

Installation and maintenance instructions



atmoTEC exclusive,
atmoTEC plus

VC, VCC, VCW

DE

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VIESSMANN



 **Vaillant**

WOLF

 **JUNKERS**  **BOSCH**

 **remeha**

 **DAIKIN**

ROTEX
a member of DAIKIN group



Individuelle Beratung



Kostenloser Versand



Hochwertige Produkte



Komplettpakete



Über 15 Jahre Erfahrung



Markenhersteller

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1 Safety

1 Safety

1.1 Action-related warnings

Classification of action-related warnings

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

Warning symbols and signal words



Danger!

Imminent danger to life or risk of severe personal injury



Danger!

Risk of death from electric shock



Warning.

Risk of minor personal injury



Caution.

Risk of material or environmental damage

1.2 Intended use

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

The product is intended as a heat generator for closed heating installations and for hot water generation.

Depending on the unit type, the products referred to in these instructions must only be installed and operated in conjunction with the air/flue pipe accessories listed in the other applicable documents.

The use of the product in vehicles, such as mobile homes and caravans, is not classed as intended use. Units that are not classed as vehicles are those that are installed in a fixed and permanent location (known as "fixed installation").

Intended use includes the following:

- observance of accompanying operating, installation and servicing instructions for the product and any other system components
- installing and fitting 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 use in industrial or commercial processes is also deemed to be improper.

Caution.

Improper use of any kind is prohibited.

1.3 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.

1.4 Risk of death from escaping gas

What to do if you smell gas in the building:

- Avoid rooms that smell of gas.
- If possible, open doors and windows fully and ensure adequate ventilation.
- Do not use naked flames (e.g. lighters, matches).
- Do not smoke.
- Do not use any electrical switches, mains plugs, doorbells, telephones or other communication systems in the building.
- Close the emergency control valve or the main isolator.
- If possible, close the gas isolator cock on the product.
- Warn other occupants in the building by yelling or banging on doors or walls.
- Leave the building immediately and ensure that others do not enter the building.



- ▶ Alert the police and fire brigade as soon as you are outside the building.
- ▶ Use a telephone outside the building to inform the emergency service department of the gas supply company.

1.5 Risk of death due to blocked or leaking flue gas routes

Installation errors, damage, tampering, unauthorised installation sites or similar can cause flue gas to escape and result in a risk of poisoning.

What to do if you smell flue gas in the property:

- ▶ Open all accessible doors and windows fully to provide ventilation.
- ▶ Switch off the product.
- ▶ Check the flue gas routes in the product and the flue gas diversions.

1.6 Risk of death due to cabinet-type casing

Cabinet-type casing can give rise to dangerous situations when used on a product which is operated with an open flue.

- ▶ Ensure that the product is supplied with sufficient combustion air.

1.7 Risk of death due to explosive and flammable materials

- ▶ Do not use the product in storage rooms that contain explosive or flammable substances (such as petrol, paper or paint).

1.8 Risk of death from electric shock

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

Before commencing work on the product:

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

1.9 Risk of poisoning due to missing flue gas monitoring device

Flue gases may escape into the installation room under unfavourable conditions. If this happens, the flue gas monitoring device switches the heat generator off. If a flue gas monitoring device has not been installed, the heat generator will continue to run.

- ▶ Never decommission the flue gas monitoring device.

1.10 Risk of death due to lack of safety devices

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

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

1.11 Risk of poisoning and burns caused by escaping hot flue gases

- ▶ Only operate the product if the flue gas guiding has been completely installed.
- ▶ With the exception of short periods for testing purposes, only operate the product when the front casing is installed and closed.

1.12 Risk of poisoning caused by insufficient supply of combustion air

Conditions: Open-flued operation

- ▶ Ensure that the air supply to the product's installation room is permanently unobstructed and sufficient in accordance with the relevant ventilation requirements.

1.13 Risk of corrosion damage due to unsuitable combustion and room air

Sprays, solvents, chlorinated cleaning agents, paint, adhesives, ammonia compounds, dust or similar substances may lead to corrosion on the product and in the flue system.

- ▶ Ensure that the supply of combustion air is always free of fluorine, chlorine, sulphur, dust, etc.





1 Safety

- ▶ Ensure that no chemical substances are stored at the installation site.
- ▶ If you are installing the product in hairdressing salons, painter's or joiner's workshops, cleaning businesses or similar locations, choose a separate installation room in which the room air is technically free of chemical substances.
- ▶ Ensure that the combustion air is not routed through chimneys which have previously been used with floor-standing oil-fired boilers, or with other boilers, which could cause soot to build up in the chimney.

1.14 Risk of being burned or scalded by hot components

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

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

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

1.16 Risk of material damage caused by frost

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

1.17 Risk of material damage caused by using an unsuitable tool

- ▶ Use the correct tool.

1.18 Regulations (directives, laws, standards)

- ▶ Observe the national regulations, standards, guidelines and laws.



2 Notes on the documentation

2.1 Observing other applicable documents

- You must observe all the operating and installation instructions included with the system components.

2.2 Storing documents

- Pass these instructions and all other applicable documents on to the system operator.

2.3 Validity of the instructions

These instructions apply only to:

Product article number

VC DE 104/4-7 A-P	0010018739
VC DE 104/4-7 A-L	0010018740
VC DE 104/4-7 A-H	0010018741
VCC 194/4-5 120 (E-DE), surface-mounted	0010024478
VCC 194/4-5 120 (E-DE), concealed	0010024480
VCC 194/4-5 120 (LL-DE), surface-mounted	0010024479
VCC 194/4-5 120 (LL-DE), concealed	0010024481
VCW DE 194/4-5 A-L	0010017844
VCW DE 194/4-5 A-H	0010017845
VCW DE 204/4-7 A-P	0010018745
VCW DE 204/4-7 A-L	0010018746
VCW DE 204/4-7 A-H	0010018747
VCW DE 244/4-5 A-L	0010017846
VCW DE 244/4-5 A-H	0010017847
VCW DE 254/4-7 A-P	0010018742
VCW DE 254/4-7 A-L	0010018743
VCW DE 254/4-7 A-H	0010018744

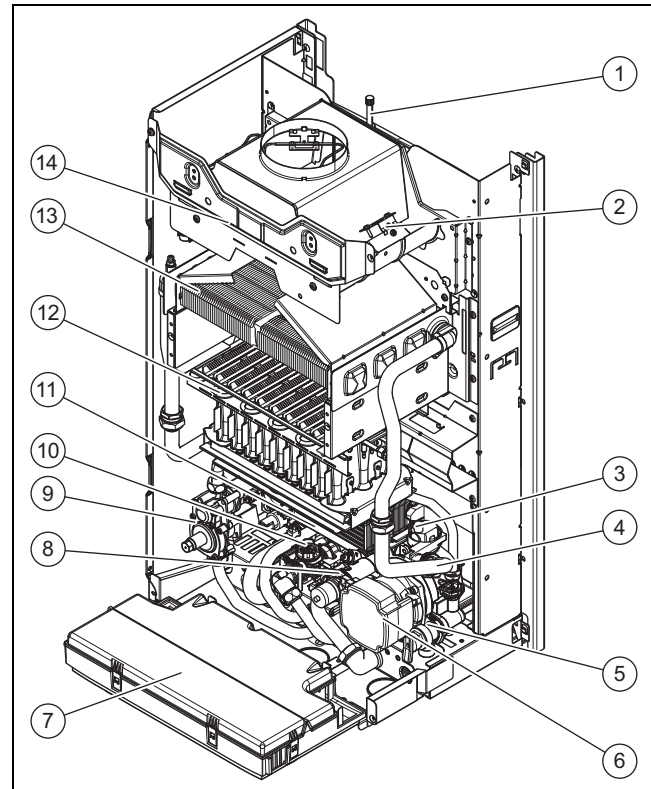
Applicability: VCC 194/4-5 120 (E-DE), surface-mounted, VCC 194/4-5 120 (E-DE), concealed, VCC 194/4-5 120 (LL-DE), surface-mounted, VCC 194/4-5 120 (LL-DE), concealed

These instructions are only valid in conjunction with the instructions for:

- **VIH R 120/6 B**
- Cylinder retrofitting set
- **VRT 350**
- Piping set
 - Surface-mounted piping set for 120 l
 - Concealed piping set for 120 l

3 Product description

3.1 Design of the product



1	Diaphragm expansion vessel	9	Gas valve assembly
2	Flue gas temperature monitor (safety function) *	10	Flow meter (only on products with integrated domestic hot water generation)
3	Automatic air vent	11	Secondary heat exchanger (only on products with integrated domestic hot water generation)
4	NTC (2x)	12	Burner
5	Expansion relief valve	13	Primary heat exchanger
6	Pump (the type may vary)	14	Down-draught diverter
7	Electronics box		
8	Prioritising diverter valve		

* The flue gas temperature monitor is installed on the left or the right of the down-draught diverter, depending on the unit output.

3.2 Information on the data plate

The data plate is mounted on the underside of the product at the factory.

Information on the data plate	Meaning
VC, VCC, VCW	Type designation
10, 19, 20, 24, 25	Unit output
/4	Unit generation
-5 = plus, -7 = exclusive	Unit type
V	Mains voltage
W	Power consumption
Hz	Mains frequency
MPa	Max. line pressure

4 Set-up

Information on the data plate	Meaning
IP	IP rating/protection class
Cat. (e.g. II _{2H3P})	Unit category
Type (e.g. B ₁₊)	Gas-fired boiler types
2E, G20 – 20 mbar (2.0 kPa)	Gas group and gas connection pressure as set at the factory
ww/yyyy (e.g. 11/2014)	Date of manufacture: Week/year
PMW (e.g. 10 bar (1 MPa))	Permissible total excess pressure during domestic hot water generation
PMS (e.g. 3 bar (0.3 MPa))	Permissible total excess pressure in heating mode
P	Nominal heat output range
T _{max.} (e.g. 85 °C)	Max. flow temperature
Q	Heat input range
D	Nominal domestic hot water draw-off rate
	Heating mode
	Domestic hot water generation
	Barcode with serial number, The 7th to 16th digits of the serial number form the article number

3.3 CE label



The CE label shows that the products comply with the basic requirements of the applicable directives as stated on the identification plate.

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

3.4 DVGW mark



The DVGW mark documents that the products comply with all of the requirements of the DVGW VP 112 (test basis from the German Association for Gas and Water Industry Association for granting the DVGW quality mark) in accordance with the identification plate.

4 Set-up

4.1 Unpacking the product

1. Remove the product from its box.
2. Remove the protective film from all parts of the product.

4.2 Checking the scope of delivery

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

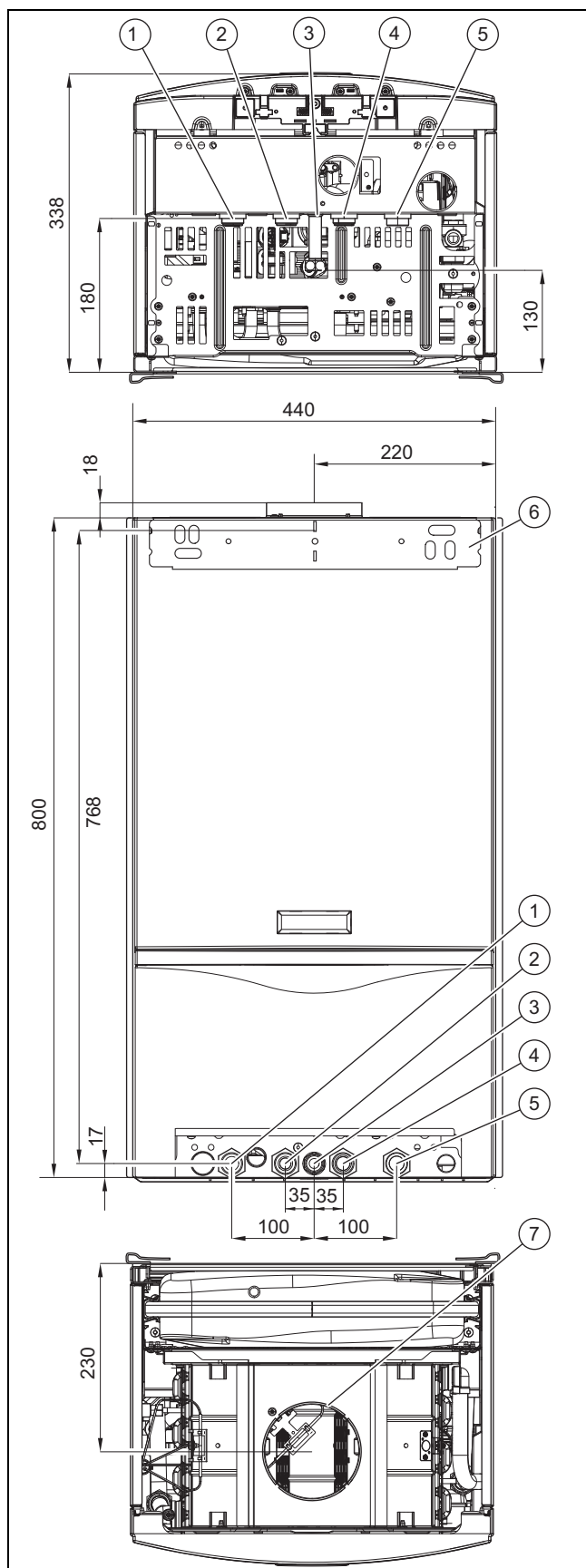
Quantity	Designation
1	Heat generator
1	Unit mounting bracket
1	Lower unit cover (exclusive only)
1	Bag with small parts: – 2 bolts – 2 rawl plugs – 2 washers – 4 seals
1	Bag with connection material – Expansion relief valve discharge pipe – Seal – Union nut
1	Enclosed documentation: – Operating instructions – Installation and maintenance instructions – Mounting template – Guarantee card – Energy data sheet – Energy product label

4.3 Dimensions

Applicability: Product with integrated hot water generation

4.3.1 VC, VCW:

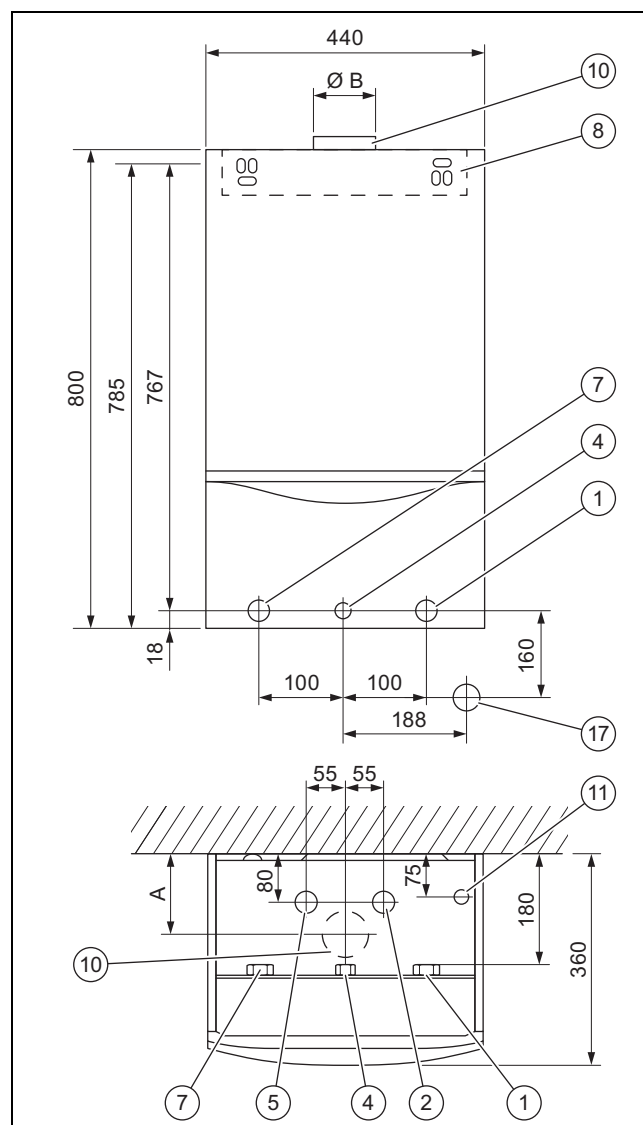
Dimensions



- | | |
|---------------------------------|------------------------------|
| 1 Heating flow | 5 Heating return |
| 2 Domestic hot water connection | 6 Unit mounting bracket |
| 3 Gas connection | 7 Connection for flue system |
| 4 Cold water connection | |

4.3.2 VCC:

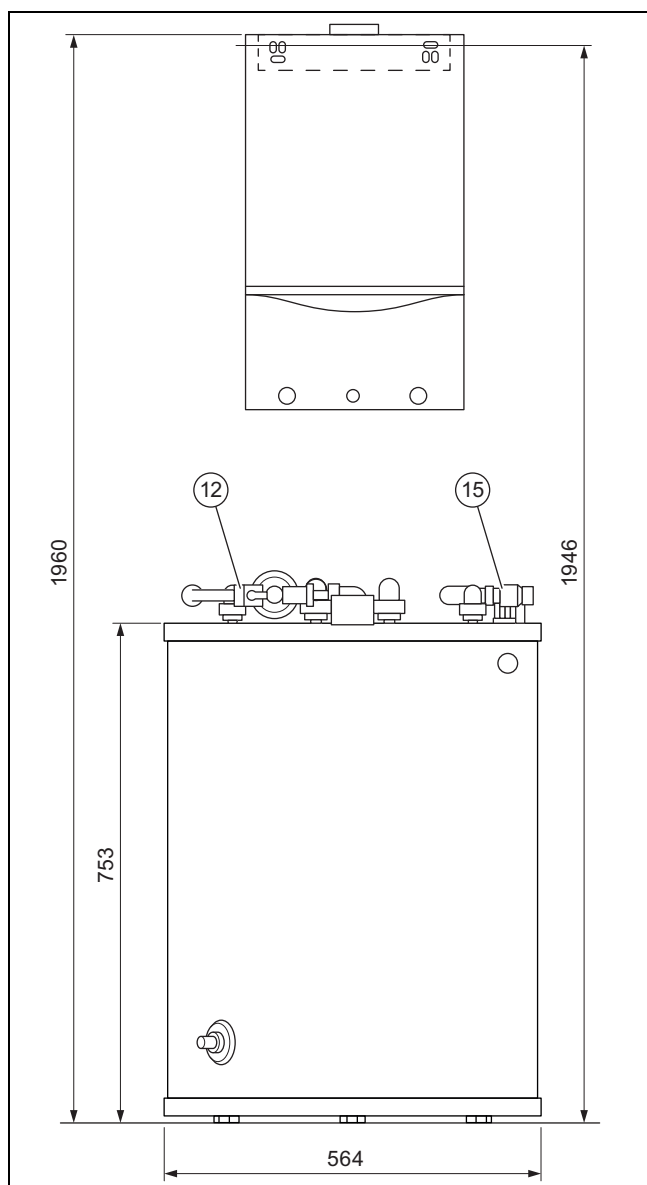
Dimensions



- | | |
|-------------------|---|
| 1 Heating return | 10 Connection for flue system |
| 2 Cylinder return | 11 Connection for heating expansion relief valve drain pipework, 15 mm diameter |
| 4 Gas connection | 17 Tundish/siphon connection R 1 |
| 5 Cylinder flow | |
| 7 Heating flow | |
| 8 Retainer | |

