

uniTOWER plus

VIH QW 190/6 E GB



en Operating instructions

en Installation and maintenance instructions

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Operating instructions

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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
VWL5/6 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 tamperproof seals on components.
- Do not make any changes:
 - to the product itself
 - to 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 eliminated 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.
- If you cannot ensure the operation, have a competent person drain the heating installation.



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 docu-► ments for further use.

These instructions apply only to:

Product	
VIH QW 190/6 E GB	

Product description 3

3.1 Heat pump system

Design of a typical heat pump system with split technology:



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- 1 Heat pump, outdoor unit
- 2 eBUS line
- 3 System control (optional)
- Control for the indoor unit
- Heat pump, indoor unit
- Heating circuit



3.3 Opening the front flap



Pull the front flap on one of the recessed handles (1) ► towards you.

3.4 **Control elements**





3.6 Description of the symbols

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

Symbol	Meaning	Explanation
κW	Compressor power	 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
bar 	 Without de- coupling module Filling pressure in the building circuit (measured in the outdoor unit) With decoup- ling module Filling pressure in the building circuit (measured in the indoor unit) 	 The dashed lines show the permitted range. Displayed statically: Filling pressure in the permitted range Displayed flashing: Filling pressure outside of the permitted range
ፍዖ	Noise reduction mode	 Operation with reduced noise emissions
<u>88</u>	Electric back-up heater	 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
Ε	eco mode	 Energy-saving domestic hot water mode
	Heating mode	 Heating mode active
H	Domestic hot water generation	 Domestic hot water mode active
X	Cooling mode	 Cooling mode active
C F.XXX	Fault condition	 Appears instead of the basic display, may be an explanatory plain text display

3.7 Functional description of buttons

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

Button	Meaning
	 Cancelling the change to a set value or activating an operating mode
	 Calling up a higher selection level in the menu
	 Confirming a set value or activating an oper- ating mode
	 Calling up a lower selection level in the menu
- + -	Calling up the additional functions

Button	Meaning				
= or +	 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.

3.8 Type designation and serial number

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

3.9 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.

3.10 Benchmark



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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.

3.11 Safety devices

3.11.1 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.

3.11.2 Low-water pressure protection

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

3.11.3 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.

3.11.4 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.

3.11.5 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: 89 °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 level $(\rightarrow Appendix B)$

4.3 Menu display



Note

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

4.4 Starting up the product

4.4.1 Opening the isolators

- 1. Ask the competent person who installed the product to explain to you where these isolators 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 Adjusting the target cylinder temperature



Risk of death from legionella.

Danger!

Legionella multiply at temperatures below 60 °C.

- Have a competent person inform you about the measures that should be taken to protect against Legionella in your installation.
- Do not set any water temperatures below 60 °C without consulting the competent person first.

Danger! Risk of d

Risk of death from legionella.

If you decrease the cylinder temperature, the risk of legionella spreading increases.

 Activate the anti-legionella times in the system control and set these.

Depending on the source of the energy obtained from the environment, target cylinder temperatures of up to 70 °C can be reached with the compressor. In order to achieve energyefficient domestic hot water generation predominantly from the energy extracted from the environment, the factory setting for the desired domestic hot water temperature must be adjusted on the optional system control and/or on the heat pump's control panel.

Condition: System control connected

- To do this, adjust the target cylinder temperature (Desired DHW circuit temperature) to between 50 and 55 °C.
- Also switch on the electric back-up heater for the domestic hot water generation so that, also at outdoor temperatures below -10 °C and above +30 °C, the required 60 °C can be achieved for the anti-legionella function time programme.

Condition: No system control connected

To do this, set the target cylinder temperature (domestic hot water target cylinder temp.) to 65 °C.



Note

If no system control is connected, the time programme for the anti-legionella function is not available. To still ensure anti-legionella function, the target cylinder temperature must therefore be set higher.

Also switch on the electric back-up heater for the domestic hot water generation so that, at outdoor temperatures below -10 °C and above +30 °C, the required 60 °C can also be achieved for the anti-legionella function.

4.4.4 Display of the energy consumption, energy yields and efficiencies

The product, the system control and the app show approximate values for energy consumption, energy yields and efficiencies, which are extrapolated based on calculation algorithms. The values that are displayed in the app may differ from the other display options due to staggered transfer intervals.

The determined values depend on:

- Installation and system of the heating installation
- User behaviour
- Seasonal weather effects
- Various tolerances of unit-internal components

The recording of the values only includes the product in the factory-delivered condition. Supplementary accessories, even if they are installed on the product, as well as any other components in the heating system and other external consumers, are not part of the data recording.

Deviations between the determined values and the actual values may be significant. The determined values are therefore not suitable for creating or comparing energy billing, for example.

When replacing the PCB, the values for energy consumption, energy yields and efficiencies are reset in the heat pump's control panel.

4.4.5 Displaying the Live Monitor

Menu → Live Monitor

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

4.4.6 Displaying the building circuit pressure

$\textbf{Menu} \rightarrow \textbf{Live Monitor} \rightarrow \textbf{Building circuit pressure}$

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

4.4.7 Reading the operating statistics

Menu \rightarrow Information \rightarrow Heating op. hours

- Menu \rightarrow Information \rightarrow DHW operating hours
- $\textbf{Menu} \rightarrow \textbf{Information} \rightarrow \textbf{Cooling op. hours}$
- 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.

4.4.8 Setting the language

- 1. If you want to set another language, press **and hold** □and **①** 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 \square or \boxdot .
- 5. Press (OK) to confirm your selection.
- 6. Once you have set the correct language, press (OK) again to confirm this.

4.4.9 Set display contrast

Menu → Basic settings → Display contrast

• You can set the contrast here.

4.4.10 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.

4.4.11 Contact details for the competent person

$\textbf{Menu} \rightarrow \textbf{Information} \rightarrow \textbf{Contact data Phone number}$

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.

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

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 Frost protection function

Caution.



Risk of material damage due to frost.

The frost protection function cannot guarantee circulation through the entire heating installation. Under certain circumstances, there is therefore a risk of frost to certain parts of the heating installation, which may cause damage.

- During a period of frost, ensure that the heating installation remains in operation and that all rooms are sufficiently heated, even when you are away.
- It is strongly recommended that antifreeze is used for filling those parts of the installation which are at risk of frost.

To ensure that the frost protection devices are permanently ready for operation, you must leave the system switched on.

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

• Consult a competent person about this.

4.7.2 Switching off heating mode (Summer mode)

Condition: No system control connected

- 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.

4.7.3 Switching off domestic hot water generation

Condition: No system control connected

- Use I 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).

5 Care and maintenance

5.1 Caring for the product

- Clean the casing with a damp cloth and a little solventfree 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.

Checking the filling pressure of the heating installation

Note

5.4

To avoid operating the installation with insufficient water volume and to prevent possible damage associated with this, the product is fitted with a pressure sensor and a digital pressure display.

To ensure that the heating installation operates properly, the filling pressure must be between 0.1 MPa and 0.15 MPa (1.0 bar and 1.5 bar) when the heating installation condition is cold.

If the heating installation extends over several storeys, a higher filling pressure may be required for the heating installation. Ask a competent person for details.

Note

If the pressure falls below 0.07 MPa (0.7 bar), message M32 appears.

If the pressure rises above 0.07 MPa (0.7 bar), message M32 goes out.

In addition, the \checkmark symbol is displayed after approx. one minute.

If the filling pressure of the heating installation falls below 0.05 MPa (0.5 bar) for longer than one minute, fault message F.22 and the current filling pressure appear alternately in the display.

If the blocking time has elapsed or if the filling pressure of the heating installation rises above 0.05 MPa (0.5 bar), fault message F.22 goes out.

- 1. Use **Menu** → **Live Monitor Water pressure** to display the filling pressure of the heating installation.
- 2. If the pressure drops frequently, identify and eliminate the reason for the pressure loss of heating water. Inform a competent person of this.

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 (→ Appendix A)
- If the product is not functioning correctly, even though you have checked the points listed in the table, contact a competent person.

7 Decommissioning

7.1 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

Disposing of the packaging

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

Disposing of the product



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.

Disposing of batteries



If the product contains batteries that are labelled with this mark:

- In this case, dispose of the batteries at a collection point for batteries.
 - Prerequisite: The batteries can be removed from the product without causing any destruction. Otherwise, the batteries are disposed of together with the product.
- In accordance with the legal regulations, used batteries must be returned since batteries may contain substances that are harmful to health and the environment.

Deleting personal data

Personal data may be misused by unauthorised third parties.

If the product contains personal data:

Ensure that there is no personal data on or in the product (e.g. online login details or similar) before you dispose of the product.

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

The contact details for our customer service are provided on the back page or on our website.

Appendix A Troubleshooting

Problem	Possible cause	Remedy		
	Building power supply switched off	Switch on building power supply		
No domostio hot water, hoot	Domestic hot water or heating set to "off"/domestic hot water temperature or target temperature set too	Ensure that domestic hot water mode and/or heating mode is activated in the system control.		
ing remains cold; product does not start up	low	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 compet- ent person		
Domestic hot water mode without any problems; heat-	No heat requirement via the control	Check the timer programme on the control and correct if necessary		
ing does not start		Check the room temperature and, if required, correct the target room temperature (→ Control operating instructions)		

B Overview of the end user 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 tar- get temperature*	Current va	lue	°C			
Actual domestic hot water cylin- der temperature	Current va	lue	°C			
Yield indicator →						
Energy yield: Day, Heating	Cumulative	e value	kWh			
Energy yield: Day, Domestic hot water	Cumulative	e value	kWh			
Energy yield: Day, Cooling	Cumulative	e value	kWh			
Energy yield: Month, Heating	Cumulative	e value	kWh			
Working figure: Month, Heating	Cumulative	e value				
Energy yield: Total, Heating	Cumulative	e value	kWh			
Working figure: Total, Heating	Cumulative	e value				
Energy yield: Month, Cooling	Cumulative	Cumulative value				
SEER, month, cooling	Cumulative	e value				
Energy yield: Total, Cooling	Cumulative	e value	kWh			
SEER, total, cooling	Cumulative	e value				
Energy yield: Month, Domestic hot water	Cumulative	e value	kWh			
Working figure: Month, Domestic hot water	Cumulative	e 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 va	lue				
Building circuit water pressure	Current value		bar			
*If no system control is installed, the menu item is displayed in the product's control panel.						

Setting level	Values		Unit	Increment, select	Factory setting	Setting
	Min.	Max.				
Building circuit flow rate	Current value		l/h			
Compressor anti-cycling time	Current val	lue	min			
Immersion heater anti-cycling time	Current va	lue	min			
Target flow temp.	Current val	lue	°C			
Current flow temp.	Current val	lue	°C			
Energy integral	Current val	lue	°min			
Cooling capacity	Current val	lue	kW			
Electrical power consumption	Current value		kW	Total power consump- tion of the heat pump without any external components connec- ted (as supplied).		
Compressor modulation	Current val	lue	%			
Air inlet temperature	Current val	lue	°C			
Immersion heater power	Current val	lue	kW			
External current anode status	Current value				Anode not con- nected	
Outdoor temperature	ature Current value		°C			
Information →						
Contact details	Phone nun	nber				
Serial number	Permanent	t value				
Operating hours total	Cumulative	e value	h			
Hours heating	Cumulative	e value	h			
DHW operating hours	Cumulative	e value	h			
Cooling op. hours	ooling 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	s displayed	in the produc	t's control panel.		

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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.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit
VWL5/6 A	VIH QW 190/6
	VWZ MEH 97/6

- 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.

1.2 General safety information

1.2.1 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.

1.2.2 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 in overvoltage category III for full partition, 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.

1.2.3 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.

1.2.4 Risk of burns or scalding caused by hot components

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

1.2.5 Risk of being scalded by hot potable water

There is a risk of scalding at the domestic hot water draw-off points if the domestic hot water temperatures are greater than 50 °C. Young children and elderly persons are particularly at risk, even at lower temperatures.

