

Installation and maintenance instructions



auroCOMPACT

VSC D ../4

DE

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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 General safety information

1.3.1 Risk caused by inadequate qualifications

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

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

1.3.2 Risk of death from electric shock

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

Before commencing work on the product:

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

1.3.3 Risk of death 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.

1.3.4 Risk of death from leaks if the product is installed below ground level

Liquid gas accumulates at floor level. If the product is installed below ground level, liquid gas may accumulate at floor level if there are any leaks. In this case, there is a risk of explosion.

- ▶ Make sure that liquid gas cannot escape from the product or the gas line under any circumstance.

1.3.5 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.

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

- ▶ Only operate the product if the air/flue pipe 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.

1.3.7 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).

1.3.8 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.

1.3.9 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.

1.3.10 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.

1.3.11 Risk of being burned or scalded by hot components

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



1 Safety



1.3.12 Risk of death from escaping flue gas

If you operate the product with an empty condensate siphon, flue gas may escape into the room air.

- ▶ In order to operate the product, ensure that the condensate siphon is always full.

Conditions: Permitted B23 or B23P unit types with condensate siphon (third-party accessory)

- Water seal level: ≥ 200 mm

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

The product weighs over 50 kg.

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

1.3.14 Risk of material damage caused by frost

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

1.3.15 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.
- ▶ 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.

1.3.16 Risk of material damage caused by leak detection sprays and fluids

Leak detection sprays and fluids block the filter for the mass flow sensor on the Venturi, thereby destroying the mass flow sensor.

- ▶ During repair work, do not apply any leak detection sprays or fluids to the covering cap on the filter for the Venturi.

1.3.17 Risk of material damage caused by using an unsuitable tool

- ▶ Use the correct tool.

1.4 Regulations (directives, laws, standards)

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



2 Notes on the documentation

2.1 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 types and article numbers

VSC D 146/4-5 150	0010020257
VSC D 146/4-5 150 (LL)	0010020258
VSC D 206/4-5 150	0010020259
VSC D 206/4-5 150 (LL)	0010020260
VSC D 146/4-5 190	0010020261
VSC D 206/4-5 190	0010020262

3 Product description

3.1 Serial number

The serial number is located behind a plate below the user interface. It is also specified on the identification plate.



Note

The serial number can also be shown on the display of the product (see the operating instructions).

3.2 Information on the data plate

The data plate indicates the country in which the unit is to be installed.

Information on the data plate	Meaning
Serial number	For identification purposes; 7th to 16th digits = product article number
VSC D...	Gas-fired boiler for heating and domestic hot water generation
auroCOMPACT	Product designation
2H, G20 - 20 mbar (2 kPa)	Gas group and gas connection pressure as set at the factory
Kat.(e.g. II _{2H3P})	Approved gas category
Condensing technology	Efficiency class of the boiler in accordance with EC Directive 92/42/EEC
Type (e.g. C ₁₃)	Permissible flue gas connections
PMS (e.g. 3 bar (0.3 MPa))	Maximum water pressure in heating mode
230 V 50 Hz	Electrical connection – Voltage – Frequency
(e.g. 100) W	Max. electrical power consumption
IP (e.g. X4D)	Degree of protection against water
	Heating mode

Information on the data plate	Meaning
	DHW mode
P _n	Nominal heat output range in heating mode
P	Nominal heat output range in domestic hot water mode
Q _n	Nominal heat input range in heating mode
Q _{nw}	Nominal heat input range in domestic hot water mode
N _L	Output characteristic figure in accordance with the standard DIN 4708
V _s	Water content in the domestic hot water cylinder
PMW	Maximum water pressure in domestic hot water mode
NO _x	NO _x class for the unit
D	Specific flow rate in domestic hot water mode in accordance with EN13203-1
CE marking	Product complies with European standards and directives



Note

Check whether the product is compatible with the gas type available on site.

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

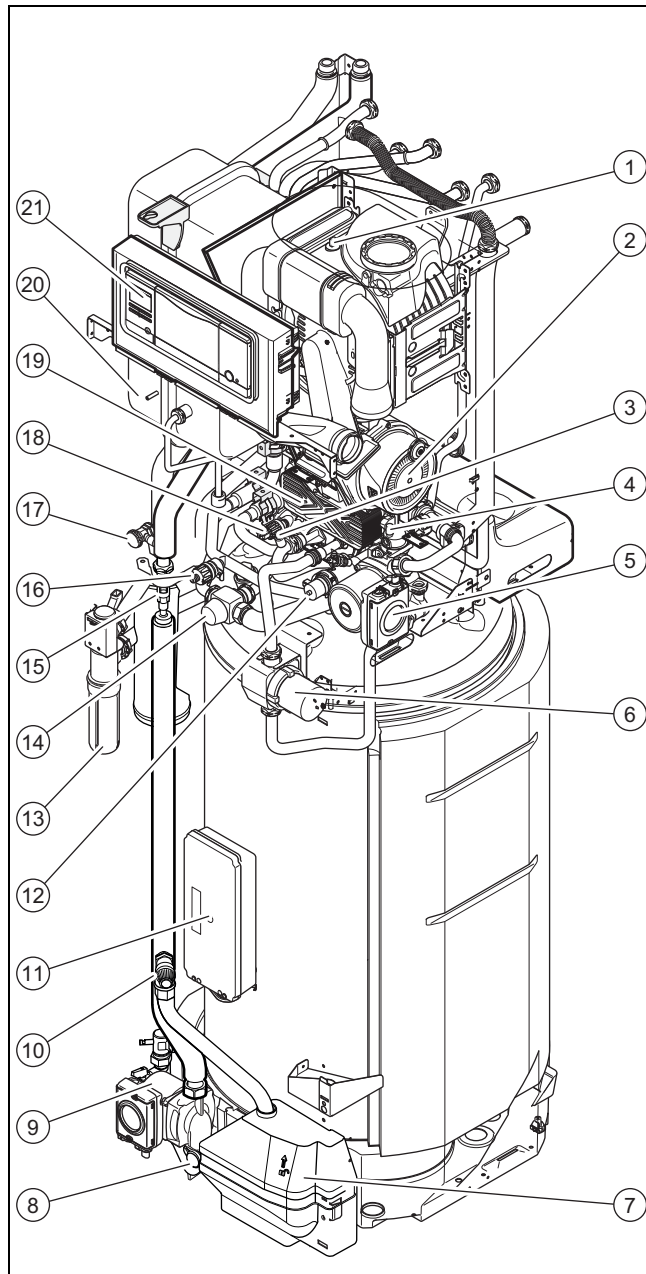
Applicability: DVGW-labelled



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

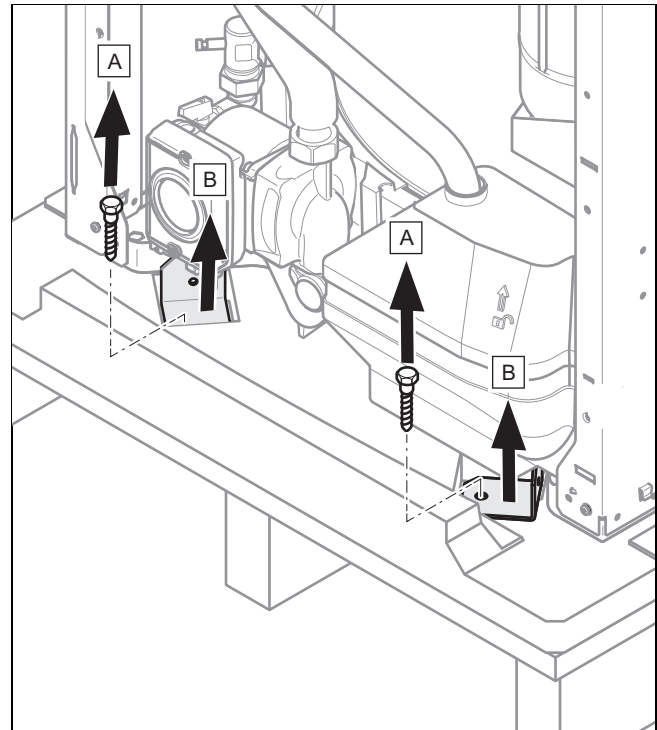
3.5 Functional elements



- | | |
|--|--|
| 1 Safety fuse | 12 3-port valve |
| 2 Fan | 13 Siphon |
| 3 Purging valve for the domestic hot water circuit | 14 Thermostatic valve domestic hot water outlet |
| 4 Automatic air vent for the heating circuit | 15 Solar fluid fill level indicator |
| 5 Heating pump | 16 Draining the heating circuit |
| 6 Domestic hot water pump | 17 Filling with solar fluid or purging |
| 7 Solar fluid collecting vessel | 18 Heating circuit pressure sensor |
| 8 Hot water drain cock | 19 Plate heat exchanger |
| 9 Solar circuit pump | 20 Heating expansion vessel |
| 10 Solar circuit valve | 21 Electronics PCB for the gas generator control process |
| 11 Solar electronics PCB | |

4 Set-up

4.1 Unpacking the product



1. Remove the packaging surrounding the unit.
2. Remove the front casing. (→ Page 11)
3. Unscrew the four fixing tabs at the front and rear of the pallet and remove them.

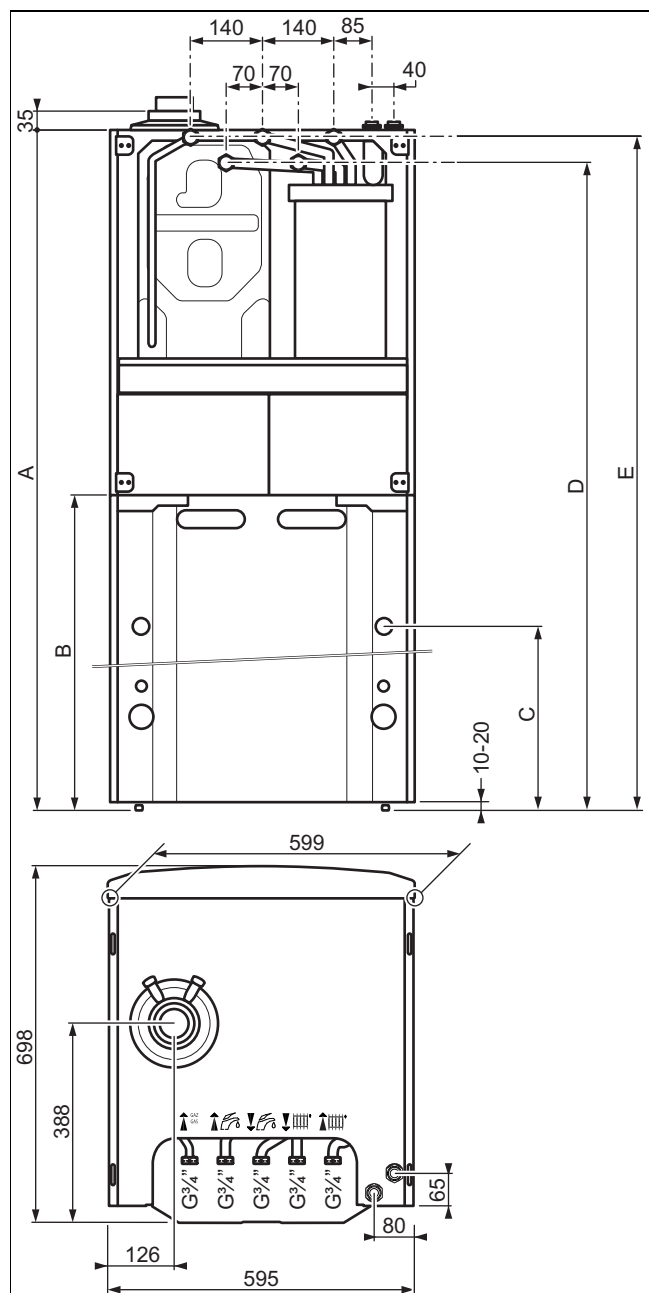
4.2 Checking the scope of delivery

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

4.2.1 Scope of delivery

Num-ber	Designation
1	Heat generator
1	Enclosed documentation
1	Bag with seals
1	proKlima set
1	Retainer for the optional radio receiver + 1 screw
1	Bag for solar connection: – Pipe fittings for the connection to the solar pipe – Temperature sensor for the solar collector

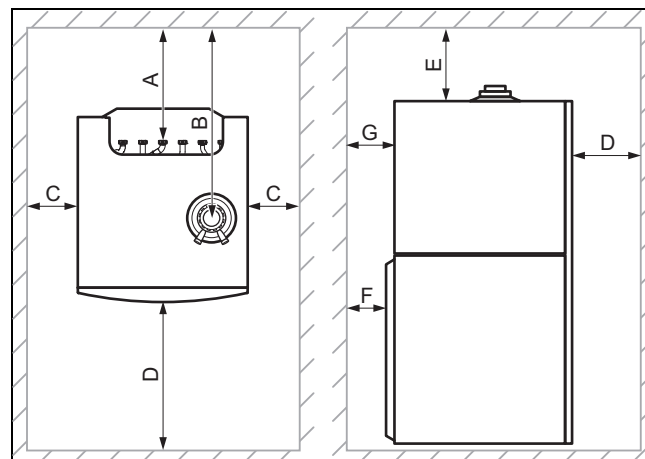
4.3 Unit dimensions



Unit dimensions

	150L	190L
Dimension (A)	1,640 mm	1,880 mm
Dimension (B)	941 mm	1,182 mm
Dimension (C)	770 mm	1,010 mm
Dimension (D)	1,577 mm	1,816 mm
Dimension (E)	1,627 mm	1,866 mm

4.4 Minimum clearances

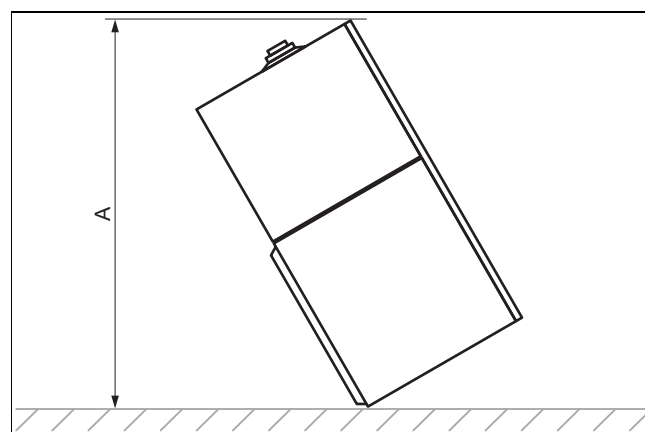


A	160 mm	E	165 mm (air/flue pipe, 60/100 mm diameter)
B	425 mm		
C	20 mm; (≥ 300 mm)		275 mm (air/flue pipe, 80/125 mm diameter)
D	600 mm	F	40 mm
		G	70 mm

4.5 Clearance from combustible components

It is not necessary to maintain a clearance between the product and components made of combustible materials that goes beyond the minimum clearances (→ Page 9).

