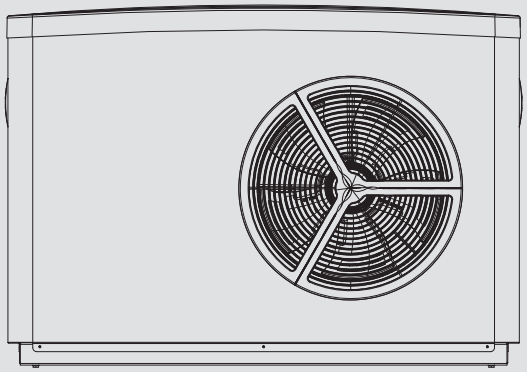
OPERATION AND INSTALLATION

Air | water heat pump

» WPL 10 AC
» WPL 10 ACS



STIEBEL ELTRON

CONTENTS

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 resulting 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.
- In dual mode operation, return water from the second heat generator may flow through the heat pump. Please note that the return water temperature may be a maximum of 60 °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 season. The system's active frost protection is not guaranteed if the power supply is interrupted.
- If the heat pump and frost protection are completely switched off, drain the system on the water side.

1. General information

The chapters "Special Information" and "Operation" are intended for both the user 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 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
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.

1.3 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 Intended use

The appliance is designed for the following purposes:
- For central heating
- For central cooling
- For DHW heating

Observe the operating limits listed in chapter "Specification".

This 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. Any changes or conversions to the appliance void any warranty.

2.2 Safety instructions

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

WARNING Injury
The appliance may be used by children aged 8 and up and persons with reduced physical, sensory or mental capabilities or a lack of experience 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.

WARNING Injury
▶ For safety reasons, only operate the appliance with the casing closed.

3. Appliance description

3.1 Properties

The appliance is an air source heat pump for outdoor installation that is designed to provide central heating. 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 60 °C. The refrigerant circuit is reversed for cooling operation.

The appliance is equipped with an electric emergency/booster heater (DHC). If the dual mode point is undershot in mono mode operation, the electric emergency/booster heater is activated to safeguard heating operation and the provision of high DHW temperatures. In such a case 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.
- Preferred for low temperature 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.
- Suitable for cooling through extraction of heat from the heating system.

Note
For centralised control over the entire heating system, you would need the "WPM 3" 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 refrigerant evaporates and is compressed by a compressor. This process requires electrical energy.

The refrigerant is then at a higher temperature level and transfers the heat drawn from the air to the heating system via an additional heat exchanger (condenser). During this process, the refrigerant expands and the cycle begins again.

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

In 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 or heating circuit. When operating without buffer cylinder, observe the general conditions defined in chapter "Installation / Preparations / Buffer cylinder". 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").

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 requires the installation of the FEK remote control unit in a reference room to capture the relative humidity and the room temperature as part of monitoring the dew point.

3.2.3 Heat pump application limit

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

4. Settings

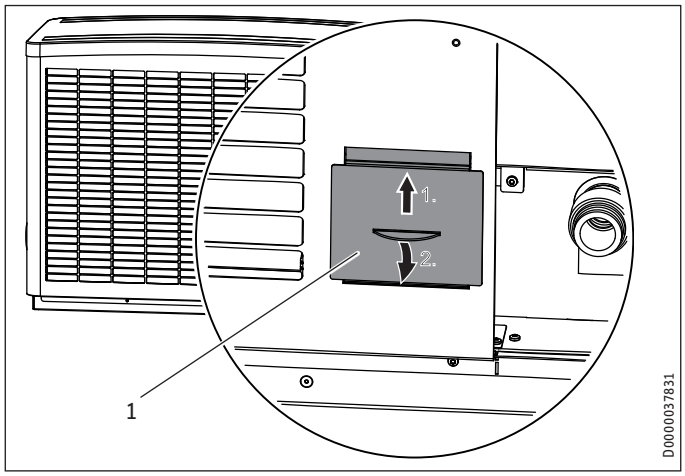
The system is operated exclusively with the heat pump manager (WPM 3).

▶ Observe the heat pump manager operating and installation instructions.

5. Maintenance and care

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

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



1 Inspection port

Check the condensate drain monthly (visual inspection). Remove contaminants and blockages immediately (see chapter "Positioning").

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

We recommend an annual inspection (establishing the actual state) and, if required, maintenance (returning the set state) by a specialist contractor.

6. Troubleshooting

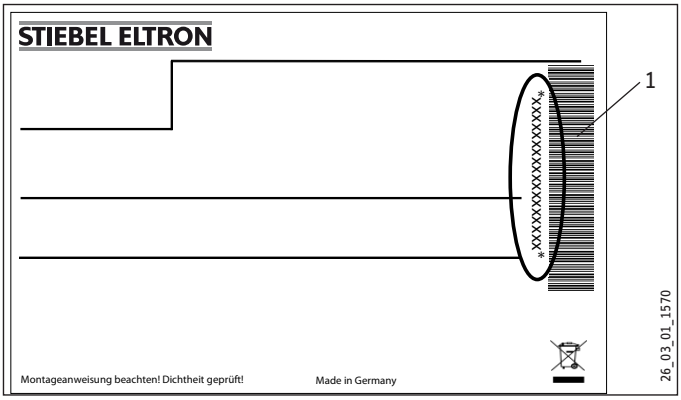
Fault	Cause	Remedy
There is no hot water or the heating system stays cold.	No power at the appliance.	Check the fuses/MCBs in your fuse box/ distribution panel. Replace the fuses/reset the MCBs if required. Notify your qualified contractor if the fuses/ MCBs blow/trip again.
Water is leaking from the appliance.	The condensate drain may be blocked.	Clean the condensate drain as described in chapter 'Care and maintenance'.
Condensate is collecting on the outside of the appliance.	The heat pump is drawing heat from the outdoor air 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.	

Note
Even when the condensate is draining away correctly, expect water to drip from the appliance onto the floor.

6.1 Other problems

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 front top, on the right or left hand side of the casing.

Sample type plate



1 Number on the type plate

INSTALLATION

7. Safety

7.1 General safety instructions

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

8. Appliance description

The appliance protects the heating water lines against freezing up. 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 Standard delivery

The following are delivered with the appliance:

- Wiring diagram
- Condensate drain hose

8.2 Accessories

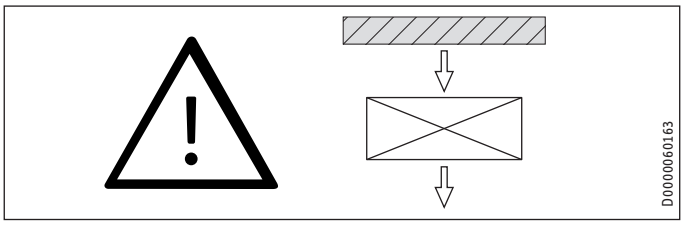
8.2.1 Required accessories

- Heat pump manager with wall mounting casing, WPMW 3

8.2.2 Further accessories

- Wall mounting bracket WK 1
- T-support SK-WPL
- Mounting bracket MK 1
- Cylinder and hydraulic module HSBB 3
- Integral cylinder HSBC 200
- Hydraulic module HM (Trend)
- Pressure hoses DN 25
- Remote control for heating systems FEK
- Remote control for heating systems FE7
- Starting current limiter 25 A
- Safety temperature controller STB-FB

9. Preparations



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 Acoustic emissions

The appliance is louder on the air intake and air discharge sides than on the two enclosed sides. Please therefore observe the information below.

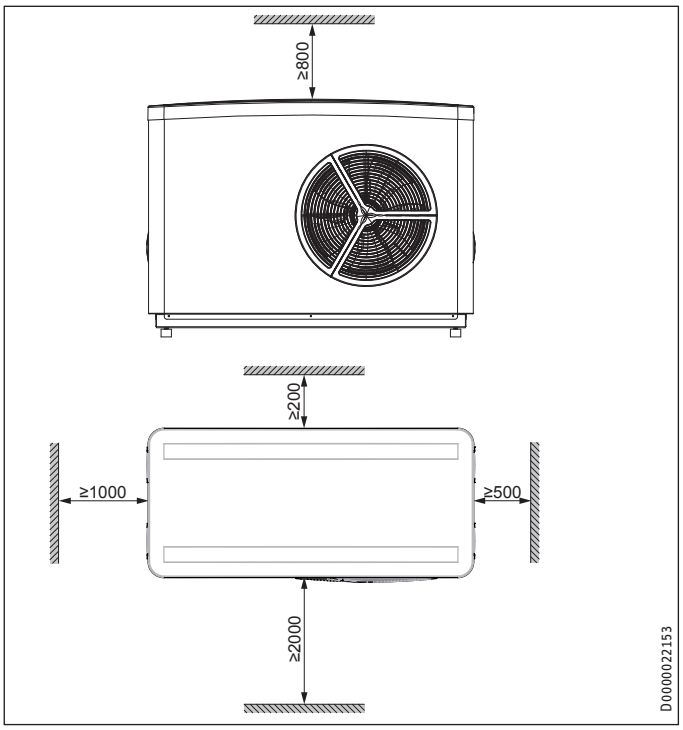
For the sound power level, see chapter "Specification/Data table".

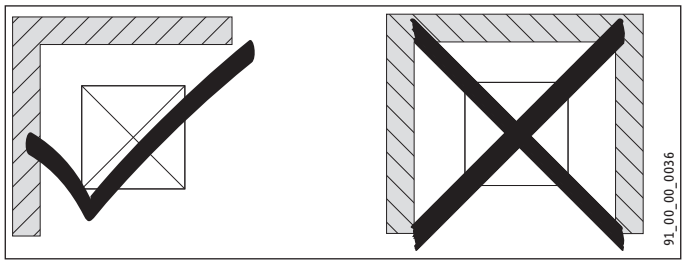
- ▶ Ensure that the air intake direction is the same as the dominant wind direction. Air should not be drawn in against the wind.
- ▶ Never direct the air intake or discharge towards noise sensitive rooms of the house (e.g. bedrooms).

Lawn areas and shrubs help reduce the spread of noise.

Sound propagation can also be reduced by installing closely spaced palisade fencing around the appliance. Observe the minimum clearances.

9.2 Minimum clearances





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

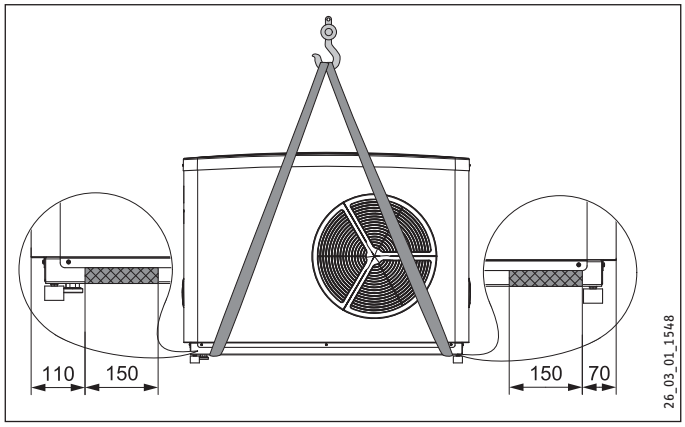
9.3 Preparation of the installation location

The substrate must be horizontal, level, solid and permanent.

- ▶ Ensure that the appliance is accessible from all sides.

9.4 Transport

- Lifting straps to transport the appliance can be hooked into the area highlighted in grey at the bottom of the support frame.



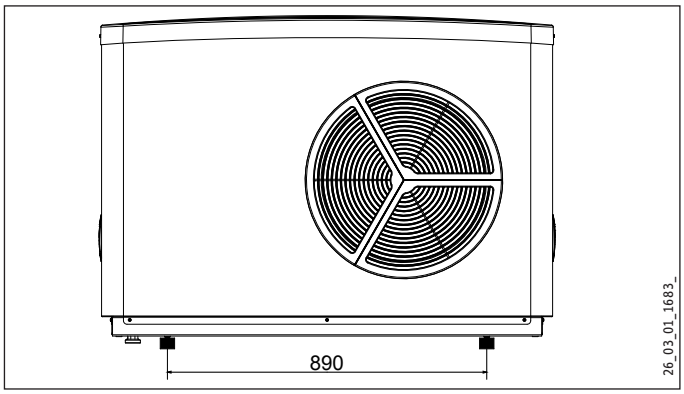
Material losses
Protect the appliance against heavy impact during transport.

If the appliance needs to be tilted during transport only do so for a short time on one of its longitudinal sides. The longer the appliance is tilted, the greater the distribution of refrigerant in the system. Wait approx. 30 minutes before starting the appliance after it has been tilted.

9.5 Siting

- ▶ Observe chapter "Sound emissions".

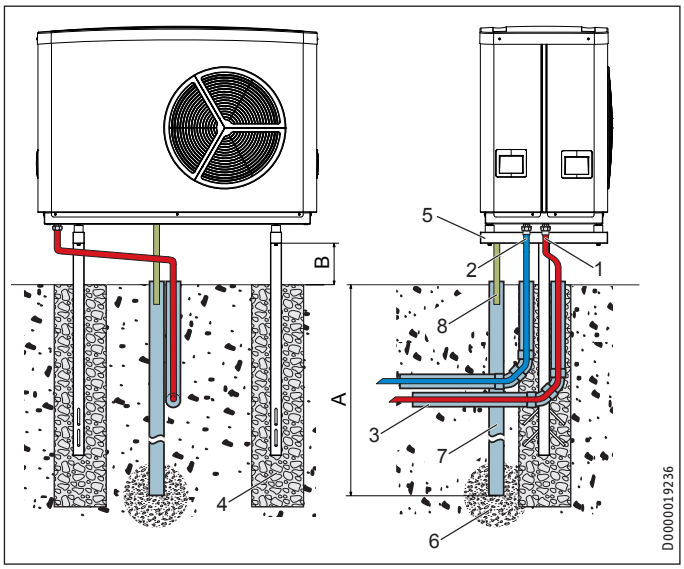
Note
- ▶ Observe the clearance dimension in the following diagram when using a T-support or wall mounting bracket.



- ▶ Only use weather-resistant cables.
- ▶ Protect the flow and return lines against frost with sufficient thermal insulation. Provide thermal insulation in accordance with applicable regulations.
- ▶ Also protect all supply lines/cables against humidity, damage and UV radiation by means of a conduit.

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

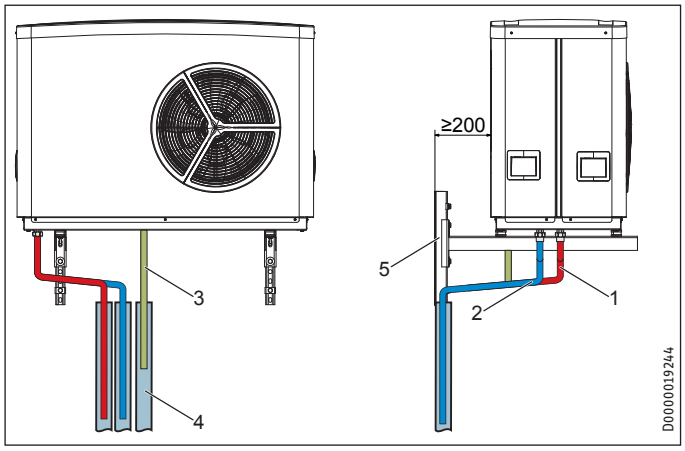
Example: T-support SK-WPL



A Depth of frost line
B 300
1 Heating flow
2 Heating return
3 Conduit for supply lines
4 Foundation
5 T-support
6 Gravel bed
7 Drainage pipe
8 Condensate drain

- ▶ Observe the static limits of the T-support used.