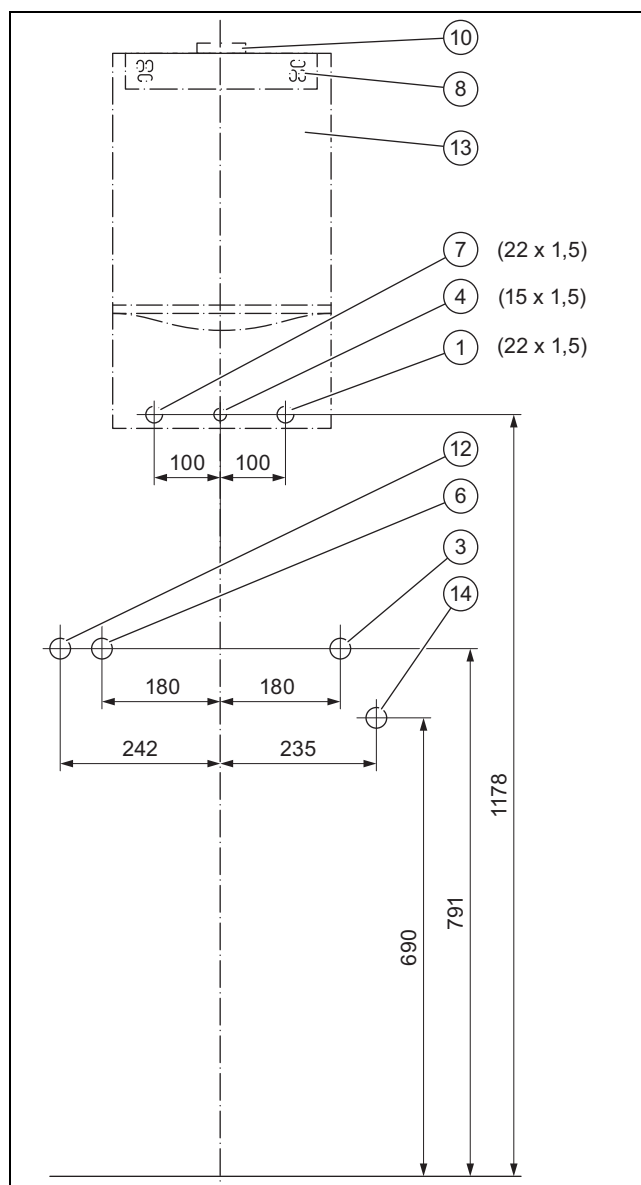
4 Set-up

Dimensions



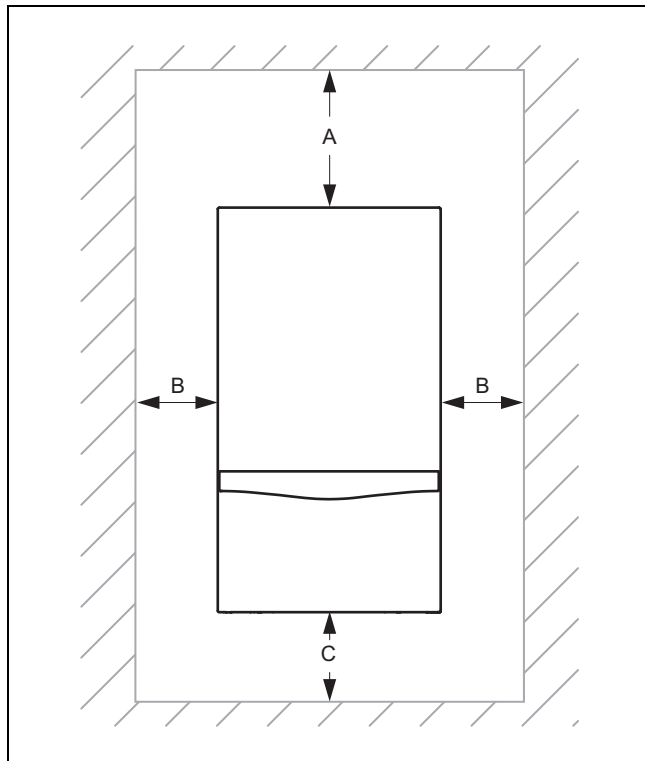
12 Circulation pump set 15 Safety group

Dimensions



1 Heating return	8 Retainer
3 Cold water connection	10 Connection for flue system
4 Gas connection	12 Circulation pump set
6 Domestic hot water connection	13 Outer edge of the casing
7 Heating flow	14 Expansion relief valve outflow

4.4 Minimum clearances



	Minimum clearance
A	450 mm
B	10 mm
C	250 mm

It is not necessary to maintain a clearance between the product and components made of combustible materials that go beyond the minimum clearances.

4.5 Using the installation template

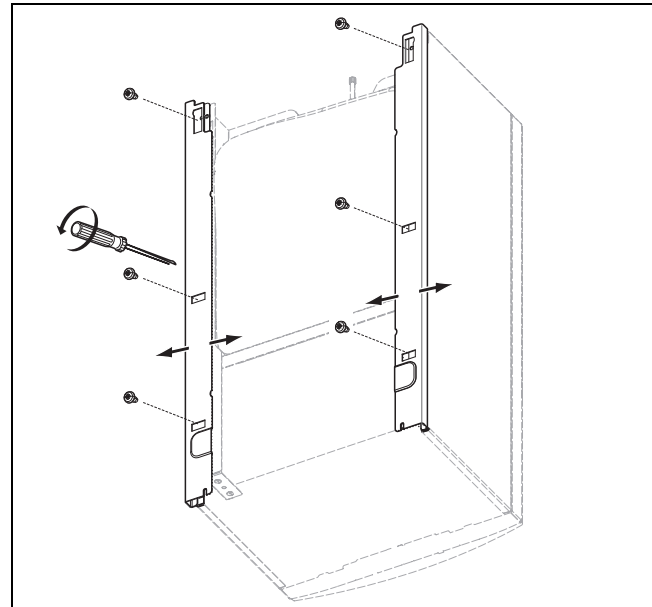
- Use the installation template to ascertain the locations at which you need to drill holes and make perforations.

4.6 Setting the variable profile frame



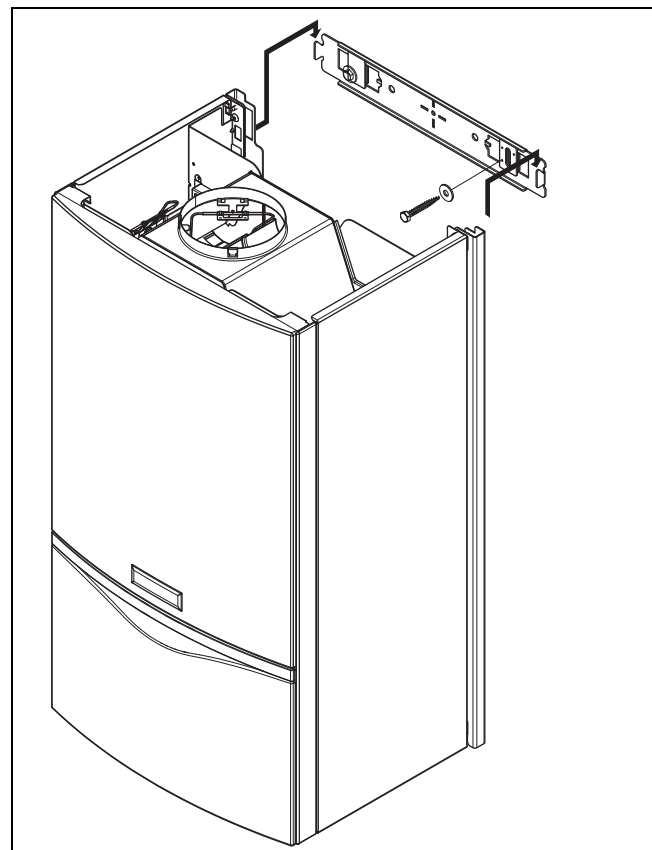
Note

The product is equipped with a variable profile frame. This allows you to replicate the exact width of the old unit when carrying out replacement installations. The variable profile frame offers the option to adjust the installation width to the wall within the range of 440 to 460 mm.



1. Undo three screws on each frame.
2. Slide the profile frame into the required position.
3. Use the screws to secure the frame.

4.7 Wall-mounting the product



1. Check the load-bearing capacity of the wall.
2. Note the total weight of the product.
3. Only use fixing material that is permitted for the wall.

Conditions: The load-bearing capacity of the wall is sufficient, The fixing material may be used for the wall

- Wall-mount the product as described.

4 Set-up

Conditions: The load-bearing capacity of the wall is not sufficient

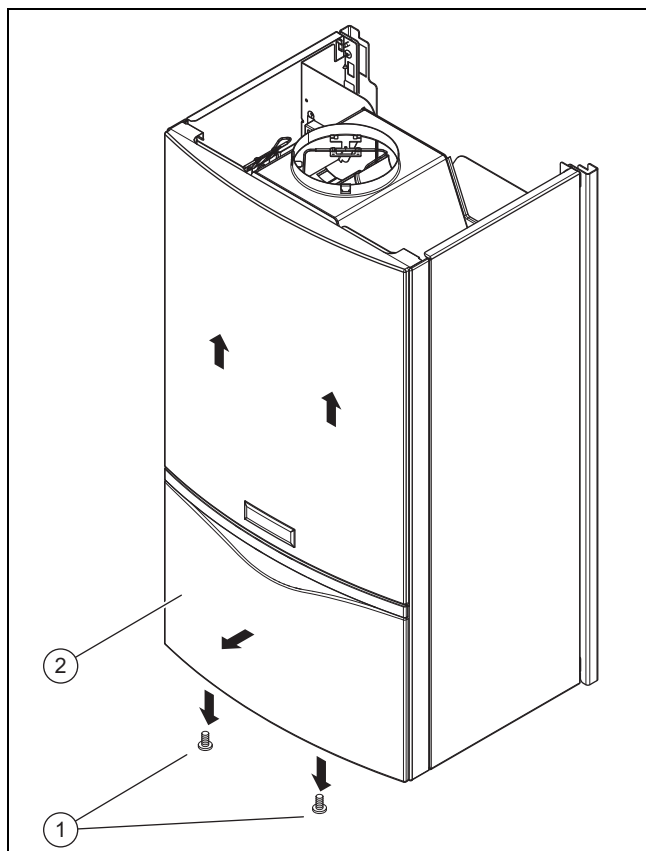
- ▶ Ensure that wall-mounting apparatus on-site has a sufficient load-bearing capacity. Use individual stands or primary walling, for example.
- ▶ Do not wall-mount the product if you cannot provide wall-mounting apparatus with a sufficient load-bearing capacity.

Conditions: The fixing material may not be used for the wall

- ▶ Wall-mount the product as described using the permitted fixing material provided on-site.

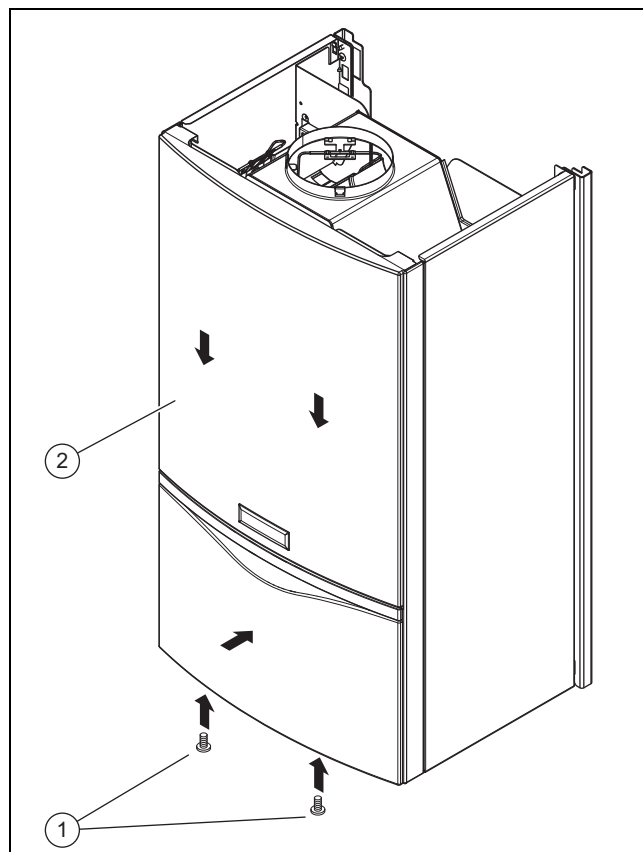
4.8 Removing/installing the front casing

4.8.1 Removing the front casing



1. Undo the two screws (1).
2. Pull the front casing (2) at the lower end approx. 1–2 cm to the front.
3. Lift the front casing and pull it forwards to remove it from the product.

4.8.2 Installing the front casing

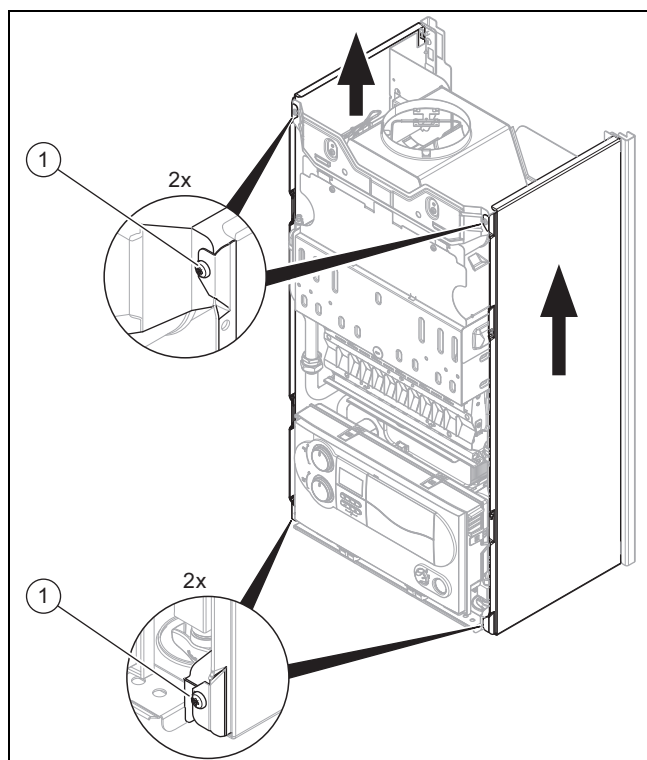


1. Hook the front casing (2) onto the upper side.
2. Check whether the top of the front casing is in the holding collar and the bottom is resting against the product.
3. Screw the casing back in tightly (1).

4.9 Removing/installing the side section

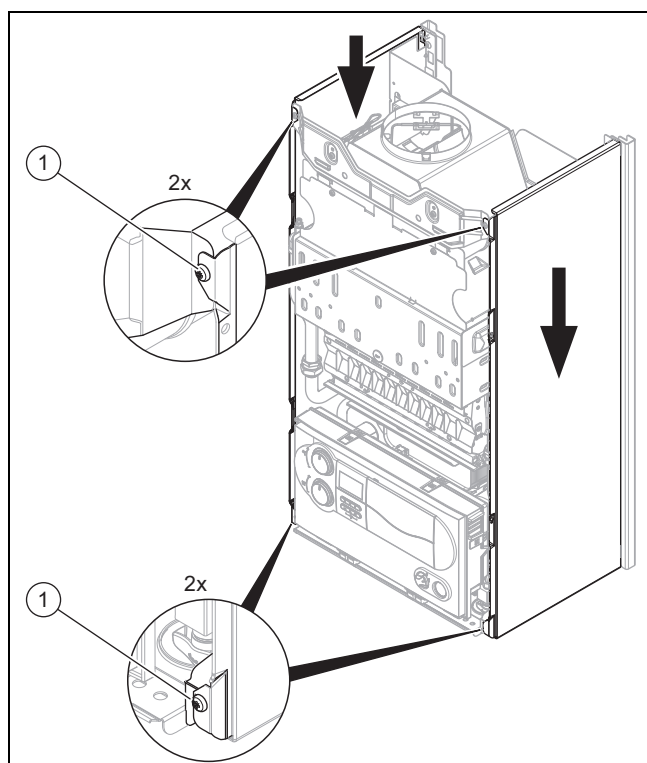
4.9.1 Removing the side section

1. Remove the front casing. (→ Page 12)



2. Undo the screws (1).
3. Slide the side casing approx. 1–2 cm upwards and pull it forwards to remove it.

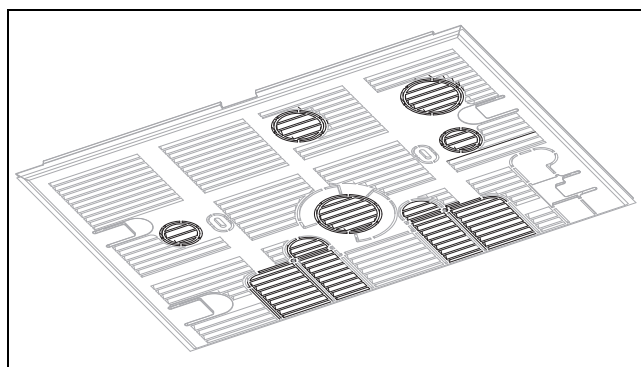
4.9.2 Installing the side section



1. Set up the side casing on the rear holding collar.
2. Slide the side casing approx. 1–2 cm downwards and tighten it again (1).

4.10 Lower unit cover

Applicability: atmoTEC exclusive



The lower unit cover can be attached to the underside of the product using snap-in mounting feet and without the need for any tools.

If required (e.g. for surface installation or additional connections), certain surfaces (marked in dark in the illustration) can be easily broken out.

5 Installation



Danger!

Risk of scalding and/or damage due to incorrect installation leading to escaping water.

