

Operating instructions



Hydraulic Station

VWZ MEH 97/6

Publisher/manufacturer

Vaillant GmbH

Berghauser Str. 40 ■ D-42859 Remscheid
Tel. +492191 18 0 ■ Fax +492191 18 2810
info@vaillant.de ■ www.vaillant.de



Contents

Contents

1	Safety	3
1.1	Intended use	3
1.2	General safety information	3
2	Notes on the documentation	5
3	Product description.....	5
3.1	Heat pump system.....	5
3.2	Design of the product.....	5
3.3	Control elements.....	5
3.4	Control panel	6
3.5	Description of the symbols	6
3.6	Functional description of buttons	6
3.7	Type designation and serial number	7
3.8	CE marking.....	7
3.9	Safety devices	7
4	Operation.....	7
4.1	Basic display.....	7
4.2	Operating concept	7
4.3	Menu display.....	7
4.4	Starting up the product	8
4.5	Setting the heating flow temperature.....	8
4.6	Setting the domestic hot water temperature.....	8
4.7	Switching off the product's functions	9
5	Care and maintenance	9
5.1	Caring for the product.....	9
5.2	Maintenance	9
5.3	Reading maintenance messages	9
5.4	Checking the system pressure	9
6	Troubleshooting	9
6.1	Reading fault messages	9
6.2	Detecting and eliminating faults.....	9
7	Decommissioning.....	10
7.1	Temporarily decommissioning the product.....	10
7.2	Permanently decommissioning the product.....	10
8	Recycling and disposal.....	10
9	Guarantee and customer service	10
9.1	Guarantee.....	10
9.2	Customer service.....	10
Appendix	11	
A	Troubleshooting	11
B	Overview of the end user operating level	11

1 Safety

1.1 Intended use

There is a risk of injury or death to the user or others, or of damage to the product and other property in the event of improper use or use for which it is not intended.

This product is a system component for controlling the heating circuits and domestic hot water generation in conjunction with a heat pump using a system control.

Intended use includes the following:

- observance of the operating instructions included for the product and any other installation components
- compliance with all inspection and maintenance conditions listed in the instructions.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit
VWL ..5/6 A ..	VIH QW 190/6...
	VWZ MEH 97/6

This product can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the product in a safe way and understand the hazards involved. Children must not play with the product. Cleaning and user maintenance work must not be carried out by children unless they are supervised.

Any other use that is not specified in these instructions, or use beyond that specified in this document, shall be considered improper use. Any direct commercial or industrial use is also deemed to be improper.

Caution.

Improper use of any kind is prohibited.

1.2 General safety information

1.2.1 Danger caused by improper operation

Improper operation may present a danger to you and others, and cause material damage.

- ▶ Carefully read the enclosed instructions and all other applicable documents, particularly the "Safety" section and the warnings.
- ▶ Only carry out the activities for which instructions are provided in these operating instructions.

1.2.2 Risk of death due to changes to the product or the product environment

- ▶ Never remove, bridge or block the safety devices.
- ▶ Do not tamper with any of the safety devices.
- ▶ Do not damage or remove any tamper-proof seals on components.
- ▶ Do not make any changes:
 - The product itself
 - The water and electricity supply lines
 - to the expansion relief valve
 - to the drain pipework
 - to constructional conditions that may affect the operational reliability of the product

1.2.3 Risk of injury and material damage due to maintenance and repairs carried out incorrectly or not carried out at all

- ▶ Never attempt to carry out maintenance work or repairs on your product yourself.
- ▶ Faults and damage should be immediately rectified by a competent person.
- ▶ Adhere to the maintenance intervals specified.

1.2.4 Risk of material damage caused by frost

- ▶ Ensure that the heating installation always remains in operation during freezing conditions and that all rooms are sufficiently heated.



1 Safety

- ▶ If you cannot ensure the operation, have a competent person drain the heating installation.

1.2.5 Benchmark



Vaillant is a licensed member of the Benchmark Scheme which aims to improve the standards of installation and commissioning of domestic heating and hot water systems in the UK and to encourage regular servicing to optimise safety, efficiency and performance.

Benchmark is managed and promoted by the Heating and Hotwater Industry Council. For more information visit www.benchmark.org.uk.

- ▶ Please ensure that the installer has fully completed the Benchmark Checklist on the inside back pages of the installation instructions supplied with the product and that you have signed it to say that you have received a full and clear explanation of its operation. The installer is legally required to complete a commissioning checklist as a means of complying with the appropriate Building Regulations (England and Wales).

All installations must be notified to Local Area Building Control either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer who should, on receipt, write the Notification Number on the Benchmark Checklist.

This product should be serviced regularly to optimise its safety, efficiency and performance. The service engineer should complete the relevant Service Record on the Benchmark Checklist after each service.

The Benchmark Checklist will be required in the event of any warranty.



2 Notes on the documentation

- ▶ Always observe all operating instructions that are enclosed with the installation components.
- ▶ Store these instructions and all other applicable documents for further use.

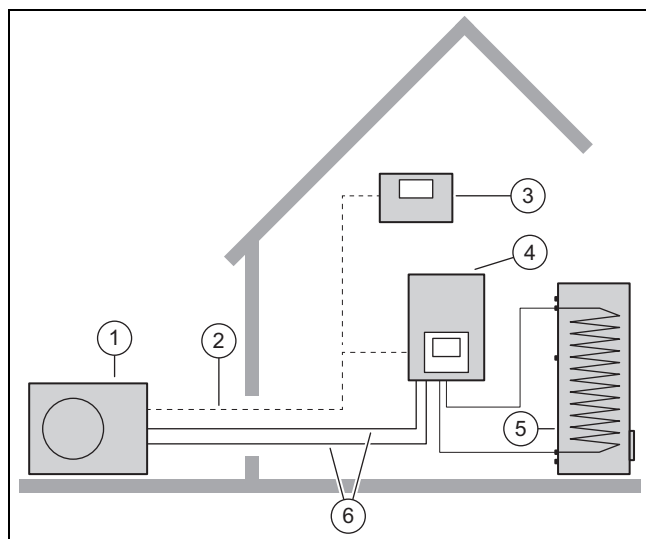
These instructions apply only to:

Product
VWZ MEH 97/6
Product
VIH QW 190/6 E GB

3 Product description

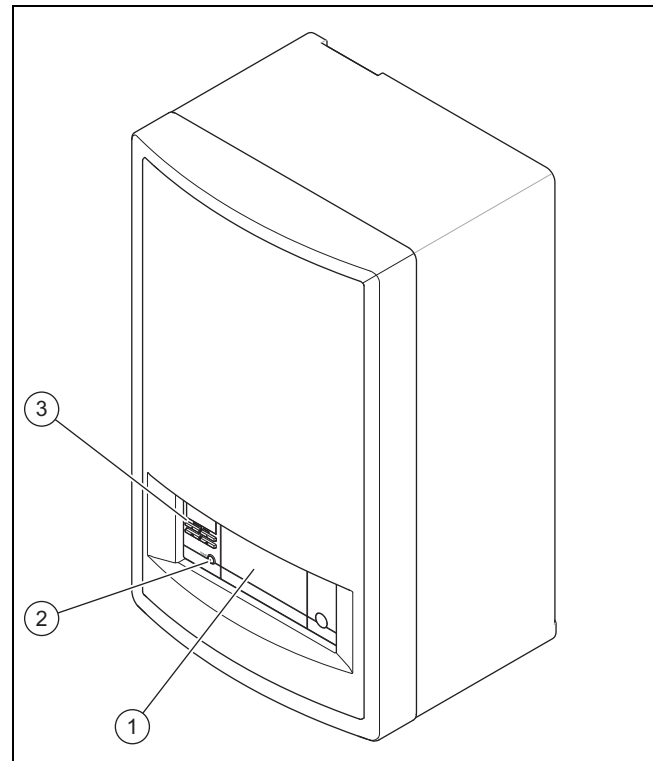
3.1 Heat pump system

Design of a typical heat pump system with monoblock technology:



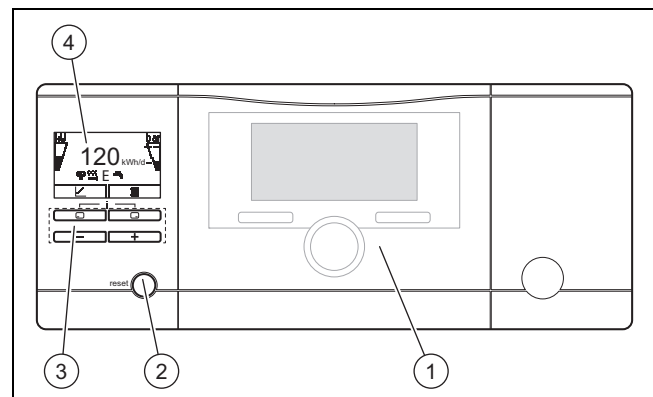
- | | |
|-----------------------------|--|
| 1 Heat pump, outdoor unit | 4 Heat pump, indoor unit |
| 2 eBUS line | 5 Monovalent domestic hot water cylinder |
| 3 System control (optional) | 6 Heating circuit |

3.2 Design of the product



- | | |
|---|--------------------|
| 1 Optional installation site for the system control | 2 Reset button |
| | 3 Control elements |

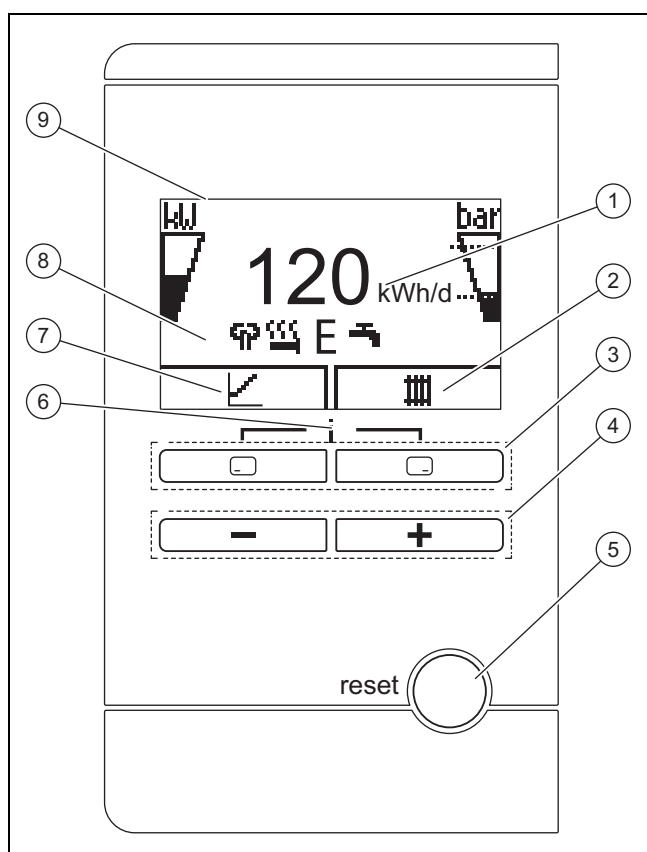
3.3 Control elements



- | | |
|---------------------------------------|-----------------|
| 1 System control (optional accessory) | 3 Control panel |
| 2 Reset button | 4 Display |

3 Product description

3.4 Control panel



- | | | | |
|---|--|---|---|
| 1 | Displays the daily environmental energy yield | 6 | Access to the menu for additional information |
| 2 | Display of the current assignment of the right-hand selection button | 7 | Display of the current assignment of the left-hand selection button |
| 3 | Left- and right-hand selection buttons | 8 | Displays the symbols for the heat pump's current operating mode |
| 4 | [-] and [+] button | 9 | Display |
| 5 | Reset button, restart the product | | |

3.5 Description of the symbols

If you do not press any buttons within one minute, the light goes out.





Symbol	Meaning	Explanation
	Compressor power	<ul style="list-style-type: none"> Not filled: Compressor not in operation Partially filled: Compressor in operation. Partial load mode. Fully filled: Compressor in operation. Full load mode.

Symbol	Meaning	Explanation
	<ul style="list-style-type: none"> Without decoupling module Filling pressure in the building circuit (measured in the outdoor unit) With decoupling module Filling pressure in the building circuit (measured in the indoor unit) 	<p>The dashed lines show the permitted range.</p> <ul style="list-style-type: none"> Displayed statically: Filling pressure in the permitted range Displayed flashing: Filling pressure outside of the permitted range
	Noise reduction mode	<ul style="list-style-type: none"> Operation with reduced sound emissions
	Electric back-up heater	<ul style="list-style-type: none"> Displayed flashing: Electric back-up heater in operation Displayed together with the "Heating mode" symbol: Electric back-up heater active for heating mode Displayed together with the "Domestic hot water generation" symbol: Electric back-up heater active for domestic hot water mode
	eco mode	<ul style="list-style-type: none"> Energy-saving domestic hot water mode
	Heating mode	<ul style="list-style-type: none"> Heating mode active
	Domestic hot water generation	<ul style="list-style-type: none"> Domestic hot water mode active
	Cooling mode	<ul style="list-style-type: none"> Cooling mode active
	Fault condition	<ul style="list-style-type: none"> Appears instead of the basic display, may be an explanatory plain text display


3.6 Functional description of buttons

The two selection buttons are soft keys, meaning that they can be assigned different functions.

Button	Meaning
	<ul style="list-style-type: none"> Cancelling the change to a set value or activating an operating mode Calling up a higher selection level in the menu
	<ul style="list-style-type: none"> Confirming a set value or activating an operating mode Calling up a lower selection level in the menu

Button	Meaning
 + 	Calling up the additional functions
 or 	<ul style="list-style-type: none"> – Navigating between individual menu items – Increasing or decreasing the chosen set value

Adjustable values flash in the display.

You must always confirm a change to a value. Only then is the new setting saved. You can press  to cancel a process at any time. If you do not press any buttons for longer than 15 minutes, the display returns to the basic display.

3.7 Type designation and serial number

The type designation and serial number are on the data plate.

3.8 CE marking



The CE marking shows that the products comply with the basic requirements of the applicable directives as stated on the declaration of conformity.

The declaration of conformity can be viewed at the manufacturer's site.

3.9 Safety devices

3.9.1 Frost protection function

The frost protection function for the system is controlled using the product itself or using the optional system control. If the system control fails, the product guarantees limited frost protection for the heating circuit.

At negative outdoor temperatures, there is an increased risk of the heating water freezing if a heat pump fault occurs, e.g. due to a power cut or a defective compressor.

3.9.2 Low-water pressure protection

This function continuously monitors the pressure of the heating water in order to prevent a possible loss of heating water.

3.9.3 Freeze protection

This function prevents the unit's internal heating circuit from freezing when the heating flow temperature drops below a certain value.

If the heating flow temperature of the outdoor unit falls below 4° C, the compressor is switched on in order to increase the heating flow temperature.

3.9.4 Pump blocking protection

This function prevents the pumps for heating water from sticking. The pumps, which were out of operation for 23 hours, are switched on for 10–20 seconds, one after the other.

3.9.5 Safety cut-out (SCO) in the heating circuit

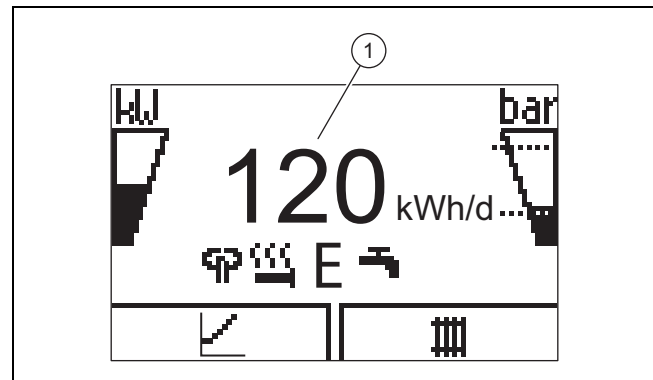
If the temperature in the heating circuit of the internal electric back-up heater exceeds the maximum temperature, the safety cut-out shuts down the electric back-up heater as a

securing measure. After it is triggered, the safety cut-out must be replaced.

- Max. heating circuit temperature: 98 °C

4 Operation

4.1 Basic display



The displays shows the basic display with the current status of the product. The daily energy yield (1) is displayed in the centre of the display.

If you press a selection button, the activated function is displayed in the display.

As soon as a fault message is present, the basic displays switches to the fault message.

4.2 Operating concept

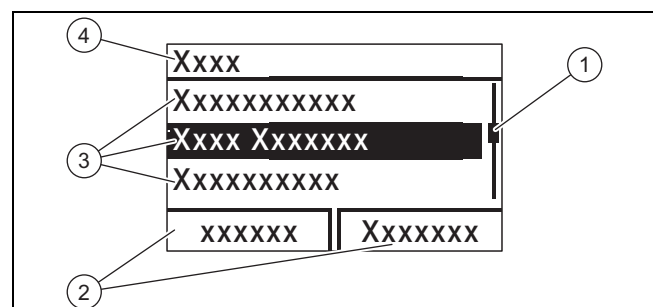
The product has two operating levels.

The operating level for the end user shows the most important information and offers setting options which do not require any special prior knowledge.

The operating level for the competent person is reserved for the competent person and is protected by a code.

Overview of the end user operating level (→ Page 11)

4.3 Menu display



- | | | | |
|---|---|---|------------------------------|
| 1 | Scroll bar | 3 | Selection level list entries |
| 2 | Current assignment of the selection buttons | 4 | Selection level |



Note

Path details at the start of a section specify how to access this function, e.g. **Menu → Information → Contact data.**

4 Operation

4.4 Starting up the product

4.4.1 Opening the isolator devices

1. Ask the competent person who installed the product to explain to you where these isolator devices are located and how to handle them.
2. If installed, open the service valves in the heating installation's flow and return.
3. Open the cold-water isolation valve.

4.4.2 Switching on the product



Note

The product does not have an on/off switch. The product is switched on and ready for operation as soon as it is connected to the power grid. It can only be switched off using the partition that is installed on-site, e.g. fuses or circuit breaker in the utility connection box.

1. Ensure that the product casing has been installed.
2. Switch on the product via the fuses in the utility connection box.
 - ◁ The "basic display" is shown in the product's operating display.
 - ◁ The "basic display" may also be shown in the display for the optional system control.

4.4.3 Yield indicator

You can use this function to display the environmental energy yield as a cumulative value for a period of a day, a month and the total for the heating, domestic hot water generation and cooling modes.

You can display the working figure for a period of a month and the total for the heating and domestic hot water generation modes. The working figure is the ratio of thermal energy generated to the operating current used. Monthly values may vary considerably since, for example, in the summer only domestic hot water generation is used. A large number of factors influence this estimate, e.g. the type of heating installation (direct heating mode = low flow temperature or indirect heating mode via buffer cylinder = high flow temperature). This figure may therefore deviate by up to 20%.

The working figures only record the power consumption of internal components, not of external components such as external heating circuit pumps, valves, etc.

4.4.4 Displaying the Live Monitor

Menu → Live Monitor

You can use the Live Monitor to view the current status of the product.

4.4.5 Displaying the building circuit pressure

Menu → Live Monitor → Building circuit pressure

You can use this function to display the current filling pressure in the heating installation.

4.4.6 Reading the operating statistics

Menu → Information → Heating op. hours

Menu → Information → DHW operating hours

Menu → Information → Cooling op. hours

Menu → Information → Total operating hours

You can use this function to display the operating hours for heating mode, for domestic hot water mode, for cooling mode and for overall operation.

4.4.7 Setting the language

1. If you want to set another language, press **and hold** and **at the same time**.
2. Also press the reset button for a short time.
3. **Press and hold** and until the display shows the language setting.
4. Select the required language by pressing or .
5. Press (OK) to confirm your selection.
6. Once you have set the correct language, press (OK) again to confirm this.

4.4.8 Set display contrast

Menu → Basic settings → Display contrast

► You can set the contrast here.

4.4.9 Serial number and article number

Menu → Information → Serial number

The product's serial number is displayed.

The article number is found in the second line of the serial number.

4.4.10 Contact details for the competent person

Menu → Information → Contact data Phone number

If the competent person has entered their telephone number during the installation, you can read it here.

4.5 Setting the heating flow temperature

Condition: No system control connected

- Press in the basic display.
- Use or to change the value and confirm this.

Condition: System control connected

- Set the heating flow temperature on the system control, → System control operating instructions.

4.6 Setting the domestic hot water temperature

Condition: No system control connected

- Press in the basic display.
- Use or to change the value and confirm this.



Condition: System control connected

- Set the domestic hot water temperature on the system control, → System control operating instructions.

4.7 Switching off the product's functions

4.7.1 Switching off heating mode (Summer mode)

Condition: No system control connected



- ▶ Press  in the basic display.
- ▶ Use  to change the value to zero and confirm this.

Condition: System control connected

- ▶ Switch off heating mode on the system control (summer mode), → System control operating instructions.

4.7.2 Switching off domestic hot water generation

Condition: No system control connected

- ▶ Press  in the basic display.
- ▶ Use  to set the value to zero and confirm this.

Condition: System control connected

- ▶ Switch off the domestic hot water generation at the system control (→ System control operating instructions).

4.7.3 Draining the heating installation

Another way to protect the heating installation and the product from frost for very long switch-off times is to drain them completely.

- ▶ Consult a competent person about this.

5 Care and maintenance


5.1 Caring for the product

- ▶ Clean the casing with a damp cloth and a little solvent-free soap.
- ▶ Do not use sprays, scouring agents, detergents, solvents or cleaning agents that contain chlorine.

5.2 Maintenance

An annual inspection of the product carried out by a competent person is a prerequisite for ensuring that the product is permanently ready and safe for operation, reliable, and has a long working life.

5.3 Reading maintenance messages

If the  symbol is shown in the display, the product requires maintenance work or the product is in restricted mode (comfort protection). The product is not in fault mode; it continues to operate.

- ▶ Consult a competent person.

Condition: Lhm. 37 is displayed

The product is in Comfort protection mode. The product has detected a permanent fault and continues to run with restricted comfort.

5.4 Checking the system pressure

1. Check the filling pressure of the heating installation every day for a week after initial start-up and maintenance work, and then twice a year.
 - Min. heating circuit operating pressure: ≥ 0.07 MPa (≥ 0.70 bar)
2. Use **Menu Live Monitor Water pressure** to display the filling pressure.
3. Inform your competent person so that they can add heating water and increase the filling pressure and, in event of frequent pressure losses, determine and eliminate the cause of the loss of heating water.

