pump power supply, even outside of the heating season. Otherwise, system frost protection is not guaranteed. The heat pump manager automatically switches the heat pump to summer or winter mode.

15.1 Standby mode

To shut the system down, simply set the heat pump manager to "Standby mode". This way, the safety functions that protect the system remain enabled, e.g. frost protection.

15.2 Power interruption

If the system is to be isolated from the power supply permanently, please observe the following:



Material losses

If the heat pump is completely switched off and there is a risk of frost, drain the system on the water side.

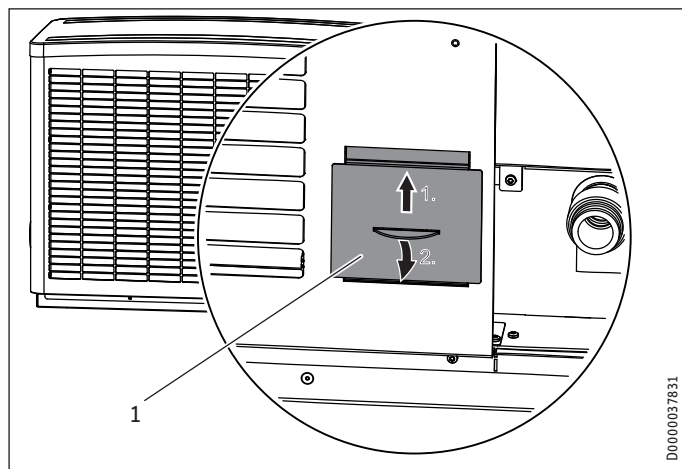
16. Maintenance



WARNING Electrocutation

► Prior to commencing any service or cleaning work, isolate the appliance across all poles from the power supply.
Following disconnection from the power supply, parts of the appliance may remain energised for 2 minutes until the inverter capacitors have discharged.

We recommend a regular inspection (to establish the current condition of the system), and maintenance if required (to return the system to its original condition).



1 Inspection port

- Open the inspection port.
- Check the condensate drain (visual inspection). Remove any contaminants and blockages immediately.



Material losses

Keep the air discharge and intake apertures free from snow and ice.

Remove any leaves or other foreign bodies from the evaporator fins periodically.

17. Troubleshooting



WARNING Electrocutation

► Before working on the appliance, isolate it from the power supply at the control panel.
Following disconnection from the power supply, parts of the appliance may remain energised for 2 minutes until the inverter capacitors have discharged.



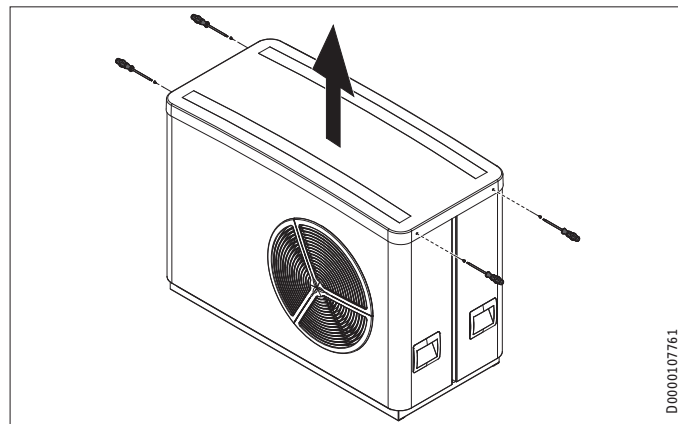
Note

Please observe the instructions for the heat pump manager.

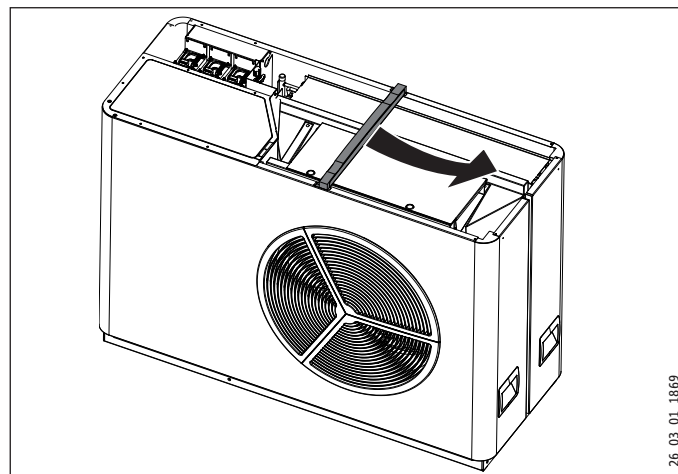
If the fault cannot be located during a service using the heat pump manager, open the control panel in emergencies and check the IWS settings.

17.1 Checking the IWS DIP switch settings

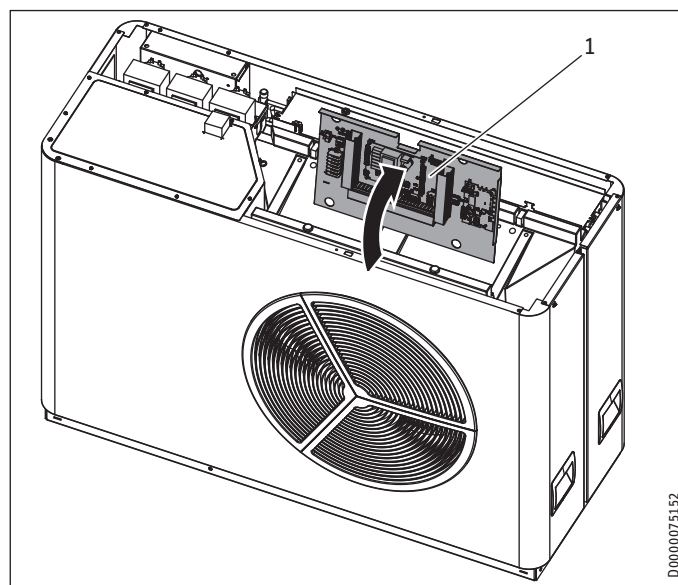
Carry out the following steps to make the IWS accessible.



- Remove the cover.



- Remove the bracket highlighted in grey.



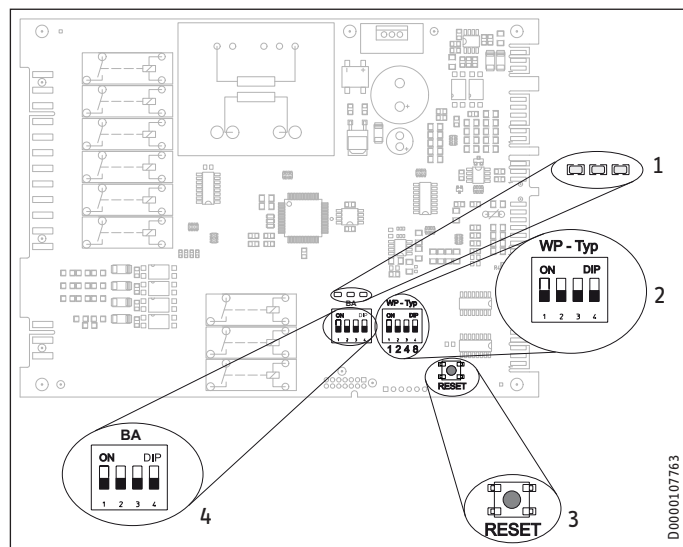
1 IWS

- Lift the control panel.
- Turn the control panel around.

INSTALLATION

Troubleshooting

IWS



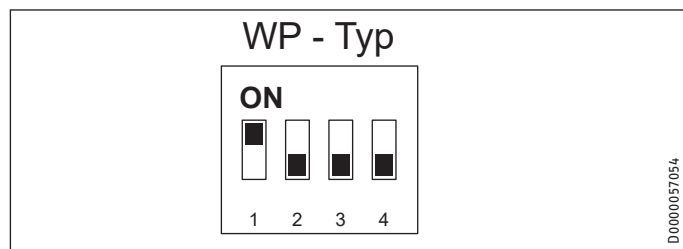
- 1 LEDs
- 2 DIP switch (WP-Typ)
- 3 Reset button
- 4 DIP switch (BA)

DIP switch (WP-Typ)

The DIP switch (WP-Typ) on the IWS serves to set the relevant heat pump type.

Factory setting

Compressor mode with electric emergency/booster heater



- Check whether the DIP switch is set correctly.

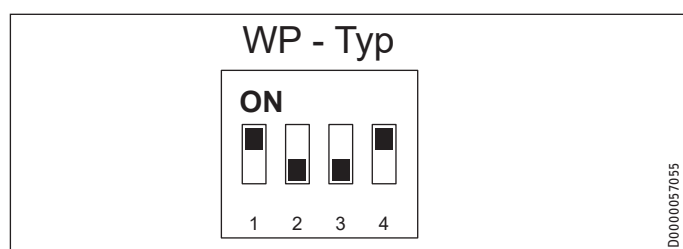
Compressor mode with an external second heat generator



Material losses

In this case, do not connect the electric emergency/booster heater.

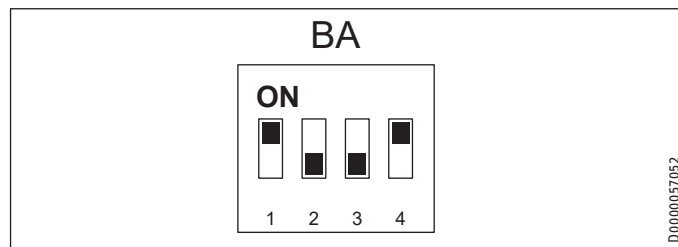
If the appliance is operated in dual mode operation with an external second heat generator or as a module with a further heat pump, set the DIP switch as shown.



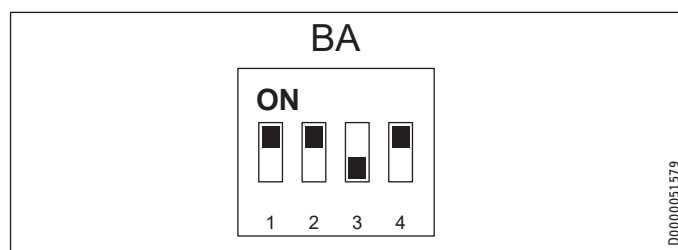
DIP switch (BA)

- Check whether the DIP switch (BA) is set correctly.