Mechanical stresses in the connection pipes may lead to leaks.

- Ensure that there is no mechanical stress when installing the connection pipes.



Caution.

Risk of material damage caused by changes to the pipes that have already been connected.

- Only bend connection pipes if they have not yet been connected to the product.



Warning.

Risk of adverse health effects caused by impurities in the potable water.

Sealing residues, dirt or other residues in the pipelines may adversely affect the quality of the potable water.

- Flush all of the hot and cold water pipes thoroughly before you install the product.

5 Installation



Caution.

Risk of material damage caused by residues in the pipelines.

Welding remnants, sealing residues, dirt or other residues in the pipelines may damage the product.

- ▶ Flush the heating installation thoroughly before installing the product.



Caution.

Risk of damage caused by incorrect gas installation.

Excessive test pressure may cause damage to the gas valve assembly.

- ▶ Check the tightness of the gas valve assembly using a maximum pressure of 1.1 kPa (110 mbar).



Caution.

Risk of material damage due to heat transfer during soldering.

- ▶ Only solder connectors if the connectors are not yet screwed to the service valves.



Caution.

Risk of material damage caused by corrosion

Due to non-diffusion-tight plastic pipes in the heating installation, air gets into the heating water. Air in the heating water causes corrosion in the heat generator circuit and in the product.

- ▶ If you use non-diffusion-tight plastic pipes in the heating installation, ensure that no air gets into the heat generator circuit.

5.1 Installation requirements

5.1.1 Information on liquid gas operation

In the as-delivered condition, the product is preset for operation with the gas group indicated on the data plate.

If you have a product that has been preset for operation with natural gas, you must convert it to run on liquid gas. You will need a conversion set for this. The conversion procedure is described in the manual supplied with the conversion set.

5.1.1.1 Purging the liquid gas tank

If the liquid gas tank is not purged properly, this may result in ignition problems.

- ▶ Ensure that the liquid gas tank has been purged properly before installing the product.
- ▶ If required, contact the filler or the liquid gas supplier.

5.1.1.2 Using the correct gas type

Using the incorrect gas type may cause fault shutdowns in the product. Ignition and combustion noise may occur in the product.

- ▶ Only use the gas type listed on the data plate.

5.1.2 Basic preparation for the installation

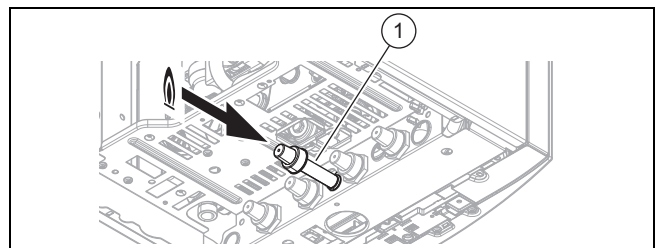
- ▶ Provide a discharge pipe between the expansion relief valve's discharge opening and the tundish with siphon.
 - The discharge must be visible.
- ▶ If plastic pipes are used in the heating installation, install a suitable limit thermostat on the heating flow on-site.
- ▶ Check whether the volume of the installed expansion vessel is sufficient for the heating system.
- ▶ If the volume of the installed expansion vessel is insufficient, install an additional expansion vessel, connected as close to the product as possible, in the heating return.
- ▶ If you are installing an additional expansion vessel, either install a non-return valve in the product outlet (heating flow) or decommission the internal expansion vessel.
- ▶ Flush out the supply lines thoroughly prior to installation.
- ▶ Install a filling device for the heating installation on-site and in accordance with the relevant standards.

Applicability: Product with integrated hot water generation

- ▶ When using the product in solar systems for drinking water post-heating, use thermostatic mixing valves upstream and downstream of the product.
 - The temperature at the product's cold water connection (combined with the domestic hot water connection for the solar cylinder) must not exceed 70 °C

5.2 Installing the gas connection

1. Make sure that the existing gas meter is capable of passing the rate of gas supply required.



2. Install the gas supply at the gas connection (1) in compliance with the applicable standards.
3. Purge the gas line.

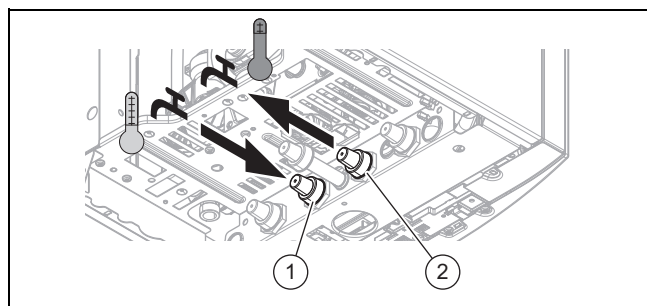
5.3 Checking the gas line for leak-tightness

- Check the entire gas line properly for leak-tightness.

5.4 Installing the water connections

5.4.1 Installing the domestic hot and cold water connection

Applicability: Product with integrated hot water generation



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

5.4.2 Descaling the water

The probability of scale increases as the water temperature increases.

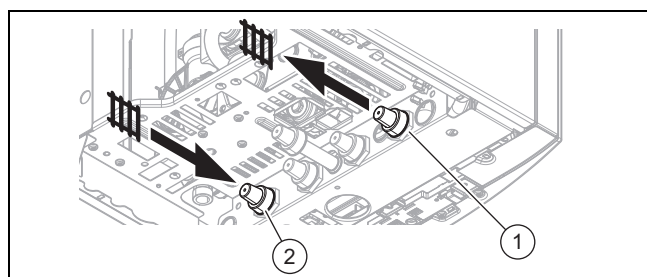
- Descale the water as required.

5.4.3 Connecting the domestic hot water cylinder

Applicability: Product without integrated hot water generation

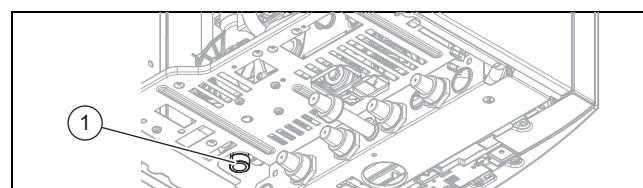
- Connect the domestic hot water cylinder to the product's cylinder connections in accordance with the relevant standards.

5.5 Installing the heating flow/return



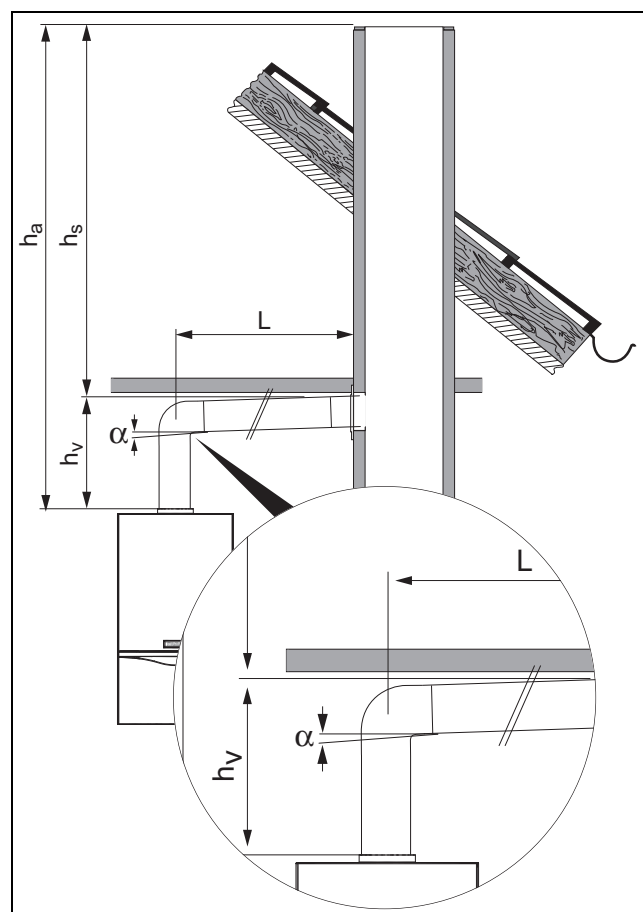
1. Install the heating flow (1) and the heating return (2) in accordance with the relevant standards.
2. Check all connections for tightness.

5.6 Connecting the discharge pipe to the expansion relief valve on the product



1. Install the drain pipe on the expansion relief valve's outlet (1).
2. Terminate the drain pipe in such a way that escaping water or steam cannot cause injury to persons or damage to electronic components.
3. Make sure that the end of the pipe is visible.

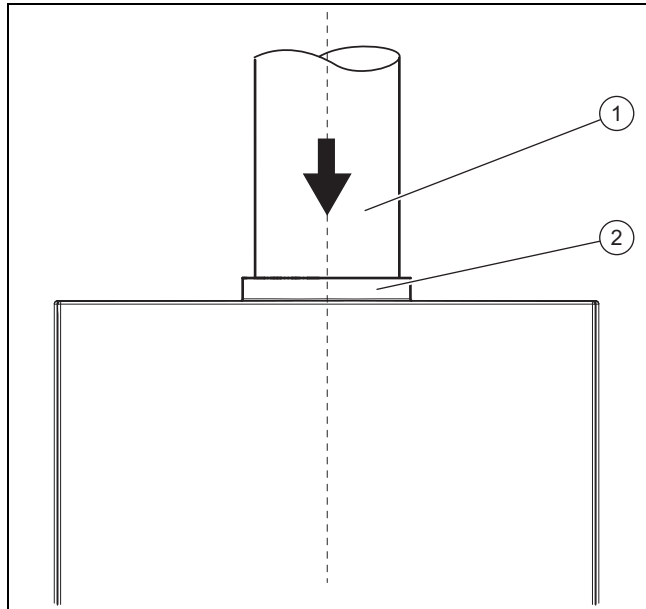
5.7 Connecting the flue pipe



1. Comply with the required pipe lengths.

h_a	Effective lifting height
h_s	Effective flue height
L	Stretched pipe length
h_v	Approach section ($h_v \geq 1/2 L$)
α	Slightly upward = -3°

5 Installation



2. Insert the flue pipe (1) into the flue connection (2).
3. Ensure that the flue pipe is positioned correctly.

5.8 Electrical installation

Only qualified electricians may carry out the electrical installation.



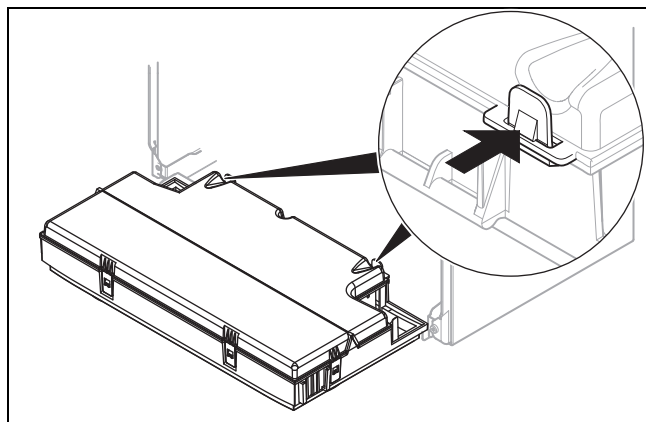
Danger! **Risk of death from electric shock!**

The mains connection terminals L and N remain live even if the product is switched off.

- ▶ Switch off the power supply.
- ▶ Secure the power supply against being switched on again.

5.8.1 Opening the electronics box

1. Remove the front casing. (→ Page 12)



2. Undo the clips on the upper cover of the electronics box.
3. Hinge up the cover.

5.8.2 Carrying out the wiring

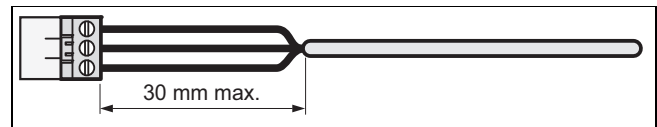


Caution. **Risk of material damage caused by incorrect installation.**

Mains voltage at the incorrect plug terminals may destroy the electronics.

- ▶ Do not connect a mains voltage to the eBUS (+/-) terminals.
- ▶ Only connect the mains connection line to the terminals marked for the purpose.

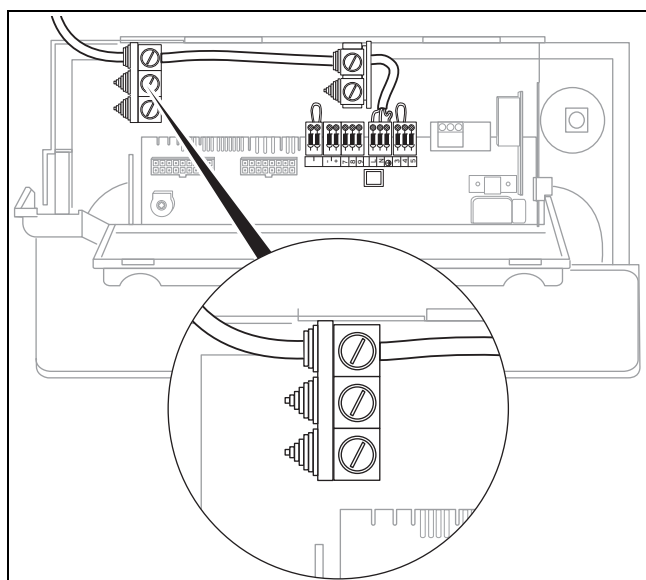
1. Route the mains cable and low-voltage cable with sufficient space between them.
2. Guide the cables through the grommet in the base of the product and into the electronics box.
3. Shorten the connection cables to the appropriate length.



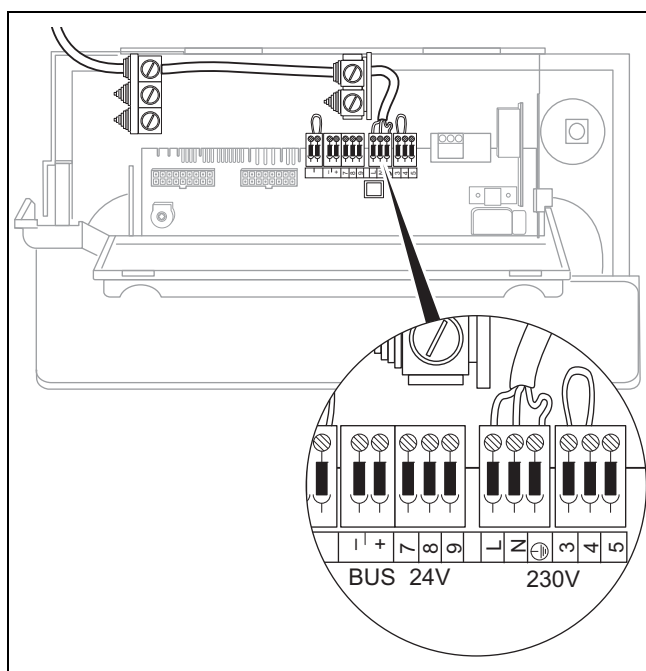
4. Strip the outer sheathing of flexible lines to a maximum of 30 mm to prevent short circuits if a strand accidentally comes loose.
5. Ensure inner conductor insulation is not damaged when stripping the outer sheathing.
6. Only strip inner conductors just enough to establish stable connections.
7. To avoid short circuits resulting from loose individual wires, 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 sitting mechanically securely in the terminals of the plug.
10. Plug the plug into the associated PCB slot.
11. Secure the cables in the electronics box using the strain reliefs.

5.8.3 Establishing the power supply

1. Make sure that the nominal mains voltage is 230 V.
2. Open the electronics box. (→ Page 16)
3. Connect the product using a fixed connection and a partition with a contact gap of at least 3 mm (e.g. fuses or power switches).
 - Power supply cable: Flexible cable (diameter $\geq 3 \times 0.75 \text{ mm}^2$)



4. Guide the power supply cable through the upper cable trunking and into the electronics box.



5. Carry out the wiring. (→ Page 16)
6. Close the electronics box.
7. Make sure that access to the power supply is always available and is not covered or blocked.

5.8.4 Connecting controls to the electronics

1. Install the control if necessary.
2. Open the electronics box. (→ Page 16)
3. Carry out the wiring. (→ Page 16)

Conditions: Connecting a weather-compensated control or room temperature control via eBUS

- ▶ Connect the control to the eBUS connection.
- ▶ Bridge terminals 3 and 4 if no bridge is present.

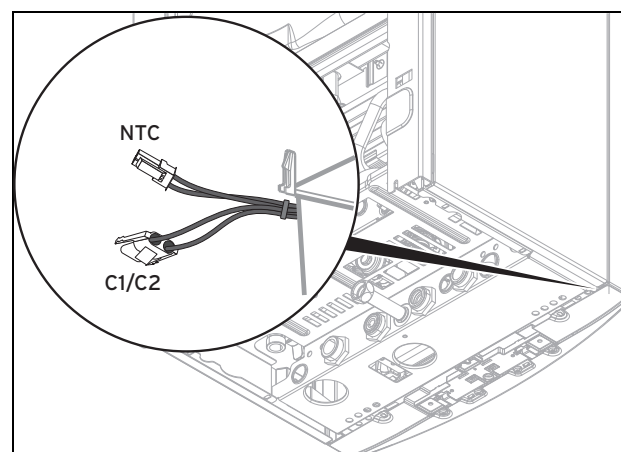
Conditions: Connecting a low-voltage control (24 V)

- ▶ Connect the control to connection terminals 7, 8, 9.
- ▶ Bridge terminals 3 and 4 if no bridge is present.

4. Close the electronics box.
5. For multi-circuit controls, change the **D.18 Pump mode** from 0 (intermittently operating pump) to 2 (continuously operating pump).

5.8.5 Connecting the domestic hot water cylinder to the electricity supply

Applicability: Product with connected domestic hot water cylinder



1. Observe the set-up instructions for the cylinder retrofitting set.
2. Connect the cable end on the cylinder temperature sensor to the NTC plug that is available in the cable harness.

Conditions: Third-party cylinder and external prioritising diverter valve

- ▶ Connect the cylinder to the C1/C2 plug that is available in the cable harness.
- ▶ Set the pump overrun under **d.72** to 0 s.

5.9 Connecting additional components

The multi-functional module can be used to actuate two additional components.

5.9.1 Activating the additional component via the multi-functional module

Conditions: Components connected to relay 1

- ▶ Select the parameter **D.27 Accessory relay 1** in **Diagnostics menu** to assign a function to relay 1. (→ Page 18)
Diagnostics level 2 diagnostics codes (→ Page 30)

Conditions: Components connected to relay 2

- ▶ Select the parameter **D.28 Accessory relay 2** in **Diagnostics menu** to assign a function to relay 2. (→ Page 18)
Diagnostics level 2 diagnostics codes (→ Page 30)

6 Operation

5.9.2 Installing the circulation pump

Applicability: Product with connected domestic hot water cylinder

1. Carry out the wiring. (→ Page 16)
2. Connect the connection cable for the external button to terminals 1 and 6 on edge connector X41.
3. Plug the edge connector into the PCB slot X41 in the product.

