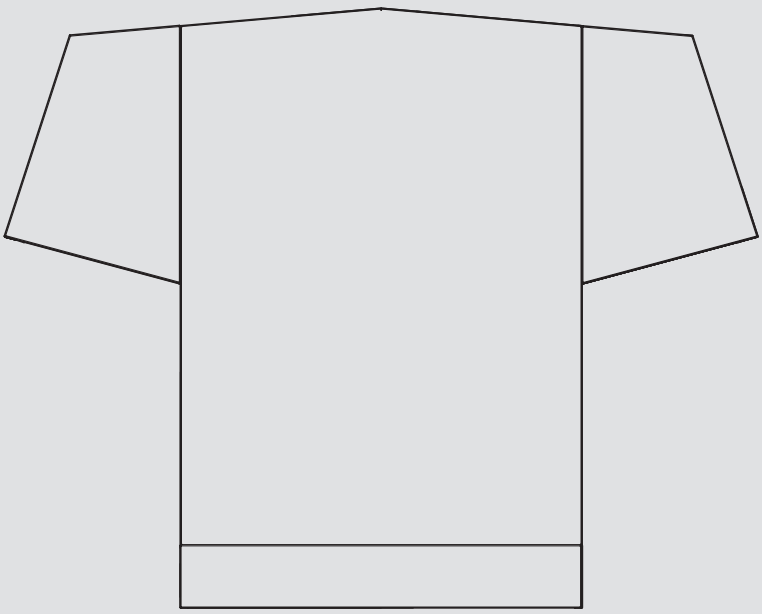
OPERATION AND INSTALLATION

Air source heat pump

» WPL 47
» WPL 57



STIEBEL ELTRON

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SPECIAL INFORMATION

- The appliance may be used by children over 8 years of age and persons with reduced physical, sensory or mental capabilities or a lack of experience and expertise, provided that they are supervised or they have been instructed on how to use the appliance safely and have understood the potential risks. Children must never play with the appliance. Cleaning and user maintenance must not be carried out by children without supervision.
- The connection to the power supply must be in the form of a permanent connection. Ensure the appliance can be separated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation.
- 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 a regular inspection (to establish the current condition of the system), and maintenance by a qualified contractor if required (to return the system to its intended condition).
- Keep the air discharge and inlet apertures free from snow and leaves.
- Check regularly whether water collects beneath the appliance.
- Ensure that the refrigerant circuit is tested once a year for leaks, in accordance with EC DIRECTIVE 517/2014. The tightness test must be documented in the log.
- 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.
- There is no need to shut the system down in summer. The heat pump manager has an automatic summer / winter changeover.
- If the heat pump is completely switched OFF and there is a risk of frost, drain the system on the water side.

OPERATION

1. General information

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

The chapter "Installation" is intended for qualified contractors.

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

1.1 Other applicable documents

- Instructions for the WPM heat pump manager
- Operating and installation instructions for system components

1.2 Safety instructions

1.2.1 Structure of safety instructions

KEYWORD Type of risk
Here, possible consequences are listed that may result from failure to observe the safety instructions.
▶ Steps to prevent the risk are listed.

1.2.2 Symbols, type of risk

Symbol	Type of risk
	Injury
	Electrocution

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 Standard: EN 14511

The output data specifically mentioned in text, diagrams and technical datasheet has been determined in line with the test conditions specified in the standard shown in the heading of this chapter.

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 the selected method deviates from the conditions specified in the standard shown in the heading of this chapter, any deviations can have a considerable impact. 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.

A confirmation of the specified output data can only be obtained if the conditions applicable to the relevant test match those of the standard shown in the heading of this chapter.

2. Safety

2.1 Intended use

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

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

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

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 ingress 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. Cleaning and user maintenance must not be carried out by children without supervision.

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 60 °C.

Operational characteristics:

- Suitable for underfloor and radiator heating systems.
- Heat pump operates most efficiently on a low-temperature heating system.
- Still extracts heat from the outdoor air at - 20 °C outside temperature.
- Corrosion-protected, external casing made from galvanised sheet steel plus powder-coated 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.

Note
The WPL 57 features a silent mode. Silent mode enables the heat pump noise emissions to be reduced.
- Silent program 1 reduces the fan speed.
- Silent program 2 switches the heat pump off. Heating will [then] be provided by the internal or external second heat source. This results in higher electricity bills.

▶ Where required, set silent mode in the heat pump manager.

3.2 Function

Heat is extracted from the outdoor air via the heat exchanger (evaporator) on the air side. The now evaporated refrigerant is compressed with 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 via a hose.

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.

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 water temperature may be a maximum of 60 °C.

4. Operation

Operation is exclusively controlled via the 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, must only be carried out by a qualified contractor.

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

- ▶ A damp cloth is sufficient for cleaning all plastic and sheet metal parts. Never use abrasive or corrosive cleaning agents.
- ▶ To prevent insects or small animals from nesting in the appliance, keep the area around and under it clean.

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

- ▶ Check regularly whether water collects beneath the appliance.
- ▶ In the event of water collecting beneath the appliance, call a qualified contractor to have the condensate drain cleaned out.

Note
Once per year, the refrigerant circuit must be tested for leaks in accordance with the EC Directive 517/2014.
The tightness test must be documented in the log.

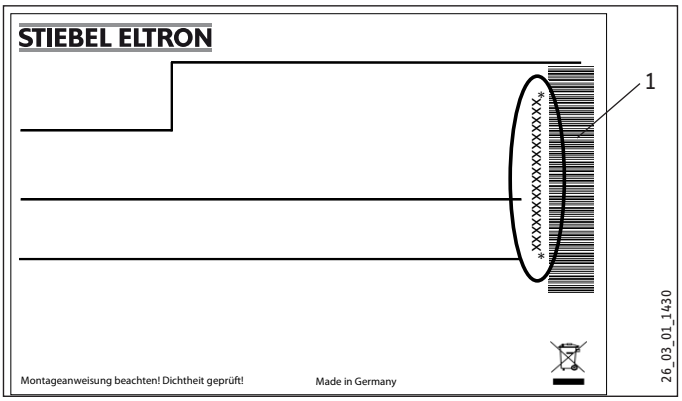
6. Troubleshooting

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 fuse box / 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.	Call your qualified contractor to have the condensate drain cleaned out.
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.
Condensate is collecting on the outside of the appliance.	The heat pump is extracting 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.	
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, expect water to drip from the appliance onto the floor.

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 (000000-0000-000000). The type plate is located at the front top, on the right or left-hand side of the casing.

Example



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.

8. Appliance description

For outdoor installation the appliance offers additional frost protection of the heating water pipes. The integral frost protection circuit starts the circulation pump in the heat pump circuit automatically at +8 °C condenser temperature, and thereby ensures circulation in all water-filled sections. The heat pump is started automatically no later than when the temperature inside the buffer cylinder drops below +5 °C.

8.1 Standard delivery

The casing components for the appliance are delivered in a separate pack.

8.1.1 Base unit

- Logbook
- Type plate
- Condensate drain hose
- Wiring diagram

8.1.2 Casing parts

- 2 Covers
- 4 Air deflector hoods
- 1 Front panel
- 1 Back panel
- 4 Side panels
- 4 Plinth trim

8.2 Required accessories

You require the following accessories to operate the heat pump:

- WPM heat pump manager
- Remote control for heating systems FE7
- Buffer cylinder
- Circulation pump, UP 30/1-8 PCV

8.3 Additional accessories

- Internet Service Gateway ISG
- WPE heat pump extension
- Contact sensor
- Immersion sensor

9. Preparation

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

▶ 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 main wind direction. Air should not be drawn in against the wind.

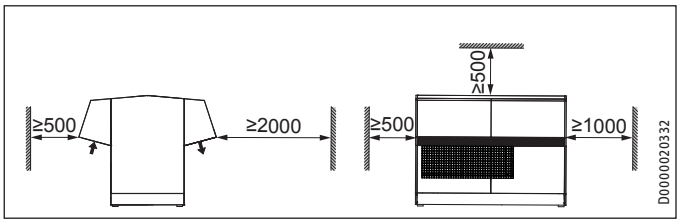
▶ Ensure that the air intake and air discharge are never directed towards noise-sensitive rooms of the house, e.g. bedrooms, or neighbouring houses.

▶ Avoid installation on large, echoing floor areas, e.g. tiled floors.

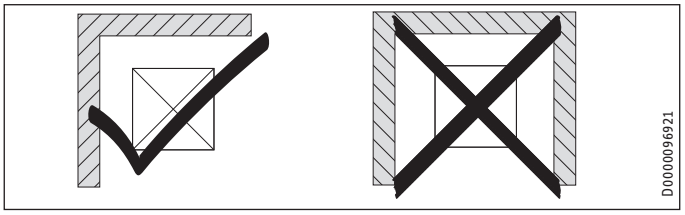
▶ Avoid installation between reflective building walls. Reflecting building walls can increase the noise level.

▶ If the appliance is installed on a roof and is indirect contact with the building structure, also install anti-vibration mounts.

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.

▶ In order to prevent air "short circuits", maintain the minimum clearances in the case of surrounding structures and in particular in the case of cascades. Maintain the flow rate on the heat source side (see chapter "Specification / data table").

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.

If the air discharge side of the appliance faces the wall of a house, the cool air from the air discharge may cause condensate to form on this wall.

Material losses
The air flow rate through the appliance must not fall below the minimum level. If the air flow rate falls below the minimum level, trouble-free operation of the appliance is not guaranteed.
▶ Ensure that the minimum air flow rate is maintained (see chapter "Specification / Data table").

9.3 Preparation of the installation site

WARNING Injury
The discharged cold air can cause condensation to be formed in the vicinity of the air discharge.
▶ **Ensure that no risk of slipping due to wet conditions or ice formation occurs on adjacent footpaths and driveways at low temperatures.**

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

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

▶ Select an installation location that will not be susceptible to insects or other small animals (e.g. mice) nesting in the appliance. The appliance may be damaged if insects or other small animals nest inside it.