6 Troubleshooting

6.1 Reading fault messages

Fault messages have priority over all other displays and are shown on the display instead of the basic display. If several faults occur at the same time, these are displayed alternately for two seconds each.

Depending on the type of fault, the system can work in limp home mode in order to maintain the heating mode or domestic hot water generation.

F.723 Building circuit: Pressure too low

If the filling pressure falls below the minimum pressure, the heat pump will be switched off automatically.

- ▶ Inform your competent person so that he can top up the heating water.

F.1120 Immersion heater: Phase failure

The product has an internal circuit breaker which switches off the heat pump in the event of short circuits or the failure of one (product with 230 V power supply) or several (product with 400 V power supply) current-carrying phases.

If the electric back-up heater is defective, the anti-legionella function is not always guaranteed.

- ▶ Inform your competent person so that they can eliminate the fault and reset the internal circuit breaker.

6.2 Detecting and eliminating faults

- ▶ If problems occur whilst operating the product, you can carry out certain checks with the aid of the table. Troubleshooting (→ Page 11)
- ▶ If the product is not functioning correctly, even though you have checked the points listed in the table, contact a competent person.

7 Decommissioning

7 Decommissioning

7.1 Temporarily decommissioning the product

- ▶ Use the partition that is installed on-site (e.g. fuses or power switches) to disconnect the product from the power supply.

7.2 Permanently decommissioning the product

- ▶ Have a competent person permanently decommission and dispose of the product.

8 Recycling and disposal

- ▶ The competent person who installed your product is responsible for the disposal of the packaging.



■ If the product is labelled with this mark:

- ▶ In this case, do not dispose of the product with the household waste.
- ▶ Instead, hand in the product to a collection centre for waste electrical or electronic equipment.



■ If the product contains batteries that are labelled with this mark, these batteries may contain substances that are hazardous to human health and the environment.

- ▶ In this case, dispose of the batteries at a collection point for batteries.

9 Guarantee and customer service

9.1 Guarantee

Vaillant provides a full parts and labour guarantee for this appliance for the duration as shown on the enclosed registration card which must be fully completed and returned within 30 days of installation. All appliances must be installed by a suitably competent person fully conversant and in accordance with all current regulations applicable to the appliance type installation. In the case of gas appliances the Gas Safety (Installation and Use) Regulations 1998, and the manufacturer's instructions. In the UK competent persons approved at the time by the Health and Safety Executive undertake the work in compliance with safe and satisfactory standards. Installers should also be fully conversant with and competent with all necessary electrical and building regulations that may apply to the installation.

In addition all unvented domestic hot water cylinders must be installed by a competent person to the prevailing building regulations at the time of installation (G3). All appliances shall be fully commissioned in accordance with our installation manual and Benchmark commissioning check list (this will be included within the installation manual). These must be signed and given to the user for safe keeping during the hand over process. Installers should also at this time advise the user of the annual servicing requirements and advise of appropriate service agreement.

Terms and conditions do apply to the guarantee, details of which can be found on the registration card included with this

appliance. In order to qualify for guarantee after one year the appliance must be serviced in accordance with our installation manual servicing instructions. The benchmark service history should be completed. Note - all costs associated with this service are excluded from this guarantee.

Failure to install and commission this appliance in compliance with the manufacturer's instructions will invalidate the guarantee (this does not affect the customer's statutory rights).

9.2 Customer service

Validity: Domestic

To ensure regular servicing, it is strongly recommended that arrangements are made for a Maintenance Agreement. Please contact Vaillant Service Solutions for further details:

Telephone: 0330 100 3461

Appendix

A Troubleshooting

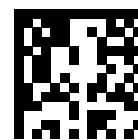
Problem	Possible cause	Remedy
No domestic hot water, heating remains cold; product does not start up	Building power supply switched off	Switch on building power supply
	Domestic hot water or heating set to "off"/domestic hot water temperature or target temperature set too low	Ensure that domestic hot water mode and/or heating mode is activated in the system control. Set the domestic hot water temperature in the system control to the required value.
	Air in the heating installation	Purging the radiators If the problem occurs again: Inform the competent person
Domestic hot water mode without any problems; heating does not start	No heat requirement via the control	Check the timer programme on the control and correct if necessary Check the room temperature and, if required, correct the target room temperature (→ Control operating instructions)

B Overview of the end user operating level

Setting level	Values		Unit	Increment, select	Factory setting	Setting
	Min.	Max.				
Basic display → Right-hand selection button						
Room temperature setpoint *	Current value		°C			
Manual cooling demand*						
Basic display → Left-hand selection button						
Domestic hot water cylinder target temperature*	Current value		°C			
Domestic hot water cylinder actual temperature	Current value		°C			
Yield indicator →						
Energy yield: Day, Heating	Cumulative value		kWh			
Energy yield: Day, Domestic hot water	Cumulative value		kWh			
Energy yield: Day, Cooling	Cumulative value		kWh			
Energy yield: Month, Heating	Cumulative value		kWh			
Working figure: Month, Heating	Cumulative value					
Energy yield: Total, Heating	Cumulative value		kWh			
Working figure: Total, Heating	Cumulative value					
Energy yield: Month, Cooling	Cumulative value		kWh			
SEER, month, cooling	Cumulative value					
Energy yield: Total, Cooling	Cumulative value		kWh			
SEER, total, cooling	Cumulative value					
Energy yield: Month, Domestic hot water	Cumulative value		kWh			
Working figure: Month, Domestic hot water	Cumulative value					
Energy yield: Total, Domestic hot water	Cumulative value		kWh			
Working figure: Total, Domestic hot water	Cumulative value					
Total energy consumption	Cumulative value		kWh			
Live Monitor →						
Current status message(s)	Current value					
*If no system control is installed, the menu item is displayed in the product's control panel.						

Appendix

Setting level	Values		Unit	Increment, select	Factory setting	Setting
	Min.	Max.				
Building circuit water pressure	Current value		bar			
Building circuit flow rate	Current value		l/h			
Compressor anti-cycling time	Current value		min			
Immersion heater anti-cycling time	Current value		min			
Target flow temp.	Current value		°C			
Current flow temp.	Current value		°C			
Energy integral	Current value		°min			
Cooling capacity	Current value		kW			
Electrical power consumption	Current value		kW	Total power consumption of the heat pump without any external components connected (as supplied).		
Compressor modulation	Current value		%			
Air inlet temperature	Current value		°C			
Immersion heater power	Current value		kW			
External current anode status	Current value				Anode not connected	
Outdoor temperature	Current value		°C			
Information →						
Contact details	Phone number					
Serial number	Permanent value					
Operating hours total	Cumulative value		h			
Hours heating	Cumulative value		h			
DHW operating hours	Cumulative value		h			
Cooling op. hours	Cumulative value		h			
Default settings →						
Language	Current language			Languages available for selection	02 English	
Display contrast	Current value			1	25	
	15	40				
Resets →						
No sub-items available						
*If no system control is installed, the menu item is displayed in the product's control panel.						



0020291544_01

0020291544_01 ■ 30.01.2020

Supplier

Vaillant Ltd.

Nottingham Road ■ Belper ■ Derbyshire ■ DE56 1JT

Telephone 0330 100 3461

info@vaillant.co.uk ■ www.vaillant.co.uk

© These instructions, or parts thereof, are protected by copyright and may be reproduced or distributed only with the manufacturer's written consent.

Subject to technical modifications.

Installation and maintenance instructions



Hydraulic Station

VWZ MEH 97/6

Publisher/manufacture

Vaillant GmbH

Berghauser Str. 40 ■ D-42859 Remscheid
Tel. +492191 18 0 ■ Fax +492191 18 2810
info@vaillant.de ■ www.vaillant.de



Contents

Contents

1	Safety	20	6.16	Connecting the domestic hot water cylinder's temperature sensor.....	32
1.1	Action-related warnings	20	6.17	Connecting the external prioritising diverter valve (optional)	32
1.2	Intended use	20	6.18	Connecting the VR 70/VR 71 mixer module	32
1.3	General safety information	20	6.19	Connecting cascades	32
1.4	Regulations (directives, laws, standards)	21	6.20	Closing the electronics box for the power supply PCB	32
2	Notes on the documentation	22	6.21	Checking the electrical installation	32
2.1	Further information	22	7	Operation	33
3	Product description	22	7.1	Operating concept of the product	33
3.1	Heat pump system	22	8	Start-up	33
3.2	Safety devices	22	8.1	Prioritising diverter valve, setting the heating circuit/cylinder charging	33
3.3	Product overview	23	8.2	Checking and treating the heating water/filling and supplementary water	33
3.4	Information on the data plate	24	8.3	Filling and purging the heating installation	34
3.5	Connection symbols	24	8.4	Purging	35
3.6	CE marking	24	8.5	Switching on the product	35
3.7	Cooling mode	24	8.6	Running the installation assistants	35
4	Set-up	24	8.7	Menu functions without the optional system control	35
4.1	Unpacking the product	24	8.8	Enabling the electric back-up heater	35
4.2	Checking the scope of delivery	24	8.9	Setting the anti-legionella function	36
4.3	Selecting the installation site	25	8.10	Calling up the installer level	36
4.4	Dimensions	25	8.11	Checking the configuration	36
4.5	Minimum clearances and installation clearances	25	8.12	Calling up statistics	36
4.6	Wall-mounting the product	26	8.13	Displaying the filling pressure in the building circuit	36
4.7	Removing the front casing	26	8.14	Checking function and leak-tightness	36
5	Hydraulics installation	26	8.15	Floor drying	36
5.1	Carrying out the installation preparations	26	8.16	Starting up the optional system control	37
5.2	Connecting the heat pump to the indoor unit	27	9	Adapting the unit to the heating installation	37
5.3	Connecting the domestic hot water cylinder's heating flow and heating return	27	9.1	Configuring the heating installation	37
5.4	Connecting the building circuit	27	9.2	Total pressure loss in the product, heating circuit and domestic hot water	37
5.5	Installing the drain hose on the expansion relief valve	27	9.3	Instructing the end user	37
6	Electrical installation	28	10	Troubleshooting	37
6.1	Preparing the electrical installation	28	10.1	Contacting your service partner	37
6.2	Requirements for the quality of the mains voltage	28	10.2	Reading off the fault codes	37
6.3	Electrical partition	28	10.3	Querying the fault memory	37
6.4	Installing components for the energy supply company lockout function	28	10.4	Resetting the fault memory	38
6.5	Establishing the power supply, 1~/230V	29	10.5	Displaying Live Monitor (status codes)	38
6.6	Establishing the power supply, 3~/400V	29	10.6	Using the function menu	38
6.7	Opening the power supply PCB's electronics box	30	10.7	Carrying out the actuator test	38
6.8	Establishing the power supply	30	10.8	Resetting parameters to factory settings	38
6.9	Installing the system control in the electronics box	31	10.9	Safety cut-out	38
6.10	Routing the cables	31	11	Inspection and maintenance	38
6.11	Carrying out the wiring	31	11.1	Procuring spare parts	38
6.12	Opening the control PCB's electronics box	32	11.2	Checking maintenance messages	39
6.13	Connecting the circulation pump	32	11.3	Observing inspection and maintenance intervals	39
6.14	Connecting a limit thermostat for the underfloor heating	32	11.4	Preparing for inspection and maintenance	39
6.15	Connecting the outdoor temperature sensor	32			

11.5	Using check programmes	39
11.6	Checking the pre-charge pressure of the expansion vessel	39
11.7	Checking the high-pressure switch-off	39
12	Draining	39
12.1	Draining the product's heating circuit.....	39
12.2	Draining the heating installation	40
13	Decommissioning.....	40
13.1	Decommissioning the product	40
13.2	Recycling and disposal.....	40
14	Customer service.....	40
Appendix		41
A	Functional diagram.....	41
B	Wiring diagram.....	42
C	Control PCB	43
D	Basic connection diagram for the energy supply company lockout, shutdown via connection S21	44
E	Basic connection diagram for the energy supply company lockout, shutdown via partition	45
F	Installer level overview.....	46
G	Status codes	50
H	Maintenance messages	52
I	Comfort protection mode.....	52
J	Fault codes.....	53
K	5.4 kW back-up heater at 230 V and at 400 V	57
L	Inspection and maintenance work.....	58
M	Characteristic values for the internal temperature sensors, hydraulic circuit	58
N	Characteristic values for the VR10 internal temperature sensors, cylinder temperature	58
O	Characteristic values for the VRC DCF outdoor temperature sensor.....	59
P	Technical data.....	60
Index		62

1 Safety

1 Safety

1.1 Action-related warnings

Classification of action-related warnings

The action-related warnings are classified in accordance with the severity of the possible danger using the following warning signs and signal words:

Warning symbols and signal words



Danger!

Imminent danger to life or risk of severe personal injury



Danger!

Risk of death from electric shock



Warning.

Risk of minor personal injury



Caution.

Risk of material or environmental damage

1.2 Intended use

There is a risk of injury or death to the user or others, or of damage to the product and other property in the event of improper use or use for which it is not intended.

This product is a system component for controlling the heating circuits and domestic hot water generation in conjunction with a heat pump using a system control.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit
VWL ..5/6 A ..	VIH QW 190/6...
	VWZ MEH 97/6

Intended use includes the following:

- observance of accompanying operating, installation and maintenance instructions for the product and any other system components
- installing and setting up the product in accordance with the product and system approval

- compliance with all inspection and maintenance conditions listed in the instructions.

Intended use also covers installation in accordance with the IP code.

Any other use that is not specified in these instructions, or use beyond that specified in this document, shall be considered improper use. Any direct commercial or industrial use is also deemed to be improper.

Caution.

Improper use of any kind is prohibited.

1.3 General safety information

1.3.1 Risk caused by inadequate qualifications

The following work must only be carried out by competent persons who are sufficiently qualified to do so:

- Set-up
- Dismantling
- Installation
- Start-up
- Inspection and maintenance
- Repair
- Decommissioning
- ▶ Proceed in accordance with current technology.

1.3.2 Risk of death from electric shock

There is a risk of death from electric shock if you touch live components.

Before commencing work on the product:

- ▶ Disconnect the product from the power supply by switching off all power supplies at all poles (electrical partition with a contact gap of at least 3 mm, e.g. fuse or circuit breaker).
- ▶ Secure against being switched back on again.
- ▶ Wait for at least 3 minutes until the capacitors have discharged.
- ▶ Check that there is no voltage.



1.3.3 Risk of death due to lack of safety devices

The basic diagrams included in this document do not show all safety devices required for correct installation.

- ▶ Install the necessary safety devices in the installation.
- ▶ Observe the applicable national and international laws, standards and directives.

1.3.4 Risk of being burned or scalded by hot components

- ▶ Only carry out work on these components once they have cooled down.

1.3.5 Risk of material damage caused by condensate inside the house

The lines between the heat pump and the air/brine collector are cold, meaning that condensate can form on the lines in the house. This may lead to material damage, for example due to corrosion.

- ▶ Ensure that you do not damage the insulation of the lines.

1.3.6 Risk of scalding from hot water

There is a risk of scalding at the hot water draw-off points if the hot water temperatures are greater than 60 °C. Young children and elderly persons are particularly at risk, even at lower temperatures.

- ▶ Select a moderate set target temperature.
- ▶ Inform the operator about the risk of scalding when the **Anti-legionella** function is switched on.

1.3.7 Risk of injury due to the heavy weight of the product

- ▶ Make sure that the product is transported by at least two people.

1.3.8 Material damage due to unsuitable installation surface

The installation surface must be even and have sufficient load-bearing capacity to support the operating weight of the product. An uneven installation surface may cause leaks in the product.

There is a risk of death if the connections are subject to leaks.

- ▶ Make sure that the product is positioned flush against the installation surface.
- ▶ Ensure that the installation surface has sufficient load-bearing capacity to bear the operating weight of the product.

1.3.9 Risk of material damage due to malfunctioning

Not rectifying faults, changing the safety devices and failing to carry out maintenance can cause malfunctioning and pose safety risks during operation.

- ▶ Ensure that the heating installation is in a technically perfect condition.
- ▶ Ensure that no safety or monitoring devices have been removed, bridged or disabled.
- ▶ Immediately eliminate any faults and damage that may affect safety.

1.3.10 Material damage due to additives in the heating water

Unsuitable antifreeze and corrosion inhibitors may damage seals and other components of the heating circuit, and may therefore also cause water leaks.

- ▶ Only add approved antifreeze and corrosion inhibitors to the heating water.

1.3.11 Risk of material damage caused by frost

- ▶ Do not install the product in rooms prone to frost.

1.3.12 Risk of material damage caused by using an unsuitable tool

- ▶ Use the correct tool.

1.4 Regulations (directives, laws, standards)

- ▶ Observe the national regulations, standards, directives, ordinances and laws.



2 Notes on the documentation

2 Notes on the documentation

- ▶ Always observe all the operating and installation instructions included with the system components.
- ▶ Pass these instructions and all other applicable documents on to the end user.

These instructions apply only to:

Product
VWZ MEH 97/6

Product
VIH QW 190/6 E GB

2.1 Further information

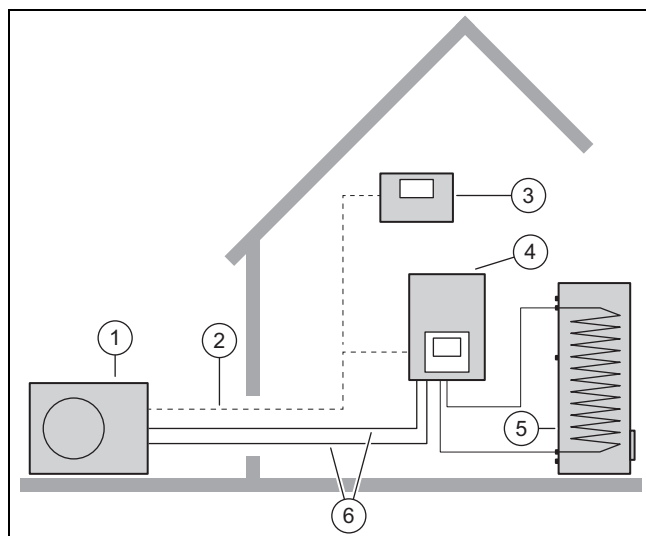


- ▶ Scan the displayed code using your smartphone in order to view further information about the installation.
 - ◀ You are guided to installation videos.

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with monoblock technology:



- | | |
|-----------------------------|--|
| 1 Heat pump, outdoor unit | 4 Heat pump, indoor unit |
| 2 eBUS line | 5 Monovalent domestic hot water cylinder |
| 3 System control (optional) | 6 Heating circuit |

3.2 Safety devices

3.2.1 Frost protection function

The frost protection function for the system is controlled using the product itself or using the optional system control. If the system control fails, the product guarantees limited frost protection for the heating circuit.

At negative outdoor temperatures, there is an increased risk of the heating water freezing if a heat pump fault occurs, e.g. due to a power cut or a defective compressor.

3.2.2 Low-water pressure protection

This function continuously monitors the pressure of the heating water in order to prevent a possible loss of heating water. If the water pressure falls below the minimum pressure, an analogue pressure sensor switches the product off and, if available, switches other modules to standby mode. If the water pressure reaches the operating pressure, the pressure sensor switches the product back on.

If the heating water pressure falls below ≤ 0.1 MPa (1 bar), a maintenance message appears below the display of the minimum operating pressure.

- Min. heating circuit pressure: ≥ 0.05 MPa (≥ 0.50 bar)
- Min. heating circuit operating pressure: ≥ 0.07 MPa (≥ 0.70 bar)

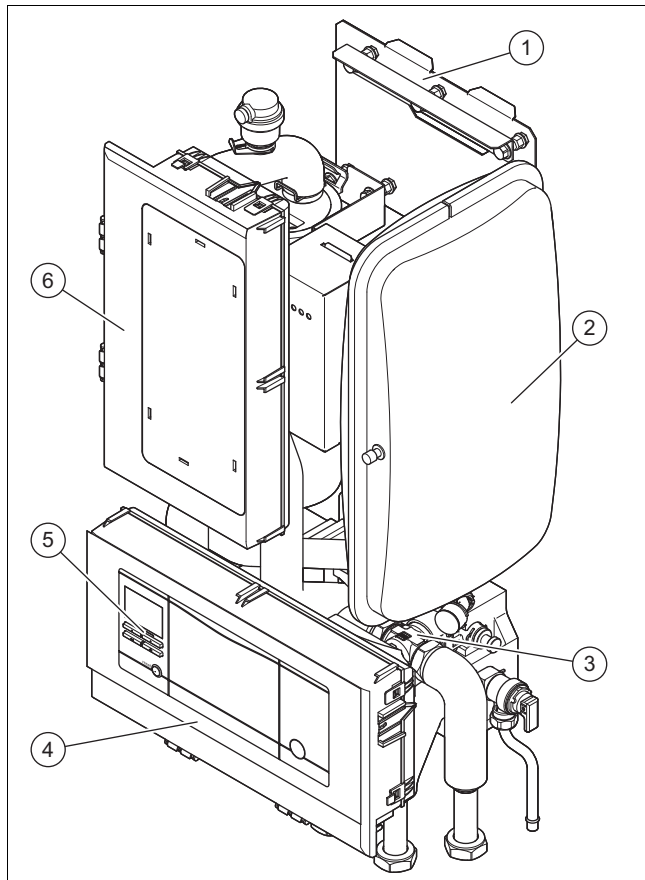
3.2.3 Safety cut-out (SCO) in the heating circuit

If the temperature in the heating circuit of the internal electric back-up heater exceeds the maximum temperature, the safety cut-out shuts down the electric back-up heater as a securing measure. After it is triggered, the safety cut-out must be replaced.