4.6 Unit dimensions for transport



Unit dimensions for transport

150L	190L
1,760 mm	1,985 mm

4.7 Transporting the unit



Danger!
Risk of injury due to carrying heavy loads.

Carrying heavy loads can cause injuries.

- When transporting heavy products, observe all valid laws and other regulations.

4 Set-up



Danger!

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

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

- ▶ Never reuse the carrying handles.

1. Remove the front casing. (→ Page 11)

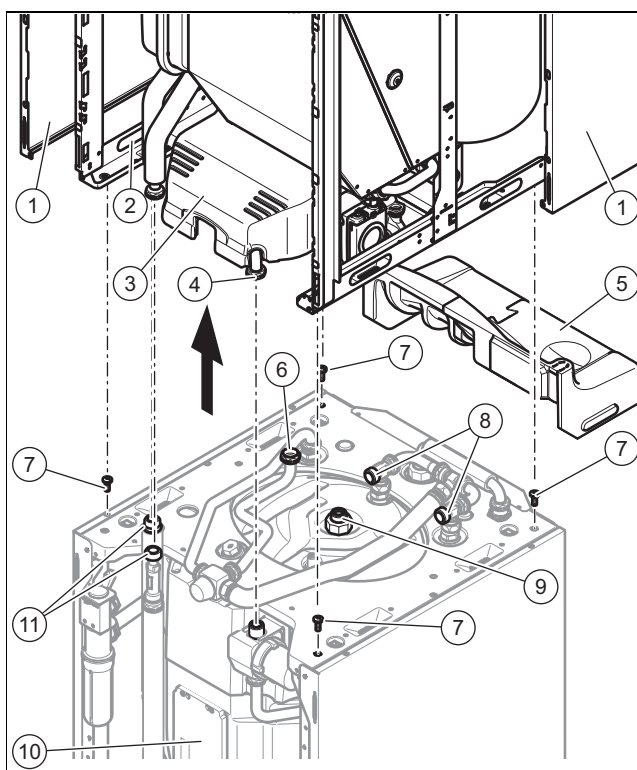
Conditions: The unit is too bulky or heavy for transport.

Disassembling for transport

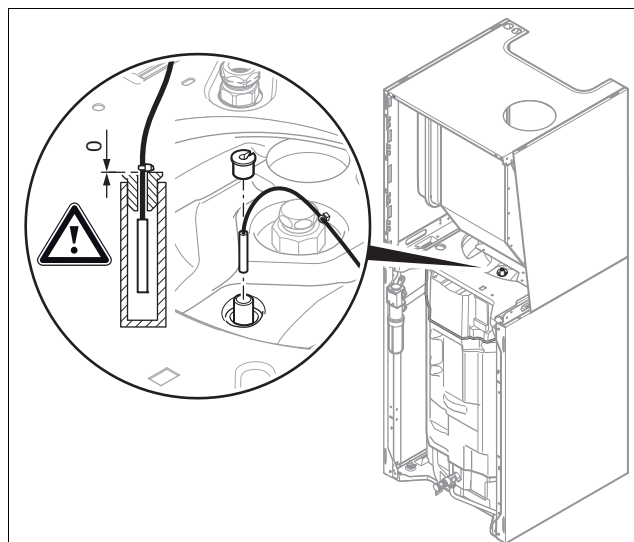


Note

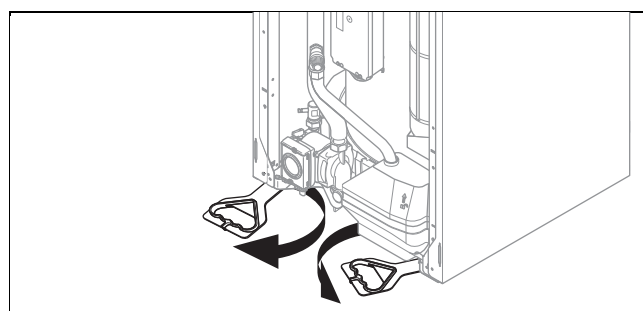
When disassembling the product, solar fluid may leak at the hydraulic connections of the solar circuit.



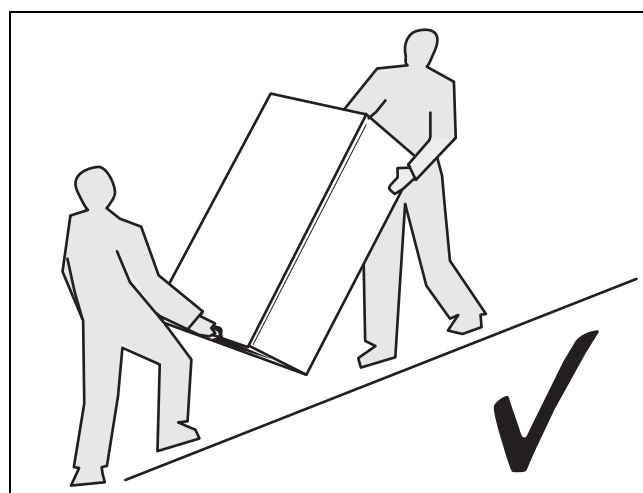
- ▶ Remove the side panels (1) to be able to use the carrying handles (2).
- ▶ Undo the nut (4) on the domestic hot water pump.
- ▶ Remove the insulating elements (3) and (5).
- ▶ Undo the nut (9) on the domestic hot water cylinder.
- ▶ Remove the upper hose from the condensate trap.
- ▶ Remove the power plug from the cylinder temperature sensor.
- ▶ Remove the two power plugs 2 of the domestic hot water pump.
- ▶ Remove the 2 power plugs of the solar PCB (10) from the product's main PCB.
- ▶ Undo the nuts (6) and (8).
- ▶ Undo the nuts (11) of the solar circuit.
- ▶ Remove the four screws (7).
- ▶ When installing the product, carry out the steps described above in reverse.



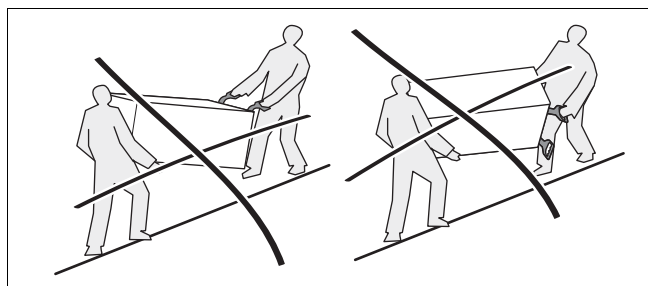
- ▶ Install the cylinder temperature sensor as shown in the illustration.
2. To transport the unit safely, use the two carrying handles on the two front feet of the unit.



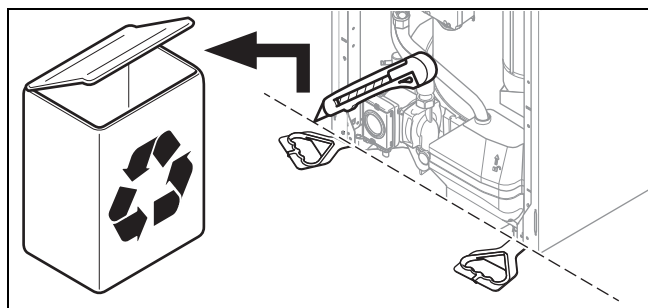
3. Turn the carrying handles under the unit so that they face forwards.
4. Ensure that the feet are screwed in fully so that the carrying handles are held properly.



5. Always transport the unit as illustrated above.



6. Never transport the unit as illustrated above.



7. After you have set up the unit, cut off the carrying handles and dispose of them in accordance with the relevant regulations.
8. Refit the unit's front casing.

4.8 Unit installation site



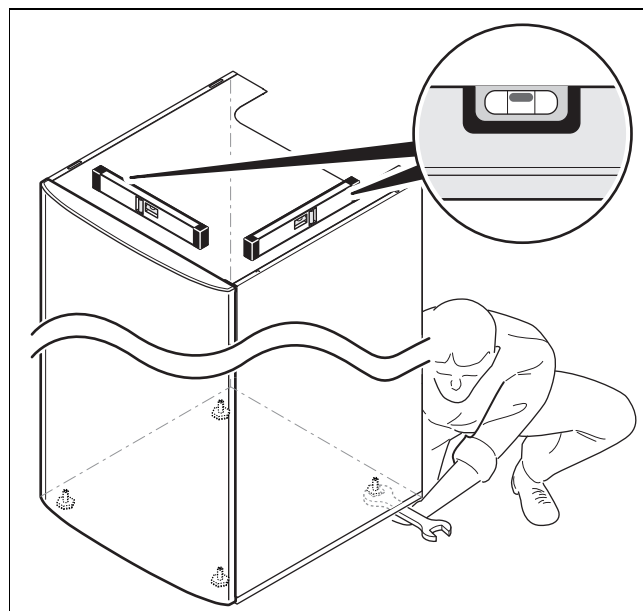
Danger!

Risk of death from leaks if the product is installed below ground level!

If the product is installed below ground level, propane will accumulate at floor level if there are any leaks. In this case, there is a risk of explosion.

- ▶ Make sure that propane cannot escape from the product or the gas line under any circumstances. Install an external solenoid valve, for example.
-
- ▶ Do not set up the unit in a room that has a very dusty atmosphere or in a corrosive environment.
 - ▶ Do not set up the unit in rooms in which sprays, solvents, chlorinated cleaning agents, paint, adhesives, ammonia compounds or other similar substances are stored or used.
 - ▶ Take the weight of the unit, including the water content, into account. Look up information on this in the technical data.
 - ▶ Ensure that the room in which you want to set up the unit is sufficiently protected against frost.
 - ▶ Do not route the combustion air via the smoke outlet on an old oil-fired floor-standing boiler as this may lead to corrosion.
 - ▶ If the air in the room in which you want to install the unit contains aggressive vapours or dust (during construction work, for example), ensure that the unit is sealed/protected.

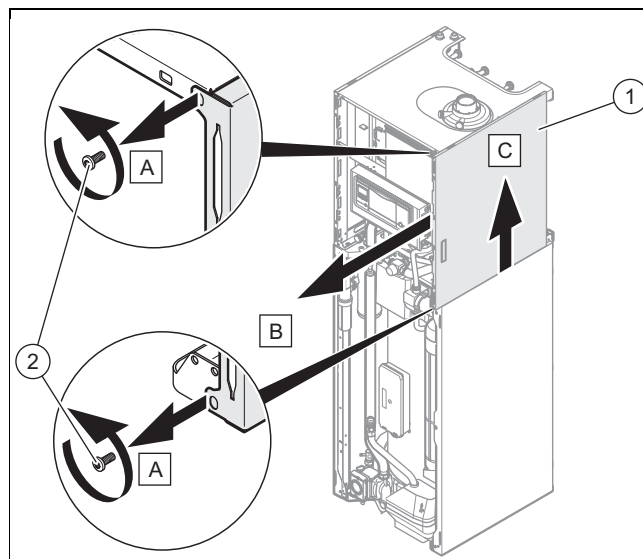
4.9 Installing the product horizontally



- ▶ Use the adjustable feet to set up the product horizontally.

4.10 Removing/installing the front casing

4.11 Installing/removing the side casing



- ▶ Refit the components in the reverse order.