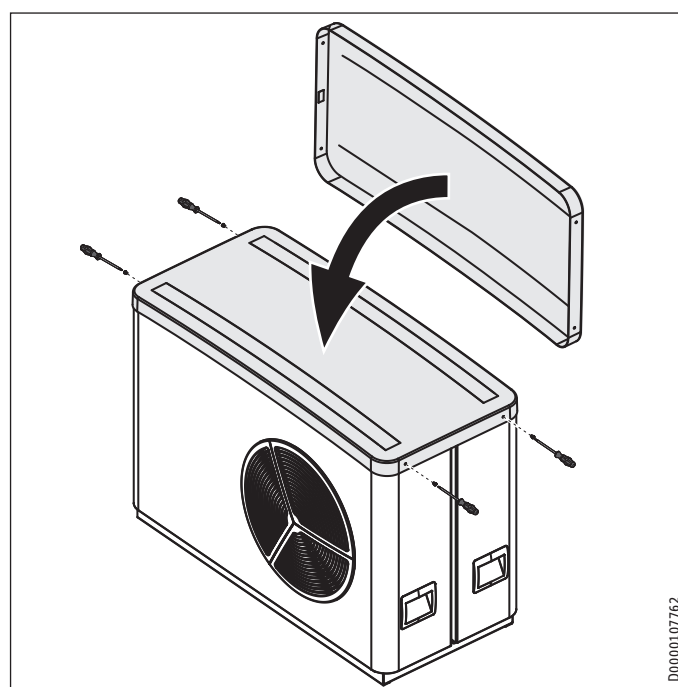
Heating mode



Heating and cooling mode



17.1.1 Closing the terminal area

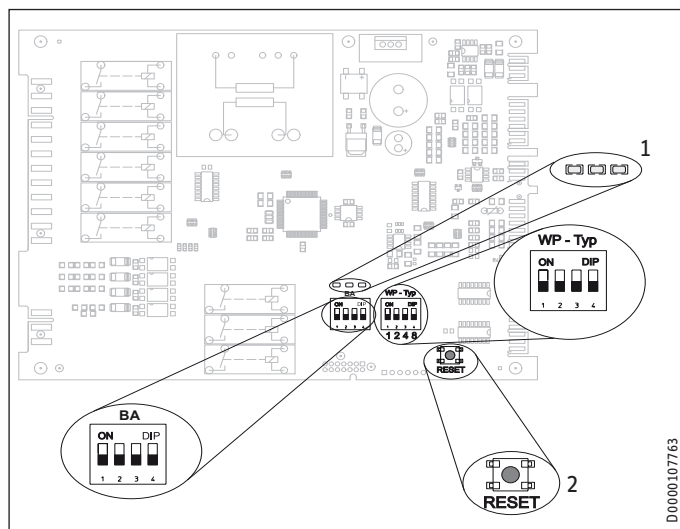


- Position the cover on the appliance.
- Secure the cover with the four screws.

INSTALLATION

Troubleshooting

17.2 Light emitting diodes (LEDs)



- 1 LEDs
- 2 Reset button

The following table shows the meaning of the LEDs on the IWS.

LED indicator	Meaning
Red LED flashes	Single fault. The appliance is shut down and re-starts after 10 minutes. The LED extinguishes.
Red LED illuminates	More than 5 faults within 2 hours run. The appliance is shut down permanently and only restarts following a reset on the IWS. This also resets the internal fault counter. The appliance can be restarted after 10 minutes. The LED extinguishes.
Green LED (centre) flashes	The heat pump is initialising.
Green LED (centre) illuminates	The heat pump was initialised successfully and the connection with the WPM is active.

Faults indicated by the red LED:

- High pressure fault
- Low pressure fault
- Central fault
- Hardware faults on the IWS (see Notification list on the WPM heat pump manager)

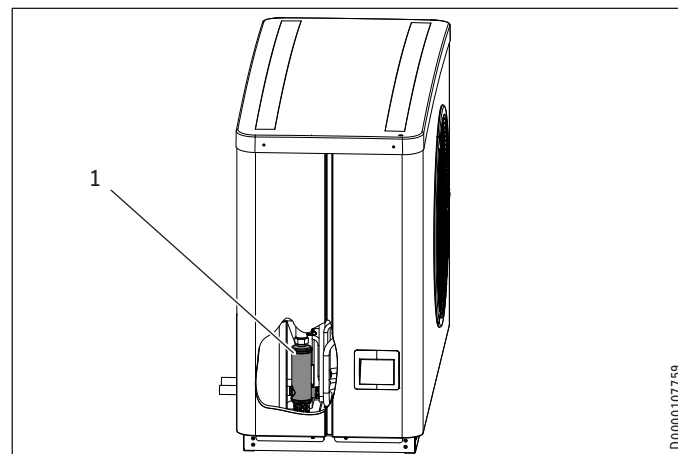
17.3 Reset button

If the IWS was not initialised successfully, you can reset the settings with this button.

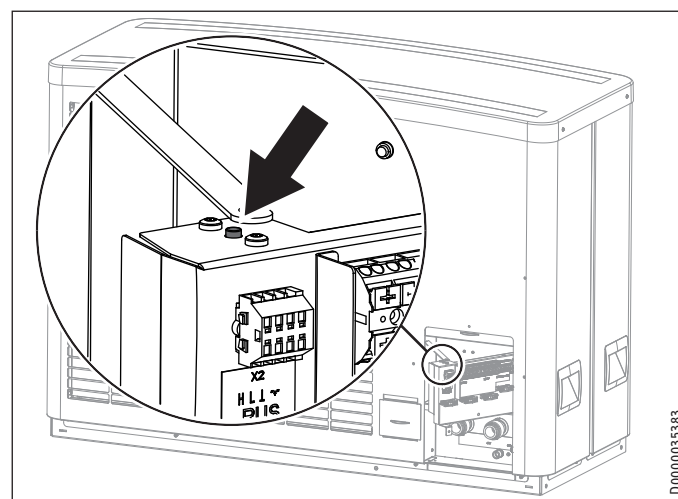
- For this, also observe chapter "Reinitialising the IWS" in the heat pump manager instructions.

17.4 Resetting the high limit safety cut-out

The electric emergency/booster heater stops if the heating water temperature exceeds 85 °C, for example if the flow rate is too low.



- 1 Electric emergency/booster heater
- Remove the cause of the fault.



- Reset the high limit safety cut-out by pressing the reset button.
- Check whether the heating water is being circulated at a sufficiently high flow rate.

17.5 Fan noise

The heat pump draws heat from the outdoor air. This causes the outdoor air to cool down. At outside temperatures of 0 °C to 8 °C, the air may be cooled to below freezing point. If, under these conditions, precipitation occurs in the form of rain or fog, ice may form on the air grille, the fan blades or the air routing pipes. If the fan comes into contact with this ice, this creates noise.

How to remedy rhythmic scratching or grinding noises:

- Check whether the condensate drain is clear of obstructions.
- Check whether the design output and temperature are set correctly. Ice formation is particularly pronounced when a high heating output is demanded at moderate outside temperatures.

INSTALLATION

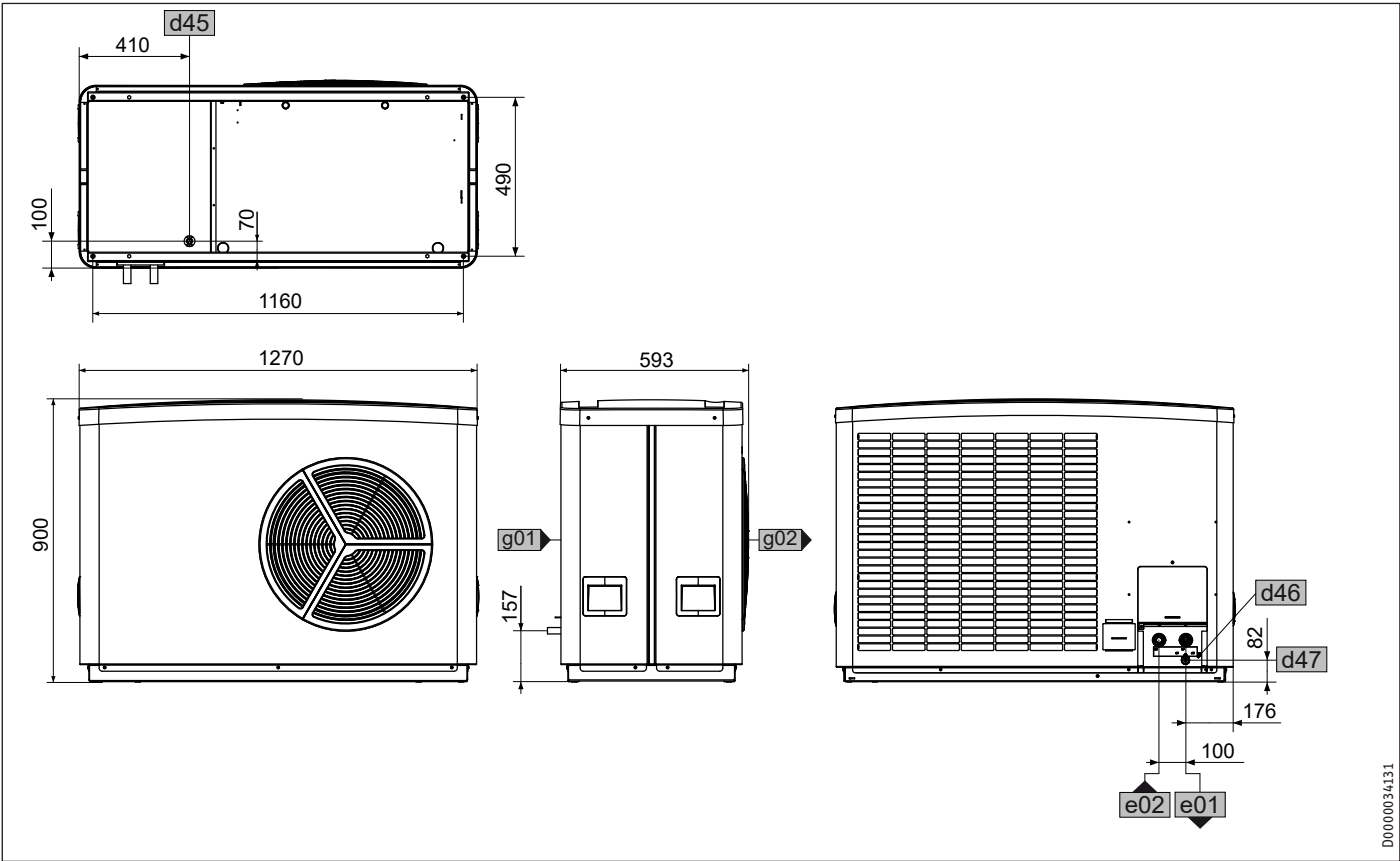
Specification

- ▶ Carry out a manual defrost, as many times as necessary, until the fan runs freely again. Observe the information in the WPM instructions and parameter "START DEFROST" in menu "COMMISSIONING / COMPRESSOR".
- ▶ At outside temperatures above +1 °C, shut down the appliance or switch it over to emergency mode for approx. 1 hour. After this, the ice should have melted.
- ▶ Check that the appliance is installed in line with the installation requirements.
- ▶ If noise occurs frequently, activate intensive defrost. Observe the information in the WPM instructions and parameter "POWERDEFROST" in menu "COMMISSIONING / COMPRESSOR".
- ▶ If noise persists, notify the customer service department.