- Select a temperature at which nobody can be harmed.
- Inform the end user about the risk of scalding when the Anti-legionella function is switched on.

1.2.6 Risk of injury due to the heavy weight 1.2.10 Risk of material damage caused by of the product

The product weighs over 50 kg.

- Make sure that the product is carried by at least two people.
- Use suitable transport and lifting equipment, in accordance with your job safety analysis.
- Use suitable personal protective equipment: Gloves, safety footwear, protective goggles, protective helmet.

1.2.7 Risk of material damage due to an 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.

1.2.8 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.

1.2.9 Risk of material damage due to additional elements 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.

frost

Do not install the product in rooms prone to frost.

1.2.11 Risk of material damage caused by using an unsuitable tool

Use the correct tool.

1.3 **Regulations (directives, laws,** standards)

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

2 Notes on the documentation

- Always observe all the operating and installation instruc-► tions included with the system components.
- Pass these instructions and all other applicable docu-► ments on to the end user.

These instructions apply only to:

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 sample heat pump system with monoblock technology:



5

6

Heat pump, outdoor unit 1

2 eBUS line

3 System control (optional)

- Control for the indoor unit
- Heat pump, indoor unit
- 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 heating water pressure 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)

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

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: 89 °C



- 1 Safety cut-out
- 2 Back-up heater
- 3 Condensate tray
- 4 Draining the domestic hot water cylinder
- 5 Domestic hot water cylinder
- 6 Draining cock, heating flow and return draining cock and building circuit

3.4 Serial number

The serial number can be found on the data plate on the rear of the electronics box.

tap

valve

sion vessel

Purging valve

Electronics box

Expansion vessel

Automatic air vent

8

9

10

11

12

13

Potable water expan-

Prioritising diverter

The serial number may also be shown on the product's display (\rightarrow Operating instructions).

3.5 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
Nomen- clature	VIH	Vaillant indirect domestic hot water cylinder
	QW	Rectangular domestic hot water cylinder
	190	Cylinder volume
	E	With electric back-up heater
	/6	Unit generation
	IP	Protection class
Symbols	\sum	Cylinder heating coil
		Control
		Heating circuit
	\sum	Cylinder tank, fill quantity, permiss- ible pressure
		Back-up heater
	P max	Rated power, maximum
	Р	Rated power
	l max	Rated current, maximum
	1	In-rush current
Heating circuit,	MPa (bar)	Permissible operating pressure
hot water circuit	L	Fill quantity
	CE marking	See section "CE marking"

Connection symbols 3.6

Symbol	Connection
∭ .	Building circuit, flow
(∩) ∭	Building circuit, return
(↑) ම	Heating flow
() ()	Heating return

Symbol	Connection
(†)	Domestic hot water circuit, cold
235	water
Ú	Domestic hot water circuit, domestic
Ú	hot water

3.7 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.

3.8 Benchmark

Vaillant is a licensed member of the Benchmark Scheme.

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by a competent person approved at the time by the Health and Safety Executive and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme.

Benchmark is managed and promoted by the Heating and Hotwater Industry Council.



For more information visit www.benchmark.org.uk.

3.9 Cooling mode

Depending on the country, the outdoor unit has the heating mode or heating and cooling mode function. The indoor unit is compatible with this.

Outdoor units that are delivered at the factory with no cooling mode are labelled with "S2" in the nomenclature. For these units, an optional accessory can be used to subsequently activate the cooling mode.

It is activated via a coding resistor and via a setting on the indoor unit's control panel and on the optional system control. (\rightarrow Section 8.19)

3.10 Display of the energy consumption, energy yields and efficiencies

The product, the system control and the app show approximate values for energy consumption, energy yields and efficiencies, which are extrapolated based on calculation algorithms.

The values that are displayed in the app may differ from the other display options due to staggered transfer intervals.

The determined values depend on:

- Installation and system of the heating installation
- User behaviour
- Seasonal weather effects
- Various tolerances of unit-internal components

The recording of the values only includes the product in the factory-delivered condition. Supplementary accessories, even if they are installed on the product, as well as any other components in the heating system and other external consumers, are not part of the data recording.

Deviations between the determined values and the actual values may be significant. The determined values are therefore not suitable for creating or comparing energy billing, for example.

When replacing the PCB, the values for energy consumption, energy yields and efficiencies are reset in the heat pump's control panel.

4 Set-up

4.1 Unpacking the product

- 1. Remove the product packaging.
- 2. Remove the documentation.
- 3. Remove the front casing. $(\rightarrow$ Section 4.10.1)



4. Unscrew the four fixing tabs at the front and rear of the pallet and remove them.

4.2 Checking the scope of delivery

Check that the scope of delivery is complete and intact.

Quantity	Designation	
1	Product	
1	Enclosed documentation	
1	Bag with installation material	
1	cold water control pack: pressure reducing valve 3,5 bar, expansion relief valve 6 bar, manifold, tundish	
1	Set: Potable water expansion vessel 8 l, piping, documentation	

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 environmental temperature: 7 to 35 °C
 - Permissible relative air humidity: 40 to 75 %
- Ensure that the required minimum clearances can be maintained.
- Observe the permissible height difference between the outdoor unit and indoor unit (→ Section 4.4).
- When selecting the installation site, you must take into consideration that, when the product is in operation, it transfers vibrations to the floor and the nearby walls.
- Ensure that the floor is even and offers sufficient loadbearing capacity to bear the weight of the product.
- Ensure that the pipes are routed appropriately.

4.4 Permissible height difference between the outdoor unit and the indoor unit

In relation to the outdoor unit's installation site, the indoor unit's installation site may be located higher or lower.

The permissible height difference depends on the unit type of the outdoor unit:

4.4.1 Outdoor unit with unit type S or M

Unit type	Product example
S, M	VWL 35/6 A 230V S2 to VWL 75/6 A 230V S2

The permissible height difference between the outdoor unit and the indoor unit is limited to 15 m.

4.4.2 Outdoor unit with unit type L

Unit type	Product example
L	VWL 105/6 A 230V S2 to VWL 125/6 A S2

Observe the permissible height difference (\rightarrow Installation instructions for the outdoor unit with unit type L)

4.5 Dimensions





4.6 Minimum clearances and installation clearances



- C 600 mm
- Provide sufficient clearance (B) on at least one side of the product in order to facilitate access for maintenance and repair work.
- When using the accessories, observe the minimum clearances/installation clearances.

4.7 Product dimensions for the transport



4.8 Transporting the product

Danger!

Risk of injury due to carrying heavy loads.

Carrying heavy loads can cause injuries.

- When transporting heavy products, observe all valid laws and other regulations.
- If the spatial conditions do not allow for the unit to be inserted as a whole, separate the product into two modules. (→ Section 4.9)
- 2. Transport the product to the installation site. Use the recessed handles on the rear and the carrying straps at the front on the underside of the product as an aid.

4.8.1 Using the carrying straps

1. Remove the front casing. $(\rightarrow$ Section 4.10.1)

Danger!



Risk of injury due to repeated use of the carrying straps.

Due to material ageing, the carrying straps are not designed to be reused during any subsequent transportation.

 Once the product has been started up, cut off the carrying straps.

Caution.

Risk of damage caused by carrying straps.

The carrying straps may damage the front casing during transport.

- Remove the front casing before you use the carrying straps.
- 2. To transport the unit safely, use the two carrying straps on the two front feet of the product.



3. If the carrying straps are located underneath the product, swivel these to the front.



4. Always transport the lower part of the product as shown above.



5. Always transport the upper part of the product as shown above.

4.9 Separating the product into two modules where necessary

- 1. Remove the front casing. $(\rightarrow$ Section 4.10.1)
- 2. Remove the side casing. (\rightarrow Section 4.10.2)
- 3. Move the electronics box into the maintenance position. (→ Section 4.12)



- 4. Slide the heat insulation (2) on the pipe transitions upwards.
- 5. Unscrew the two nuts (1) on the pipe connections.



Note

Rear screwed connection has a left-hand thread.



- 6. Disconnect the plug connection for the cylinder temperature sensor **(6)**.
- 7. Remove the four screws (3).
- 8. Unscrew the two nuts (4) on the pipe connections.
- 9. Use the recessed handles **(5)** to lift off the upper part of the product.

10. To assemble the product, carry out the steps described above in reverse order.

4.10 Removing the casing

4.10.1 Removing the front casing



- 1. Remove the front flap on the control panel by taking hold of the recessed handles with both hands and lift-ing off the front flap towards you.
- 2. Turn two screws on the right-hand side anti-clockwise by a quarter turn each, and by a quarter turn clockwise on the left-hand side. Pull the control panel cover forwards and out.



3. Remove both screws, raise the lower section of the front casing and pull it forwards and out.



Note All connecting screws in the housing parts are Torx T20.



4. Lift the upper section of the front casing upwards and out.

4.10.2 Removing the side casing



• Remove the side casing as shown in the figure.

4.11.1 Installing the front casing



1. Install the upper part of the front casing as shown in the figure.



- 2. Hook the lower part of the front casing, using the retaining brackets, into the cut-outs in the side casings and lower it down.
- 3. Use the two screws to secure the lower part of the front casing.



- 4. Fit the control panel cover and use the four screws to secure it in place.
- 5. Attach the control panel's front flap and check that the front flap can move easily when it is opened from either side.

4.11.2 Installing the side casing



Install the side casing as shown in the figure.



- 1. Push the electronics box (1) upwards and pull it towards you.
- 2. Move the electronics box into the required position.

4.13 Setting up the indoor unit

1. When setting up the product, take its weight, including the water content, into account.



2. Orientate the product horizontally by adjusting the adjustable feet. 4.14 Removing the carrying straps



- 1. After you have set up the product, cut off the carrying straps and dispose of them in accordance with the relevant regulations.
- 2. Refit the front casing to the product.

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. Adjust the pre-charge pressure of the heating installation.
- 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 pipework 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 5.5



- 1G 1 1/4" connection,
heating flow from the
heat pump2G 1 1/4" connection,
heating return to the
heat pump
- 1. Blow or flush the supply pipes thoroughly prior to installation.
- 2. Connect the heat pump to the product.
- 3. Check whether the connections are leak-tight. $(\rightarrow$ Section 8.22)

5.3 Installing the building circuit connections



Install the building circuit's flow (2) and return (1) in accordance with the relevant standards.
 Connection symbols (→ Section 3.6)

5.4 Installing the domestic hot and cold water connection



Install the cold water connection (2) and the domestic hot water connection (1) in accordance with the relevant standards.

5.5 Installing potable water pipes

To connect the potable water pipes to the domestic hot water cylinder, various piping sets are offered as accessories for surface or concealed installation.

The piping, which is to be set up on-site, requires the following components:

- Domestic hot water thermostatic mixing valve
- Potable water expansion vessel, if required
- Pressure reducer in the cold water pipe (if required)
- Non-return valve in the heating circuit (if required)
- Service valves
- Circulation pump for anti-legionella function, if required

The domestic hot water thermostatic mixing valve ensures that the hot water from the cylinder is mixed with cold water to produce water with a maximum temperature between 30 and 70 $^{\circ}$ C as required. When starting up the heating installation, if you set the domestic hot water thermostatic mixing valve to the required maximum temperature, this maximum temperature is retained at the domestic hot water draw-off points.

- When installing the supply pipes, observe the set-up instructions that are included with the relevant accessories.
- To guarantee effective scald protection, set the thermostatic mixing valve to < 60 °C and check the temperature at a domestic hot water draw-off point.

5.6 Hydraulic connection

Caution.

Risk of damage caused by heat transfer when welding.

The heat that is transferred during welding may damage the cylinder and its components as well as the connection seals.

- Protect the product and its components.
- Do not weld the connectors if these have been screwed into the pipe fittings.

Caution.

Risk of material damage to the cylinder.

If an unvented hot water cylinder is fitted at a high level (eg, loft space), potential damage to the cylinder may occur if the correct method of draining is not followed.

In certain circumstances and at the discretion of the installer, install a WRAS approved automatic air vent on the hot water outlet at the highest point.