6 Operation

6.1 Using diagnostics codes

You can use the parameters marked as adjustable in the tables of diagnostics codes to adapt the product to the installation and customer requirements.

The diagnostics codes in the 2nd diagnostics level are protected by a password.

Diagnostics level 1 diagnostics codes (→ Page 29)

Diagnostics level 2 diagnostics codes (→ Page 30)

6.1.1 Activating diagnostics codes

1. Press the **i** and **+** buttons simultaneously.
◁ **d. 0** is shown in the display.
2. Use the **-** and **+** buttons to select the required diagnostics code.
3. Press the **i** button to confirm.
◁ The diagnostics information is shown in the display.
4. Use the **+** and **-** buttons to set the required value.
◁ The display flashes
5. Save the value by pressing and holding the **i** button for five seconds.
◁ The display no longer flashes
6. Press the **i** and **+** buttons at the same time or wait four minutes before pressing any buttons in order to return to the basic display.

6.1.2 Activating the 2nd diagnostics level



Caution.

Risk of material damage caused by incorrect handling.

Incorrect settings in the 2nd diagnostics level may cause damage to the heating installation.

- ▶ Only competent persons may access the 2nd diagnostics level.

1. Activate the diagnostics codes. (→ Page 18)
2. Change the value under **d.97** to 17 (password).
◁ The 2nd diagnostics level displays all of the information from the 1st and 2nd diagnostics levels.



Note

If you press the **i** and **+** buttons within four minutes of exiting the 2nd diagnostics level, you can directly access the 2nd diagnostics level without re-entering the password.

6.2 Using check programmes

Special functions can be triggered by activating various check programmes.

Check programmes (→ Page 34)

6.2.1 Activating check programmes

1. Turn the main switch to **I** and press and hold the **+** button for five seconds.
◁ **P.0** is shown in the display.
2. Use the **+** and **-** buttons to select the required check programme.
3. Press the **i** button to confirm.
◁ The selected check programme is started.
4. Press the **i** and **+** buttons at the same time to end the check programme.



Note

If you do not press any button for 15 minutes, the current programme is automatically cancelled and the basic display is shown.

6.3 Displaying the status codes

The status codes display the product's current operating mode.

Status codes – Overview (→ Page 34)

6.3.1 Calling up status codes

1. Press the **i** button.
Status codes – Overview (→ Page 34)
◁ The current operating mode **S.XX** is shown in the display.
2. Press the **i** button or do not press any button for four minutes in order to return to the basic display.

7 Start-up

7.1 Switching on the product

- ▶ Switch the main switch to **I**.
◁ The basic display appears on the display.

7.2 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-protection measures, or fit a magnetic filter.
- ▶ Check the pH value of the removed water at 25 °C.
- ▶ If the value is below 8.2 or above 10.0, clean the installation and treat the heating water.
- ▶ Ensure that oxygen cannot get into the heating water.

Checking the filling and supplementary water

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

Treating the filling and supplementary water

- ▶ Observe all applicable national regulations and technical standards when treating the filling and supplementary water.
- ▶ In particular, observe VDI directive 2035, sheets 1 and 2.

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

You must treat the heating water in the following cases:

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

Total heating output	Water hardness at specific system volume ¹⁾					
	≤ 20 l/kW		> 20 l/kW ≤ 50 l/kW		> 50 l/kW	
kW	°dH	mol/m ³	°dH	mol/m ³	°dH	mol/m ³
< 50	< 16.8	< 3	11.2	2	0.11	0.02
> 50 to ≤ 200	11.2	2	8.4	1.5	0.11	0.02
> 200 to ≤ 600	8.4	1.5	0.11	0.02	0.11	0.02
> 600	0.11	0.02	0.11	0.02	0.11	0.02

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



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 frost and corrosion protection agents, 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 Alpha 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.

7.3 Preventing low water pressure

The filling pressure is shown in the display and on the manometer. To operate the heating installation correctly, the filling pressure must lie between 0.1 MPa and 0.2 MPa (1.0 bar and 2.0 bar).

If the heating installation extends over several storeys, higher filling pressures may be required to avoid air entering the heating installation.

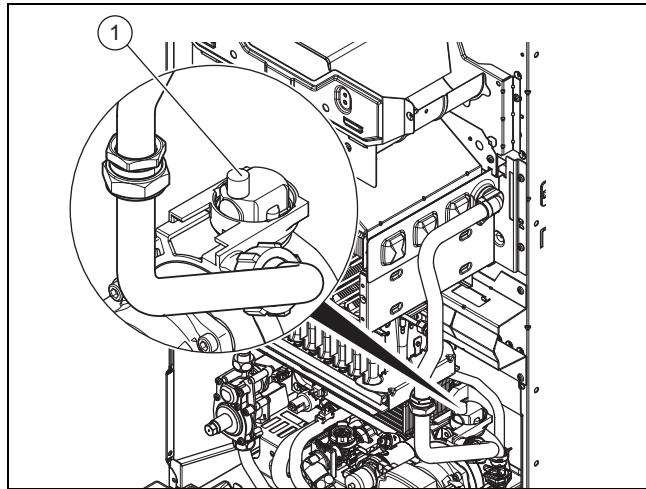
If the filling pressure falls below the required value, the product switches off. The display shows **F.22**.

- ▶ Top up the heating water to start the product up again.

7.4 Filling the heating installation

1. Remove the front casing. (→ Page 12)
2. Flush the heating installation before filling it.
3. Hinge the electronics box downwards.

7 Start-up



4. Undo the cap on the automatic air vent (1).
– Rotations: 1 ... 2
5. Hinge the electronics box upwards.
6. Select check programme **P. 6**.
Check programmes (→ Page 34)
7. Open all of the thermostatic radiator valves and, if required, the service valves.
8. Open the filling device that is installed on-site.
9. Fill it with water until the required system pressure is shown on the manometer and/or in the display.

7.5 Purging the heating installation

1. Select check programme **P. 0**.
Check programmes (→ Page 34)
2. Make sure that the filling pressure of the heating installation does not fall below the minimum filling pressure.
– $\geq 0.1 \text{ MPa}$ ($\geq 1.0 \text{ bar}$)
3. Check whether the filling pressure of the heating installation is at least 0.02 MPa (0.2 bar) above the counter-pressure of the expansion vessel ("Exp") ($P_{\text{Installation}} \geq P_{\text{Exp}} + 0.02 \text{ MPa}$ (0.2 bar)).

Result:

Filling pressure for the heating installation is too low

- Fill the heating installation. (→ Page 19)
4. If there is still too much air in the heating installation at the end of check programme **P. 0**, repeat the check programme.

7.6 Filling and purging the domestic hot water system

Applicability: Product with integrated hot water generation

1. Open the cold-water isolation valve on the product and all the hot water draw-off valves.
2. Fill the domestic hot water system until water escapes.
◁ The domestic hot water system is filled and purged.
3. Check all of the connections and the entire domestic hot water system for leaks.

7.7 Checking and adjusting the gas setting

7.7.1 Checking the factory-set gas setting

The product's combustion has been tested at the factory and preset for the gas type indicated on the data plate.

- Check the information about the gas type indicated on the data plate and compare this with the gas type available at the installation site.

Conditions: The product design is **not compatible** with the local gas group

- Do not start up the product.
- For the gas conversion, use a conversion set (with conversion instructions).
- If possible, carry out a gas conversion for the product, as described in the conversion instructions.

Conditions: The product design is **compatible** with the local gas group

- Proceed as described below.

7.7.2 Checking the gas connection pressure (gas flow pressure)



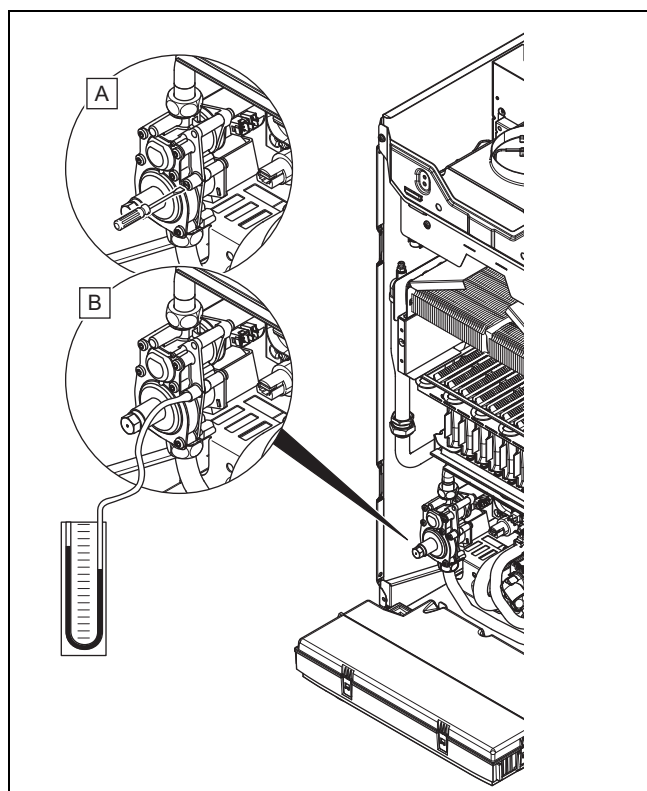
Caution.

Risk of material damage and operating faults caused by incorrect gas connection pressure.

If the gas connection pressure lies outside the permissible range, this can cause operating faults in and damage to the product.

- Do not make any adjustments to the product.
- Do not start up the product.

1. Close the gas stopcock.
2. Hinge the electronics box downwards.



3. Use a screwdriver to undo the sealing screw on the measuring connection of the gas valve assembly.
4. Connect a manometer to the test nipple.
 - Working materials: U tube manometer
 - Working materials: Digital pressure gauge
5. Hinge the electronics box upwards.
6. Open the gas stopcock.
7. Start up the product with check programme **P. 1**.
8. Measure the gas connection pressure against atmospheric pressure.

Permissible connection pressure

Germany	Natural gas	G20	1.7 ... 2.5 kPa (17.0 ... 25.0 mbar)
		G25	1.7 ... 2.5 kPa (17.0 ... 25.0 mbar)
	Liquid gas	G31	4.25 ... 5.75 kPa (42.50 ... 57.50 mbar)

Result:

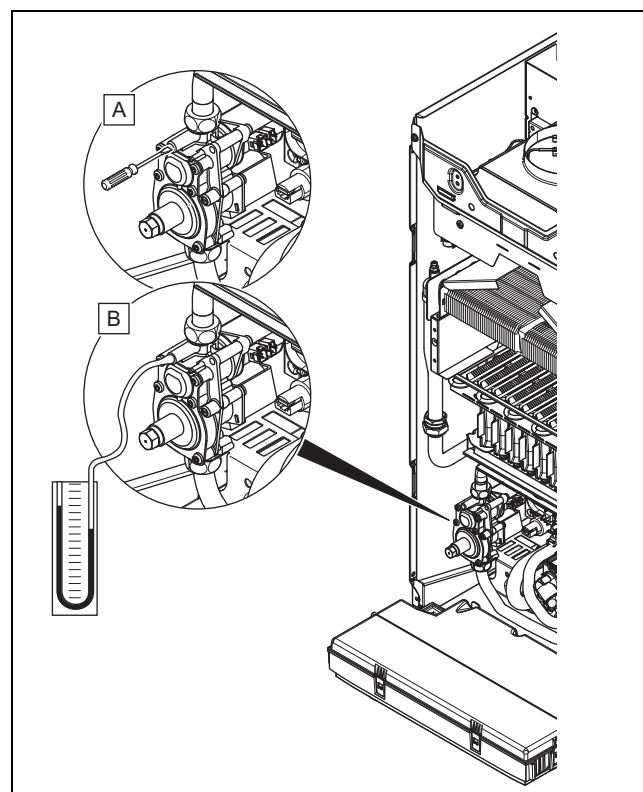
Gas connection pressure not in the permissible range

- If you are unable to eliminate the fault, contact the gas supply company.
- Close the gas stopcock.

9. Temporarily decommission the product.
10. Close the gas stopcock.
11. Remove the manometer.
12. Tighten the screw on the test nipple.
13. Open the gas stopcock.
14. Check the test nipple for gas tightness.

7.7.3 Checking the maximum heat input

1. Temporarily decommission the product.
2. Flap the electronics box downwards.



3. Loosen the sealing screw.
4. Connect a manometer to the test nipple.
 - Working materials: U tube manometer
 - Working materials: Digital pressure gauge
5. Tilt the electronics box upwards.
6. Start check programme **P. 1**.
Check programmes (→ Page 34)
7. Check the value on the manometer.

Technical data – Gas adjustment values for the heat input (jet pressure) (→ Page 43)

Result:

The value lies outside of the permitted range

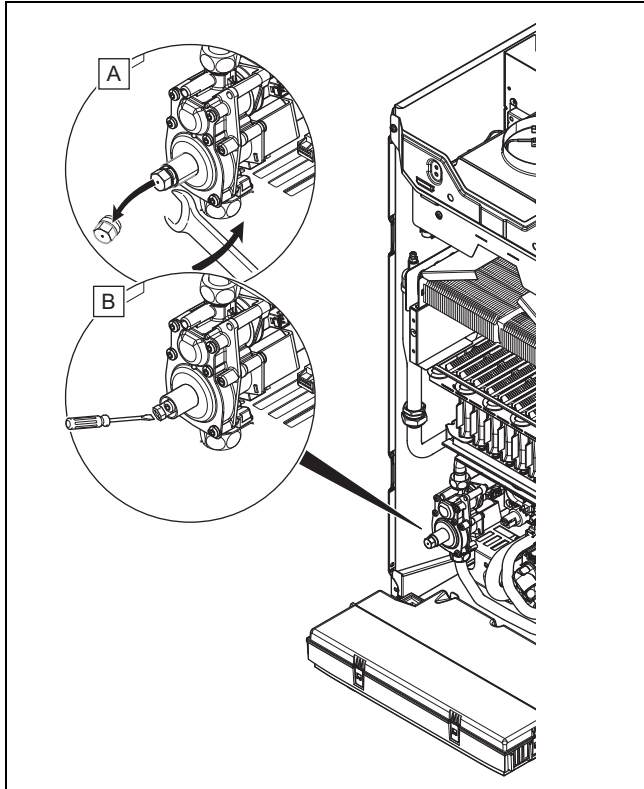
- Ensure that the correct burner jets have been installed properly and are not damaged.

Technical data – Burner jets (→ Page 45)

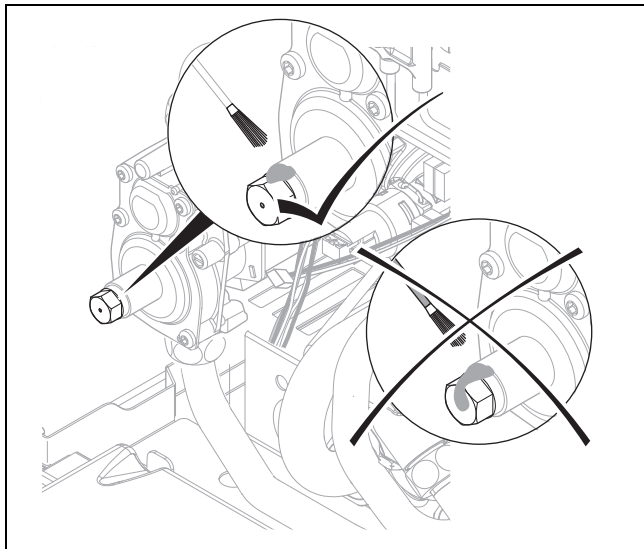
Technical data – liquefied petroleum gas orifice plates (G31) (→ Page 45)

- Carry out the following steps.

7 Start-up



8. Unscrew the gas pressure regulator's hexagon from the gas valve assembly.
9. Use a screwdriver to set the maximum heat input.
 - Turning the adjusting screw clockwise increases the nominal heat input
 - Turning the adjusting screw anti-clockwise decreases the nominal heat input



10. Screw the hexagon tightly back onto the gas valve assembly and seal it.
 - The middle opening on the hexagon must remain open and must not be covered with sealing wax or become dirty.
11. Switch off the product.
12. Remove the manometer.
13. Retighten the sealing screw on the gas valve assembly.
14. Check the gas tightness.
15. Then check the minimum gas volume.

7.7.4 Checking the minimum heat input

1. Temporarily decommission the product.
2. Flap the electronics box downwards.
3. Loosen the sealing screw.
4. Connect a manometer to the test nipple.
 - Working materials: U tube manometer
 - Working materials: Digital pressure gauge
5. Hinge the electronics box upwards.
6. Start check programme **P. 2**.
Check programmes (→ Page 34)
7. Check the value on the manometer.
Technical data – Gas adjustment values for the heat input (jet pressure) (→ Page 43)

Result:

The value lies outside of the permitted range

- ▶ Ensure that the correct orifice plate and the correct burner jets have been installed properly and are not damaged.
Technical data – Burner jets (→ Page 45)
Technical data – liquefied petroleum gas orifice plates (G31) (→ Page 45)
 - ▶ Carry out the following steps.
8. Press the **i** button.
 - The display shows a value between 0 and 99.
 9. Adjust the value by pressing the **+** and **–** buttons until the manometer displays the correct pressure.
 10. Save the set value by pressing and holding the **i** button for approx. five seconds.
 - The product then automatically exits the check programme.
 11. Decommission the product.
 12. Remove the manometer.
 13. Retighten the sealing screw on the gas valve assembly.

7.7.5 Checking leak-tightness

- ▶ Check the gas pipe, the heating circuit and the hot water circuit for leak-tightness.
- ▶ Check that the flue system has been installed correctly.

7.7.6 Checking the heating mode

1. Make sure that there is a heat requirement.
2. Call up the status codes. (→ Page 18)
 - ◁ If the product is operating correctly, the display runs through status displays **S. 2** and **S. 3** until the product operates correctly in normal operating mode and **S. 4** appears in the display.

7.7.7 Checking the hot water generation

1. Observe the applicable regulations regarding legionella prevention.

Applicability: Product with integrated hot water generation

- ▶ Open a hot water tap completely.
- ▶ Call up the status codes. (→ Page 18)
 - ◁ If hot water generation is working correctly, the display shows **S.14**.