18. Specification

18.1 Dimensions and connections

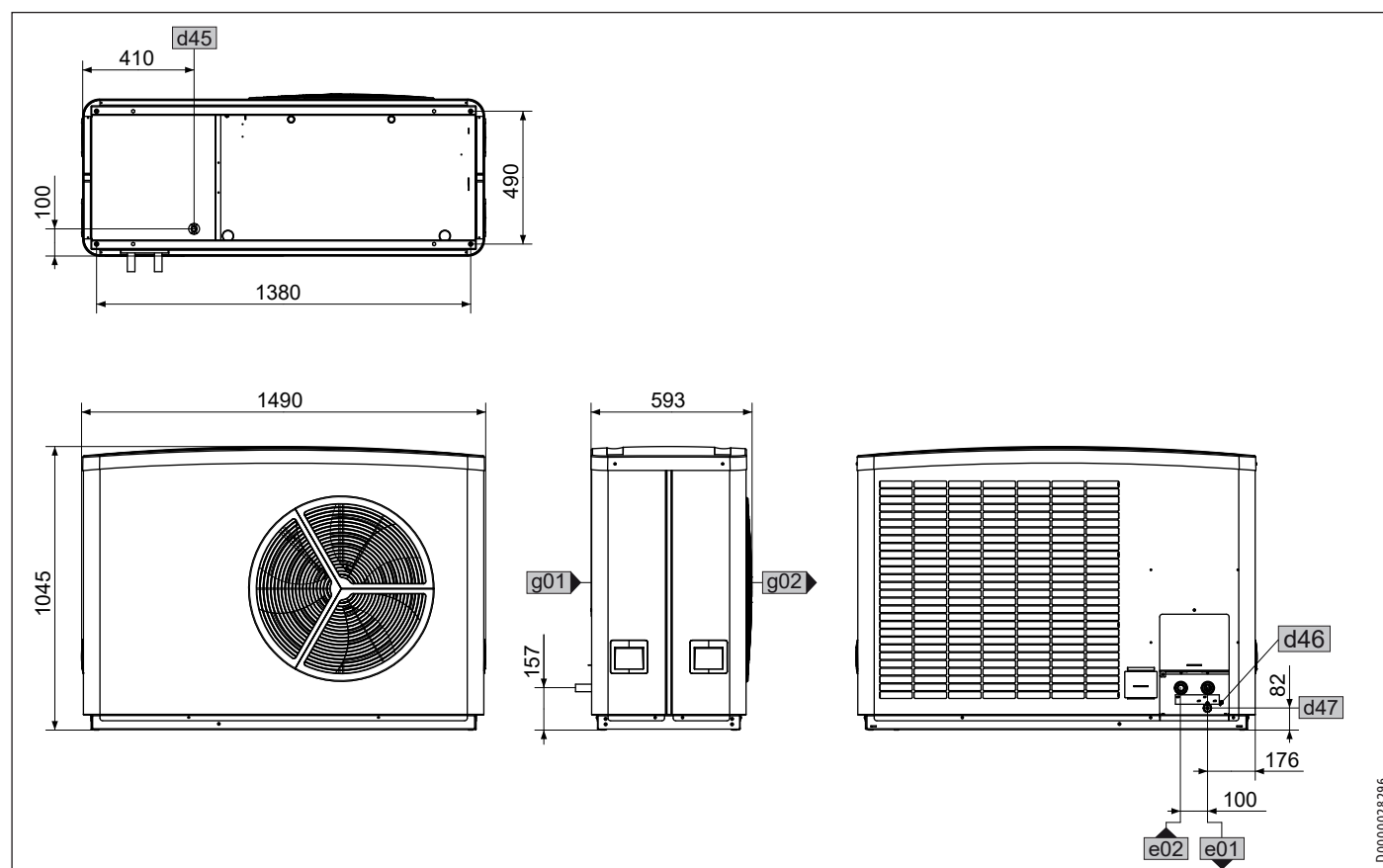
WPL 15 AS | WPL 15 ACS



			WPL 15 AS	WPL 15 ACS
e01	Heating flow	Type of connection	Push-fit connection	Push-fit connection
		Diameter	mm 28	28
e02	Heating return	Type of connection	Push-fit connection	Push-fit connection
		Diameter	mm 28	28
d45	Condensate drain	Diameter	mm 29.6	29.6
d46	Ventilation			
d47	Drain			
g01	Air intake			
g02	Air discharge			

INSTALLATION Specification

WPL 20 A | WPL 20 AC | WPL 25 A | WPL 25 AS | WPL 25 AC |
WPL 25 ACS



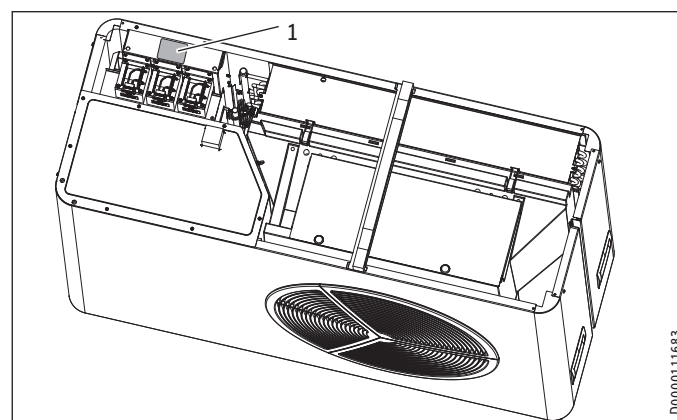
			WPL 20 A	WPL 20 AC	WPL 25 AS	WPL 25 ACS	WPL 25 A	WPL 25 AC
e01	Heating flow	Type of connection	Push-fit connection	Push-fit connection	Push-fit connection	Push-fit connection	Push-fit connection	Push-fit connection
		Diameter mm	28	28	28	28	28	28
e02	Heating return	Type of connection	Push-fit connection	Push-fit connection	Push-fit connection	Push-fit connection	Push-fit connection	Push-fit connection
		Diameter mm	28	28	28	28	28	28
d45	Condensate drain	Diameter mm	29.6	29.6	29.6	29.6	29.6	29.6
d46	Ventilation							
d47	Drain							
g01	Air intake							
g02	Air discharge							

18.2 Wiring diagram

WPL 20 A, WPL 20 AC, WPL 25 A, WPL 25 AC: There are two wiring diagrams for the appliances.

To find out which wiring diagram is applicable to your appliance, open the appliance cover.

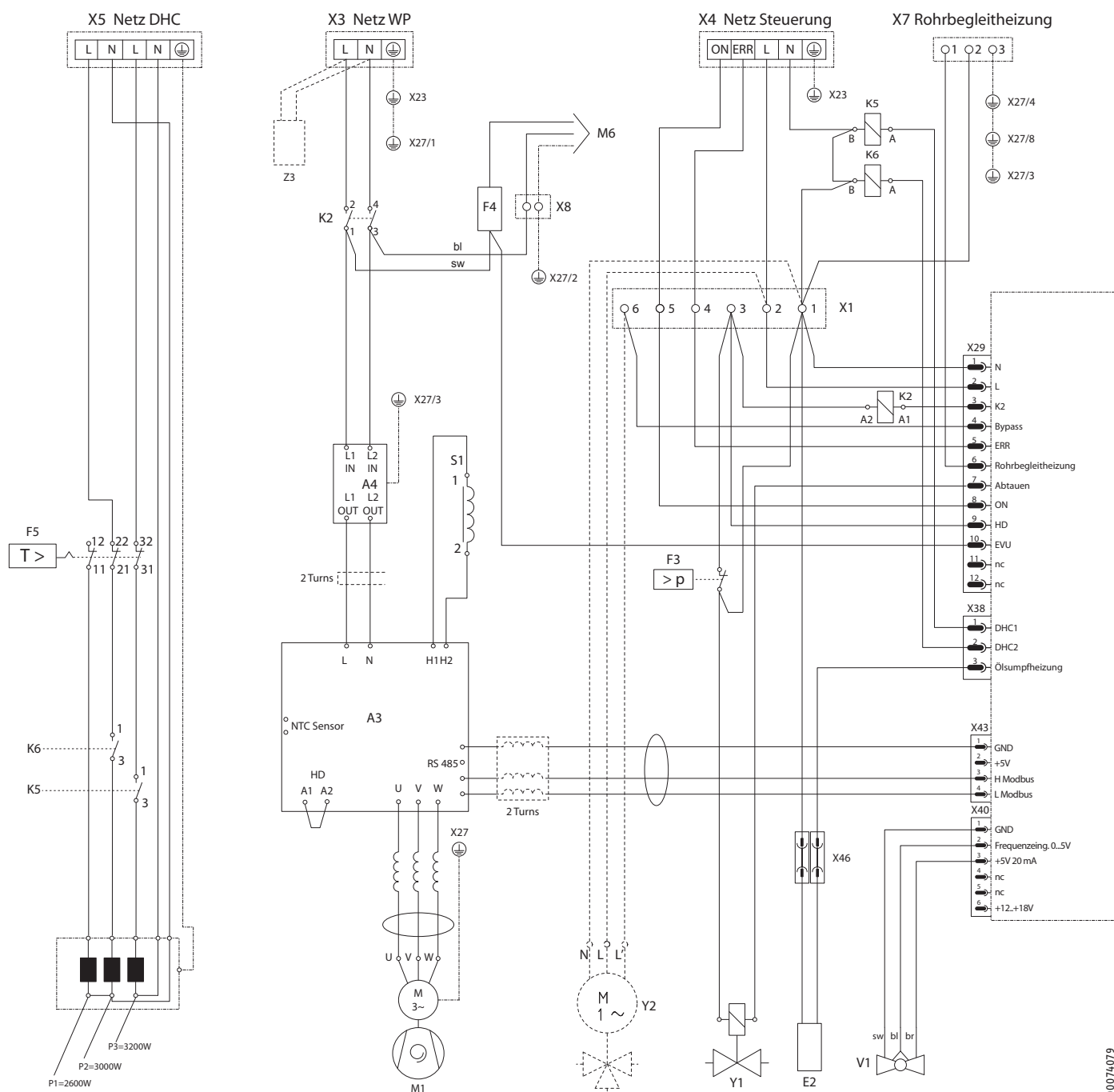
- Undo the four screws on the side.
- Remove the cover.
- No label where indicated?
- Observe wiring diagram version A.
- Label where indicated?
- Observe wiring diagram version B.