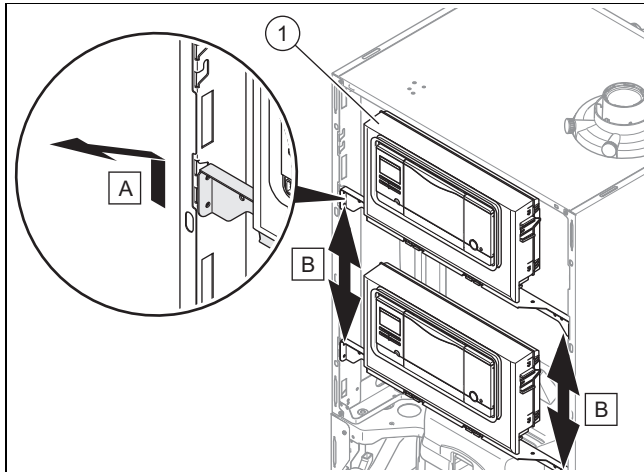
4.12 Moving the electronics box into the lower or upper position



Note

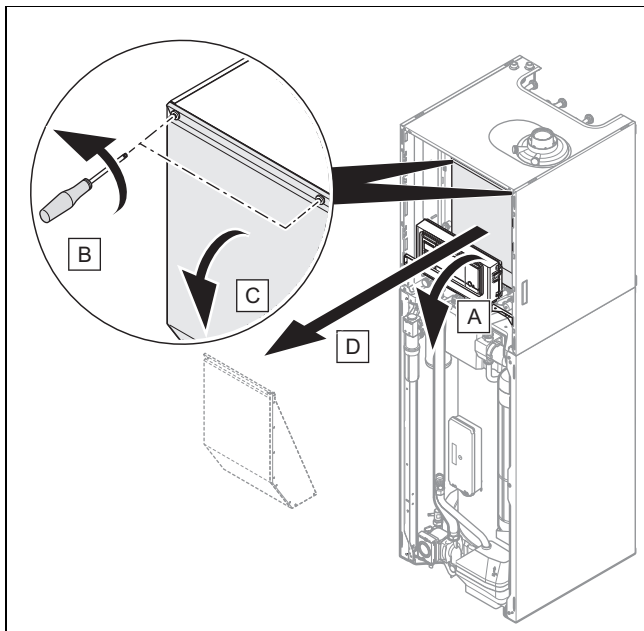
Moving the electronics box into the lower or upper position makes it easier to access the unit's various components.

5 Installation



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

4.13 Removing/installing the vacuum chamber's front wall



- Refit the components in the reverse order.

5 Installation



Danger!
Risk of scalding and/or risk of material damage due to incorrect installation leading to escaping water.

Mechanical stresses in connection cables can cause leaks.

- Install the connection cables voltage-free.



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 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.



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.

5.1 Information on liquid gas operation

In the as-supplied 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 instructions supplied with the conversion set.

5.1.1 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.

5.1.2 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.

5.2 Checking the gas meter

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

5.3 Gas and water connections



Caution.

Risk of material damage due to the gas leak-tightness test.

At a test pressure of >11 kPa (110 mbar), gas leak-tightness tests may cause damage to the gas valve.

- If, during gas leak-tightness tests, you also place the gas lines and the gas valve in the product under pressure, use a max. test pressure of 11 kPa (110 mbar).
- If you cannot limit the test pressure to 11 kPa (110 mbar), close any gas isolator cocks that are installed upstream from the product before you carry out the gas leak-tightness test.
- If, during gas leak-tightness tests, you have closed the gas isolator cock that is installed upstream of the product, relieve the gas line pressure before you open this gas isolator cock.



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.

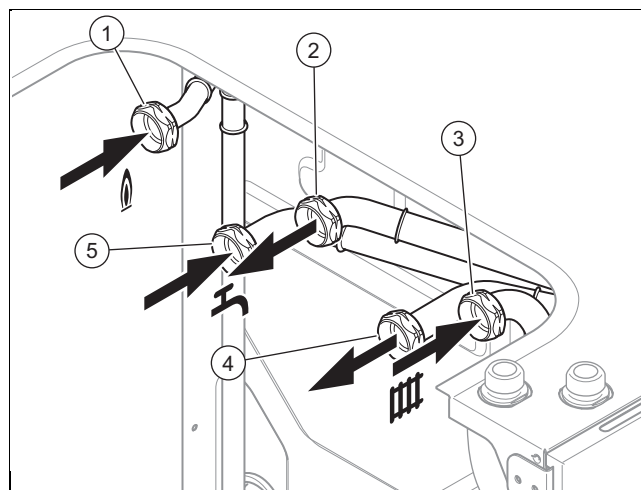


Note

In order to keep heat losses to a minimum, we recommend that you provide the water pipe spigots to the floor-standing boiler outlet and to the installation with heat insulation.

1. Check that the volumetric capacity of the expansion vessel is sufficient for the system volume.
 - ◁ If the volume of the expansion vessel is insufficient for the installation, install an additional expansion vessel, connected as close to the product as possible, in the heating return.
2. Install an expansion relief valve and a stopcock on the heating return.
3. Install a domestic hot water safety group and a stopcock on the cold water pipe.
4. Install a filling device between the cold water pipe and the heating flow.

5. Install a stopcock on the heating flow.
6. Install a stopcock on the gas pipe.
7. Blow or flush the supply pipes thoroughly prior to installation.



- | | | | |
|---|---------------------------------|---|---|
| 1 | Gas connection, G3/4 | 4 | Heating flow connection, G3/4 |
| 2 | Hot water connection, G3/4 | 5 | Connection for the cold water supply line, G3/4 |
| 3 | Heating return connection, G3/4 | | |

8. Connect the water and gas connections in accordance with the applicable standards.
 - Loss of pressure between the gas meter and the product: ≤ 1 mbar
9. Purge the gas pipe before start-up.
10. Check whether the connections (→ Page 27) are leak-tight.
11. Water can escape from the expansion relief valve. You should therefore ensure that the drain hose opposite the outdoor air remains open.
12. Actuate the drainage device on the expansion relief valve regularly in order to remove any scale deposition and ensure that the device is not blocked.

5.3.1 Checking the gas line for leak-tightness

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

5.4 Connecting the condensate drain pipework



Danger!

Risk of death from escaping flue gases!

The siphon's condensate drain pipework must not be connected to waste-water piping because, otherwise, the internal condensate siphon may be drained fully and flue gas may escape.

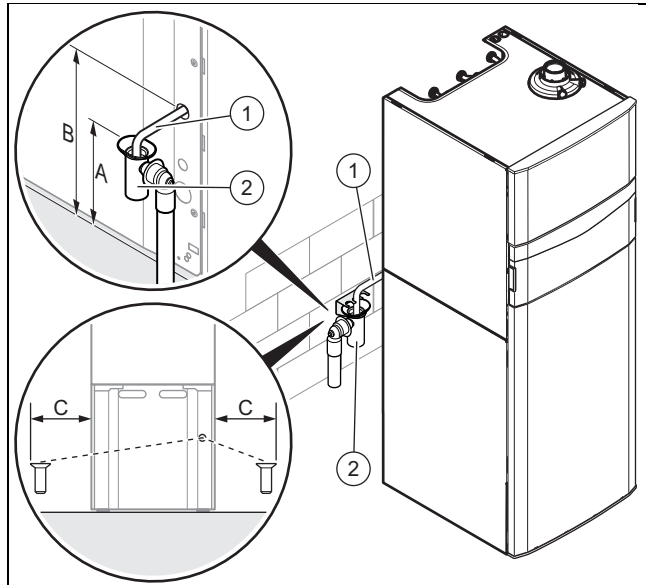
- Do not connect the condensate drain pipework tightly to the waste-water piping.



Note

Follow the instructions listed here and observe directives and local regulations on condensed water discharge.

5 Installation



Clearances for connecting the siphon

	150L	190L
Max. dimension (A)	720 mm	960 mm
Dimension (B)	770 mm	1,010 mm
Max. dimension (C)	300 mm	300 mm

Condensed water forms during combustion. The condensed water discharge pipe routes this condensed water to the waste water connection via a tundish.

- ▶ Use PVC or another material that is suitable for draining the non-neutralised condensed water.
- ▶ Only use corrosion-resistant piping material for removing condensate.
- ▶ If it cannot be guaranteed that the materials are suitable, install a system for neutralising the condensed water.
- ▶ Connect the condensed water discharge pipe (1) to a suitable drain siphon (2).
- ▶ Ensure that the condensed water in the drain line is drained properly.

5.5 Solar connection

5.5.1 General information



Caution. **Risk of voltage surge.**

Overvoltage may damage the solar plant.

- ▶ Earth the solar circuit to provide equipotential bonding and overvoltage protection.
- ▶ Secure earthing pipe clamps to the solar lines.
- ▶ Connect the earthing pipe clamps to a busbar using 16 mm² copper cable.



Note

If there is a fault in the solar system or if the solar system is connected at a later point, this unit can be used without being connected to the solar circuit.

In this case, set diagnostics code d.200 to 1.

- ▶ Ensure that the heat insulation of the lines is sufficient to prevent excessive heat losses.
 - The outside lines are exposed to the weather and ultraviolet radiation and are pecked by birds, making them particularly vulnerable; select effective protection against these risks.
- ▶ Maintain a minimum downward gradient in order to guarantee automatic draining of the solar circuit.
 - Minimum downward gradient that is to be maintained: 4 %
- ▶ Solder all of the pipelines.
- ▶ Do not use plastic pipes.
- ▶ Only use press connections if the temperature that is permitted by the manufacturer is 200 °C.

Conditions: The building has a lightning conductor.

- ▶ Connect the solar collectors to the lightning conductor.

5.5.2 Material for the solar pipes



Caution.

Risk of material damage caused by mechanical deformation or burst lines.

Due to the extremely high temperatures that the solar fluid can reach from time to time, plastic lines (e.g. PE pipe) may deform or burst.

- ▶ Do not use plastic lines.
- ▶ It is preferable to use copper pipes.

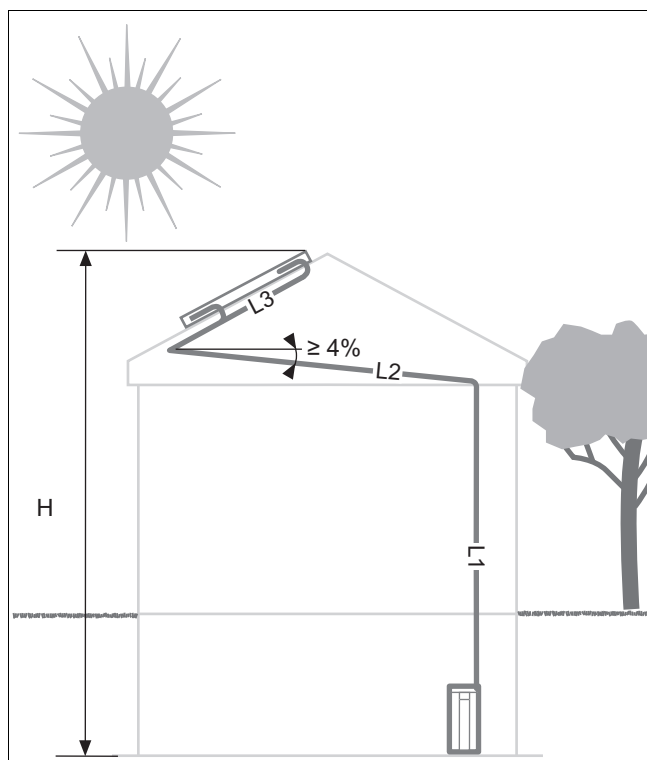
Selecting a suitable line diameter has a great influence on the solar system's efficiency. The system works with a hose with an internal diameter of 8 mm.

5.5.3 Maximum length of the solar pipes



Note

To prevent energy losses, the hydraulic lines must be provided with heat insulation that complies with the applicable thermal insulation regulations.



The total length of the piping between the solar collectors and the cylinder must not exceed the specified values.

- If the installation reaches a height of 12 metres, install a back-up pump.
- Observe the information in the table below.
 - $L = L1 + L2 + L3$

Length of the 2 in 1 solar tube (L)

			Building height (H)	
			8 m	12 m
150L	One sensor	Without retention vessel (accessory)	20 m	20 m
		With retention vessel (accessory)	20 m	20 m
	Two sensors	Without retention vessel (accessory)	12.5 m	–
		With retention vessel (accessory)	20 m	20 m
190L	One sensor	Without retention vessel (accessory)	20 m	20 m
		With retention vessel (accessory)	20 m	20 m
	Two sensors	Without retention vessel (accessory)	20 m	15 m
		With retention vessel (accessory)	–	20 m
	Three sensors	With retention vessel (accessory)	20 m	20 m



Note

If there is insufficient solar fluid in the installation, the pump may cause a noise. If required, fill the unit.

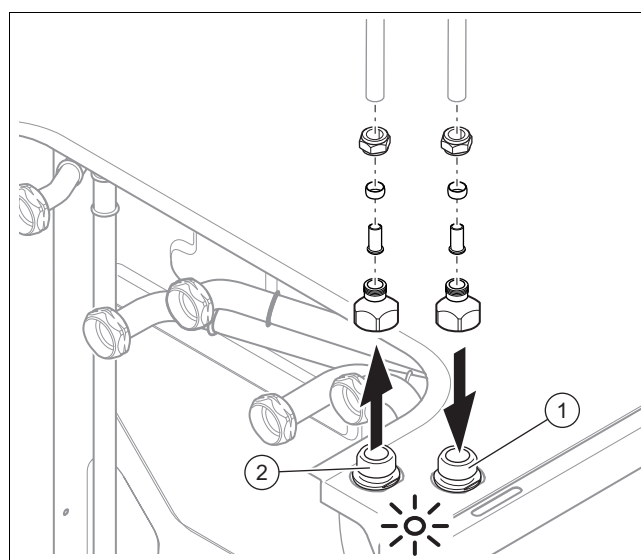
5.5.4 Solar connection



Note

The unit has the following components as standard:

- Solar pump
- Safety assembly
- Fill level indicator
- Solar fluid collecting vessel



- 1 Solar return connection (from the collector), G 3/4
- 2 Solar flow connection (to the collector), G 3/4

1. Consult the installation instructions for the solar system when setting up the hydraulic connection.
2. Connect the enclosed solar connections to solar tube 2 at position 1.
3. Connect the solar circuit's flow and return pipes to the floor-standing boiler.