2

3

4

8

- A Installation alternative for the potable water expansion vessel in the product
- B Installation alternative for the potable water expansion vessel on the safety assembly
- 1 15 mm diameter connection, e.g. potable water expansion vessel
- 22 mm diameter connection, e.g. potable water expansion vessel
- Cold water supply
- Safety assembly
- 5 Expansion relief valve6 Domestic hot water
- cylinder drain valve 7 Tundish
 - Temperature and pressure relief valve

5.6.1 Installing the safety assembly

<u>.</u>

Caution.

Excessive pressure in the domestic hot water cylinder

Excessive pressure in the domestic hot water cylinder may cause the cylinder to burst.

- Ensure that the expansion relief valves are not blocked.
- Ensure that there is no isolation valve between the safety assembly and the cylinder.



Cold water with equal pressure 15 mm diameter con-

1

2

- 15 mm diameter connection, e.g. potable water expansion vessel
- 22 mm diameter connection, e.g. potable water expansion vessel Pressure reducer
- 5 Cold water supply
- 6 Expansion relief valve
- 1. Before installation, flush the pipes in order to clear any contamination and prevent the build up of dirt.

3

4

- 2. Install the safety assembly horizontally and install the expansion relief valve so that it is facing upwards.
- 3. Note the flow direction, which is specified by an arrow.
- 4. Connect the safety assembly to the drain valve. Consult the table below to find out the length to which the pipe should be cut.

Size of the cylinder	Length of the pipe that has a diameter of 22 mmPre-charge pres sure of the exp sion vessel	
200	900 mm	0.3 MPa
		(3.0 bar)

- 5. Install a pipe between the safety assembly's connection and the product's temperature and pressure relief valve. Use a T-piece for this. The pipe system must continuously slope downwards, must be visible and must be protected against frost. There must be no risk of injury to persons.
 - Diameter of the pipe: 22 mm
 - Length of the pipe between the temperature and pressure relief valve and the expansion relief valve.: ≤ 600 mm
- 6. Connect the cold water supply to the safety assembly.
 Diameter of the cold water supply pipe: ≥ 22 mm
- 7. Ensure that no valve will be fitted between storage cylinder and expansion valve.
- 8. Install the potable water expansion vessel form the bag of small parts either on the rear of the product (option A) in accordance with the enclosed installation instructions or to one of the two free connections for the safety assembly (option B). Adjust the pre-charge pressure in accordance with the drinking water system.

5.6.2 Installing a drain pipe



Discharges at high level: e.g. into metal hopper and metal downpipe with the end of the discharge pipe clearly visible or onto a roof capable of withstanding high temperature discharges of water and 3 m from any plastic guttering system that would collect such discharges. The discharge would consist of high temperature water and steam. Asphalt, roofing felt and non-metallic rainwater goods may be damaged by such discharges.

The drain connections of the temperature and pressure relief valve and the expansion relief valve must be connected to the supplied tundish via 22-mm-thick copper pipes. The tundish must be installed vertically, as close to the cylinder as possible and with a maximum clearance of 600 mm from the connection of the temperature and pressure relief valve. It must be installed in the same room as the cylinder, but at a sufficient distance from electrical components. The drain pipes from the temperature and pressure relief valve and from the expansion relief valve can be connected above the tundish using a T-piece. The drain pipe from the 28 mm connection of the tundish must consist of copper pipes with a diameter of at least 28 mm and be connected to a safe and visible drainage point. The vertical section of pipe beneath the tundish must be at least 300 mm long before any bends or diversions in the line. If the total resistance of the drain pipework exceeds the values in the following table, you must increase the diameter of the pipework.

Any discharge should be visible at the tundish. In addition, where discharges from safety devices my not be apparent, e.g. in dwellings occupied by people with impaired vision or mobility, consideration should be given to the installation of a suitable safety device to warn when discharge takes place, e.g. electronically operated.

When installing the drain pipework, comply with the standards, directives and laws that are applicable in your country.

Size of the outlet valve	Minimum diameter of the drain pipe D1	Minimum diameter of the drain pipe from the tundish D2	Maximum permiss- ible res- istance, inform- ation on the length of a straight pipe	Resist- ance per elbow or bend
1/2"	15 mm	22 mm 28 mm	9 mm ≤ 18 m	0.8 m 1.0 m
		35 mm	≤ 27 m	1.4 m
		28 mm	≤9 m	1.0 m
3/4"	22 mm	35 mm	≤ 18 m	1.4 m
		42 mm	≤ 27 m	1.7 m
		35 mm	≤9 m	1.4 m
1"	28 mm	42 mm	≤ 18 m	1.7 m
		54 mm	≤ 27 m	2.3 m

Sample calculation

The following example corresponds to a temperature and pressure relief valve G1/2 with a drain pipe (D2) with four 22 mm elbows and a length of 7 m from the tundish to the drainage point. According to the table, the maximum permissible resistance for a straight length of a 22-mm-thick copper discharge pipe (D2) of a thermal expansion relief valve G1/2 is 9.0 m. The resistance of the four 22 mm elbows. which are each 0.8 m in length, must be subtracted from this, i.e. a total of 3.2 m. The maximum permitted length is accordingly 5.8 m and is therefore below the current length of 7 m. The calculation must therefore be performed using the second largest size. The maximum permissible resistance for a straight length of a 28-mm-thick pipe (D2) of a thermal expansion relief valve G1/2 is 18 m. The resistance of the four 28 mm elbows, which are each 1.0 m in length, must be subtracted from this, i.e. a total of 4.0 m. The maximum permitted length is accordingly 14 m. As the current length is 7 m, a 28 mm copper pipe (D2) should be selected.

Where a single common discharge pipe serves more than one system, it should be at least one pipe size larger the largest discharge pipe (D2) to be connected.

A suitable location for the drain pipe terminal is, for example, beneath a fixed mesh above the odour trap in a soakaway with a siphon. Low drain pipework, for example up to 100 mm above external surfaces (car parks, meadows, etc.) can be used provided that it is protected by a wire fence or something similar to prevent children from coming into contact with the waste water and provided that the system is not visible. Do not install any valves or stopcocks on the drain pipework.

Make sure that the drain pipe from the tundish to the drain has a constant downward gradient of at least 1:200. The drain pipe for the heat generator expansion relief valve can be connected to the horizontal drain pipe for the cylinder behind the tundish using a T-piece.

The discharge pipe should not be connected to a soil discharge stack unless it can be demonstrated that the soil discharge stack is capable of safety withstanding temperatures of the water discharged, in which case, it should:

- contain a mechanical seal, not incorporating a water trap, which allows water into the branch pipe without allowing foul air from the drain to be ventilated through the tundish
- be a seperate branch pipe with no sanitary appliances connected to it

- if plastic pipes are used as branch pipes carrying discharge from a safety device, they should be either polybutalene or crosslinked polyethylene complying with national standards as Class S of BS7291-2:2006 or Class S of BS7291-3:2006 respectively
- be continuously marked with a warning that no sanitary appliances should be connected to the pipe.

Note

Plastic pipes should be joined and assembled with fitting appropriate to the circumstances in which they are used as set out in BS EN ISO 1043-1:2002 Plastics. Symbols and abbreviated terms. Basic polymers and their special characteristics.

Where pipes cannot be connected to the stack it may be possible to route a dedicated pipe alongside or in close proximity to the discharge stack.

5.6.3 High-level drain

Installing the highest drain is permitted as long as this does not present a danger to anyone in or outside the building at the drain point. Examples of points to consider when deciding whether a location is suitable for the highest drain:

- The possibility (taking the wind into account) that a person might stay in the area where the water is drained for a prolonged period of time, and, if this is the case, whether the water is sufficiently cooled by that point to pose no danger. The thermal conductivity of the material surfaces, the climatic conditions, the installation location and the drain pipework direction can, to different extents, contribute to reducing the temperature of the water that is being drained.
- The position of the windows and other openings.
- The probability of prams being under the drain opening.
- The resistance of the surface to hot water.
- The possibility of ice formation if water drains onto access paths.

5.7 Installing the drain pipe on the expansion relief valve

- 1. Install the drain pipe with a continuous downwards incline in a frost-free environment.
- 2. Ensure that the size of the drain pipe corresponds to the size of the expansion relief valve that has been checked with the type sample.
- 3. Ensure that the drain pipe has a maximum of two elbows and a maximum length of 2 m.
- 4. Make sure that the end of the pipe is visible.
- 5. Terminate the drain pipe in such a way that escaping water or steam cannot cause injury to persons or damage to electronic components.
- 6. Open the expansion relief valve regularly in order to remove any scale deposition and ensure that the device is not blocked.

5.8 Connecting the condensate discharge

Condition: Cooling mode activated



- Heat-insulate all of the pipes for the building circuit in the building.
- If the product is installed in the wet room, you must connect a condensate discharge.
- Drill a hole into the hopper (1) on the condensate tray.
 Diameter: 8 mm
- Install a condensate discharge hose on the condensate tray on-site and connect it to the sewage system via a free drain.
- Ensure that the drain hose for condensate and expansion relief valve opens in a siphon, which prevents the escape of ammonia and sulphurous gases.

5.9 Connecting additional components

You can install the following components:

- Domestic hot water circulation pump
- Domestic hot water expansion vessel
- External heating pump (multi-zone operation)
- External heating solenoid valve (multi-zone operation)
- Buffer cylinder for the heating system
- 2 l brine expansion vessel

Multiple-zone module and buffer cylinder cannot be installed at the same time, because they are installed at the same connections.

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.
- Observe the technical connection conditions for connecting to the energy supply company's low-voltage network.
- 2. Use the data plate to determine whether the product requires a 1^{230V} or a 3^{400V} electrical connection.
- 3. 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.

- 4. Determine whether the power supply for the product should be set up with a single-tariff meter or a dual-tariff meter.
- 5. Connect the product via a fixed connection and a partition with a contact gap of at least 3 mm.
- 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.
- 10. Determine whether the energy supply company lockout function has been provided for the product, and how the power supply for the product should be designed, depending on the type of shutdown.

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 of the heat pump can be switched off intermittently. It is switched off by the energy supply company and usually with a ripple control receiver.

Option 1: Actuating connection S21

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



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 back-up heater, the compressor or both should be blocked.
- Set the parametrisation for connection S21 in the system control.

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.
- ► Undo the lines to plug X311, which were factory-installed, and remove these along with plug X310.
- Connect an unblocked power supply to X311.
- Connect the power supply that is switched by the contactor to X300, see appendix.



Note

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

6.5 Removing the cover from the power supply PCB



- 1. Remove the front casing. $(\rightarrow$ Section 4.10.1)
- 2. Remove both screws.
- 3. Pull the cover for the power supply PCB forwards and out.

6.6 Routing the cables in the product



- 1. If required, remove the left-hand side casing.
- 2. Guide the power supply cable (1) and other connection cables (24 V/eBUS) (2) along the left-hand side casing in the product.



- 3. Guide the power supply cables through the strain reliefs and to the terminals on the power supply PCB.
- 4. Connect the power supply cable to the corresponding terminals.
- 5. Secure the power supply cable in the strain reliefs.

6.7 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	

6.7.1 1~/230V single power supply



Caution.

Risk of material damage due to high connected voltage.

With excessive mains voltages, electronic components may be damaged.

 Ensure that the mains voltage is in the permissible range.



- 1. Note the specifications on the sticker on the electronics box.
- 2. Install a disconnector for the product.
- 3. Use one 3-pole power supply cable:

- H05V2V2-F (300/500 V, T90 3G6.0, 90 °C)
- 4. Connect the power supply cable to L1, N, PE.
- 5. Use the strain relief clamp to secure the cable in place.

6.7.2 1~/230V dual power supply

Caution.

Risk of material damage due to high connected voltage.

With excessive mains voltages, electronic components may be damaged.

 Ensure that the mains voltage is in the permissible range.