- Max. heating circuit temperature: 98°C

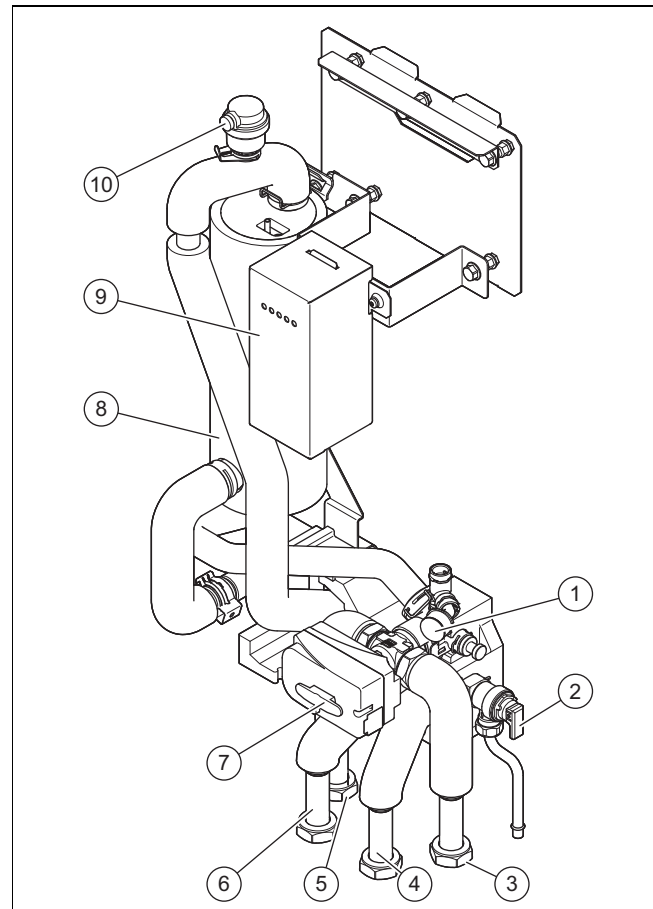
3.3 Product overview

3.3.1 Product design



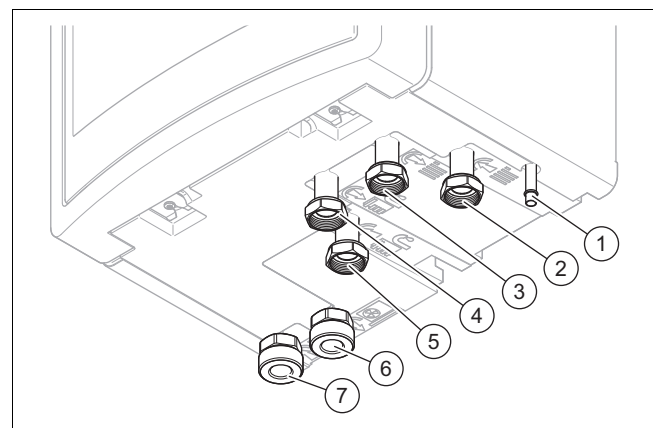
- | | |
|-------------------------|---|
| 1 Unit mounting bracket | 4 Electronics box with control PCB |
| 2 Expansion vessel | 5 Control for the indoor unit |
| 3 Hydraulic block | 6 Electronics box with power supply PCB |

3.3.2 Design of the hydraulic block



- | | |
|--------------------------------------|---|
| 1 Manometer | 6 Domestic hot water cylinder flow |
| 2 Expansion relief valve | 7 Prioritising diverter valve (heating circuit/cylinder charging) |
| 3 Building circuit return | 8 Electric back-up heater |
| 4 Building circuit flow | 9 Safety cut-out |
| 5 Domestic hot water cylinder return | 10 Automatic air vent |

3.3.3 Underside of the product



- | | |
|------------------------------------|--------------------------------------|
| 1 Drain for expansion relief valve | 5 Domestic hot water cylinder return |
| 2 Building circuit return | 6 Heating return, to the heat pump |
| 3 Building circuit flow | 7 Heating flow, from the heat pump |
| 4 Domestic hot water cylinder flow | |

4 Set-up

3.4 Information on the data plate

The data plate keeps record of the country in which the product is to be installed.

	Information	Meaning
	Serial no.	Unique unit identification number
Nomenclature	VWZ	Vaillant heat pump accessory
	MEH	Electro-hydraulic module
	97	9 = 9 kW back-up heater 7 = integrated 3-port motorised valve for external domestic hot water cylinder
	/6	Unit generation
	230 V	Electrical connection: 230 V: 1~N/PE 230 V 400 V: 3~N/PE 400 V
	IP	Protection class
Symbols		Control
		Heating circuit
		Back-up heater
	P max	Rated power, maximum
	P	Rated power
	I max	Rated current, maximum
	I	In-rush current
Heating circuit, domestic hot water circuit	MPa (bar)	Permissible operating pressure
	L	Fill quantity
	CE marking	See section "CE marking"

3.5 Connection symbols

Symbol	Connection
	Building circuit, flow
	Building circuit, return
	Heating flow, outdoor unit
	Heating return, outdoor unit
	Heating flow, domestic hot water cylinder

Symbol	Connection
	Heating return, domestic hot water cylinder

3.6 CE marking



The CE marking shows that the products comply with the basic requirements of the applicable directives as stated on the declaration of conformity.

The declaration of conformity can be viewed at the manufacturer's site.

3.7 Cooling mode

Depending on the country, the heat pump (outdoor unit) has the heating mode or heating and cooling mode function. The product is compatible with this.

An optional accessory can be used to subsequently activate the cooling mode.

- Activate and parametrise cooling mode in the system control.

4 Set-up

4.1 Unpacking the product

1. Remove the product from the packaging.
2. Remove the documentation.
3. Remove the protective film from all parts of the product.

4.2 Checking the scope of delivery

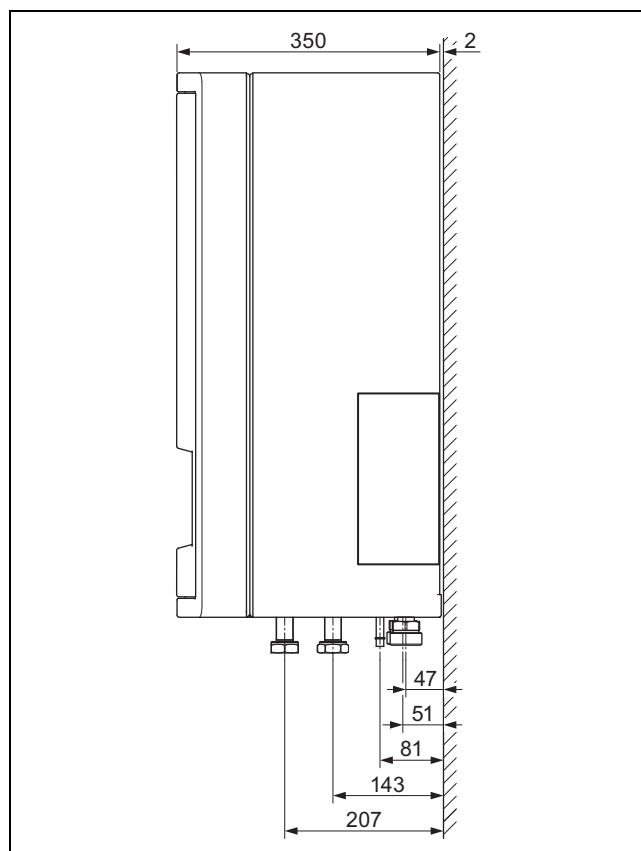
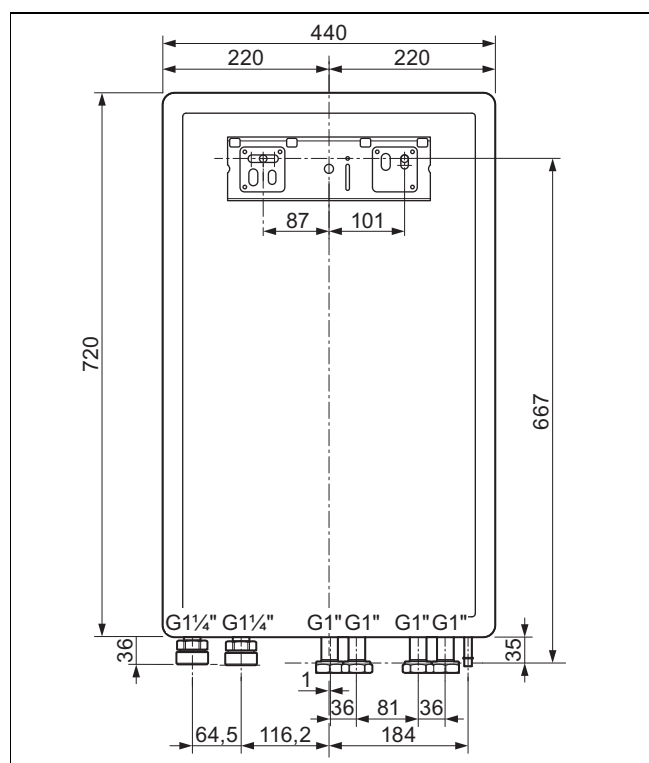
- Check that the scope of delivery is complete and intact.

Number	Designation
1	Hydraulic station
1	Unit mounting bracket
1	Enclosed documentation
1	Bag with installation material
1	Selection lever for prioritising diverter valve
1	Filling device
1	5-pole 400 V connection cable, 5 x 2.5 mm ²
1	Adhesive strips for noise reduction

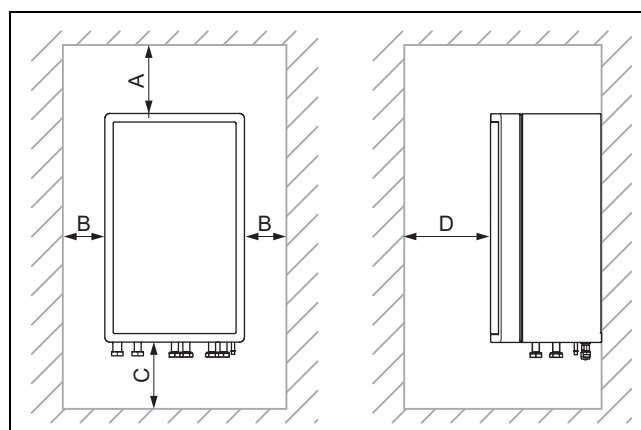
4.3 Selecting the installation site

- ▶ The installation site must be below 2000 metres above sea level.
- ▶ Select a dry room that is frost-proof throughout and in which the maximum installation height is not exceeded and the environmental temperature is neither above nor below the permitted range.
 - Permissible relative air humidity: 40 ... 75 %
- ▶ Ensure that the required minimum clearances can be maintained.
- ▶ The permissible height difference between the indoor unit and outdoor unit must not be greater than 15 m.
- ▶ When selecting the installation site, you must take into consideration that when the heat pump is in operation, it will transfer vibrations to the walls.
- ▶ Ensure that the wall is even and offers sufficient load-bearing capacity to bear the weight of the product.
- ▶ Ensure that the pipes are routed appropriately.
- ▶ Do not install the product above another unit that may damage it (e.g. above a cooker that produces water vapour and grease) or in a room with a high level of exposure to dust or in a corrosive environment.
- ▶ Do not install the product below a unit from which liquids may flow.

4.4 Dimensions



4.5 Minimum clearances and installation clearances



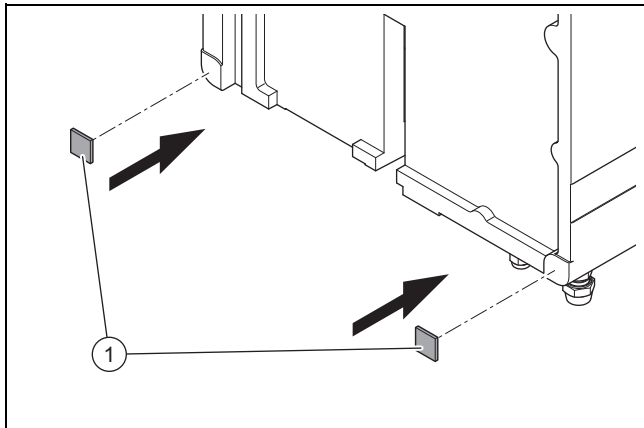
A	Min. 200 mm	C	1000 mm
B	Min. 200 mm	D	> 600 mm

- ▶ Provide sufficient clearance on both sides of the product in order to facilitate access for maintenance and repair work.
- ▶ When using the accessories, observe the minimum clearances/installation clearances.
- ▶ Ensure that no highly flammable parts come into contact with the components as these may reach temperatures of over 80°C.
- ▶ Ensure that there is a minimum clearance between the highly flammable parts and the hot components.

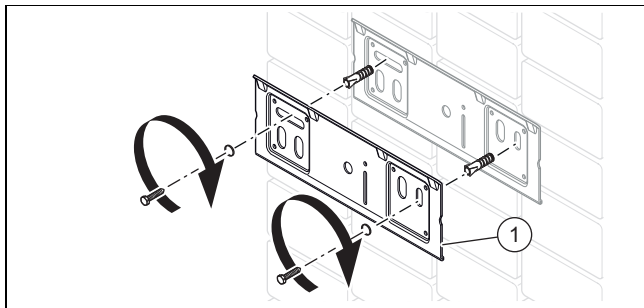
5 Hydraulics installation

- Minimum clearance: 200 mm

4.6 Wall-mounting the product

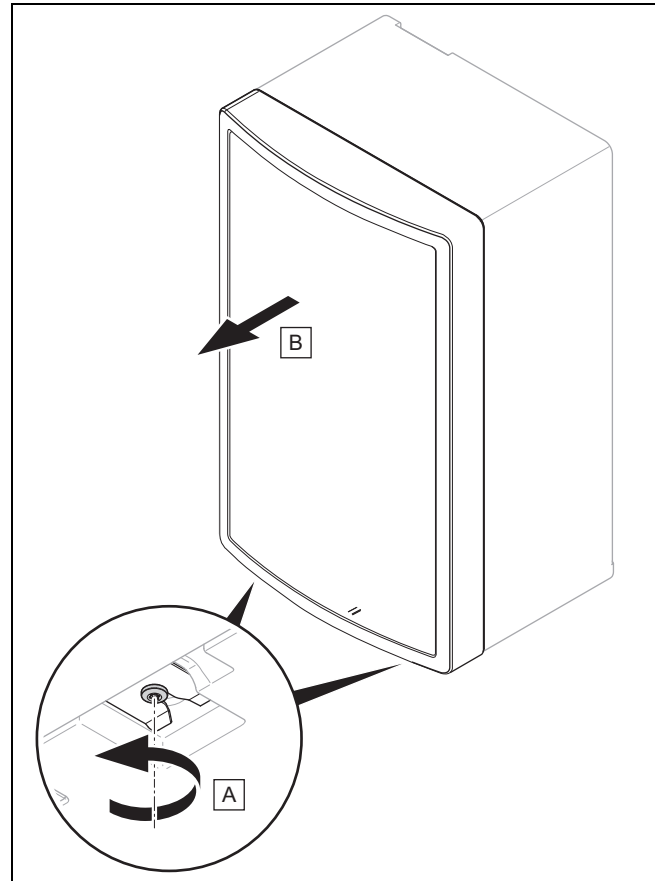


1. Cut the enclosed adhesive strips for noise reduction into two equally sized pieces (3 cm x 3 cm).
2. Affix the adhesive strips to the product as shown in the figure.



3. Check the load-bearing capacity of the wall.
4. Note the total weight of the product.
5. Only use fixing material that is permitted for the wall.
6. If required, ensure that mounting apparatus on-site has sufficient load-bearing capacity.
7. Suspend the product on the unit mounting bracket from above using the hanging bracket.

4.7 Removing the front casing



- Reinstall the components in the reverse order.

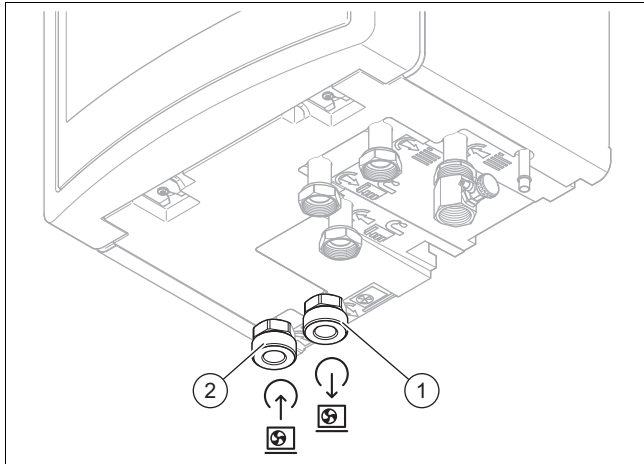
5 Hydraulics installation

5.1 Carrying out the installation preparations

- Install the following components, preferably from the manufacturer's accessories:
 - An expansion relief valve, a stopcock and a manometer on the heating return
 - A domestic hot water safety assembly and a stopcock on the cold water supply
 - A stopcock on the heating flow
- Check whether the volume of the installed expansion vessel is sufficient for the heating system. If required, install an additional expansion vessel, connected as close to the product as possible, in the heating return.
- Install the connection pipes such that they are free from mechanical stress.
- If you are using metallic pipes to connect the pipe to the outdoor unit, earth the pipes.
- Heat-insulate the pipes.
- Only solder connectors if the connectors are not yet screwed to the service valves.
- Carefully flush the heating installation before connecting the product.
- Check whether the expansion relief valve's drain pipe-work opposite the outdoor air remains open, is installed in a frost-free environment, always runs downwards and visibly ends in an open drain.

- For heating installations with solenoid valves or thermostatically controlled valves, install a bypass with bypass valve in order to guarantee a volume flow of at least 40%.

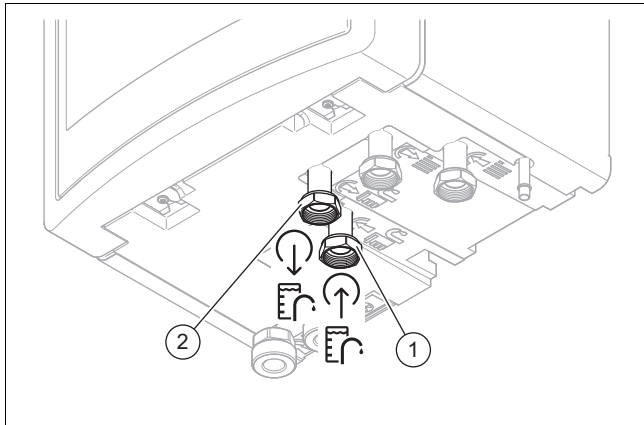
5.2 Connecting the heat pump to the indoor unit



- | | |
|--|--|
| 1 G 1 1/4" connection,
heating return to the
heat pump | 2 G 1 1/4" connection,
heating flow from the
heat pump |
|--|--|

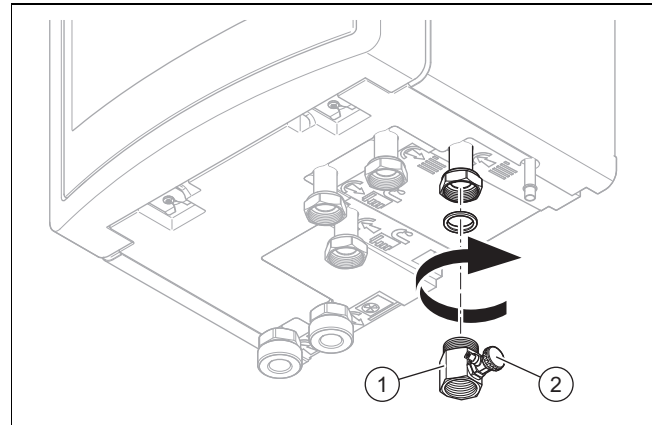
1. Blow or flush the supply pipes thoroughly prior to installation.
2. Connect the heat pump to the hydraulic station.
3. Check whether the connections are leak-tight. (→ Page 36)

5.3 Connecting the domestic hot water cylinder's heating flow and heating return

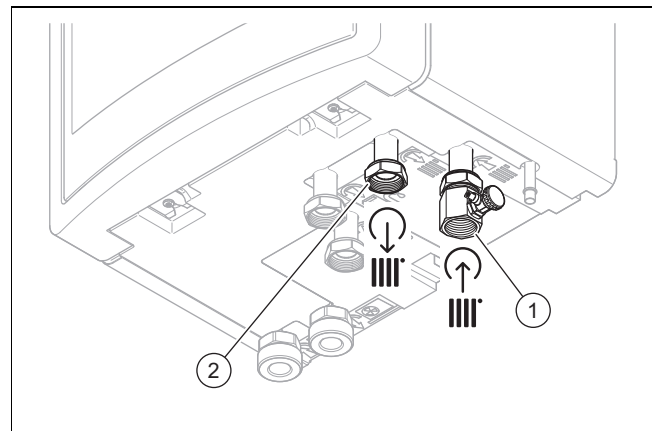


- Connect the domestic hot water cylinder's heating return (1) and heating flow (2) in accordance with the relevant standards.

5.4 Connecting the building circuit

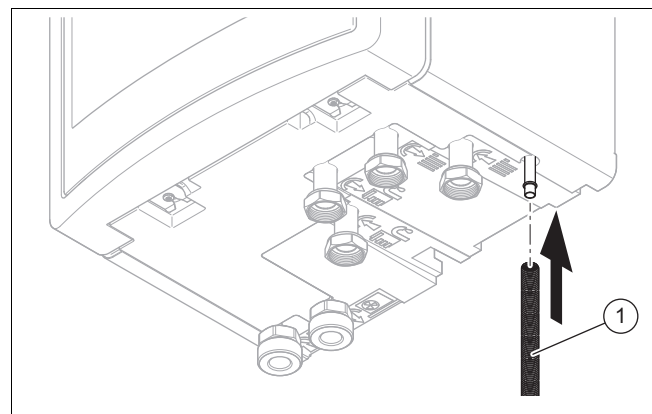


1. Connect the filling device with the enclosed seal to the product's heating return.



2. Connect the building circuit's return (1) and flow (2) in accordance with the relevant standards.

5.5 Installing the drain hose on the expansion relief valve



1. Install a drain hose (1) on the expansion relief valve.
2. Install the expansion relief valve hose in a frost-free environment and ensure that its routing ends in an open drain where it is then visible.
3. Terminate the drain hose in such a way that escaping water or steam cannot cause injury to persons or damage to electrical components.
4. Open the expansion relief valve regularly in order to remove scale deposition, and ensure that the device is not blocked.

6 Electrical installation

6 Electrical installation

6.1 Preparing the electrical installation



Danger!

Risk of death from electric shock as a result of an improper electrical connection!

An improper electrical connection may negatively affect the operational safety of the product and result in material damage or personal injury.

- ▶ Only carry out the electrical installation if you are a trained competent person and are qualified for this work.