5.6 Air/flue system

5.6.1 Installing the air/flue pipe

- Install the air/flue pipe as described in the separate set-up instructions for the air/flue pipe.

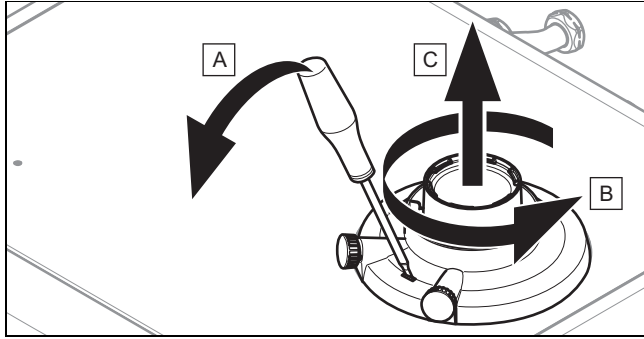
5.6.2 Changing the connector for the air/flue pipe



Note

The products are fitted with a 60/100 mm diameter connector as standard.

5 Installation



1. Insert a screwdriver into the slot between the test points.
2. Carefully exert pressure on the screwdriver (A).
3. Turn the connector anti-clockwise (B) as far as it will go and then remove it by pulling it upwards (C).
4. Insert the new connector. In doing so, pay attention to the latching lugs.
5. Turn the connector clockwise until it clicks into position.

5.6.3 Information and specifications for installing the B23P

Pipe lengths in the B23P installation (→ Page 42)

The flue gas system must at least correspond to the classification T 120 P1 W 1 in accordance with EN 1443.

The maximum pipe length (straight pipe only) corresponds to the maximum permitted flue gas pipe length without any elbows. If elbows are used, the maximum pipe length must be reduced in accordance with the dynamic flow characteristics of the elbows. Elbows must not be connected directly after one another as this method dramatically increases pressure losses.

In particular, if the flue pipe is installed in cold rooms or outside of the building, the freezing point on the surface of the inside of the pipe may be reached. A proven design in accordance with EN 13384-1 for a maximum boiler load at a flue gas temperature of 40 °C must be used to prevent this problem. The product must not be connected to a cascade flue gas system that is being used by other units.

- Observe the applicable international, national and local regulations for flue gas systems, in particular for installations in living rooms. Inform the operator how to correctly operate the product.

5.7 Electrical installation

Only qualified electricians may carry out the electrical installation.



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

Touching live connections may cause serious personal injury. Since mains connection terminals L and N remain live even if the on/off button is switched off:

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



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

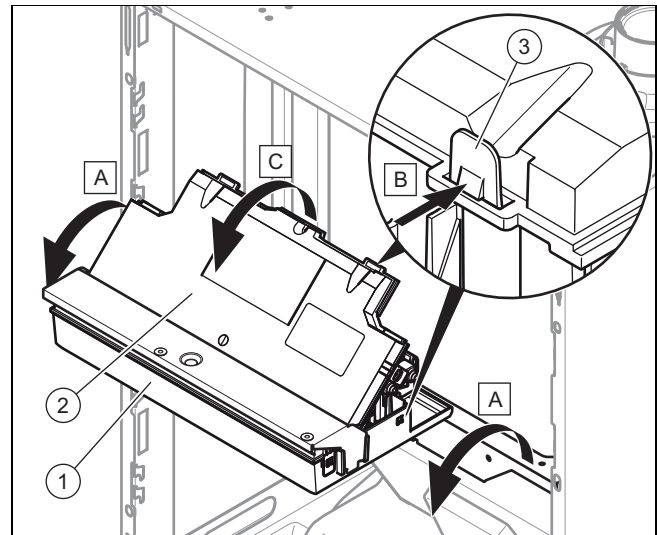
An improper electrical connection may negatively affect the operational safety of the product and result in material damage or personal injury.

- Only carry out the electrical installation if you are a trained competent person and are qualified for this work.
- Observe all applicable laws, standards and directives in the process.
- Earth the product.

5.7.1 Opening/closing the electronics box

5.7.1.1 Opening the electronics box

1. Remove the front casing. (→ Page 11)

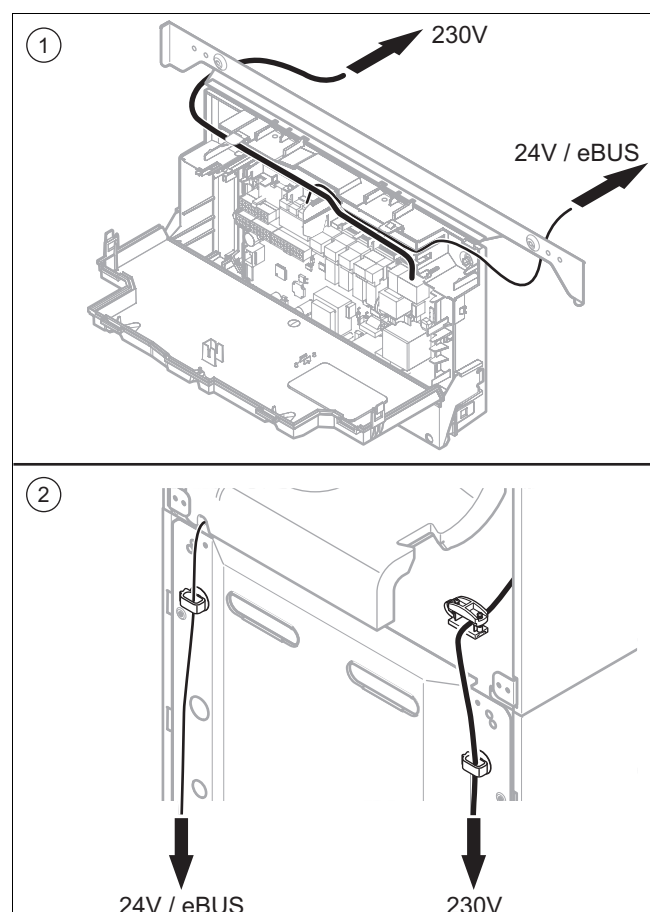


2. Hinge the electronics box (1) forwards.
3. Undo the four left- and right-hand clips (3) from the retainer.
4. Fold up the cover (2).

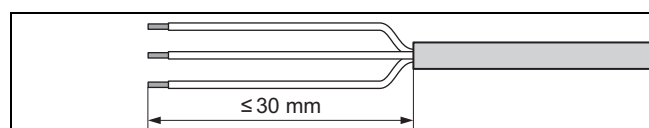
5.7.1.2 Closing the electronics box

1. Close the back panel (2) by pressing downwards on the electronics box (1).
2. Ensure that all four clips (3) audibly click into the retainer.
3. Fold the electronics box upwards.

5.7.2 Carrying out the wiring



- 1 Route of the cables on the electronics box
- 2 Route of the cables on the back panel of the product
1. Route the connection cables of the component to be connected through the grommet to the electronics box.
2. If required, shorten the connection cables.



3. Strip the flexible line as shown in the figure. In doing so, ensure that the insulation on the individual conductors is not damaged.
4. Only strip inner conductors just enough to establish good, sound connections.
5. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.
6. Screw the respective plug to the connection cable.
7. Check whether all conductors are properly fastened to the connection terminals of the plug. Remedy this if necessary.
8. Plug the plug into the associated PCB slot.

5.7.3 Establishing the power supply

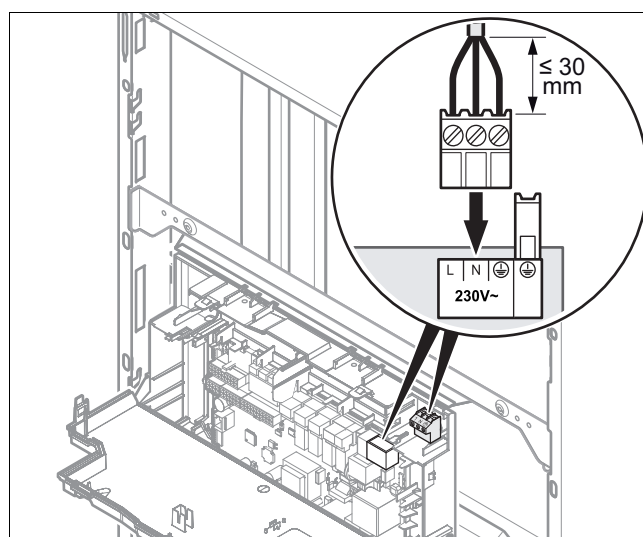


Caution.

Risk of material damage due to high connected voltage.

At mains voltages greater than 253 V, electronic components may be damaged.

- Make sure that the rated voltage of the mains is 230 V.



1. Observe all valid regulations.
2. Open the electronics box. (→ Page 16)
3. Set up a fixed connection and install a partition with a contact gap of at least 3 mm (e.g. fuses or power switches).
4. Use a flexible line for the mains feed line, which is routed through the grommet into the product.
5. Carry out the wiring. (→ Page 17)
6. Screw the supplied plug to a three-core power supply cable that complies with the relevant standards.
7. Close the electronics box. (→ Page 16)
8. Make sure that access to the power supply is always freely available and is not covered or blocked by an obstruction.

5.7.4 Installing the product in a moist environment



Danger!

Risk of death from electric shock!

If you install the product in a room with high levels of moisture, e.g. a bathroom, observe the nationally recognised technical standards for electrical installations. If you use the factory-installed connection cable, if installed, with an earthed plug, there is a risk of death from electric shock.

- Never use the factory-installed connection cable with earthed plug when installing the product in a moist environment.
- Connect the product using a fixed connection and a partition with a contact open-

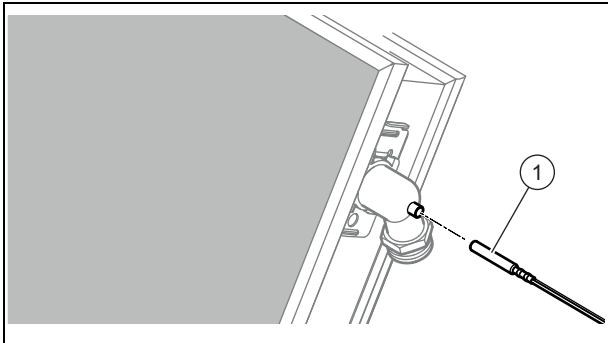
5 Installation

ing of at least 3 mm (e.g. fuses or power switches).

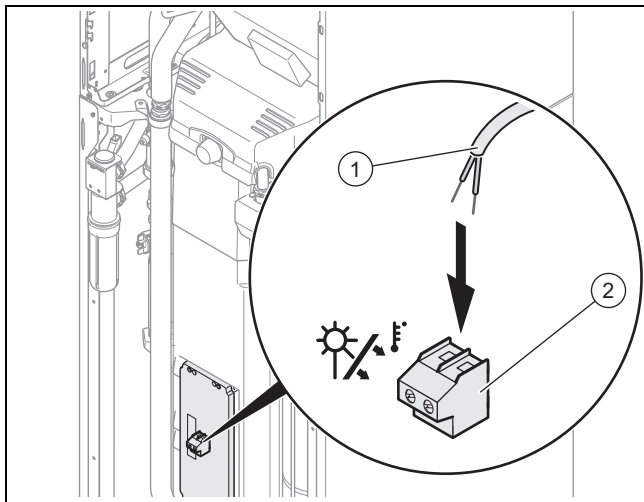
- ▶ Use a flexible line for the mains connection line, which is routed through the cable duct into the product.
- ▶ Observe all valid regulations.

1. Open the electronics box. (→ Page 16)
2. Detach the ProE plug from the PCB slot for the mains connection (X1).
3. Unscrew the ProE plug for the factory-installed mains connection cable, if installed.
4. Instead of the factory-installed mains connection cable, if installed, use a suitable three-core mains connection cable which complies with the relevant standards.
5. Carry out the wiring. (→ Page 17)
6. Close the electronics box. (→ Page 16)

5.7.5 Connecting the solar sensor



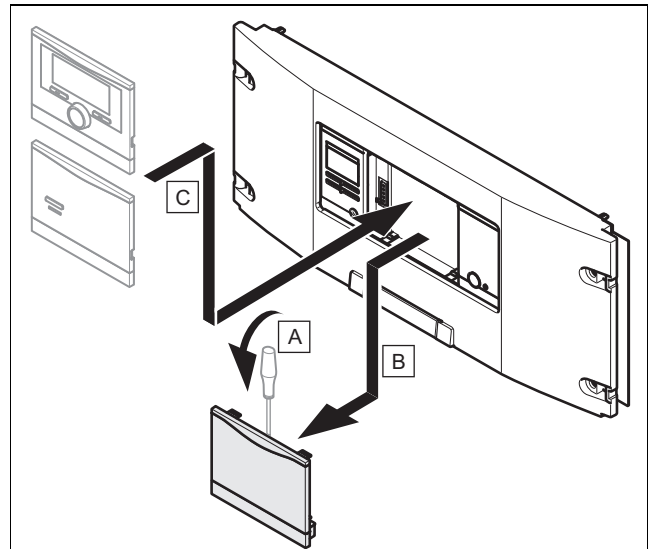
1. To install the solar sensor, follow the installation instructions for the solar collector.
2. Route the cable for the solar sensor (1) from the collector to the product's solar plug.