- 1. Note the specifications on the sticker on the electronics box.
- 2. Install two disconnectors for the product.
- 3. Use two 3-pole power supply cables.
 - H05V2V2-F (300/500 V, T90 3G6.0, 90 °C)
 - Note that commercially available power supply cables do not usually have sufficient temperature resistance.
- 4. Connect the power supply cable (from the heat pump electricity meter) to connection *X300*.
- 5. Remove the 2-pole bridge between connections *X310* and *X311*.
- 6. Connect the second power supply cable (from the household electricity meter) to connection *X311*.
- 7. Use the strain relief clamps to secure the cables in place.

6.8 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	

6.8.1 3~/400V single power supply

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Caution.

Risk of material damage due to high connected voltage.

With excessive mains voltages, electronic components may be damaged.

 Ensure that the mains voltage is in the permissible range.



- 1. Note the specifications on the sticker on the electronics box.
- 2. Install a disconnector for the product.
- 3. Use one 5-pole power supply cable:

H05V2V2-F (T90 5G1.5, 90 °C)

- 4. Remove the 2-pole bridge from between contacts L1 and L2 on connection *X311*.
- 5. Connect the power supply cable to connection *X300*.

6.8.2 3~/400V dual power supply

Caution.

Risk of material damage due to high connected voltage.

With excessive mains voltages, electronic components may be damaged.

 Ensure that the mains voltage is in the permissible range.



- 1. Note the specifications on the sticker on the electronics box.
- 2. Install two disconnectors for the product.

- 3. Use one 5-pole power supply cable (low tariff) and one 3-pole power supply cable (high tariff):
 - H05V2V2-F (T90 5G1.5, 90 °C)
 - H05V2V2-F (300/500 V, T90 3G6.0, 90 °C)
- 4. Remove the 2-pole bridge from between contacts L1 and L2 on connection *X300*.
- 5. Remove the 2-pole bridge between connections *X310* and *X311*.
- 6. Connect the 5-pole power supply cable (from the heat pump electricity meter) to connection *X300*.
- 7. Connect the 3-pole power supply cable (from the household electricity meter) to connection *X311*.
- 8. Use the strain relief clamps to secure the cables in place.

6.9 Installing the system control in the electronics box

Condition: Installing a multiMATIC VRC 700



- Remove the cover (1) on the electronics box.
- Connect the DIF cable (2), which is laid out ready, either to the system control or to the mobile base station.
- If you are using a radio receiver, use the mobile base station (3).
- Consult the instructions for the system control for information on coupling the mobile base station and the system control.
- If you are using the wired system control, use the system control (4), → Installation instructions for the system control and system instructions.
- Consult the wiring diagram in the appendix for information on the integration into the eBUS network.

6.10 Requirements for the eBUS line

Observe the following rules when routing the eBUS lines:

- Use twin-core cables.
- Never use shielded or twisted cables.
- ► Use only appropriate cables, e.g. NYM or H05VV (-F/-U).
- ► Observe the permissible total length of 125 m. For a total length of up to 50 m, a conductor cross-section of ≥0.75 mm² applies; from 50 m upwards, a conductor cross-section of 1.5 mm² applies.

In order to prevent faults in the eBUS signals (e.g. due to interferences):

- Maintain a minimum clearance of 120 mm to power supply cables or other electromagnetic sources of interference.
- For parallel routing to mains connection lines, guide the cables in accordance with the applicable regulations, e.g. on cable trays.
- Exceptions: For wall breaks and in the electronics box, it is acceptable to not reach the minimum clearance.

6.11 Opening the control PCB's electronics box



- 1. Hinge the electronics box forwards.
- 2. Detach the four clips, on the left and the right and at the top, from the brackets.

6.12 Routing the cables in the electronics box

- At lengths of over 10 m, route connection cables with mains voltage separately from sensor lines. Minimum clearance for the extra low-voltage wire and power supply cable at a line length of > 10 m: 25 cm.
- 2. Observe the requirements for eBUS lines. $(\rightarrow$ Section 6.10)



3. Route 24 V cables and eBUS cables through the lefthand strain reliefs on the electronics box.



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

6.13 Carrying out the wiring

Note

There is a safety extra-low voltage (SELV) at connections S20 and S21.

Note

If the energy supply company lockout function is used, connect a potential-free normally open contact with a breaking capacity of 24 V/0.1 A to connection S21. You must configure how the connection works in the system control. (For example, if the contact is closed, the electric back-up heater is blocked.)

- 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 plug terminals. Remedy this if necessary.
- 10. Plug the plug into the associated PCB slot.

6.14 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.
- Connect the 230 V connection cable to the plug from slot X11 on the control PCB and plug it into the slot.



- 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.
- Plug the edge connector into slot X41 on the control PCB.
- 3. Set the circulation pump in the system control.

6.15 Connecting a limit thermostat for the underfloor heating

Condition: Intermediate heat exchanger installed

- Remove the bypass line at plug S20 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.

6.16 Actuating a circulation pump with an eBUS control

- 1. Ensure that the circulation pump is correctly parametrised in the system control.
- 2. Select a hot water programme (preparation).

6.17

- 3. Parametrise a circulation programme in the system control.
 - ⊲ The pump runs during the time period specified in the programme.

Connecting the outdoor temperature sensor

4 3 2 1 X35 X24 9 1 10 2 11 3 12 4 13 5 FB \oslash 6 14 6 AF 5 \oslash 7 15 RF \oslash 4 16 8 \oslash DCF 3 \oslash 0 2 \oslash X41 0 1

Connect the connection cable for an outdoor temperature sensor to terminals 2 (0) and 5 (AF) on the X41 edge connector, which is supplied with the control. If a system control is present, also connect terminal 3 (DCF) of the edge connector.

6.18 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.

6.19 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.

6.20 Installing the cover for the power supply PCB

- 1. Tighten all of the screws on the strain relief clamps.
- 2. Position the cover. Ensure that you do not damage any cables.
- 3. Use the two screws to secure the cover for the power supply PCB.

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 read-out 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".
- 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 (e.g. fit a magnetite separator).
- 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 filling and supplementary 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 pH value of the heating water is lower than 8.2 or higher than 10.0, or
- The guideline values listed in the following table are not met.

Total	Water hardness at specific system volume ¹⁾								
output	≤ 20 I/kW		> 20 ≤ 40	l/kW l/kW	> 40 l/kW				
kW	mg CaCO₃/ m³ I		mg CaCO₃/ I	mol/ m³	mg CaCO₃/ I	mol/ m³			
≤ 50 ²⁾	None	None	≤ 30	< 300	< 3.0	< 0.05			
< 50 ³⁾	< 300	< 3.0	150	≤ 1.5	5.0	0.05			
> 50 to ≤ 200	200	< 2.0	100	≤ 1.0	5.0	0.05			
> 200 to ≤ 600	150	< 1.5	5.0	0.05	5.0	0.05			

Total	Wate	Water hardness at specific system volume ¹⁾							
output	≤ 20	≤ 20 l/kW		> 20 l/kW ≤ 40 l/kW		> 40 l/kW			
kW	mg CaCO₃/ I	mol/ m³	mg CaCO₃/ I	mol/ m³	mg CaCO₃/ I	mol/ m³			
> 600	5.0	0.05	5.0	0.05	5.0	0.05			

 Nominal capacity in litres/heat output; in the case of multiboiler systems, the smallest single heat output is to be used.
 Specific water capacity of the heat generator ≥ 0.3 I per kW.
 Specific water capacity of the heat generator < 0.3 I per kW (e.g. circulation water heater) and installations with electrical heating elements.

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.
- Open all of the thermostatic valves on the heating installation and, if required, all other isolation valves.
- 3. Check all of the connections and the entire heating installation for leaks.
- Switch the prioritising diverter valve to manual operation (→ Section 8.1) 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.

Note

If you are using a filling device that is set onsite, this must have WRAS approval.



- 5. Connect a filling hose to the filling/draining valve (1).
- 6. To do this, unscrew the screw cap from the filling/draining valve and secure the free end of the filling hose to here.



- Open the purging screw (1) on the automatic air vent (2) in order to purge the product.
- 8. Open the filling/draining valve.

- 9. Open the heating water supply slowly.
- 10. Purge the highest radiator or underfloor heating circuit and wait until the circuit is completely purged.
- 11. Fill with water until the manometer (on-site) shows that the heating installation has reached a pressure of approx. 1.5 bar.
- 12. Close the filling/draining valve.
- 13. Then check the heating installation pressure again (if required, repeat the filling procedure).
- 14. Remove the filling hose from the filling/draining valve and screw the screw cap back on.
- Set automatic mode for the prioritising diverter valve again (→ Section 8.1).

8.4 Filling the domestic hot water circuit

- 1. Open all domestic hot water tap fittings.
- 2. Wait until water escapes from each draw-off point and then close all the hot water taps.
- 3. Check the system for tightness.

8.5 Purging

- 1. Open the automatic air vent.
- 2. Start the purge programme for the building circuit P06 via: 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).

8.6 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.
 - \triangleleft The system's products start up.
 - The heating and domestic hot water demand are activated by default.
- 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.

8.7 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 $\ensuremath{\textbf{Next}}$ 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.

8.7.1 Ending the installation assistant

- 1. 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.
- 2. Observe the corresponding sections and information in the system instructions.

8.8 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.

8.9 Energy balance control

The energy balance is the integral from the difference between the flow temperature actual value and target value, which is added up every minute. If the set heat deficit (WE = -60°min in heating mode) is reached, the heat pump starts. If the supplied heat volume corresponds to the heat deficit (integral = 0°min), the heat pump is switched off.

The energy balancing is used for heating and cooling mode.

8.10 Compressor hysteresis

The heat pump is switched on and off via the compressor hysteresis for heating mode and also for energy balancing. When the compressor hysteresis is above the target flow temperature, the heat pump is switched off. When the hysteresis is below the target flow temperature, the heat pump starts up again.

8.11 Enabling the electric back-up heater

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. Set the maximum output for the electric back-up heater at the indoor unit's control panel here.

The electric back-up heater is controlled automatically and according to demand.

- 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 (→ Appendix K)
- ► 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; for rated currents, see Technical data. (→ Appendix Q)

8.12 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 **MO relay**.

Menu \rightarrow Installer level \rightarrow Configuration.

8.13 Purging

You can use the installation assistant to run through the purging programmes.

► To do this, read the purging section. (→ Section 8.5)

8.14 Calling up the installer level

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

8.15 Restarting the installation assistants

You can restart the installation assistant at any time by calling it up in the menu.

Menu \rightarrow Installer level \rightarrow Start inst. assistant.

8.16 Checking the configuration

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

Menu \rightarrow Installer level \rightarrow Configuration.

8.17 Calling up statistics

$Menu \rightarrow Installer \ level \rightarrow Test \ menu \rightarrow Statistics$

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

8.18 Floor drying

Condition: No system control connected

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, without the need for a system control to be connected.

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If there is no electric back-up heater, screed drying is only possible with this product if the return temperature is above 10 °C. This corresponds approximately to an outdoor temperature of +5 °C. At outdoor temperatures below +5 °C, there is a risk of increased icing of the fin-type heat exchanger in the outdoor unit.

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 preset programme, regardless of the outdoor temperature.

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

Days after starting the func- tion	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).

8.18.1 Activating the screed drying

- 1. Press the reset button.
- 2. When restarting the display, press and hold the 🛨 button until the language selection opens.
- 3. Set the required language. (\rightarrow Section 4.4.8)
- 4. Press the 🖵 button in order to select the power supply for the back-up boiler.
- 5. Press the 🖵 button in order to select the output of the back-up boiler.
- 6. Press the 🖵 button in order to select the start day for the screed drying.
 - The screed drying is started and the display shows the current flow temperature and the right-hand status bar shows the system pressure.
- 7. In the current programme, call up the current status messages for the system in the display.
- 8. To do this, press the and buttons at the same time.
- 9. If required, change the settings for the function in the current programme.
- 10. Return to the programme steps in order to change the settings or the current day.
 - If the screed drying has not been run successfully by day 29, the display shows the message Screed drying ending.
 - ▽ If a fault occurs during screed drying, the display shows the message **Fault**.
 - Select a new start day for the screed drying or interrupt the process.