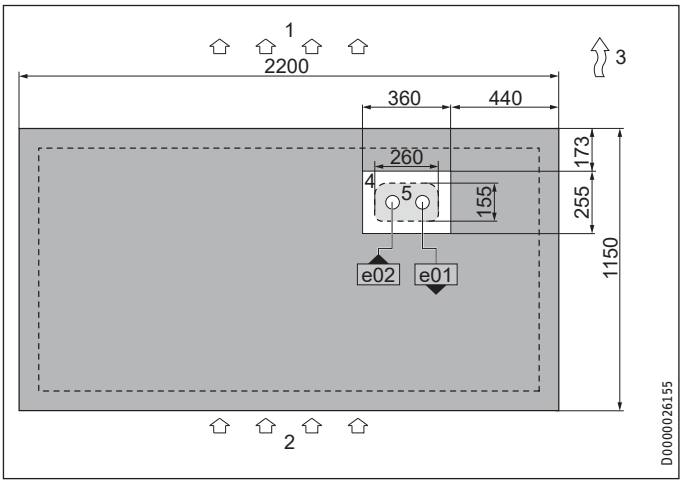
9.3.1 Installing the supply lines

WARNING Injury
▶ **Seal all supply line entries into the building to ensure that they are watertight.**

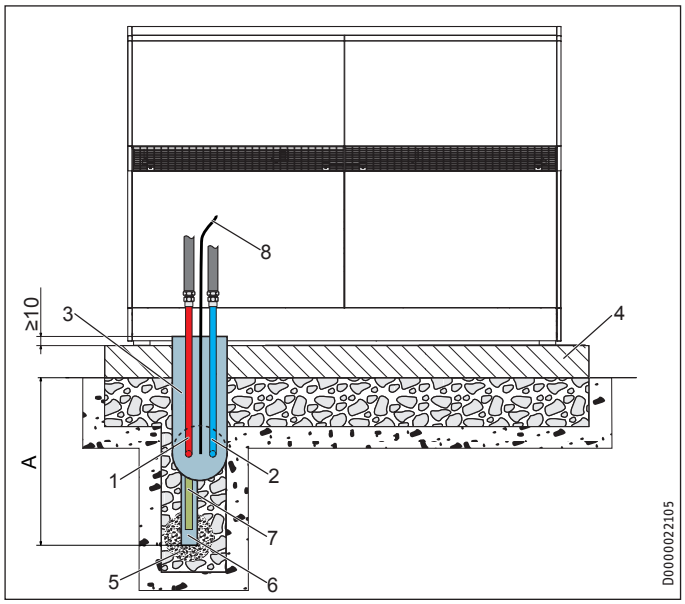
The supply lines are all electric cables plus the flow and return lines.
- To facilitate connection to the appliance, we recommend using flexible supply lines in the case of outdoor installation.
▶ Also protect all supply lines against humidity, damage and UV radiation by means of a conduit.
▶ Use only 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".

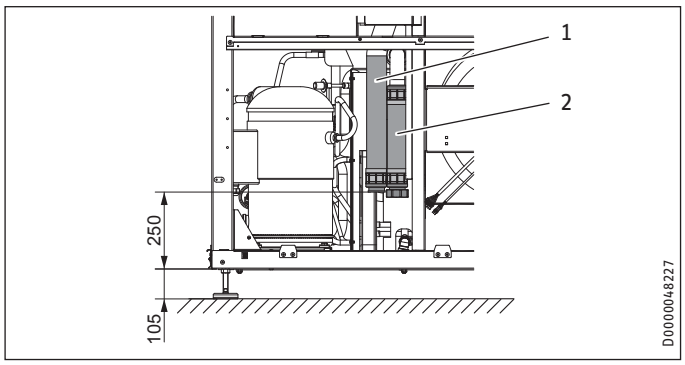
9.3.2 Foundations with recess



1 Air discharge
2 Air intake
3 Main wind direction
4 Entry supply lines
5 Knock-out inside the appliance
e01 "Heating flow" connection
e02 "Heating return" connection



A Depth of frost line
1 Heating flow
2 Heating return
3 Conduit for supply lines/cables
4 Foundation
5 Coarse gravel soakaway
6 Condensate drain conduit
7 Condensate drain
8 Electrical power cable



1 Heating flow
2 Heating return

9.4 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.

9.5 Buffer cylinder

The installation of a buffer cylinder is essential to ensure trouble-free operation of the appliance.

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.

9.6 Preparing the electrical installation

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

WARNING 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 using contactors, circuit breakers, fuses/MCBs, etc.

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

Material losses
Provide common fuses/MCBs for the appliance control cable and the heat pump manager.

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

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

Fuse protection	Assignment	Cable cross-section
B 16 A	Control	1.5 mm²
C 32 A	Compressor	10.0 mm² when routing in a wall.
		6.0 mm² when routing a multi-core line on a wall or in an electrical conduit on a wall.

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

10. Installation

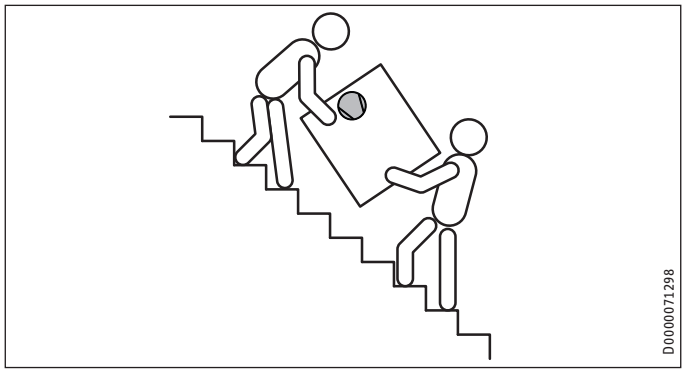
10.1 Transport

▶ 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.

Where space is restricted, you can also tilt the appliance at an angle to move it.



- 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 Siting

▶ Pay attention to the air discharge direction.

▶ Position the appliance on the prepared substrate.

▶ Level the appliance horizontally by adjusting the feet.

▶ Route the water pipes and electrical cables into the appliance from below through the knock-outs in the base.

Note
Do not fit the casing components until the electrical and hydraulic connections have been made.

10.3 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.

▶ Install a filling nozzle on site.

▶ Before connecting the heat pump, flush the pipework thoroughly with suitable water. Foreign bodies, such as rust, sand or sealant can impair the operational reliability of the heat pump.

▶ Connect the heat pump on the heating water side. Check for leaks.

▶ 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").

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.

10.4 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.

10.5 Filling the heating system

10.5.1 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 chlorine value in 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 or the pH value of the fill water is less than 8.2, check the pH value 8 to 12 weeks after installation, every time the system is topped up and the next time it is serviced.

▶ 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 (shutdown, 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 (20-40 % by vol.). 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.

MEG 10	Heat transfer medium as concentrate on an ethylene glycol base
MEG 30	Heat transfer medium as concentrate on an ethylene glycol base

10.5.2 Filling the heating system

▶ Fill the heating system via the filling nozzle installed on site.

▶ After filling the heating system, check the connections for leaks.

10.6 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.

10.7 Minimum flow rate

The minimum flow rate is set via the temperature differential of the buffer circuit.

▶ Set the buffer charging pump so that the value is equal to or lower than the maximum temperature differential. See the chart “Maximum temperature differential on the heating side with buffer cylinder”.

You can set the flow rate in heat pump mode. In order to do this, firstly make the following settings:

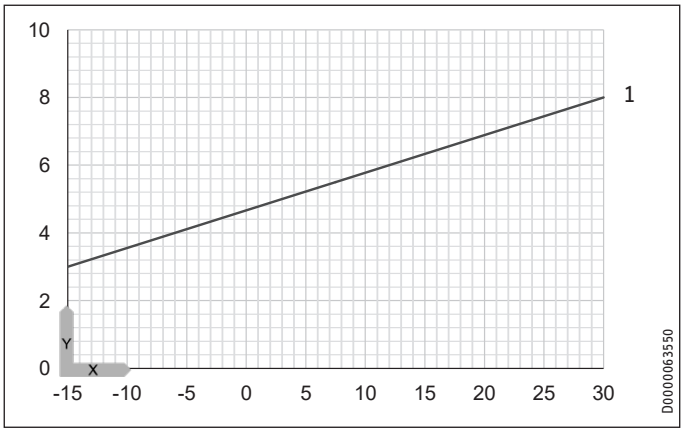
▶ Temporarily remove the fuse from the electric emergency/auxiliary heater to isolate the emergency/auxiliary heater from the power supply. Alternatively, switch OFF the second heat generator.

▶ Operate the appliance in heating mode.

▶ In the menu “SETTINGS / HEATING / STANDARD SETTING”, 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 differential 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 pump 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 pipe for the condensate drain is fitted at the factory to the defrost pan. The pipe terminates near the aperture on the floor plate. The appliance is supplied with a two meter hose with elbow plug-in fittings for draining the condensate.

- ▶ Secure the hose supplied on the pipe of the defrost pan.
- ▶ Channel the condensate into a drain or allow it to drain into a coarse gravel soakaway. Ensure the pipework is free from the risk of frost.

10.9 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).

10.10 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

11.1 General

Note
The leakage current of this appliance can be > 3.5 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.

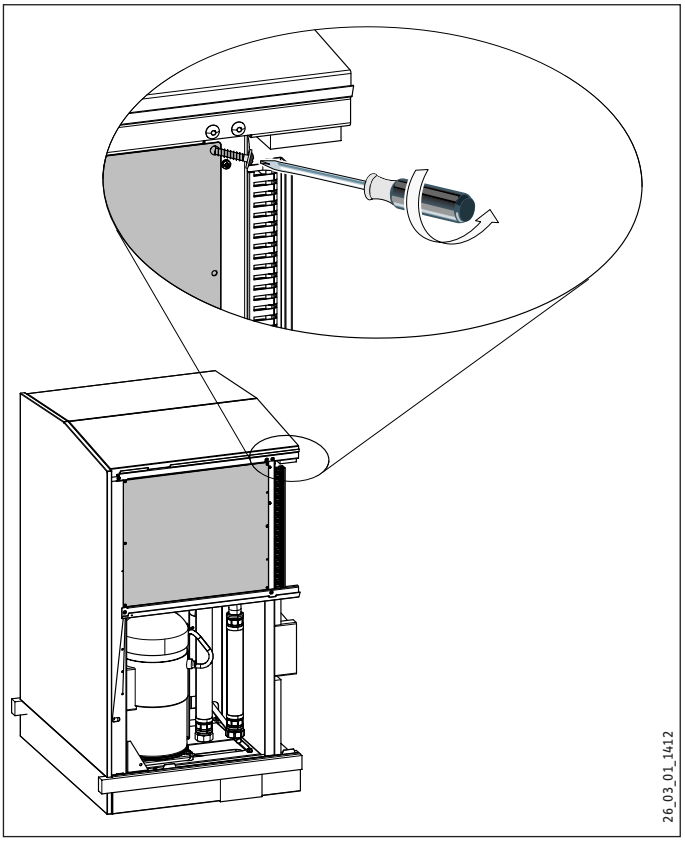
Permission to connect the appliance may need to be obtained from your local power supply utility.