1 Label

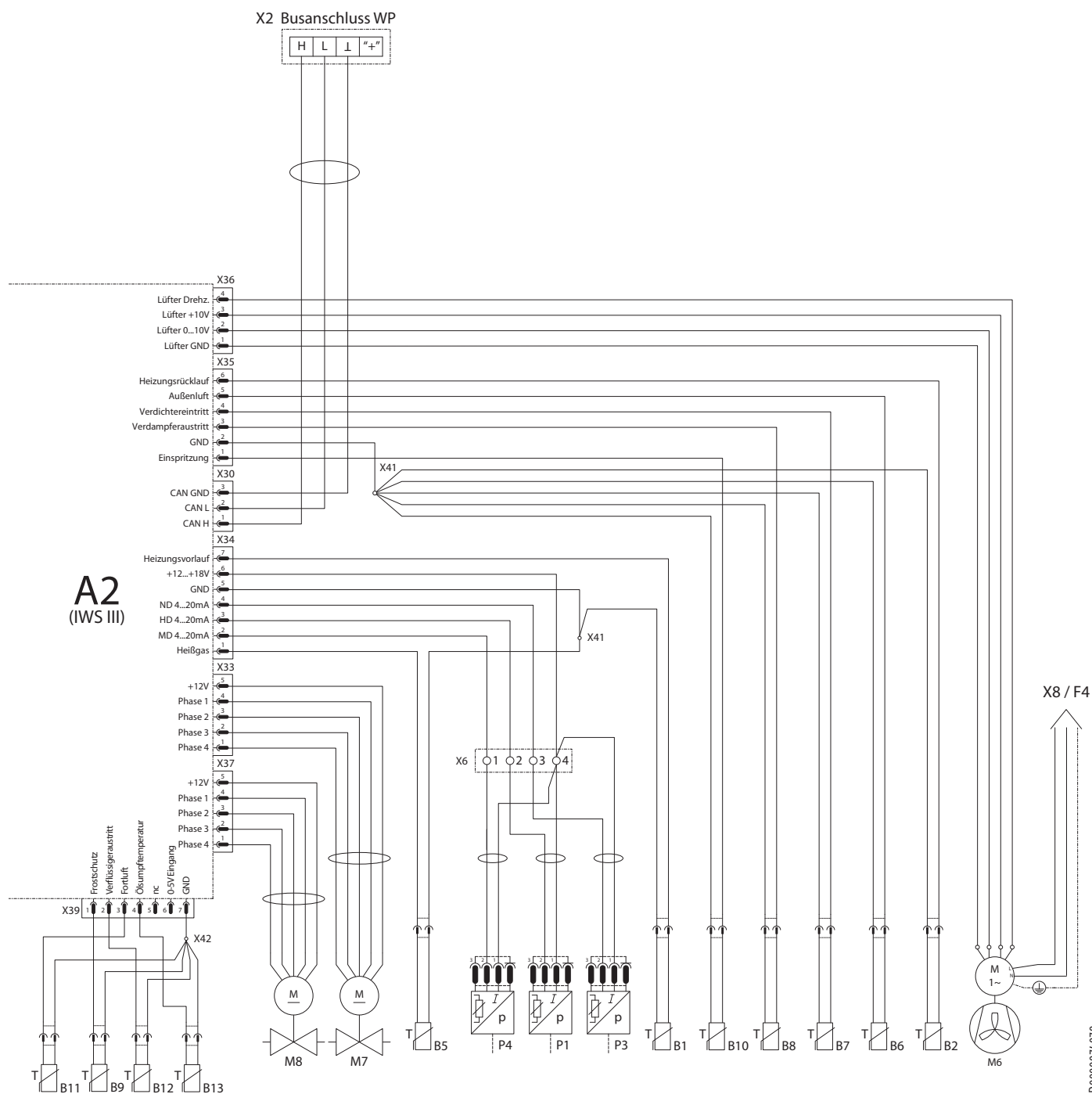
INSTALLATION Specification

WPL 15 AS | WPL 15 ACS | WPL 25 AS | WPL 25 ACS (single phase)