8.19 Activating cooling mode

- 1. Go to the indoor unit's control panel.
- 2. Navigate to: Menu \rightarrow Installer level \rightarrow Configuration \rightarrow Cooling technology.
- 3. Select: Active cooling.
- 4. If this involves a heat pump cascade, implement this setting for every heat pump with cooling function.

Condition: System control connected

- Go to the system control.
- Activate cooling mode (→ Installation instructions for the system control).

8.20 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.

8.21 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.
 - To ensure that the building circuit works correctly, the filling pressure must be between 1 bar and 1.5 bar. If the heating installation extends over several storeys, higher filling pressures may be required to avoid air entering the heating installation.

8.22 Checking function and leak-tightness

Before you hand the product over to the end user:

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

8.22.1 Checking the heating mode

► Start check programme P.04.

8.22.2 Checking the domestic hot water generation

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

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 $\textbf{Menu} \rightarrow \textbf{Installer level} \rightarrow \textbf{Configuration}.$

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, building circuit



9.3 Total pressure loss in the product, domestic hot water



9.4 Setting the flow temperature in heating mode (with no control connected)

- 1. Press 🗔 (III).
 - ⊲ The display shows the flow temperature in heating mode.
- - Max. heating mode target flow temperature: 75 $^\circ \! C$
- 3. Confirm this change by pressing \Box (**OK**).

9.5 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.
- 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.

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 Displaying the Live Monitor (current product status)

Menu → Live Monitor

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

Status codes (→ Appendix G)

10.3 Checking fault codes

The display shows a fault code **F.xxx**.

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.

10.4 Querying the fault memory

Menu → Installer level Fault list

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

Display views:

- Number of faults that occurred
- The fault that is currently selected with fault number
 F.xxx
- A plain text display explaining the fault.

10.5 Resetting the fault memory

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

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. (\rightarrow Section 10.8)

10.7 Using check programmes

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

You can activate various special functions in the product by using various check programmes.

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.

10.8 Carrying out the actuator test

Menu \rightarrow Installer level \rightarrow Test menu \rightarrow 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 (\rightarrow Appendix M)

Characteristic values for the VRC DCF outdoor temperature sensor (\rightarrow Appendix O)

10.9 Resetting parameters to factory settings

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

10.10 Preparing the repair work

- 1. Switch off the power supply.
- 2. Remove the front casing.
- 3. Close the service valves in the heating flow and in the heating return.
- 4. Close the service valve in the cold water pipe.
- 5. Drain the product if you want to replace water-bearing components of the product.
- 6. Ensure that water does not drip on live components (e.g. the electronics box).
- 7. Use only new seals.

10.11 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 (→ Appendix J)
- 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.

10.11.1 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. Remove the cover from the power supply PCB. $(\rightarrow$ Section 6.5)
- 4. Remove the connection cable from terminal block *X302*.
- 5. Remove the capillary tube from the temperature sensor 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 Inspection and maintenance information

11.1.1 Inspection

The inspection is intended to determine the actual condition of a product and compare it with the target condition. This is done by measuring, checking and observing.

11.1.2 Maintenance

Maintenance is required in order to eliminate any deviations between the actual condition and the target condition. This is normally done by cleaning, setting and, if necessary, replacing individual components that are subject to wear.

11.2 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 result in the product no longer meeting the applicable standards, thereby voiding the conformity of the product.

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.

11.3 Checking maintenance messages

If the *spin* 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 (→ Appendix H)

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 (→ Section 10.4).



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, if required.

11.4 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.

11.5 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.

11.6 Checking the pre-charge pressure of the expansion vessel

1. Close the service valves and drain the heating circuit. (\rightarrow Section 12.1)



Measure the pre-charge pressure of the expansion vessel at the valve (1).

Result:



Note

The required pre-charge pressure of the heating installation may vary depending on the static pressure (0.1 bar per metre in height).

Pre-charge pressure is below 0.75 bar (±0.1 bar/m)

- Fill the expansion vessel with nitrogen.
- 3. Fill the heating circuit. (\rightarrow Section 8.3)

11.7 Cleaning the domestic hot water cylinder



Note

As the cylinder tank is cleaned on the domestic hot water side, ensure that the cleaning agents used satisfy hygiene requirements.

- 1. Drain the domestic hot water cylinder.
- 2. Remove the protection anode from the cylinder.
- 3. Use a jet of water through the anode opening on the cylinder to clean the cylinder interior.
- 4. Rinse sufficiently and allow the water used for cleaning to flow out via the cylinder drain cock.
- 5. Close the draining cock.
- 6. Refit the protection anode to the cylinder.
- 7. Fill the cylinder with water and check whether it is leaktight.
- 8. Actuate the draining device on the domestic hot water safety assembly regularly in order to remove any scale deposition, and ensure that the device is not blocked.

11.8 Checking and correcting the filling pressure of the heating installation

If the filling pressure falls below the minimum pressure, a maintenance message is shown on the display.

- Min. heating circuit pressure: \ge 0.05 MPa (\ge 0.50 bar)
- ► Top up the heating water in order to start up the heat pump again; Filling and purging the heating installation (→ Section 8.3).
- If you notice frequent pressure losses, determine and eliminate the cause.

11.9 Completing inspection and maintenance

- 1. Start up the heat pump system.
- 2. Check that the heat pump system is working without any problems.

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. $(\rightarrow$ Section 4.10.1)
- 3. Remove the side casing. (\rightarrow Section 4.10.2)
- 4. Hinge the electronics box downwards.



- Connect a hose to each of the draining cocks (1) and (2), and guide the ends of the hoses to a suitable drainage point.
- Use manual actuation to move the prioritising diverter valve to the "Heating circuit/domestic hot water cylinder" position. (→ Section 8.1)
- 7. Open the automatic air vent (red wheel).
- 8. After five minutes, open the air vent (3). If required, close it again if water is escaping.
- 9. Open the two stopcock in order to fully drain the heating circuit, including the heating coil for the domestic hot water cylinder.

12.2 Draining the product's domestic hot water circuit

- 1. Unlock the cold water connection.
- 2. Remove the front casing. $(\rightarrow$ Section 4.10.1)



- Connect a hose to the connection on the draining cock
 (1) and route the free end of the hose to a suitable drainage point.
- 4. Open the draining cock (1) to fully drain the product's domestic hot water circuit.
- 5. Open one of the 3/4 connections on the rear of the product on the domestic hot water cylinder.

13 Decommissioning

13.1 Temporarily decommissioning the product

- 1. Switch off all of the disconnectors to which the product is connected in the building.
- 2. Disconnect the product from the power supply.

13.2 Permanently decommissioning the product

- Switch off all of the disconnectors to which the product is connected in the building.
- Disconnect the product from the power supply.
- Close the cold-water stopcock.
- Close the stopcocks.
- Drain the product.
- Dispose of or recycle the product and its components.

14 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.

15 Customer service

Validity: Great Britain AND Vaillant

For contact details for our customer service department, you can write to the address that is provided on the back page, or you can visit www.vaillant.co.uk.

Appendix

A Functional diagram



1	Automatic air vent	10	Cylinder temperature sensor
2	Flow temperature sensor: Electric back-up heater	11	Manometer
3	output Building circuit, flow	12	Filling/draining cock
4	Building circuit, return	13	Isolation valve
5	Back-up beater	14	Draining cock, heat pump and heating circuit
6	Heating flow from the outdoor unit	15	Domestic hot water cylinder's draining cock
7	Heating roturn to the outdoor unit	16	Diaphragm expansion vessel
<i>i</i>	Prioriticing diverter velve	17	Cold water
0		18	Domestic hot water
9	Protection anode		



9

10

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
3	Permanently installed protective conductor connec-
4	[X300] Power supply connection
5	[X302] Safety cut-out
6	[X301] Back-up heater

[X313] Power supply for the control PCB or the optional VR 70/VR 71 or the optional external current anode
[X314] Power supply for the control PCB or the optional VR 70/VR 71 or the optional external current

anode [X312] Power supply for the control PCB or the optional **VR 70/VR 71** or the optional external current anode

С **Control PCB**



2	[X29] eBUS bus connection for the installed system control
3	[X51] Display edge connector
4	[X35] External current anode edge connector
5	[X24] Coding resistor 3
6	[X24] Coding resistor 2
7	[X41] Edge connector (outdoor temperature sensor, DCF, system temperature sensor, multi-function input)
8	[X106/S20] Limit thermostat
9	[X106/S21] ESCO contact
10	[X106/BUS] eBUS bus connection (outdoor unit, VRC 700, VR 70 / VR 71)
11	[X16] Optional: Accessory (intermediate heat ex- changer pump)

12	[X15] Internal prioritising diverter valve for heating circuit/cylinder charging
13	[X11] Multi-function output 2: Domestic hot water circulation pump, anti-legionella pump, dehumidifier, zone valve
14	[X13] Multi-function output 1: Cooling valve, zone valve
15	[X14] Multi-function output: External back-up heater, external prioritising diverter valve, external fault message
16	[X1] 230 V supply for control PCB
17	[X1] Functional earth
18	[X28] Data connection to the power supply PCB
19	[X22] Immersion heater flow temperature sensor
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



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

F Installer level overview

Setting level	Values		Unit	Increment, select, ex-	Factory setting	Setting
	Min.	Max.		planation		
Installer level →						
Enter code	00	99		1 (competent person	17	
				code 17)		
Installor lovel . Fault list .						
$\frac{1}{1}$	Current vol		1		1	
F.XX – F.XX ⁷	Current val	ue				
Installar laust Tast many Stati						
	Stics →		h		1	
	Current val					
Ruild nump hours	Current val		h			
Build numn starts	Current val					
A-port valve hours	Current val		h			
A-port valve sw ons	Current val					
Fan 1 operating hours	Current val	ue	h			
Fan 1 starts	Current val	ue	1			
Fan 2 operating hours	Current val	ue	h			
Fan 2 starts	Current val	ue				
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 val	ue				
					1	
Installer level → Test menu → Cheo	k programn	nes →				
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		
		1				
Installer level → Test menu → Sens	or/actuator	test →				
T.0.01 Building circuit pump	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		
T.0.42 Building circuit: Water	0	3	bar	0.1		
Pressure						
\int_{2}^{10} See the overview of fault codes: Fa	ault lists are	only availabl	e, and can only	/ be deleted, if faults have o	ccurred.	
² This parameter does not appear if	a system co	ntrol is conne	ected.			

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

Setting level	Values		Unit	Increment, select, ex-	Factory setting	Setting
	Min.	Max.		planation		
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 tem- perature	-40	135	°C	0.1		
T.0.56 Compressor inlet temper- ature	-40	135	°C	0.1		
T.0.57 EEV outlet temperature	-40	90	°C			
T.0.59 Condenser outlet temper- ature	-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	К	0.1		
T.0.88 Overheating actual value	-40	90	к	0.1 to 20 K are normal op- erating parameters		
T.0.89 Subcooling target value	-40	90	К	0.1		
T.0.90 Subcooling actual value	-40	90	К	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 val	ue		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 val	ue				
T.1.126 MO2 output	Off	On		Off, On	Off	
T.1.127 MO output	Off	On		Off, On	Off	
Installer level \rightarrow Configuration \rightarrow						
Language	Current lan	guage		Languages available for selection	02 English	
Contact details → Telephone number	Phone num	iber		0–9		
Heat curve ²⁾	0.4	4.0		0.1		
Summer swoff temp. ²⁾	10	90	°C	1		
Heating biv. point ²⁾	-30	+20	°C	1		
DHW bivalence point 2)	-20	+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 						

Setting level	Values		Unit	Increment, select, ex-	Factory setting	Setting
	Min.	Max.	1	planation		
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	К	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	ĸ	Applies for heating mode only: 1	7	
Compressor hyster. Cool.	0	15	к	Applies for cooling mode only: 1	5	
Max. rem. feed head	200	900	mbar	10	900	
DHW mode	0 = ECO	2 = Bal- ance		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	6	kW	1–6: 1 kW–6 kW	6	
Compr. current limit				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		
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, ex-	Factory setting	Setting
	Min.	Max.		planation		
Software version	Current val control PCI indoor unit outdoor uni the display	ue of the 3 (HMU xxxx, HMU it xxxx) and (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 fact- ory settings				Yes, No	No	
Screed drying ²⁾				Off, 1–29	Off	
				1	1	1
Installer level → Start inst. assistar	nt →					
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	6	kW	1–6: 1 kW–6 kW	6	
Cooling technology	No cool- ing	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 num- ber	Phone num	nber		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

Code	Meaning
Status external current anode	Anode not connected, Anode OK, Anode Fault
S.34 Heating mode: Frost pro- tection	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 application lim- its.
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.