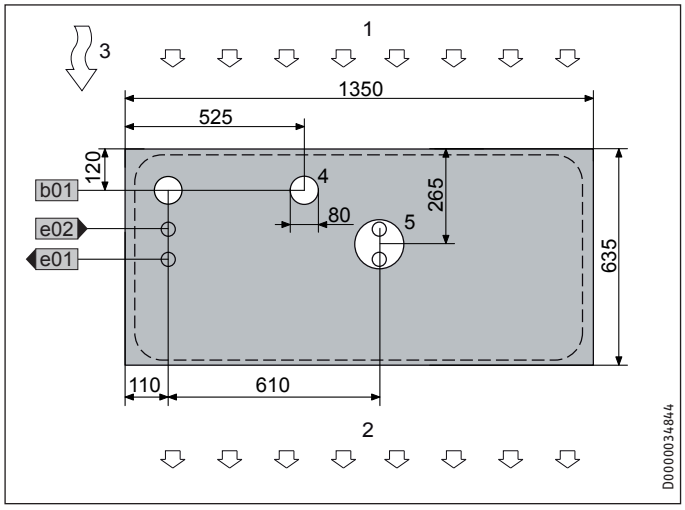
Example: Wall mounting bracket WK 1



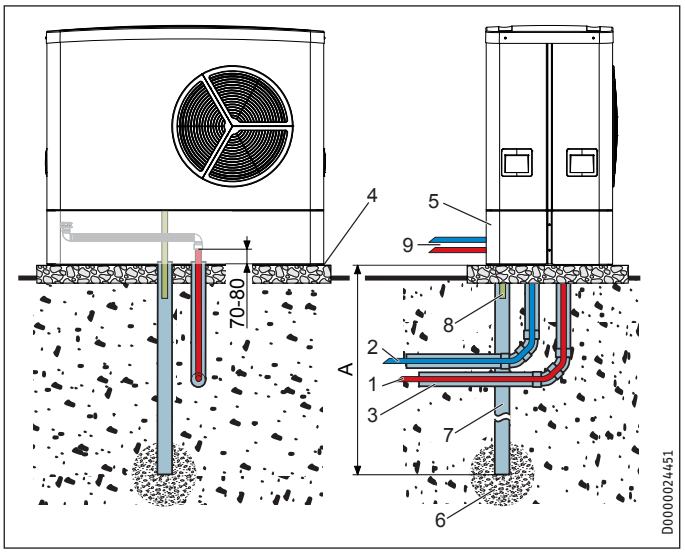
1 Heating flow
2 Heating return
3 Condensate drain
4 Drainage pipe
5 Wall mounting bracket

▶ Observe the static limits of the building wall and the wall mounting bracket.

Example: Mounting bracket MK 1



b01 Entry electrical cables
e01 Heating flow
e02 Heating return
1 Air intake side
2 Air discharge side
3 Main wind direction
4 Condensate drain
5 Supply line outlet



A Depth of frost line
1 Heating flow
2 Heating return
3 Conduit for supply lines/cables
4 Foundation
5 Mounting bracket
6 Gravel bed
7 Drainage pipe
8 Condensate drain
9 Outlet for supply lines opt.

9.6 WPM 3 heat pump manager

A WPM 3 heat pump manager is required to operate the appliance. This controls the entire heating system.

9.7 Buffer cylinder

A buffer cylinder is recommended 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.

▶ When operating without buffer cylinder, observe the details specified in chapter "Minimum flow rate with individual room controller by means of FEK / FE7 in the case of systems without buffer cylinder".

Material losses
A buffer cylinder with diffusion-proof insulation is essential for cooling mode.

9.8 Preparing the electrical installation

WARNING Risk of electrocution!
Carry out all electrical connection and installation work in accordance with national and regional regulations.

WARNING Risk of electrocution!
The connection to the power supply must be in the form of a permanent connection. The appliance must be able to be separated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation. 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 for the 3 power circuits (for the appliance, the electric emergency/booster heater and the control unit).

- ▶ Always connect "L" for the heat pump and the control unit to the same phase.

Where required, you can install our starting current limiter with 25 A for the WPL 10 AC (see "Additional accessories").

- ▶ Route cables with the following cross-sections in accordance with the respective fuse rating:

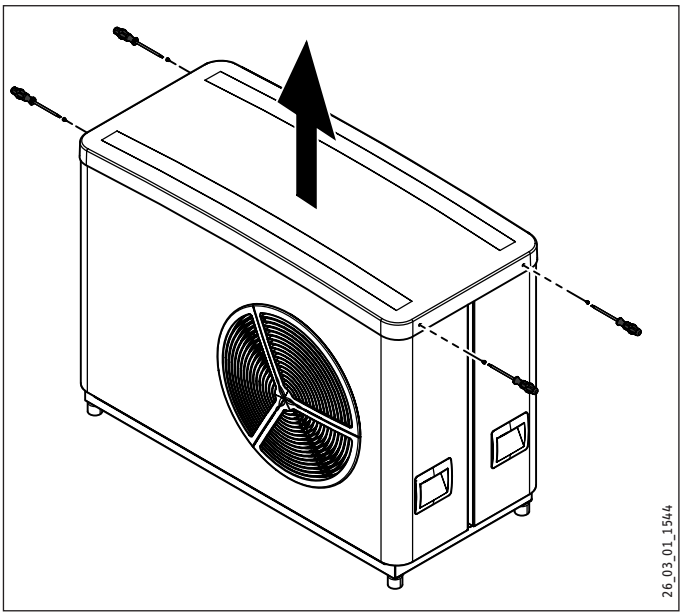
MCB/fuse rating	Assignment	Cable cross-section
C 25 A	Heat pump (single phase)	2.5 mm² for routing above the surface 4.0 mm² for routing through a wall
C 16 A	Heat pump (3-phase)	2.5 mm²
B 35 A	Electric emergency/booster heater (DHC) (single phase)	6.0 mm² for routing through a wall 4.0 mm² when routing multi-core cables on a wall or in an electrical conduit on a wall
B 16 A	Electric emergency/booster heater (DHC) (3-phase)	2.5 mm 1.5 mm² with only two live cores and routing on a wall or in an electrical conduit on a wall.
B 16 A	Control	1.5 mm²

The electrical data is provided in the chapter "Specification" . You require a J-Y (St) 2x2x0.8 mm² cable as BUS cable.

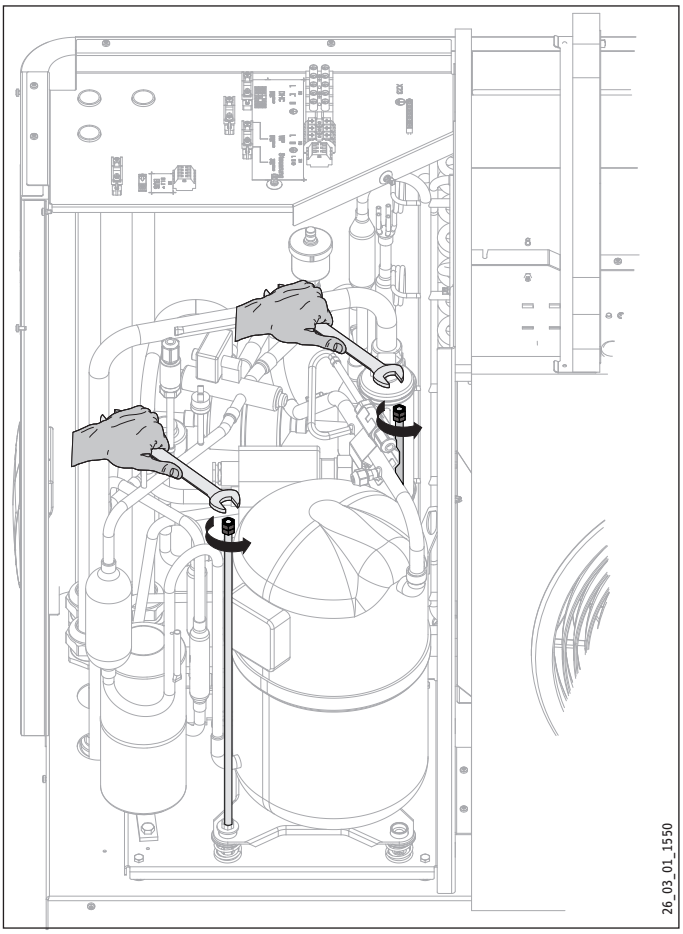
10. Installation

10.1 Siting

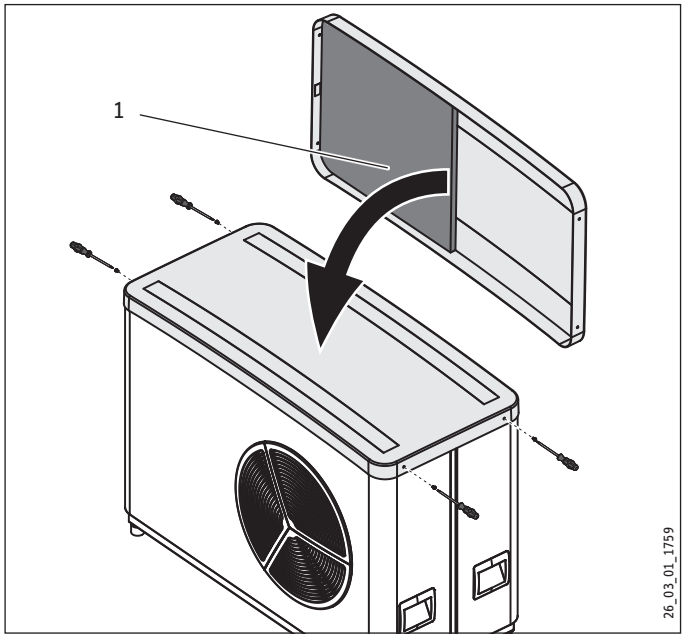
- ▶ When installing the appliance, observe the air intake direction.
- ▶ Position the standard appliance on the prepared substrate.



- ▶ Remove the cover.



▶ Remove the transport locks (threaded rods) from the compressor.



1 Sound insulation

▶ Position the cover on the appliance.

▶ Secure the cover with the four screws.

10.2 Heating water connection

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

▶ Thoroughly flush the pipework before connecting the heat pump. Foreign matter, such as welding pearls, rust, sand or sealant will impair the operational reliability of the heat pump and can result in the heat pump condenser becoming blocked.

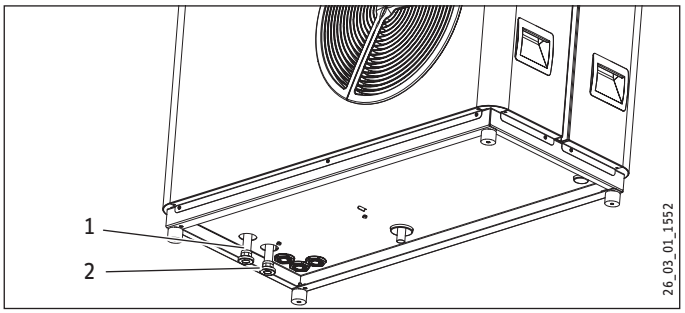
10.3 Flow and return connection

Material losses
Insulate the heating flow and return lines with vapour diffusion-proof material.

Fit an anti-vibration mount at least 1 m long to the connectors.

Structure-borne noise is largely prevented by the anti-vibration construction of the heat pump and by the flexible pressure hoses, which act as anti-vibration mounts.

▶ Take the position of the heating flow and return from the following figure:



1 Heating circuit flow
2 Heating circuit return

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

10.4 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.

10.5 Filling the heating system

10.5.1 Water quality

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

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

▶ Recheck these limits 8-12 weeks after commissioning and as part of the annual system maintenance.

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

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

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

10.5.2 Venting the heating system

▶ Vent the pipework carefully. For this, also activate the air vent valve integrated into the heating flow inside the heat pump.

10.6 Minimum flow rate

For heating operation without buffer cylinder, ensure the minimum flow rate and the availability of defrost energy.

10.7 Setting the flow rate on the heating side

Note
In combination with an hydraulic module or integral cylinder, the flow rate can be checked and set at the heat pump manager. Observe that the flow rate is set indirectly via the rating of the pump used.
- ▶ Check the flow rate in the heat pump manager menu "INFO / HEATING / FLOW RATE" or "INFO / DHW / FLOW RATE".
- ▶ Set the flow rate in the heat pump manager menu "COMMISSIONING / HEATING / HEATING CIRC PUMP RATE" or "COMMISSIONING / DHW / DHW PUMP RATE".

The appliance is designed in such a way that no buffer cylinder is required to provide hydraulic separation of the flow in the heat pump circuit and the heating circuit in conjunction with panel heating systems.

We recommend the use of a buffer cylinder for installations with several heating circuits.

The minimum flow rate is set via the temperature differential of the heating system.

Set the heating circuit pump so that the value is equal to or lower than the maximum temperature differential.

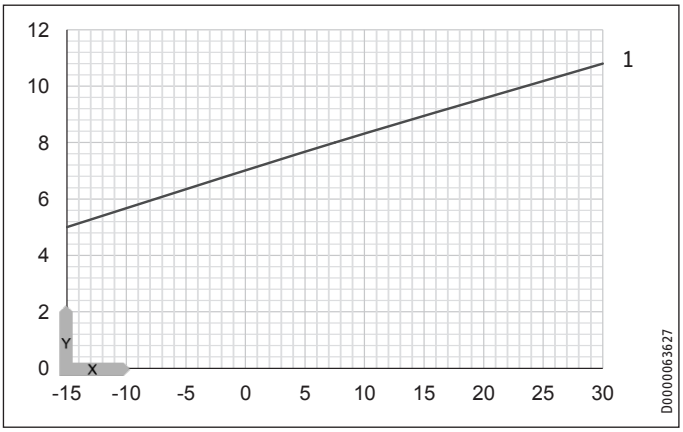
The setting is made in heat pump mode. For this, make the following settings first:

▶ 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.

▶ Operate the appliance in heating mode.

10.7.1 Minimum flow rate with individual room controller by means of FEK / FE7 in systems without buffer cylinder

Maximum temperature differential on the heating side with individual room controller and external programming unit:



1 Minimum flow rate
X Outside temperature [°C]
Y Maximum temperature differential [K]

In the case of systems without buffer cylinder, in menu "SETTINGS / HEATING / STANDARD SETTINGS", set parameter "BUFFER OPERATION" to "OFF".

In such cases, one or more heating circuits in the heating system must be left open. Ensure the minimum flow rate (see "Technical Data / Data table") by means of the correspondingly opened heating circuits (see table "Design recommendation for underfloor heating system inside the lead room").

Design recommendation for underfloor heating system inside the lead room:

	Minimum flow rate	Minimum water content of buffer cylinder or open circuits	Composite pipework 16 x 2 mm / routing gap 10 cm		Composite pipework 20 x 2.25 mm / routing gap 15 cm	
			Lead room floor area	Number of circuits	Lead room floor area	Number of circuits
	l/h	l	m²	n x m	m²	n x m
WPL 10 AC	700	19	21	3x70	21	2x70
WPL 10 ACS	700	19	21	3x70	21	2x70

	Buffer cylinder always required	Recommended buffer cylinder volume, underfloor heating	Recommended buffer cylinder volume, radiators	enable booster heater
WPL 10 AC	no	100	200	Yes
WPL 10 ACS	no	100	200	Yes

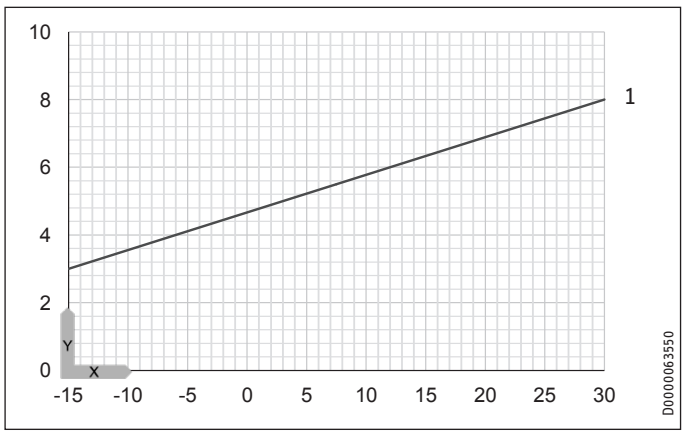
- ▶ Install the open heating circuit(s) in the lead room (room where the external programming unit of the heat pump control unit is installed, such as in the living room). The individual room can then be controlled either with the external programming unit or directly by adjusting the heating curve or the room influence.
- ▶ Fully open the heating circuit(s) in the lead room.
- ▶ Close all other heating circuits.
- ▶ If an overflow valve has been installed in the heating system, fully close this overflow valve in order to determine the minimum flow rate.
- ▶ Make the settings at the circulation pump when the temperature differential between the flow and return temperature has stabilised.
- ▶ Set the heating circuit pump so that the minimum flow rate required to operate the system is safeguarded.
- ▶ Compare the resulting temperature difference between the flow and return at the appliance with the diagram "Maximum temperature differential on the heating side with individual room controller and external programming unit".
- ▶ Set the heating circuit pump so that the maximum temperature differential is achieved or undershot.
- ▶ Set the heating circuit pump to Δp constant.
- ▶ If the appliance will be used for DHW heating, check the setting of the delivery head in DHW mode.