11.2 Terminal box

WARNING Electrocution
Before carrying out any work, isolate the appliance and all associated terminals from the power supply at the control panel.

The terminal box is located on the air outlet side.

- ▶ Open the junction box as shown:

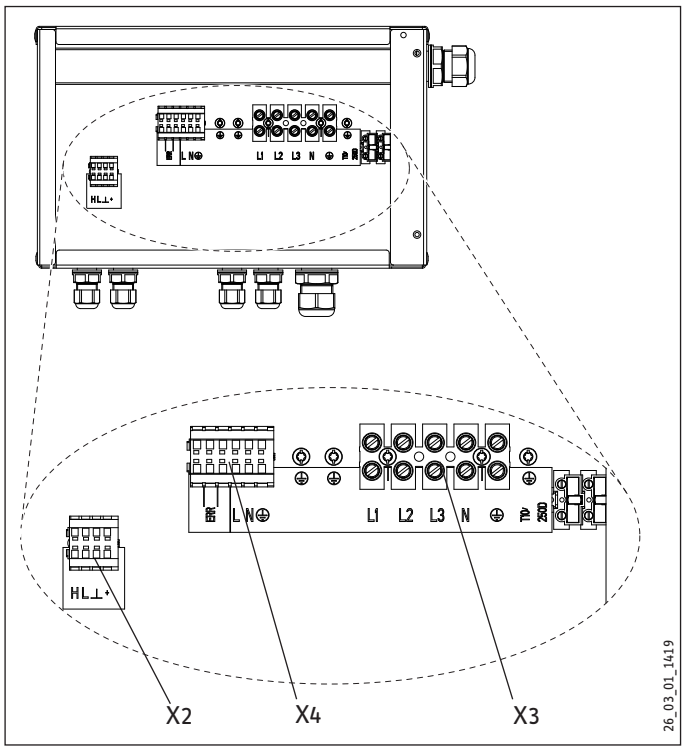


Note
The wiring diagram of the appliance is located behind the cover.

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

- ▶ Strip 10-11 mm of insulation from the wires of the electric cables for the compressor.
- ▶ Route the cables through the knock-out in the floor, through the cable trunking and upwards into the junction box.
- ▶ Route the electrical cables through the cable entries with strain reliefs.
- ▶ Connect the circulation pumps for the heating and buffer cylinder to the heat pump manager in accordance with the engineering documents.
- ▶ Check that the strain relief fittings are working as intended.

11.3 Electrical connections



X3	Compressor (HP)	
	L1, L2, L3, N, PE	Power supply
X2	Safety extra low voltage	
	H	Bus high
	L	BUS Low
	⊥	Bus earth
	+	BUS (is not connected)
X4	Control voltage	
	L, N, PE	Power supply
	ERR	Output signal fault

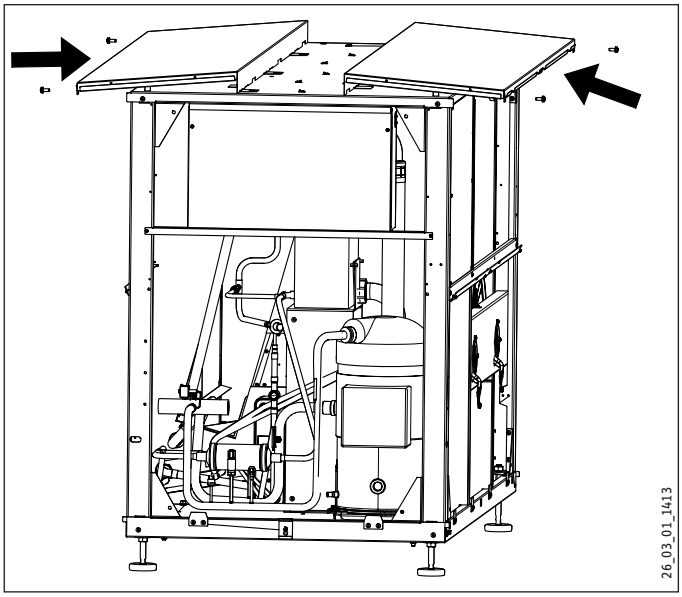
Note
The compressor in the appliance can only turn in one direction. If the appliance is not connected correctly, the compressor remains in operation for 30 seconds then switches off.
A message is displayed on the heat pump manager.
▶ In this case, change the direction of the rotating field by swapping two of the phases.

Note
The "ERR" output issues a 230 V signal for every appliance fault. The output passes the signal on to the external controller.
In the case of temporary faults, the output switches the signal through for a specific time.
In the case of faults that result in a permanent appliance shutdown, the output switches through permanently.

12. Fitting casing parts

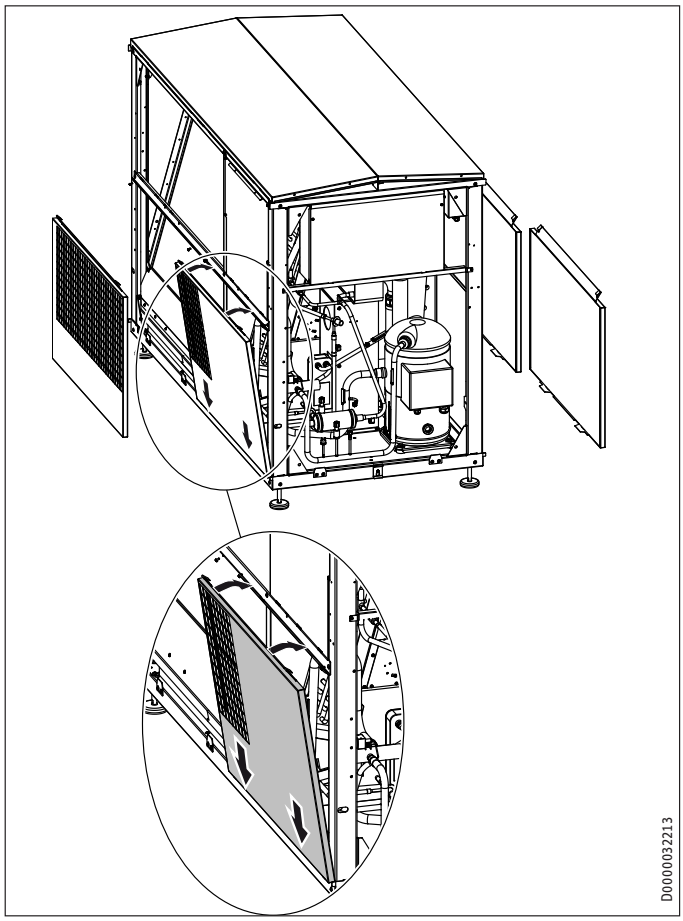
Four screws are available at the top of the frame to affix the hoods. Eight screws are available to affix the reversing hoods.

▶ Remove the 12 fixing screws from the frame of the standard appliance and retain them.
▶ Place the hoods at the front of the appliance and push them to the centre. Ensure that the tabs of the lid click into the guides on the casing.
▶ Secure the hoods with two screws each.

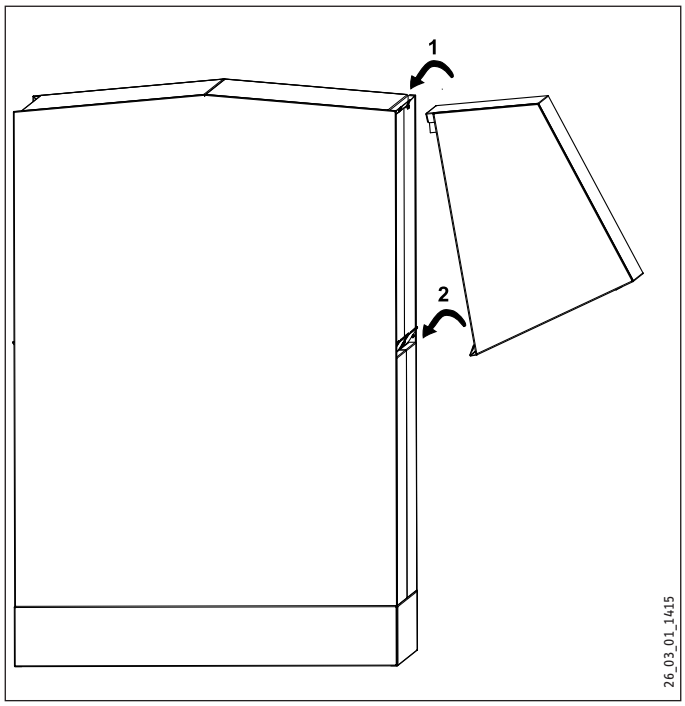


▶ Hook the lower side panels into the mounting brackets on the appliance. Simultaneously insert the tabs fixed to the bottom of the side panels into the slots provided in the appliance frame.

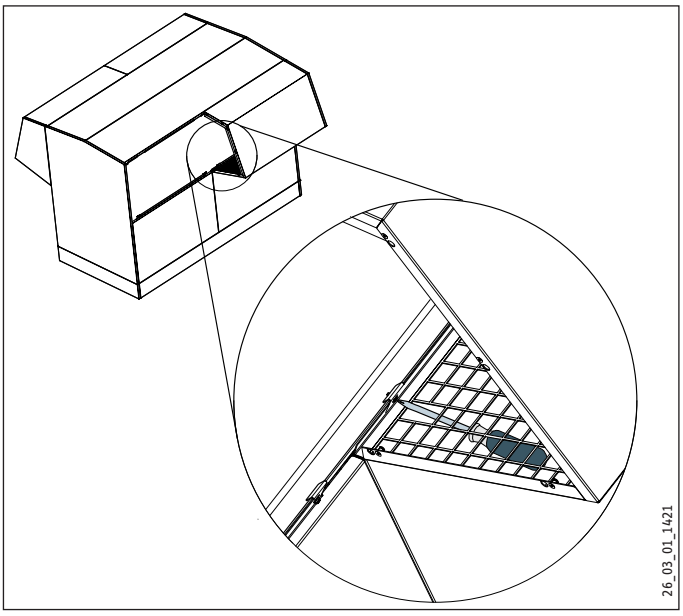
Fitting casing parts



▶ Hook the reversing hoods into the mounting brackets at the top and bottom.