3. Connect the cable for the solar sensor (1) to the solar plug (2).

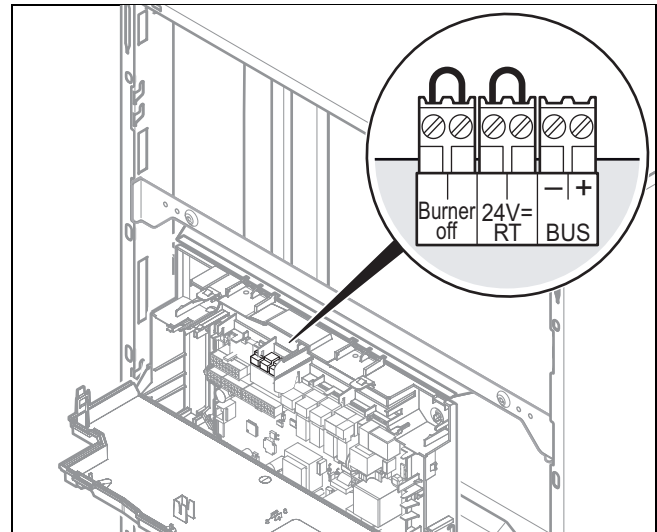
5.7.6 Installing the control in the electronics box

Conditions: If you are connecting a weather-compensated **eBUS** control or a room-temperature-controlled **Vaillant eBUS** control:



- ▶ Install the control in the electronics box.
- ▶ Bridge the plug **24 V = RT** if it has not been bridged already.

5.7.7 Connecting controllers to the electronic system



1. Open the electronics box. (→ Page 16)
2. Carry out the wiring. (→ Page 17)

Conditions: If you are connecting a weather-controlled **eBUS** controller or a room-temperature-controlled **eBUS** controller:

- ▶ Connect the controller to the **BUS** plug.
- ▶ Bridge the plug **24 V = RT** if it has not been bridged already.

Conditions: If you are connecting a low-voltage controller (24 V):

- ▶ Connect the controller to the **24 V = RT** plug instead of the bridge.

Conditions: If you are connecting a safety thermostat for underfloor heating:

- ▶ Connect the thermostat to the **Burner off** plug instead of the shunt.
- 3. Close the electronics box.
- 4. To trigger the **Comfort** pump operating mode (pump runs permanently) using a multi-circuit controller, change the diagnostics code D.018 Pump operating mode (→ Page 28) from **Eco (3)** (pump runs intermittently) to **Comfort (1)**.

5.7.8 Connecting additional components

The following components can be actuated:

- Hot water circulation pump
- External heating pump
- Cylinder charging pump (not activated)
- Extractor hood
- External solenoid valve
- External fault signal
- Solar pump (not active)
- eBUS remote control (not active)
- Legionella protection pump (not active)
- Solar valve (not active).

5.7.8.1 Using the auxiliary relay

1. Connect an additional component directly to the integrated auxiliary relay using the grey plug on the PCB.
2. Connect the wiring in the same way as described in the section "Installing the control (→ Page 18)".
3. To start up the connected component, select the component using diagnostics code **D.026**, see Calling up diagnostics codes (→ Page 27).

5.7.8.2 Using the VR 40 ("2 in 7" multi-functional module)

1. Install the components in accordance with the respective instructions.
2. Select **D.027** (→ Page 27) to actuate relay 1 on the multi-functional module.
3. Select **D.028** (→ Page 27) to actuate relay 2 on the multi-functional module.

5.7.8.3 Actuating the circulation pump according to requirements

1. Connect the connection cable for the external button using terminals 1 (0) and 6 (functional drawing) on the X41 edge connector, which is supplied with the controller.
2. Plug the edge connector into the PCB slot X41.
3. Press the external button to make the circulation pump to run for five minutes.

5.7.8.4 Actuating a circulation pump with an eBUS controller

1. Select a hot water programme (preparation).
2. Parametrise a circulation programme on the controller.
 - ◁ The pump runs during the time period specified in the programme.

6 Operation

6.1 Operating concept of the product

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

An overview of the display and setting options of the installer level can be found in the section "Overview of the menu structure – Installer level" (→ Page 43).

6.1.1 Calling up the installer level



Caution.

Risk of material damage caused by incorrect handling.

Incorrect settings at installer level may cause damage and operating faults to the heating installation.

- ▶ You must only access the installer level if you are an approved competent person.



Note

The installer level is protected against unauthorised access using a password.

1. Press and ("i") simultaneously.
 - ◁ The following menu appears in the display.
2. Use the or button to scroll until the **Installer level** menu point appears.
3. Press **(OK)** to confirm your selection.
 - ◁ In the display, the text **Enter code** appears along with the value **00**.
4. Use or to set the value **17** (code).
5. Press **(OK)** to confirm your selection.
 - ◁ The installer level appears with a selection of menu points.

6.2 Live Monitor (status codes)

Menu → Live Monitor

Status codes in the display provide information on the product's current operating status.

Status codes – Overview

Status codes – Overview (→ Page 49)

7 Start-up

6.3 Test programmes

As well as the installation assistants, you can also call up the test programmes for start-up, service and troubleshooting.

Menu → Installer level Appliance config.

This is where you will find the **Check programs** (→ Page 23), in addition to the **Function menu**, an **Electronics self-test** and the **Gas family check**.

7 Start-up

7.1 Auxiliary service equipment

Applicability: Germany

The following test and measuring equipment is required for start-up:

- CO₂ measuring instrument
- Digital or U tube manometer
- Flat blade screwdriver, small
- 2.5 mm Allen key

7.2 Checking the factory setting



Caution.

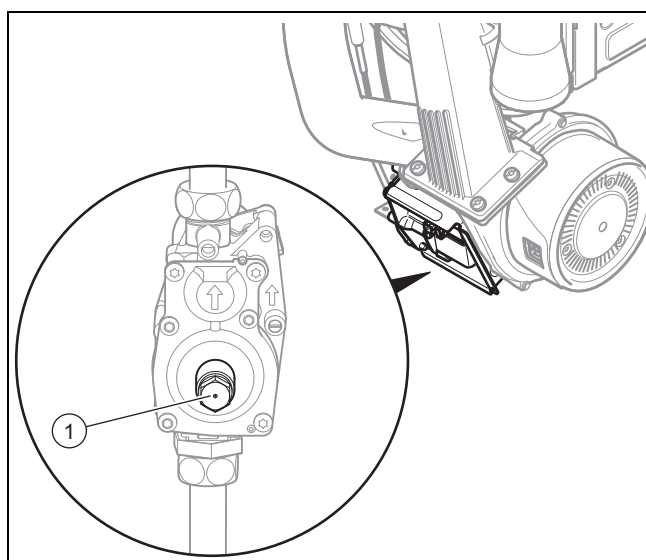
Risk of material damage caused by making unauthorised settings.

- Never modify the factory setting of the gas pressure regulator of the gas valve.



Note

Each destroyed seal must be restored.



Note

Some units are equipped with gas valves that have no pressure regulator (1).



Caution.

An incorrect gas group setting may cause operating faults or a reduction in the service life of the product.

If the product design does not match the local gas group, malfunctions will occur or you will have to replace product components prematurely.

- Before you start up the product, compare the gas group information on the data plate with the gas group available at the installation site.

The product's combustion has been factory tested and is preset for operation with the gas group indicated on the identification plate.

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

- Do not start up the product.
- Change the type of gas in accordance with your system.

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

- Proceed as described below.

7.3 Filling the condensate siphon

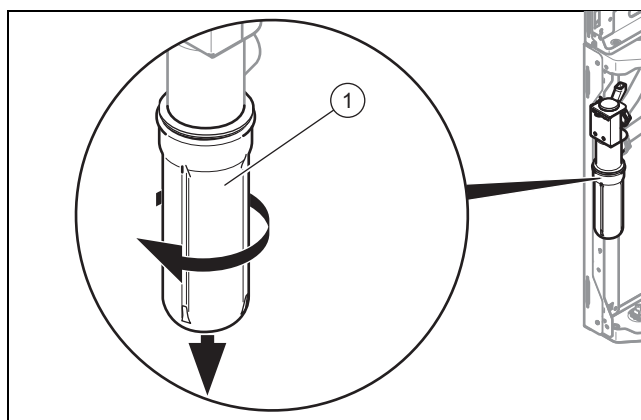


Danger!

Risk of poisoning due to escaping flue gas.

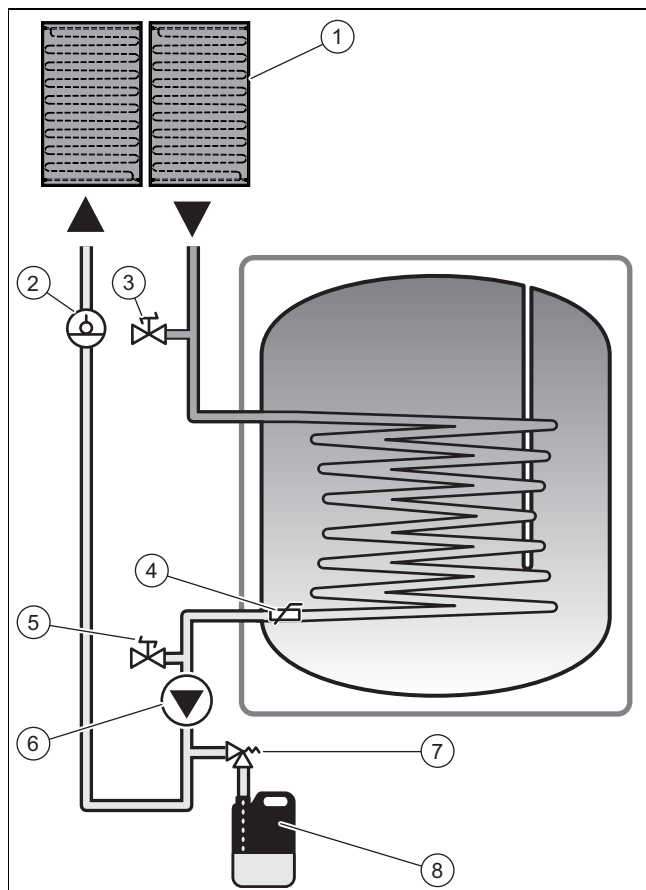
An empty or insufficiently filled condensate siphon may allow flue gas to escape into the room air.

- Fill the condensate siphon with water before starting up the product.



1. Remove the lower section of the siphon (1) by turning the bayonet fitting anti-clockwise.
2. Fill the lower section of the siphon with water up to 10 mm below the upper edge.
3. Screw the lower section back onto the condensate siphon correctly.

7.4 Filling the solar system



- | | |
|-------------------------------------|---------------------------------|
| 1 Solar collectors | 5 Drain cock |
| 2 Solar fluid fill level indicator | 6 Solar pump |
| 3 Filling or drain valve | 7 Expansion relief valve |
| 4 Lower cylinder temperature sensor | 8 Solar fluid collecting vessel |

- Use only our solar fluid for this.
 - Frost protection until: -28 C

7.4.1 Filling the solar circuit

Applicability: One sensor
OR Two sensors
OR Three sensors

The unit has already been filled when it is delivered. The solar circuit does not need to be filled.

- Carry out a leak-tightness test (check programme **P.09**).
 - ◁ The solar function carries out a filling cycle for the solar panel and the pump then stops.
 - ◁ The solar fluid is automatically drained.

7.5 Switching on the product

- Press the on/off button on the product.
 - ◁ The basic display appears on the display.

7.6 Running the installation assistants

The installation assistant is displayed whenever the product is switched on until it has been successfully completed. It provides direct access to the most important check programmes and configuration settings for starting up the product.

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

Confirm that you want to navigate to the next point by pressing **Next**.

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

7.6.1 Language

- Set the required language.
- Press (**OK**) twice to confirm the set language and to avoid unintentionally changing it.

If you have unintentionally set a language that you do not understand, proceed as follows to change it:

- **Simultaneously press and hold** and .
- Also press the fault clearance key for a short time.
- Press and hold and until the display shows the language setting option.
- Select the required language.
- Confirm this change by pressing (**OK**) twice.

7.6.2 Filling the heating circuit

The steps that are described here for filling the heating circuit and the hot water circuit must be carried out before running the programme for automatically purging the heating and hot water circuits.

Filling mode (check programme (→ Page 23)**P.06**) is activated automatically in the installation assistant for as long as the filling mode appears on the display.

If problems occur, restart the purge programme (→ Page 23).

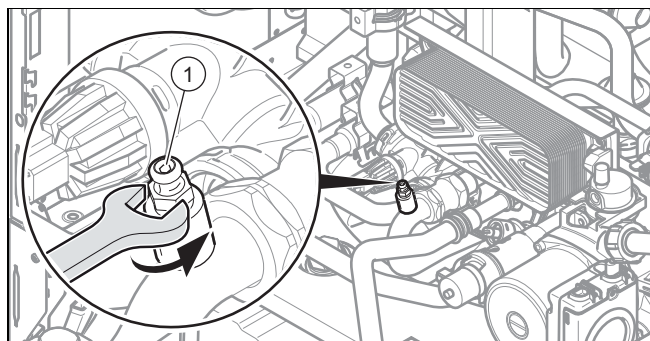
7.6.3 Purging

Purging (check programme **P.00**) is activated automatically in the installation assistant for as long as purging appears on the display.