Code	Meaning		
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 application lim- its.		
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 application 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.176 External electrical power limitation is active	The heat pump or the electric back-up heater is limited by the energy supply company.		
S.202 Check programme: Pur- ging 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: Con- trol 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	too The compressor heating is switched on. The unit does not start up.		
S.252 Fan unit 1: Fan blocked	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 application limits. Heating mode: > 43 °C. Domestic hot water mode: > 43 °C. Cooling mode: > 46 °C.		
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 application 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: Re- maining 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 application 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 temper- ature 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		

Code	Meaning
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 restar- ted. 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 heat energy is available from the building circuit.
S.284 De-icing flow temperat- ure 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 heat energy is available from the building circuit.
S.285 Compressor outlet tem- perature 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 out- side 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 out- side wind.
S.289 Current limit active	The outdoor unit's power consumption is reduced, the compressor speed is reduced. The com- pressor'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 application 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 tem- perature too high	The operating characteristics have been exited. The heat pump is restarted.
S.304 Evaporation temperat- ure too low	The operating characteristics have been exited. The heat pump is restarted.
S.305 Condensation temperat- ure too low	The operating characteristics have been exited. The heat pump is restarted.
S.306 Evaporation temperat- ure too high	The operating characteristics have been exited. The heat pump is restarted.
S.308 Condensation temperat- ure 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.
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 max- imum 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: Fre- quency converter not recog- nised	Missing communication between the frequency converter and the outdoor unit's PCB. After this oc- curs three times, fault message F.753 appears.
S.590 Fault: 4-port valve posi- tion 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	 External current anode not recog- nised 	- If required, check for a cable break
M.32	Building circuit: Waterpress. Low	 Pressure loss in the building circuit due to leakages or air pockets Building circuit pressure sensor is defective 	 Check the building circuit for leaks, top up with heating water and purge Check the plug contact on the PCB and on the wiring harness; check that the pressure sensor is working correctly and, if required, replace the pressure sensor
M.200	Building circuit : Brine pressure low	 Pressure loss in the building circuit due to leakages or air pockets Building circuit pressure sensor is defective 	 Check the building circuit for leaks, top up with heating water and purge Check the plug contact on the PCB and on the wiring harness; check that the pressure sensor is working correctly and, if required, replace the pressure sensor
M.201	Sensor fault: Cylinder temperature	 Cylinder temperature sensor defect- ive 	 Check the plug contact on the PCB and on the wiring harness; check that the sensor is working correctly and, if required, replace the sensor
M.202	Sensor fault: System temperature	 System temperature sensor defective 	 Check the plug contact on the PCB and on the wiring harness; check that the sensor is working correctly and, if required, replace the sensor
M.203	Connection fault: Disp. not recog- nised	 Display defective Display not connected 	 Check the quality of the plug contact on the PCB and on the wiring har- ness 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	Building circuit: Water press. too low	 Pressure loss in the building circuit due to leakages or air pockets Building circuit pressure sensor defective 	 Check the building circuit for leaks Top up with water, purge Check the quality of the plug contact on the PCB and on the wiring harness Check that the pressure sensor is working correctly Replace the pressure sensor
F.042	Fault: Coding resistor	 Coding resistor damaged or not set 	 Check that the coding resistor is positioned correctly and, if required, replace it.
F.073	Sensor fault: Building circ. water pressure	 The sensor is not connected or the sensor input has short-circuited 	 Check and, if required, replace the sensor Replace the wiring harness
F.094	Fault: Vortex	 Volume flow sensor not connected or sensor input has short-circuited 	 Check and, if required, replace the sensor Replace the wiring harness
F.103	Fault: Spare part ident.	 Incorrect control PCB installed on the outdoor unit 	 Installing the correct PCB
F.514	Sensor fault: Compr. inlet temp.	 The sensor is not connected or the sensor input has short-circuited 	 Check and, if required, replace the sensor Replace the wiring harness

Code	Meaning	Cause	Remedy
F.517	Sensor fault: Compr. outlet temp.	 The sensor is not connected or the sensor input has short-circuited 	 Check and, if required, replace the sensor Replace the wiring harness
F.519	Sensor fault: Building circuit re- turn temp.	 The sensor is not connected or the sensor input has short-circuited 	 Check and, if required, replace the sensor Replace the wiring harness
F.520	Sensor fault: Building circuit flow temp.	 The sensor is not connected or the sensor input has short-circuited 	Check and, if required, replace the sensorReplace the wiring harness
F.526	Sensor fault: EEV outlet temp.	 The sensor is not connected or the sensor input has short-circuited 	 Check and, if required, replace the sensor Replace the wiring harness
F.546	Sensor fault: High pressure	 The sensor is not connected or the sensor input has short-circuited 	 Check the sensor (e.g. using an in- stallation aid), and replace if neces- sary Replace the wiring harness
F.582	Fault: EEV	 EEV is not connected correctly or there is a cable break to the coil 	 Check the plug connections and, if required, replace the coil from the EEV
F.585	Sensor fault: Capac. outlet temp.	 The sensor is not connected or the sensor input has short-circuited 	 Check and, if required, replace the sensor Replace the wiring harness
F.703	Sensor fault: Low pressure	 The sensor is not connected or the sensor input has short-circuited 	 Checking the sensor (e.g. using an installation aid), and replacing it if necessary Replace the wiring harness
F.718	Fan unit 1: Fan blocked	 There is no confirmation signal stat- ing that the fan is rotating 	 Check the air route and, if required, remove any blockages
F.729	Compressor outlet temperature too low	 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. 	 Checking the high-pressure sensor Checking that the EEV is working correctly Check the condenser outlet temperature sensor (supercooling) Check whether the 4-port diverter valve is in the intermediate position Checking the refrigerant volume for overfilling
F.731	High-pressure switch open	 Refrigerant pressure too high. The integrated high-pressure switch in the outdoor unit has tripped at 31.5 bar (g) or 32.5 bar (abs) Insufficient energy output via the condenser 	 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 The compressor outlet temperature is alove 110 °C: - Application limits exceeded - EEV does not work or does not open correctly - Check the compressor outlet temper- alure sensor - Check the compressor outlet temper- defrosting due to extremely low evaporation temperatures) - Check the compressor outlet temper- alure sensor (T1135) F.733 Evaporation temperature too low - Refrigerant volume flow through the outdoor unit's heat exchanger (cantening mode) in building circuit contains ther- mostatic valves, check that they are suitable for cooling mode) - If the building circuit contains ther- mostatic valves, check that they are suitable for cooling mode) F.734 Condensation temperature too low - Refrigerant volume too low - Insufficient air volume too low - Refrigerant volume too low - If the building circuit contains ther- mostatic valves, check that they are suitable for cooling mode) - Check the fan unit for dit - Check the fan unit for dit - Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test) F.734 Condensation temperature too low - F.735 - The temperature in the heating circuit (solow, outside of the operating characteristics - Refrigerant volume too low - Check the refrigerant fulling volume (see technical data) - Check the effer move to the limit stop? Use the sensor/actuator test) F.735 Evaporation temperature too high - F.736 - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) for building circuit (cooling mode) for building circuit (cooling mode) for building circuit (cooling mode) for building circuit (cool
F.733Evaporation temperature too low-
F.733Evaporation temperature too low-Insufficient air volume too low (frequent defrosting due to extremely low evaporation temperatures)-F.733Evaporation temperature too low-Insufficient air volume flow through the outdoor unit's heat exchanger (heating mode) relating mode) relating input in the environment circuit (heating mode) or building circuit (cooling mode)-If the building circuit contains thermostatic valves, check that they are suitable for cooling mode)F.734Condensation temperature too low-If the part of the environment circuit (heating mode) or building circuit (cooling mode)-If the building circuit contains thermostatic valves, check that they are suitable for cooling mode)F.734Condensation temperature too low-The temperature in the heating circuit (heating mode) or building circuit is too low, outside of the operating characteristics-Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test)F.735Evaporation temperature too high-The temperature in the heating circuit is too low, outside of the operating characteristics-Check the compressor inlet sensorF.735Evaporation temperature too high-Temperature in the environment circuit (cooling mode) too high for compressor operation-Check the system temperaturesF.735Evaporation temperature too high-Temperature in the environment circuit (cooling mode) too high for compressor operation-Check the refrigerant filling volume (see technical data)F.735Evaporation temperature too high-Temperature in the environment circuit (cooling mode) too high for compressor operation-
F.733 Evaporation temperature too low - Insufficient air volume foo through the outdoor unit's heat exchanger (heating mode) leads to an insufficient environment circuit (heating mode) or building circuit contains thermostatic valves, check that they are suitable for cooling mode) - If the building circuit contains thermostatic valves, check that they are suitable for cooling mode) F.734 Condensation temperature too low - Insufficient air volume flow through the outdoor unit's heat exchanger (heating mode) or building circuit contains thermostatic valves, check that they are suitable for cooling mode) - If the building circuit contains thermostatic valves, check that they are suitable for cooling mode) - Refrigerant volume too low - If the building circuit contains thermostatic valves, check that they are suitable for cooling mode) - Refrigerant volume too low - The temperature too low - Check the fan unit for dit - Refrigerant volume too low - The temperature in the heating circuit is too low, outside of the operating characteristics - Check the refrigerant filling volume (see technical data) - Check the refrigerant volume too low - The temperature too low - Check the refrigerant filling volume (see technical data) - - Check the refrigerant volume too low - The temperature too low -
F.733 Evaporation temperature too low - 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 contains thermediate point in the environment circuit (heating mode) or building circuit cooling mode) - If the building circuit contains thermediate point in the environment circuit (heating mode) or building circuit contains thermediate point in the environment circuit (heating mode) or building circuit cooling mode) - If the building circuit contains thermediate point in the environment circuit (heating mode) or building circuit cooling mode) - If the building circuit contains thermediate point in the environment circuit (heating mode) or building circuit cooling mode) - If the building circuit contains thermediate point in the environment circuit (heating mode) or building circuit cooling mode) - If the building circuit contains thermediate point in the point cooling mode (heck volume flow in cooling mode) - Check the fan unit for dir - Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test) - Check the erfigerant volume - Check the erfigerant folling volume - Check the refrigerant filling volume - Check the compressor inlet sensor - Check the refrigerant filling volume - Check the point temperatures - Check the point temperatures - Check the pressure sensor - Check the prefigure filling volume -
F.733 Evaporation temperature too low - Insufficient air volume flow through the outdoor units heat exchanger (heating mode) leads to an insufficient energy input in the environment circuit (heating mode) or building circuit (cooling mode) - If the building circuit contains thermostatic valves, check that they are suitable for cooling mode (heck volume flow in cooling mode) - - Refrigerant volume too low - If the building circuit contains thermostatic valves, check that they are suitable for cooling mode (heck volume flow in cooling mode) - Check the fan unit for dit - - Refrigerant volume too low - The temperature in the heating mode) or building circuit is too low, outside of the operating characteristics - Check the EEV (does the EEV (move to the limit stop? Use the sensor/actuator test) - - The temperature in the heating circuit is too low, outside of the operating characteristics - Check the EEV (does the EEV (move to the limit stop? Use the sensor/actuator test) - - Refrigerant volume too low - - Check the compressor inlet sensor - - The temperature in the environment circuit (heating mode) or building circuit (cooling mode) - Check the refrigerant filling volume (see technical data) - Check the pressure sensor - - Refrigerant volume too low - -
F.733 Evaporation temperature too low - Insufficient air volume flow through the outdoor unit's heat exchanger (heading mode) leads to an insufficient energy input in the environment circuit (cooling mode) - 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 dit F.734 Condensation temperature too low - The temperature in the heating circuit is too low, outside of the operating characteristics - Check the compressor inlet sensor F.734 Condensation temperature too low - The temperature in the heating circuit is too low, outside of the operating characteristics - Check the compressor inlet sensor F.735 Evaporation temperature too high circuit (heating mode) or building circuit (cooling mode) or building circuit (cooling mode) - Check the refrigerant fulling volume (see technical data) F.735 Evaporation temperature too high circuit (heating mode) or building circuit (cooling mode) or building circuit (beating mode) or building circuit (beating mode) or building circuit (cooling mode) or b
F.734Condensation temperature too low-Refrigerant volume too low-Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test)F.734Condensation temperature too low-The temperature in the heating circuit is too low, outside of the operating characteristics Check the refrigerant volumeF.735Evaporation temperature too high-Temperature in the environment circuit (heating mode) or building circuit (cooling mode) to high for compressor operation Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test)F.735Evaporation temperature too high Temperature in the environment circuit (cooling mode) to high for compressor operation Check the system temperatures -F.735Evaporation temperature too high Temperature in the environment circuit (cooling mode) to high for compressor operation Check the EEV (does the EEV move to the limit stop? Use
F.734 Condensation temperature too low - The temperature in the heating circuit is too low, outside of the operating characteristics - Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test) - Refrigerant volume too low - Refrigerant volume too low - Check the compressor inlet sensor - Refrigerant volume too low - Refrigerant volume too low - Check the compressor inlet sensor - Check the compressor inlet sensor - Check the compressor inlet sensor - - Refrigerant volume too low - Check the compressor inlet sensor - - Check the compressor inlet sensor - Check the refrigerant filling volume (see technical data) - - 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 - F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit - Check the system temperatures - Check the system temperatures - Check the EEV (does the EEV move to the limit stop?) Use
F.734 Condensation temperature too low - The temperature in the heating circuit is too low, outside of the operating characteristics - Check the EEV (does the EEV move to the limit stop? Use the sensor/actuator test) - Refrigerant volume too low - Check the compressor inlet sensor - Refrigerant volume too low - Check the compressor inlet sensor - Refrigerant volume too low - Check the refrigerant filling volume (see technical data) - Check the pressure sensor - Check the pressure sensor - Check the pressure sensor in the heating circuit (heating mode) or building circuit (cooling mode) or building circuit (cooling mode) or building - Check the refrigerant filling volume for overfilling F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the refrigerant filling volume for overfilling - Feed-in of external heat into the - Check the EEV (does the EEV move to the limit ston? Lise
F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the system temperatures - F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the refrigerant filling volume (see technical data) - F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the refrigerant filling volume (see technical data) - Check the pressure sensor - Check the pressure sensor - - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the refrigerant filling volume for overfilling - Feed-in of external heat into the - Check the EEV (does the EEV move to the limit stor)? Use
F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the refrigerant filling volume (see technical data) F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - 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 - Check the pressure sensor - Check the pressure sensor in the heating circuit - Check the pressure sensor in the heating circuit - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the refrigerant filling volume for overfilling - Feed-in of external heat into the - Check the EEV (does the EEV move to the limit ston?) Use
F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the system temperatures - Check the pressure sensor - Check the pressure sensor - - Check the pressure sensor in the heating circuit - Check the pressure sensor in the heating circuit - - Check the pressure sensor in the heating circuit - Check the system temperatures - - - Check the system temperatures - - - Check the refrigerant filling volume for overfilling - - - Feed-in of external heat into the - Check the EEV (does the EEV move to the limit ston? Use
F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the system temperatures - Check the efrigerant filling volume for overfilling - Check the EEV (does the EEV move to the limit stor?) Use
 F.735 Evaporation temperature too high Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation Teed-in of external heat into the Check the EEV (does the EEV move to the limit stor? Use
F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the pressure sensor in the heating circuit - Check the pressure sensor in the heating circuit - Check the pressure sensor in the heating circuit - Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the refrigerant filling volume for overfilling - Feed-in of external heat into the - Check the EEV (does the EEV move to the limit stop? Lise
F.735 Evaporation temperature too high - Temperature in the environment circuit (heating mode) or building circuit (cooling mode) too high for compressor operation - Check the system temperatures - Check the refrigerant filling volume for overfilling - Check the tefrigerant filling volume for overfilling - Feed-in of external heat into the
 Circuit (ricuiting mode) to blanking Circuit (cooling mode) too high for compressor operation Feed-in of external heat into the Circuit (cooling mode) too high for overfilling Check the EEV (does the EEV move to the limit stop? Use
- Feed-in of external heat into the - Check the EEV (does the EEV - Feed-in of external heat into the
environment circuit too high due to sensor/actuator test)
increased fan speed - Check the sensor for the evaporation temperature (depending on the position of the 4-port diverter value)
 Check the volume flow in cooling mode
 Check the air volume flow in heating mode
F.737 Condensation temperature too – Temperature in the environment – Reduce or stop the external heat that is entering
circuit (heating mode) too high for compressor operation – Check the back-up heater (heats up even though it is off in the
 Feed-in of external heat into the sensor/actuator test?) building circuit Check the EEV (does the EEV)
Refrigerant circuit overfilled Refrigerant circuit overfilled Insufficient flow rate in the building 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 automatic are appendix
 Check the air volume flow in cooling mode for sufficient flow rate
 Checking the heating pump Check the building circuit flow rate