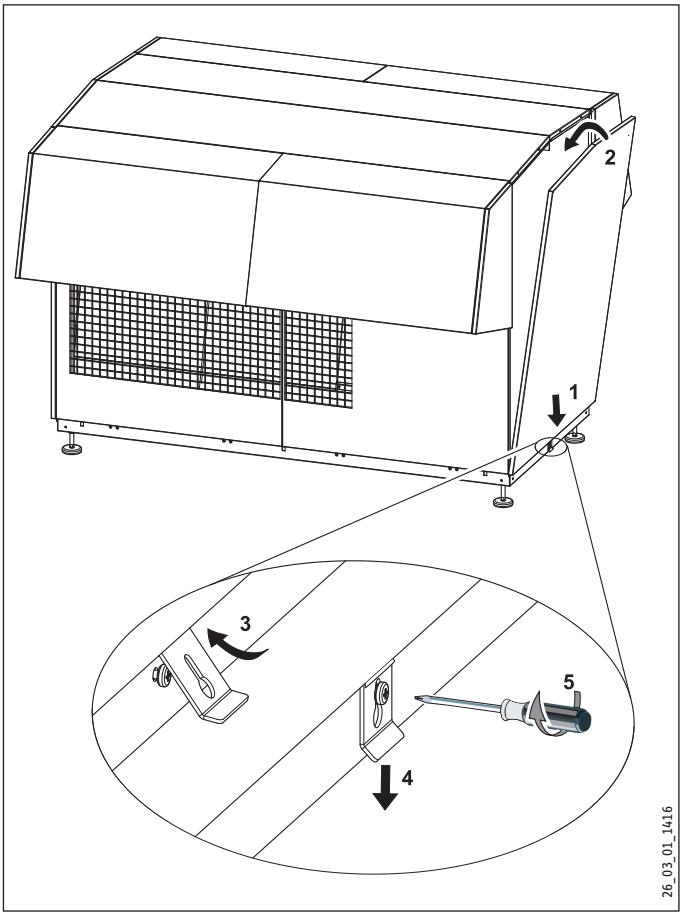


▶ Secure the reversing hoods with two screws each.



▶ Hook the front and back panels into the mounting brackets of the hoods. Simultaneously insert the tabs fixed to the bottom of the panels into the slots provided in the appliance frame.

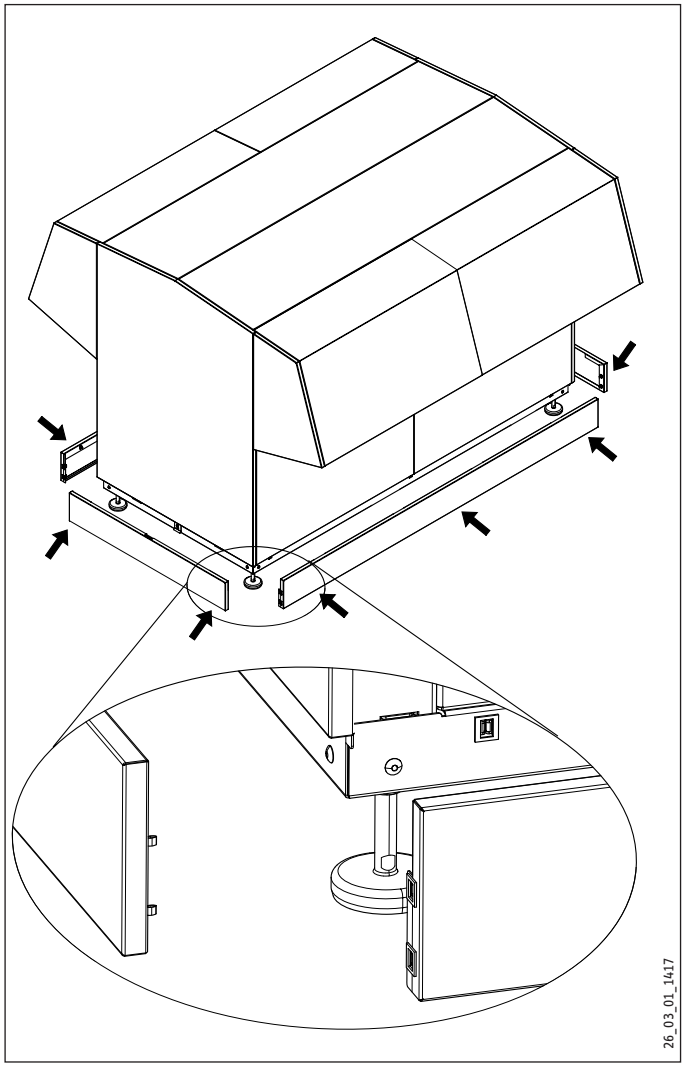
▶ Secure the front and back panels using the mounting tabs provided for this purpose at the bottom of the appliance frame.



▶ Secure the side plinth trims by hooking into the appliance frame.

▶ Secure the front and back plinth trims by hooking into the side plinth trims.

▶ Affix the type plate supplied at the top of the front or rear casing panel, where it is clearly visible.



13. 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 heating contractors may carry out the adjustments on the heat pump manager commissioning list, commission the appliance and instruct the owner in its use.

Commission the appliance 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.

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

13.1 Checks before commissioning

▶ Before commissioning check the points detailed below.

13.1.1 Heating system

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

13.1.2 Temperature sensors

- Have you correctly connected and positioned the outside temperature sensor and the return sensor?

13.1.3 Power supply

- Have you correctly connected the power supply?

14. Settings

14.1 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 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 achieved in the lead room.

Standard values to begin with:

Parameter	Underfloor heating	Radiator heating system
Heating curve	0.4	0.8
Control dynamic	10	10
Comfort temperature	20 °C	20 °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.

Note
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.

14.2 Reduced night mode (Silent mode)

Note
The WPL 57 features a silent mode. Silent mode enables the heat pump noise emissions to be reduced.

▶ 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 the fan. If the emergency/auxiliary 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/auxiliary heater. If the emergency/auxiliary heater cuts in, this will result in higher running costs.

14.2.1 Reduced night mode

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

	Meaning
max. reduced night mode	The fan speed cannot be reduced any further.

▶ Reduce the fan speed in the heat pump manager.

Parameter
FAN REDUCTION (COMMISSIONING / SILENT MODE)

14.2.2 Appliance switched off

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

▶ Switch the appliance off in the heat pump manager.

Parameter
HEAT PUMP OFF (COMMISSIONING / SILENT MODE)

14.3 Other settings

▶ For operation with a buffer cylinder, see chapter “Operation / Menu / Menu description / SETTINGS / STANDARD SETTING / BUFFER OPERATION” in the WPM commissioning instructions.

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.

15. 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.

16. Shutting down the system

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.

16.1 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.

16.2 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.

17. Troubleshooting

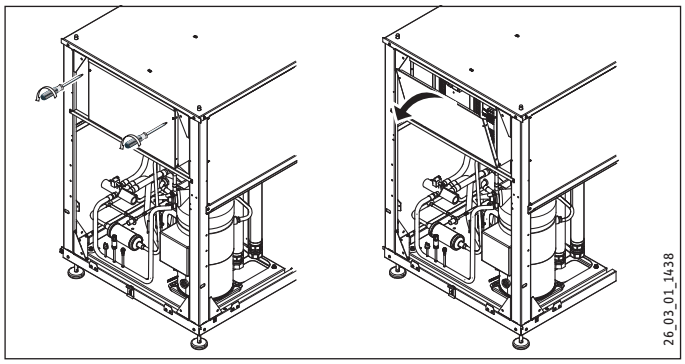
WARNING Electrocution
Before removing the casing parts, disconnect the appliance and all associated terminals across all poles from the power supply.

Note
Observe the instructions for the heat pump manager.

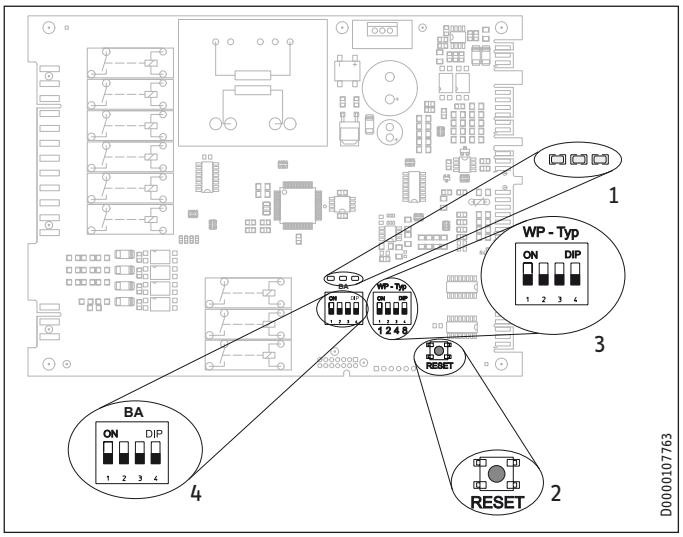
If the fault cannot be located during a service using the heat pump manager, open the control panel in emergencies and check the IWS settings.

17.1 Checking the IWS DIP switch settings

▶ Open the control panel.



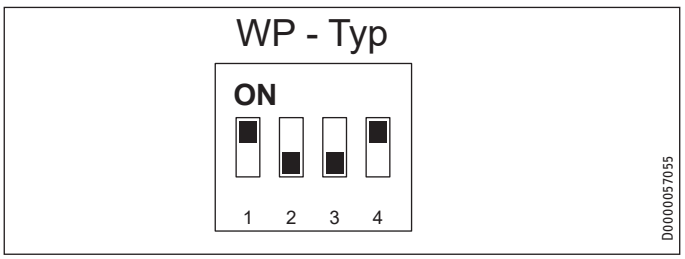
IWS



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

DIP switch (WP-Typ)

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



▶ Check whether the DIP switch is set correctly.