10.7.2 Flow rate with buffer cylinder

When using a buffer cylinder, make the following setting: In the menu "SETTINGS / HEATING / STANDARD SETTINGS", set parameter "BUFFER OPERATION" to "ON".

The flow rate can be adjusted using the temperature differential of the buffer circuit. The value must not fall below the minimum flow rate.

Maximum temperature differential on the heating side with buffer cylinder:

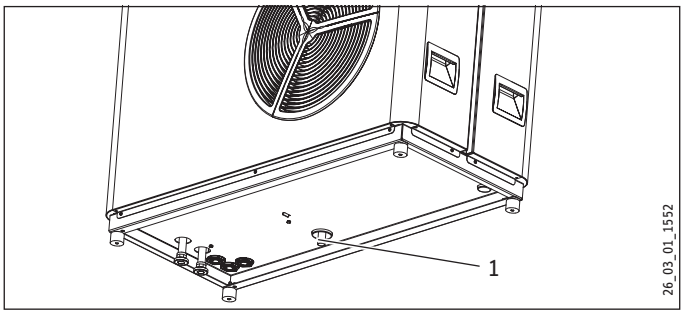


1 Nominal flow rate
X Outside temperature [°C]
Y Maximum temperature differential [K]

- ▶ Make the settings at the circulation pump when the temperature differential between the flow and return temperature has stabilised.
- ▶ Compare the resulting temperature difference between the flow and return at the appliance with the diagram “Maximum temperature differential on the heating side with buffer cylinder”.
- ▶ Set the buffer charging pump so that the maximum temperature differential is achieved or undershot.
- ▶ If the appliance will be used for DHW heating, check the setting of the delivery head in DHW mode.
- ▶ If necessary, adjust the delivery head setting for the DHW primary pump.
- ▶ Set the buffer charging pump and the DHW primary pump to Δp constant.

10.8 Condensate drain

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



1 Condensate drain

- ▶ Secure a hose to the condensate drain connector.
- ▶ Insulate the hose to ensure frost protection.

Material losses
Ensure the hose is not kinked. Route the hose with a slope.

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

10.9 External heat source 2

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

10.10 Safety temperature controller for underfloor heating system

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

11. Power supply

Note
Observe the operating and installation instructions of the WPM 3 heat pump manager.

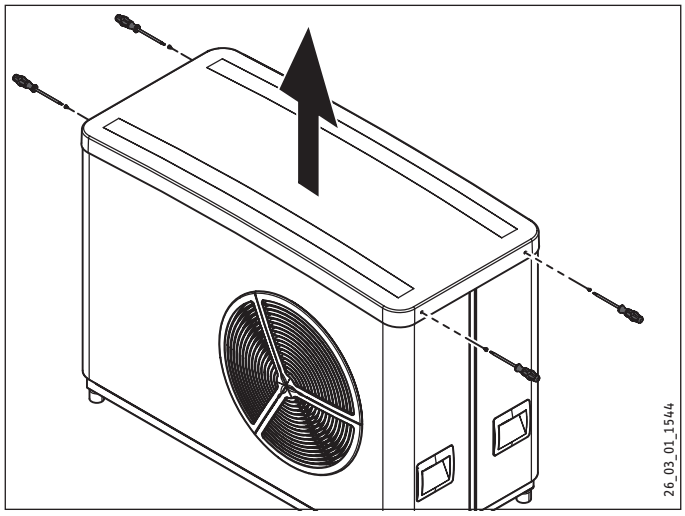
The connection must only be carried out by a qualified contractor and in accordance with these instructions.

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

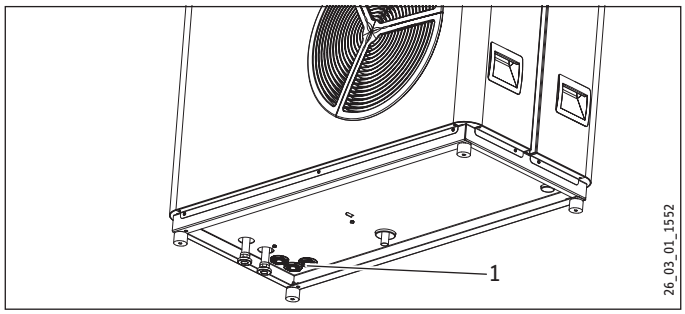
The terminals are located in the wiring chamber of the appliance.

- ▶ Observe chapter "Preparing the electrical installation".
- ▶ Use appropriate cables in accordance with local regulations for all connections.
- ▶ Route all cables and leads through strain relief fittings.

11.1 Access to the wiring chamber

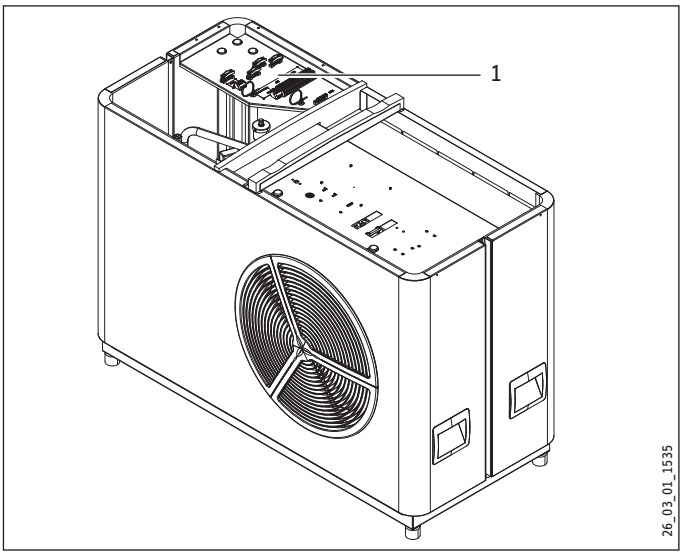


- ▶ Remove the cover.



1 Cable entries

- ▶ Thread the connecting cables from below through the cable entries upwards to the connecting chamber.



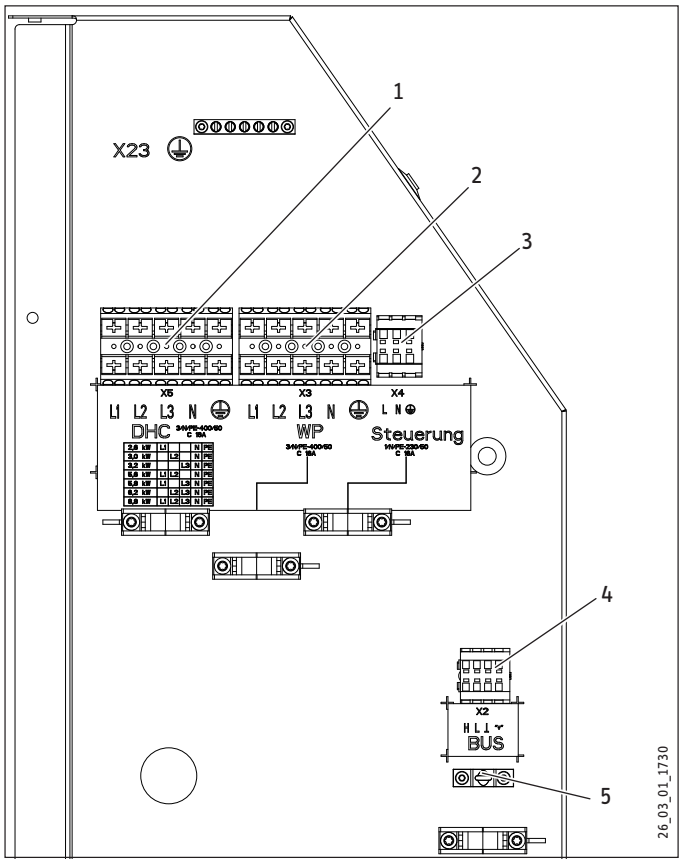
1 Wiring chamber

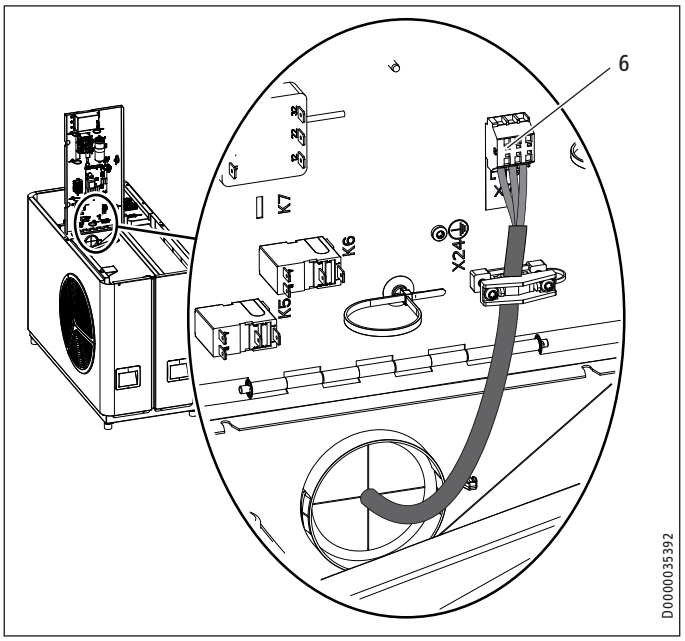
11.2 Power supply WPL 10 AC (three-phase)

- ▶ Connect cables according to the following diagram.
- ▶ Connect the electric emergency/booster heater if you want to utilise the following appliance functions:

Appliance function	Effect of the electric emergency/booster heater
Mono energetic operation	If the heat pump undershoots the dual mode point, the electric emergency/booster heater safeguards both the heating operation and the delivery of high DHW temperatures.
Emergency mode	Should the heat pump suffer a fault that prevents its continued operation, the heating output will be covered by the electric emergency/booster heater.
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 these low system temperatures, the drying heat 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, you can disconnect the electric emergency/booster heater if it is not required for the appliance operation. Please note that during the heat-up program, the emergency operation cannot be selected.
Pasteurisation control	The electric emergency/booster heater starts automatically when the pasteurisation control is active in order to regularly heat the DHW to 60 °C to protect it against the growth of legionella bacteria.

Power supply





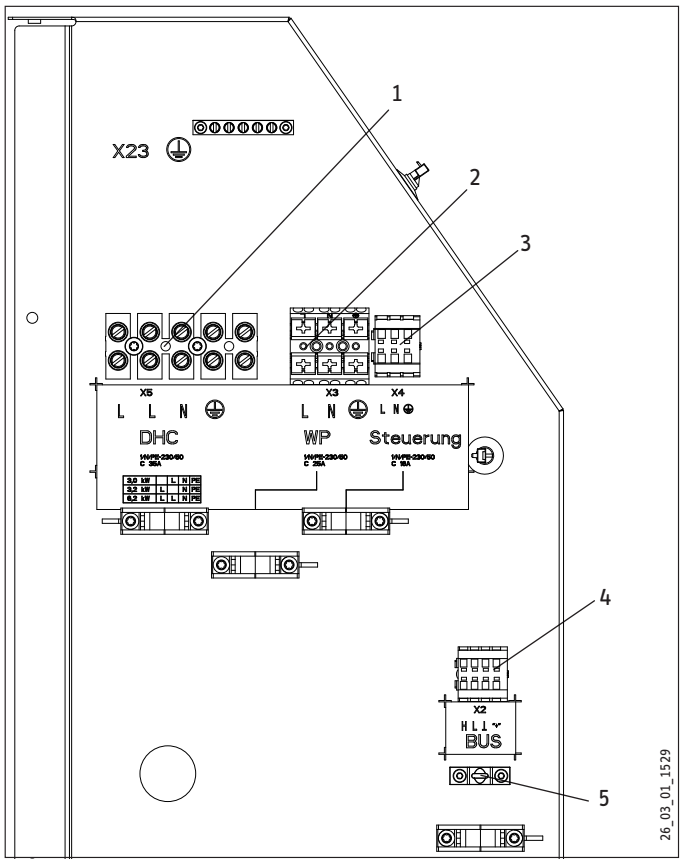
1	X5	Electric emergency/booster heater (DHC)				
		L1, L2, L3, N, PE				
		Connected load	Terminal assignment			
		2.6 kW	L1		N	PE
		3.0 kW		L2	N	PE
		3.2 kW			L3	N	PE
		5.6 kW	L1	L2	N	PE
		5.8 kW	L1		L3	N	PE
		6.2 kW		L2	L3	N	PE
		8.8 kW	L1	L2	L3	N	PE
2	X3	Power supply (heat pump, compressor)				
		L1, L2, L3, N, PE				
3	X4	Control voltage				
		Power supply: L, N, PE				
4	X2	Low voltage (BUS cable)				
		BUS High H BUS Low L BUS earth ⊥ BUS "+" (is not connected)				
5		Earth terminal for screening the LV lead				
6		Ribbon heater				
		Power supply: L, N, PE				

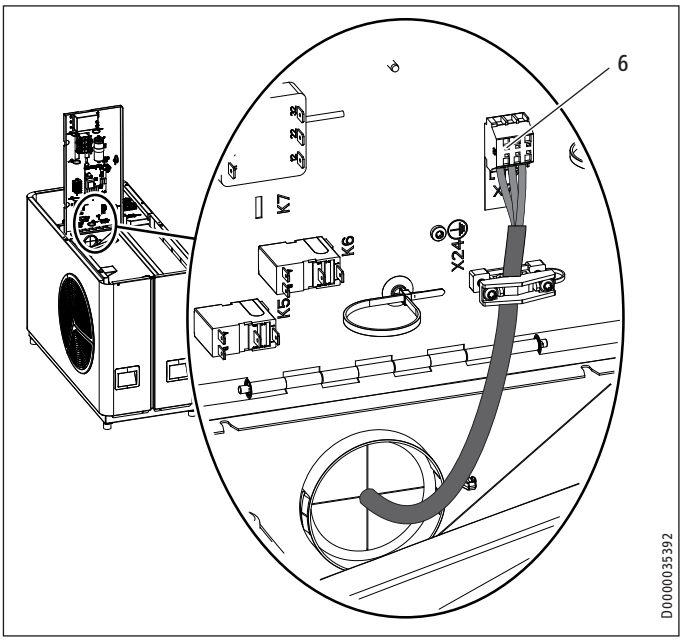
- ▶ Earth the LV lead by inverting the screen over the external sheath and clamping it under the earth terminal.
- ▶ Then check the function of the strain relief fittings.

11.3 Power supply WPL 10 ACS (single phase)

- ▶ Connect cables according to the following diagram.
- ▶ Connect the electric emergency/booster heater if you want to utilise the following appliance functions:

Appliance function	Effect of the electric emergency/booster heater
Mono energetic operation	If the heat pump undershoots the dual mode point, the electric emergency/booster heater safeguards both the heating operation and the delivery of high DHW temperatures.
Emergency mode	Should the heat pump suffer a fault that prevents its continued operation, the heating output will be covered by the electric emergency/booster heater.
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 these low system temperatures, the drying heat 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, you can disconnect the electric emergency/booster heater if it is not required for the appliance operation. Please note that during the heat-up program, the emergency operation cannot be selected.
Pasteurisation control	The electric emergency/booster heater starts automatically when the pasteurisation control is active in order to regularly heat the DHW to 60 °C to protect it against the growth of legionella bacteria.