Adapting the unit to the heating installation 8

Conditions: Hot water generation via external domestic hot water cylinder

- Make sure that the cylinder thermostat is requesting heat.
 - ◁ If the domestic hot water cylinder is charged correctly, the display shows **S.24**.

Conditions: Hot water generation via external domestic hot water cylinder, Controller connected

- Set the domestic hot water temperature on the boiler to the maximum possible temperature.
- Adjust the target temperature for the connected domestic hot water cylinder to the control.
 - ◁ The boiler adopts the set target temperature which is set on the control.

8 Adapting the unit to the heating installation

You can reset/change the system parameters.

Diagnostics level 1 diagnostics codes (→ Page 29)

Diagnostics level 2 diagnostics codes (→ Page 30)

8.1 Burner anti-cycling time

To prevent frequent switching on and off of the burner and thus prevent energy losses, an electronic restart lockout is activated for a specific period each time the burner is switched off. The burner anti-cycling time is only active for the heating mode. Hot water handling during a burner anti-cycling time does not affect the time function element (default setting: 20 mins).

8.1.1 Setting the burner anti-cycling time

- Set the burner anti-cycling time via **d. 2**.

T _{Flow} (target) [°C]	Set maximum burner anti-cycling time [min]						
	2	5	10	15	20	25	30
20	2	5	10	15	20	25	30
25	2	4	9	14	18	23	27
30	2	4	8	12	16	20	25
35	2	4	7	11	15	18	22
40	2	3	6	10	13	16	19
45	2	3	6	8	11	14	17
50	2	3	5	7	9	12	14
55	2	2	4	6	8	10	11
60	2	2	3	5	6	7	9
65	2	2	2	3	4	5	6
70	2	2	2	2	2	3	3
75	2	2	2	2	2	2	2

T _{Flow} (target) [°C]	Set maximum burner anti-cycling time [min]					
	35	40	45	50	55	60
20	35	40	45	50	55	60
25	32	36	41	45	50	54
30	29	33	37	41	45	49
35	25	29	33	36	40	44

T _{Flow} (target) [°C]	Set maximum burner anti-cycling time [min]					
	35	40	45	50	55	60
40	22	26	29	32	35	38
45	19	22	25	27	30	33
50	16	18	21	23	25	28
55	13	15	17	19	20	22
60	10	11	13	14	15	17
65	7	8	9	10	11	11
70	4	4	5	5	6	6
75	2	2	2	2	2	2

8.1.2 Resetting the remaining burner anti-cycling time

- Switch off the product via the main switch and then switch it back on again.

8.2 Setting the maintenance interval

- Use **d.84** to set the maintenance interval (operating hours) until the next maintenance work is due.

Diagnostics level 2 diagnostics codes (→ Page 30)

Heat demand	Number of persons	Guideline value for burner operating hours until the next inspection/maintenance work is due for an average operating time of one year (dependent upon the system type)
5,0 kW	1 - 2	1050 h
	2 - 3	1150 h
10,0 kW	1 - 2	1500 h
	2 - 3	1600 h
15,0 kW	2 - 3	1800 h
	3 - 4	1900 h
20,0 kW	3 - 4	2600 h
	4 - 5	2700 h
25,0 kW	3 - 4	2800 h
	4 - 6	2900 h
> 27,0 kW	3 - 4	3000 h
	4 - 6	3000 h

8.3 Setting the pump output

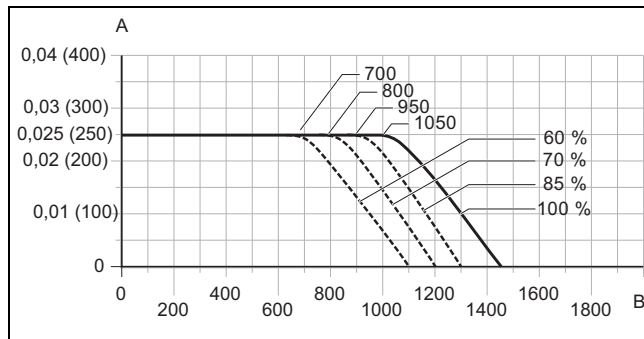
If required, you can manually set the pump output in the diagnostics mode. This therefore switches off the speed regulation.

- If you are using an external pump, set the internal pump to maximum output (100%).
- If a low loss header is installed in the heating installation, switch off the speed regulation and set the pump output to 100%.
- Activate the 2nd diagnostics level. (→ Page 18)
- Set the pump output for **d.14**.

9 Handing the product over to the end user

Diagnostics level 2 diagnostics codes (→ Page 30)

8.3.1 Pump curve



A Remaining feed head [mbar] B Flow rate [l/h]

8.4 Setting the bypass valve



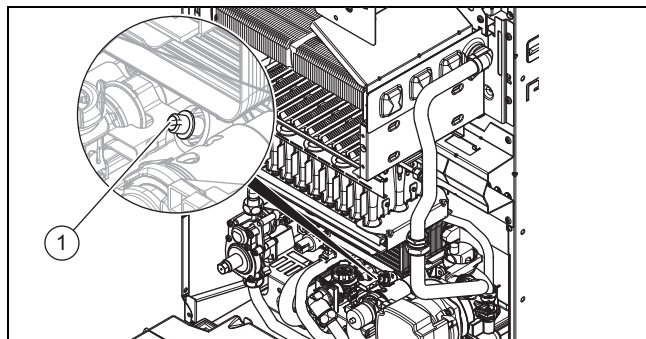
Caution.

Risk of material damage caused by incorrect setting of the high-efficiency pump

If the pressure at the bypass valve is increased (by turning it clockwise) and the pump output is set to less than 100%, the product may not operate correctly.

- In this case, set the pump output to = 100% using diagnostics code **d.14**.

1. Remove the front casing. (→ Page 12)
2. Hinge the electronics box downwards.



3. Regulate the pressure using the adjusting screw (1).

Position of the adjusting screw	Pressure in MPa (mbar)	Notes/application
Right-hand stop (turned all the way down)	0.035 (350)	If the radiators do not heat up sufficiently at the default setting. In this case, you must set the pump to the maximum speed.
Mid-position (5 turns to the left)	0.025 (250)	Default setting
5 further turns to the left from the mid-position	0.017 (170)	If noises are produced in the radiators or radiator valves

4. Hinge the electronics box upwards.
5. Install the front casing. (→ Page 12)

9 Handing the product over to 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.

- When you have finished the installation, attach the sticker supplied in the end user's language to the front of the product.
- Explain to the end user how the safety devices work and where they are located.
- Inform the end user how to handle the product.
- In particular, draw attention to the safety information which the end user must follow.
- Inform the end user of the necessity to have the product maintained according to the specified intervals.
- Pass all of the instructions and documentation for the product to the end user for safe-keeping.
- Inform the end user about measures taken to ensure the combustion air supply and flue system, and instruct the end user that he must not make any changes.

10 Inspection and maintenance

10.1 Observing inspection and maintenance intervals

- Adhere to the minimum inspection and maintenance intervals.
- 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.

10.2 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 void the conformity of the product and it will therefore no longer comply with the applicable standards.

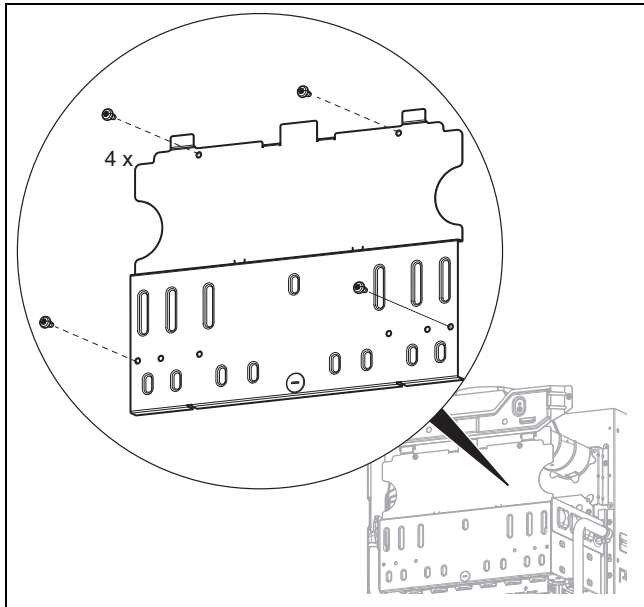
We strongly recommend that you use original spare parts from the manufacturer as this guarantees fault-free and safe operation of the product. To receive information about the available original spare parts, contact the contact address provided on the reverse of these instructions.

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

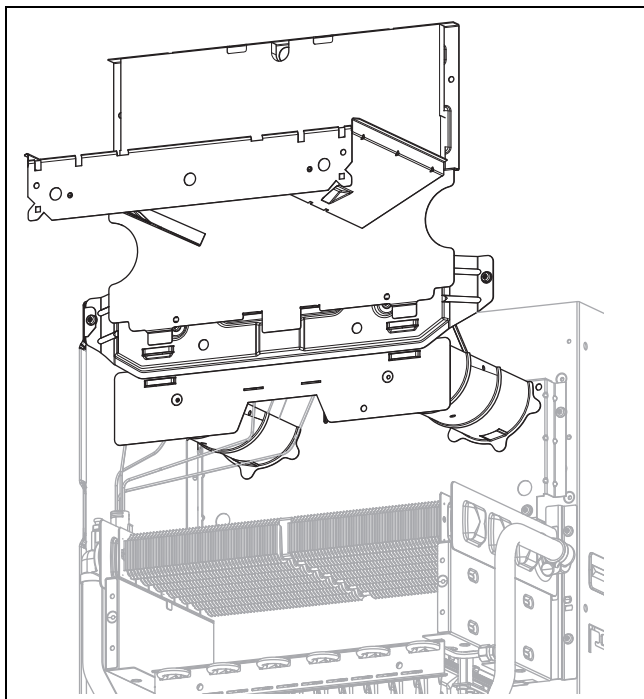
10.3 Preparing the cleaning work

- ▶ Temporarily decommission (→ Page 28) the product.
- ▶ Remove the front casing. (→ Page 12)
- ▶ Remove the cover from the down-draught diverter. (→ Page 25)
- ▶ Hinge the electronics box down and protect the electronics box against spraying water.

10.3.1 Removing the cover from the down-draught diverter

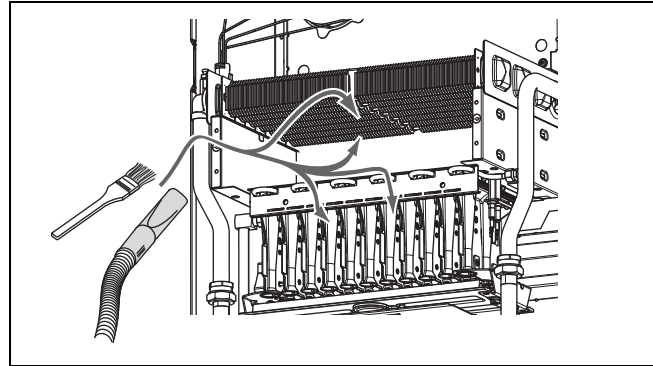


1. Remove the four screws from the down-draught diverter plate.



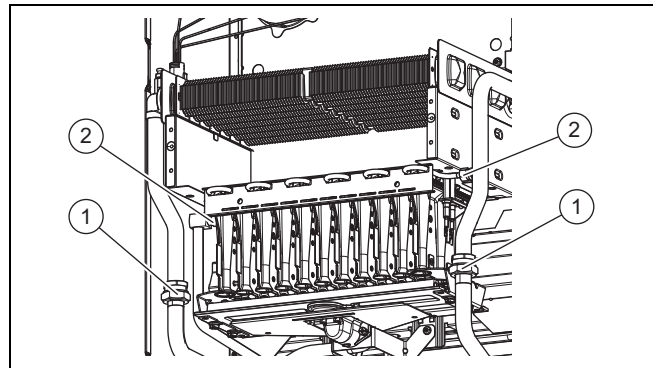
2. Remove the plate for the down-draught diverter.
3. Hook the plate into the straps provided for it.

10.3.2 Cleaning the burner and heat exchanger (light soiling)

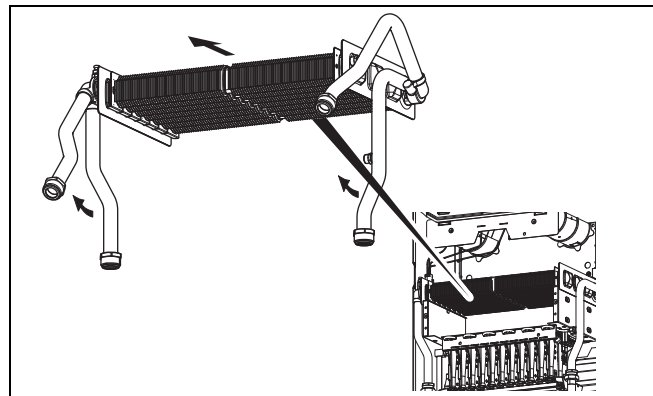


1. Clean combustion residue from the burner and primary heat exchanger using a brush and a vacuum cleaner.
2. Clean the nozzles and injectors with a soft brush then blow these through.

10.3.3 Cleaning the heat exchanger (heavy dirt)



1. Undo the screwed connections on the flow and return pipe (1).
2. Undo the screwed connection for the cooling pipes on the right and left of the burner (2).

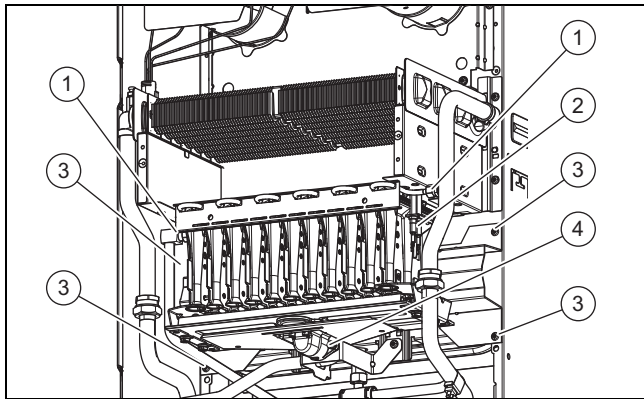


3. Remove the upper flow and return pipe by turning it upwards by approx. 90° and pulling it out.
4. Pull the heat exchanger towards the front and out.
5. Clean the heat exchanger.
6. Reinsert the heat exchanger.
7. Replace all the seals.
8. Install the upper flow pipe and return pipe.
9. Tighten the screwed connections on the flow and return pipe again.
10. Retighten the screwed connections on the cooling pipes.

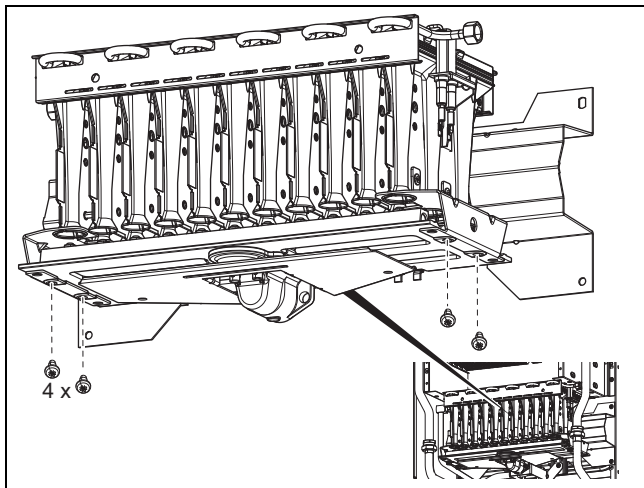
10 Inspection and maintenance

11. Screw in the plate for the down-draught diverter.

10.3.4 Cleaning the burner (heavy dirt)



1. Undo the screwed connection for the cooling pipes on the right and left of the burner (1).
2. Undo the four screws for the burner fastening on the frame (3).
3. Remove the plug from the ignition and monitoring electrodes (2).
4. Undo the screw on the gas pipe (4).



5. Pull the burner with jet plate towards the front and out.
6. Undo the four screws for the jet plate fasteners on the burner frame.
7. Clean the burner.
8. Clean the jets and injectors with a soft brush then blow these through.
9. Reinstall the jet plate with the burner.

10.4 Completing cleaning work

- ▶ Hinge the electronics box upwards.
- ▶ Screw in the plate for the down-draught diverter.
- ▶ Install the front casing. (→ Page 12)
- ▶ Open the gas stopcock and, in combination products, the cold-water isolation valve.
- ▶ Switch on the product. (→ Page 18)

10.5 Checking the flue gas sensors

1. Temporarily decommission the product.
2. Use a flue gas restrictor to block the flue gas route.
3. Start up the product.

Result 1:

The product automatically switches off within 3.5 minutes.

The product automatically switches on again after 15 to 20 minutes.

The flue gas sensors work without any problems.

Result 2:

The product does not automatically switch off within 3.5 minutes.



Danger!

Risk of poisoning caused by flue gas!

- ▶ Temporarily decommission the product.

- ▶ Temporarily decommission the product.

10.6 Draining the product

1. Close the service valves of the product.
2. Close the gas stopcock.
3. Start check programme P. 6 (prioritising diverter valve mid-position).
4. Open the drain valves.
5. Make sure that the cap of the automatic air vent on the internal pump is open so that the product can be drained fully.

10.7 Draining the product on the domestic hot water side

Applicability: Product with integrated hot water generation

1. Cut off the cold water supply.
2. Undo the screwed connections on the domestic hot water pipe under the product.

10.8 Draining the entire installation

1. Attach a hose to the draining device on the installation.
2. Place the free end of the hose in a suitable drainage point.
3. Ensure that the service valves are open.
4. Open the drain cock.
5. Open the purging valves on the radiators. Start from the highest radiator and then work from the top to the bottom.
6. Once the water has drained off, close the purging valves for the radiators and the drain cock.

10.9 Checking the pre-charge pressure of the expansion vessel

1. Close the service valves and drain the product.
2. Measure the pre-charge pressure of the expansion vessel at the vessel valve.

Conditions: Pre-charge pressure < 0.075 MPa (0.75 bar)

- ▶ Top up the expansion vessel in accordance with the static height of the heating installation, ideally with nitrogen, otherwise with air. Ensure that the drain valve is open when topping up.
3. If water escapes from the valve of the expansion vessel, you must replace the expansion vessel.
 4. Fill the heating installation. (→ Page 19)
 5. Purge the heating installation. (→ Page 20)

10.10 Checking the product for leak-tightness

- ▶ Check that the product is leak-tight. (→ Page 22)

10.11 Completing inspection and maintenance work

1. Check that all control, regulation and monitoring devices are functioning properly.
2. Check the over-ignition and that the flame on the burner is burning evenly.
3. Check the heating mode. (→ Page 22)
4. Check the hot water generation. (→ Page 22)
5. Log the maintenance work that is carried out.