DIP switch (BA)

The heat pump operating mode is set using the DIP switch (BA).

▶ Check whether the DIP switch is set correctly.

17.2 LEDs

Red LED

Fault	Cause	Remedy
The appliance shuts down for 12 minutes and then restarts. Red LED flashes.	Heat pump fault.	Check the fault message in the WPM. Find the solution in the WPM instructions (fault list). Perform a reset of the IWS (see WPM instructions).
Appliance stops permanently. Red LED illuminates.	Five faults within two hours.	Check the fault message in the WPM. Find the solution in the WPM instructions (fault list). Perform a reset of the IWS (see WPM instructions).

Green LED centre

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

17.3 Reset button

If the IWS was incorrectly initialised, the settings can be reset with this button.

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

17.4 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, this creates noise.

How to remedy rhythmic scratching or grinding noises:

► Check whether the condensate drain is clear of obstructions.

► Carry out a manual defrost, as many times as necessary, until the fan runs freely again.

► 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 the noises occur frequently, notify customer support.

18. Maintenance

WARNING Electrocution
Before carrying out any maintenance and cleaning work, isolate the appliance and all associated terminals from the power supply.

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).

Cleaning the condensate drain

Environmental conditions may result in the condensate drain becoming blocked. To clean the drain, proceed as follows:

► Remove casing panels (see chapter “Installation”).

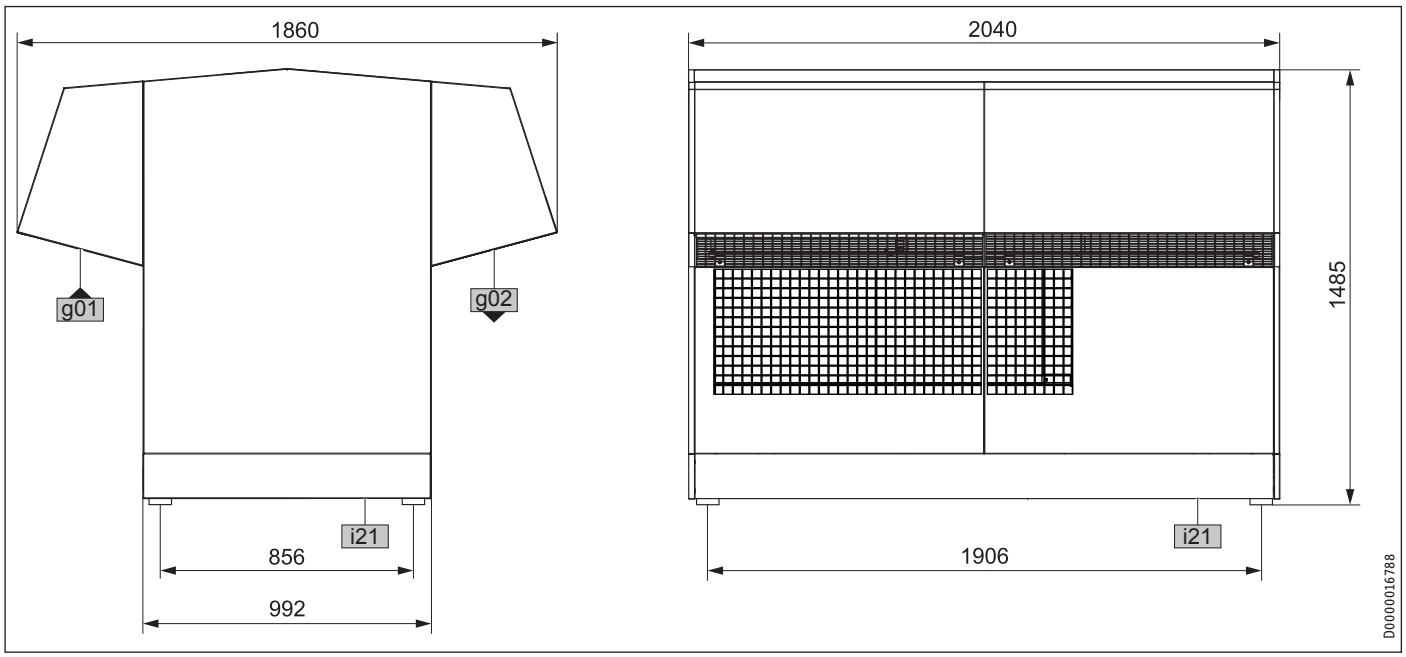
► Check the hose and the pipe of the condensate drain.

► Remove dirt and blockages immediately.

► Refit the casing parts on the appliance (see chapter “Installation”).

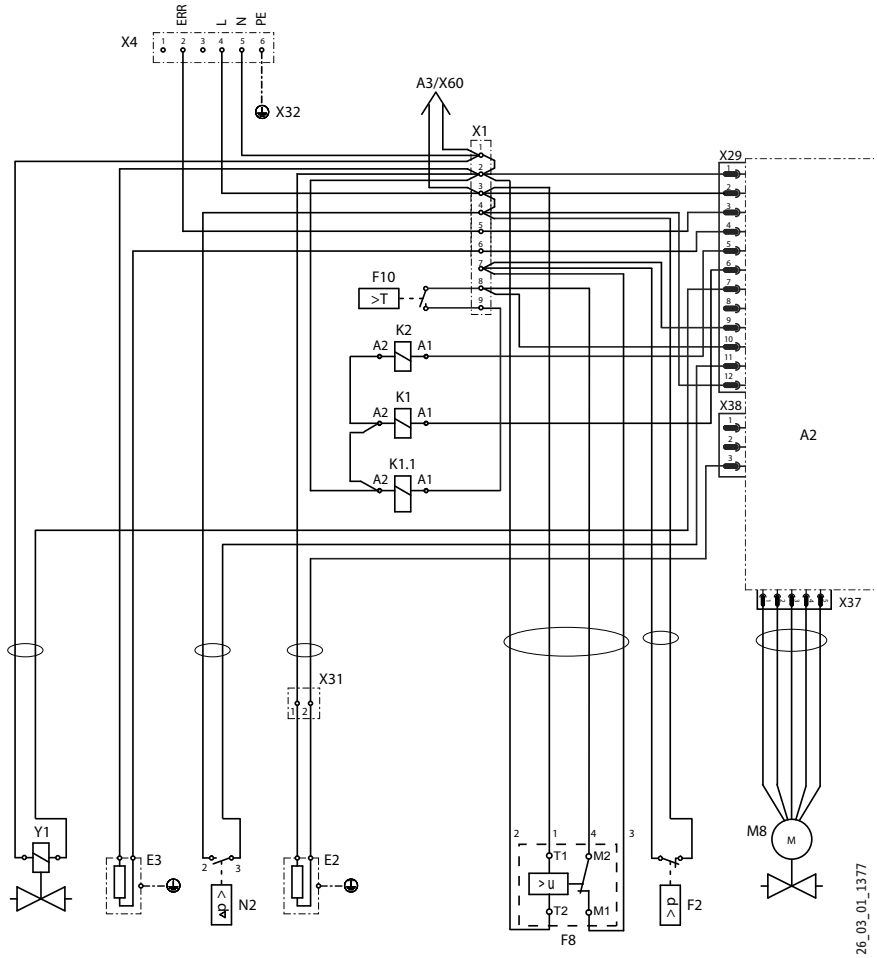
19. Specification

19.1 Dimensions and connections



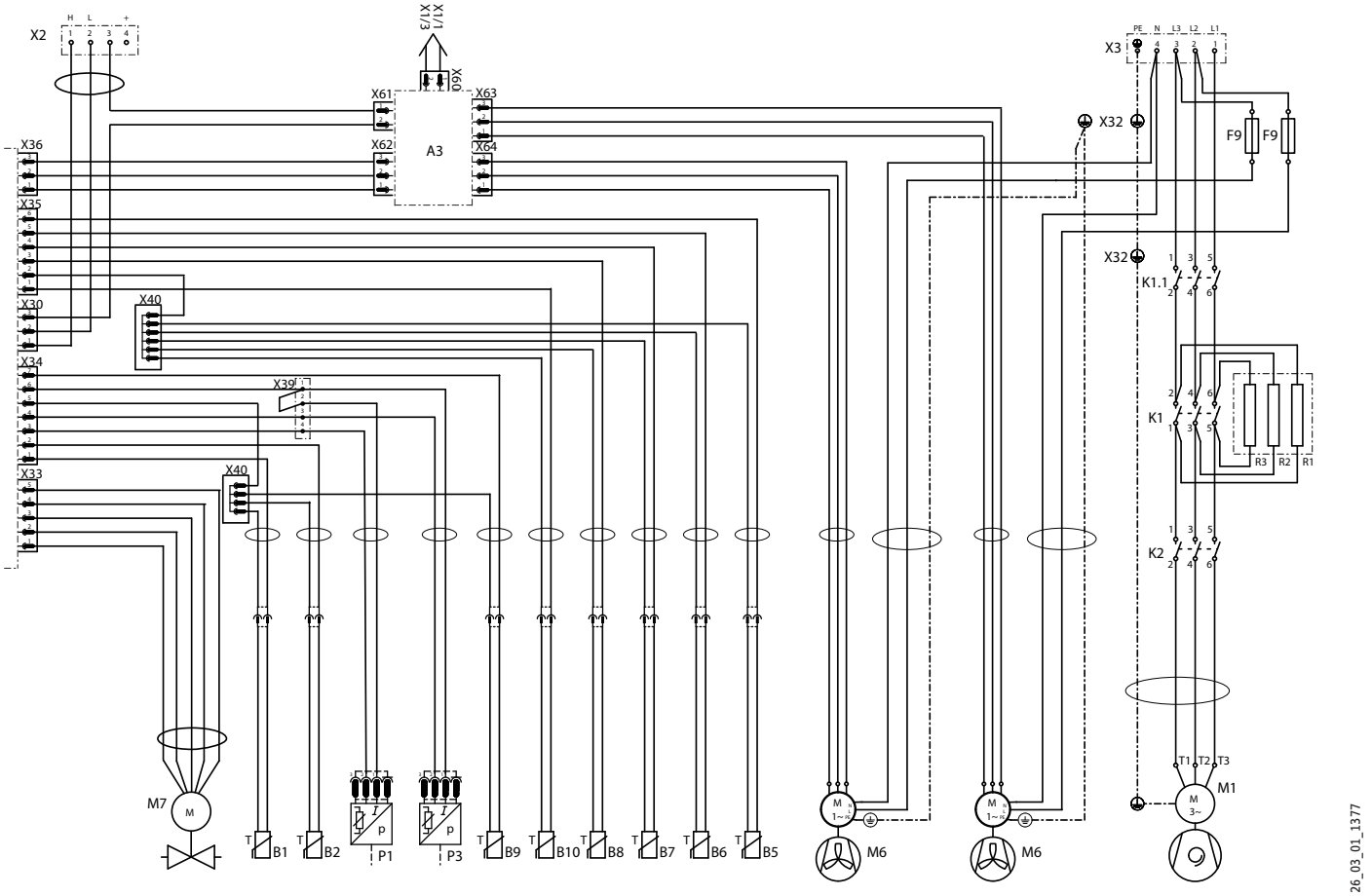
g01	Air intake
g02	Air discharge
i21	Entry supply line