Code	Meaning	Cause	Remedy	
F.741	Building circuit: Return temp. too low	 During the de-icing, the return temperature falls below 13 °C 	 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	 Internal electronics fault on the inverter PCB Mains voltage outside of 70 V–282 V 	 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.	 Missing communication between the frequency converter and the outdoor unit's control PCB 	 Check the integrity of the wiring 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	 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 EEV environment circuit displays an incorrect temperature. 	 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 wiring harness and plug connections Check the temperature sensor in the EEV environment circuit 	
F.774	Sensor fault: Air inlet temp.	 The sensor is not connected or the sensor input has short-circuited 	 Check and, if required, replace the sensor Replace the wiring harness 	
F.785	Fan unit 2: Fan blocked	 There is no confirmation signal stat- ing that the fan is rotating 	 Check the air route and, if required, remove any blockages 	
F.788	Building circuit: Pump fault	 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. 	 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	 Defect in the compressor (e.g. short circuit) Defect in the frequency converter Connection cable to the compressor is defective or loose 	 Measure the winding resistance in the compressor Measure the frequency converter output between the three phases, (it must be > 1 kΩ) Check the wiring harness and plug connections 	
F.818	Freq. converter fault: Mains voltage	 Incorrect mains voltage for operating the frequency converter Shutdown via the energy supply company 	 Measure and, if required, correct the mains voltage The mains voltage must be between 195 V and 253 V. 	

Code	Meaning	Cause	Remedy	
F.819	Freq. converter fault: Overheating	 Internal overheating of the frequency converter 	 Allow the frequency converter to cool and restart the product Check the frequency converter's air route Check that the fan is working cor- rectly The maximum environmental tem- perature of the outdoor unit (46 °C) has been exceeded. 	
F.820	Connection fault: Building circuit pump	 Pump does not report any signal back to the heat pump 	 Check the cable to the pump for defects and, if required, replace it Replace the pump 	
F.821	Sensor fault: Immers. heater flow temp.	 The sensor is not connected or the sensor input has short-circuited Both of the flow temperature sensors in the heat pump are defective 	 Check and, if required, replace the sensor Replace the wiring harness 	
F.823	Hot gas temperature switch open	 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: Heat requirement without switch- ing off prematurely 60 mins uninterrupted operation 	 Check the EEV Replace the dirt filter in the refrigeration circuit, if required 	
F.824	Building circuit : Brinepressure too lowNoteCan only occur in conjunction with an installed and activated intermedi- ate heat exchanger set.Fault refers to the outdoor unit's brine pressure sensor.	 Pressure loss in the building circuit due to leakages or air pockets Building circuit pressure sensor defective 	 Check the building circuit for leaks Top up with water, purge Check the quality of the plug contact on the PCB and on the wiring har- ness Check that the pressure sensor is working correctly Replace the pressure sensor 	
F.825	Sensor fault: Capac. inlet temp.	 Refrigerant circuit temperature sensor (vapour-forming) not con- nected or the sensor input has short- circuited 	 Check and, if required, replace the sensor and cable 	
F.1100	Immersion heater: Safety cut-out open	 The safety cut-out on the electric back-up heater is open due to: 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 89 °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 	 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	 Defective fuse Incorrect electrical connections Mains voltage too low Compressor/low tariff power supply not connected Energy supply company lockout for over three hours 	 Check the fuse Checking the electrical connections Check the voltage at the heat pump electrical connection Set the max. duration of the ESCO anti-cycling time to at least three or more hours 	

Code	Meaning	Cause	Remedy
F.1120	Immersion heater: Phase failure	 Electric back-up heater defective Poorly tightened electrical connections Mains voltage too low 	 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	 eBUS cable not connected or con- nected incorrectly Outdoor unit without supply voltage 	 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

L Inspection and maintenance work

#	Maintenance work	Interval	
1	Checking the pre-charge pressure of the expansion vessel	Annually	45
2	Cleaning the domestic hot water cylinder	If required, at least every 2 years	
3	Check that the prioritising diverter valve can move easily (visually/audibly)	Annually	
4	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

Temperature (°C)	Resistance (ohms)
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
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

Temperature (°C)	Resistance (ohms)
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

Benchmark Commissioning & Warranty Validation Service Record

It is a requirement that the heat pump is installed and commissioned to the manufacturers' instructions and the data fields on the commissioning checklist completed in full.

To instigate the warranty the heat pump needs to be registered with the manufacturer within one month of the installation. The warranty rests with the end-user (consumer), and they should be made aware it is ultimately their responsibility to register with the manufacturer, within the allotted time period.

It is essential that the heat pump is serviced in line with the manufacturers' recommendations, at least annually. This must be carried out by a competent, certified operative. The service details should be recorded on the Benchmark Service and Interim Heat Pump Work Record and left with the householder. Failure to comply with the manufacturers' servicing instructions and requirements will invalidate the warranty.



THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

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This Commissioning Checklist is to be completed in full by the competent person who commissioned the heat pump and associated equipment as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission according to the manufacturers' instructions and complete this Benchmark Commissioning Checklist will invalidate the warranty. This does not affect the customer's statutory rights.