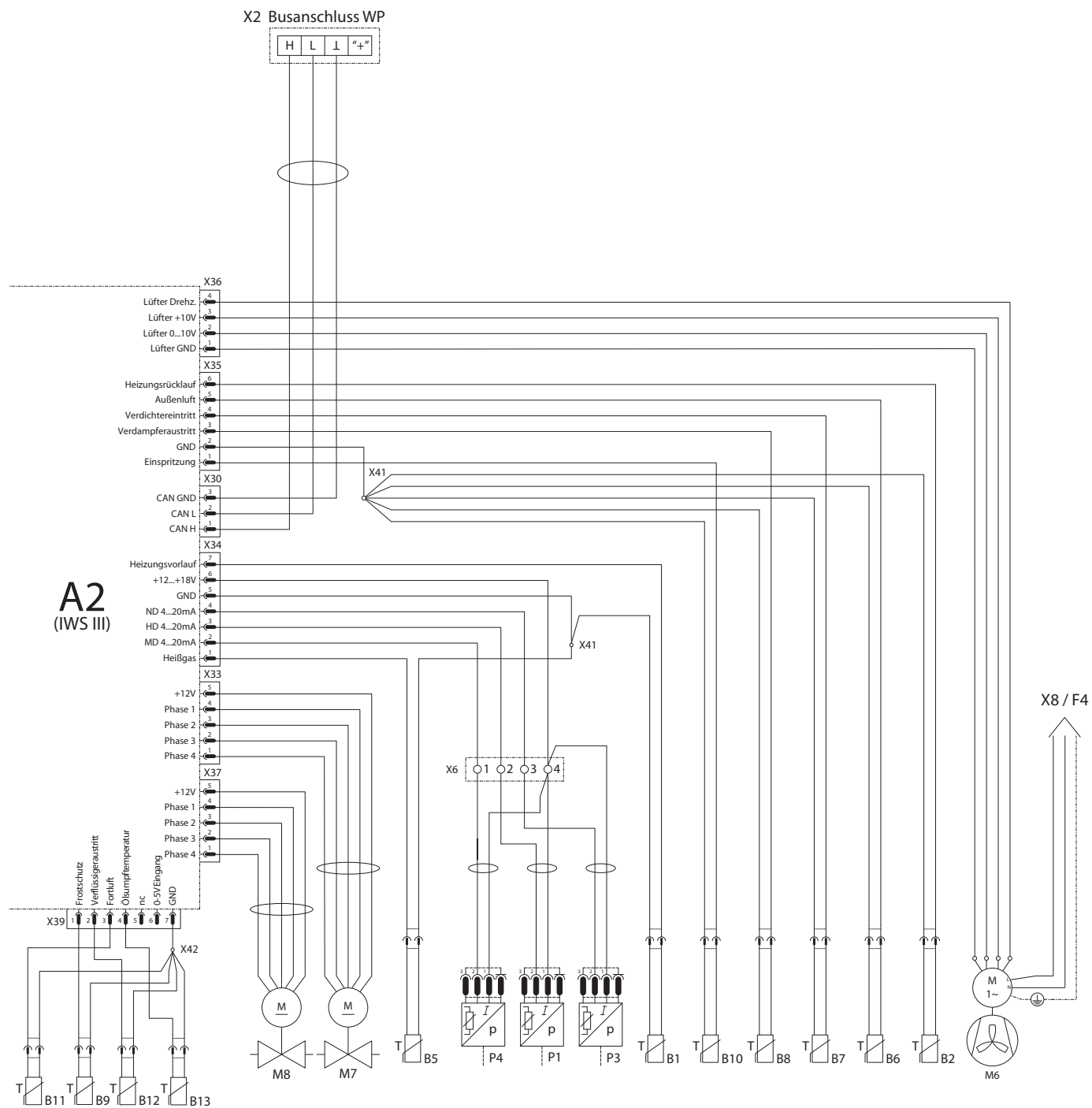


D0000074079

INSTALLATION Specification

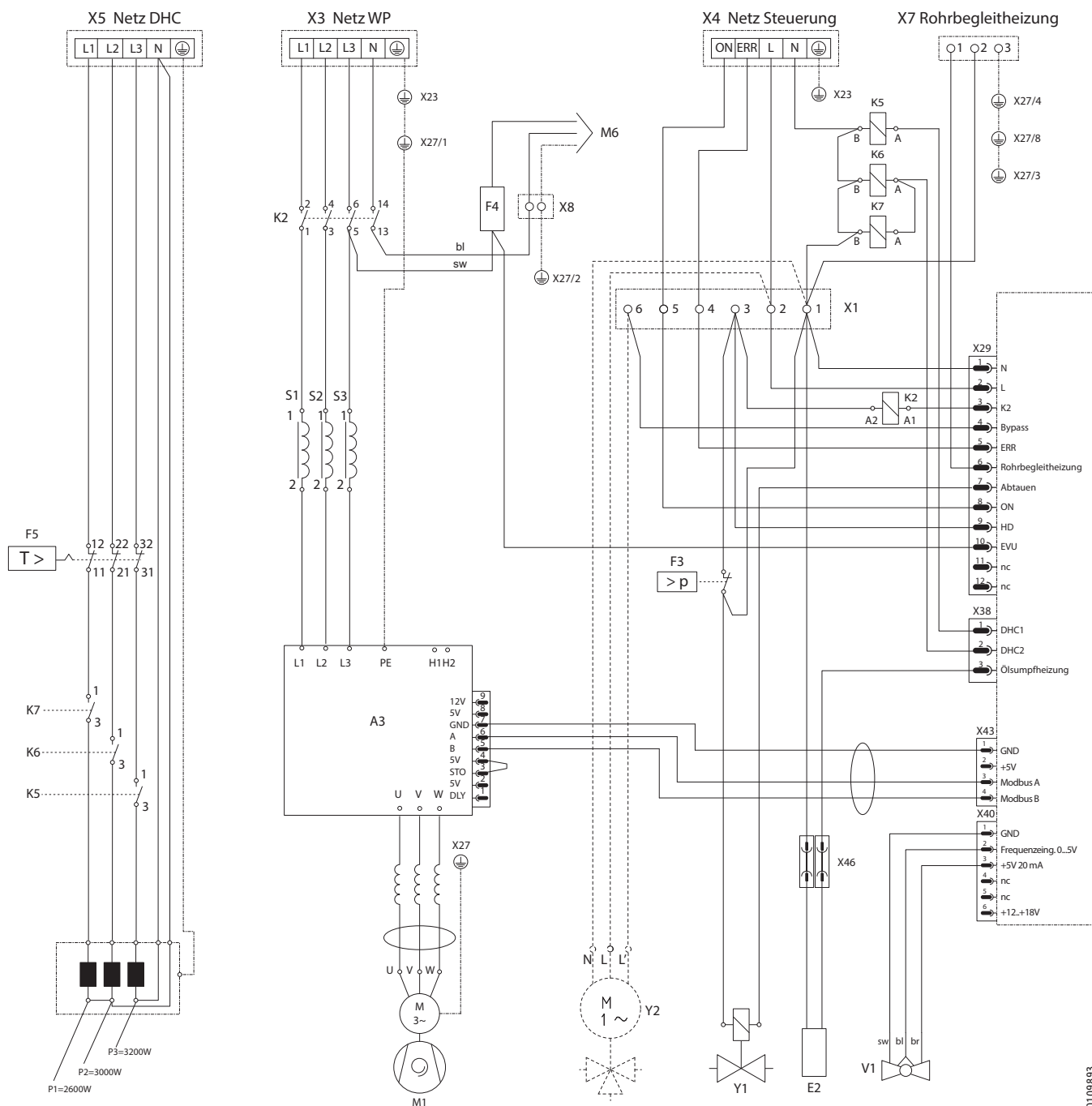


INSTALLATION Specification



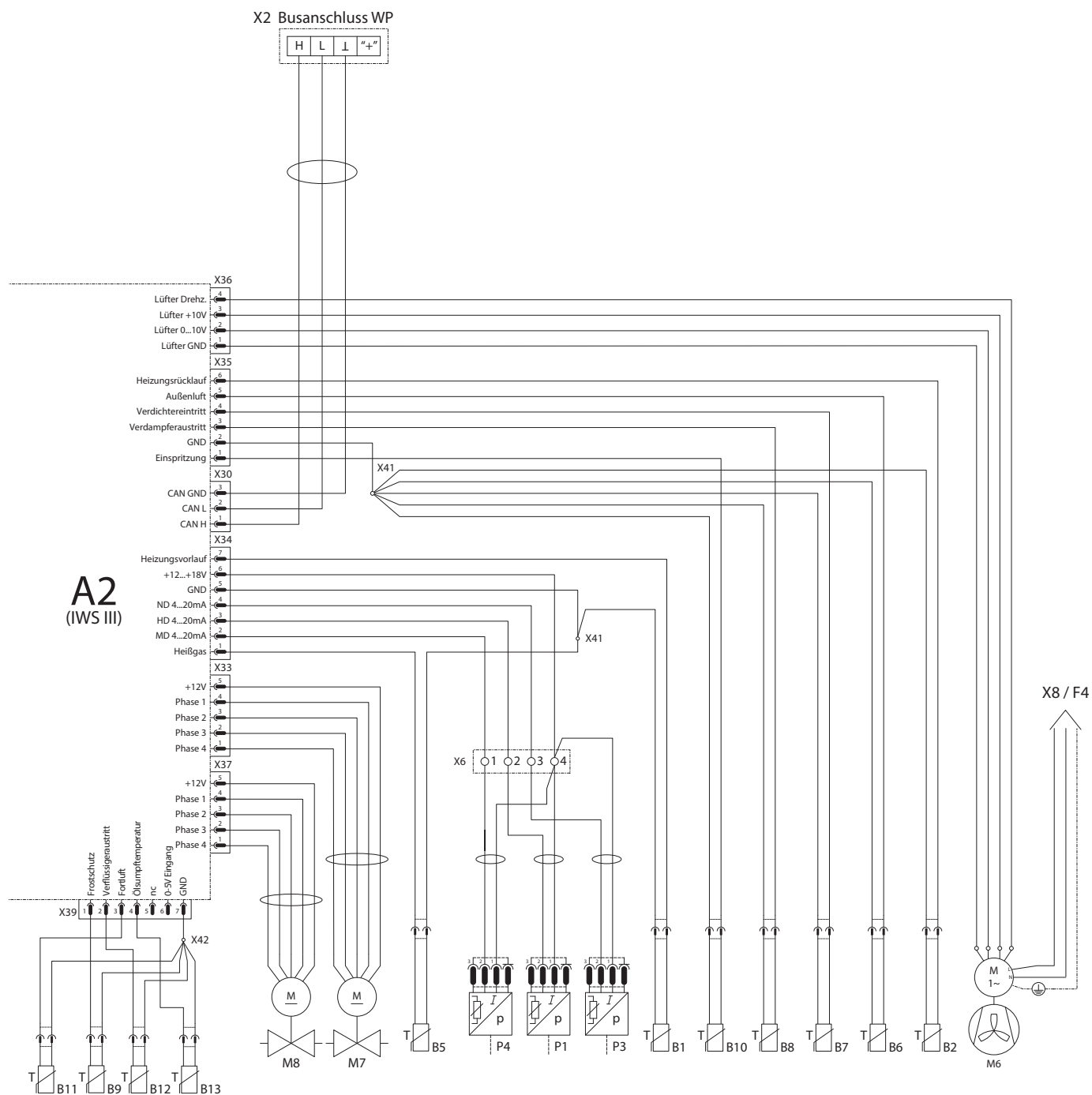
INSTALLATION Specification

Version B: observe the information about versions A and B at the start of the “Wiring diagram” chapter.



D0000109893

INSTALLATION Specification



D0000109893

INSTALLATION

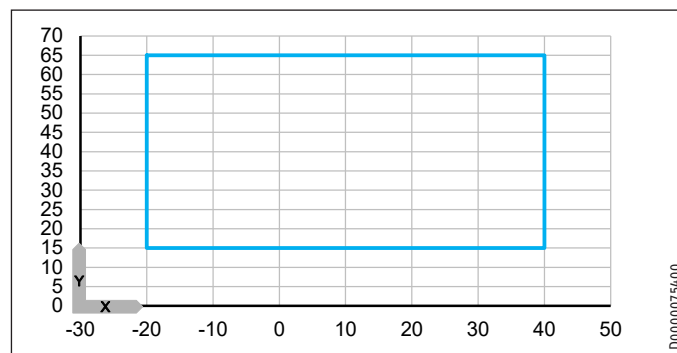
Specification

Key

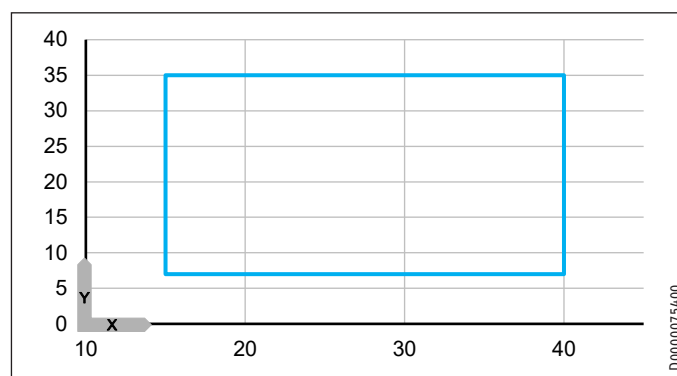
A2	Integral heat pump control unit (IWS)
A3	Inverter, compressor
A4	Filter assembly
A5	DC assembly
B1	Heating flow temperature sensor - KTY
B2	Heating return temperature sensor - KTY
B5	Hot gas temperature sensor - PT1000
B6	Outdoor air temperature sensor - PT1000
B7	Compressor intake temperature sensor - PT1000
B8	Evaporator discharge temperature sensor - PT1000
B9	Frost protection temperature sensor - KTY
B10	Injection temperature sensor - PT1000
B11	Exhaust air temperature sensor - KTY
B12	Condenser discharge temperature sensor - KTY
B13	Oil sump temperature sensor - KTY
E1	Emergency/booster heater NHZ
E2	Oil sump heater
F3	High pressure switch 42 bar
F4	Fuse 10 A (fan)
F5	High limit safety cut-out for NHZ
K2	Compressor start contactor L
K5	NHZ relay
K6	NHZ relay
K7	NHZ relay
M1	Compressor motor
M6	Fan motor
M7	Electrical expansion valve stepper motor
M8	Electrical injection valve stepper motor
P1	High pressure sensor (42 bar)
P3	Low pressure sensor (16 bar)
P4	Mean pressure sensor (30 bar)
S1	Sinus filter coil
S2	Sinus filter coil
S3	Sinus filter coil
V1	Flow rate sensor
X1	Internal distribution terminal
X2	External bus terminal
X3	External power supply terminal
X4	External control unit terminal
X5	External NHZ terminal
X6	4-pole terminal
X7	Ribbon heater terminal
X8	2-pole terminal
X23	Earth block, power supply
X27	Earth stud
X29	IWS plug 12-pin - control unit
X30	IWS plug 3-pin - BUS
X33	IWS plug 5-pin - electrical expansion valve
X34	IWS plug 7-pin - sensors
X35	IWS plug 6-pin - temperature sensors
X36	IWS plug 3-pin - fan
X37	IWS plug 5-pin - electrical injection valve
X38	IWS plug 3-pin - oil sump
X39	IWS plug 7-pin - temperature
X40	IWS plug 6-pin - HT special
X41	Link PCB ground
X42	Link PCB ground
X43	IWS plug 3-pin - Modbus
X46	Plug-in connector
Y1	Diverter valve, defrost
Y2	Bypass diverter valve (only for WPL 15 ACS, WPL 20 AC, WPL 25 AC, WPL 25 ACS)
Z3	Interference suppression filter