19.2 Wiring diagram WPL 47

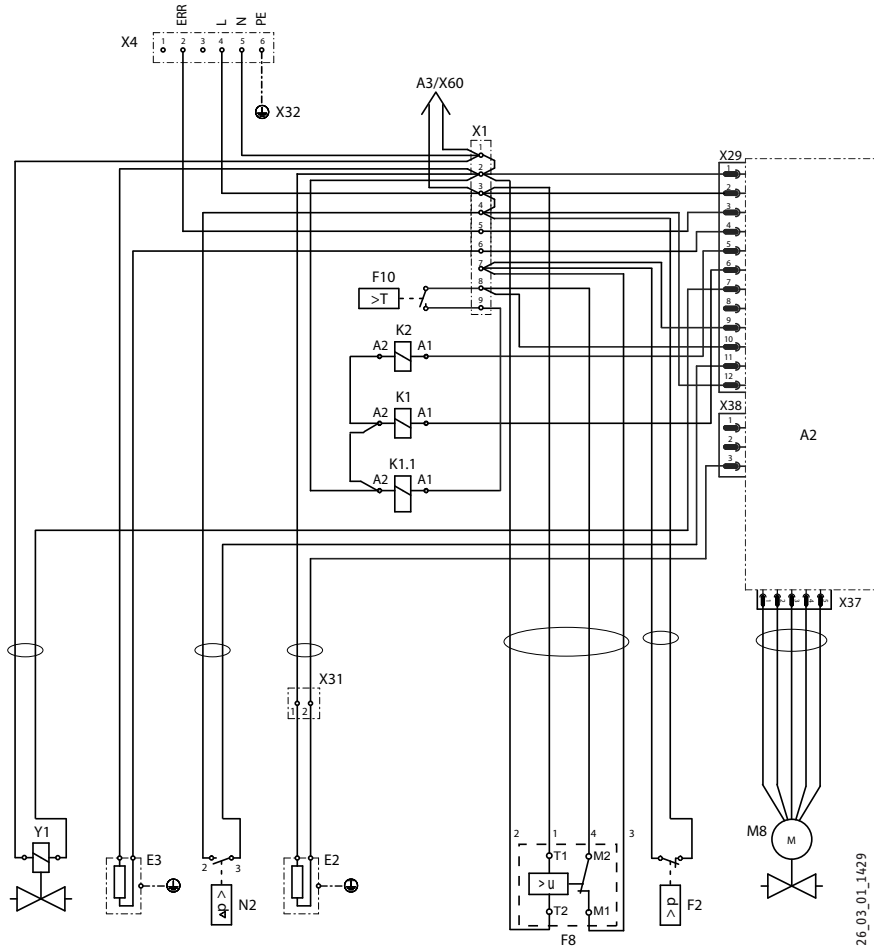


A2	Integral heat pump control unit (IWS)
A3	Fan auxiliary PCB/Expansion valves (ZPLE)
B1	Heat pump flow temperature sensor - KTY
B2	Heat pump return temperature sensor - KTY
B5	Hot gas temperature sensor - KTY
B6	Intake air temperature sensor - Pt1000
B7	Temperature sensor, compressor intake – PT 1000
B8	Evaporator discharge temperature sensor – Pt1000
B9	Frost protection temperature sensor – KTY
B10	Temperature sensor, injection – PT 1000
E2	Oil sump heater
E3	Ribbon heater
F2	High pressure switch
F8	Motor overload relay
F9	Fan fuse
F10	Temperature limiter, starting resistor
K1.1	Safety contactor
K1	Contactor - resistance start
K2	Compressor start contactor
M1	Motor, compressor
M6	Fan motor
M7	Electrical expansion valve stepper motor
M8	Electrical injection valve stepper motor
N2	Defrost differential pressure switch
P1	High pressure sensor
P3	Low pressure sensor
R1, R2, R3	Starting resistors
X1	Terminals
X2	Low voltage terminal strip
X3	Mains terminal
X4	Terminal, control
X29	12-pole IWS connector - control unit
X30	3-pole IWS connector - bus
X31	Oil sump heater terminal
X32	Earth support point
X33	5-pole IWS plug - electrical expansion valve
X34	7-pole IWS connector - sensors
X35	6-pole IWS connector - temperature sensors
X36	3-pole IWS connector - fan
X37	5-pole IWS plug - electrical injection valve
X38	3-pole IWS plug - DHC
X39	Pressure sensor terminal
X40	Ground temperature sensor terminal
X41	Expansion valve terminal
X60	2-pin ZPLE plug - supply voltage
X61	2-pin ZPLE plug - ground
X62	3-pin ZPLE plug - fan input
X63	3-pin ZPLE plug - fan output
X64	3-pin ZPLE plug - fan output
Y1	Diverter valve