The programme must be carried out once or else the unit will not start.

If the radiators in the house are fitted with thermostatic radiator valves, ensure that all of them are open so that the circuit is properly purged.

7 Start-up



- ▶ Open the purging valve on the hot water circuit (1) once the purging programme has ended.
- ▶ Close the purging valve on the hot water circuit as soon as the circuit has been purged.

7.6.4 Target flow temperature, domestic hot water temperature, Comfort mode

1. To set the target flow temperature, domestic hot water temperature and Comfort mode, use the and buttons.
2. Confirm the setting by pressing (OK).

7.6.5 Setting the maximum heating output

The unit's maximum heating output can be adjusted to the system's heat demand. Use diagnostics code **D.000** to set a value that corresponds to the output in kW.

7.6.6 Auxiliary relay and multi-functional module

Additional components that are connected to the product can be adjusted here. You can use diagnostics codes **D.026**, **D.027** and **D.028** to change the setting.

7.6.7 Telephone number for the competent person

You can store your telephone number in the unit menu. The end user can view the telephone number. The telephone number can be up to 16 digits long and must not contain any spaces.

7.6.8 Ending the installation assistant

Once the installation assistant has been completed and confirmed, it will not start up automatically next time the unit is switched on.

7.7 Restarting the installation assistants

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

Menu → Installer level → Start inst. assistant

7.8 Calling up appliance config. and diagnostics menu

You can recheck and reset the most important system parameters using the diagnostics codes. Call up the **Appliance config.** to configure the unit.

Menu → Installer level Appliance config.

The settings options for more complex systems can be found in the **Diagnostics menu**.

Menu → Installer level Diagnostics menu

7.9 Performing a gas family check



Danger! Risk of poisoning!

Inadequate combustion quality (CO), indicated by **F.92/93**, leads to an increased risk of poisoning.

- ▶ Make sure that the fault is completely eliminated before starting up the product for continuous operation.

Menu → Installer level → Test programs → Gas family check

The gas family check checks the product setting with regard to combustion quality.



Note

If additional condensing units are connected to the same flue gas pipe in the heating installation, ensure that none of these condensing units are in operation or start operating throughout the entire test programme, so that the test result is not distorted.

- ▶ Perform the gas family check as part of routine product maintenance work, after replacing components, carrying out work on the gas route and following gas conversion.

Result	Meaning	Measure
F.92 Coding resistance fault	The coding resistor on the PCB does not match the gas group that is entered	Check the coding resistor, repeat the gas family check and enter the correct gas group.
"Successful"	Combustion quality is good. Unit configuration matches the specified gas group.	None

Result	Meaning	Measure
"Warning"	Combustion quality inadequate. The CO ₂ value is incorrect.	Start check programme P.01 and adjust the CO ₂ value with the adjusting screw in the Venturi. If the correct CO ₂ value cannot be set: Check that the gas restrictor is correct (yellow: G20 natural gas, blue: G25 natural gas, grey: Liquid gas) and undamaged. Repeat the gas family check.
F.93 Gas group fault	Combustion quality outside the permitted range	Damaged or incorrect gas restrictor (yellow: G20 natural gas, blue: G25 natural gas, grey: Liquid gas), incorrect gas group, internal pressure measuring point in Venturi blocked (do not use lubricants on the O-ring in the Venturi), recirculation, defective seal. Eliminate faults in the product. Set the correct CO ₂ value using check programme P.01 (adjusting screw in the Venturi). Repeat the gas family check.


Note

It is not possible to perform CO₂ measurements during the gas family check.

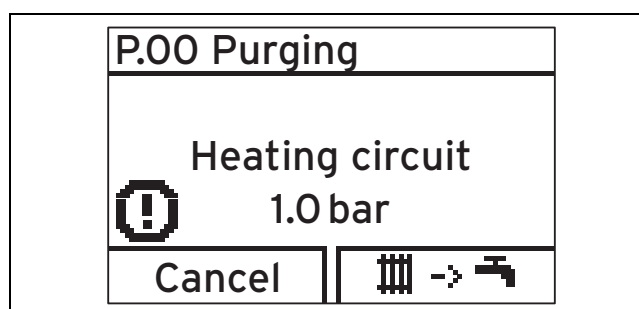
7.10 Using check programmes

Menu → Installer level → Test programs → Check programs

By activating various check programmes, you can trigger special functions on the product.

Display	Meaning
---------	---------

P.00	Purging check programme: The heating pump is actuated cyclically. The heating circuit and the hot water circuit are purged via the automatic air vent on the heat pump (the automatic air vent's cap must be loosened). The purge programme always begins with the hot water circuit (short heating circuit = 7 minutes and 30 seconds) and ends with the heating circuit (2 minutes and 30 seconds). 1 x Cancel: End purge programme Note The purge programme runs for 10 minutes and then ends. Purging the hot water circuit: 3-port valve in the hot water position. Heating pump cycle: Five seconds on, five seconds off. Domestic hot water pump at full capacity in continuous operation. At the end of the purging cycle, the domestic hot water circuit must be purged using the manual domestic hot water purging valve. Purging the heating circuit: 3-port valve in the heating position; heating pump controlled as specified above.
P.01	Maximum load check programme: After successful ignition, the product is operated at maximum heat input.
P.02	Minimum load check programme: After successful ignition, the product is operated at minimum heat input.
P.06	Filling mode check programme: The 3-port valve is moved to the mid-position. The burner and pump are switched off (to fill or drain the product).
P.09	Checking leak-tightness The solar pump is started up in order to check the tightness of the circuit. Note At the end of the programme, purge the solar circuit.


Note

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

To terminate the check programmes, you can press **Cancel** at any time; this does not apply for initial start-up, however. The purging cycle must be completely carried out once so that the burner can ignite.

7 Start-up

7.11 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 Alphi 11
- Sentinel X 500

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

7.12 Reading off the filling pressure

The unit comes with a bar chart showing the pressure and a digital pressure display.

- To read off the digital filling pressure value, press the  button twice.

For the heating installation to operate properly, the bar chart in the display must remain roughly in the centre (between the dotted limit values). This corresponds to a filling pressure of between 100 kPa and 150 kPa (1.0 bar and 1.5 bar).

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

7.13 Preventing low water pressure

To prevent damage to the heating installation that is caused by low filling pressure, the product is fitted with a water pressure sensor. If the water pressure falls below 80 kPa (0.8 bar), the unit indicates low pressure by displaying a flashing pressure value. If the filling pressure falls below a value of 50 kPa (0.5 bar), the unit switches off. The display shows **F.22**.

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

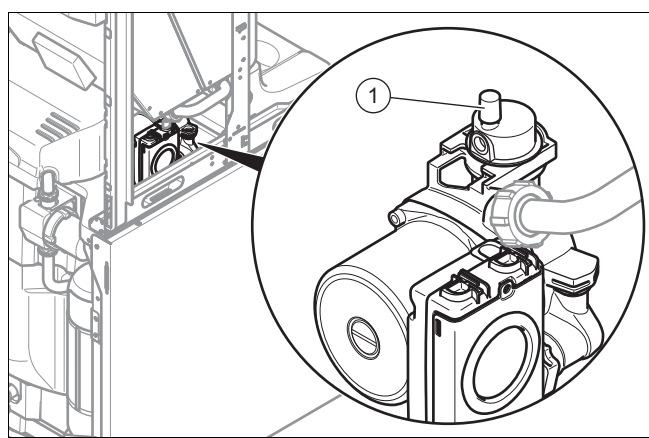
A flashing pressure value is shown in the display until a pressure of 110 kPa (1.1 bar) or higher has been reached.

- If you notice frequent drops in pressure, determine and eliminate the cause.

7.14 Filling and purging the heating installation

Preliminary work

- Flush the heating installation thoroughly before filling it.



1. Loosen the cap of the automatic air vent (1) by one to two rotations and leave it in this position, as the unit automatically purges itself in this way during operation.
2. Select the check programme **P.06**.
 - ◁ The 3-way valve moves to the mid-position, the pumps do not run and the unit does not switch to heating mode.
3. Observe the information on the topic of treating (→ Page 24) heating water.
4. Connect the heating installation's filling cock on the connection accessory to a heating water supply in accordance with the relevant standards; fit a cold water valve where possible.
5. Supply the heating circuit with water.
6. Open all thermostatic radiator valves.
7. Check whether the stop cocks for the heating flow and return are open.
8. Slowly open the combined filling and emptying valve to allow water to flow into the heating circuit.
9. Purge the highest radiator and wait until water flows out of the purging valve without bubbles.
10. Purge all other radiators until the entire heating system has been filled with water.
11. Close all purging valves.
12. Fill with water until the required filling pressure is reached.
13. Close the combined filling and emptying valve and the cold water valve.
14. Check all connections and the entire system for leaks.

15. To purge the heating installation, select the check programme **P.00**.
 - ◁ The unit does not switch on, the internal pump runs intermittently and enables the circuit to be purged.
 - ◁ The display shows the filling pressure of the heating installation.
16. To be able to carry out the purging process properly, ensure that the heating installation filling pressure is above the minimum filling pressure.
 - Minimum heating installation filling pressure: 80 kPa



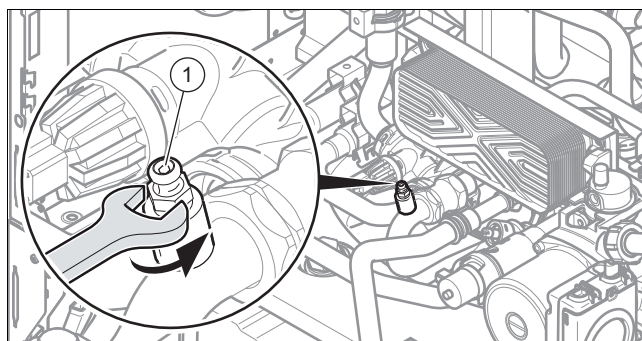
Note

The check programme **P.00** runs for 7.5 minutes in the hot water circuit and for 2.5 minutes in the heating circuit.

At the end of the filling process, the filling pressure of the heating installation should be at least 20 kPa (0.2 bar) above the counterpressure of the expansion vessel (Exp) ($P_{\text{Installation}} \geq P_{\text{Exp}} + 20 \text{ kPa (0.2 bar)}$).

17. If there is still too much air in the heating installation at the end of the check programme **P.00**, restart the check programme.
18. Check that all connections are leak-tight.

7.15 Filling and purging the hot water system



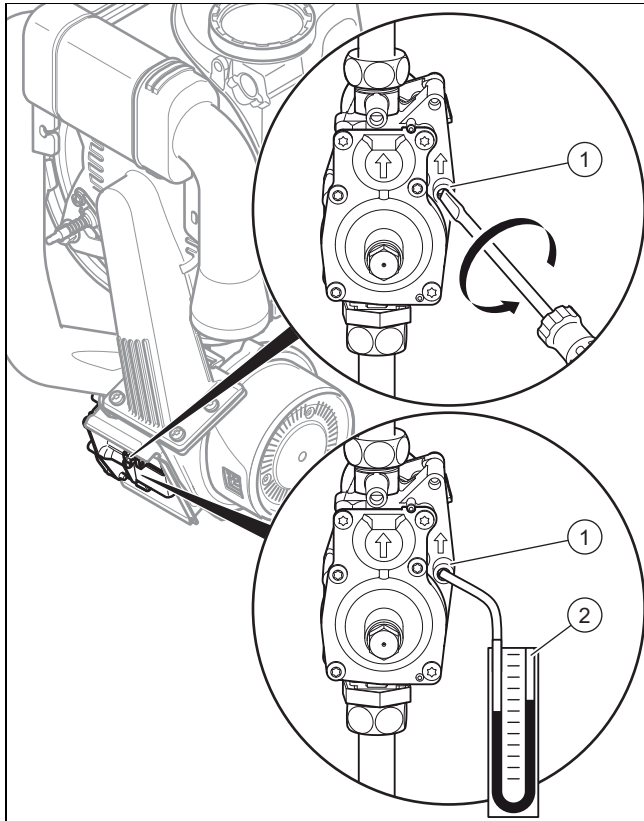
1. Open the cold water stop valve on the product.
2. Fill the hot water system by opening all the hot water draw-off valves until water escapes.
3. Connect a hose and open the purging valve (1) on the unit's hot water circuit until water escapes from it, and then close it again.
4. Close the hot water valves once the appropriate volume of water has flowed out.
5. To purge the circuit, start check programme **P.00**.
6. As soon as check programme **P.00** has finished, open the air separator (1) on the unit's hot water circuit until water escapes from it, and then close it again.

7 Start-up

7.16 Checking and adjusting the gas setting

7.16.1 Checking the gas connection pressure (gas flow pressure)

1. Close the gas isolator cock.



2. Use a screwdriver to undo the sealing screw on the gas valve's measuring connection (1) (bottom screw).
3. Connect a pressure gauge (2) to the measuring nipple (1).
4. Open the gas isolator cock.
5. Start up the product with the check programme **P.01**.
6. Measure the gas connection pressure against atmospheric pressure.
 - Permissible gas connection pressure for operation with G20 natural gas: 1.7 ... 2.5 kPa
 - Permissible gas connection pressure for operation with G25 natural gas: 1.8 ... 2.5 kPa
 - Permissible gas connection pressure for operation with G31 liquid gas: 4.25 ... 5.75 kPa
7. Switch off the product.
8. Close the gas isolator cock.
9. Remove the pressure gauge.
10. Tighten the screw on the measuring nipple (1).
11. Open the gas isolator cock.
12. Check the measuring nipple for gas tightness.