1	X5	Electric emergency/booster heater (DHC) L, L, N, PE

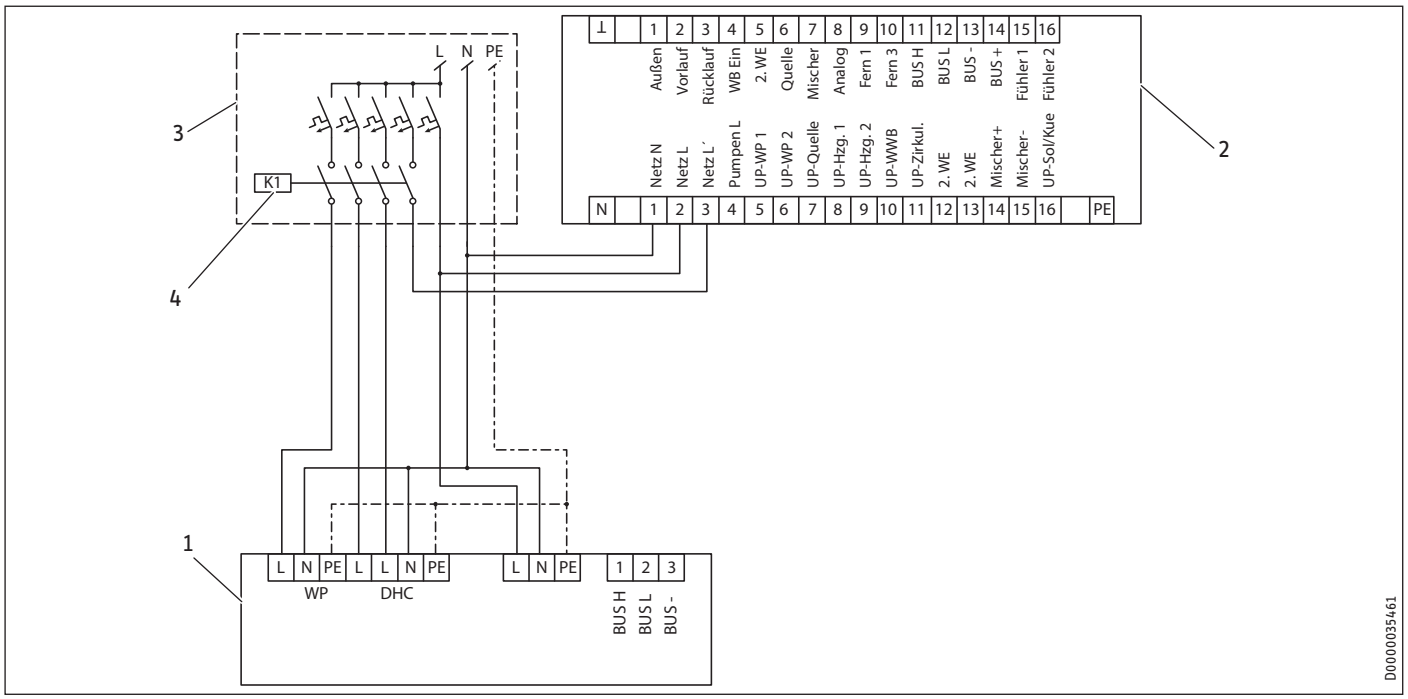
Connected load	Terminal assignment			
3.0 kW	L		N	PE
3.2 kW		L	N	PE
6.2 kW	L	L	N	PE

2	X3	Power supply (heat pump, compressor) L, N, PE
3	X4	Control voltage Power supply: L, N, PE
4	X2	Low voltage (BUS cable) BUS High H BUS Low L BUS earth ⊥ BUS "+" (is not connected)
5		Earth terminal for screening the LV lead
6		Ribbon heater Power supply: L, N, PE

- ▶ Earth the LV lead by inverting the screen over the external sheath and clamping it under the earth terminal.
- ▶ Then check the function of the strain relief fittings.

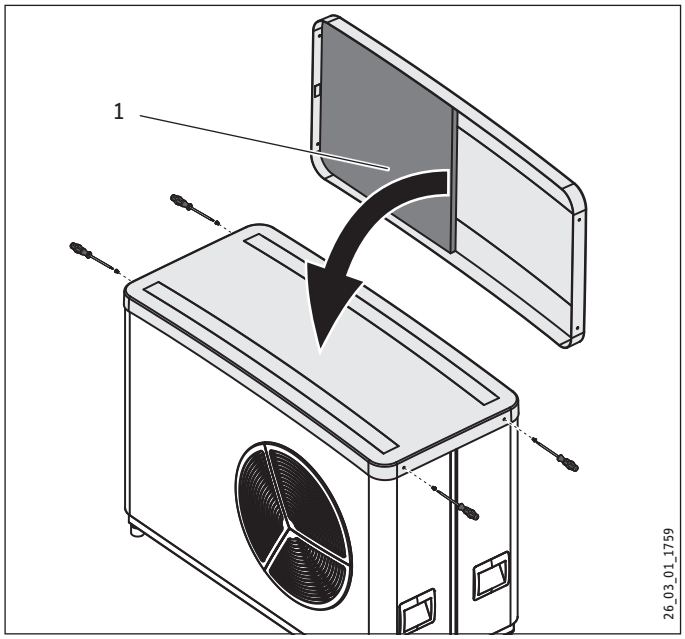
Material losses
When making the L and N connections of the compressor and the L and N connections of the control unit in single phase appliances, ensure that the same phase is used. Protect the circuit with an RCD.

Connection example



1 Heat pump
2 Heat pump manager
3 Main control panel
4 Power-OFF contactor

11.4 Closing the wiring chamber



1 Sound insulation

- ▶ Position the cover on the appliance.
- ▶ Secure the cover with the four screws.
- ▶ Connect the circulation pump for the heat utilisation side to the heat pump manager in accordance with the technical guides.

12. Commissioning

A WPM 3 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 carry out adjustments on the heat pump manager commissioning report, commission the appliance and instruct the owner in its use.

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

Where this appliance is intended for commercial use, the rules of the relevant Health & Safety at Work Act must be observed at commissioning. For further details, check your local authorising body.

After commissioning, complete the commissioning report that is included in these instructions.

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 sensor

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

12.1.3 Power supply

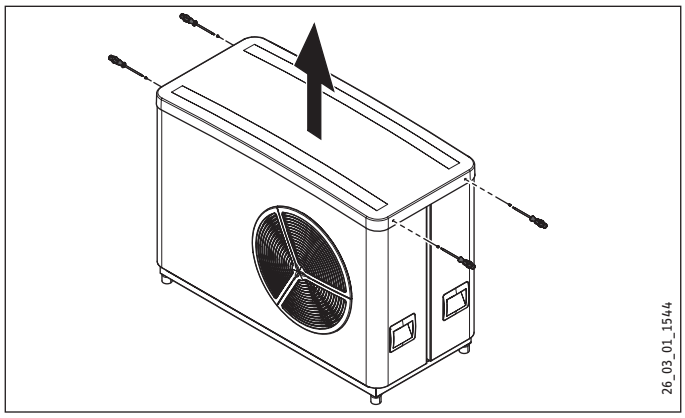
- Have you correctly connected the power supply?

12.1.4 Transport locks

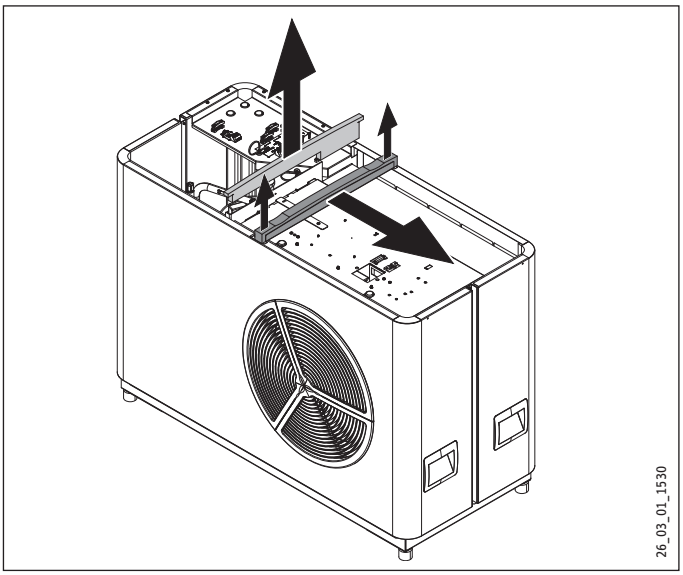
- Have you removed the threaded rods that secure the compressor?

12.1.5 Checking the IWS DIP switch settings

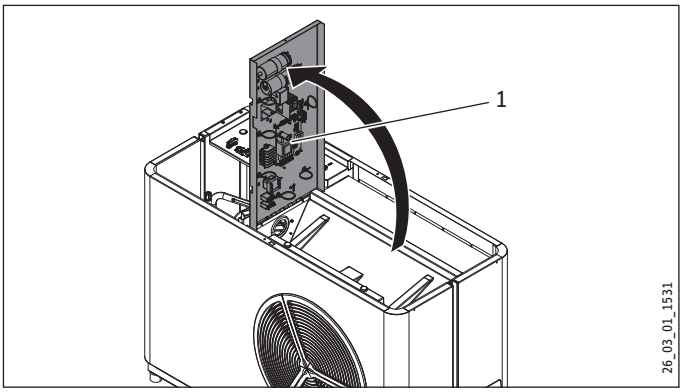
Carry out the following steps to make the IWS accessible.



▶ Remove the cover.

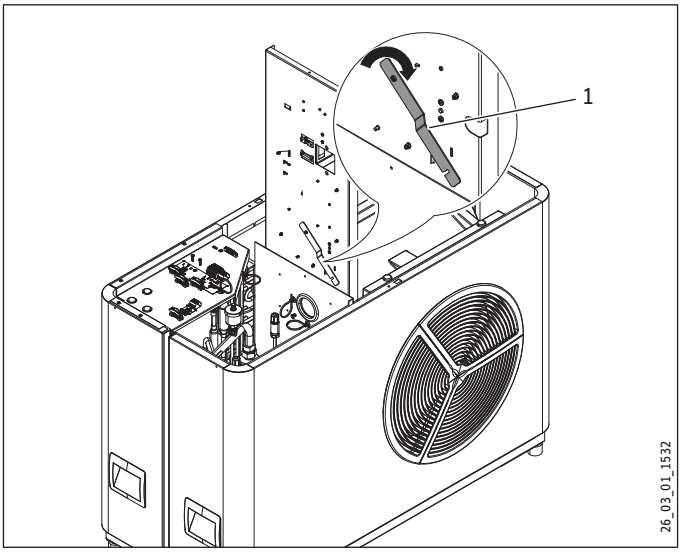


▶ Remove the bracket highlighted in grey as follows:



1 IWS

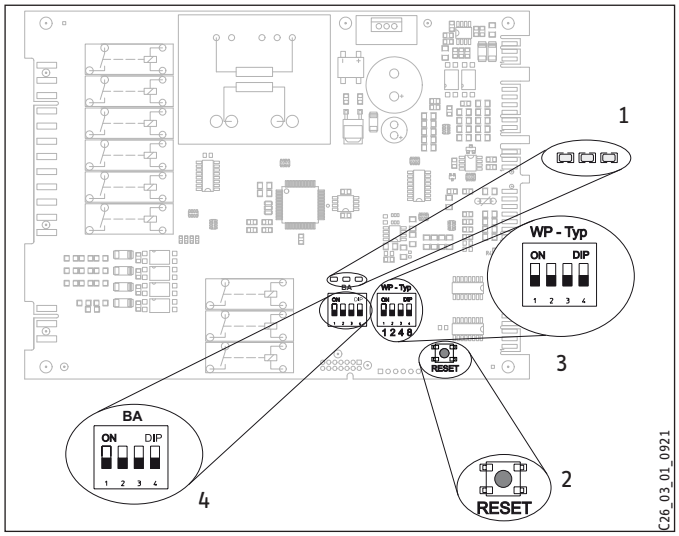
▶ Lift the panel highlighted in grey.



1 Locking stay

▶ Secure the panel with the locking stay.

IWS

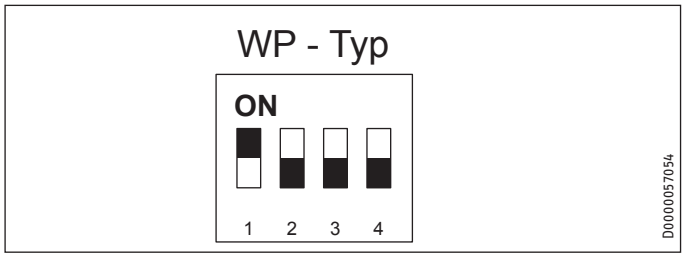


1 LEDs
2 Reset button
3 DIP switch (WP-Typ)
4 DIP switch (BA)

DIP switch (WP-Typ)

With the DIP switch ("WP-Typ"), you can select the various heat pump types on the IWS.

Factory setting
Compressor mode with electric emergency/booster heater

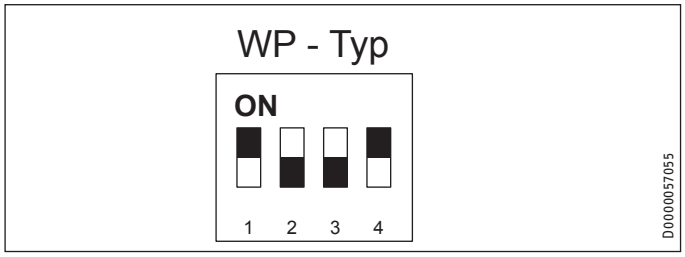


▶ Check whether the DIP switch is set correctly.

Compressor mode with 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 module with a further WPL, set the DIP switch as follows:

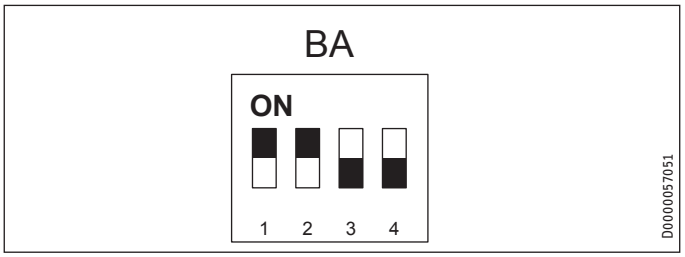


DIP switch (BA)

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

Heating mode:

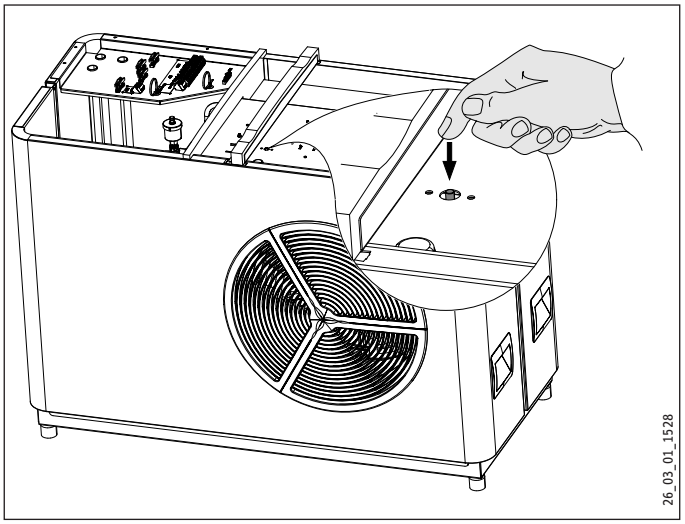
Cooling mode:



12.1.6 High limit safety cut-out

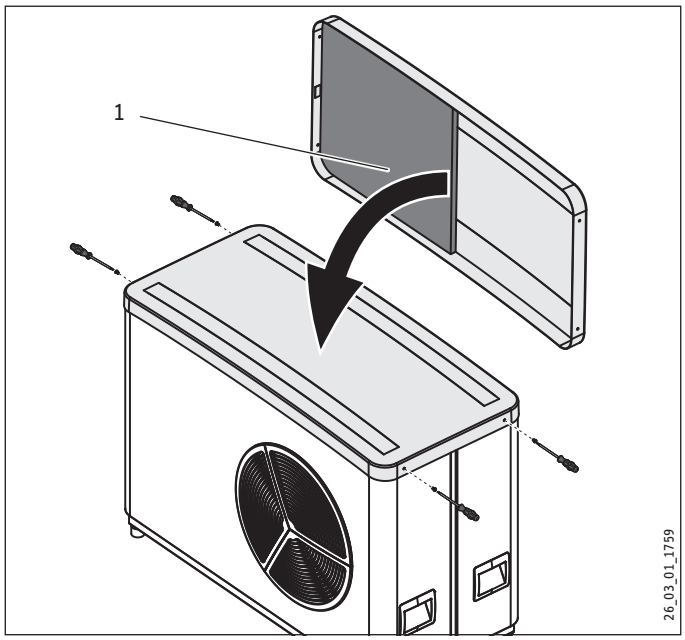
In ambient temperatures of below -15 °C it is possible that the high limit safety cut-out of the electrical emergency/booster heater may trip.