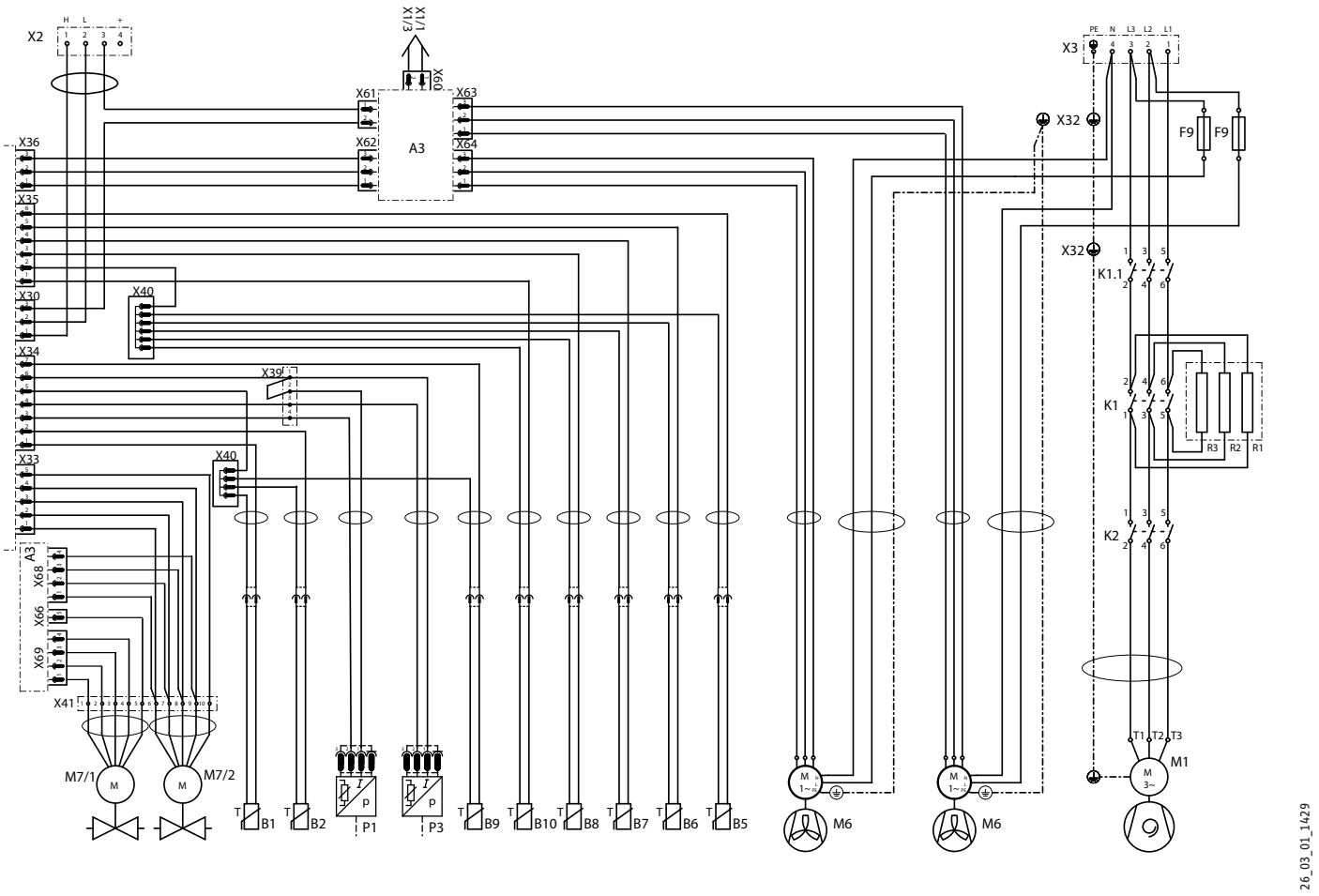
Specification



19.3 Wiring diagram WPL 57

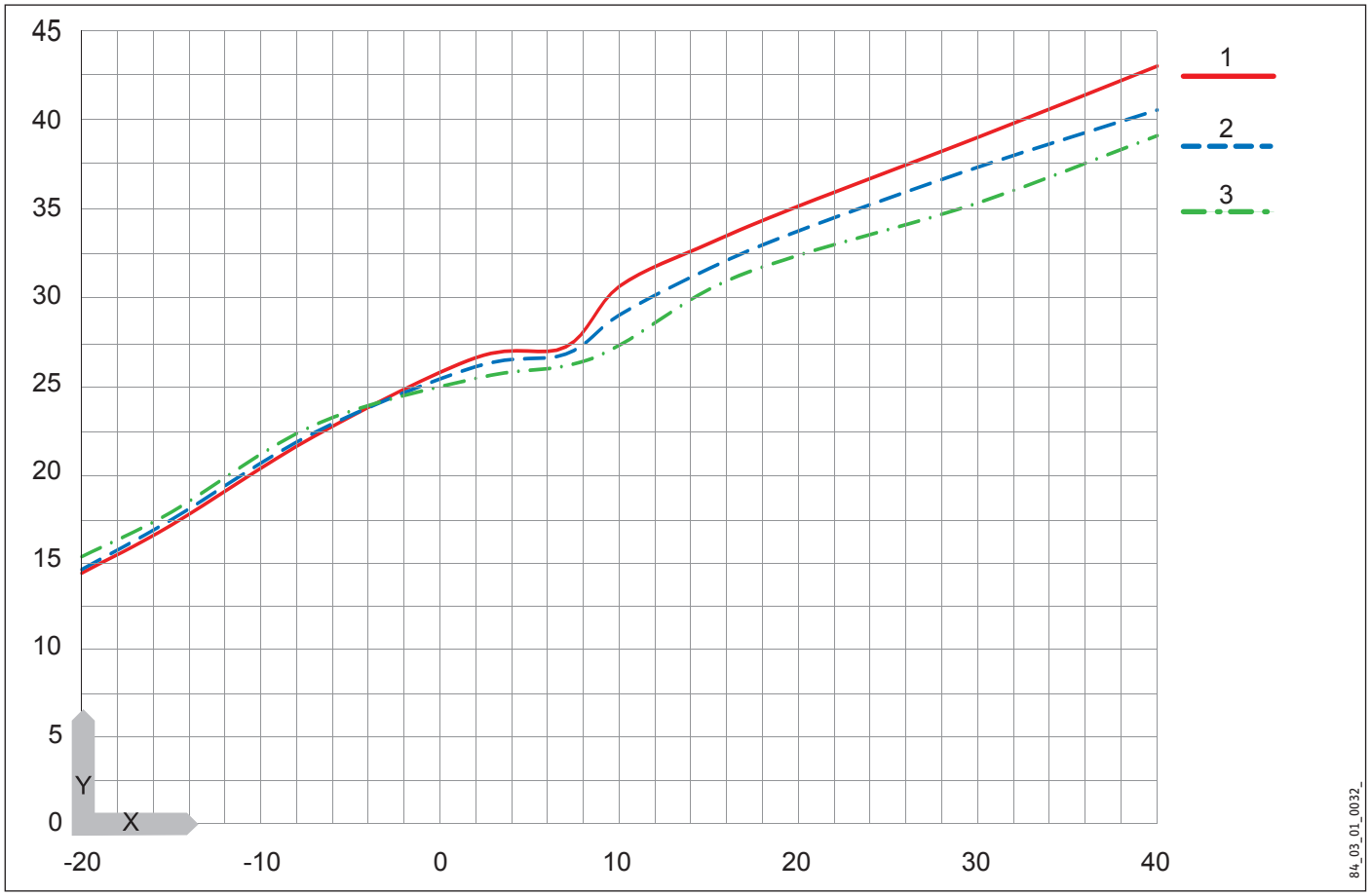


A2	Integral heat pump control unit (IWS)
A3	Fan auxiliary PCB/Expansion valves (ZPLE)
B1	Heat pump flow temperature sensor - KTY
B2	Heat pump return temperature sensor - KTY
B5	Hot gas temperature sensor - KTY
B6	Intake air temperature sensor - Pt1000
B7	Temperature sensor, compressor intake – PT 1000
B8	Evaporator discharge temperature sensor – Pt1000
B9	Frost protection temperature sensor – KTY
B10	Temperature sensor, injection – PT 1000
E2	Oil sump heater
E3	Ribbon heater
F2	High pressure switch
F8	Motor overload relay
F9	Fan fuse
F10	Temperature limiter, starting resistor
K1.1	Safety contactor
K1	Contactor - resistance start
K2	Compressor start contactor
M1	Motor, compressor
M6	Fan motor
M7	Electrical expansion valve stepper motor
M8	Electrical injection valve stepper motor
N2	Defrost differential pressure switch
P1	High pressure sensor
P3	Low pressure sensor
R1, R2, R3	Starting resistors
X1	Terminals
X2	Low voltage terminal strip
X3	Mains terminal
X4	Terminal, control
X29	12-pole IWS connector - control unit
X30	3-pole IWS connector - bus
X31	Oil sump heater terminal
X32	Earth support point
X33	5-pole IWS plug - electrical expansion valve
X34	7-pole IWS connector - sensors
X35	6-pole IWS connector - temperature sensors
X36	3-pole IWS connector - fan
X37	5-pole IWS plug - electrical injection valve
X38	3-pole IWS plug - DHC
X39	Pressure sensor terminal
X40	Ground temperature sensor terminal
X41	Expansion valve terminal
X60	2-pin ZPLE plug - supply voltage
X61	2-pin ZPLE plug - ground
X62	3-pin ZPLE plug - fan input
X63	3-pin ZPLE plug - fan output
X64	3-pin ZPLE plug - fan output
Y1	Diverter valve


X2
X1/3
X60
X61
X62
X63
X64
A3
X36
X35
X30
X34
X33
X40
X39
X68
X66
X69
X41
M7/1
M7/2
B1
B2
P1
P3
B9
B10
B8
B7
B6
B5
M6
M6
X3
PE
N
L3
L2
L1
X32
F9
F9
K1.1
K1
K2
R3
R2
R1
T1
T2
T3
M1
26_03_01_1429

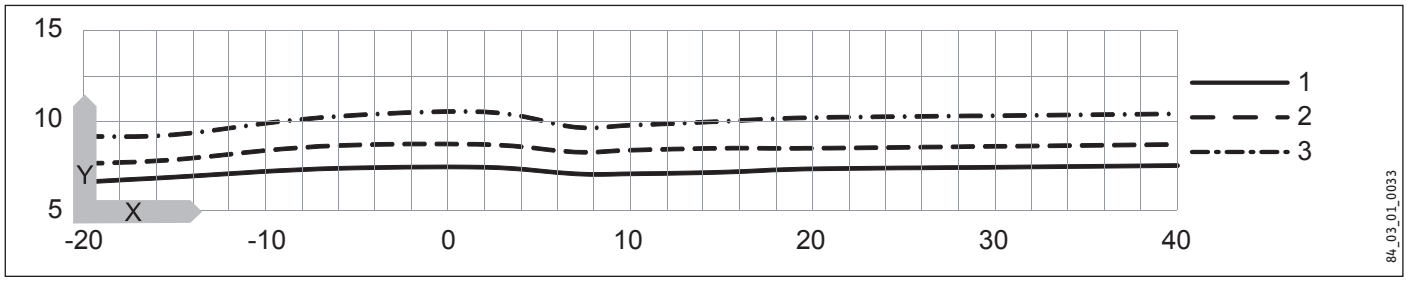
19.4 Output diagrams WPL 47

Heating output



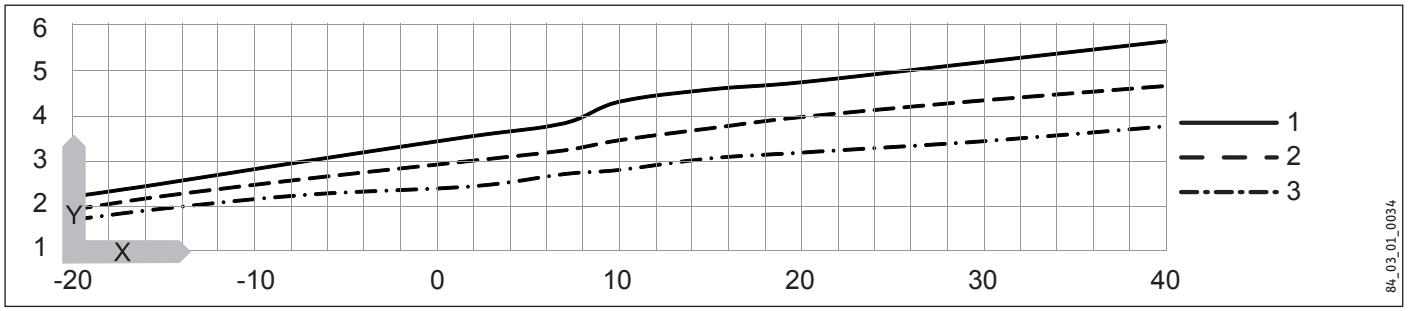
Y Heating output [kW]
X Inlet temperature of the WQA medium [°C]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C

Power consumption



Y Power consumption [kW]
X Inlet temperature of the WQA medium [°C]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C