11 Troubleshooting

11.1 Eliminating faults

- ▶ If fault messages (**F.XX**) occur, eliminate the fault by referring to the table in the appendix or using the Check programmes (→ Page 18) to help.

Fault messages – Overview (→ Page 33)

If several faults occur at the same time, the display shows the corresponding fault messages for two seconds each in alternation.

- ▶ Press the reset button (max. three times) to restart the product.
- ▶ If you are unable to eliminate the fault and the fault recurs despite reset attempts, contact customer service.

11.2 Calling up the fault memory

If faults have occurred, the last ten (max.) fault messages are available in the fault memory.

If --- is displayed, this indicates that no fault was recorded. If nnn is displayed, this indicates the time at which the fault memory was last read out.

- ▶ Press the **i** and **-** buttons at the same time.
- ▶ Use the **+** button in the fault memory to scroll back.
- ▶ Press the **i** and **+** buttons at the same time or wait for four minutes in order to exit the fault list display.

11.3 Resetting parameters to factory settings

1. Activate the 2nd diagnostics level. (→ Page 18)
2. Set the value under **d.96** to 1.
Diagnostics level 2 diagnostics codes (→ Page 30)

11.4 Preparing the repair work

1. Temporarily decommission (→ Page 28) the product.
2. Disconnect the product from the power grid.
3. Remove the front casing. (→ Page 12)
4. Close the service valves in the heating flow, in the heating return and in the cold water pipe.
5. Drain the product (→ Page 26) if you want to replace any of the product's water-bearing components.
6. Make sure that water does not drip on live components (e.g. the electronics box).
7. Use only new seals.

11.4.1 Replacing the burner

1. Remove the cover from the down-draught diverter. (→ Page 25)
2. Remove the burner. (→ Page 26)
3. Insert the new burner.
4. Screw in the ignition and monitoring electrode tightly.
5. Screw in the burner tightly.
6. Screw in the plate for the down-draught diverter.

11.4.2 Replacing the heat exchanger

1. Remove the cover from the down-draught diverter. (→ Page 25)
2. Remove the heat exchanger. (→ Page 25)
3. Insert the new heat exchanger.
4. Replace all the seals.
5. Install the upper flow pipe and return pipe.
6. Tighten the screwed connections on the flow and return pipe again.
7. Screw in the plate for the down-draught diverter.

11.4.3 Replacing the expansion vessel

1. Drain the product. (→ Page 26)
2. Undo the nuts below the expansion vessel.
3. Pull out the expansion vessel upwards.
4. Insert the new expansion vessel into the product.
5. Screw in the nuts below the expansion vessel tightly. Use a new seal for this.
6. Fill (→ Page 19) and purge (→ Page 20) the product and, if required, the heating installation.

11.4.4 Replacing the PCB or the display

1. Open the electronics box. (→ Page 16)
2. Replace the PCB or display according to the assembly and installation instructions supplied.
3. Close the electronics box.

12 Decommissioning

11.4.5 Replacing the PCB and the display

1. Replace the PCB and display according to the assembly and installation instructions supplied.
2. Set the Device Specific Number for the product type under **d.93**.

Diagnostics level 2 diagnostics codes (→ Page 30)

Display number

VC DE 104/4-7 A-P	9
VC DE 104/4-7 A-L	8
VC DE 104/4-7 A-H	7
VCC 194/4-5 120 (E-DE), surface-mounted	61
VCC 194/4-5 120 (E-DE), concealed	61
VCC 194/4-5 120 (LL-DE), surface-mounted	62
VCC 194/4-5 120 (LL-DE), concealed	62
VCW DE 254/4-7 A-P	17
VCW DE 254/4-7 A-L	15
VCW DE 254/4-7 A-H	14
VCW DE 204/4-7 A-P	13
VCW DE 204/4-7 A-L	11
VCW DE 204/4-7 A-H	10
VCW DE 194/4-5 A-L	62
VCW DE 194/4-5 A-H	61
VCW DE 244/4-5 A-L	67
VCW DE 244/4-5 A-H	66

◁ The electronics are now set to the product type and the parameters of all diagnostics codes are set to default settings.

3. Make the system-specific settings.

11.4.6 Checking the product for leak-tightness

- Check that the product is leak-tight. (→ Page 22)

11.4.7 Completing repair work

1. Install the front casing. (→ Page 12)
2. Establish the power supply if this has not yet been done (→ Replacing the PCB and display).
3. Switch the product (→ Page 18) on again if you have not already done so (→ Replacing the PCB and display).
4. Open all service valves and the gas isolator cock.

12 Decommissioning

12.1 Temporarily decommissioning the product

- Switch the main switch to **0**.
 - ◁ The display goes out.
- Close the gas stopcock.
- On combination products and products with a connected domestic hot water cylinder, you must also close the cold-water isolation valve.

12.2 Decommissioning the product

- Switch the main switch to **0**.
 - ◁ The display goes out.
- Disconnect the product from the power grid.
- Close the gas stopcock.
- On combination products and products with a connected domestic hot water cylinder, you must also close the cold-water isolation valve.
- Drain the product. (→ Page 26)

13 Customer service

Auftragsannahme Vaillant Kundendienst: 021 91 5767901

14 Recycling and disposal

Disposing of the packaging

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

Appendix

A Diagnostics level 1 diagnostics codes

Since the code table is used for various products, some codes may not be visible for the product in question.

Diagnostics code	Values		Unit	Increment, select, explanation	Default setting
	Min.	Max.			
d. 0 Partial heat load	Product-dependent	Product-dependent	kW	1	Full load
d. 1 Pump overrun	2	60	min	1	5
d. 2 Maximum heating anti-cycling time at 20°C flow temperature	2	60	min	1	20
d. 3 Target warm start temperature (product with integrated domestic hot water generation) Target cylinder temperature (product without integrated domestic hot water generation and with a connected domestic hot water cylinder)	Current value		°C	99 = No NTC connected 999 = NTC short circuit	–
d. 4 Display of secondary heat exchanger – temperature (product with integrated domestic hot water generation) Cylinder temperature (product without integrated domestic hot water generation and with connected domestic hot water cylinder)	Current value		°C	99 = No NTC connected 999 = NTC short circuit	–
d. 5 Target flow temperature	30	Value set under d.71	°C	1	75
d. 6 Target domestic hot water temperature	35	65	°C	1	60
d. 8 Room thermostat at terminals 3 and 4	Current value		–	0 = Open (no heat requirement) 1 = Closed (heat requirement)	–
d. 9 Target flow temperature from the external control at terminal 7-8-9/eBUS	Current value		°C	–	–
d.10 Status of the internal heating pump	Current value		–	1, 2 = On 0 = Off	–
d.11 Status of the external heating pump	Current value		–	1 to 100 = On 0 = Off	–
d.15 Pump speed	Current value		%	–	–
d.22 Domestic hot water requirement	Current value		–	1 = On 0 = Off	–
d.23 Summer mode (heating on/off)	Current value		–	1 = Heating on 0 = Heating off (Summer mode)	–
d.25 Cylinder charging/warm start enabled by the control	Current value		–	1 = Yes 0 = No	–
d.30 Control signal for both gas valves	Current value		–	1 = On 0 = Off	–
d.35 Position of the prioritising diverter valve	Current value		–	0 = Heating mode 40 = Mid-position 100 = Domestic hot water mode	–

Appendix

Diagnostics code	Values		Unit	Increment, select, explanation	Default setting
	Min.	Max.			
d.36 Domestic hot water flow meter	Current value		l/min	–	–
d.40 Flow temperature	Current value		°C	–	–
d.41 Return temperature	Current value		°C	–	–
d.44 Digitalised ionisation voltage	Current value		–	Value range 0-102	–
d.47 Outdoor temperature (with weather-compensated Vaillant control)	Current value		°C	–	–
d.48 Flue gas temperature	Current value		°C	–	–
d.49 Supply air temperature	Current value		°C	–	–
d.67 Remaining burner anti-cycling time	Current value		min	–	–
d.76 Unit type (Device specific number)	Current value		–	–	–
d.90 Status of the digital control	Current value		–	0 = Not recognised 1 = Recognised	–
d.91 DCF status with outdoor temperature sensor and DCF77 receiver connected	Current value		–	0 = No reception 1 = Reception 2 = Synchronised 3 = Valid	–
d.97 Activation of diagnostics level 2	0	99	–	Password: 17	–
d.99 Set the language (exclusive only)	Current value		–	–	–

B Diagnostics level 2 diagnostics codes



Note

Since the code table is used for various products, some codes may not be visible for the product in question.

Diagnostics code	Values		Unit	Increment, select, explanation	Default setting
	Min.	Max.			
d.14 Set the pump speed	0	5	–	0 = Auto 1 = 53% 2 = 60% 3 = 70% 4 = 85% 5 = 100%	0
d.17 Switch heating flow/return temperature control	0	1	–	0 = Flow 1 = Return	0
d.18 Pump mode (overrun)	0	2	–	0 = Overrun 1 = Continuous 2 = Winter	0
d.20 Cylinder temperature limit (product without integrated domestic hot water generation and with connected cylinder)	50	70	°C	1	65
d.27 Switching accessory relay 1	1	6	–	1 = Circulation pump 2 = External pump 3 = Cylinder charging pump 4 = Flue non-return flap/extraction hood 5 = External gas valve 6 = External fault message	2

Diagnostics code	Values		Unit	Increment, select, explanation	Default setting
	Min.	Max.			
d.28 Switching accessory relay 2	1	6	–	1 = Circulation pump 2 = External pump 3 = Cylinder charging pump 4 = Flue non-return flap/extraction hood 5 = External gas valve 6 = External fault message	2
d.52 Offset for minimum step motor position	0	99	–	1 Only change after the gas valve assembly has been replaced	Product-dependent
d.53 Offset for maximum step motor position of the gas valve assembly	-99	0	–	1	-25
d.56 Set the flue gas characteristic line	0	2	–	0: Austria characteristic line 1: Europe standard characteristic line 2: Not suitable for use	1
d.58 Activation of solar potable water post-heating (product with integrated domestic hot water generation); raising the minimum target potable water temperature.	0	3	–	0: Solar post-heating deactivated (adjustment range for the target potable water temperature: 35–65 °C) 1: Solar post-heating activated (adjustment range for the target potable water temperature: 60–65 °C) 2: Solar post-heating activated (adjustment range for the target potable water temperature: 35–65 °C) 3: Solar post-heating deactivated (adjustment range for the target potable water temperature: 60–65 °C)	0
d.60 Number of temperature limiter shut-downs	Current value		–	–	–
d.61 Number of flame sequence control faults	Current value		–	Unsuccessful ignitions at last attempt	–
d.63 Fuel gas fault meter	Current value		–	Flue gas exit detected	–
d.64 Average ignition time	Current value		s	–	–
d.65 Maximum ignition time	Current value		s	–	–
d.68 Unsuccessful ignitions at 1st attempt	Current value		–	–	–
d.69 Unsuccessful ignitions at 2nd attempt	Current value		–	–	–
d.70 Set the prioritising diverter valve position	0	2	–	0 = Normal operating mode 1 = Mid-position 2 = Permanent heating mode position	0
d.71 Max. target heating flow temperature	40	85	°C	1	75
d.72 Pump overrun after charging a domestic hot water cylinder (also warm start and charging via C1/C2)	0	600	s	10	Product with domestic hot water generation: 20 Product without domestic hot water generation: 80
d.73 Offset for target warm start value	-15	5	K	1	0
d.75 Maximum cylinder charging time (for cylinders without their own control system)	20	90	min	1	45
d.77 Domestic hot water generation partial load	Product-dependent	Product-dependent	kW	1	Full load

Appendix

Diagnostics code	Values		Unit	Increment, select, explanation	Default setting
	Min.	Max.			
d.78 Target value for maximum flow temperature for cylinder charging (only products without domestic hot water generation)	55	85	°C	1 This value must lie at least 15 K or 15 °C above the set cylinder target value.	80
d.80 Heating operating hours	Current value		h	After pressing the i button once, the first three numbers are displayed; after pressing the i button a second time, the second three numbers of the six-digit number are displayed.	–
d.81 DHW operating hours	Current value		h	After pressing the i button once, the first three numbers are displayed; after pressing the i button a second time, the second three numbers of the six-digit number are displayed.	–
d.82 Number of burner starts in heating mode	Current value		–	After pressing the i button once, the first three numbers are displayed; after pressing the i button a second time, the second three numbers of the six-digit number (burner starts x 100) are displayed.	–
d.83 Number of burner starts in domestic hot water mode	Current value		–	After pressing the i button once, the first three numbers are displayed; after pressing the i button a second time, the second three numbers of the six-digit number (burner starts x 100) are displayed.	–
d.84 Maintenance display: Number of hours until the next maintenance	0	300	h	300 corresponds to 3000 hrs – = Maintenance display not active	–
d.85 Lower unit output limit to prevent chimney sooting.	Product-dependent	Product-dependent	kW	Setting minimum to maximum heating output	–
d.88 Minimum DHW flow rate	0	1	–	0 = 1.5 l/min (no delay) 1 = 3.7 l/min (2 s delay)	0
d.93 Set the Device Specific Number	0	99	–	1	–
d.96 Default setting	–	–	–	1 = Reset adjustable parameters to factory setting	–
d.99 Telephone: Competent person	–	–	–	Programmable telephone number	–

C Inspection and maintenance work – Overview

The table below lists the manufacturer requirements with respect to minimum inspection and maintenance intervals. If national regulations and directives require shorter inspection and maintenance intervals, you should observe these instead of the intervals listed in the table.

No.	Work	Annually	As required
1	Disconnect the product from the power grid and shut off the gas supply	X	
2	Close the service valves; depressurise the product on both the heating and domestic hot water sides, if necessary also drain the unit	X	
3	Cleaning the primary heat exchanger		X
4	Checking the burner for dirt	X	
5	Cleaning the burner		X
6	If required, remove, descale and refit the secondary heat exchanger (to do this, close the cold-water isolation valve on the product)		X
7	Remove the flow meter, clean the strainer in the cold water inlet of the flow meter and refit the flow meter (to do this, close the cold-water isolation valve on the product)		X
8	Check whether the electrical plug connections and other connections are positioned correctly; adjust if necessary	X	
9	Check and, if required, correct the expansion vessel's pre-charge pressure	X	
10	Open the service valves, fill the product/installation to approx. 0.1–0.2 MPa (1.0–2.0 bar), depending on the static height of the installation	X	
11	Check the general condition of the product, remove any general dirt from the product	X	
12	Open the gas supply and switch on the product	X	

No.	Work	Annually	As required
13	Carry out a test operation on the product and heating installation including domestic hot water generation; purge if necessary.	X	
14	Perform a test operation of the product and heating installation, including domestic hot water generation (if available), and purge the system once more if necessary.	X	
15	Check the ignition and burner behaviour	X	
16	Check the product for gas and water leaks	X	
17	Check the flue system and air supply	X	
18	Check the safety devices	X	
19	Check and record the gas settings for the product		X
20	Log any inspection/maintenance work carried out	X	

D Fault messages – Overview

Fault code	Meaning	Possible cause
F. 0	Flow temperature sensor interruption	NTC plug not plugged in or has come loose, multiple plug on the PCB not plugged in correctly, interruption in cable harness, NTC defective
F. 1	Return temperature sensor interruption	NTC plug not plugged in or has come loose, multiple plug on the PCB not plugged in correctly, interruption in cable harness, NTC defective
F. 2	Interruption: DHW outlet sensor	NTC defective, NTC cable defective, defective plug connection on NTC, defective plug connection on cylinder electronics
F. 3	Interruption in cylinder temperature sensor/warm start temperature sensor	NTC defective, NTC cable defective, defective plug connection on NTC, defective plug connection on cylinder electronics
F. 5	Interruption at external flue gas sensor	Sensor defective, plug not connected, cable defective
F. 6	Interruption at internal flue gas sensor	Sensor defective, plug not connected, cable defective
F.10	Flow temperature sensor short circuit	NTC defective, short circuit in cable harness, cable/housing
F.11	Return temperature sensor short circuit	NTC defective, short circuit in cable harness, cable/housing
F.12	Short circuit: DHW outlet sensor	NTC defective, short circuit in cable harness, cable/housing
F.13	Short circuit in cylinder temperature sensor/warm start temperature sensor	NTC defective, short circuit in cable harness, cable/housing
F.15	Short circuit in external flue gas sensor	Short circuit in the cable to the housing, sensor defective
F.16	Short circuit in internal flue gas sensor	Short circuit in the cable to the housing, sensor defective
F.20	Safety shutdown: Safety cut-out	Incorrect earth connection between cable harness and product, flow or return NTC defective (loose connection), stray spark via ignition cable, ignition plug or ignition electrode
F.22	Safety shutdown: Water deficiency	No or insufficient water in the product, water pressure sensor defective, cable to the pump or to the water pressure sensor loose/not connected/defective
F.23	Safety shutdown: Temperature spread too great	Pump blocked, insufficient pump output, air in product, flow and return NTC connected the wrong way round
F.24	Safety shutdown: Temperature rise too fast	Pump blocked, insufficient pump output, air in product, system pressure too low, non-return valve blocked/incorrectly installed
F.25	flue gas temperature too high	Plug not plugged in or loose, safety cut-out plug not plugged in or loose, interruption in the cable harness, interruption in the cable to the heating pump, internal air vent does not work, flue gas route blocked or there are adverse wind conditions, flue pipework is too long, insufficient water in the heating circuit, heating pump does not work Activate check programme P.0.
F.26	Gas valve stepper motor current implausible	Gas valve stepper motor not connected, gas valve stepper motor defective, PCB defective
F.27	Safety shutdown: Flame simulation	Moisture on the electronics, electronics (flame monitor) defective, gas solenoid valve leaking
F.28	Failure during start-up: Ignition unsuccessful	Gas meter defective or gas pressure monitor has triggered, air in gas, gas flow pressure too low, thermal isolator device (TAE) has triggered, incorrect gas injector, incorrect spare gas valve assembly, fault on the gas valve assembly, multiple plug on PCB incorrectly plugged in, break in cable harness, ignition system (ignition transformer, ignition cable, ignition plug, ignition electrode) defective, ionisation flow interrupted (cable, electrode), incorrect earthing of product, electronics defective