* All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



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AIR TO WATER HEAT PUMP COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the heat pump and associated equipment as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer name: Address: Heat Pump Make and Model Heat Pump Serial Number														
Address: Heat Pump Make and Model Heat Pump Serial Number		Customer name: Telephone number:												
Heat Pump Make and Model Heat Pump Serial Number		Address:												
Heat Pump Serial Number														
Commissioned by (PRINT NAME):						Certified	Operative	e Reg. No.	[1]					_
Company name: Telephone number:														
Company address:										-				
						Commis	sioning da	ate:						
Building Regulations Notification Number (if applicable) [2]														
CONTROLS - SYSTEM AND HEAT PUN	IP (tick the app	oropria	te boxes)	1										
Time and temperature control to beating Programmable Roomstat and programmer/timer Programmable Roomstat					at 🔄									
				Load/	weather	compens	sation				Op	timum s	tart contro	ol 📃
Time and temperature control to hot wate	er	Cyl	inder ther	mostat	and prog	grammer/	/timer		Combined	with H	leat p	ump ma	ain control	s
Heating zone valves (including underfloo	r loops)					I	Fitted					N	ot require	d
Hot water zone valves						I	Fitted					N	ot require	d
Thermostatic radiator valves						I	Fitted					N	ot require	d
Heat Pump Safety Interlock [3]						В	uilt In						Provide	d
Outdoor Sensor						I	Fitted					N	ot require	d
Automatic bypass to system						I	Fitted					N	ot require	d
Buffer Vessel Fitted			Yes		No		If YES	3	Volume:				Litres	
ALL SYSTEMS													1	
The heating system has been filled and p	pressure tested												Ye	s
Expansion vessel for heating is sized, fitt	ed & charged i	n acco	ordance w	ith man	ufacture	r's instru	ctions						Ye	s
The heat pump is fitted on a solid/stable	surface capabl	e of ta	kina its w	eiaht									Ye	s
The system has been flushed and cleane	ed in accordance	e with	BS7593	and hea	at pump	manufac	turer's ins	tructions					Ye	s
What system cleaner was used?														-
What inhibitor was used?										Qu	antity	/		litre
Is the system adequately frost protected	2												Ye	s
	•													
														_
Are all external pipeworks insulated?													Ye	s
Is the fan free from obstacles and operat	ional?												Ye	s
	or waste water (lischa	rge?										re	s
CENTRAL HEATING MODE														
Heating Flow Temperature °C Heating Return Temperature °C														
DOMESTIC HOT WATER MORE Manage	DOMESTIC HOT WATER MODE Measure and Record:													
DOMESTIC HOT WATER MODE Measu	er cylinder?		Unvented	1		Vented		Th	ermal Store			Not Cor	inected	
DOMESTIC HOT WATER MODE Measu Is the heat pump connected to a hot water Hot water has been checked at all outlet	er cylinder?		Unvented Yes	Have	Thermo	Vented	ending Val	The ves been f	ermal Store	Yes		Not Cor	inected	
DOMESTIC HOT WATER MODE Measu Is the heat pump connected to a hot wate Hot water has been checked at all outlets	er cylinder?		Unvented Yes	Have	e Thermo	Vented ostatic Ble	ending Val	Ves been f	ermal Store	Yes		Not Con	inected t required	_
DOMESTIC HOT WATER MODE Measu Is the heat pump connected to a hot wate Hot water has been checked at all outlets ADDITIONAL SYSTEM INFORMATON Additional beat sources connected:	er cylinder?		Vnvented Yes	Have	Thermo	Vented	ending Val	The ves been f	ermal Store	Yes	Othor	Not Con No	inected t required	
DOMESTIC HOT WATER MODE Measu Is the heat pump connected to a hot wate Hot water has been checked at all outlets ADDITIONAL SYSTEM INFORMATON Additional heat sources connected:	er cylinder? s Gas Boik	er	Unvented Yes Oil E	Have Boiler	e Thermo	Vented ostatic Ble Electric	ending Val	ves been f	ermal Store itted?	Yes	Other	Not Con No	nected t required	
DOMESTIC HOT WATER MODE Measu Is the heat pump connected to a hot wate Hot water has been checked at all outlets ADDITIONAL SYSTEM INFORMATON Additional heat sources connected: ALL INSTALLATIONS	er cylinder? s Gas Boile	er	Unvented Yes Oil E	Have Boiler	Thermo	Vented ostatic Ble Electric	ending Val	Ves been f	ermal Store itted?	Yes	Other	Not Con No	inected t required	
DOMESTIC HOT WATER MODE Measu Is the heat pump connected to a hot wate Hot water has been checked at all outlets ADDITIONAL SYSTEM INFORMATON Additional heat sources connected: ALL INSTALLATIONS The heating, hot water and ventilation sy	er cylinder? s Gas Boile stems complies	er s with 1	Unvented Yes Oil E the appro	Have Boiler priate B	Thermo	Vented ostatic Ble Electric I Regulatio	ending Val Heater	Ves been f	ermal Store itted?	Yes	Other	Not Con No	nected t required Ye	s
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DOMESTIC HOT WATER MODE Measures in the heat pump connected to a hot water Hot water has been checked at all outlets in the water has been checked at all outlets in the heat sources connected: ADDITIONAL SYSTEM INFORMATON Additional heat sources connected: ALL INSTALLATIONS The heating, hot water and ventilation systems of the heat pump and associated products. The operation of the heat pump and systems of the manufacturer's literature, including E Commissioning Engineer's Signature	er cylinder? s Gas Boile stems complies opriate Regula have been inst em controls ha Benchmark Che	er fions alled a color because of the color because	Unvented Yes Oil E the appro and comm and comm and Servi	A Have Boiler priate B hissione strated ce Reco	a Thermo Building F ed in acc to the cu ord, has	Vented ostatic Ble Electric I Regulatio ordance v ustomer been exp	Heater ns with the m	Thives been f	ermal Store itted?	yes Yes ons er	Other	Not Con No	rected t required Ye Ye Ye Ye	
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SERVICE RECORD

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

Service Provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions. Always use the manufacturer's specified spare part when replacing controls.

Date:	SERVICE 02	Date:				
jineer name:		Engineer name:				
Company name:		Company name:				
Telephone No:		Telephone No:				
Operative ID No:		Operative ID No:				
Comments:		Comments:				
	Cignoture					
Date:	SERVICE 04	Date:				
	Engineer name:					
	Company name:					
	Telephone No:					
	Operative ID No:					
	Comments:					
	Signature					
Date:	SERVICE 06	Date:				
	Engineer name:					
	Company name:					
	Telephone No:					
	Operative ID No:					
Comments:		Comments:				
	Signatura					
	Signature					
Date:	SERVICE 08	Date:				
	Engineer name:					
	Company name:	Company name:				
	Telephone No:	Telephone No:				
	Operative ID No:	Operative ID No:				
	Comments:					
	Signature					
Date:		Date:				
Date.		Date.				
	Company name:					
	Telephone No					
	Operative ID No:					
	Comments:					
	Date:	Date: SERVICE 02 Engineer name: Company name: Telephone No: Operative ID No: Comments: Signature Date: Signature Date: Company name: Telephone No: Operative ID No: Company name: Telephone No: Operative ID No: Comments: Company name: Telephone No: Operative ID No: Comments: Company name: Telephone No: Operative ID No: Comments: Signature Signature Date: SERVICE 06 Engineer name: Company name: Telephone No: Operative ID No: Comments: Operative ID No: Comments: Operative ID No: Comments: Signature Date: Signature Signature Signature Date: Signature Date: Signature Date: Signature Date: Signature Date: Signature Signature Operative ID No:				

Q Technical data

Note



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

	VIH QW 190/6 E GB				
Product dimensions, width	595 mm				
Product dimensions, height	1,880 mm				
Product dimensions, depth	693 mm				
Weight, without packaging	146 kg				
Weight, ready for operation	351 kg				
IP rating	IP 10B				
Heating circuit connections	G 1"				
Heat source connections	G 1 1/4"				
Cold water and domestic hot wa- ter connections	G 3/4"				

Technical data – General

Technical data – Heating circuit

	VIH QW 190/6 E GB
Material in the heating circuit	Copper, copper-zinc alloy, stainless steel, ethylene propylene diene monomer rubber, brass, iron
Permissible water composition	Technical data calculated 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	16.0 I
Volume of the internal diaphragm expansion vessel	15 I
Min. operating pressure, heating circuit	0.05 MPa (0.50 bar)
Max. operating pressure, primary circuit	0.20 MPa (2.00 bar)
Expansion relief valve operating pressure, heating circuit	0.25 MPa (2.50 bar)
Max. heating mode flow temperat- ure with compressor	75 ℃
Max. heating mode flow temperat- ure with back-up heater	75 °C
Min. cooling mode flow temperat- ure	7 °C
Permissible medium in the de- coupling circuit (separation heat exchanger accessory)	Propylene glycol/water mixture
Sound power A7/W35 in accordance with EN 12102 / EN 14511 $L_{\rm WI}$ in heating mode	≤ 30 dB(A)
Sound power A7/W45 in accordance with EN 12102 / EN 14511 $L_{\rm WI}$ in heating mode	≤ 30 dB(A)
Sound power A7/W55 in accordance with EN 12102 / EN 14511 $L_{\rm WI}$ in heating mode	≤ 30 dB(A)

	VIH QW 190/6 E GB
Sound power A7/W65 in accordance with EN 12102 / EN 14511 $L_{\rm WI}$ in heating mode	≤ 30 dB(A)
Sound power A35/W7 in accordance with EN 12102 / EN 14511 $L_{\rm WI}$ in cooling mode	≤ 30 dB(A)
Sound power A35/W18 in accordance with EN 12102 / EN 14511 $L_{\rm WI}$ in cooling mode	≤ 31 dB(A)

Technical data – Domestic hot water

	VIH QW 190/6 E GB
Water content of the domestic hot water cylinder	185 l
Heat exchanger nominal volume (heating coil)	8.6 l
Surface area of the heat exchanger	1.3 m²
Domestic hot water cylinder ma- terial	Steel, enamelled
Insulation material for the do- mestic hot water cylinder	Neopor
Min. insulating thickness	26 mm
Max. insulating thickness	74 mm
Corrosion protection	External current anode
Secondary operating pressure, max.	0.55 MPa (5.50 bar)
Max. water supply pressure to the	1.00 MPa
pressure reduction valve	(10.00 bar)
Volume of the internal diaphragm expansion vessel	81
Volume of the external diaphragm expansion vessel	81
Pre-charge pressure of the in-	0.4 MPa
ternal and external diaphragm ex- pansion vessel	(4.0 bar)
Operating temperature and pres- sure of the temperature and pres- sure relief valve	90 °C/0.7 MPa (7 bar)
Operating pressure of the expan- sion relief valve	0.6 MPa (6.0 bar)
Max. cylinder temperature due to the heat pump	70 °C
Max. cylinder temperature due to back-up heater	70 °C
Heat-up time in accordance with DIN EN 16147 to target cylinder temperature, A7 with an outdoor unit up to 5 kW	192 min
Power consumption during standby in accordance with DIN EN 16147, A7 – with an outdoor unit up to 5 kW	22 W
Coefficient of performance (COPdhw) in accordance with EN 16147, A7, L profile – with an outdoor unit up to 5 kW	2.57
Reference domestic hot water temperature in accordance with DIN EN 16147, A7 – with an out- door unit up to 5 kW	49.9 °C
Mixed water volume V40 in ac- cordance with DIN EN 16147, A7 – with an outdoor unit up to 5 kW	230

	VIH QW 190/6 E GB
Heat-up time in accordance with DIN EN 16147 to target cylinder temperature, A7 with an outdoor unit up to 7 kW	125 min
Power consumption during standby in accordance with DIN EN 16147, A7 – with an outdoor unit up to 7 kW	45 W
Coefficient of performance (COPdhw) in accordance with EN 16147, A7, XL profile – with an outdoor unit up to 7 kW	2.55
Reference domestic hot water temperature in accordance with DIN EN 16147, A7 – with an out- door unit up to 7 kW	51.6 ℃
Mixed water volume V40 in ac- cordance with DIN EN 16147, A7 – with an outdoor unit up to 7 kW	246 I
Heat-up time in accordance with DIN EN 16147 to target cylinder temperature, A7 with an outdoor unit up to 12 kW	80 min
Power consumption during standby in accordance with DIN EN 16147, A7 – with an outdoor unit up to 12 kW	39 W
Coefficient of performance (COPdhw) in accordance with EN 16147, A7, XL profile – with an outdoor unit up to 12 kW	2.61
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Technical data – Electrics

	VIH QW 190/6 E GB
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	5.4 kW
Rated current, maximum, 230 V	23.5 A
Rated current, maximum, 400 V	13.6 A
Overvoltage category	II
Fuse type, characteristic C, slow-blow, three-pole switching (disconnection of the three mains connection lines in one switching operation)	Design in accordance with the selected connection diagrams

Results regarding BS 7206

	VIH QW 190/6 E GB
Reheat test time	70% of the storage ca- pacity back to 65 °C: 27:30 minutes
Supply temperature test time	16 °C to 65 °C: 35 minutes
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