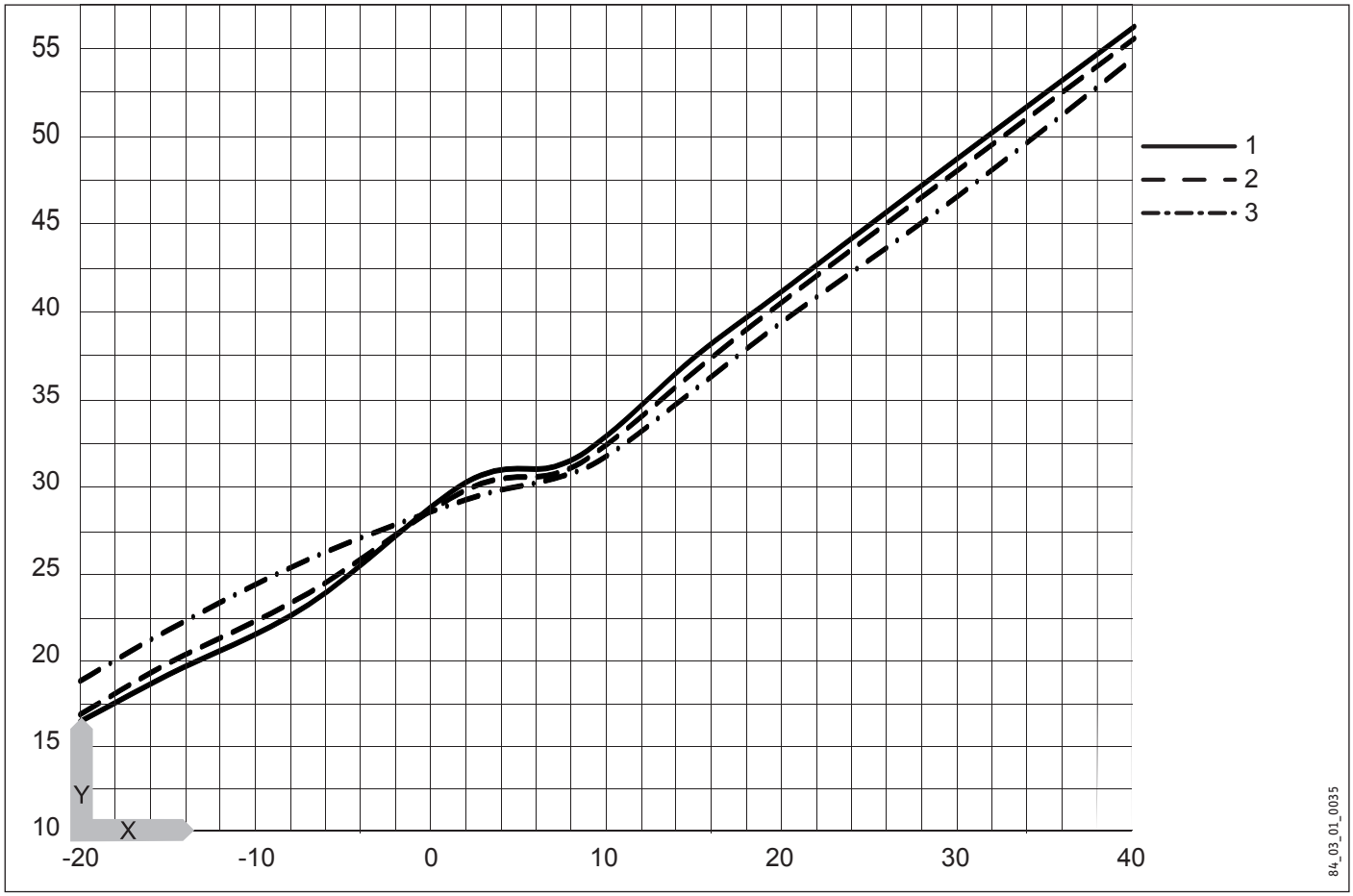
Coefficient of performance



Y Coefficient of performance ε [-]
X Inlet temperature of the WQA medium [°C]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C

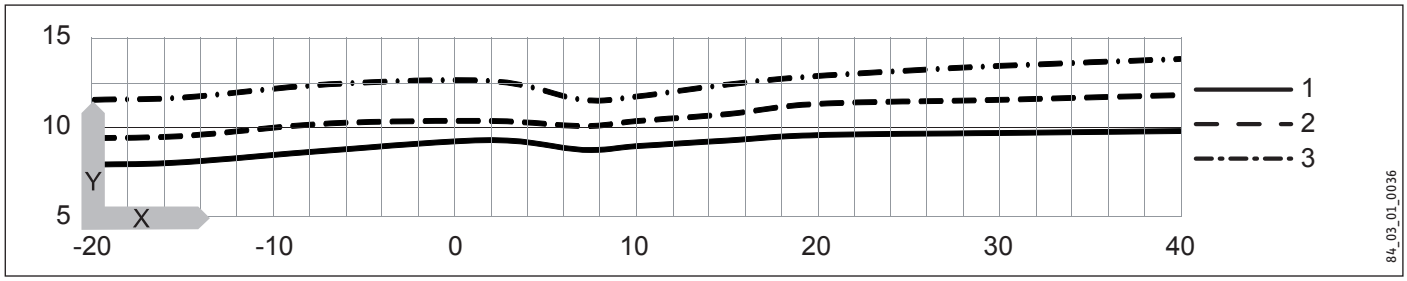
19.5 Output diagrams WPL 57

Heating output



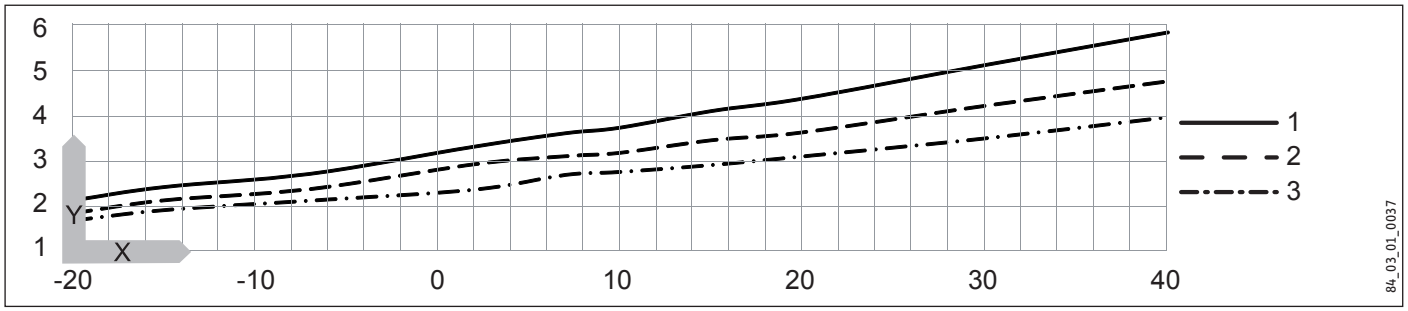
Y Heating output [kW]
X Inlet temperature of the WQA medium [°C]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C

Power consumption



Y Power consumption [kW]
X Inlet temperature of the WQA medium [°C]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C

Coefficient of performance



Y Coefficient of performance ε [-]
X Inlet temperature of the WQA medium [°C]
1 Flow temperature 35 °C
2 Flow temperature 45 °C
3 Flow temperature 55 °C

19.6 Data table

The output data refers to new appliances with clean heat exchangers.

The power consumption of the integral auxiliary drives represents the maximum value and may vary subject to operating point.

The power consumption of the integral auxiliary drives is included in the output data for the appliance (to EN 14511)

		WPL 47	WPL 57
		228836	228837
Heating output			
Heating output at A10/W35 (EN 14511)	kW	30.50	33.60
Heating output at A7/W35 (EN 14511)	kW	26.83	31.01
Heating output at A2/W35 (EN 14511)	kW	24.82	29.81
Heating output at A-7/W35 (EN 14511)	kW	21.68	24.02
Heating output at A-7/W55 (EN 14511)	kW	20.43	25.72
Heating output in max. reduced night mode A-7/W35	kW		22.82
Power consumption			
Power consumption at A7/W35 (EN 14511)	kW	6.80	8.64
Power consumption at A2/W35 (EN 14511)	kW	7.24	9.03
Power consumption at A-7/W35 (EN 14511)	kW	7.10	8.46
Power consumption at A-7/W55 (EN 14511)	kW	9.36	11.56
Max. power consumption, fan, heating	kW	0.65	0.65
Coefficients of performance			
COP at A7/W35 (EN 14511)		3.94	3.59
COP at A2/W35 (EN 14511)		3.43	3.30
COP at A-7/W35 (EN 14511)		3.05	2.84
COP at A-7/W55 (EN 14511)		2.18	2.22
SCOP (EN 14825)		3.79	3.42
Sound emissions			
Sound power level (EN 12102)	dB(A)	69	69
Sound power level max. reduced night mode	dB(A)	-	67
Sound pressure level at 1 m distance in free field	dB(A)	59	61
Sound pressure level at 5 m distance in free field	dB(A)	45	47
Sound pressure level at 10 m distance in free field	dB(A)	39	41
Application limits			
Max. permissible pressure	MPa	0.3	0.3
Min. application limit on 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
Energy data			
Energy efficiency class		A++	A+
Electrical data			
Max. power consumption excl. emergency/auxiliary heater	kW	13.90	15.60
Max. power consumption	kW	13.4	15.1
Control unit fuse protection	A	1 x B 16	1 x B 16
Compressor fuse protection	A	3 x C 32	3 x C 32
Max. mains impedance Zmax	Ω	226	226
Phases, control unit		1/N/PE	1/N/PE
Phases, compressor		3/N/PE	3/N/PE
Rated voltage, control unit	V	230	230
Rated voltage, compressor	V	400	400
Frequency	Hz	50	50
Starting current (with/without starting current limiter)	A	70/-	78/-
Max. operating current	A	22	23
Versions			
Condenser material		1.4401/Cu	1.4401/Cu
Refrigerant		R407 C	R407 C
Refrigerant charge	kg	7.3	7.5
CO_2 equivalent (CO_2e)	t	12.95	13.31
Global warming potential of the refrigerant (GWP100)		1774	1774
Defrost type		Circuit reversal	Circuit reversal
IP rating		IP 14B	IP 14B

Specification

		WPL 47	WPL 57
Dimensions			
Height (outdoor installation)	mm	1485	1485
Width (outdoor installation)	mm	1860	1860
Depth (outdoor installation)	mm	2040	2040
Weights			
Weight	kg	540	600
Connections			
Connection, heating flow/return		G 2	G 2
Values			
Pressure differential on the heating side	hPa	100	100
Min. flow rate, heating	m³/h	3.00	3.50
Heating flow rate (EN 14511) at A7/W35, B0/W35 and 5 K	m³/h	4.90	5.70
Nominal heating flow rate at A-7/W35 and 7 K	m³/h	3.00	3.66
Flow rate on heat source side	m³/h	7000	7300

Further details

		WPL 47	WPL 57
		228836	228837
Maximum height for installation	m	2000	2000

Guarantee

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

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

Environment and recycling

- ▶ Dispose of the appliances and materials after use in accordance with national regulations.

- ▶ If a crossed-out waste bin is pictured on the appliance, take the appliance to your local waste and recycling centre or nearest retail take-back point for reuse and recycling.

This document is made of recyclable paper.

- ▶ Dispose of the document at the end of the appliance's life cycle in accordance with national regulations.

NOTES

Comfort through Technology

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