Appendix

Fault code	Meaning	Possible cause
F.29	Failure during operation: Re-ignition unsuccessful	Gas supply temporarily stopped, flue gas recirculation, incorrect earthing of product, ignition transformer has spark failure
F.36	Flue gas exit detected	Flue system faulty/blocked, insufficient supply of supply air, return flow through the extract air fan/extraction hood
F.49	Fault: eBUS	Short circuit on eBUS, eBUS overload or two power supplies with different polarities on the eBUS
F.61	Fault: Gas valve assembly regulation	Short circuit/short to earth in cable harness for the gas valve assembly, gas valve assembly defective (coils shorted to earth), electronics defective
F.62	Fault: Gas valve assembly switch-off delay	Delayed switch-off of gas valve assembly, delayed extinguishing of flame signal, gas valve assembly leaking, electronics defective
F.63	Fault: EEPROM	Electronics defective
F.64	Electronics/NTC fault	Flow or return NTC short circuited, electronics defective
F.65	Fault: Electronics temp.	Electronics overheating due to external influences, electronics defective
F.67	Electronics/flame fault	Implausible flame signal, electronics defective
F.70	Invalid device specific number (DSN)	Display and PCB changed at the same time and Device Specific Number not reset
F.71	Flow temperature sensor fault	Flow temperature sensor signalling constant value: Flow temperature sensor incorrectly positioned on flow pipe, flow temperature sensor defective
F.72	Flow and/or return temperature sensor fault	Flow/return NTC temperature difference too great → flow and/or return temperature sensor defective
F.73	Fault: Water pressure sensor	Interruption/short circuit of water pressure sensor, interruption/short circuit to GND in supply line to water pressure sensor or water pressure sensor defective
F.74	Fault: Water pressure sensor	Line to water pressure sensor has a short circuit to 5 V/24 V or internal fault in the water pressure sensor
F.75	Fault: No pressure change detection when starting pump	Water pressure sensor and/or pump defective, air in the heating installation, insufficient water in the product; check adjustable bypass, connect external expansion vessel to the return
F.77	Fault in the flue non-return flap	No response, connection to the flue non-return flap defective, flue non-return flap defective
con	No communication with the PCB	Communication fault between the display and the PCB in the electronics box

E Check programmes

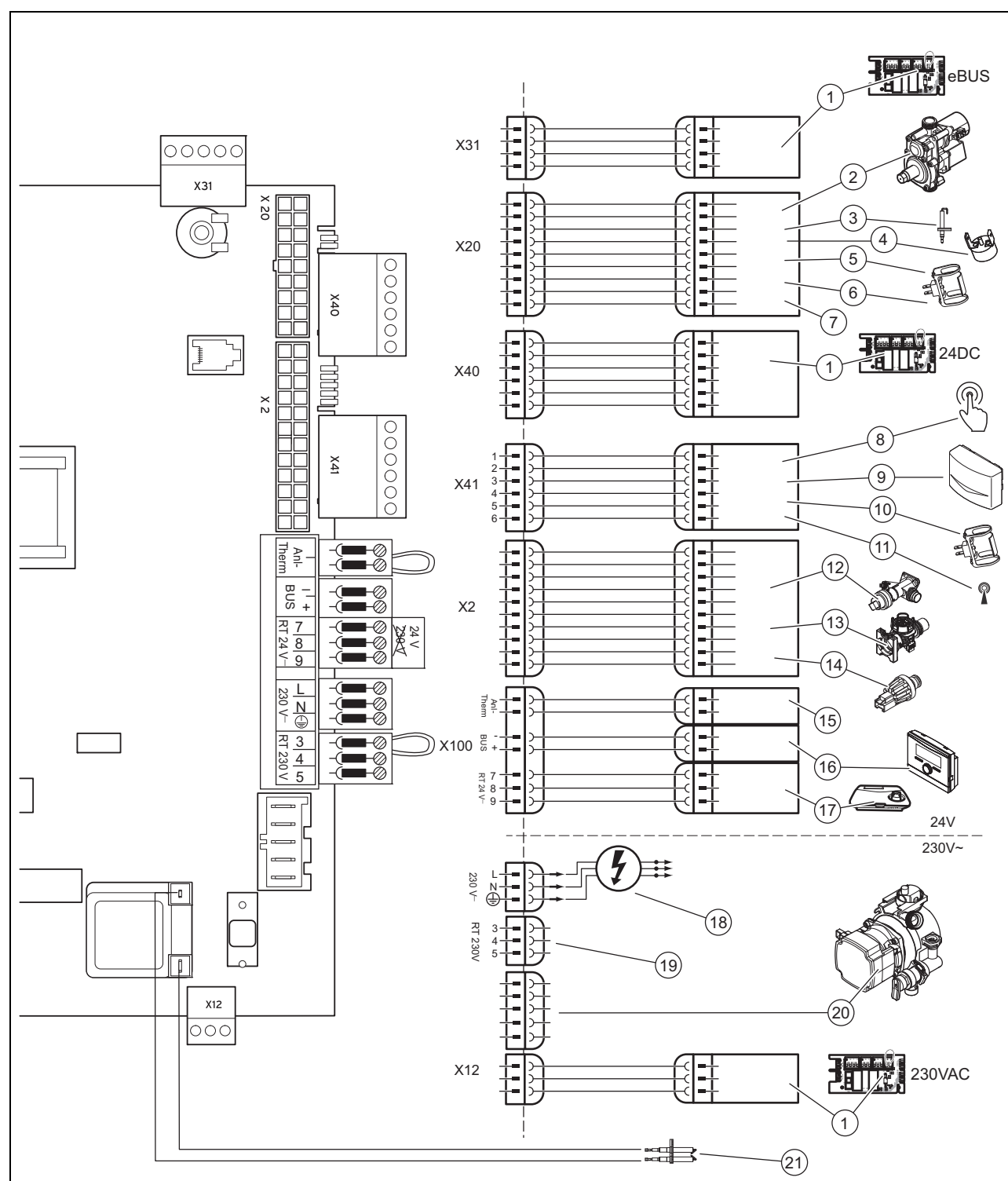
Display	Meaning
P.0	Purging check programme: The heating circuit and the hot water circuit are purged at the same time. The heating circuit and the hot water circuit are purged via the automatic air vent (the cap of the automatic air vent must be released).
P.1	Maximum load check programme: After successful ignition, the product is operated at maximum heat input.
P.2	Minimum load check programme: After successful ignition, the product is operated at minimum heat input.
P.5	Check programme for the safety cut-out (SCO). The burner is switched on with maximum output, the temperature control is switched off so that the burner heats until the software safety cut-out responds by reaching the safety cut-out temperature on the flow or return sensor.
P.6	Filling mode check programme: The prioritising diverter valve is moved to the mid-position. The burner and pump are switched off (to fill or drain the product).

F Status codes – Overview

Status code	Meaning
Displays in heating mode	
S.0	Heating: No heat demand
S.2	Heating mode: Pump prerun
S.3	Heating mode: Ignition
S.4	Heating mode: Burner on
S.7	Heating mode: Pump overrun
S.8	Heating, remaining anti-cycling time xx mins
Displays in domestic hot water mode	
S.10	Domestic hot water requirement

Status code	Meaning
S.13	DHW mode: Ignition
S.14	DHW mode: Burner on
S.17	DHW mode: Pump overrun
Displays in Comfort mode with warm start or domestic hot water mode with cylinder	
S.20	Domestic hot water requirement
S.23	DHW mode: Ignition
S.24	DHW mode: Burner on
S.27	DHW mode: Pump overrun
S.28	Domestic hot water burner anti-cycling time
Other displays	
S.30	Room thermostat blocks heating mode (control at terminals 3-4-5, terminals 3-4 are open)
S.31	Summer mode active or eBUS control is blocking heating mode
S.36	Control target value lies below 20 °C, external control blocks heating mode (control at terminals 7-8-9)
S.39	Surface-mounted thermostat contact open
S.41	Water pressure > 0.27 MPa (2.7 bar)
S.42	Flue non-return flap open (flue non-return flap feedback blocks burner operation)
S.51	The product is within the 55 s tolerance period as a result of a flue gas potentially escaping
S.52	The product is within the 20 minute waiting period due to flue gas exit
S.53	The product is within the 2.5 minute waiting period due to a water deficiency (difference between flow and return is too large)
S.54	The product is within the 20 minute waiting period due to a water deficiency (temperature gradient)
S.96	Return sensor test running, heating demands are blocked.
S.97	The water pressure sensor test is running, the heat demands are blocked.
S.98	Flow/return sensor test running, heating demands are blocked.

G Wiring diagram



- | | | | |
|---|--|----|--|
| 1 | Optional components | 10 | Flow temperature sensor (optional, external) |
| 2 | Gas valve assembly | 11 | DCF receiver |
| 3 | Monitoring electrode | 12 | Prioritising diverter valve |
| 4 | flue gas temperature monitor (safety function) | 13 | Flow meter |
| 5 | Flow temperature sensor | 14 | Pressure sensor |
| 6 | Return temperature sensor | 15 | Limit thermostat for 20 V underfloor heating |
| 7 | Flue gas sensor, warm start NTC, DHW outlet NTC (exclusive only) | 16 | eBUS controller |
| 8 | Circulation pump remote control | 17 | 24 V room thermostat |
| 9 | Outdoor temperature sensor | 18 | Power supply: 230 V/50 Hz |

19 230 V/50 Hz room thermostat
20 Heating pump (the type may vary)

21 Ignition electrode

H Technical data

Technical data – Power/loading G20/G25

	VC DE 104/4-7 A-L	VC DE 104/4-7 A-H	VCC 194/4-5 120 (E-DE), surface-mounted	VCC 194/4-5 120 (E-DE), concealed	VCC 194/4-5 120 (LL-DE), surface-mounted	VCC 194/4-5 120 (LL-DE), concealed	VCW DE 204/4-7 A-L
Nominal heat output range P at 80/60 °C	4.8 ... 10.0 kW	4.8 ... 10.0 kW	8.0 ... 20.0 kW	8.0 ... 20.0 kW	8.0 ... 20.0 kW	8.0 ... 20.0 kW	8.0 ... 20.0 kW
Maximum heating output for domestic hot water generation	10.0 kW	10.0 kW	20.0 kW	20.0 kW	20.0 kW	20.0 kW	22.0 kW
Maximum heating-side heating load	11.1 kW	11.1 kW	22.2 kW	22.2 kW	22.2 kW	22.2 kW	22.2 kW
Minimum heating-side heating load	5.3 kW	5.3 kW	8.9 kW	8.9 kW	8.9 kW	8.9 kW	8.9 kW
Maximum heating load for domestic hot water generation	11.1 kW	11.1 kW	22.2 kW	22.2 kW	22.2 kW	22.2 kW	24.4 kW

	VCW DE 204/4-7 A-H	VCW DE 254/4-7 A-L	VCW DE 254/4-7 A-H	VCW DE 194/4-5 A-L	VCW DE 194/4-5 A-H	VCW DE 244/4-5 A-L	VCW DE 244/4-5 A-H
Nominal heat output range P at 80/60 °C	8.0 ... 20.0 kW	9.6 ... 24.0 kW	9.6 ... 24.0 kW	8.0 ... 20.0 kW	8.0 ... 20.0 kW	9.6 ... 24.0 kW	9.6 ... 24.0 kW
Maximum heating output for domestic hot water generation	22.0 kW	26.0 kW	26.0 kW	20.0 kW	20.0 kW	24.0 kW	24.0 kW
Maximum heating-side heating load	22.2 kW	26.6 kW	26.6 kW	22.2 kW	22.2 kW	26.6 kW	26.6 kW
Minimum heating-side heating load	8.9 kW	10.7 kW	10.7 kW	8.9 kW	8.9 kW	10.7 kW	10.7 kW
Maximum heating load for domestic hot water generation	24.4 kW	28.9 kW	28.9 kW	22.2 kW	22.2 kW	26.6 kW	26.6 kW

Technical data – Power/loading G31

	VC DE 104/4-7 A-P	VCW DE 204/4-7 A-P	VCW DE 254/4-7 A-P
Nominal heat output range P at 80/60 °C	4.8 ... 10.0 kW	8.9 ... 18.0 kW	11.0 ... 22.0 kW
Maximum heating output for hot water generation	10.0 kW	20.0 kW	24.0 kW

Appendix

	VC DE 104/4-7 A-P	VCW DE 204/4-7 A-P	VCW DE 254/4-7 A-P
Maximum heating-side heating load	11.1 kW	20.0 kW	24.4 kW
Minimum heating-side heating load	5.3 kW	9.9 kW	12.0 kW
Maximum heating load for hot water generation	11.1 kW	22.2 kW	26.6 kW

Technical data – Heating

	VC DE 104/4-7 A-P	VC DE 104/4-7 A-L	VC DE 104/4-7 A-H	VCC 194/4-5 120 (E-DE), surface-mounted	VCC 194/4-5 120 (E-DE), concealed	VCC 194/4-5 120 (LL-DE), surface-mounted	VCC 194/4-5 120 (LL-DE), concealed
Maximum flow temperature	75 °C	75 °C	75 °C	75 °C	75 °C	75 °C	75 °C
Max. flow temperature adjustment range (default setting: 75 °C)	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C
Permissible total over-pressure	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)
Circulation water volume (with reference to $\Delta T = 20$ K)	430 l/h	430 l/h	430 l/h	860 l/h	860 l/h	860 l/h	860 l/h
Remaining feed head of pump (at nominal circulation water volume)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)

	VCW DE 204/4-7 A-P	VCW DE 204/4-7 A-L	VCW DE 204/4-7 A-H	VCW DE 254/4-7 A-P	VCW DE 254/4-7 A-L	VCW DE 254/4-7 A-H	VCW DE 194/4-5 A-L
Maximum flow temperature	75 °C	75 °C	75 °C	75 °C	75 °C	75 °C	75 °C
Max. flow temperature adjustment range (default setting: 75 °C)	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C
Permissible total over-pressure	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)
Circulation water volume (with reference to $\Delta T = 20$ K)	860 l/h	860 l/h	860 l/h	1,030 l/h	1,030 l/h	1,030 l/h	860 l/h
Remaining feed head of pump (at nominal circulation water volume)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)

	VCW DE 194/4-5 A-H	VCW DE 244/4-5 A-L	VCW DE 244/4-5 A-H
Maximum flow temperature	75 °C	75 °C	75 °C
Max. flow temperature adjustment range (default setting: 75 °C)	30 ... 85 °C	30 ... 85 °C	30 ... 85 °C
Permissible total overpressure	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)	0.3 MPa (3.0 bar)
Circulation water volume (with reference to $\Delta T = 20 \text{ K}$)	860 l/h	1,030 l/h	1,030 l/h
Remaining feed head of pump (at nominal circulation water volume)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)	0.025 MPa (0.250 bar)

Technical data – Domestic hot water mode

	VC DE 104/4-7 A-P	VC DE 104/4-7 A-L	VC DE 104/4-7 A-H	VCC 194/4-5 120 (E-DE), surface-mounted	VCC 194/4-5 120 (E-DE), concealed	VCC 194/4-5 120 (LL-DE), surface-mounted	VCC 194/4-5 120 (LL-DE), concealed
Water volume (at $\Delta T = 30 \text{ K}$)	–	–	–	9.6 l/min	9.6 l/min	9.6 l/min	9.6 l/min
Water volume (at $\Delta T = 45 \text{ K}$)	–	–	–	6.4 l/min	6.4 l/min	6.4 l/min	6.4 l/min
Permitted overpressure	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)
Domestic hot water output temperature range	40 ... 70 °C	40 ... 70 °C	40 ... 70 °C	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C

	VCW DE 204/4-7 A-P	VCW DE 204/4-7 A-L	VCW DE 204/4-7 A-H	VCW DE 254/4-7 A-P	VCW DE 254/4-7 A-L	VCW DE 254/4-7 A-H	VCW DE 194/4-5 A-L
Water volume (at $\Delta T = 30 \text{ K}$)	9.6 l/min	10.5 l/min	10.5 l/min	11.5 l/min	12.4 l/min	12.4 l/min	9.6 l/min
Water volume (at $\Delta T = 45 \text{ K}$)	6.4 l/min	7.0 l/min	7.0 l/min	7.7 l/min	8.3 l/min	8.3 l/min	6.4 l/min
Permitted overpressure	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)
Domestic hot water output temperature range	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C

Appendix

	VCW DE 194/4-5 A-H	VCW DE 244/4-5 A-L	VCW DE 244/4-5 A-H
Water volume (at $\Delta T = 30 \text{ K}$)	9.6 l/min	11.5 l/min	11.5 l/min
Water volume (at $\Delta T = 45 \text{ K}$)	6.4 l/min	7.7 l/min	7.7 l/min
Permitted overpressure	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)	1.0 MPa (10.0 bar)
Domestic hot water output temperature range	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C

Technical data – General

	VC DE 104/4-7 A-P	VC DE 104/4-7 A-L	VC DE 104/4-7 A-H	VCC 194/4-5 120 (E-DE), surface-mounted	VCC 194/4-5 120 (E-DE), concealed	VCC 194/4-5 120 (LL-DE), surface-mounted	VCC 194/4-5 120 (LL-DE), concealed
Unit category	I _{2ELL3P}	I _{2ELL}	I _{2ELL}	I _{2E}	I _{2E}	I _{2LL}	I _{2LL}
Gas connection, boiler side	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Flow/return heating connections, boiler side	22 mm	22 mm	22 mm	22 mm	22 mm	22 mm	22 mm
Domestic hot and cold water connection, boiler side	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm
Expansion vessel volume	12 l	12 l	12 l	12 l	12 l	12 l	12 l
Expansion vessel pre-charge pressure	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)
Flue gas connection	90 mm	90 mm	90 mm	110 mm	110 mm	110 mm	110 mm
G20 natural gas flow pressure	2 kPa	2 kPa	2 kPa	2 kPa	2 kPa	–	–
G25 natural gas flow pressure	2 kPa	2 kPa	2 kPa	–	–	2 kPa	2 kPa
G31 natural gas flow pressure	2 kPa	2 kPa	2 kPa	–	–	–	–
Gas connection G20, $H_i = 34.02 \text{ MJ/m}^3$	1.17 m³/h	1.17 m³/h	1.17 m³/h	2.35 m³/h	2.35 m³/h	–	–
G25 gas connection, $H_i = 29.25 \text{ MJ/m}^3$	1.37 m³/h	1.37 m³/h	1.37 m³/h	–	–	2.73 m³/h	2.73 m³/h
G31 gas connection, $H_i = 88.00 \text{ MJ/m}^3$	0.86 kg/h	–	–	–	–	–	–
Min. flue gas mass flow rate (G20)	6.0 g/s	6.0 g/s	6.0 g/s	11.0 g/s	11.0 g/s	11.0 g/s	11.0 g/s
Max. flue gas mass flow rate (G20)	8.0 g/s	8.0 g/s	8.0 g/s	13.0 g/s	13.0 g/s	13.0 g/s	13.0 g/s
Min. flue gas temperature	85 °C	85 °C	85 °C	90 °C	90 °C	90 °C	90 °C
Max. flue gas temperature	120 °C	120 °C	120 °C	150 °C	150 °C	150 °C	150 °C
NOx emissions	51 mg/kW·h	51 mg/kW·h	51 mg/kW·h	30 mg/kW·h	30 mg/kW·h	30 mg/kW·h	30 mg/kW·h