1. Observe the technical connection conditions for connecting to the energy supply company's low-voltage network.
2. If the local power supply network operator requires that the heat pump is controlled using an ESCO blocking signal, install a corresponding contact switch as prescribed by the power supply network operator.
3. Determine whether the power supply for the product should be set up with a single-tariff meter or a dual-tariff meter.
4. Connect the product via a fixed connection and a partition with a contact gap of at least 3 mm.
5. For the electrical fuse protection, use slow-blow fuses with C characteristics. Lay out fuses in accordance with the selected connection diagrams. Use three-pole switching fuses for a three-phase power supply.
6. Leave the cable cross-section for the connection cable to the distribution box unchanged.
7. If the power supply cable for this product is damaged, it must be replaced by the manufacturer or their customer service or a similarly qualified person in order to prevent any hazards.
8. Ensure that the nominal voltage of the power grid corresponds to that of the product's main power supply cabling.
9. Make sure that access to the power supply is always available and is not covered or blocked.

6.2 Requirements for the quality of the mains voltage

For the mains voltage of the single-phase 230 V network, a tolerance of +10% to -15% must be provided.

For the mains voltage of the three-phase 400 V network, a tolerance of +10% to -15% must be provided. For the voltage difference between the individual phases, a tolerance of +-2% must be provided.

6.3 Electrical partition

The electrical partitions are referred to as "disconnectors" in these instructions. The fuse or the circuit breaker that is installed in the building's meter/fuse box is usually used as the disconnector.

6.4 Installing components for the energy supply company lockout function

Condition: Energy supply company lockout function provided

The heat generation from the heat pump can be switched off temporarily by the energy supply company – usually by using a ripple control receiver. The unit can be shut down in two ways:

- The signal for the shutdown is fed to connection S21 for the indoor unit.
- The signal for the shutdown is fed to a partition that is installed on-site in the meter/fuse box.

- ▶ Install and wire additional components in the building's meter/fuse box. To do this, follow the wiring diagram in the appendix.

Option 1: Actuating connection S21

- ▶ Connect a 2-pole control cable to the relay contact (potential-free) for the ripple control receiver and to connection S21.



Note

In the event of control via connection S21, the energy supply does not have to be disconnected on-site.

- ▶ In the system control, set whether the electric back-up heater, the compressor or both should be blocked via S21.

Option 2: Disconnect the power supply with contactor

- ▶ Upstream of the indoor unit, install a contactor into the power supply for the low tariff.
- ▶ Install a 2-pole control cable. Connect the control output for the ripple control receiver to the control input for the contactor.
- ▶ Connect the power supply that is switched by the contactor to X300.



Note

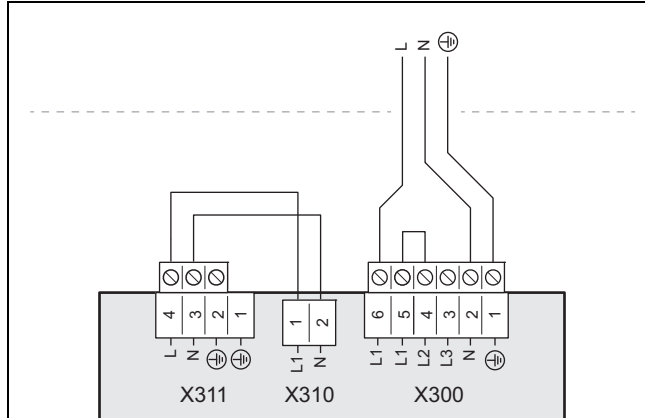
When the energy supply (for the compressor or electric back-up heater) is switched off via the tariff contactor, S21 is not connected.

6.5 Establishing the power supply, 1~/230V

- Determine the type of connection:

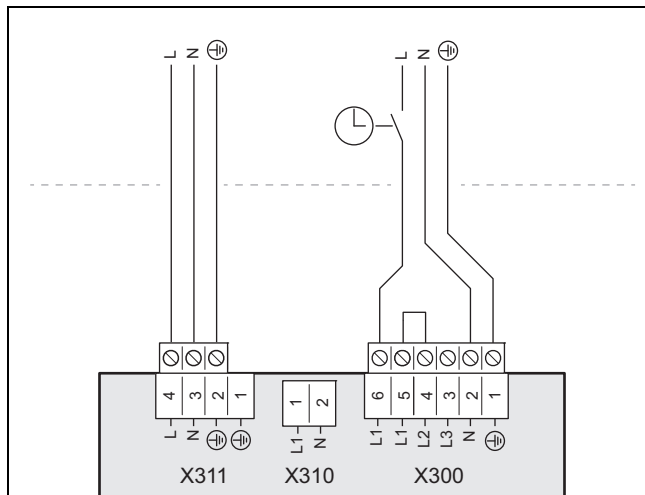
Case	Connection type
Energy supply company lockout not provided	Single power supply
Energy supply company lockout provided, shutdown via connection S21	
Energy supply company lockout provided, shutdown via partition	Dual power supply

6.5.1 1~/230V single power supply



1. Note the specifications on the sticker on the electronics box.
2. Install a disconnector for the product.
3. Use the preinstalled 3-pole power supply cable (3 x 4 mm²).
4. Connect the power supply cable to L1, N, PE.

6.5.2 1~/230V dual power supply



1. Note the specifications on the sticker on the electronics box.
2. Install two disconnectors for the product.
3. Use the preinstalled 3-pole power supply cable and an additional 3-pole power supply cable (3 x 4 mm²) with a temperature resistance of 90 °C.

- Note that commercially available power supply cables do not usually have sufficient temperature resistance.

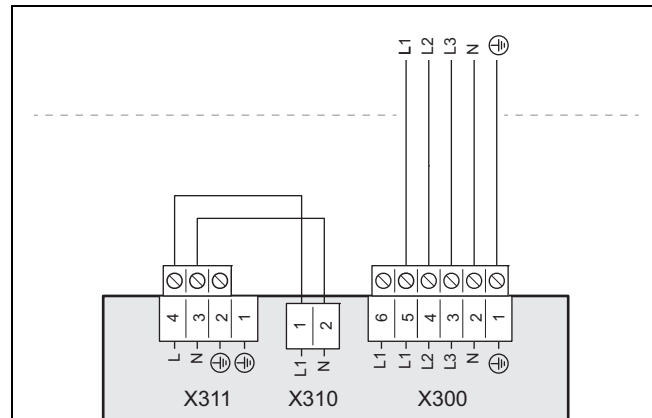
4. Connect the preinstalled power supply cable to the X300 connection with the heat pump electricity meter.
5. Remove the 2-pole bridge between the X310 and X311 connections.
6. Connect the additional power supply cable (from the household electricity meter) to the X311 connection.
7. Use the strain relief clamps to secure the cables in place.

6.6 Establishing the power supply, 3~/400V

- Determine the type of connection:

Case	Connection type
Energy supply company lockout not provided	Single power supply
Energy supply company lockout provided, shutdown via connection S21	
Energy supply company lockout provided, shutdown via partition	Dual power supply

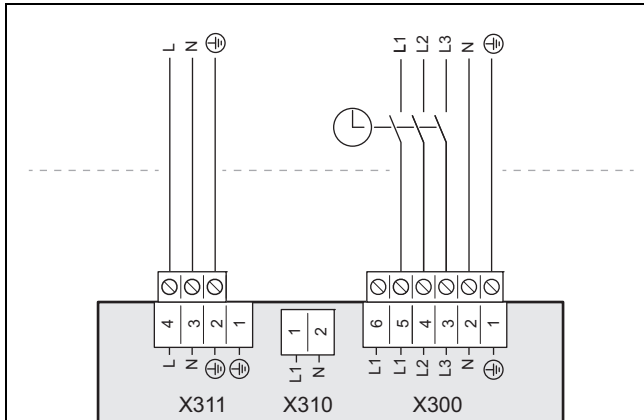
6.6.1 3~/400V single power supply



1. Note the specifications on the sticker on the electronics box.
2. Install a disconnector for the product.
3. Use the enclosed 5-pole power supply cable (5 x 2.5 mm²).
4. Remove the preinstalled 3-pole power supply cable to the X300 connection.
5. Remove the 2-pole bridge between contacts L1 and L2 on the X300 connection.
6. Connect the 5-pole power supply cable to the X300 connection.

6 Electrical installation

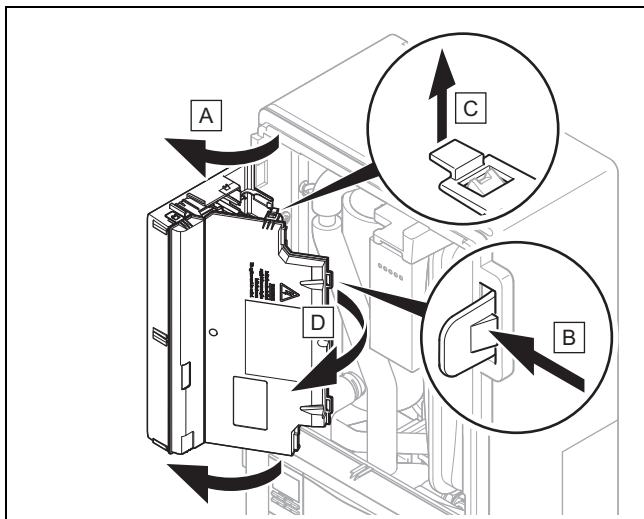
6.6.2 3~/400V dual power supply



1. Note the specifications on the sticker on the electronics box.
2. Install two disconnectors for the product.
3. Use the enclosed 5-pole power supply cable (5 x 2.5 mm²) and the preinstalled 3-pole power supply cable (3 x 4 mm²).
4. Remove the preinstalled 3-pole power supply cable from the X300 connection.
5. Remove the 2-pole bridge between contacts L1 and L2 on the X300 connection.
6. Remove the 2-pole bridge between the X310 and X311 connections.
7. Connect the 5-pole power supply cable (from the heat pump electricity meter) to the X300 connection.
8. Connect the 3-pole power supply cable (from the household electricity meter) to the X311 connection.
9. Use the strain relief clamps to secure the cables in place.

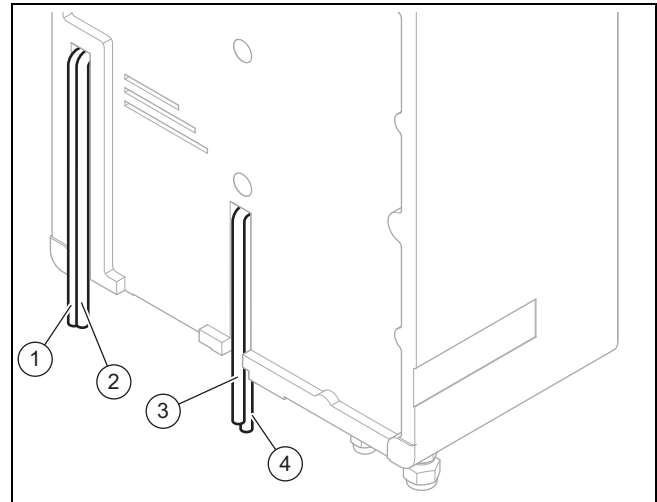
6.7 Opening the power supply PCB's electronics box

1. Remove the front casing. (→ Page 26)

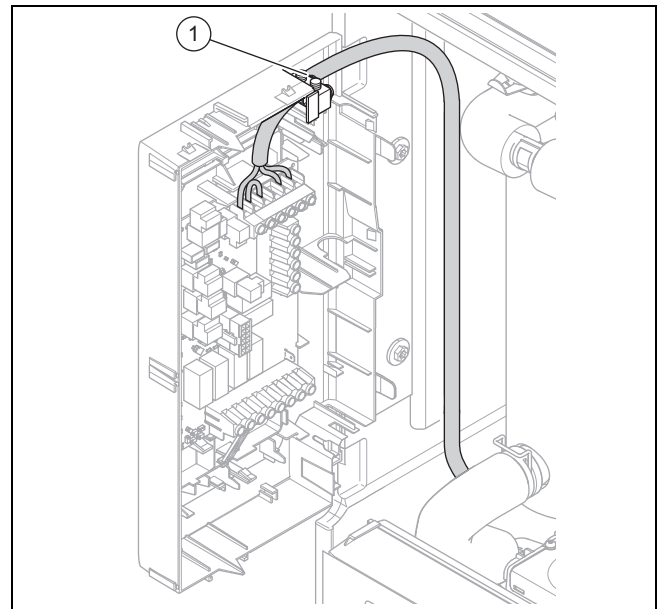


2. Hinge the electronics box forwards.
3. Detach the four clips, on the left and the right, from the brackets.

6.8 Establishing the power supply

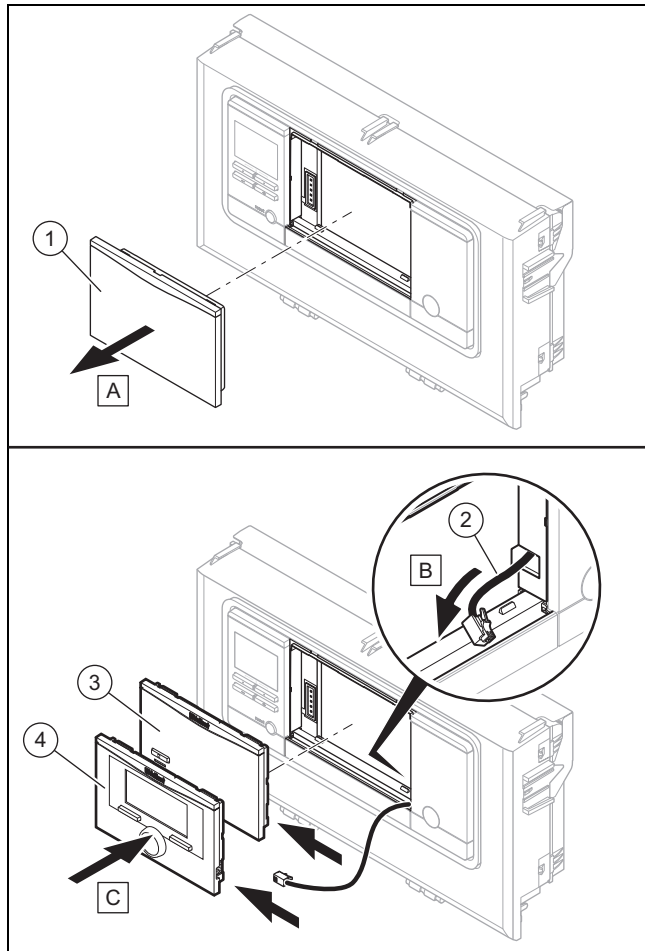


1. Remove the front casing. (→ Page 26)
2. Open the power supply PCB's electronics box. (→ Page 30)
3. Guide the power supply cable (3) and additional power supply cables (230 V) (4) through the central opening and into the product.
4. Guide the eBUS cable (1) and other low-voltage connection cables (24 V) (2) through the left-hand unit opening and into the product.



5. Guide the power supply cables through the strain relief (1) to the terminals on the power supply PCB.
6. Connect the power supply cable to the corresponding terminals.
7. Secure the power supply cable in the strain reliefs.

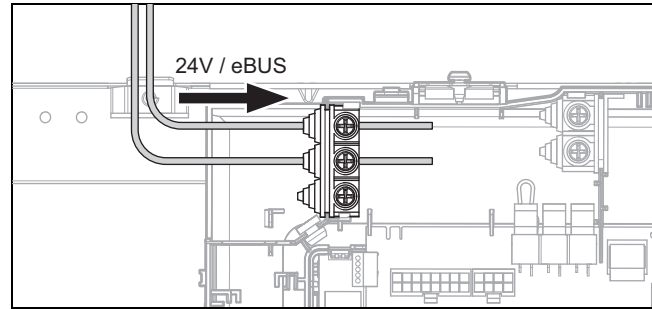
6.9 Installing the system control in the electronics box



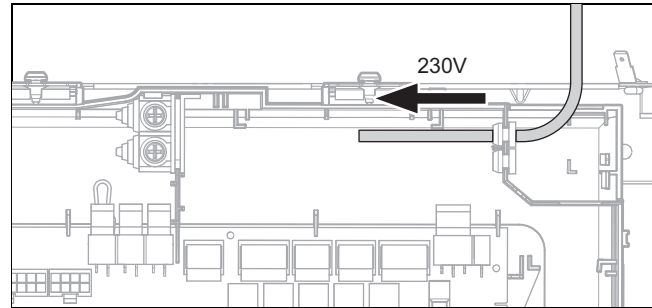
1. Remove the cover (1) on the electronics box.
2. Connect the DIF cable (2), which is laid out ready, either to the system control or to the mobile base station.
3. If you are using a radio receiver, use the mobile base station (3).
4. If you are using the wired system control, use the system control (4).
5. Consult the instructions for the system control for information on coupling the mobile base station and the system control.

6.10 Routing the cables

1. At lengths of 10 m or more, mains voltage connection cables must be laid separately from sensor or bus lines. Minimum clearance for the extra low-voltage wire and power supply cable at a line length of > 10 m: 25 cm.



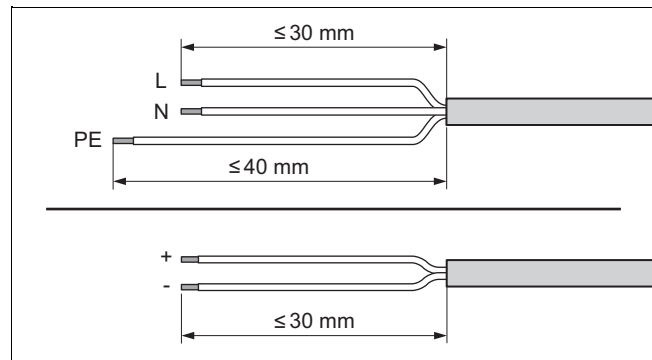
2. Route 24 V cables and eBUS cables through the left-hand strain reliefs on the electronics box.



3. Route 230 V cables through the right-hand strain reliefs on the electronics box.

6.11 Carrying out the wiring

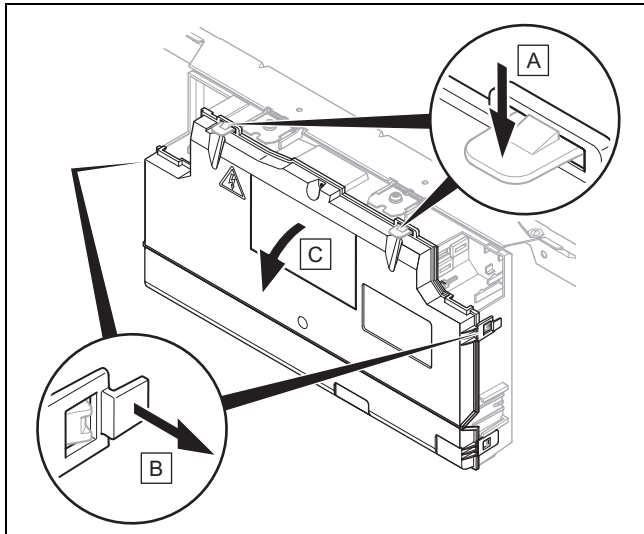
1. Ensure that the mains voltage is correctly disconnected from the safety extra-low voltage.
2. Only connect power supply cables to the terminals that are marked for the purpose.
3. Shorten the connection cables according to requirements.



4. Strip the electrical wire as shown in the figure. In doing so, ensure that the insulation on the individual conductors is not damaged.
5. Ensure the inner conductor insulation is not damaged when stripping the outer sheathing.
6. Only strip inner conductors just enough to establish good, sound connections.
7. Fit conductor end sleeves on the stripped ends of the conductors.
8. Screw the respective plug to the connection cable.
9. Check whether all conductors are inserted mechanically securely in the terminals of the plug. Remedy this if necessary.
10. Plug the plug into the associated PCB slot.

6 Electrical installation

6.12 Opening the control PCB's electronics box



1. Hinge the electronics box forwards.
2. Undo the four clips on the left and the right and the top from the brackets.

6.13 Connecting the circulation pump

1. Route the 230 V connection cable for the circulation pump from the right and into the control PCB's electronics box.
2. Connect the 230 V connection cable to the plug from slot X11 on the control PCB and plug it into the slot.
3. Connect the connection cable for the external button using terminals 1 (0) and 6 (FB) on the X41 edge connector, which is supplied with the control.
4. Plug the edge connector into slot X41 on the control PCB.
5. Set the circulation pump in the system control.

6.14 Connecting a limit thermostat for the underfloor heating

Condition: Intermediate heat exchanger installed

- Remove the S20 plug for the bypass line at terminal X100 on the indoor unit's control PCB.
- Connect the limit thermostat to plug S20 for the indoor unit.

Condition: No intermediate heat exchanger installed

- Connect the limit thermostat to plug S20 for the outdoor unit, → aroTHERM plus operating and installation instructions.

6.15 Connecting the outdoor temperature sensor

Condition: No system control connected

- Connect an outdoor temperature sensor to plug AF on terminal X41 on the control PCB.

6.16 Connecting the domestic hot water cylinder's temperature sensor

Condition: No system control connected

- Connect a temperature sensor to the fed cable on the X22 terminal block (connection terminals 19/20) on the control PCB. The range of accessories includes a temperature sensor (VR 10) with corresponding mating connector and an extension with corresponding plug and bush.

6.17 Connecting the external prioritising diverter valve (optional)

- Connect the external prioritising diverter valve to X14 on the control PCB.
 - The connection to a permanently live phase "L" with 230 V and to a switched phase "S" is available. Phase "S" is actuated by an internal relay and releases 230 V.

6.18 Connecting the VR 70/VR 71 mixer module

1. Connect the power supply for the VR 70/VR 71 mixer module to X314 on the power supply PCB.
2. Connect the VR 70/VR 71 mixer module to the eBUS interface on the control PCB.

6.19 Connecting cascades

- If you want to use cascades (max. seven units), you must connect the eBUS line to contact X30 via the VR32b bus coupler (accessory).

6.20 Closing the electronics box for the power supply PCB

1. Tighten all of the screws on the strain relief clamps.
2. Close the cover on the electronics box.
3. Hinge the electronics box back up.

6.21 Checking the electrical installation

- After the installation is complete, check the electrical installation to ensure that the connections that have been established are secured properly and are sufficiently insulated.