▶ Check whether the high limit safety cut-out has tripped.
▶ Remove the cause of the fault.



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

12.1.7 Closing the wiring chamber



1 Sound insulation

► Position the cover on the appliance.

► Secure the cover with the four screws.

12.2 Initial start-up

12.2.1 Heating curve adjustment

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

► Observe the WPM operating and installation instructions.

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

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

Standard values to begin with:

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

If the room temperature is not high enough in spring and autumn (approx. 10 °C outside temperature), raise the "COMFORT TEMPERATURE" parameter in the heat pump manager menu under "SETTINGS / HEATING / HEATING CIRCUIT".

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

Increase the "HEATING CURVE" parameter, if the room temperature is not high enough when outside temperatures are low.

If you raise the "HEATING CURVE" parameter, adjust the zone valve or thermostatic valve in the lead room to the required temperature when outside temperatures are high.

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

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

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

12.2.2 Other settings

► For operation with and without buffer cylinder, observe chapter "Operation / Menu structure / Menu SETTINGS / STANDARD SETTING / BUFFER OPERATION" in the operating and installation instructions of the WPM.

When using the heat-up program

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

► Initially set parameter "DUAL MODE TEMP HZG" to 30 °C.

► The set parameter "LOWER APP LIMIT HZG" to 30 °C.

Note
Following the heat-up process, return parameters "DUAL MODE TEMP HZG" and "LOWER APP LIMIT HZG" to their default values or to system values.

12.3 Operation and control

Material losses
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.

The system does not have to be switched off in summer. The WPM 3 has an automatic summer/winter changeover.

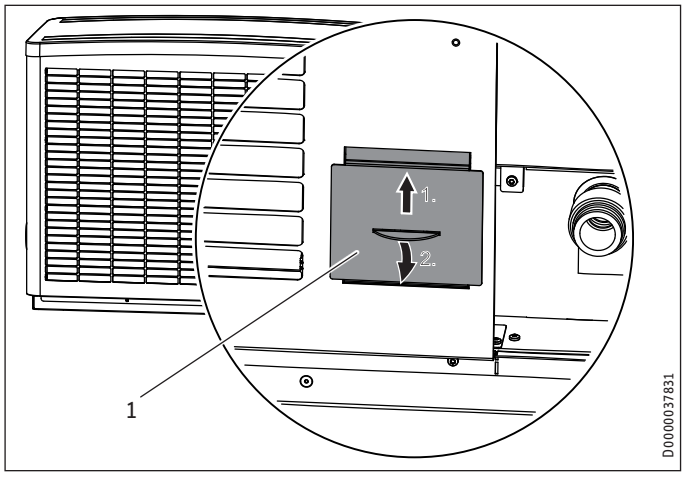
12.4 Decommissioning

If the appliance is to be taken out of use, set the WPM 3 to standby. This retains the safety functions designed to protect the system (e.g. frost protection).

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

13. Maintenance

Check the condensate drain (visual inspection). Remove contaminants and blockages immediately.



1 Inspection port

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

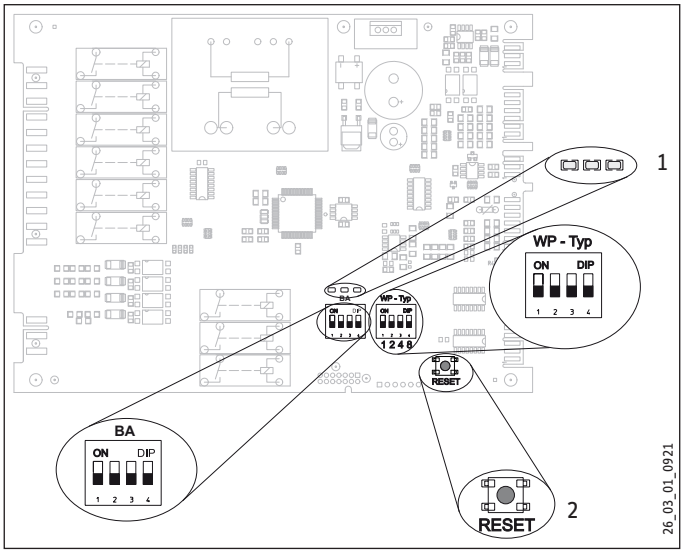
Regularly remove all leaves and accumulated dirt from the evaporator fins, which can be accessed by removing the side panel on the condenser side.

14. Troubleshooting

Note
Observe the heat pump manager operating and installation instructions (WPM 3).

If a fault cannot be located during service using the heat pump manager, open the control panel in emergencies and check the IWS settings. This check must only be carried out by a qualified contractor.

14.1 Light emitting diodes (LEDs)



1 LEDs
2 Reset button

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

LED indicator	Meaning
Red LED flashes	Single fault. Appliance stops and restarts after 10 minutes, and 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. The internal fault counter will then be reset. 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 3 is active.

Faults indicated by the red LED:

- High pressure fault
- Low pressure fault
- Other fault and
- Hardware fault on the IWS (see fault list)

14.2 Reset button

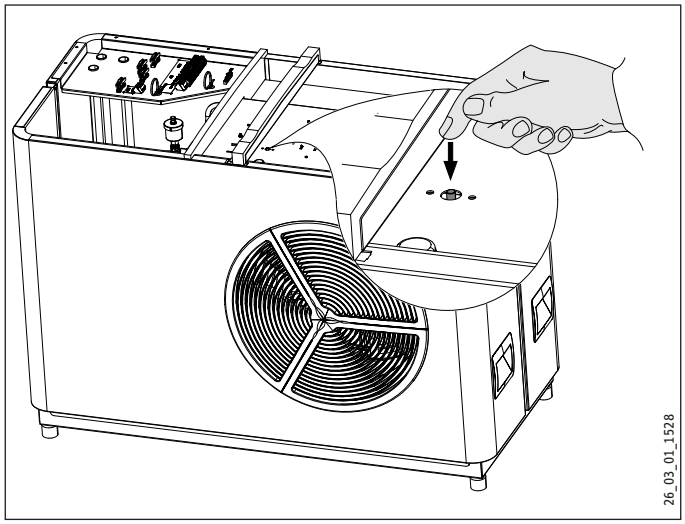
If the IWS was not initialised successfully, you can reset the settings with this button.

- ▶ For this also observe the chapter "Reinitialising IWS" in the heat pump manager operating and installation instructions.

14.3 Resetting the high limit safety cut-out

The electric emergency/booster heater stops if the heating water temperature exceeds 85 °C, for example on account of a low flow rate.

- ▶ Check whether the high limit safety cut-out has tripped.
- ▶ Remove the cause of the fault.



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

14.4 Fan noise

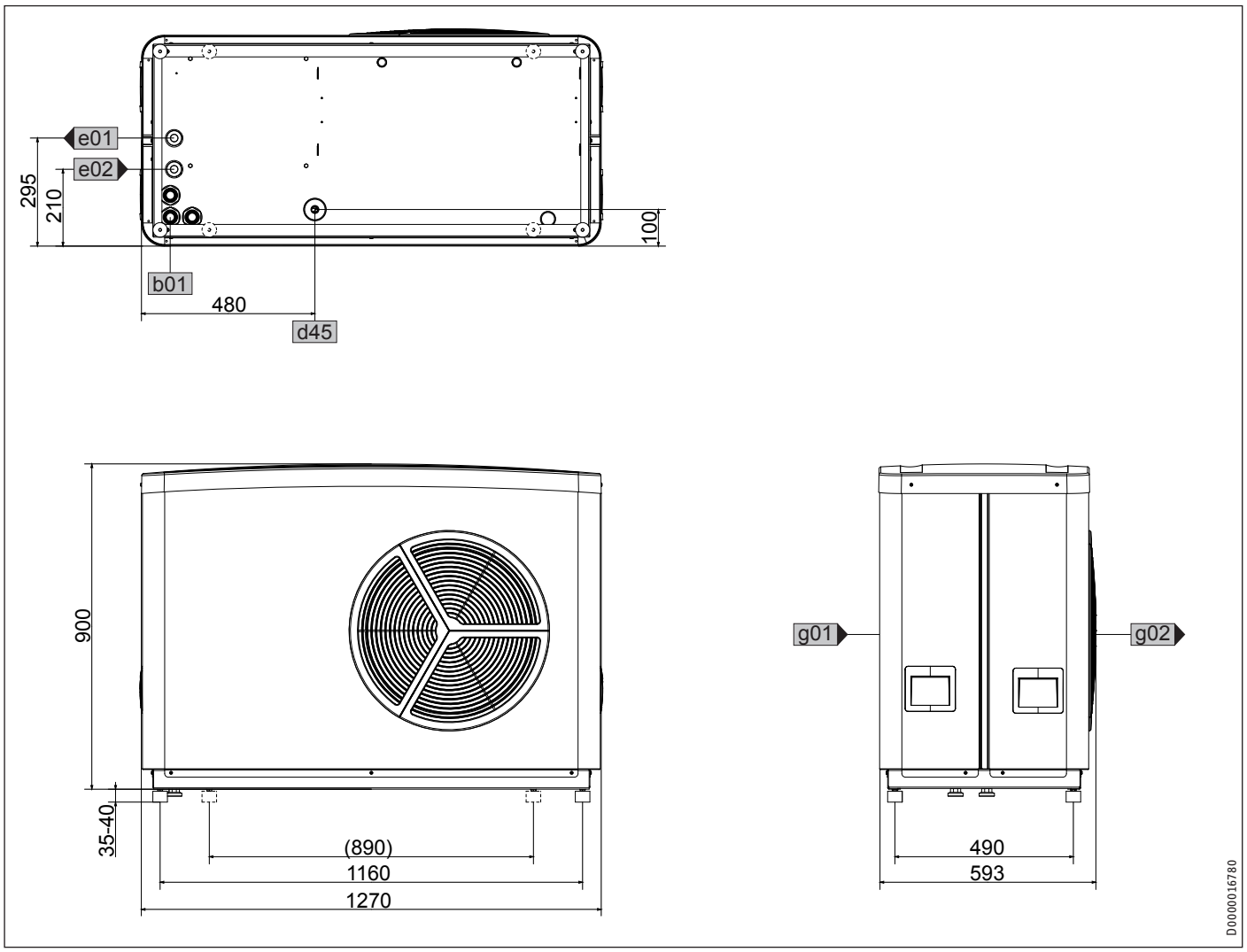
The heat pump draws heat from the outdoor air. This causes the outdoor air to cool down. At outside temperatures of 0 °C to 8 °C, the air may be cooled to below freezing point. If under these conditions precipitation occurs in the form of rain or fog, ice may form on the air grille, the fan blades or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

How to remedy rhythmic scratching or grinding noises:

- ▶ Check whether the condensate drain is clear of obstructions.
- ▶ Carry out a manual defrost, repeatedly if required, until the fan runs free again.
- ▶ At outside temperatures above + 1 °C, switch the appliance off for around 1 hour or switch it over to emergency mode. After this, the ice should have melted.
- ▶ Check whether the appliance is installed in line with the installation conditions.
- ▶ If the noises occur frequently, notify customer support.