18.3 Application limit

18.3.1 Heating



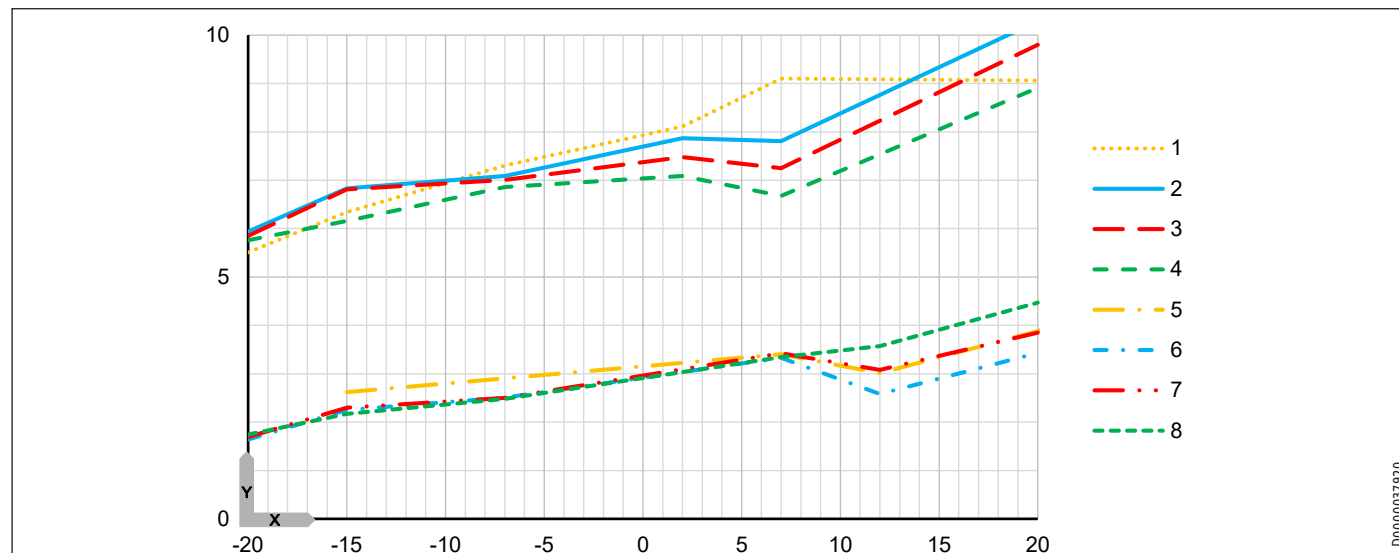
18.3.2 Cooling



18.4 Output diagrams

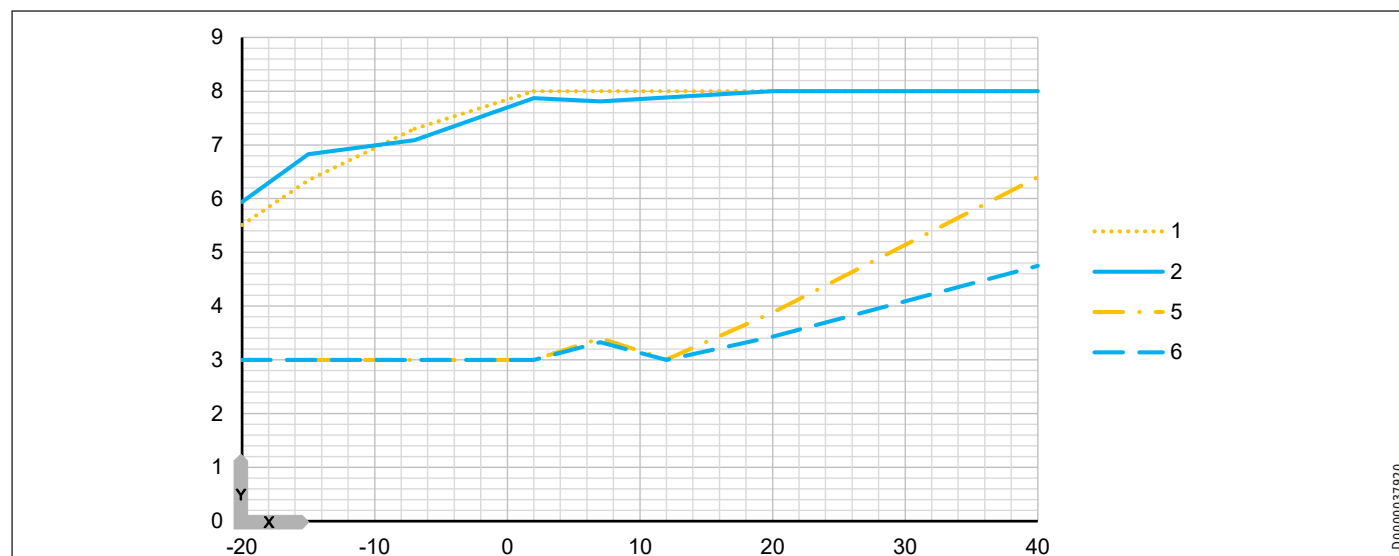
18.4.1 WPL 15 AS | WPL 15 ACS

Heating output



X Outside temperature [°C] 1 max. W65 3 max. W45 5 min. W65 7 min. W45
Y Heating output [kW] 2 max. W55 4 max. W35 6 min. W55 8 min. W35

DHW output

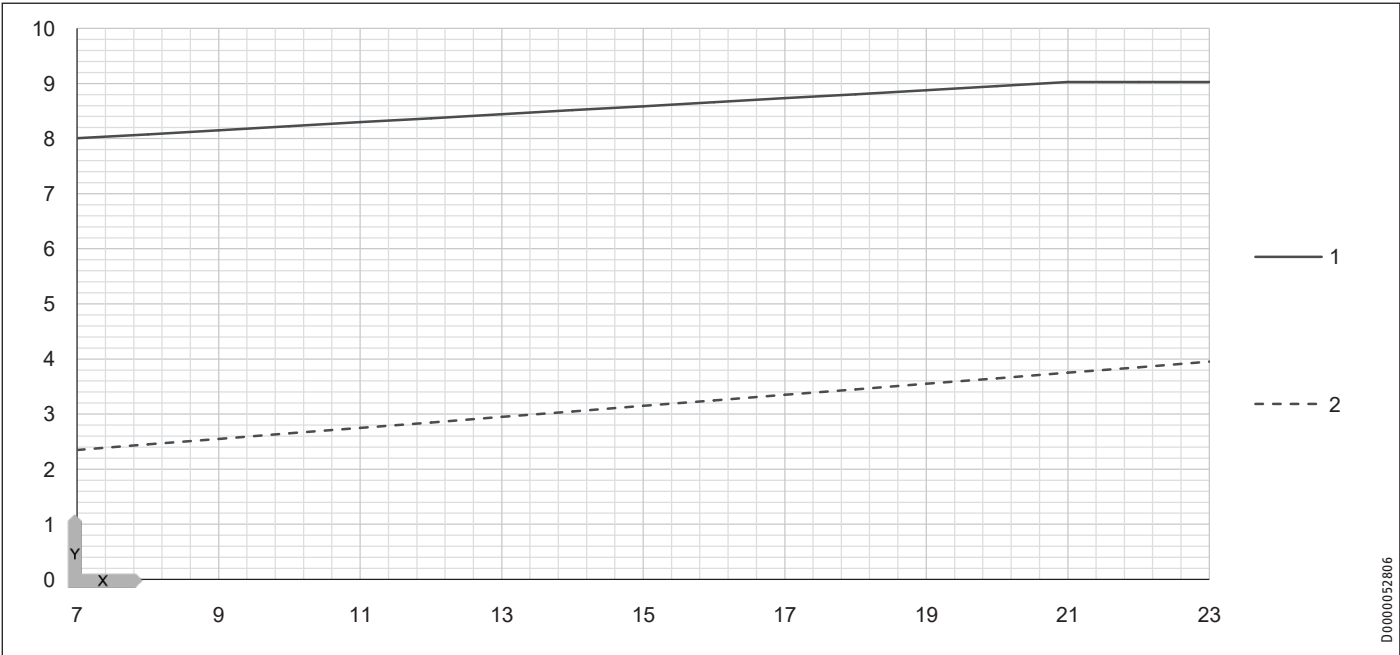


X Outside temperature [°C] 1 max. W65 5 min. W65
Y DHW output [kW] 2 max. W55 6 min. W55

INSTALLATION

Specification

Cooling capacity

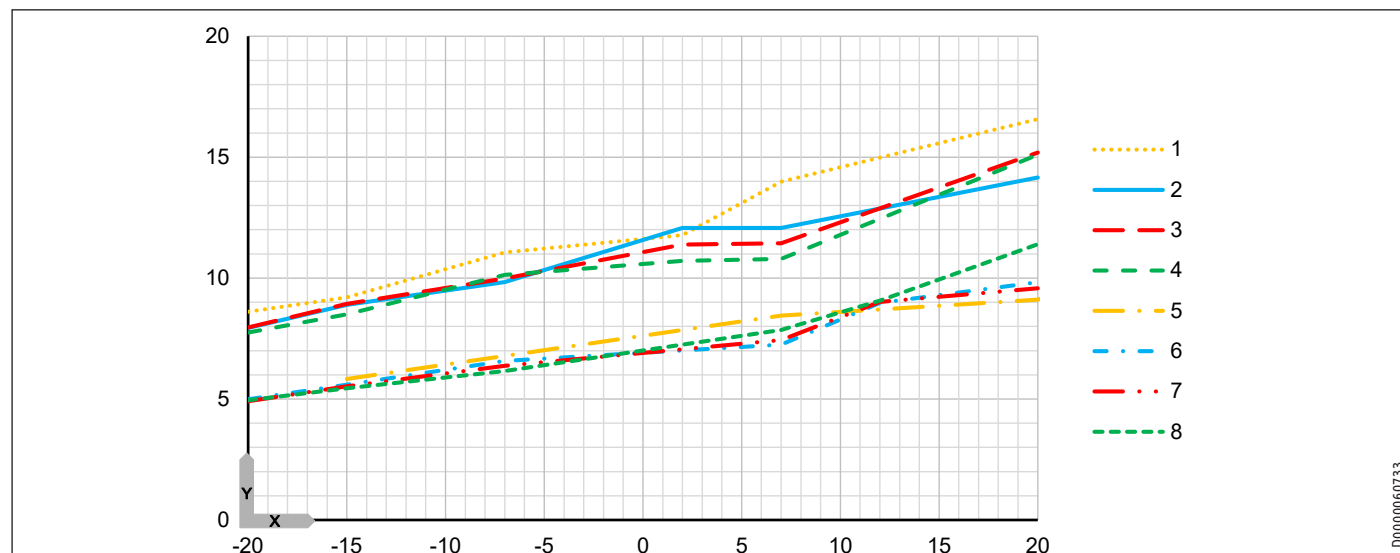


X Flow temperature [°C] 1 Max. A35
Y Cooling capacity [kW] 2 Min. A35

INSTALLATION Specification

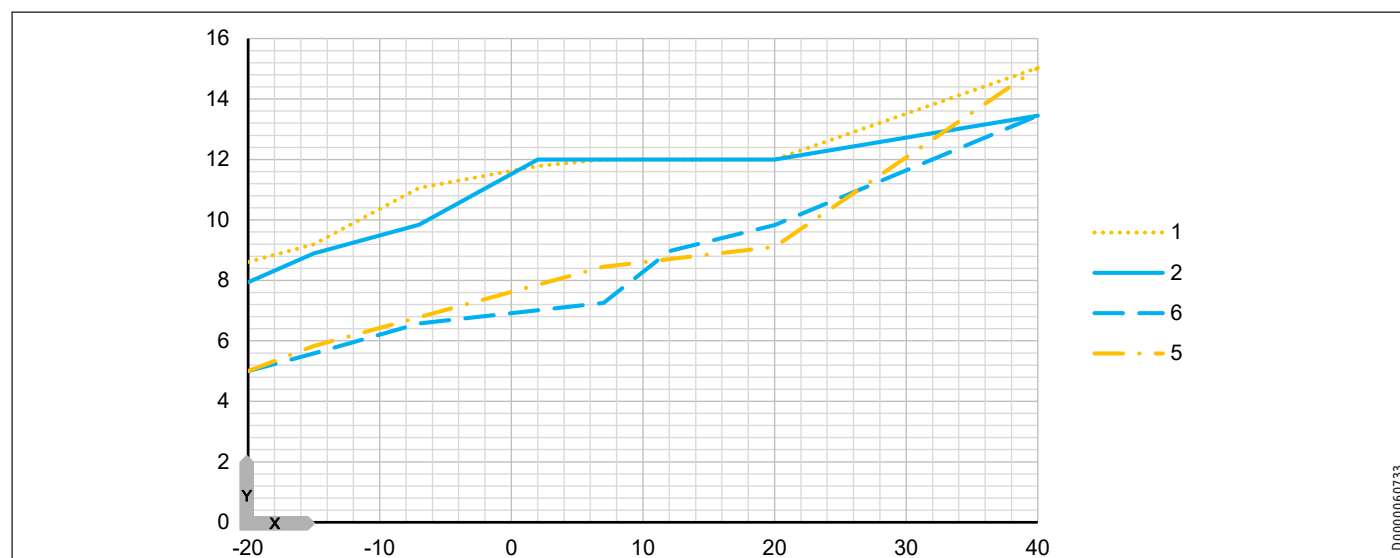
18.4.2 WPL 20 A | WPL 20 AC

Heating output



X Outside temperature [°C] 1 max. W65 3 max. W45 5 min. W65 7 min. W45
Y Heating output [kW] 2 max. W55 4 max. W35 6 min. W55 8 min. W35