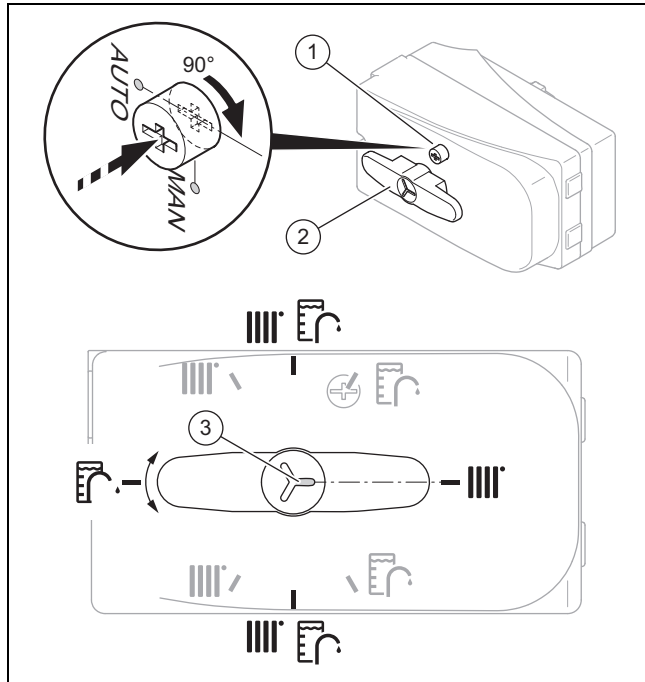
7 Operation

7.1 Operating concept of the product

The operating concept and the display and setting options of the end user level are described in the operating instructions.

8 Start-up

8.1 Prioritising diverter valve, setting the heating circuit/cylinder charging



1. If you want to manually set the prioritising diverter valve, press the knob (1) and turn it 90° clockwise.
 - ◀ You can now turn the selection lever (2) to the required position.



Note

The notch (3) that points to the selection lever's extension displays the position of the selection lever. You can turn the selection lever by 90° each time to select heating, cylinder charging and the mid-position between heating/cylinder charging (black). In automatic mode, the selection lever can move to other intermediate positions (grey).

2. If you want to actuate the heating circuit, turn the selection lever (2) to "Heating circuit".
3. If you want to actuate the domestic hot water cylinder, turn the selection lever to "Domestic hot water cylinder".
4. If you want to actuate the heating circuit and the domestic hot water cylinder, turn the selection lever to "Heating circuit/domestic hot water cylinder".

8.2 Checking and treating the heating water/filling and supplementary water



Caution.

Risk of material damage due to poor-quality heating water

- ▶ Ensure that the heating water is of sufficient quality.

- ▶ Before filling or topping up the installation, check the quality of the heating water.

Checking the quality of the heating water

- ▶ Remove a little water from the heating circuit.
- ▶ Check the appearance of the heating water.
- ▶ If you ascertain that it contains sedimentary materials, you must desludge the installation.
- ▶ Use a magnetic rod to check whether it contains magnetite (iron oxide).
- ▶ If you ascertain that it contains magnetite, clean the installation and apply suitable corrosion-inhibition measures, or fit a magnetic filter.
- ▶ Check the pH value of the removed water at 25 °C.
- ▶ If the value is below 8.2 or above 10.0, clean the installation and treat the heating water.
- ▶ Ensure that oxygen cannot get into the heating water.

Checking the filling and supplementary water

- ▶ Before filling the installation, measure the hardness of the filling and supplementary water.

Treating the filling and supplementary water

- ▶ Observe all applicable national regulations and technical rules when treating the filling and supplementary water.

Provided the national regulations and technical rules do not stipulate more stringent requirements, the following applies:

You must treat the heating water in the following cases

- If the entire filling and supplementary water quantity during the operating life of the system exceeds three times the nominal volume of the heating installation, or
- If the guideline values listed in the following table are not met, or
- If the pH value of the heating water is less than 8.2 or more than 10.0.

Total heating output	Water hardness at specific system volume ¹⁾					
	≤ 20 l/kW		> 20 l/kW ≤ 50 l/kW		> 50 l/kW	
kW	ppm CaCO ₃	mol/m ³	ppm CaCO ₃	mol/m ³	ppm CaCO ₃	mol/m ³
< 50	< 300	< 3	200	2	2	0.02
> 50 to ≤ 200	200	2	150	1.5	2	0.02
> 200 to ≤ 600	150	1.5	2	0.02	2	0.02
> 600	2	0.02	2	0.02	2	0.02

1) Nominal capacity in litres/heating output; in the case of multi-boiler systems, the smallest single heating output is to be used.

8 Start-up



Caution.

Risk of material damage if the heating water is treated with unsuitable additives.

Unsuitable additives may cause changes in the components, noises in heating mode and possibly subsequent damage.

- ▶ Do not use any unsuitable antifreeze and corrosion inhibitors, biocides or sealants.

No incompatibility with our products has been detected to date with proper use of the following additives.

- ▶ When using additives, follow the manufacturer's instructions without exception.

We accept no liability for the compatibility of any additive or its effectiveness in the rest of the heating system.

Additives for cleaning measures (subsequent flushing required)

- Adey MC3+
- Adey MC5
- Fernox F3
- Sentinel X 300
- Sentinel X 400

Additives intended to remain permanently in the installation

- Adey MC1+
- Fernox F1
- Fernox F2
- Sentinel X 100
- Sentinel X 200

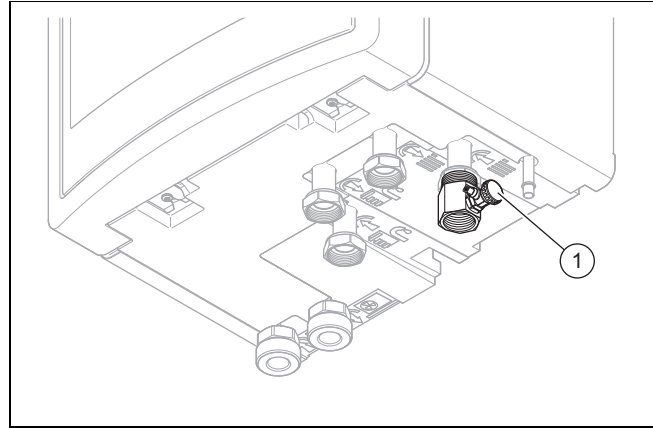
Additives for frost protection intended to remain permanently in the installation

- Adey MC ZERO
- Fernox Antifreeze Alphi 11
- Sentinel X 500

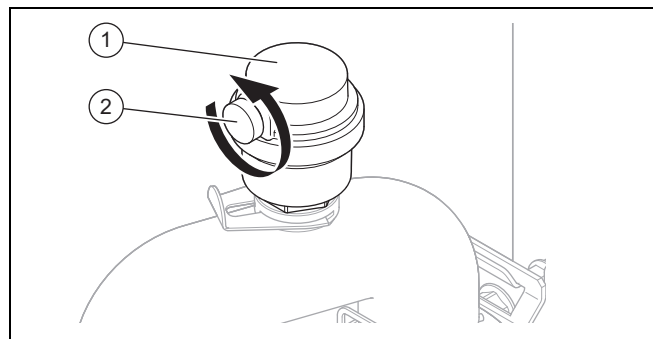
- ▶ If you have used the above-mentioned additives, inform the end user about the measures that are required.
- ▶ Inform the end user about the measures required for frost protection.

8.3 Filling and purging the heating installation

1. Flush the heating installation thoroughly prior to filling.
2. Open all of the thermostatic valves on the heating installation and, if required, all other isolation valves.
3. If no domestic hot water cylinder is connected, seal the product's cylinder flow and cylinder return connection with on-site plugs.
4. Check all of the connections and the entire heating installation for leaks.
5. Switch the prioritising diverter valve to manual operation (→ Page 33) and turn the selection lever to "Heating circuit/domestic hot water cylinder".
 - ◁ Both valves are open and the filling procedure is improved since the air in the system can escape.
 - ◁ The heating circuit and the spiral immersion heater for the domestic hot water cylinder are filled at the same time.



6. Connect a filling hose to the filling device (1).
7. To do this, unscrew the screw cap from the filling device and secure the free end of the filling hose to here.



8. Open the purging screw (2) on the automatic air vent (1) in order to purge the product.
9. Open the filling device.
10. Open the heating water supply slowly.
11. Purge the highest radiator or underfloor heating circuit and wait until the circuit is completely purged.
 - ◁ The water must escape from the purging valve without bubbles.
12. Fill with water until the manometer (on-site) shows that the heating installation has reached a pressure of approx. 1.5 bar.



Note

If you fill the heating circuit at an external location, you must install an additional manometer to check the pressure in the installation.

13. Close the filling device.
14. Then check the heating installation pressure again (if required, repeat the filling procedure).
15. Remove the filling hose from the filling device and screw the screw cap back on.
16. Set automatic mode for the prioritising diverter valve again (→ Page 33).
 - ◁ When the product starts up, the diverter valve automatically moves to the "Heating circuit" outlet position.

8.4 Purging

1. Open the automatic air vent.
2. Start the purge programme for the building circuit P06 using: **Menu → Installer level → Test menu → Check programmes → Purge building circuit.**
3. Allow the P06 function to run for 15 minutes.
4. Once both purge programmes have finished, check whether the pressure in the heating circuit is 150 kPa (1.5 bar).
 - ◁ Top up with water if the pressure is below 150 kPa (1.5 bar).

8.5 Switching on the product



Note

The product does not have an on/off switch. The product is switched on as soon as it is connected to the power grid.

1. Use the partition that is installed on-site to switch the product on.
 - ◁ The display shows the basic display.
 - ◁ The basic display appears on the system control display.
 - ◁ The system's products start up.
 - ◁ The heating and domestic hot water demand are activated by default.
2. When you start up the heat pump system for the first time after electrical installation, the installation assistants for the system components will start automatically. Set the required values on the control panel of the indoor unit first, then on the optional system control and the other system components.

8.6 Running the installation assistants

The installation assistant is launched when the product is switched on for the first time. It provides direct access to the most important check programmes and configuration settings for starting up the product.

Confirm the launch of the installation assistant. All heating and domestic hot water demands are blocked whilst the installation assistant is active.

Set the following parameters:


- Language
- System control present
- Immersion heater power supply (electric back-up heater)
- Immersion heater power limit (electric back-up heater)
- Cooling technology
- Compressor current limit
- Relay multi-function output
- Intermediate heat exchanger present
- Check programme: Purge building circuit
- Contact details, Telephone number

To access the next item, confirm by pressing **Next** in each case.

If you do not confirm the launch of the installation assistant, it is closed 10 seconds after you switch on the unit and the basic display then appears. If the installation assistant does

not run through completely, it restarts the next time the unit is switched on.

8.6.1 Ending the installation assistant

- Once you have run through the installation assistant successfully, confirm by pressing .
 - ◁ The installation assistant will close and will not launch again when the product is next switched on.

8.7 Menu functions without the optional system control

If no system control is installed and this has been confirmed in the installation assistant, the following additional functions are displayed in the product's control panel:

- End user level
 - Room temperature setpoint
 - Screed drying activ.
 - Target cylinder temp.
 - Domestic hot water cylinder temp.
 - Manual cooling activation
- Installer level
 - Heat curve
 - Summer sw.-off temp.
 - Heating biv. point
 - DHW bivalence point
 - Heating alt. point
 - Max. flow temperature
 - Min. flow temperature
 - Heating mode activ.
 - DHW activation
 - Cyl. charg. hysteresis
 - Limp home mode Immersion heater: Heating/DHW
 - Cooling target flow
 - Screed drying day

If the system control has been retroactively removed or a defect is present, you must reset the product to the factory setting and select the system control in the installation assistant in order to obtain the additional functions in the product's control panel.

8.8 Enabling the electric back-up heater

The electric back-up heater is controlled automatically and according to demand. Set the maximum output for the electric back-up heater at the indoor unit's control panel here.

On the system control, you can select whether the electric back-up heater is to be used for heating mode, domestic hot water mode or both modes.

- Activate the internal electric back-up heater with one of the output levels.
- You can find the output levels for the electric back-up heater in the tables in the appendix.
5.4 kW back-up heater at 230 V and at 400 V (→ Page 57)
- Ensure that the maximum output for the electric back-up heater does not exceed the output of the fuse protection for the household electricity system .

8 Start-up

8.9 Setting the anti-legionella function

- Set the anti-legionella function using the system control.

To ensure sufficient anti-legionella protection, the electric back-up heater must be activated.





Condition: Internal electric back-up heater deactivated or external back-up heater

The anti-legionella function can be used without a back-up heater in the outdoor temperature range of -10 °C to +30 °C; outside of this temperature range, the function can only be used with an activated internal or external back-up heater.

An external back-up heater must be protected against overheating, for example, so that it is intrinsically safe. An external back-up heater must be connected to contact X14 via a cut-off relay. On the indoor unit's control, the setting must be converted to the external back-up heater under **MA relay**.

Menu → Installer level → Configuration.

8.10 Calling up the installer level

1. Press  and  at the same time.
2. Navigate to **Menu → Installer level** and confirm by pressing  (OK).
3. Set the value **17** and confirm by pressing .

8.11 Checking the configuration

You can recheck and set the most important system parameters. Call up **Configuration** to configure the menu item.

Menu → Installer level → Configuration.

8.12 Calling up statistics

Menu → Installer level → Test menu → Statistics

You can use this function to call up the statistics for the heat pump.

8.13 Displaying the filling pressure in the building circuit

The product has a pressure sensor in the heating circuit and a digital pressure display.

- Select **Menu Live Monitor** to display the filling pressure in the building circuit.

8.14 Checking function and leak-tightness

Before you hand the product over to the end user:

- Check that the heating installation (heat generator and system) and the domestic hot water pipes are leak-tight.
- Check whether the drain pipework for the purging connections has been installed correctly.

8.14.1 Checking the heating mode

- Start check programme P.04.

8.14.2 Checking the domestic hot water generation

- Check whether the cylinder is purged and the domestic hot water temperature is reached.

8.15 Floor drying



Caution.

Risk of damage to the product caused by impermissible purging

Without purging the heating circuit, the system may become damaged.

- If the screed drying is activated without a system control, purge the system manually. No automatic purging takes place.

You can use this function to "dry heat" freshly laid screed in accordance with the construction regulations, according to a defined time and temperature schedule. To do this, the outdoor unit must be available and connected. The system control does not have to be connected for this.

It is activated via **Installer level → Resets**. See overview of the installer levels in the appendix.

When screed drying is activated, all the selected operating modes are interrupted. The function controls the flow temperature of the controlled heating circuit according to a pre-set programme, regardless of the outdoor temperature.

The display shows the target flow temperature. You can manually set the current day.

Days after starting the function	Target flow temperature for this day [°C]
1	25
2	30
3	35
4	40
5	45
6–12	45
13	40
14	35
15	30
16	25
17–23	10 (frost protection function, pump in operation)
24	30
25	35
26	40
27	45
28	35
29	25

The day is always changed at 00:00, irrespective of when the function starts.

After a mains Off/On, screed drying starts with the last active day.

The function ends automatically when the last day of the temperature profile has elapsed (day = 29) or if you set the start day to 0 (day = 0).

8.16 Starting up the optional system control

The following work for starting up the system was carried out:

- The system control and the outdoor temperature sensor have been installed and wired.
- Start-up of all system components (except for the system control) is complete.

Follow the installation assistant and the operating and installation instructions for the system control.

- Explain to the end user how the safety devices work and where they are located.
- Inform the end user about all of the anti-legionella measures.
- Inform the end user how to handle the product.
- Draw particular attention to the safety warnings, which the end user must follow.
- Inform the end user that they must have the product maintained in accordance with the specified intervals.
- Explain to the end user how to check the system's water volume/filling pressure.
- Pass all of the instructions and documentation for the product to the end user for safe-keeping.

9 Adapting the unit to the heating installation

9.1 Configuring the heating installation

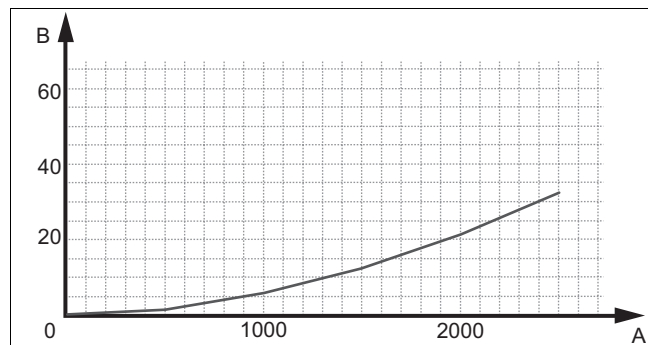
To adjust the water flow rate that is created by the heat pump to the relevant installation, the maximum available remaining feed head can be set for the heat pump in heating and domestic hot water mode and the output of the building circuit pump for heating, cooling and domestic hot water.

Since the heat pump installation regulates the building circuit pump at the nominal flow in automatic mode, only set the parameters where required.

You can call up these parameters via **Menu → Installer level → Configuration**.

The adjustment range for the remaining feed head is between 20 kPa (200 mbar) and 90 kPa (900 mbar). The heat pump operates at its optimum level when the nominal flow can be achieved by setting the available pressure (Delta T = 5 K).

9.2 Total pressure loss in the product, heating circuit and domestic hot water



A Flow rate in the building circuit (l/h) B Pressure loss (kPa)

9.3 Instructing the end user



Danger!
Risk of death from legionella.

Legionella multiply at temperatures below 60 °C.

- Ensure that the end user is familiar with all of the Anti-legionella measures in order to comply with the applicable regulations regarding legionella prevention.

10 Troubleshooting

10.1 Contacting your service partner

If you contact your service partner, please mention if possible:

- The fault code that is displayed (**F.xx**)
- The status code (**S.xx**) that is displayed by the product in the Live Monitor

10.2 Reading off the fault codes

If a fault develops in the product, the display shows a fault code **F.xx**.

Fault codes have priority over all other displays.

If multiple faults occur at the same time, the display shows the corresponding fault codes for two seconds each in sequence.

- Eliminate the fault.
- To start up the product again, press the reset button (Operating instructions).
- If you are unable to eliminate the fault and the fault recurs despite several reset attempts, contact Customer Service.

10.3 Querying the fault memory

The product has a fault memory. You can use this to query the last ten faults that occurred in chronological order.

To call up the fault memory, select **Menu → Installer level → List of faults**.

The display shows:

- Number of faults that occurred
- The fault that is currently selected with fault number **F.xx**
- A plain text display explaining the fault.
- Use the **[-]** or **[+]** button to display the last ten faults that occurred.

11 Inspection and maintenance

10.4 Resetting the fault memory

- ▶ Press  twice and then **Delete** and **OK** to delete the fault list.

10.5 Displaying Live Monitor (status codes)

Status codes in the display provide information on the product's current operating mode. These can be called up via the **Live Monitor** menu.

10.6 Using the function menu

You can use the function menu to actuate and test individual components of the product during the fault diagnostics. (→ Page 38)

10.7 Carrying out the actuator test

Menu → Installer level → Test menu → Sensor/actuator test

You can check that the components of the heating installation are functioning correctly using the sensor/actuator test. You can actuate more than one actuator at a time.

If you do not select anything to change, you can have the current control values for the actuators and the sensor values displayed.

You can find a list of the sensor characteristic values in the appendix.

Characteristic values for the internal temperature sensors, hydraulic circuit (→ Page 58)

Characteristic values for the VRC DCF outdoor temperature sensor (→ Page 59)

10.8 Resetting parameters to factory settings

- ▶ Select **Menu → Menu → Installer level → Resets** to reset all of the parameters at the same time and to restore the product to the factory settings.

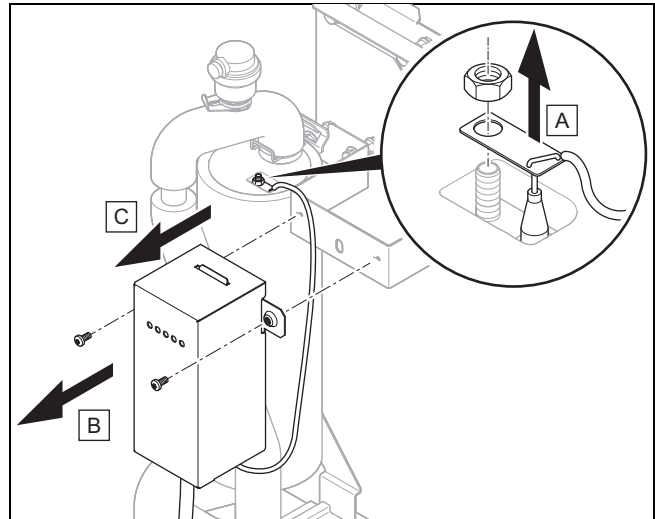
10.9 Safety cut-out

The product has a safety cut-out.

If the safety cut-out has tripped, the cause must be eliminated and the safety cut-out replaced.

- ▶ See the "Fault codes" table in the appendix. Fault codes (→ Page 53)
- ▶ Check the back-up heater for damage due to overheating.
- ▶ Check that the power supply for the power supply PCB is working properly.
- ▶ Check the cabling for the power supply PCB.
- ▶ Check the cabling for the electric back-up heater.
- ▶ Check that all temperature sensors are working properly.
- ▶ Check that all other sensors are working properly.
- ▶ Check the pressure in the heating circuit.
- ▶ Check that the heating circuit pump is working properly.
- ▶ Check whether there is air in the heating circuit.

10.9.1 Replace the safety cut-out



1. Disconnect the product from the power grid and protect it against being switched back on.
2. Remove the front casing.
3. Open the power supply PCB's electronics box. (→ Page 30)
4. Remove the connection cable on the X302 terminal block.
5. Remove the temperature sensor's capillary tube on the electric back-up heater.
6. Remove both screws and remove the safety cut-out with the retainer from the product.
7. Install the new safety cut-out in reverse order.

11 Inspection and maintenance


11.1 Procuring spare parts

The original components of the product were also certified by the manufacturer as part of the declaration of conformity. If you use other, non-certified or unauthorised parts during maintenance or repair work, this may void the conformity of the product and it will therefore no longer comply with the applicable standards.

We strongly recommend that you use original spare parts from the manufacturer as this guarantees fault-free and safe operation of the product. To receive information about the available original spare parts, contact the contact address provided on the back page of these instructions.

- ▶ If you require spare parts for maintenance or repair work, use only the spare parts that are permitted for the product.

11.2 Checking maintenance messages

If the  symbol is shown in the display, the product requires maintenance work or the product is in comfort protection mode.

- ▶ To obtain further information, call up the **Live Monitor**.
- ▶ Carry out the maintenance work that is listed in the table. Maintenance messages (→ Page 52)

Condition: Lhm.XX is displayed

The product is in Comfort protection mode. The product has detected a permanent fault and continues to run with restricted comfort.

- ▶ To determine which component is defective, read the fault memory (→ Page 37).



Note

If a fault message is present, the product remains in comfort protection mode after it is reset. After the product is reset, the fault message is displayed first before the message **Limp home mode (comfort protection)** appears again.

- ▶ Check the component that is displayed and replace it.