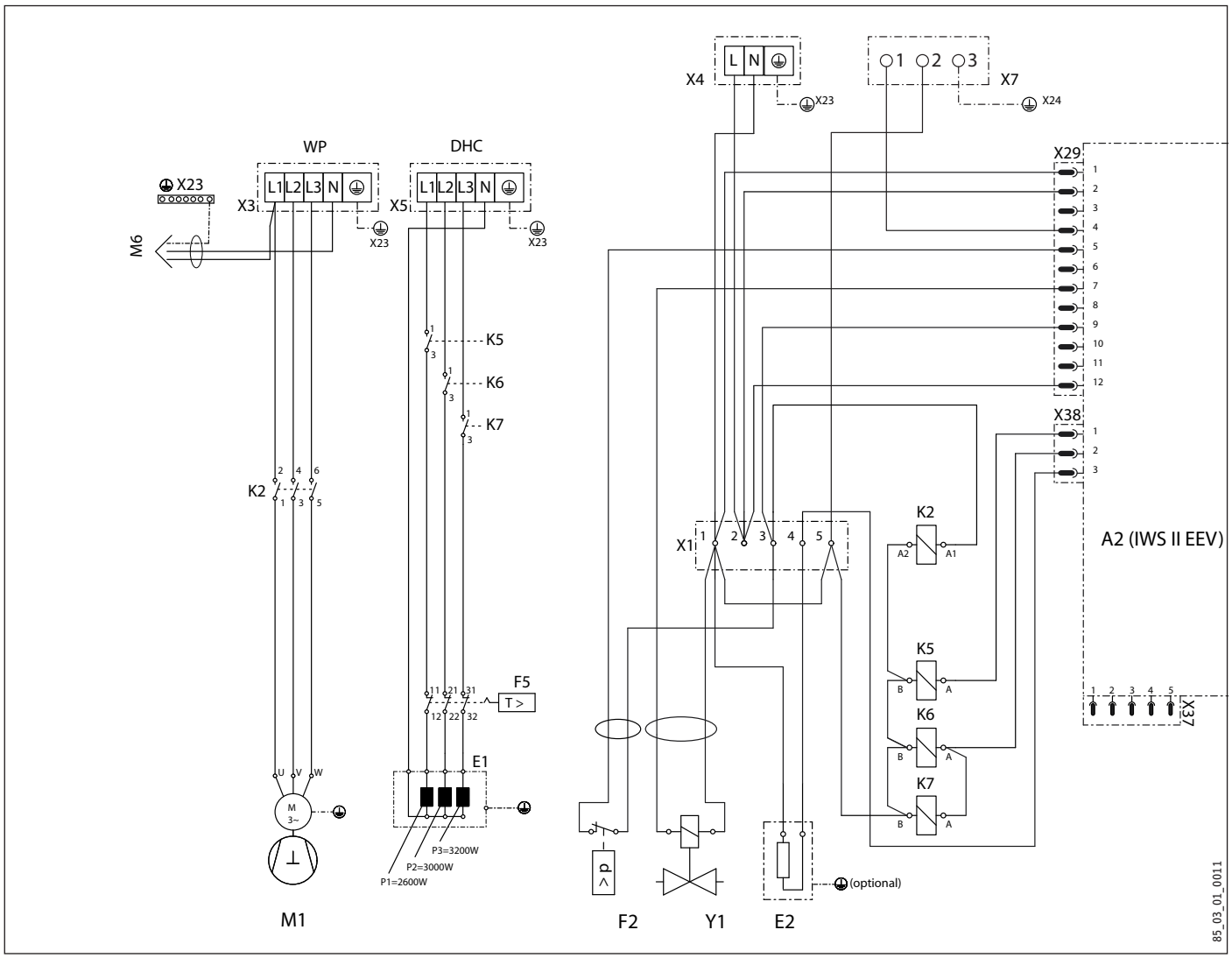
15. Specification

15.1 Connection dimensions and variations

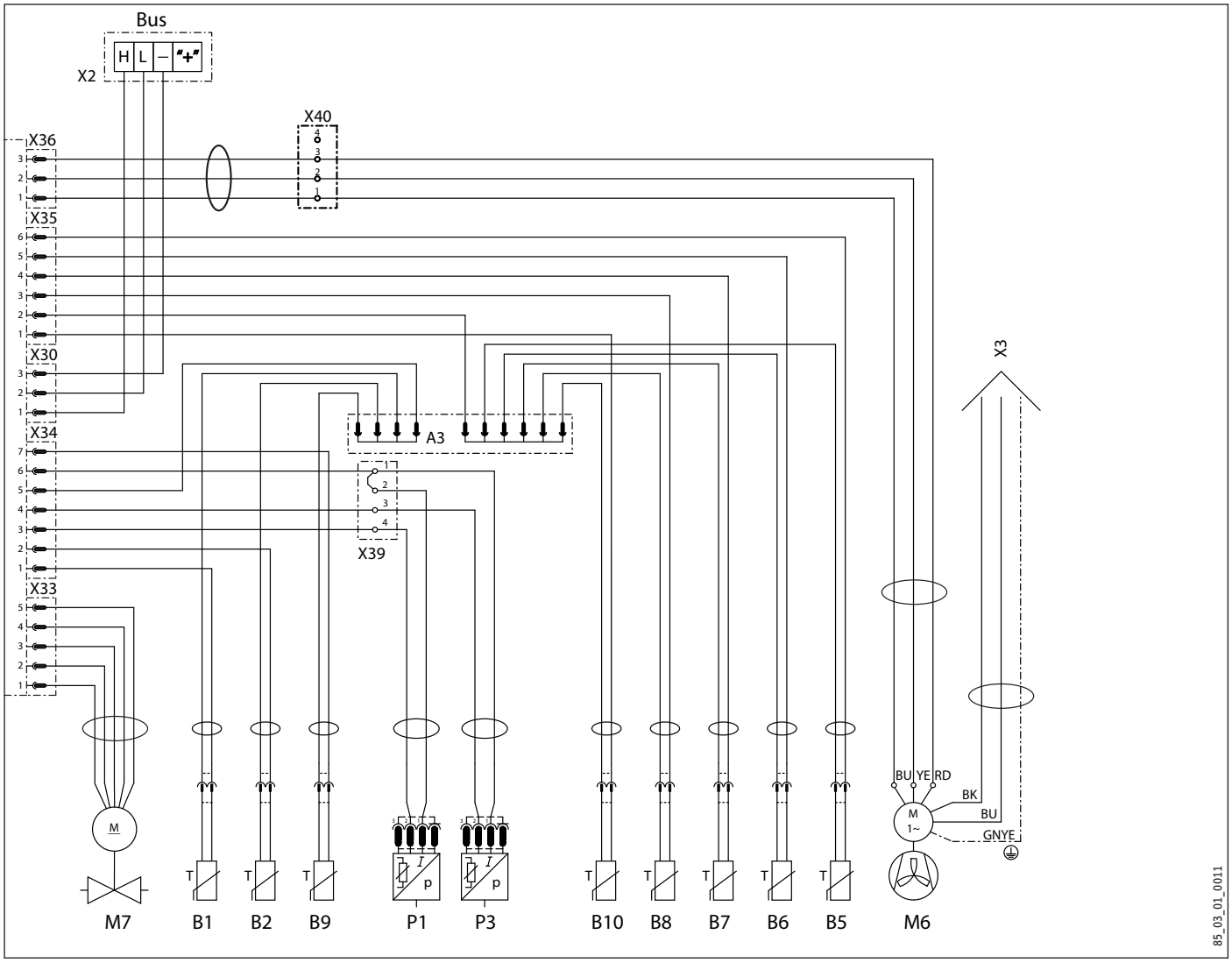


				WPL 10 AC	WPL 10 ACS
b01	Entry electrical cables				
d45	Condensate drain	Diameter	mm	22	22
e01	Heating flow	Male thread		G 1 1/4	G 1 1/4
e02	Heating return	Male thread		G 1 1/4	G 1 1/4
g01	Air intake				
g02	Air discharge				

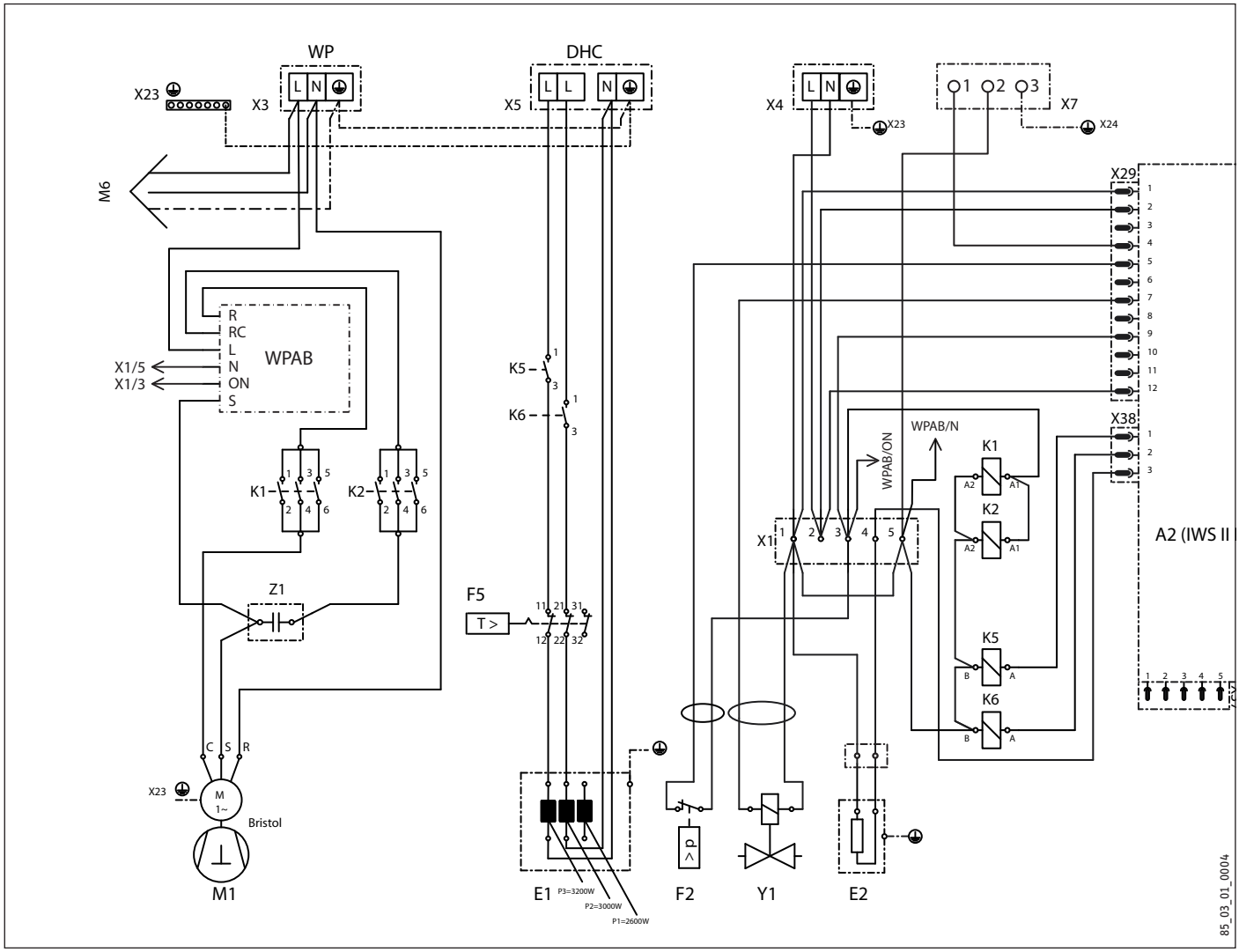
15.2 Wiring diagram WPL 10 AC (three-phase)



A2 Integral heat pump control unit IWS
A3 Junctions PCB, earth temperature sensor
B1 Heat pump flow temperature sensor - KTY
B2 Heat pump return temperature sensor - KTY
B5 Hot gas temperature sensor - KTY
B6 Intake air temperature sensor - PT1000
B7 Compressor intake temperature sensor - PT1000
B8 Evaporator discharge temperature sensor - PT1000
B9 Frost protection temperature sensor - KTY
B10 Discharge air temperature sensor - PT1000
E1 Electric emergency/booster heater (DHC)
E2 Oil sump heater
F2 High pressure switch
F5 High limit safety cut-out for DHC
K2 Contactor, compressor start
K5 Instantaneous water heater relay
K6 Instantaneous water heater relay
K7 Instantaneous water heater relay
M1 Compressor motor
M6 Fan motor
M7 Stepper motor for electric Expansion valve
P1 High pressure sensor
P3 Low pressure sensor
X1 Terminal
X2 LV terminal
X3 Power supply
X4 Control terminal
X5 DHC terminal
X7 Ribbon heater terminal
X23 Power supply earth block
X29 12-pin IWS plug - control unit
X30 3-pin IWS plug - BUS
X33 5-pin IWS plug - expansion valve
X34 7-pin IWS plug - sensors
X35 6-pin IWS plug - temperature sensors
X36 3-pin IWS plug - fan
X37 3-pole IWS plug - el. Injection valve
X38 3-pin IWS plug - DHC
X39 Pressure sensor terminal
Y1 Diverter valve


Bus
H
L
–
"+"
X2
X40
X36
X35
X30
X34
X33
A3
X39
X3
M
M7
B1
B2
B9
P1
P3
B10
B8
B7
B6
B5
M6
BU
YE
RD
BK
BU
GNYE
M
1~
T
I
p
85_03_01_0011

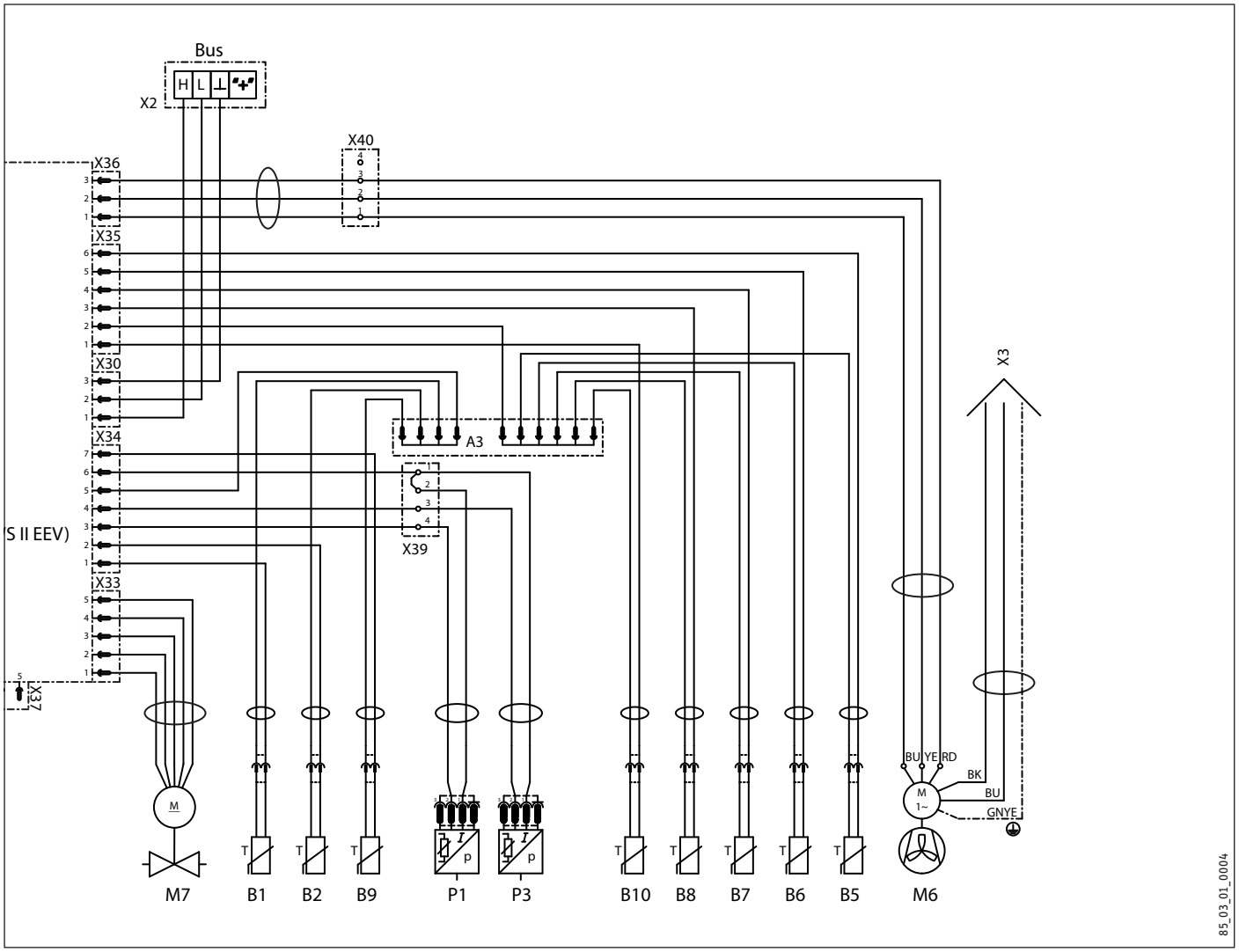
15.3 Wiring diagram WPL 10 ACS (single phase)



A2 Integral heat pump control unit IWS
A3 Junctions PCB, earth temperature sensor
B1 Heat pump flow temperature sensor - KTY
B2 Heat pump return temperature sensor - KTY
B5 Hot gas temperature sensor - KTY
B6 Intake air temperature sensor - PT1000
B7 Compressor intake temperature sensor - PT1000
B8 Evaporator discharge temperature sensor - PT1000
B9 Frost protection temperature sensor - KTY
B10 Discharge air temperature sensor - PT1000
E1 Electric emergency/booster heater (DHC)
E2 Oil sump heater
F2 High pressure switch
F5 High limit safety cut-out for DHC
K1 Contactor, compressor start
K2 Contactor, compressor start
K5 Electric emergency/booster heater relay
K6 Electric emergency/booster heater relay
K7 Electric emergency/booster heater relay
M1 Compressor motor
M6 Fan motor
M7 Stepper motor for electric Expansion valve
P1 High pressure sensor
P3 Low pressure sensor

X1 Terminal
X2 LV terminal
X3 Power supply
X4 Control terminal
X5 DHC terminal
X7 Ribbon heater terminal
X23 Power supply earth block
X29 12-pin IWS plug - control unit
X30 3-pin IWS plug - BUS
X33 5-pin IWS plug - expansion valve
X34 7-pin IWS plug - sensors
X35 6-pin IWS plug - temperature sensors
X36 3-pin IWS plug - fan
X37 3-pole IWS plug - el. Injection valve
X38 3-pin IWS plug - DHC
X39 Pressure sensor terminal
Y1 Diverter valve
Z1 Run capacitor, compressor