DHW output

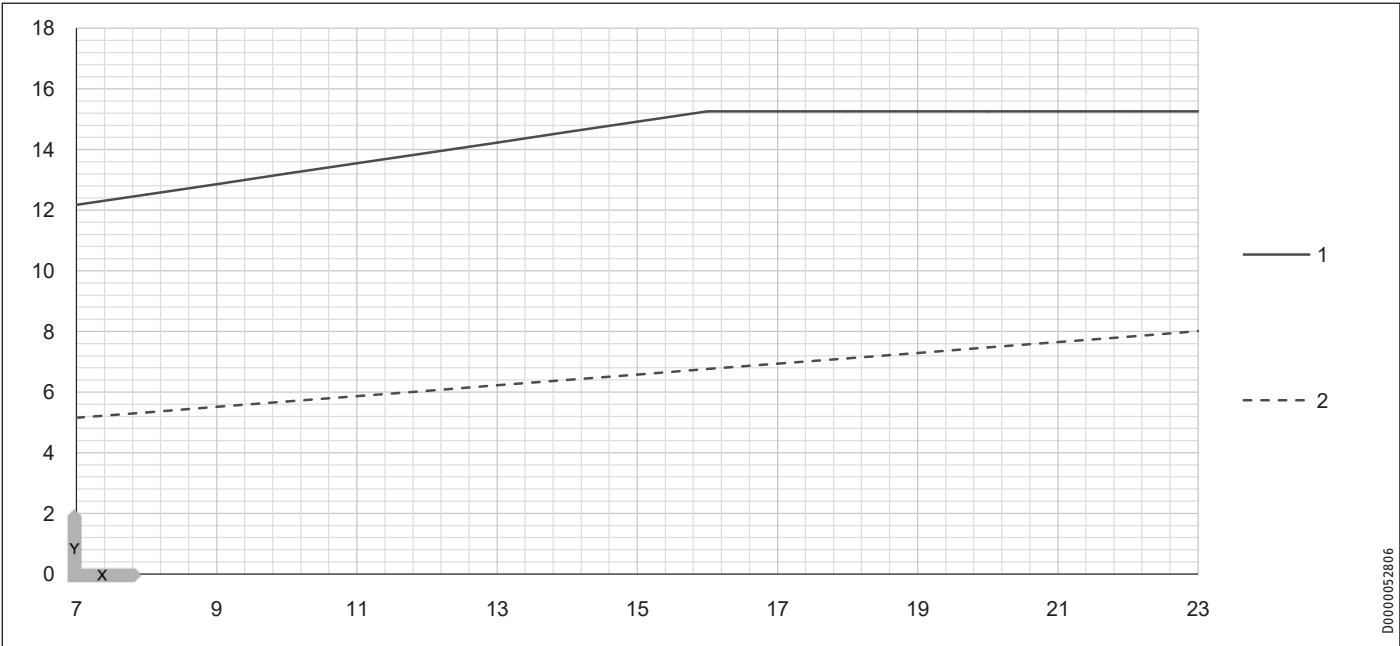


X Outside temperature [°C] 1 max. W65 5 min. W65
Y DHW output [kW] 2 max. W55 6 min. W55

INSTALLATION

Specification

Cooling capacity

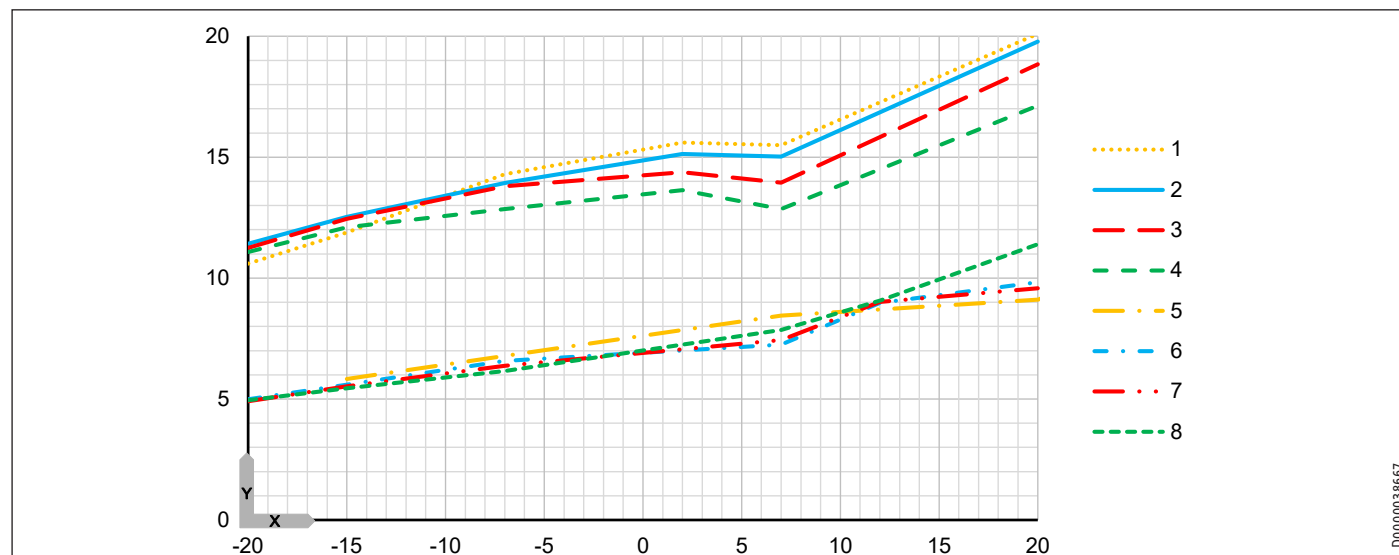


X Flow temperature [°C] 1 Max. A35
Y Cooling capacity [kW] 2 Min. A35

INSTALLATION Specification

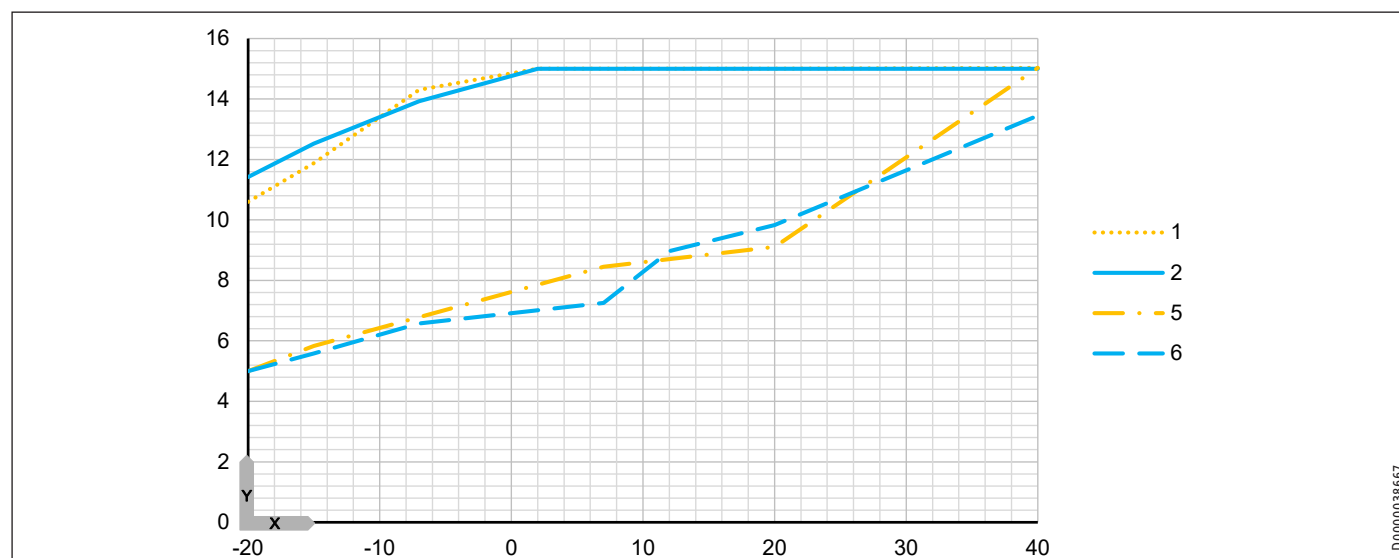
18.4.3 WPL 25 A | WPL 25 AC | WPL 25 AS | WPL 25 ACS

Heating output



X Outside temperature [°C] 1 max. W65 3 max. W45 5 min. W65 7 min. W45
Y Heating output [kW] 2 max. W55 4 max. W35 6 min. W55 8 min. W35

DHW output

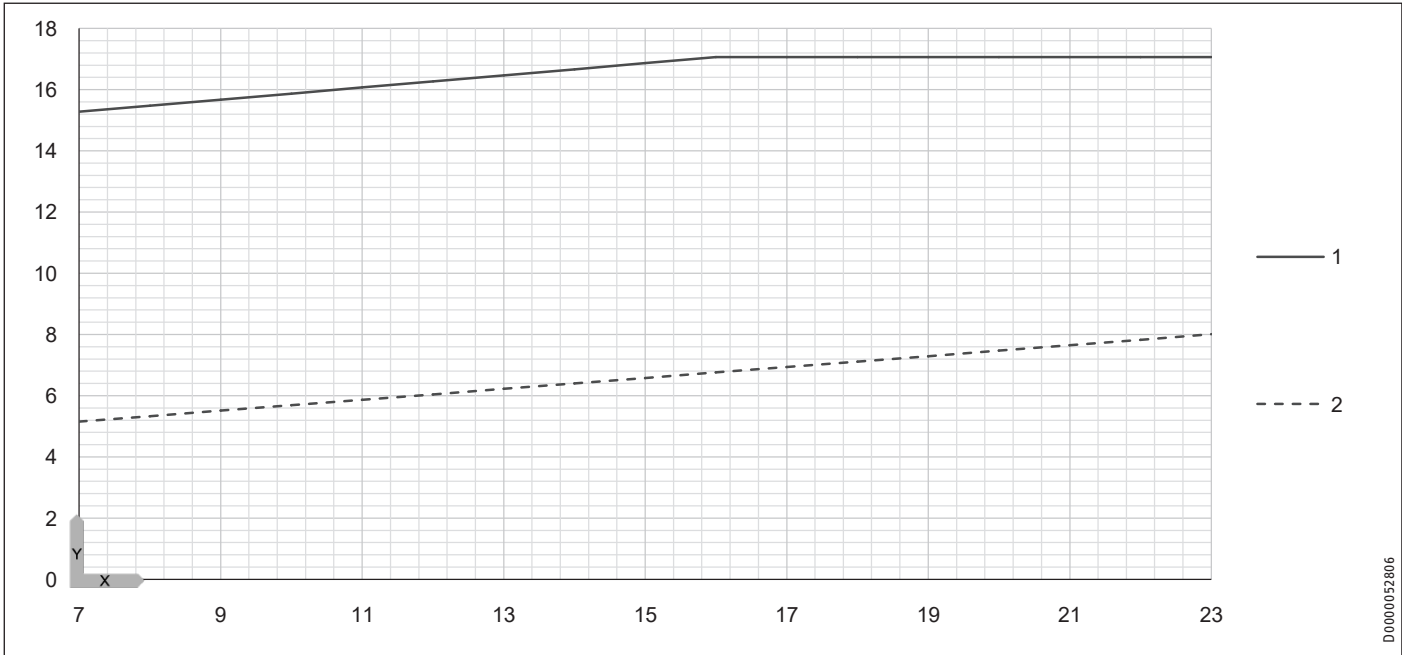


X Outside temperature [°C] 1 max. W65 5 min. W65
Y DHW output [kW] 2 max. W55 6 min. W55

INSTALLATION

Specification

Cooling capacity



X Flow temperature [°C] 1 Max. A35
Y Cooling capacity [kW] 2 Min. A35

INSTALLATION

Specification

18.5 Data table

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

The power consumption figures for the integral auxiliary drives are maximum values and may vary subject to operating point.