Conditions: Gas connection pressure **not** in the permissible range



Caution.

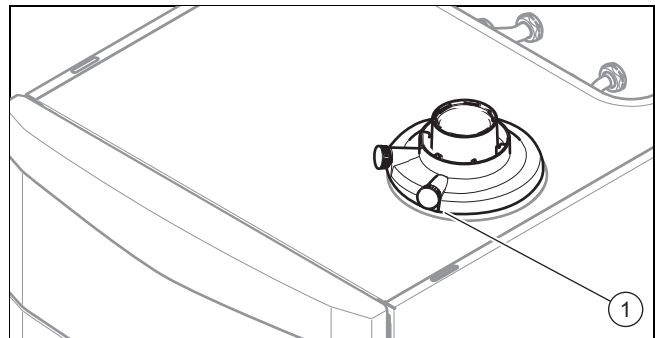
Risk of material damage and operating faults caused by incorrect gas connection pressure.

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.

- ▶ If you are unable to remedy the fault, contact the gas supply company.
- ▶ Close the gas isolator cock.

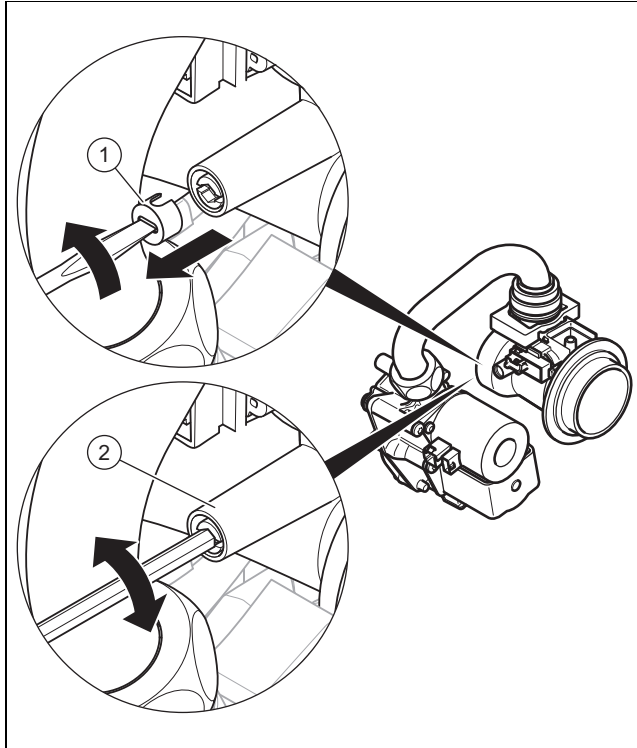
7.16.2 Checking the CO₂ content and, if necessary, adjusting it (air index setting)



1. Start up the product with the check programme **P.01**.
2. Wait at least five minutes until the product reaches its operating temperature.
3. Measure the CO₂ content at the flue gas analysis point (1).
4. Compare the measured value with the corresponding value in the table.
Gas adjustment values as set at the factory (→ Page 54)

Conditions: The CO₂ content must be adjusted

- ▶ Remove the front casing.



- ▶ Pierce the covering cap (1) at the mark using a small flat-blade screwdriver and unscrew it.
- ▶ Set the CO₂ content (value with front casing removed) by turning the screw (2).



Note

Turn to the left: Higher CO₂ content
Turn to the right: Lower CO₂ content

- ▶ For natural gas only: Adjust the value in increments of 1 turn and wait approx. 1 minute after each adjustment until the value stabilises.
- ▶ For liquid gas only: Adjust the value in small increments of 1/2 turn and wait approx. 1 minute after each adjustment until the value stabilises.
- ▶ Once the setting is finished, lock the check programme.
- ▶ If an adjustment is not possible in the specified adjustment range, you must not start up the product.
- ▶ If this is the case, inform Vaillant Customer Service.
- ▶ Screw the covering cap back in.
- ▶ Refit the front casing.

7.17 Checking leak-tightness

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

Conditions: Room-sealed operation

- ▶ Check whether the vacuum chamber has been closed tightly.

7.17.1 Checking the heating mode

1. Make sure that there is a heat requirement.
 - E.g. using settings on the system control or cooling the buffer cylinder.



Note

Alternatively, you can use the service software to make a target flow value specification.

2. Call up the **Live Monitor**.
 - **Menu → Live Monitor**
 - ◁ If the product is working correctly, the display shows **S.04**.

7.17.2 Checking the hot water generation

1. Open a hot water valve all the way.
2. Call up the **Live Monitor**.
 - **Menu → Live Monitor**
 - ◁ If the hot water generation is working correctly, the display shows **S.24** after a few minutes.

8 Adapting the unit to the heating installation

To reset the most important system parameters, use the **Appliance config.** menu item.

Menu → Installer level Appliance config.

Or manually relaunch the installation assistant.

Menu → Installer level → Start inst. assistant

8.1 Calling up diagnostics codes

The settings options for more complex systems can be found in the **Diagnostics menu**.

Menu → Installer level Diagnostics menu

Overview of diagnostics codes (→ Page 44)

You can use the parameters that are marked as adjustable in the overview of diagnostics codes to adapt the product to the heating installation and the needs of the customer.

- ▶ Press or to change the diagnostics code.
- ▶ Press (**Select**) to select the parameter to change.
- ▶ Press or to change the current setting.
- ▶ Press (**OK**) to confirm your selection.

8 Adapting the unit to the heating installation

8.2 Setting the maximum heating output

The unit's maximum heating output can be adjusted to the system's heat demand. Use diagnostics code **D.000** to set a value that corresponds to the output in kW.

8.3 Setting the pump overrun and pump operating mode

You can set the pump overrun under **D.001** (default setting: 5 min.).

You can use diagnostics code **D.018** to set the pump operating modes **Eco** or **Comfort**.

In **Comfort** mode, the internal pump is switched on when the heating flow temperature is not at **Heating off** (Operating instructions) and the heating requirement is enabled via an external control.

Eco (default setting) is useful for removing residual heat after hot water generation when the heat demand is extremely low and large target temperature spreads exist between the hot water generation and heating mode target values. This prevents living rooms from being under-supplied. If there is a heat demand, the pump is switched on every 25 minutes for 5 minutes once the overrun time has elapsed.

8.4 Setting the maximum flow temperature

You can use diagnostics code **D.071** to set the maximum flow temperature for heating mode (default setting: 75 °C).

8.5 Setting the return flow temperature control

If the product is connected to an underfloor heating system, the temperature control setting can be changed from flow temperature control (default setting) to return flow temperature control using diagnostics code **D.017**.

8.6 Burner anti-cycling time

8.6.1 Setting the 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. You can adjust the burner anti-cycling time to the conditions of the heating installation. The burner anti-cycling time is only active for the heating mode. Hot water handling mode during a burner anti-cycling time does not affect the time function element. You can use diagnostics code **D.002** to set the maximum burner anti-cycling time (default setting: 20 min.). The effective burner anti-cycling times with respect to the target flow temperature and the maximum set burner anti-cycling time can be found in the following table:

T _{Flow} (target) [°C]	Set maximum burner anti-cycling time [min]						
	1	5	10	15	20	25	30
30	2.0	4.0	8.5	12.5	16.5	20.5	25.0
35	2.0	4.0	7.5	11.0	15.0	18.5	22.0
40	2.0	3.5	6.5	10.0	13.0	16.5	19.5
45	2.0	3.0	6.0	8.5	11.5	14.0	17.0
50	2.0	3.0	5.0	7.5	9.5	12.0	14.0
55	2.0	2.5	4.5	6.0	8.0	10.0	11.5
60	2.0	2.0	3.5	5.0	6.0	7.5	9.0

T _{Flow} (target) [°C]	Set maximum burner anti-cycling time [min]						
	1	5	10	15	20	25	30
65	2.0	1.5	2.5	3.5	4.5	5.5	6.5
70	2.0	1.5	2.0	2.5	2.5	3.0	3.5
75	2.0	1.0	1.0	1.0	1.0	1.0	1.0

T _{Flow} (target) [°C]	Set maximum burner anti-cycling time [min]					
	35	40	45	50	55	60
30	29.0	33.0	37.0	41.0	45.0	49.5
35	25.5	29.5	33.0	36.5	40.5	44.0
40	22.5	26.0	29.0	32.0	35.5	38.5
45	19.5	22.5	25.0	27.5	30.5	33.0
50	16.5	18.5	21.0	23.5	25.5	28.0
55	13.5	15.0	17.0	19.0	20.5	22.5
60	10.5	11.5	13.0	14.5	15.5	17.0
65	7.0	8.0	9.0	10.0	11.0	11.5
70	4.0	4.5	5.0	5.5	6.0	6.5
75	1.0	1.0	1.0	1.0	1.0	1.0



Note

The remaining burner anti-cycling time following a regular shutdown in heating mode can be called up under diagnostics code **D.067**.

8.6.2 Resetting the remaining burner anti-cycling time

1st option

Menu → **Reset anti-cycl. time**

The current burner anti-cycling time appears in the display.

- Confirm the burner anti-cycling time reset by pressing (**Select**).

2nd option

- Press the fault clearance key.

8.7 Setting the maintenance interval

If you set the maintenance interval, after a configurable number of burner operating hours, the message that the product must be serviced appears in the display together with the maintenance symbol . The eBUS controller display shows the information **Maintenance MAIN**.

- Set the operating hours until the next maintenance using diagnostics code **D.084**. Guideline values can be found in the following table.

Heat demand	Number of persons	Burner operating hours until the next inspection/maintenance work is due (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

Adapting the unit to the heating installation 8

Heat demand	Number of persons	Burner operating hours until the next inspection/maintenance work is due (dependent upon the system type)
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

The values stated correspond to an average operating time of one year.

If you do not set a numerical value, but instead set the symbol "-", the "Maintenance display" function is not active.



Note

On completion of the set operating hours, you must set the maintenance interval again.

8.8 Setting the pump output

The product is equipped with a speed-regulated high-efficiency pump, which adjusts independently to the hydraulic conditions of the heating installation.

If required, you can manually set the pump output to five fixed, selectable steps based on the maximum possible output. This switches the speed regulation off.

The pump operating mode is set to "auto" at the factory in accordance with the most recent energy conservation ordinance.

- To change the pump output, change **D.014** to the desired value.

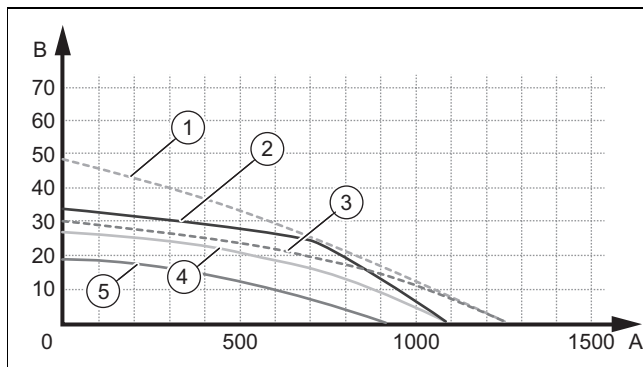


Note

If you have installed a low loss header in the heating installation, we recommend switching off the speed regulation and setting the pump output to a fixed value.

8.8.1 Remaining feed head, pump

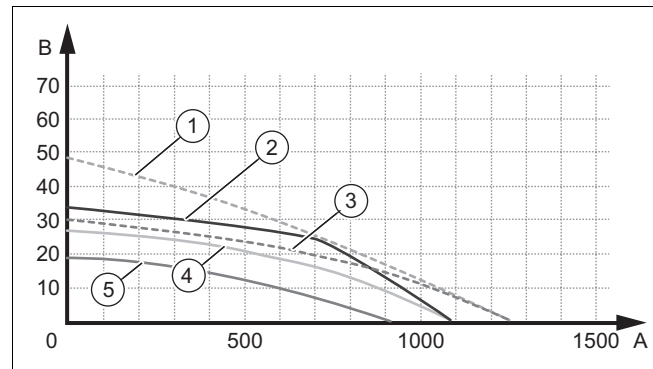
8.8.1.1 Pump curve for 14 kW



- | | |
|--|---------------------------------|
| 1 Bypass closed/Vmax/code d148=8 (boost) | 2 Bypass closed/Vmax/code d14=0 |
|--|---------------------------------|

- | | |
|--|-------------------------------|
| 3 Bypass in factory setting/Vmax/code d148=8 (boost) | 5 Bypass open/Vmin/code d14=0 |
| 4 Bypass in factory setting/Vmax/code d14=0 | A Throughput in circuit (l/h) |
| | B Available pressure (kPa) |

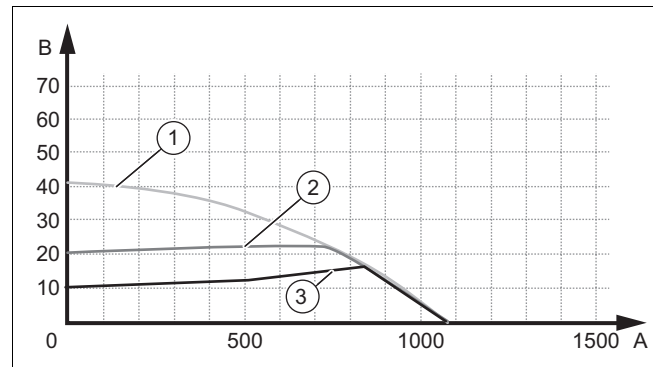
8.8.1.2 Pump characteristic line for 20 kW



- | | |
|--|---|
| 1 Bypass closed/Vmax/code d148=8 (boost) | 4 Bypass in factory setting/Vmax/code d14=0 |
| 2 Bypass closed/Vmax/code d14=0 | 5 Bypass open/Vmin/code d14=0 |
| 3 Bypass in factory setting/Vmax/code d148=8 (boost) | A Throughput in circuit (l/h) |
| | B Available pressure (kPa) |

8.8.2 Setting the pump output for subsidy programmes

Characteristic line for proKlima (14 and 20 kW)



- | | |
|------------------------------|-------------------------------|
| 1 Bypass plug d14=6/d122=400 | A Throughput in circuit (l/h) |
| 2 Bypass plug d14=6/d122=200 | B Available pressure (kPa) |
| 3 Bypass plug d14=6/d122=100 | |

Changes must be made during the installation for the proKlima or KfW label.