WPAB Softstart

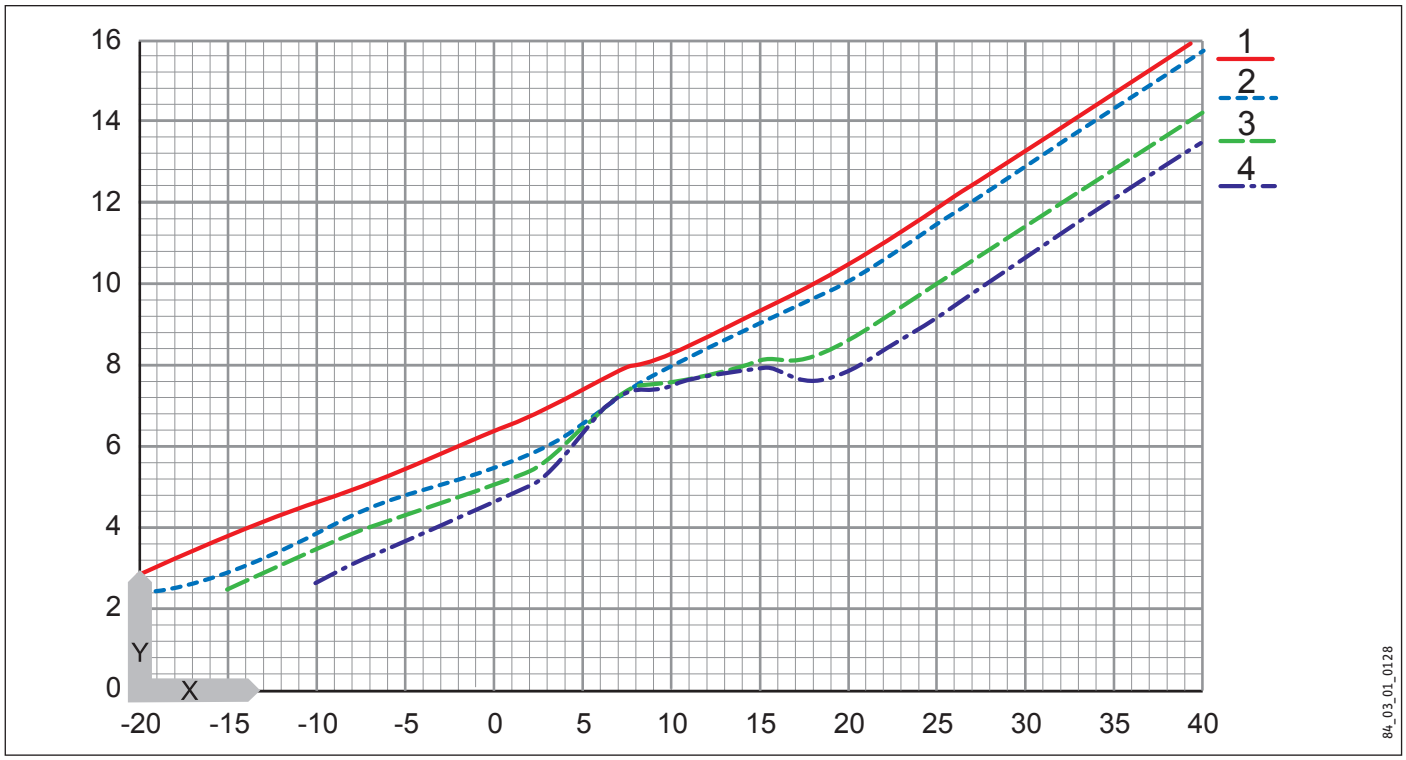

Bus
X2
H
L
X40
X36
X35
X30
X34
X33
X37
A3
X39
X3
S II EEV)
M
M7
B1
B2
B9
P1
P3
B10
B8
B7
B6
B5
M6
BU YE RD
BK
BU
GNYE
M
1~
85_03_01_0004

15.4 Output diagrams, heating WPL 10 AC

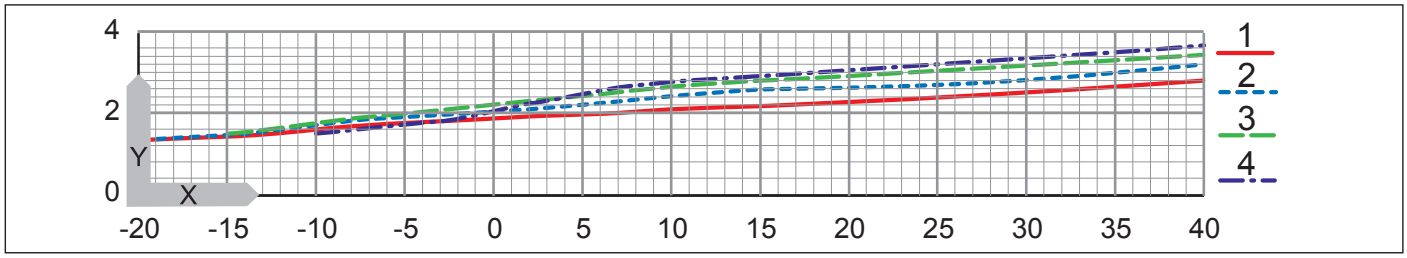
Key to output diagrams

X Inlet temperature of the heat source medium [°C]
Y Heating output [kW] | Power consumption [kW] | Coefficient of performance ε [-]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C
4 Flow temperature 60 °C

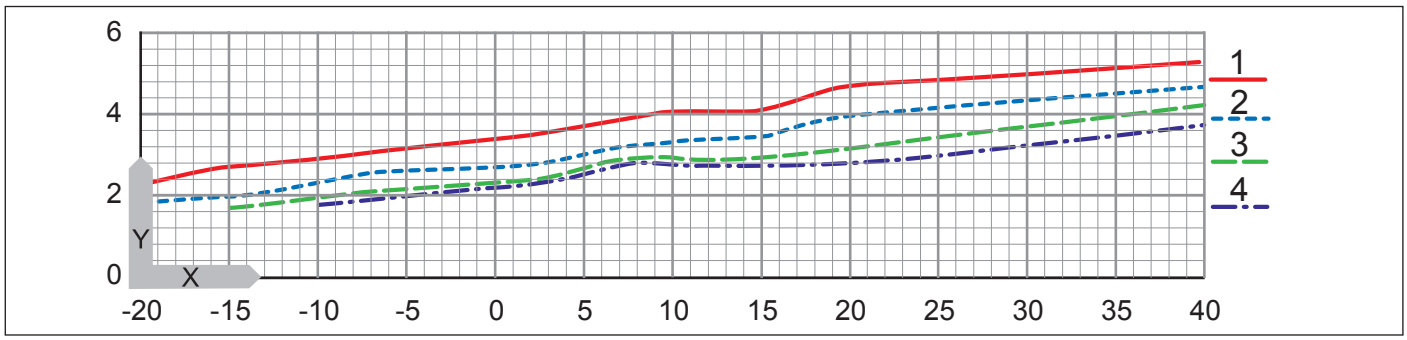
Heating output



Power consumption



Coefficient of performance (COP)

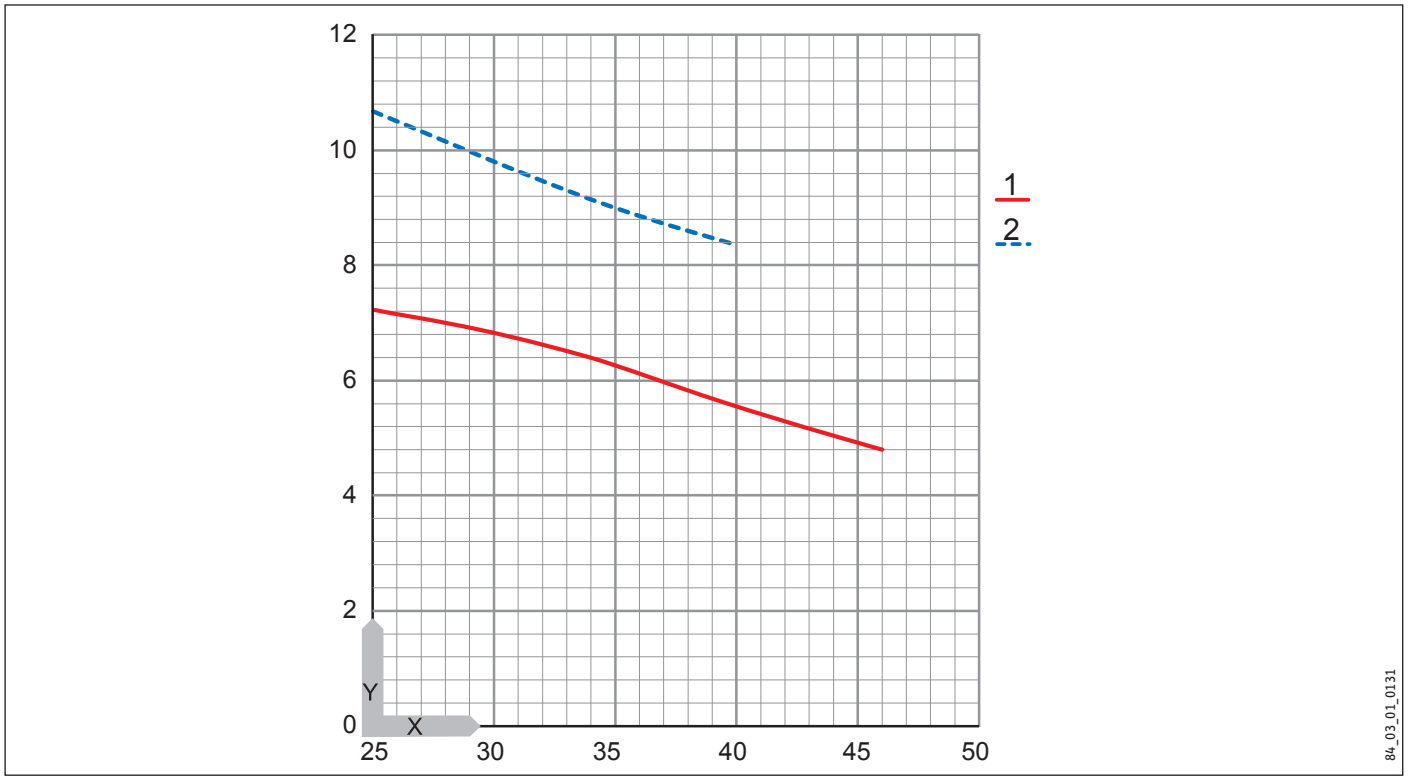


15.5 Output diagrams, cooling WPL 10 AC

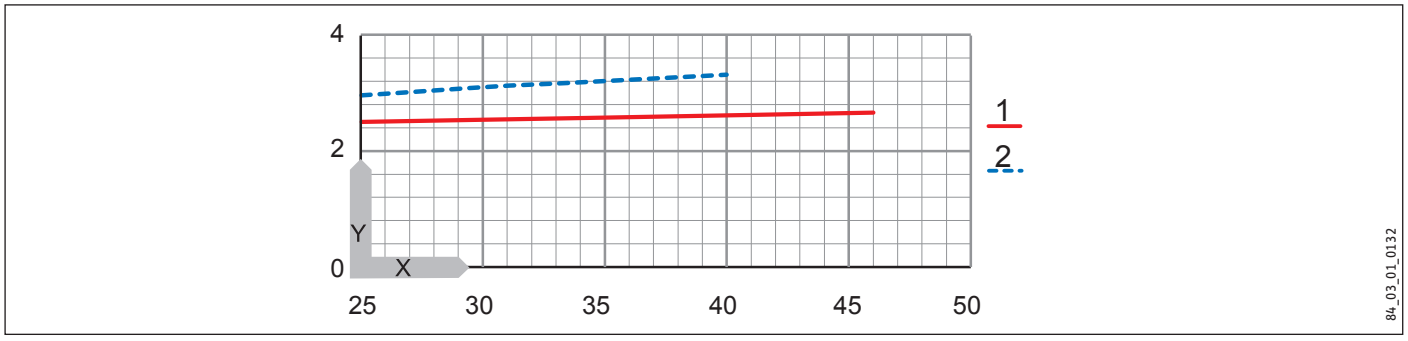
Key to output diagrams

X Inlet temperature of the heat source medium [°C]
Y Cooling capacity [kW] | Power consumption cooling [kW] | Coefficient of performance cooling ε [-]
1 Flow temperature +7 °C
2 Flow temperature +18 °C

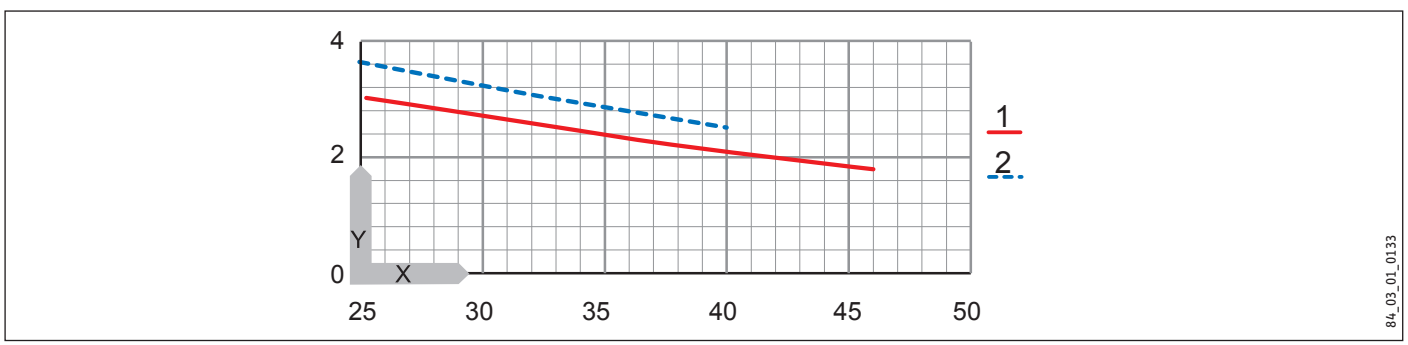
Cooling capacity



Power consumption



Coefficient of performance (COP)