11.3 Observing inspection and maintenance intervals

- ▶ Adhere to the minimum inspection and maintenance intervals. Carry out all of the work that is listed in the "Inspection and maintenance work" table in the appendix.
- ▶ Carry out maintenance work on the product at an earlier point if the results of the inspection that was carried out during previous maintenance make this necessary.

11.4 Preparing for inspection and maintenance

Observe the basic safety rules before carrying out inspection and maintenance work or installing spare parts.

- ▶ Switch off the product.
- ▶ Disconnect the product from the power supply.
- ▶ Secure the product against being switched back on again.
- ▶ When working on the product, protect all electric components from spraying water.
- ▶ Remove the front casing.

11.5 Using check programmes

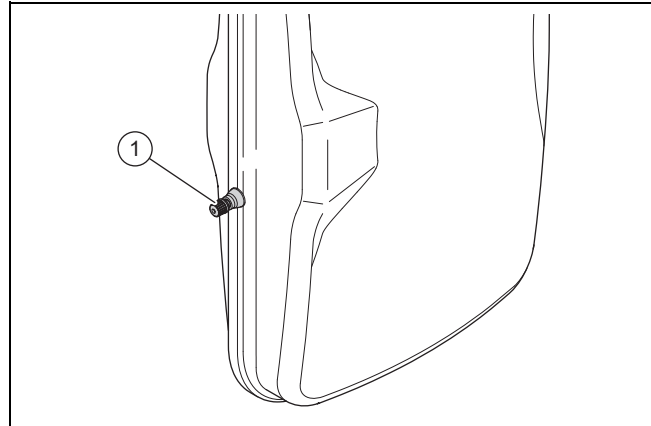
You can call up the check programmes via **Menu** → **Installer level** → **Test menu** → **Check programme**.

If the product is in error condition, you cannot start any check programmes. You can detect an error condition by the fault symbol shown in the left bottom corner of the display. You must first reset.

To end the check programmes, you can press **Cancel** at any time.

11.6 Checking the pre-charge pressure of the expansion vessel

1. Close the service valves and drain the heating circuit. (→ Page 39)



2. Measure the pre-charge pressure of the expansion vessel at the valve (1).
3. If the pressure is below 0.075 (0.75 bar) (depending on the static pressure of the heating installation), use nitrogen to fill the expansion vessel.
4. Fill the heating circuit. (→ Page 34)

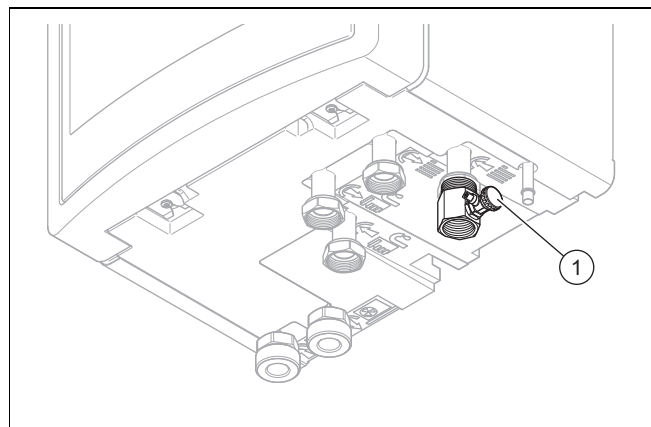
11.7 Checking the high-pressure switch-off

- ▶ Start check programme P.29 **High pressure**.
 - ◁ The compressor starts and the flow rate monitoring for the pump is deactivated.
- ▶ Block the heating circuit.
 - ◁ The product is switched off by the high-pressure switch-off.

12 Draining

12.1 Draining the product's heating circuit

1. Close the service valves in the heating flow and in the heating return.
2. Remove the front casing. (→ Page 26)



3. Connect a hose to the filling device (1) and guide the ends of the hose to a suitable drainage point.
4. Use manual actuation to move the prioritising diverter valve to the "Heating circuit/domestic hot water cylinder" position. (→ Page 33)

13 Decommissioning

5. Open the stopcock on the filling device.
6. Open the automatic air vent.
7. Use the expansion relief valve to check whether the heating circuit has been completely drained.
 - ◁ Residual hot water may escape from expansion relief valve's drain.

12.2 Draining the heating installation

1. Connect a hose to the draining point of the installation.
2. Route the free end of the hose to a suitable drainage point.
3. Ensure that the installation's service valves are open.
4. Open the drain cock.
5. Open the purging valves on the radiators. Start from the highest radiator and then work from the top to the bottom.
6. Once the heating water has completely drained from the installation, close the purging valves on all the radiators and the drain cock again.

13 Decommissioning

13.1 Decommissioning the product

- ▶ Disconnect the product from the power grid.
- ▶ Close the cold-water stopcock.
- ▶ Close the heating stopcock (flow and return).
- ▶ Drain the product.

13.2 Recycling and disposal

Disposing of the packaging

- ▶ Dispose of the packaging correctly.
- ▶ Observe all relevant regulations.

Disposing of the product and accessories

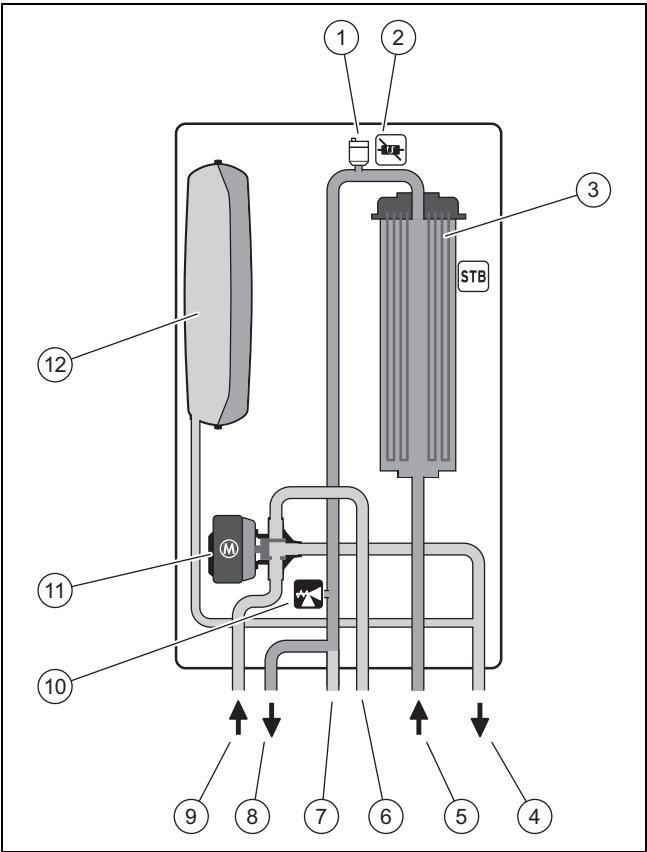
- ▶ Do not dispose of the product or the accessories with household waste.
- ▶ Dispose of the product and all accessories correctly.
- ▶ Observe all relevant regulations.

14 Customer service

Validity: Domestic

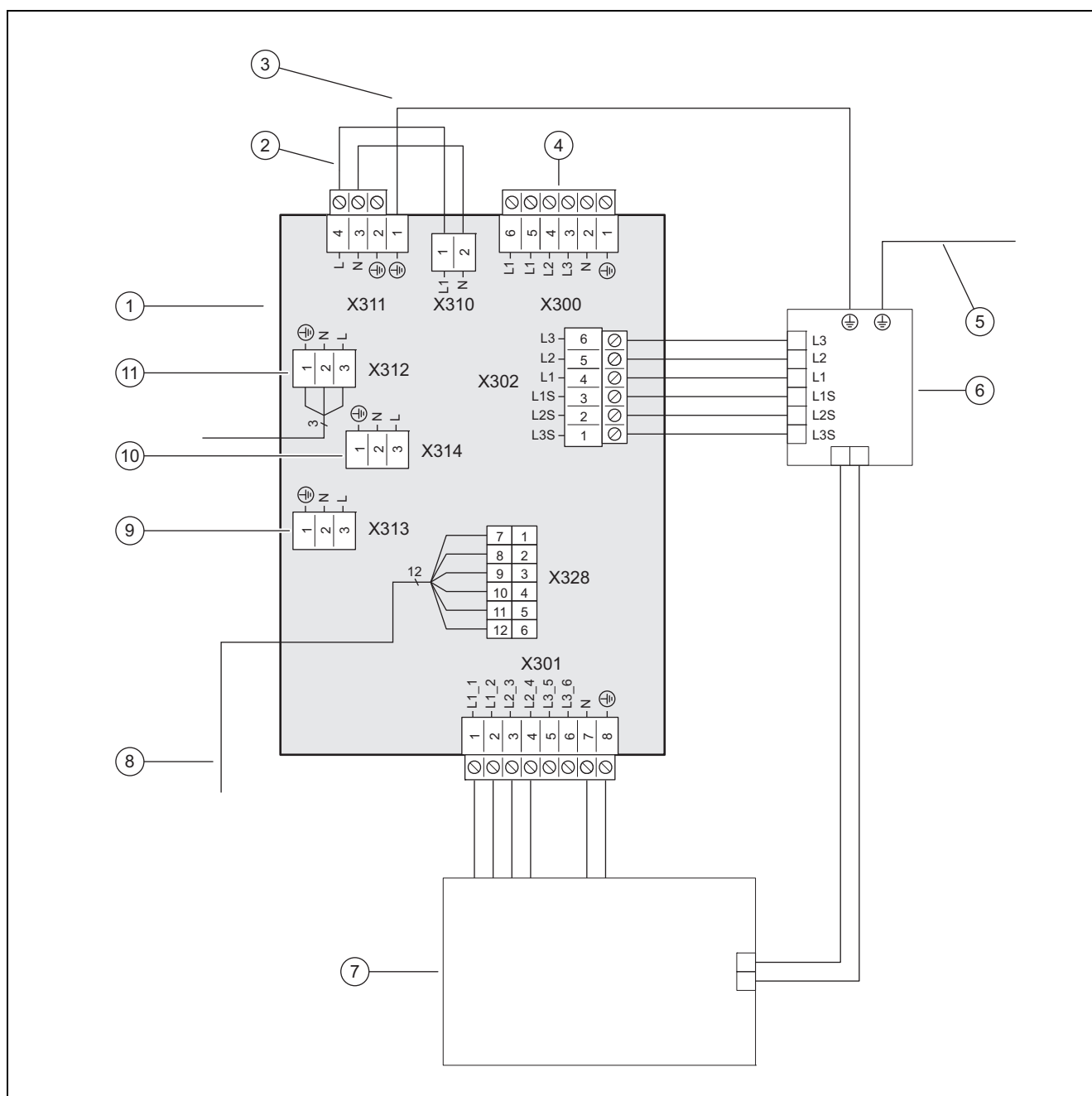
To ensure regular servicing, it is strongly recommended that arrangements are made for a Maintenance Agreement. Please contact Vaillant Service Solutions for further details:
Telephone: 0330 100 3461

Appendix
A Functional diagram



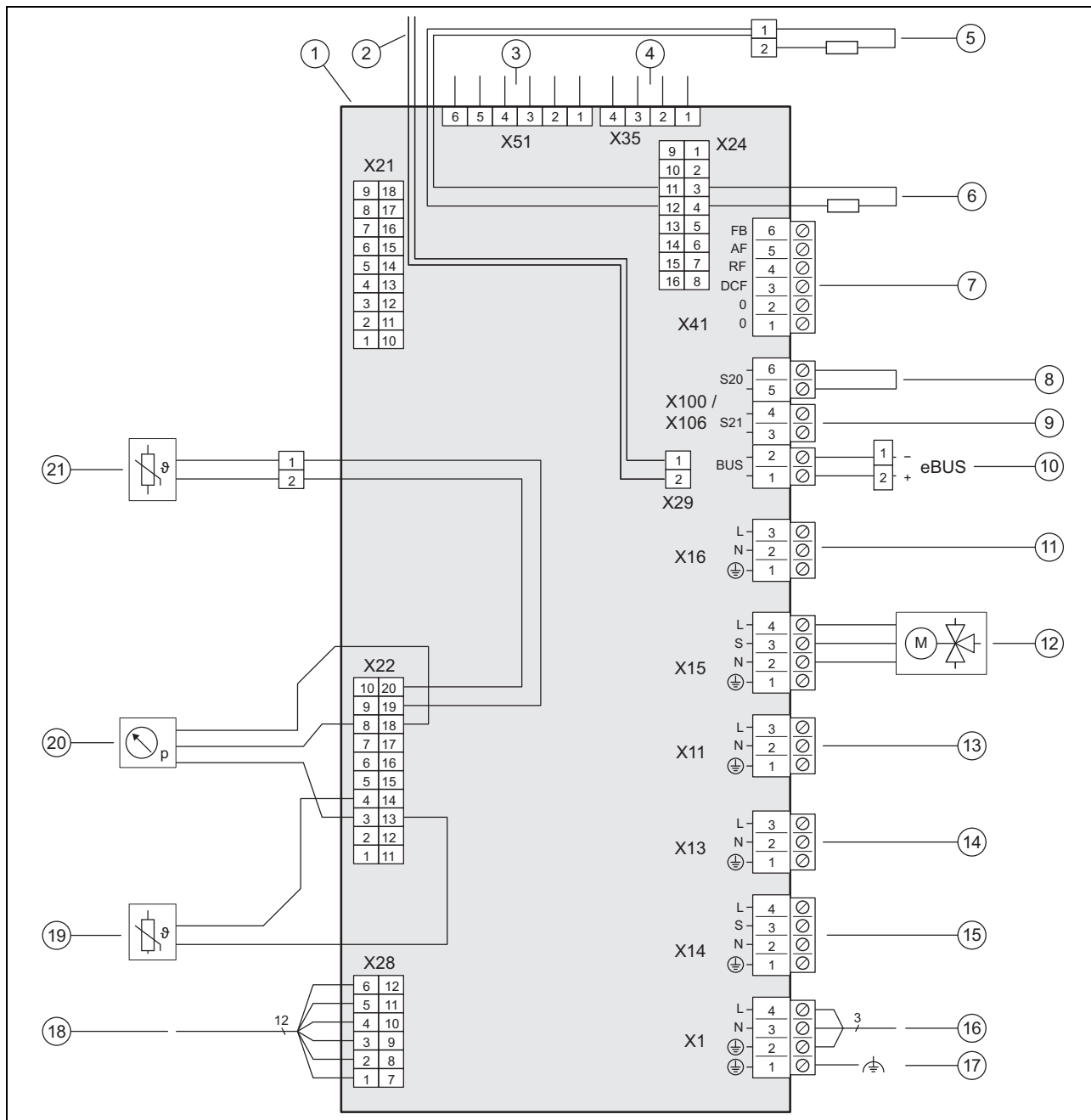
- | | | | |
|---|---|----|---|
| 1 | Automatic air vent | 7 | Heating circuit, flow, domestic hot water |
| 2 | Flow temperature sensor: Electric back-up heater output | 8 | Building circuit, flow, heating |
| 3 | Back-up heater | 9 | Building circuit, return, heating |
| 4 | Heating return to the outdoor unit | 10 | Expansion relief valve, 3 bar |
| 5 | Heating flow from the outdoor unit | 11 | Prioritising diverter valve |
| 6 | Heating circuit, return, domestic hot water | 12 | Diaphragm expansion vessel |

B Wiring diagram



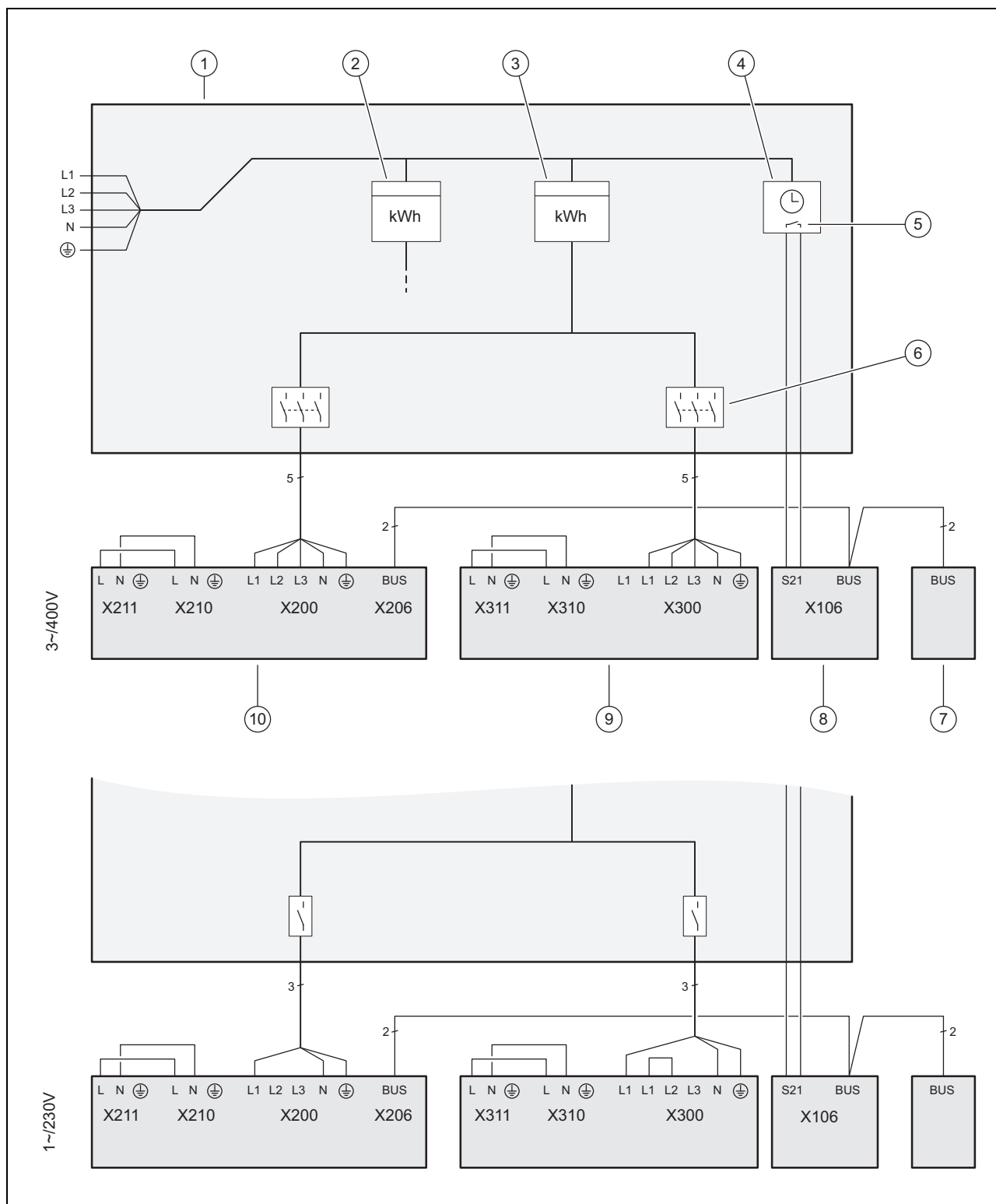
- | | | | |
|---|--|----|--|
| 1 | Power supply PCB | 8 | [X328] Data connection to the control PCB |
| 2 | For single power supply: 230 V bridge between X311 and X310; for dual power supply: Replace the bridge at X311 with the 230 V connection | 9 | [X313] Power supply for the control PCB or the optional VR 70/VR 71 or the optional external current anode |
| 3 | Earthing | 10 | [X314] Power supply for the control PCB or the optional VR 70/VR 71 or the optional external current anode |
| 4 | [X300] Power supply connection | 11 | [X312] Power supply for the control PCB or the optional VR 70/VR 71 or the optional external current anode |
| 5 | Earth wire to X1 on the control PCB | | |
| 6 | [X302] Safety cut-out | | |
| 7 | [X301] Back-up heater | | |

C Control PCB



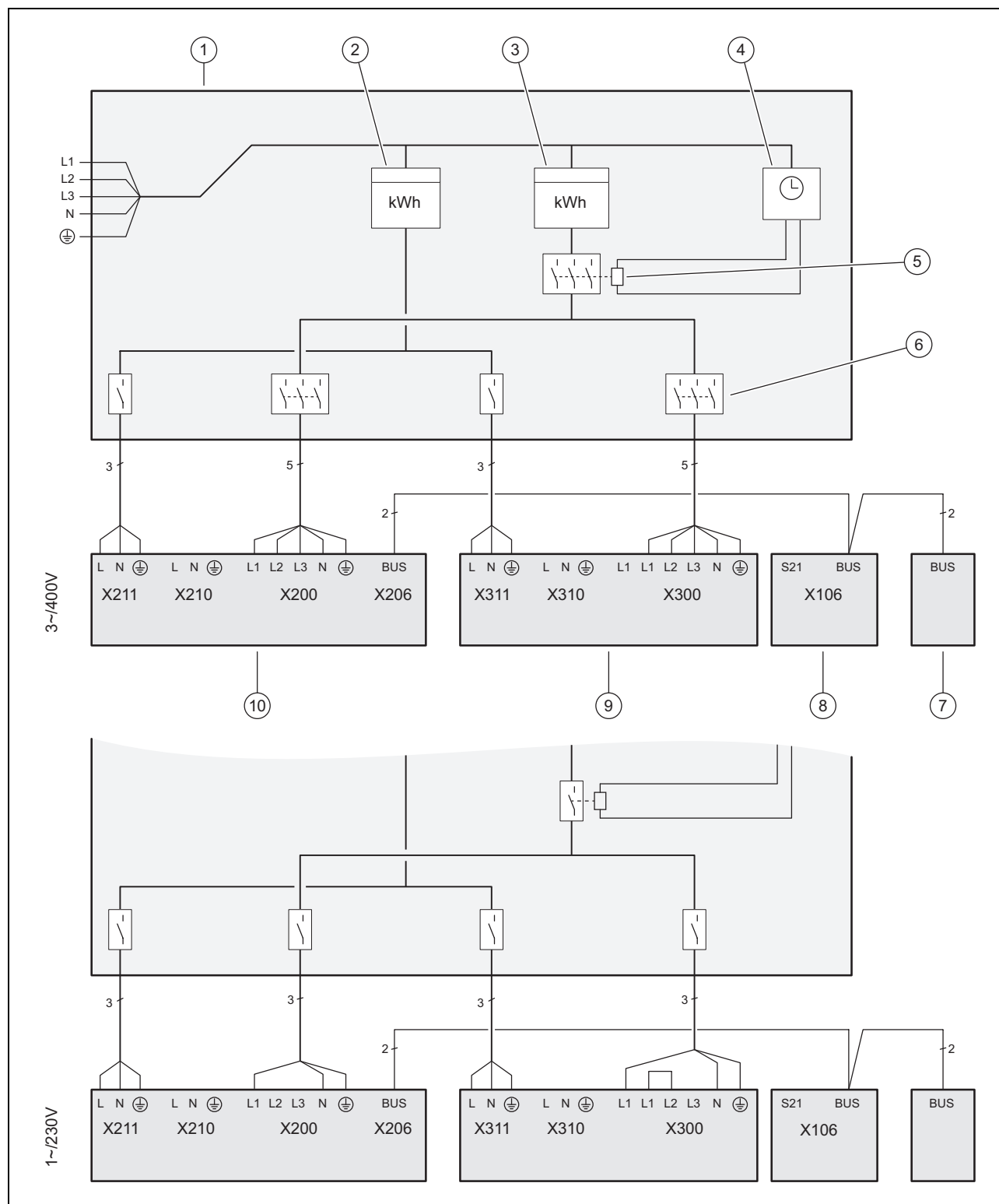
- | | | | |
|----|---|----|---|
| 1 | Control PCB | 11 | [X16] Optional: Accessory (intermediate heat exchanger pump) |
| 2 | [X29] eBUS bus connection for the installed system control | 12 | [X15] Internal prioritising diverter valve for heating circuit/cylinder charging |
| 3 | [X51] Display edge connector | 13 | [X11] Multi-function output 2: Domestic hot water circulation pump |
| 4 | [X35] Edge connector for optional external current anode | 14 | [X13] Multi-function output 1 |
| 5 | [X24] Coding resistor 3 | 15 | [X14] Multi-function output: External back-up heater/external prioritising diverter valve |
| 6 | [X24] Coding resistor 2 | 16 | [X1] 230 V supply for control PCB |
| 7 | [X41] Edge connector (outdoor temperature sensor, DCF, system temperature sensor, multi-function input) | 17 | [X1] Functional earth |
| 8 | [X106/S20] Limit thermostat | 18 | [X28] Data connection to the power supply PCB |
| 9 | [X106/S21] ESCO contact | 19 | [X22] Immersion heater flow temperature sensor |
| 10 | [X106/BUS] eBUS bus connection (outdoor unit, VRC 700, VR 70 / VR 71) | 20 | [X22] Optional: Accessory (building circuit pressure sensor for optional intermediate heat exchanger) |
| | | 21 | [X22] Domestic hot water cylinder temperature sensor |