	VC DE 104/4-7 A-P	VC DE 104/4-7 A-L	VC DE 104/4-7 A-H	VCC 194/4-5 120 (E-DE), surface-mounted	VCC 194/4-5 120 (E-DE), concealed	VCC 194/4-5 120 (LL-DE), surface-mounted	VCC 194/4-5 120 (LL-DE), concealed
Flue gas discharge pressure P_w	0.0015 kPa (0.0150 mbar)	0.0015 kPa (0.0150 mbar)	0.0015 kPa (0.0150 mbar)	0.0015 kPa (0.0150 mbar)	0.0015 kPa (0.0150 mbar)	0.0015 kPa (0.0150 mbar)	0.0015 kPa (0.0150 mbar)
Boiler dimension, width	440 mm	440 mm	440 mm	440 mm	440 mm	440 mm	440 mm
Boiler dimension, height	800 mm	800 mm	800 mm	800 mm	800 mm	800 mm	800 mm
Boiler dimension, depth	338 mm	338 mm	338 mm	338 mm	338 mm	338 mm	338 mm
Approx. net weight	39 kg	39 kg	39 kg	44 kg	44 kg	44 kg	44 kg

	VCW DE 204/4-7 A-P	VCW DE 204/4-7 A-L	VCW DE 204/4-7 A-H	VCW DE 254/4-7 A-P	VCW DE 254/4-7 A-L	VCW DE 254/4-7 A-H	VCW DE 194/4-5 A-L
Unit category	II _{2ELL3P}	I _{2ELL}	I _{2ELL}	II _{2ELL3P}	I _{2ELL}	I _{2ELL}	I _{2ELL}
Gas connection, boiler side	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Flow/return heating connections, boiler side	22 mm	22 mm	22 mm	22 mm	22 mm	22 mm	22 mm
Domestic hot and cold water connection, boiler side	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm
Expansion vessel volume	12 l	12 l	12 l	12 l	12 l	12 l	12 l
Expansion vessel pre-charge pressure	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)
Flue gas connection	110 mm	110 mm	110 mm	130 mm	130 mm	130 mm	110 mm
G20 natural gas flow pressure	2 kPa	2 kPa	2 kPa	2 kPa	2 kPa	2 kPa	2 kPa
G25 natural gas flow pressure	2 kPa	2 kPa	2 kPa	2 kPa	2 kPa	2 kPa	2 kPa
G31 natural gas flow pressure	2 kPa	2 kPa	2 kPa	2 kPa	2 kPa	2 kPa	2 kPa
Gas connection G20, $H_i = 34.02 \text{ MJ/m}^3$	2.35 m ³ /h	2.58 m ³ /h	2.58 m ³ /h	2.81 m ³ /h	3.06 m ³ /h	3.06 m ³ /h	2.35 m ³ /h
G25 gas connection, $H_i = 29.25 \text{ MJ/m}^3$	2.73 m ³ /h	2.58 m ³ /h	2.58 m ³ /h	3.27 m ³ /h	3.56 m ³ /h	3.56 m ³ /h	2.73 m ³ /h
G31 gas connection, $H_i = 88.00 \text{ MJ/m}^3$	1.72 kg/h	–	–	2.07 kg/h	–	–	–
Min. flue gas mass flow rate (G20)	11.0 g/s	11.0 g/s	11.0 g/s	15.0 g/s	15.0 g/s	15.0 g/s	11.0 g/s
Max. flue gas mass flow rate (G20)	13.0 g/s	13.0 g/s	13.0 g/s	18.0 g/s	18.0 g/s	18.0 g/s	13.0 g/s
Min. flue gas temperature	90 °C	90 °C	90 °C	90 °C	90 °C	90 °C	90 °C
Max. flue gas temperature	150 °C	150 °C	150 °C	130 °C	130 °C	130 °C	150 °C
NOx emissions	33 mg/kW·h	30 mg/kW·h	30 mg/kW·h	29.0 mg/kW·h	37 mg/kW·h	37 mg/kW·h	30 mg/kW·h

Appendix

	VCW DE 204/4-7 A- P	VCW DE 204/4-7 A- L	VCW DE 204/4-7 A- H	VCW DE 254/4-7 A- P	VCW DE 254/4-7 A- L	VCW DE 254/4-7 A- H	VCW DE 194/4-5 A- L
Flue gas discharge pressure P_w	0.0017 kPa (0.0170 mbar)	0.0017 kPa (0.0170 mbar)	0.0017 kPa (0.0170 mbar)	0.0015 kPa (0.0150 mbar)	0.0022 kPa (0.0220 mbar)	0.0022 kPa (0.0220 mbar)	0.0015 kPa (0.0150 mbar)
Boiler dimension, width	440 mm	440 mm	440 mm	440 mm	440 mm	440 mm	440 mm
Boiler dimension, height	800 mm	800 mm	800 mm	800 mm	800 mm	800 mm	800 mm
Boiler dimension, depth	338 mm	338 mm	338 mm	338 mm	338 mm	338 mm	338 mm
Approx. net weight	44 kg	44 kg	44 kg	44 kg	44 kg	44 kg	44 kg

	VCW DE 194/4-5 A- H	VCW DE 244/4-5 A- L	VCW DE 244/4-5 A- H
Unit category	I _{2ELL}	I _{2ELL}	I _{2ELL}
Gas connection, boiler side	20 mm	20 mm	20 mm
Flow/return heating connections, boiler side	22 mm	22 mm	22 mm
Domestic hot and cold water connection, boiler side	15 mm	15 mm	15 mm
Expansion vessel volume	12 l	12 l	12 l
Expansion vessel pre-charge pressure	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)	0.075 MPa (0.750 bar)
Flue gas connection	110 mm	130 mm	130 mm
G20 natural gas flow pressure	2 kPa	2 kPa	2 kPa
G25 natural gas flow pressure	2 kPa	2 kPa	2 kPa
G31 natural gas flow pressure	2 kPa	2 kPa	2 kPa
Gas connection G20, $H_i = 34.02 \text{ MJ/m}^3$	2.35 m ³ /h	2.81 m ³ /h	2.81 m ³ /h
G25 gas connection, $H_i = 29.25 \text{ MJ/m}^3$	2.73 m ³ /h	3.27 m ³ /h	3.27 m ³ /h
G31 gas connection, $H_i = 88.00 \text{ MJ/m}^3$	–	–	–
Min. flue gas mass flow rate (G20)	11.0 g/s	15.0 g/s	15.0 g/s
Max. flue gas mass flow rate (G20)	13.0 g/s	18.0 g/s	18.0 g/s
Min. flue gas temperature	90 °C	90 °C	90 °C
Max. flue gas temperature	150 °C	130 °C	130 °C
NOx emissions	30 mg/kW-h	37 mg/kW-h	37 mg/kW-h
Flue gas discharge pressure P_w	0.0015 kPa (0.0150 mbar)	0.0015 kPa (0.0150 mbar)	0.0015 kPa (0.0150 mbar)

	VCW DE 194/4-5 A- H	VCW DE 244/4-5 A- L	VCW DE 244/4-5 A- H
Boiler dimension, width	440 mm	440 mm	440 mm
Boiler dimension, height	800 mm	800 mm	800 mm
Boiler dimension, depth	338 mm	338 mm	338 mm
Approx. net weight	44 kg	44 kg	44 kg

Technical data – Electrics

	VC DE 104/4- 7 A-P	VC DE 104/4- 7 A-L	VC DE 104/4- 7 A-H	VCC 194/4- 5 120 (E- DE), surface- mounted	VCC 194/4-5 120 (E-DE), concealed	VCC 194/4- 5 120 (LL- DE), surface- mounted	VCC 194/4-5 120 (LL-DE), concealed
Electric con- nection	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz
Max. elec- trical power consumption	50 W	50 W	50 W	50 W	50 W	50 W	50 W
Level of pro- tection	IP X4 D	IP X4 D	IP X4 D	IP X4 D	IP X4 D	IP X4 D	IP X4 D

	VCW DE 204/4-7 A-P	VCW DE 204/4-7 A-L	VCW DE 204/4-7 A-H	VCW DE 254/4-7 A-P	VCW DE 254/4-7 A-L	VCW DE 254/4-7 A-H	VCW DE 194/4-5 A-L
Electric con- nection	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz
Max. elec- trical power consumption	50 W	50 W	50 W	50 W	50 W	50 W	50 W
Level of pro- tection	IP X4 D	IP X4 D	IP X4 D	IP X4 D	IP X4 D	IP X4 D	IP X4 D

	VCW DE 194/4-5 A-H	VCW DE 244/4-5 A-L	VCW DE 244/4-5 A-H
Electric con- nection	230 V/50 Hz	230 V/50 Hz	230 V/50 Hz
Max. elec- trical power consumption	50 W	50 W	50 W
Level of pro- tection	IP X4 D	IP X4 D	IP X4 D

Technical data – Gas adjustment values for the heat input (jet pressure)

	VC DE 104/4- 7 A-P	VC DE 104/4- 7 A-L	VC DE 104/4- 7 A-H	VCC 194/4- 5 120 (E- DE), surface- mounted	VCC 194/4-5 120 (E-DE), concealed	VCC 194/4- 5 120 (LL- DE), surface- mounted	VCC 194/4-5 120 (LL-DE), concealed
Natural gas (G20)	0.2 ... 0.73 kPa (2.0 ... 7.30 mbar)	0.2 ... 0.73 kPa (2.0 ... 7.30 mbar)	0.2 ... 0.73 kPa (2.0 ... 7.30 mbar)	0.17 ... 0.95 kPa (1.70 ... 9.50 mbar)	0.17 ... 0.95 kPa (1.70 ... 9.50 mbar)	–	–
Natural gas (G25)	0.13 ... 0.49 kPa (1.30 ... 4.90 mbar)	0.13 ... 0.49 kPa (1.30 ... 4.90 mbar)	0.13 ... 0.49 kPa (1.30 ... 4.90 mbar)	–	–	0.13 ... 0.71 kPa (1.30 ... 7.10 mbar)	0.13 ... 0.71 kPa (1.30 ... 7.10 mbar)
(G31) liquid gas	0.62 ... 2.09 kPa (6.20 ... 20.90 mbar)	–	–	–	–	–	–
Minimum heat input (G20)	2.0 mbar	2.0 mbar	2.0 mbar	1.7 mbar	1.7 mbar	–	–

Appendix

	VC DE 104/4-7 A-P	VC DE 104/4-7 A-L	VC DE 104/4-7 A-H	VCC 194/4-5 120 (E-DE), surface-mounted	VCC 194/4-5 120 (E-DE), concealed	VCC 194/4-5 120 (LL-DE), surface-mounted	VCC 194/4-5 120 (LL-DE), concealed
Maximum heat input (G20)	7.3 mbar	7.3 mbar	7.3 mbar	9.5 mbar	9.5 mbar	–	–
Minimum heat input (G25)	1.3 mbar	1.3 mbar	1.3 mbar	–	–	1.3 mbar	1.3 mbar
Maximum heat input (G25)	4.9 mbar	4.9 mbar	4.9 mbar	–	–	7.1 mbar	7.1 mbar
Minimum heat input (G31)	6.2 mbar	–	–	–	–	–	–
Maximum heat input (G31)	20.9 mbar	–	–	–	–	–	–

	VCW DE 204/4-7 A-P	VCW DE 204/4-7 A-L	VCW DE 204/4-7 A-H	VCW DE 254/4-7 A-P	VCW DE 254/4-7 A-L	VCW DE 254/4-7 A-H	VCW DE 194/4-5 A-L
Natural gas (G20)	0.17 ... 0.95 kPa (1.70 ... 9.50 mbar)	0.17 ... 1.16 kPa (1.70 ... 11.60 mbar)	0.17 ... 1.16 kPa (1.70 ... 11.60 mbar)	0.18 ... 0.9 kPa (1.80 ... 9.0 mbar)	0.18 ... 1.03 kPa (1.80 ... 10.30 mbar)	0.18 ... 1.03 kPa (1.80 ... 10.30 mbar)	0.17 ... 0.95 kPa (1.70 ... 9.50 mbar)
Natural gas (G25)	0.13 ... 0.71 kPa (1.30 ... 7.10 mbar)	0.13 ... 0.86 kPa (1.30 ... 8.60 mbar)	0.13 ... 0.86 kPa (1.30 ... 8.60 mbar)	0.14 ... 0.65 kPa (1.40 ... 6.50 mbar)	0.14 ... 0.76 kPa (1.40 ... 7.60 mbar)	0.14 ... 0.76 kPa (1.40 ... 7.60 mbar)	0.13 ... 0.71 kPa (1.30 ... 7.10 mbar)
(G31) liquid gas	0.56 ... 2.39 kPa (5.60 ... 23.90 mbar)	–	–	0.55 ... 2.41 kPa (5.50 ... 24.10 mbar)	–	–	–
Minimum heat input (G20)	1.7 mbar	1.7 mbar	1.7 mbar	1.8 mbar	1.8 mbar	1.8 mbar	1.7 mbar
Maximum heat input (G20)	9.5 mbar	11.6 mbar	11.6 mbar	9 mbar	10.3 mbar	10.3 mbar	9.5 mbar
Minimum heat input (G25)	1.3 mbar	1.3 mbar	1.3 mbar	1.4 mbar	1.4 mbar	1.4 mbar	1.3 mbar
Maximum heat input (G25)	7.1 mbar	8.6 mbar	8.6 mbar	6.5 mbar	7.6 mbar	7.6 mbar	7.1 mbar
Minimum heat input (G31)	5.6 mbar	–	–	5.5 mbar	–	–	–
Maximum heat input (G31)	23.9 mbar	–	–	24.1 mbar	–	–	–

	VCW DE 194/4-5 A-H	VCW DE 244/4-5 A-L	VCW DE 244/4-5 A-H
Natural gas (G20)	0.17 ... 0.95 kPa (1.70 ... 9.50 mbar)	0.18 ... 0.9 kPa (1.80 ... 9.0 mbar)	0.18 ... 0.9 kPa (1.80 ... 9.0 mbar)
Natural gas (G25)	0.13 ... 0.71 kPa (1.30 ... 7.10 mbar)	0.14 ... 0.65 kPa (1.40 ... 6.50 mbar)	0.14 ... 0.65 kPa (1.40 ... 6.50 mbar)
(G31) liquid gas	–	–	–

	VCW DE 194/4-5 A-H	VCW DE 244/4-5 A-L	VCW DE 244/4-5 A-H
Minimum heat input (G20)	1.7 mbar	1.8 mbar	1.8 mbar
Maximum heat input (G20)	9.5 mbar	9 mbar	9 mbar
Minimum heat input (G25)	1.3 mbar	1.4 mbar	1.4 mbar
Maximum heat input (G25)	7.1 mbar	6.5 mbar	6.5 mbar
Minimum heat input (G31)	–	–	–
Maximum heat input (G31)	–	–	–

Technical data – Burner jets

	VC DE 104/4-7 A-P	VC DE 104/4-7 A-L	VC DE 104/4-7 A-H	VCC 194/4-5 120 (E-DE), surface-mounted	VCC 194/4-5 120 (E-DE), concealed	VCC 194/4-5 120 (LL-DE), surface-mounted	VCC 194/4-5 120 (LL-DE), concealed
Natural gas (G20)	13x7/84, 2x7/95	13x7/84, 2x7/95	13x7/84, 2x7/95	25x7/84, 2x7/95	25x7/84, 2x7/95	–	–
Natural gas (G25)	13x7/100, 2x7/110	13x7/100, 2x7/110	13x7/100, 2x7/110	–	–	25x7/100, 2x7/110	25x7/100, 2x7/110
(G31) liquid gas	13x7/52, 2x7/57	–	–	–	–	–	–

	VCW DE 204/4-7 A-P	VCW DE 204/4-7 A-L	VCW DE 204/4-7 A-H	VCW DE 254/4-7 A-P	VCW DE 254/4-7 A-L	VCW DE 254/4-7 A-H	VCW DE 194/4-5 A-L
Natural gas (G20)	25x7/84, 2x7/95	25x7/84, 2x7/95	25x7/84, 2x7/95	31 x 7/84, 2 x 7/95	31 x 7/84, 2 x 7/95	31 x 7/84, 2 x 7/95	25x7/84, 2x7/95
Natural gas (G25)	25x7/100, 2x7/110	25x7/100, 2x7/110	25x7/100, 2x7/110	31 x 7/100, 2 x 7/110	31 x 7/100, 2 x 7/110	31 x 7/100, 2 x 7/110	25x7/100, 2x7/110
(G31) liquid gas	25x7/52, 2x7/57	–	–	31x7/52, 2x7/57	–	–	–

	VCW DE 194/4-5 A-H	VCW DE 244/4-5 A-L	VCW DE 244/4-5 A-H
Natural gas (G20)	25x7/84, 2x7/95	31 x 7/84, 2 x 7/95	31 x 7/84, 2 x 7/95
Natural gas (G25)	25x7/100, 2x7/110	31 x 7/100, 2 x 7/110	31 x 7/100, 2 x 7/110
(G31) liquid gas	–	–	–

Technical data – liquefied petroleum gas orifice plates (G31)

VC DE 104/4-7 A-P	VC DE 104/4-7 A-L	VC DE 104/4-7 A-H	VCC 194/4-5 120 (E-DE), surface-mounted	VCC 194/4-5 120 (E-DE), concealed	VCC 194/4-5 120 (LL-DE), surface-mounted	VCC 194/4-5 120 (LL-DE), concealed
2.0	–	–	–	–	–	–

VCW DE 204/4-7 A-P	VCW DE 204/4-7 A-L	VCW DE 204/4-7 A-H	VCW DE 254/4-7 A-P	VCW DE 254/4-7 A-L	VCW DE 254/4-7 A-H	VCW DE 194/4-5 A-L
3.0	–	–	3.4	–	–	–

VCW DE 194/4-5 A-H	VCW DE 244/4-5 A-L	VCW DE 244/4-5 A-H
–	–	–

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