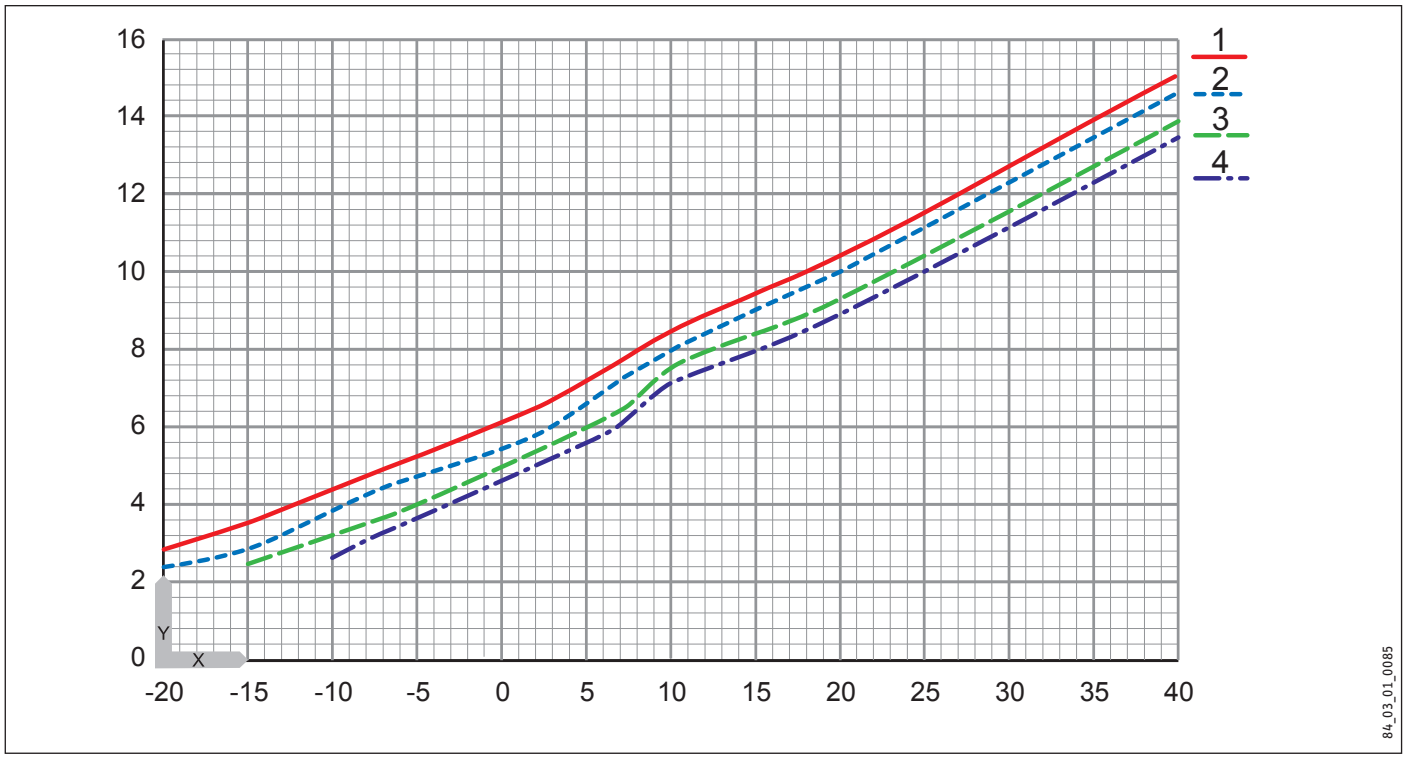


15.6 Output diagrams, heating WPL 10 ACS

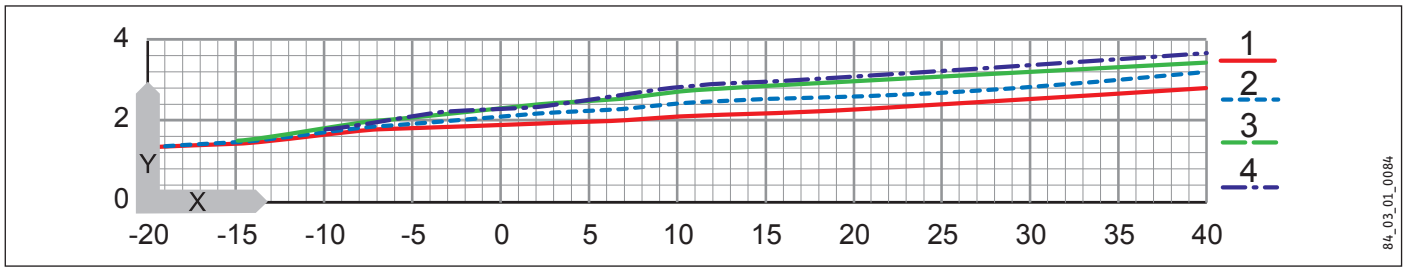
Key to output diagrams

X Inlet temperature of the heat source medium [°C]
Y Heating output [kW] | Power consumption [kW] | Coefficient of performance ε [-]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C
4 Flow temperature 60 °C

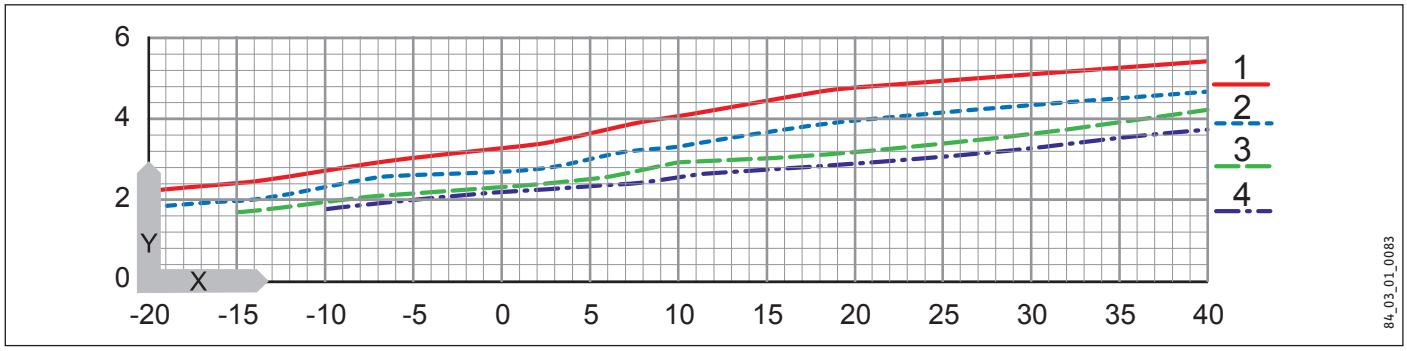
Heating output



Power consumption



Coefficient of performance (COP)

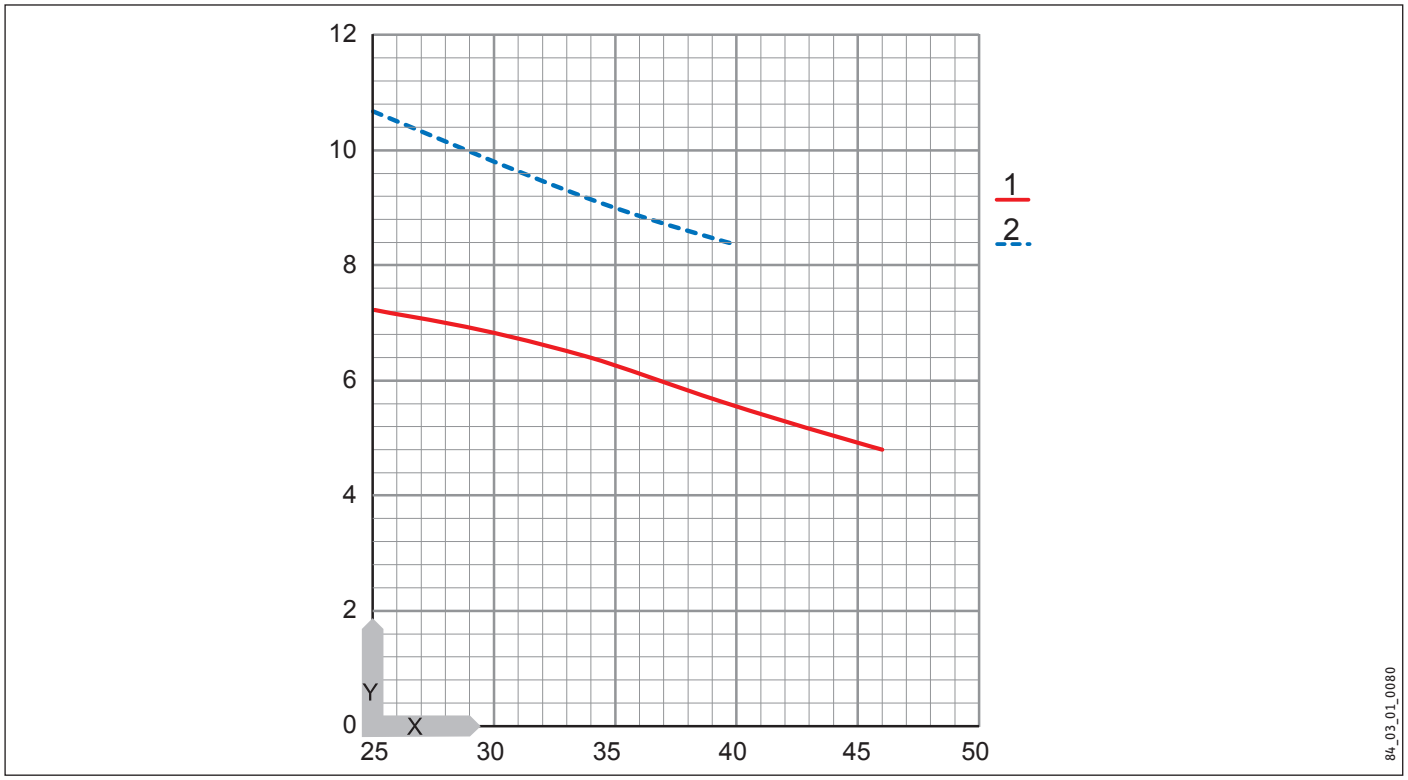


15.7 Output diagrams, cooling WPL 10 ACS

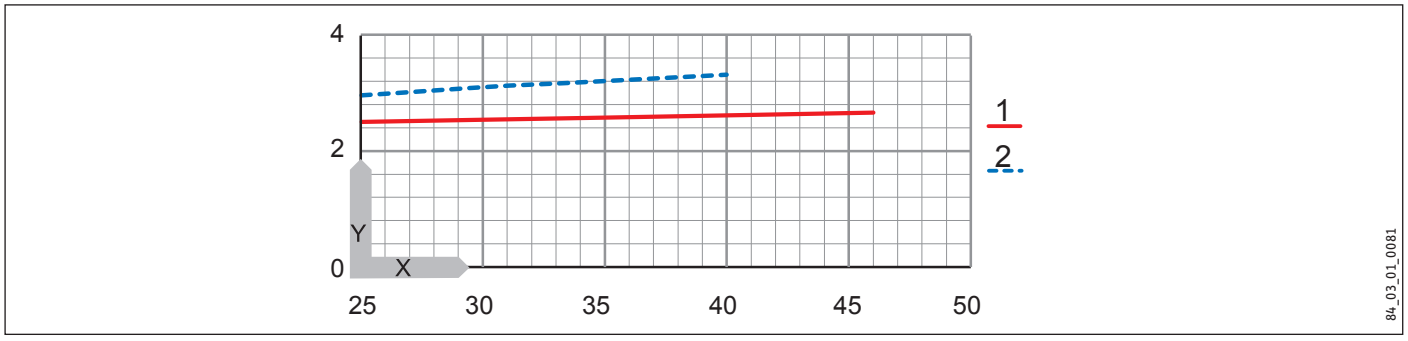
Key to output diagrams

X Inlet temperature of the heat source medium [°C]
Y Cooling capacity [kW] | Power consumption cooling [kW] | Coefficient of performance cooling ε [-]
1 Flow temperature +7 °C
2 Flow temperature +18 °C

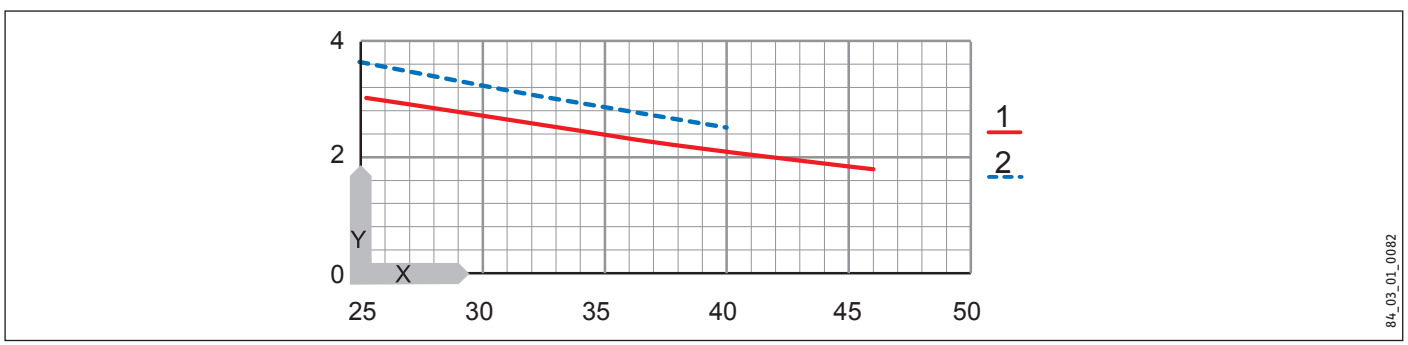
Cooling capacity



Power consumption



Coefficient of performance (COP)



15.8 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 10 AC	WPL 10 ACS
		230236	227995
Heating output			
Heating output at A10/W35 (EN 14511)	kW	8.29	8.49
Heating output at A7/W35 (EN 14511)	kW	7.83	7.72
Heating output at A2/W35 (EN 14511)	kW	6.74	6.53
Heating output at A-7/W35 (EN 14511)	kW	5.11	4.94
Heating output at A7/W45 (EN 14511)	kW	7.26	7.22
Heating output in silent mode at A-7/W35 max.	kW	4.85	4.69
Cooling capacity at A35/W7	kW	6.22	6.39
Cooling capacity at A35/W18	kW	9.12	9.31
Power consumption			
Power consumption at A10/W35 (EN 14511)	kW	2.06	2.11
Power consumption at A7/W35 (EN 14511)	kW	2.03	2.05
Power consumption at A2/W35 (EN 14511)	kW	1.92	1.94
Power consumption at A-7/W35 (EN 14511)	kW	1.67	1.73
Power consumption at A7/W45 (EN 14511)	kW	2.25	2.26
Power consumption, cooling at A35/W18	kW	3.16	3.26
Power consumption, cooling at A35/W7	kW	2.56	2.61
Power consumption, emergency/booster heater	kW	8.8	6.2
Power consumption, fan heating max.	kW	0.11	0.11
Coefficient of performance			
COP at A10/W35 (EN 14511)		4.02	4.02
COP at A7/W35 (EN 14511)		3.86	3.77
COP at A2/W35 (EN 14511)		3.51	3.37
COP at A-7/W35 (EN 14511)		3.06	2.86
COP at A7/W45 (EN 14511)		3.22	3.19
Cooling capacity factor at A35/W18		2.95	2.86
Sound data			
Sound power level outdoor installation (EN 12102)	dB(A)	59	59
Sound pressure level at 5 m distance in a free field	dB(A)	37	37
Sound pressure level at 10 m distance in a free field	dB(A)	31	31
Max. sound power level, silent mode	dB(A)	57	57
Application limits			
Min. application limit on the heating side	°C	15	15
Max. application limit on the heating side	°C	60	60
Min. application limit, heat source	°C	-20	-20
Max. application limit, heat source	°C	40	40
Water hardness	°dH	≤3	≤3
pH value (with aluminium compounds)		8.0-8.5	8.0-8.5
pH value (without aluminium compounds)		8.0-10.0	8.0-10.0
Chloride	mg/l	<30	<30
Conductivity (softening)	µS/cm	<1000	<1000
Conductivity (desalination)	µS/cm	20-100	20-100
Oxygen 8-12 weeks after filling (softening)	mg/l	<0.02	<0.02
Oxygen 8-12 weeks after filling (desalination)	mg/l	<0.1	<0.1
Energy data			
Energy efficiency class		A+/A+	A+/A+
Electrical data			
Starting current (with/without starting current limiter)	A	25/39	26/-
Compressor fuse/MCB	A	C16	C25
MCB/fuse protection, emergency/booster heater	A	B16	B 35
MCB/fuse protection, controller	A	B16	B16
Frequency	Hz	50	50
Rated voltage, compressor	V	400	230
Rated voltage, emergency/booster heater	V	400	230
Rated voltage, controller	V	230	230
Phases, compressor		3/N/PE	1/N/PE
Phases, controller		1/N/PE	1/N/PE
Phases, emergency/booster heater		3/N/PE	1/N/PE

Specification

		WPL 10 AC	WPL 10 ACS
Versions			
Refrigerant		R407 C	R407 C
Refrigerant charge	kg	2.5	2.5
Flow/return connection		G 1 1/4 A	G 1 1/4 A
Defrost type		Circuit reversal	Circuit reversal
IP rating		IP14B	IP14B
Frost protection		X	X
Dimensions			
Height	mm	900	900
Width	mm	1270	1270
Depth	mm	593	593
Weights			
Weight	kg	120	120
Values			
Flow rate on the heating side	m³/h	1.4	1.4
Min heating flow rate	m³/h	0.7	0.7
Flow rate, heat source side	m³/h	2300	2300
Internal pressure differential	hPa	180	180

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 | R407C

This device is filled with refrigerant R407C.

Refrigerant R407C is a CFC greenhouse gas mentioned in the Kyoto protocol with a global greenhouse potential (GWP) = 1653.

Never release refrigerant R407C to atmosphere.

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Stand 9147

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