The power consumption of the integral auxiliary drives is included in the output details of the heat pump (to EN 14511).

		WPL 15 AS	WPL 15 ACS	WPL 20 A	WPL 20 AC	WPL 25 AS	WPL 25 ACS	WPL 25 A	WPL 25 AC
		236638	236639	236640	236641	236642	236643	236644	236645
Heating output									
Heating output at A7/W35 (min./max.)	kW	3.50/7.40	3.50/7.40	7.85/10.80	7.85/10.80	7.85/12.85	7.85/12.85	7.85/12.85	7.85/12.85
Heating output at A2/W35 (min./max.)	kW	3.10/7.09	3.10/7.09	8.33/10.71	8.33/10.71	8.33/13.64	8.33/13.64	8.33/13.64	8.33/13.64
Heating output at A-7/W35 (min./max.)	kW	2.50/6.86	2.50/6.86	6.16/10.14	6.16/10.14	6.16/12.86	6.16/12.86	6.16/12.86	6.16/12.86
Heating output at A7/W65 (EN 14511)	kW	4.56	4.56	8.45	8.45	8.45	8.45	8.45	8.45
Heating output at A7/W35 (EN 14511)	kW	4.68	4.68	7.84	7.84	8.00	8.00	7.84	7.84
Heating output at A2/W35 (EN 14511)	kW	4.23	4.23	8.33	8.33	8.33	8.33	8.33	8.33
Heating output at A-7/W35 (EN 14511)	kW	6.86	6.86	9.54	9.54	12.86	12.86	12.86	12.86
Heating output at A-7/W55 (EN 14511)	kW	7.09	7.09	10.73	10.73	13.97	13.97	13.93	13.93
Heating output at A-7/W65 (EN 14511)	kW	7.30	7.30	11.06	11.06	14.30	14.30	14.30	14.30
Heating output at A-15/W35 (EN 14511)	kW	6.16	6.16	8.51	8.51	11.96	11.96	12.05	12.05
Heating output in reduced night mode A-7/W35	kW	4.80	4.80	7.10	7.10	9.00	9.00	9.00	9.00
Heating output in max. reduced night mode A-7/W35	kW	4.30	4.30	7.10	7.10	7.85	7.85	7.85	7.85
Max. cooling capacity at A35/W7	kW		7.86		11.49		14.88		14.88
Cooling capacity at A35/W7 partial load	kW		3.27		6.76		6.76		6.76
Max. cooling capacity at A35/W18	kW		8.66		15.26		17.06		17.06
Cooling capacity at A35/W18 partial load	kW		4.70		6.76		6.76		6.76
Power consumption									
Power consumption at A7/W65 (EN 14511)	kW	1.93	1.93	3.28	3.28	3.28	3.28	3.28	3.28
Power consumption at A7/W35 (EN 14511)	kW	1.11	1.11	1.54	1.54	1.66	1.66	1.54	1.54
Power consumption at A2/W35 (EN 14511)	kW	1.09	1.09	2.01	2.01	2.01	2.01	2.01	2.01
Power consumption at A-7/W35 (EN 14511)	kW	2.42	2.42	2.93	2.93	4.31	4.31	4.16	4.16
Power consumption at A-7/W55 (EN 14511)	kW	3.38	3.38	4.10	4.10	5.94	5.94	5.76	5.76
Power consumption at A-7/W65 (EN 14511)	kW	3.95	3.95	5.25	5.25	7.53	7.53	7.53	7.53
Power consumption at A-15/W35 (EN 14511)	kW	2.45	2.45	2.91	2.91	4.56	4.56	4.48	4.48
Max. power consumption, fan, heating	kW	0.10	0.10	0.20	0.20	0.20	0.20	0.20	0.20
Power consumption, emergency/auxiliary heater	kW	6.20	6.20	8.80	8.80	6.20	6.20	8.80	8.80
Coefficients of performance									
COP at A7/W65 (EN 14511)		2.36	2.36	2.57	2.57	2.57	2.57	2.57	2.57
COP at A7/W35 (EN 14511)		4.23	4.23	5.09	5.09	4.82	4.82	5.09	5.09
COP at A2/W35 (EN 14511)		3.88	3.88	4.14	4.14	4.14	4.14	4.14	4.14
COP at A-7/W35 (EN 14511)		2.83	2.83	3.26	3.26	2.98	2.98	2.93	2.93
COP at A-7/W55 (EN 14511)		2.10	2.10	2.62	2.62	2.35	2.35	2.42	2.42
COP at A-7/W65 (EN 14511)		1.85	1.85	2.10	2.10	1.90	1.90	1.90	1.90
COP at A-15/W35 (EN 14511)		2.51	2.51	2.92	2.92	2.62	2.62	2.69	2.69
SCOP (EN 14825)		3.84	4.04	4.70	4.87	4.39	4.53	4.63	4.76
Max. cooling capacity factor at A35/W7			2.41		2.53		2.38		2.38
Cooling capacity factor at A35/W7 partial load			2.79		2.93		2.93		2.93
Max. cooling capacity factor at A35/W18			2.87		3.12		2.83		2.83
Cooling capacity factor at A35/W18 partial load			3.88		3.76		3.76		3.76
Power factor cos(phi)		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Sound emissions									
Sound power level (EN 12102)	dB(A)	50	50	55	55	55	55	55	55
Sound pressure level at 5 m distance in free field	dB(A)	28	28	32	32	32	32	32	32
Max. sound power level	dB(A)	61	61	61	61	66	66	66	66
Sound power level, reduced night mode	dB(A)	52	52	55	55	57	57	57	57
Sound power level max. reduced night mode	dB(A)	50	50	55	55	55	55	55	55
Application limits									
Min. application limit, heat source	°C	-20	-20	-20	-20	-20	-20	-20	-20
Max. application limit, heat source	°C	40	40	40	40	40	40	40	40
Min. application limit on heating side	°C	15	15	15	15	15	15	15	15
Max. application limit on the heating side	°C	65	65	65	65	65	65	65	65
Application limit, heat source at W65	°C	-20	-20	-20	-20	-20	-20	-20	-20
Min. cooling mode application limit for outside temperature	°C		15		15		15		15
Max. cooling mode application limit for outside temperature	°C		40		40		40		40

INSTALLATION

Specification

		WPL 15 AS	WPL 15 ACS	WPL 20 A	WPL 20 AC	WPL 25 AS	WPL 25 ACS	WPL 25 A	WPL 25 AC
Energy data									
Energy efficiency class, moderate climate, W55/W35		A++/A++	A++/A++	A++/A+++	A++/A+++	A+/A++	A++/A+++	A++/A+++	A++/A+++
Electrical data									
Max. power consumption excl. emergency/auxiliary heater	kW	4.40	4.40	5.50	5.50	6.90	6.90	7.10	7.10
Rated voltage, compressor	V	230	230	400	400	230	230	400	400
Rated voltage, control unit	V	230	230	230	230	230	230	230	230
Rated voltage, emergency/auxiliary heater	V	230	230	400	400	230	230	400	400
Phases, compressor		1/N/PE	1/N/PE	3/N/PE	3/N/PE	1/N/PE	1/N/PE	3/N/PE	3/N/PE
Phases, control unit		1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE
Phases, emergency/auxiliary heater		2/N/PE	2/N/PE	3/N/PE	3/N/PE	2/N/PE	2/N/PE	3/N/PE	3/N/PE
Compressor fuse protection	A	1 x B 20	1 x B 20	3 x B 16	3 x B 16	1 x B 35	1 x B 35	3 x B 16	3 x B 16
Control unit fuse protection	A	1 x 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	1 x B 16
Emergency/auxiliary heater fuse protection	A	2 x B 16	2 x B 16	3 x B 16	3 x B 16	2 x B 16	2 x B 16	3 x B 16	3 x B 16
Starting current	A	7	7	4	4	10	10	4	4
Max. operating current	A	19.10	19.10	7.90	7.90	30.00	30.00	10.20	10.20
Locked rotor amperes LRA	A	17	17	38	38	38	38	38	38
Max. mains impedance Zmax to EN 61000-3-11	Ω	0.16	0.16	0.45	0.45	0.17	0.17	0.45	0.45
Versions									
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	kg	4.20	4.2	4.7	5.5	4.7	5.5	4.7	5.5
CO ₂ equivalent (CO ₂ e)	t	8.77	8.77	9.81	11.48	9.81	11.48	9.81	11.48
Global warming potential of the refrigerant (GWP100)		2088	2088	2088	2088	2088	2088	2088	2088
IP rating		IP 14B	IP 14B	IP 14B	IP 14B	IP 14B	IP 14B	IP 14B	IP 14B
Condenser material		1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu	1.4401/Cu
Dimensions									
Height	mm	900	900	1045	1045	1045	1045	1045	1045
Width	mm	1270	1270	1490	1490	1490	1490	1490	1490
Depth	mm	593	593	593	593	593	593	593	593
Weights									
Weight	kg	160	160	175	175	175	175	175	175
Connections									
Connection, heating flow/return		28 mm	28 mm	28 mm	28 mm	28 mm	28 mm	28 mm	28 mm
Values									
Permissible operating pressure, heating circuit	MPa	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Heating flow rate (EN 14511) at A7/W35, B0/W35 and 5 K	m ³ /h	0.73	0.73	1.06	1.06	1.40	1.40	1.40	1.40
Flow rate on heat source side	m ³ /h	2300	2300	4000	4000	4000	4000	4000	4000
Nominal heating flow rate at A-7/W35 and 7 K	m ³ /h	0.842	0.842	1.17	1.17	1.59	1.59	1.57	1.57
Nominal internal pressure drop, heating	hPa	45	45	100	100	100	100	100	100
Min. flow rate, heating	m ³ /h	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00

Further details

		WPL 15 ACS	WPL 15 AS	WPL 20 A	WPL 20 AC	WPL 25 AS	WPL 25 ACS	WPL 25 A	WPL 25 AC
		236639	236638	236640	236641	236642	236643	236644	236645
Maximum altitude for installation	m	2000	2000	2000	2000	2000	2000	2000	2000

Guarantee

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

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

Environment and recycling

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

NOTES

NOTES

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