D Basic connection diagram for the energy supply company lockout, shutdown via connection S21



- | | | | |
|---|---|----|------------------------------------|
| 1 | Meter/fuse box | 6 | Disconnect (circuit breaker, fuse) |
| 2 | Household electricity meter | 7 | System control |
| 3 | Heat pump electricity meter | 8 | Indoor unit, control PCB |
| 4 | Ripple control receiver | 9 | Indoor unit, power supply PCB |
| 5 | Potential-free normally open contact, for actuating S21, for the energy supply company lockout function | 10 | Outdoor unit, PCB INSTALLER BOARD |

E Basic connection diagram for the energy supply company lockout, shutdown via partition



- | | | | |
|---|---|----|--------------------------------------|
| 1 | Meter/fuse box | 6 | Disconnector (circuit breaker, fuse) |
| 2 | Household electricity meter | 7 | System control |
| 3 | Heat pump electricity meter | 8 | Indoor unit, control PCB |
| 4 | Ripple control receiver | 9 | Indoor unit, power supply PCB |
| 5 | Partition, for the energy supply company lockout function | 10 | Outdoor unit, PCB INSTALLER BOARD |

F Installer level overview

Setting level	Values		Unit	Increment, select, explanation	Factory setting	Setting
	Min.	Max.				
Installer level →						
Enter code	00	99		1 (competent person code 17)	17	
Installer level → Fault list →						
F.XX – F.XX ¹⁾	Current value					
Installer level → Test menu → Statistics →						
Compressor hours	Current value		h			
Compressor starts	Current value					
Build. pump hours	Current value		h			
Build. pump starts	Current value					
4-port valve hours	Current value		h			
4-port valve sw. ops	Current value					
Fan 1 operating hours	Current value		h			
Fan 1 starts	Current value					
Fan 2 operating hours	Current value		h			
Fan 2 starts	Current value					
EEV steps	Current value					
DHW PDV switch. ops	Current value					
Im. heater power cons.	Current value		kWh			
Im. heater op. hours	Current value		h			
Im. heater switch. ops	Current value					
No. switch. ops	Current value					
Installer level → Test menu → Check programmes →						
P.04 Heating mode				Select		
P.06 Purge building circuit				Select		
P.11 Cooling mode				Select		
P.12 De-icing				Select		
P.27 Immersion heater				Select		
P.29 High pressure				Select		
Installer level → Test menu → Sensor/actuator test →						
T.0.01 Building circuit pump power	0	100	%	5, off	0	
T.0.17 Fan 1	0	100	%	5	0	
T.0.18 Fan 2	0	100	%	5	0	
T.0.19 Condensate tray heater	Off	On		On, Off	Off	
T.0.20 4-port valve	Off	On		On, Off	Off	
T.0.21 Position: EEV	0	100	%	5	0	
T.0.23 Heating coil compressor	Off	On		On, Off	Off	
T.0.40 Flow temperature	-40	90	°C	0.1		
T.0.41 Return temperature	-40	90	°C	0.1		

¹⁾ See the overview of fault codes: Fault lists are only available, and can only be deleted, if faults have occurred.

²⁾ This parameter does not appear if a system control is connected.

³⁾ This parameter is only available in the products for Spain

Setting level	Values		Unit	Increment, select, explanation	Factory setting	Setting
	Min.	Max.				
T.0.42 Building circuit: Pressure	0	3	bar	0.1		
T.0.43 Building circuit: Flow rate	0	4000	l/h	1		
T.0.48 Air inlet temperature	-40	90	°C	0.1		
T.0.55 Compressor outlet temperature	-40	135	°C	0.1		
T.0.56 Compressor inlet temperature	-40	135	°C	0.1		
T.0.57 EEV outlet temperature	-40	90	°C			
T.0.59 Capacitor outlet temperature	-40	90	°C	0.1		
T.0.63 High pressure	0	31.9	bar (abs)	0.1		
T.0.64 Low pressure	0	8	bar (abs)	0.1		
T.0.67 High-pressure switch	Closed	Open		Closed, Open		
T.0.85 Evaporation temperature	-40	90	°C	0.1		
T.0.86 Condensation temperature	-40	70	°C	0.1		
T.0.87 Overheating target value	-40	90	K	0.1		
T.0.88 Overheating actual value	-40	90	K	0.1 to 20 K are normal operating parameters		
T.0.89 Subcooling target value	-40	90	K	0.1		
T.0.90 Subcooling actual value	-40	90	K	0.1		
T.0.93 Compressor speed	0	120	Rotation/s	1		
T.0.123 Temperature switch: Compressor outlet	Open	Closed		Open, closed		
T.1.02 DHW prioritising diverter valve	Heating	Domestic hot water		Heating, domestic hot water	Heating	
T.1.44 Cylinder temperature	-40	90	°C	0.1		
T.1.46 Lockout contact S20	Closed	Open		Closed, Open	Closed	
T.1.69 Outdoor temperature	-40	90	°C	0.1		
T.1.70 System temperature	-40	90	°C	0.1		
T.1.71 DCF status	Current value			No DCF signal Validate DCF signal Valid DCF signal		
T.1.72 Lockout contact S21	Closed	Open		Closed, Open	Open	
T.1.119 MO1 output	Off	On		Off, On	Off	
T.1.124 Safety cut-out immersion heater	Closed	Open		Closed, Open	Closed	
T.1.125 MPI input	Current value					
T.1.126 MO2 output	Off	On		Off, On	Off	
T.1.127 MO3 output	Off	On		Off, On	Off	
Installer level → Configuration →						
Language	Current language			Languages available for selection	02 English	
Contact details → Telephone number	Phone number			0–9		
Heat curve ²⁾	0.4	4.0		0.1		
Summer sw.-off temp. ²⁾	10	90	°C	1		
Heating biv. point ²⁾	-30	+20	°C	1		
¹⁾ See the overview of fault codes: Fault lists are only available, and can only be deleted, if faults have occurred. ²⁾ This parameter does not appear if a system control is connected. ³⁾ This parameter is only available in the products for Spain						

Appendix

Setting level	Values		Unit	Increment, select, explanation	Factory setting	Setting
	Min.	Max.				
DHW bivalence point ²⁾	-20	+20	°C	1		
Heating alt. point ²⁾	-20	+40	°C	Off 1		
Max. flow temperature ²⁾	15	90	°C	1		
Min. flow temperature ²⁾	15	90	°C	1		
Heating mode activ. ²⁾				On Off		
DHW activation ²⁾				On Off		
Cyl. charg. hysteresis ²⁾	3	20	K	1		
Immers. heater mode ²⁾				Off Heating+DHW Heating Domestic hot water		
Limp home mode ²⁾				Off Heating Domestic hot water Heating+domestic hot water		
Cooling target flow ²⁾	7	24	°C	1		
MO relay				None Fault signal Ext. immersion heater DHW 3WV		
Compr.start heat. from	-999	9	°min	1	-60	
Compr.start cool. from	0	999	°min	1	60	
Compressor hyster. Heat.	0	15	K	Applies for heating mode only: 1	7	
Compressor hyster. Cool.	0	15	K	Applies for cooling mode only: 1	5	
Max. rem. feed head	200	900	mbar	10	900	
DHW mode	0 = ECO	2 = Balance		0 = ECO, 1 = Normal, 2 = Balance	0	
Max. anti-cycl. time	0	9	h	1	5	
Conf. heat. build. pump	50	100	% PWM	Auto	Auto	
Conf. cool. build. pump	50	100	% PWM	Auto	Auto	
Conf. DHW build. pump	50	100	% PWM	Auto	65	
Reset anti-cycl. time → Anti-cycl. time after pow. supp. switch-on	0	120	min	1	0	
Im. heater power supp.	230	400	V	230, 400		
Im. heater outp. range	External	9	kW	5 kW and 7 kW: 230 V and 400 V: 1-6: 1 kW-6 kW 12 kW: 230 V 1-6: 1 kW-6 kW 12 kW: 400 V 1-9: 1 kW-9 kW	6 or 9	
¹⁾ See the overview of fault codes: Fault lists are only available, and can only be deleted, if faults have occurred. ²⁾ This parameter does not appear if a system control is connected. ³⁾ This parameter is only available in the products for Spain						

Setting level	Values		Unit	Increment, select, explanation	Factory setting	Setting
	Min.	Max.				
Compr. current limit				1 5–7 kW: 13–16 A 12 kW: 20–25 A		
Fan boost ³⁾	52	70		1	70	
Compr. noise reduct. ²⁾	40	60	%	1	40	
Only for products with cooling: Cooling technology	None	Active cooling		None, active cooling	None	
Intermediate heat exchanger	Yes	no		Yes, No		
Software version	Current value of the control PCB (HMU indoor unit xxxx, HMU outdoor unit xxxx) and the display (AI xxxx)			xxxx.xx.xx		
Installer level → Resets →						
Statistics → Reset statistics?				Yes, No	No	
Maintenance messages → Reset maintenance message				Yes, No	No	
High-pressure switch → Reset fault?				Yes, No	No	
Factory settings → Restore factory settings				Yes, No	No	
Screed drying ²⁾				Off, 1–29	Off	
Installer level → Start inst. assistant →						
Language				Languages available for selection	02 English	
Syst. control avail.?	Yes	no		Yes, No		
Im. heater power supp.	230 V	400 V				
Im. heater outp. range	External	9	kW	230 V: 1–6: 1 kW–6 kW 400 V: 1–9: 1 kW–9 kW	6 or 9	
Cooling technology	No cooling	Active cooling				
Compr. current limit	13	25	A	1 5–7 kW: 13–16 A 12 kW: 20–25 A		
MO relay				None, fault signal, ext. immersion heater, DHW 3WV	None	
Intermediate heat exchanger	Yes	no		Yes, No		
Check program: Purge building circuit	Yes	no		Yes, No	no	
Contact details Telephone number	Phone number			0–9	Empty	
End the installation assistant?				Yes, back		

¹⁾ See the overview of fault codes: Fault lists are only available, and can only be deleted, if faults have occurred.
²⁾ This parameter does not appear if a system control is connected.
³⁾ This parameter is only available in the products for Spain

G Status codes

Statuscode	Meaning
Status external current anode	Anode not connected, Anode OK, Anode Fault
S.34 Heating mode: Frost protection	If the measured outdoor temperature falls below XX °C, the temperature of the heating circuit's flow and return is monitored. If the temperature difference exceeds the set value, the pump and compressor are started without a heat demand.
S.100 Standby	There is no heat demand or cooling demand. Standby 0: Outdoor unit. Standby 1: Indoor unit
S.101 Heating: Compressor shutdown	The heat demand is met, the demand is ended by the system control and the heat deficit is offset. The compressor is switched off.
S.102 Heating: Compressor blocked	The compressor is blocked for heating mode because the heat pump is outside of its operating limits.
S.103 Heating: Prerun	The start conditions for the compressor in heating mode are checked. Start the other actuators for heating mode.
S.104 Heating: Compressor active	The compressor works in order to meet the heat demand.
S.107 Heating: Overrun	The heat demand is met, the compressor is switched off. The pump and fan overrun.
S.111 Cooling: Compressor shutdown	The cooling demand is met, the demand is ended by the system control. The compressor is switched off.
S.112 Cooling: Compressor blocked	The compressor is blocked for cooling mode because the heat pump is outside of its operating limits.
S.113 Cooling: Compressor mode prerun	The start conditions for the compressor in cooling mode are checked. Start the other actuators for cooling mode.
S.114 Cooling: Compressor active	The compressor works in order to meet the cooling demand.
S.117 Cooling: Compressor mode overrun	The cooling demand is met, the compressor is switched off. The pump and fan overrun.
S.125 Heating: Immersion heater active	The immersion heater is used in heating mode.
S.132 Domestic hot water: Compressor blocked	The compressor is blocked for domestic hot water mode because the heat pump is outside of the operating limits.
S.133 Domestic hot water: Prerun	The start conditions for the compressor in domestic hot water mode are checked. Start the other actuators for domestic hot water mode.
S.134 Domestic hot water: Compressor active	The compressor works in order to meet the domestic hot water demand.
S.135 Domestic hot water: Immersion heater active	The immersion heater is used in domestic hot water mode.
S.137 Domestic hot water: Overrun	The domestic hot water demand is met, the compressor is switched off. The pump and fan overrun.
S.141 Heating: Immersion heater shutdown	The heat demand is met, the immersion heater is switched off.
S.142 Heating: Immersion heater blocked	The immersion heater is blocked for heating mode.
S.151 Domestic hot water: Immersion heater shutdown	The domestic hot water demand is met, the immersion heater is switched off.
S.152 Domestic hot water: Immersion heater blocked	The immersion heater is blocked for domestic hot water mode.
S.173 Anti-cycling time for the energy supply company	The mains voltage supply is interrupted by the energy supply company. The maximum anti-cycling time is set in the configuration.
S.202 Check programme: Purging of building circuit active	The building circuit pump is actuated in cyclical intervals, alternately in heating mode and domestic hot water mode.
S.203 Actuator test active	The sensor and actuator test is currently operating.
S.212 Connection fault: Control not recognised	System control was previously detected but the connection is broken. Check the eBUS connection to the system control. It can only be operated with the heat pump's additional functions.
S.240 Compr. oil temp. too low, environment too cold	The compressor heating is switched on. The unit does not start up.
S.252 Fan unit 1: Fan blocked	If the fan speed is 0 rpm, the heat pump is switched off for 15 minutes and then restarted. If the fan does not start up after four unsuccessful restarts, the heat pump is switched off and the fault message F.718 is displayed.
S.255 Fan unit 1: Air inlet temp. too high	The compressor does not start because the outdoor temperature at the fan is above the operating limits. Heating mode: > 43 °C. Domestic hot water mode: > 43 °C. Cooling mode: > 46 °C.

Statuscode	Meaning
S.256 Fan unit 1: Air inlet temp. too low	The compressor does not start because the outdoor temperature at the fan is below the operating limits. Heating mode: < -20 °C. Domestic hot water mode: < -20 °C. Cooling mode: < 15 °C.
S.260 Fan unit 2: Fan blocked	If the fan speed is 0 rpm, the heat pump is switched off for 15 minutes and then restarted. If the fan does not start up after four unsuccessful restarts, the heat pump is switched off and the fault message F.785 is displayed.
S.272 Building circuit: Remaining feed head limit active	The remaining feed head that is set under the configuration is reached.
S.273 Building circuit: Flow temperature too low	The flow temperature that is measured in the building circuit is below the operating limits.
S.275 Building circuit: Flow rate too low	Building circuit pump defective. All consumers in the heating system are closed. The values fall below the specific minimum volume flows. Check that the dirt filter is permeable. Check the stopcocks and thermostatic valves. Ensure that the flow rate is at least 35% of the nominal flow rate. Check that the building circuit pump functions correctly.
S.276 Building circuit: Lock-out contact S20 open	Contact S20 is open at the heat pump's main PCB. Incorrect limit thermostat setting. Flow temperature sensor (heat pump, gas-fired boiler, system sensor) measures values that deviate downwards. Adjust the maximum flow temperature for the direct heating circuit via the system control (observe the upper switch-off threshold for the boilers). Adjust the set value for the limit thermostat. Check the sensor values
S.277 Building circuit: Pump fault	If the building circuit pump is inactive, the heat pump is switched off for 10 minutes and is then restarted. If the building circuit pump does not start up after three unsuccessful restarts, the heat pump is switched off and the fault message F.788 is displayed.
S.280 Freq. converter fault: Compressor	The compressor motor or wiring is defective.
S.281 Freq. converter fault: Mains voltage	There is overvoltage or undervoltage.
S.282 Freq. converter fault: Overheating	If the cooling of the frequency inverter is not sufficient, the heat pump is switched off for one hour and then restarted again. If the cooling is not sufficient after three unsuccessful restarts, the heat pump is switched off and the fault message F.819 is displayed.
S.283 De-icing time too long	If the de-icing takes longer than 15 minutes, the heat pump is restarted. If the time for the de-icing is still not sufficient after three unsuccessful restarts, the heat pump is switched off and the fault message F.741 is displayed. ► Check whether sufficient thermal energy is available from the building circuit.
S.284 De-icing flow temperature too low	If the flow temperature is below 5 °C, the heat pump is restarted. If the flow temperature is still not sufficient after three unsuccessful restarts, the heat pump is switched off and the fault message F.741 is displayed. ► Check whether sufficient thermal energy is available from the building circuit.
S.285 Compressor outlet temperature too low	Compressor outlet temperature is too low
S.286 Hot gas temperature switch open	If the hot gas temperature is above 119 °C +5 K, the heat pump is switched off for one hour and then restarted again. If the hot gas temperature has not fallen after three unsuccessful restarts, the heat pump is switched off and the fault message F.823 is displayed.
S.287 Fan 1: Wind	Before starting, the fan rotates at a speed of 50 rpm or higher. This may be caused by a strong outside wind.
S.288 Fan 2: Wind	Before starting, the fan rotates at a speed of 50 rpm or higher. This may be caused by a strong outside wind.
S.289 Current limit active	The outdoor unit's power consumption is reduced, the compressor speed is reduced. The compressor's operating current exceeds the limit value that is set under the configuration. (for 3 kW, 5 kW, 7 kW units: <16 A; for 10 kW, 12 kW units: <25 A)
S.290 Switch-on delay active	The compressor's switch-on delay is active.
S.302 High-pressure switch open	If the pressure in the refrigerant circuit exceeds the operating limit, the heat pump is switched off for 15 minutes and is then restarted again. If the pressure remains too high after four unsuccessful restarts, the fault message F.731 is displayed.
S.303 Compressor outlet temperature too high	The operating characteristics have been exited. The heat pump is restarted.
S.304 Evaporation temperature too low	The operating characteristics have been exited. The heat pump is restarted.
S.305 Condensation temperature too low	The operating characteristics have been exited. The heat pump is restarted.
S.306 Evaporation temperature too high	The operating characteristics have been exited. The heat pump is restarted.
S.308 Condensation temperature too high	The operating characteristics have been exited. The heat pump is restarted.
S.312 Building circuit: Return temperature too low	Return temperature in the building circuit too low for compressor to start. Heating: Return temperature < 5 °C. Cooling: Return temperature < 10 °C. Cooling: Check that the 4-port diverter valve works correctly.

Appendix

Statuscode	Meaning
S.314 Building circuit: Return temperature too high	Return temperature in the building circuit too high for the compressor to start. Heating: Return temperature > 56 °C. Cooling: Return temperature > 35 °C. Cooling: Check that the 4-port diverter valve works correctly. Check the sensors.
S.351 Immersion heater: Flow temp. too high	The flow temperature at the immersion heater is too high. Flow temperature > 75 °C. The heat pump is switched off.
S.516 De-icing mode active	The heat pump de-ices the outdoor unit's heat exchanger. The heating mode is interrupted. The maximum de-icing time is 16 minutes.
S.575 Frequency converter: Internal fault	An internal electronics fault is present on the outdoor unit's inverter PCB. If this occurs three times, fault message F.752 appears.
S.581 Connection fault: Frequency converter not recognised	Missing communication between the frequency converter and the outdoor unit's PCB. After this occurs three times, fault message F.753 appears.
S.590 Fault: 4-port valve position not correct	The 4-port diverter valve does not move fully to the heating or cooling position.

H Maintenance messages

Code	Meaning	Cause	Remedy
M.23	Status external current anode	<ul style="list-style-type: none"> External current anode not recognised 	<ul style="list-style-type: none"> If required, check for a cable break
M.32	Building circuit: Pressure low	<ul style="list-style-type: none"> Pressure loss in the building circuit due to leakages or air pockets Building circuit pressure sensor is defective 	<ul style="list-style-type: none"> Check the building circuit for leaks, top up with heating water and purge Check the plug contact on the PCB and on the cable harness; check that the pressure sensor is working correctly and, if required, replace the pressure sensor
M.200	Building circuit 2: Low pressure	<ul style="list-style-type: none"> Pressure loss in the building circuit due to leakages or air pockets Building circuit pressure sensor is defective 	<ul style="list-style-type: none"> Check the building circuit for leaks, top up with heating water and purge Check the plug contact on the PCB and on the cable harness; check that the pressure sensor is working correctly and, if required, replace the pressure sensor
M.201	Sensor fault: Cylinder temperature	<ul style="list-style-type: none"> Cylinder temperature sensor defective 	<ul style="list-style-type: none"> Check the plug contact on the PCB and on the cable harness; check that the sensor is working correctly and, if required, replace the sensor
M.202	Sensor fault: System temperature	<ul style="list-style-type: none"> System temperature sensor defective 	<ul style="list-style-type: none"> Check the plug contact on the PCB and on the cable harness; check that the sensor is working correctly and, if required, replace the sensor
M.203	Connection fault: Disp. not recognised	<ul style="list-style-type: none"> Display defective Display not connected 	<ul style="list-style-type: none"> Check the quality of the plug contact on the PCB and on the cable harness Replace the display, if required

I Comfort protection mode

Code	Meaning	Description	Remedy
200	Sensor fault: Temp. air inlet	Still possible to operate with existing, functional outdoor temperature sensor	Replace the air inlet sensor

J Fault codes

Code	Meaning	Cause	Remedy
F.022	Water pressure too low	<ul style="list-style-type: none"> – Pressure loss in the building circuit due to leakages or air pockets – Building circuit pressure sensor defective 	<ul style="list-style-type: none"> – Check the building circuit for leaks – Top up with water, purge – Check the quality of the plug contact on the PCB and on the cable harness – Check that the pressure sensor is working correctly – Replace the pressure sensor
F.042	Fault: Coding resistor	<ul style="list-style-type: none"> – Coding resistor damaged or not set 	<ul style="list-style-type: none"> – Check that the coding resistor is positioned correctly and, if required, replace it.
F.073	Sensor fault: Build. circ. pressure	<ul style="list-style-type: none"> – The sensor is not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Check and, if required, replace the sensor – Replace the cable harness
F.094	Fault: Vortex	<ul style="list-style-type: none"> – Volume flow sensor not connected or sensor input has short-circuited 	<ul style="list-style-type: none"> – Check and, if required, replace the sensor – Replace the cable harness
F.103	Fault: Spare part ident.	<ul style="list-style-type: none"> – Incorrect control PCB installed on the outdoor unit 	<ul style="list-style-type: none"> – Installing the correct PCB
F.514	Sensor fault: Compr. inlet temp.	<ul style="list-style-type: none"> – The sensor is not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Check and, if required, replace the sensor – Replace the cable harness
F.517	Sensor fault: Compr. outlet temp.	<ul style="list-style-type: none"> – The sensor is not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Check and, if required, replace the sensor – Replace the cable harness
F.519	Sensor fault: Building circuit re- turn temp.	<ul style="list-style-type: none"> – The sensor is not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Check and, if required, replace the sensor – Replace the cable harness
F.520	Sensor fault: Building circuit flow temp.	<ul style="list-style-type: none"> – The sensor is not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Check and, if required, replace the sensor – Replace the cable harness
F.526	Sensor fault: EEV outlet temp.	<ul style="list-style-type: none"> – The sensor is not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Check and, if required, replace the sensor – Replace the cable harness
F.546	Sensor fault: High pressure	<ul style="list-style-type: none"> – The sensor is not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Check the sensor (e.g. using an installation aid), and replace if necessary – Replace the cable harness
F.582	Fault: EEV	<ul style="list-style-type: none"> – EEV is not connected correctly or there is a cable break to the coil 	<ul style="list-style-type: none"> – Check the plug connections and, if required, replace the coil from the EEV
F.585	Sensor fault: Capac. outlet temp.	<ul style="list-style-type: none"> – The sensor is not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Check and, if required, replace the sensor – Replace the cable harness
F.703	Sensor fault: Low pressure	<ul style="list-style-type: none"> – The sensor is not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Checking the sensor (e.g. using an installation aid), and replacing it if necessary – Replace the cable harness
F.718	Fan unit 1: Fan blocked	<ul style="list-style-type: none"> – There is no confirmation signal stating that the fan is rotating 	<ul style="list-style-type: none"> – Check the air route and, if required, remove any blockages
F.729	Compressor outlet temperature too low	<ul style="list-style-type: none"> – The compressor outlet temperature is lower than 0 °C for more than 10 minutes or the compressor outlet temperature is lower than -10 °C even though the heat pump is in the operating characteristics. 	<ul style="list-style-type: none"> – Checking the high-pressure sensor – Checking that the EEV is working correctly – Checking for condensate leaking from the temperature sensor (undercooling) – Check whether the 4-port diverter valve is in the intermediate position – Checking the refrigerant volume for overfilling

Appendix

Code	Meaning	Cause	Remedy
F.731	High-pressure switch open	<ul style="list-style-type: none"> Refrigerant pressure too high. The integrated high-pressure switch in the outdoor unit has tripped at 41.5 bar (g) or 42.5 bar (abs) Insufficient energy output via the condenser 	<ul style="list-style-type: none"> Purging the building circuit Too low a volume flow as a result of closing single room controls in an underfloor heating system Check that the dirt filter that is in place is permeable Refrigerant flow rate too low (e.g. electronic expansion valve defective, 4-port diverter valve is mechanically blocked, filter is blocked). Inform customer service. Cooling mode: Check the fan unit for dirt Check the high-pressure switch and high-pressure sensor Reset the high-pressure switch and carry out a manual reset on the product.
F.732	Compressor outlet temperature too high	<p>The compressor outlet temperature is above 110 °C:</p> <ul style="list-style-type: none"> Application limits exceeded EEV does not work or does not open correctly Refrigerant volume too low (frequent defrosting due to extremely low evaporation temperatures) 	<ul style="list-style-type: none"> Check the compressor inlet sensor and outlet sensor Check the compressor outlet temperature sensor (TT135) Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test) Check the refrigerant volume (see Technical data) Carry out a leak-tightness test Check whether the service valves on the outdoor unit are open.
F.733	Evaporation temperature too low	<ul style="list-style-type: none"> Insufficient air volume flow through the outdoor unit's heat exchanger (heating mode) leads to an insufficient energy input in the environment circuit (heating mode) or building circuit (cooling mode) Refrigerant volume too low 	<ul style="list-style-type: none"> If the building circuit contains thermostatic valves, check that they are suitable for cooling mode (check volume flow in cooling mode) Check the fan unit for dirt Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test) Check the compressor inlet sensor Check the refrigerant volume
F.734	Condensation temperature too low	<ul style="list-style-type: none"> The temperature in the heating circuit is too low, outside of the operating characteristics Refrigerant volume too low 	<ul style="list-style-type: none"> Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test) Check the compressor inlet sensor Check the refrigerant filling volume (see technical data) Check whether the 4-port diverter valve is in an intermediate position and is not correctly switched Checking the high-pressure sensor Check the pressure sensor in the heating circuit
F.735	Evaporation temperature too high	<ul style="list-style-type: none"> Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation Feed-in of external heat into the environment circuit due to increased fan speed 	<ul style="list-style-type: none"> Check the system temperatures Check the refrigerant filling volume for overfilling Check the EEV (does the EEV move to the limit stop? Use sensor/actuator test) Check the sensor for the evaporation temperature (depending on the position of the 4-port diverter valve) Check the volume flow in cooling mode Check the air volume flow in heating mode

Code	Meaning	Cause	Remedy
F.737	Condensation temperature too high	<ul style="list-style-type: none"> – Temperature in the environment circuit (cooling mode) or building circuit (heating mode) too high for compressor operation – Feed-in of external heat into the building circuit – Refrigerant circuit overfilled – Insufficient flow rate in the building circuit 	<ul style="list-style-type: none"> – Reduce or stop the external heat that is entering – Check the back-up heater (heats up even though it is off in the sensor/actuator test?) – Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test) – Check the compressor outlet sensor, compressor outlet temperature sensor (TT135) and high-pressure sensor – Check the refrigerant filling volume for overfilling – Check whether the service valves on the outdoor unit are open. – Check the air volume flow in cooling mode for sufficient flow rate – Checking the heating pump – Check the building circuit flow rate
F.741	Building circuit: Return temp. too low	<ul style="list-style-type: none"> – During the de-icing, the return temperature falls below 13 °C 	<ul style="list-style-type: none"> – Ensure the minimum installation volume is maintained; if required, install a series return cylinder – The fault message is displayed until the return temperature increases to above 20 °C. – Activate the electric back-up heater in the product's control panel and in the system control in order to increase the return temperature. The compressor is blocked while the fault message is present.
F.752	Fault: Frequency converter	<ul style="list-style-type: none"> – Internal electronics fault on the inverter PCB – Mains voltage outside of 70 V–282 V 	<ul style="list-style-type: none"> – Check the integrity of the power supply cables and compressor connection cables The plugs must audibly click into place. – Check the cable – Check the mains voltage The mains voltage must be between 195 V and 253 V. – Check the phases – Replace the frequency converter, if required
F.753	Connection fault: Freq. conv. n.recogn.	<ul style="list-style-type: none"> – Missing communication between the frequency converter and the outdoor unit's control PCB 	<ul style="list-style-type: none"> – Check the integrity of the cable harness and plug connection and, if required, replace them – Check the frequency converter by actuating the compressor safety relay – Read the assigned parameters for the frequency converter and check whether values are displayed
F.755	Fault: 4-port valve position not correct	<ul style="list-style-type: none"> – Incorrect position of the 4-port diverter valve. If, in heating mode, the flow temperature is lower than the return temperature in the building circuit. – The temperature sensor in the electronic expansion valve environment circuit displays an incorrect temperature. 	<ul style="list-style-type: none"> – Check the 4-port diverter valve (is an audible switching available? Use the sensor/actuator test) – Check that the coil is positioned correctly on the 4-port valve – Check the cable harness and plug connections – Check the temperature sensor in the electronic expansion valve environment circuit
F.774	Sensor fault: Air inlet temp.	<ul style="list-style-type: none"> – The sensor is not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Check and, if required, replace the sensor – Replace the cable harness

Appendix

Code	Meaning	Cause	Remedy
F.785	Fan unit 2: Fan blocked	<ul style="list-style-type: none"> There is no confirmation signal stating that the fan is rotating 	<ul style="list-style-type: none"> Check the air route and, if required, remove any blockages
F.788	Building circuit: Pump fault	<ul style="list-style-type: none"> The electronics system of the high-efficiency pump has detected a fault (e.g. dry running, blockage, overvoltage, undervoltage) and has switched off and locked the pump. 	<ul style="list-style-type: none"> Switch the heat pump off for at least 30 seconds (no current) Check the quality of the plug contact on the PCB Check that the pump functions correctly Purging the building circuit Check that the dirt filter that is in place is permeable
F.817	Freq. converter fault: Compressor	<ul style="list-style-type: none"> Defect in the compressor (e.g. short circuit) Defect in the frequency converter Connection cable to the compressor is defective or loose 	<ul style="list-style-type: none"> Measure the winding resistance in the compressor Measure the frequency converter output between the three phases, (it must be > 1 kΩ) Check the cable harness and plug connections
F.818	Freq. converter fault: Mains voltage	<ul style="list-style-type: none"> Incorrect mains voltage for operating the frequency converter Shutdown via the energy supply company 	<ul style="list-style-type: none"> Measure and, if required, correct the mains voltage The mains voltage must be between 195 V and 253 V.
F.819	Freq. converter fault: Overheating	<ul style="list-style-type: none"> Internal overheating of the frequency converter 	<ul style="list-style-type: none"> Allow the frequency converter to cool and restart the product Check the frequency converter's air route Check that the fan is working correctly The maximum environmental temperature of the outdoor unit (46 °C) has been exceeded.
F.820	Connection fault: Building circuit pump	<ul style="list-style-type: none"> Pump does not report any signal back to the heat pump 	<ul style="list-style-type: none"> Check the cable to the pump for defects and, if required, replace it Replace the pump
F.821	Sensor fault: Immers. heater flow temp.	<ul style="list-style-type: none"> The sensor is not connected or the sensor input has short-circuited Both of the flow temperature sensors in the heat pump are defective 	<ul style="list-style-type: none"> Check and, if required, replace the sensor Replace the cable harness
F.823	Hot gas temperature switch open	<ul style="list-style-type: none"> The hot gas thermostat shuts down the heat pump if the temperature in the refrigerant circuit is too high. Following a waiting period, the heat pump attempts to start once more. After three failed start attempts in succession, a fault message is displayed. Max. refrigerant circuit temperature: 110 °C Waiting period: 5 mins (after it first occurs) Waiting period: 30 mins (after it occurs a second time and any other time after that) The fault counter is reset if both of the following conditions are met: <ul style="list-style-type: none"> Heat requirement without switching off prematurely 60 mins uninterrupted operation 	<ul style="list-style-type: none"> Check the EEV Replace the dirt filter in the refrigeration circuit, if required


Code	Meaning	Cause	Remedy
F.824	Building circuit 2: Pressure too low Note Can only occur in conjunction with an installed and activated intermediate heat exchanger set. Fault refers to the outdoor unit's brine pressure sensor.	<ul style="list-style-type: none"> – Pressure loss in the building circuit due to leakages or air pockets – Building circuit pressure sensor defective 	<ul style="list-style-type: none"> – Check the building circuit for leaks – Top up with water, purge – Check the quality of the plug contact on the PCB and on the cable harness – Check that the pressure sensor is working correctly – Replace the pressure sensor
F.825	Sensor fault: Capac. inlet temp.	<ul style="list-style-type: none"> – Refrigerant circuit temperature sensor (vapour-forming) not connected or the sensor input has short-circuited 	<ul style="list-style-type: none"> – Check and, if required, replace the sensor and cable
F.1100	Immersion heater: Safety cut-out open	<p>The safety cut-out on the electric back-up heater is open due to:</p> <ul style="list-style-type: none"> – Insufficient volume flow or air in the building circuit – The immersion heater is operated when the building circuit is not filled – Immersion heater operation at flow temperatures above 98 °C trips the safety fuse of the safety cut-out and requires that the fuse be replaced – Feed-in of external heat into the building circuit 	<ul style="list-style-type: none"> – Check the circulation in the building circuit pump – If required, open the stopcocks – Replace the safety cut-out – Reduce or stop the external heat that is entering – Check that the dirt filter that is in place is permeable
F.1117	Compressor: Phase failure	<ul style="list-style-type: none"> – Defective fuse – Incorrect electrical connections – Mains voltage too low – Compressor/low tariff power supply not connected – Blocked by energy supply company for over three hours 	<ul style="list-style-type: none"> – Check the fuse – Checking the electrical connections – Check the voltage at the heat pump electrical connection – Reduce energy supply company anti-cycling time to under three hours
F.1120	Immersion heater: Phase failure	<ul style="list-style-type: none"> – Electric back-up heater defective – Poorly tightened electrical connections – Mains voltage too low 	<ul style="list-style-type: none"> – Check the electric back-up heater and its power supply – Check the electrical connections – Measure the voltage at the electrical connection for the electric back-up heater
F.9998	Connection fault: Heat pump	<ul style="list-style-type: none"> – eBUS cable not connected or connected incorrectly – Outdoor unit without supply voltage 	<ul style="list-style-type: none"> – Check the connection pipes between the power supply PCB and control PCB on the indoor and outdoor unit

K 5.4 kW back-up heater at 230 V and at 400 V

Internal control of the output levels at 230 V and at 400 V	Power consumption	Set value
0	0.0 kW	
1	0.7 kW	1 kW
2	1.2 kW	
3	1.8 kW	2 kW
4	2.2 kW	3 kW
5	3.2 kW	
6	3.8 kW	4 kW
7	4.7 kW	5 kW
8	5.4 kW	6 kW

Appendix

L Inspection and maintenance work

#	Maintenance work	Interval	
1	Checking the pre-charge pressure of the expansion vessel	Annually	39
2	Check that the prioritising diverter valve can move easily (visually/audibly)	Annually	
3	Checking the electronics boxes, removing dust from the ventilation slits	Annually	

M Characteristic values for the internal temperature sensors, hydraulic circuit

Sensors: TT620 TT650

Temperature (°C)	Resistance (ohms)
0	33400
5	25902
10	20247
15	15950
20	12657
25	10115
30	8138
35	6589
40	5367
45	4398
50	3624
55	3002
60	2500
65	2092
70	1759
75	1486
80	1260
85	1074
90	918
95	788
100	680
105	588
110	510

N Characteristic values for the VR10 internal temperature sensors, cylinder temperature

Temperature (°C)	Resistance (ohms)
-40	88130
-35	64710
-30	47770
-25	35440
-20	26460
-15	19900
-10	15090
-5	11520
0	8870
5	6890
10	5390
15	4240

Temperature (°C)	Resistance (ohms)
20	3375
25	2700
30	2172
35	1758
40	1432
45	1173
50	966
55	800
60	667
65	558
70	470
75	397
80	338
85	288
90	248
95	213
100	185
105	160
110	139
115	122
120	107
125	94
130	83
135	73
140	65
145	58
150	51

O Characteristic values for the VRC DCF outdoor temperature sensor

Temperature (°C)	Resistance (ohms)
-25	2167
-20	2067
-15	1976
-10	1862
-5	1745
0	1619
5	1494
10	1387
15	1246
20	1128
25	1020
30	920
35	831
40	740

P Technical data



Note

The following performance data is only applicable to new products with clean heat exchangers.

Technical data – General

	VWZ MEH 97/6
Product dimensions, width	440 mm
Product dimensions, height	720 mm
Product dimensions, depth	350 mm
Weight, without packaging	20 kg
Weight, ready for operation	28 kg
IP rating	IP 10B
Heating circuit connections	G 1"
Heat source connections	G 1 1/4"
Permissible height difference between outdoor unit and indoor unit	≤ 15 m

Technical data – Heating circuit

	VWZ MEH 97/6
Material in the heating circuit	Copper, copper-zinc alloy, stainless steel, ethylene propylene diene monomer rubber, brass, steel, composite materials
Permissible water composition	Without frost or corrosion protection. Soften the heating water at water hardnesses from 3.0 mmol/l (16.8° dH) in accordance with Directive VDI2035 sheet 1
Water content	8 l
Volume of the internal diaphragm expansion vessel	10 l
Minimum operating pressure	0.05 MPa (0.50 bar)
Maximum operating pressure	0.3 MPa (3.0 bar)
Max. heating mode flow temperature with compressor	75 °C
Max. heating mode flow temperature with back-up heater	75 °C
Min. cooling mode flow temperature	7 °C
Sound power A7/W35 in accordance with EN 12102 / EN 14511 L _{Wl} in heating mode	≤ 29 dB(A)
Sound power A7/W45 in accordance with EN 12102 / EN 14511 L _{Wl} in heating mode	≤ 29 dB(A)
Sound power A7/W55 in accordance with EN 12102 / EN 14511 L _{Wl} in heating mode	≤ 29 dB(A)
Sound power A7/W65 in accordance with EN 12102 / EN 14511 L _{Wl} in heating mode	≤ 29 dB(A)

	VWZ MEH 97/6
Sound power A35/W7 in accordance with EN 12102 / EN 14511 L _{Wl} in cooling mode	≤ 29 dB(A)
Sound power A35/W18 in accordance with EN 12102 / EN 14511 L _{Wl} in cooling mode	≤ 30 dB(A)

Technical data – Electrics

	VWZ MEH 97/6
Rated voltage	230 V (+10%/-15%), 50 Hz, 1~/N/PE
Rated voltage	400 V (+10%/-15%), 50 Hz, 3~/N/PE
Rated power, maximum	8.6 kW
Rated current, maximum, 230 V	2.6 A
Rated current, maximum, 400 V	13.6 A
Overvoltage category	II
Fuse type, 230 V	C characteristics, slow-blow
Fuse type, 400 V	C characteristics (slow-blow), 3-pole switching

Index

A

Actuator test	38
Actuators, checking	38

B

Basic diagram	21
Building circuit connections	27

C

Calling up, code layer	36
Calling up, installer level	36
Calling up, statistics	36
CE marking	7, 24
Check programmes	39
Checking, electrical installation	32
Checking, high-pressure switch-off	39
Checking, maintenance message	39
Checking, service message	39
Circulation pump, connecting	32
Code layer, calling up	36
Comfort protection mode	9, 39
Competent person	20
Component test	38
Cylinder connection	27

D

Data plate	24
Decommissioning	10, 40
Displaying, Live Monitor	38
Displaying, status codes	38
Disposal, accessories	40
Disposal, packaging	40
Disposal, product	40

E

Electric back-up heater, enabling	35
Electric back-up heater, maximum output	35
Electrical installation, checking	32
Electricity	20
Energy supply company lockout	28
Expansion relief valve	27
Expansion vessel, pre-charge pressure	39

F

Factory settings, restoring	38
Fault codes	37
Fault memory	37
Fault symbol	39
Filling and purging	34
Filling pressure, displaying	36
Frost	3, 21
Frost protection function	7, 22
Function menu	38

H

High-pressure switch-off	39
Hot water temperature Risk of scalding	21

I

Inspection work	39
Installation assistant	35
Installation clearances	25
Installer level, calling up	36
Intended use	3, 20

L

Live Monitor, displaying	38
--------------------------------	----

Low-water pressure protection	22
-------------------------------------	----

M

Maintenance message, checking	39
Maintenance work	39
Minimum clearances	25

O

Operating concept	7, 33
-------------------------	-------

P

Parameters, resetting	38
Power supply	30
Pre-charge pressure, expansion vessel	39
Product, switching on	35

Q

Qualification	20
---------------------	----

R

Regulations	21
Reset	38

S

Safety cut-out	7, 22
Safety device	21
Screed drying, function	36
Self-test	38
Sensor test	38
Service message, checking	39
Service partner	37
Spare parts	38
Statistics, calling up	36
Status codes, displaying	38
Switching on, product	35

T

Test menu	38
Tool	21
Transport	21
Treating the heating water	33

U

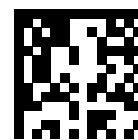
Unit configuration, checking	36
------------------------------------	----

V

Voltage	20
---------------	----

W

Weight	26
Wiring	31



0020291544_01

0020291544_01 ■ 30.01.2020

Supplier

Vaillant Ltd.

Nottingham Road ■ Belper ■ Derbyshire ■ DE56 1JT

Telephone 0330 100 3461

info@vaillant.co.uk ■ www.vaillant.co.uk

© These instructions, or parts thereof, are protected by copyright and may be reproduced or distributed only with the manufacturer's written consent.

Subject to technical modifications.