Setting for proKlima

- Remove the bypass and replace it with the plug that is supplied.
- Set **D.014** to 6 (= auto (Δp limit)).
- If required, adjust **D.122** (set to 200 mbar as standard).
 - ◁ The hydraulic pressure difference with respect to the heating system is limited to the set value (see diagram).

8 Adapting the unit to the heating installation



Note

When starting up the product or after switching on the power supply, this pump setting does not take effect until after the burner has run for the first time.

Setting for KfW

- Set **D.014** to 7 (= fixed (Δp Limit)).

Conditions: The hydraulics in the heating system or the heating system itself is suitable for this type of pump operation.

- The pump is only operated at this pump stage. The hydraulic power of the pump for transferring the heat output is limited.
- ◁ The pump is permanently set to a lower pump stage with a maximum feed head of 200 mbar.



Note

If the heating system is not suitable for this type of pump operation, this can lead to insufficient supply to the product and to safety shutdowns.

- Make sure that there is a guaranteed minimum flow of heating water via the heating system to transfer the heat output.



Note

The bypass valve remains inoperative as the pump stage is not sufficient to open it (provided the factory settings remain unchanged).



Note

If the "Pump speed target value = fixed (Δp Limit)" pump mode is selected, the product's maximum heat output is automatically no longer available. The relevant nominal output is adapted to the hydraulic potential of this pump stage at the factory.

8.9 Setting the domestic hot water temperature

- Observe the applicable regulations regarding legionella prevention.

8.10 Descaling the water

The probability of scale increases as the water temperature increases.

- Descale the water as required.

8.11 Handing the product over to the end user

1. When you have finished the installation, attach the sticker supplied (835593) to the front of the product in the user's language.
2. Explain to the end user how the safety devices work and where they are located.
3. Inform the end user how to handle the product. Answer any questions the end user may have. In particular, draw attention to the safety warnings which the end user must follow.
4. Inform the end user that they must have the product maintained in accordance with the specified intervals.
5. Pass all of the instructions and documentation for the product to the end user for safe-keeping.
6. 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.



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.

7. Inform the end user that the specifications for domestic hot water apply.

8.12 Setting the hot water thermostatic mixer



Warning.

Risk of burns from contact with components carrying hot water.

There is a risk of burns from the cylinder and all components carrying hot water that are located close to the cylinder. In solar mode, the cylinder temperature can rise to 80 °C.

- When setting the thermostatic mixer, do not touch the hot water pipes.



Warning.

Risk of burns if the temperature is set too high.

There is a risk of scalding at the hot water draw-off points if the water temperature is too high.

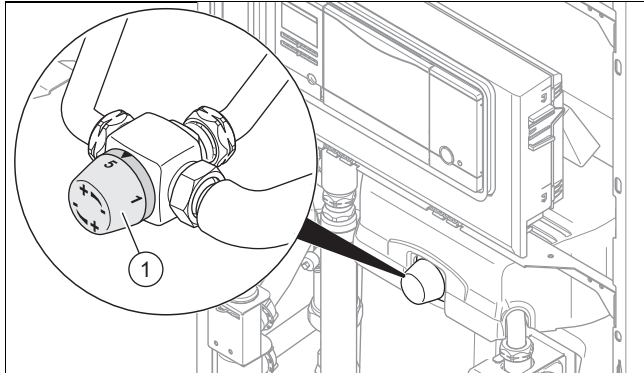
- Check the temperature at a draw-off point and set the thermostatic mixer to a value below 60 °C.



Note

The hot water thermostatic mixer protects against high temperatures in the hot water installation. The hot water from the cylinder is mixed with cold water in the thermostatic mixer and is thereby heated to the maximum required temperature between 40 °C and 60 °C. The hot water thermostatic mixer is set to 60 °C at the factory.

Due to energy losses in the hot water pipe, the temperature at the draw-off points is always lower than the temperature that is set at the thermostatic mixer.



1. Set the cylinder temperature to 65 °C and wait until this value has been reached.



Note

Depending on the temperature setting for the cylinder, the auxiliary heater is activated if the solar heating is not sufficient for achieving the target temperature.

2. Measure the hot water temperature at a draw-off point and set the thermostatic mixer to the position that corresponds to the maximum temperature that is required by the operator.
 - 40 °C (1)
 - 45 °C (2)
 - 50 °C (3)
 - 55 °C (4)
 - 60 °C (5)
3. Then set the set target temperature for the cylinder on the operating display.
 - ◁ Each additional temperature boost causes unnecessary energy consumption.
4. To optimise solar energy consumption in the summer, reduce the minimum hot water temperature to 45 °C.

9 Inspection and maintenance

- Carry out all inspection and maintenance work in the order shown in the table "Overview of inspection and maintenance work".

Inspection and maintenance work – Overview
(→ Page 48)

9.1 Checking the product for leak-tightness

- Check that the product is leak-tight. (→ Page 27)

9.2 Observing inspection and maintenance intervals

Proper regular inspections (once a year) and maintenance (depending on the result of the inspection, but at least once every two years) combined with the exclusive use of original spare parts are decisive factors in ensuring smooth operation and long working life for the product.

We recommend taking out an inspection or maintenance contract.

Inspection

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

Maintenance

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

Based on experience, it is not necessary to carry out annual cleaning, e.g. on heat exchangers, under normal operating conditions. The maintenance intervals and the scope of the maintenance intervals are determined by the specialist installer depending on the conditions on inspection. It is nevertheless necessary to carry out maintenance work at least every two years.

9.3 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.

9.4 Using the function menu

The function menu allows you to actuate and test individual components in the heating installation.

Menu → Installer level → Test programs → Function menu

- Choose the heating installation components.
- Press (**Select**) to confirm your selection.

9 Inspection and maintenance

Display	Test programme	Action
T.01	Check internal pump	Switch the internal pump on and off.
T.02	Check 3-way valve	Move the diverter valve to the heating position or to the hot water position.
T.03	Check fan	Switch the fan on and off. The fan runs at maximum rotational speed.
T.04	Check cylinder charge pump	Switch the cylinder charging pump on and off.
T.05	Check circulation pump	Switch the circulation pump on and off.
T.06	Check external pump	Switch the external pump on and off.
T.07	Inspect solar pump	Switch the solar pump on and off.
T.08	Check burner	The product starts up and switches to minimum load. The flow temperature is shown in the display.
T.29	Inspect auxiliary solar pump	Switch the auxiliary solar pump on and off.
T.92	Inspect Legionella protection pump	Switch the Legionella protection pump on and off.

Terminate function menu

- To terminate the function menu, select **(Cancel)**.

9.5 Carrying out electronics self-tests

Menu → Installer level → Test programs → Electronics self-test

You can use the electronics self-test to check the PCB in advance.

9.6 Removing the compact thermal module



Note

The compact thermal module consists of five main components:

- Speed-regulated fan,
- Gas valve including support plate,
- Venturi including mass flow sensor and gas connection pipe,
- Burner door,
- Premix burner.



Danger!

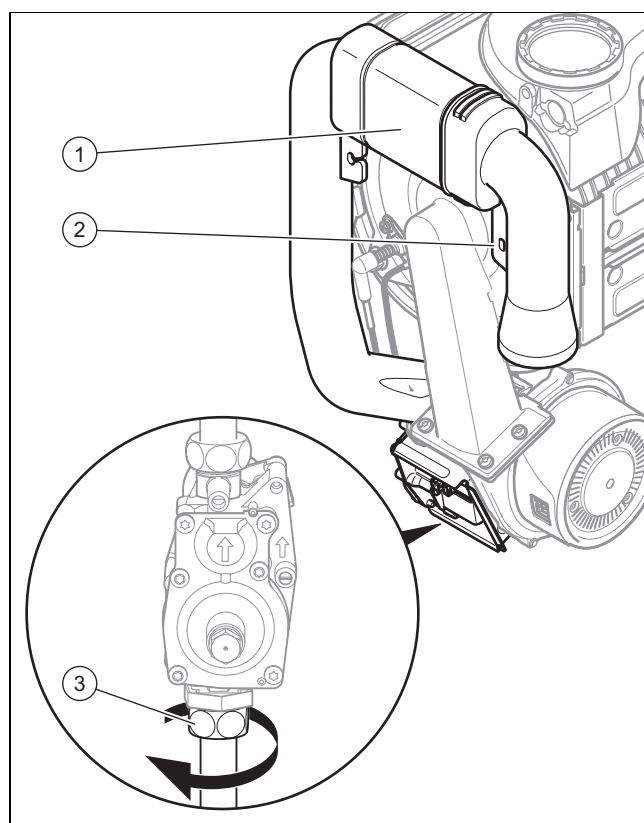
Risk of death and risk of material damage caused by hot flue gas.

The seal, heat insulation and self-locking nuts on the burner flange must not be damaged. Otherwise, hot flue gases may escape and cause personal injury and material damage.

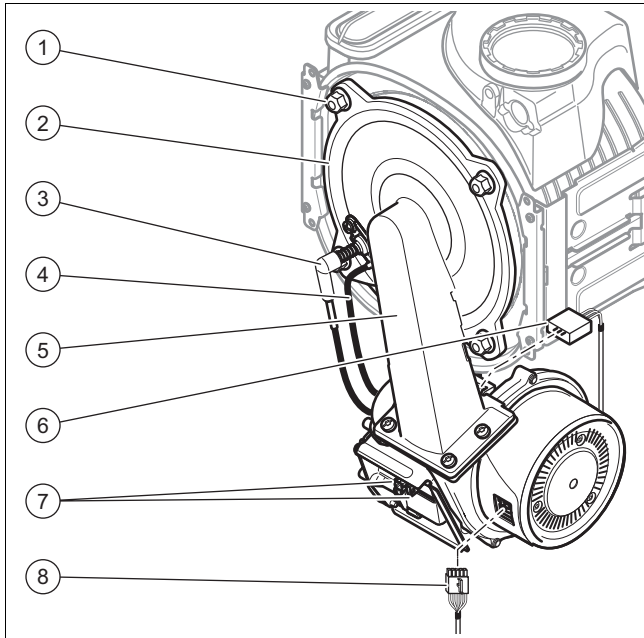
- Replace the seal each time you open the burner flange.

- Replace the self-locking nuts on the burner flange each time you open the burner flange.
- If the heat insulation on the burner flange or on the back wall of the heat exchanger shows signs of damage, replace the heat insulation.

1. Switch off the product using the on/off button.
2. Close the gas isolator cock.
3. Remove the front casing. (→ Page 11)
4. Tilt the electronics box forward.
5. Remove the vacuum chamber's front wall. (→ Page 12)



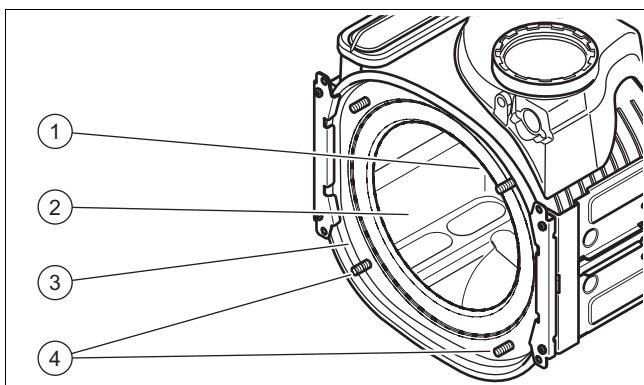
6. Undo the fixing screw **(2)** and remove the air intake pipe **(1)** from the intake manifold.
7. Undo the cap nut **(3)** on the gas valve.



8. Remove the ignition cable plug (3) and the earth cable (4) from the ignition electrode.
9. Remove the plug (8) from the fan motor by pressing on the locking lug.
10. Remove the plug (7) from the gas valve.
11. Remove the plug (6) from the Venturi jet by pressing on the locking lug.
12. Undo the four nuts (1).
13. Pull the compact thermal module's assembly group (2) out of the heat exchanger.
14. Check the burner and the heat exchanger for damage and dirt.
15. If necessary, clean or replace the components according to the following sections.
16. Fit a new burner door seal.
17. Check the heat insulation on the burner door. If you notice any signs of damage, replace the heat insulation.

9.7 Cleaning the heat exchanger

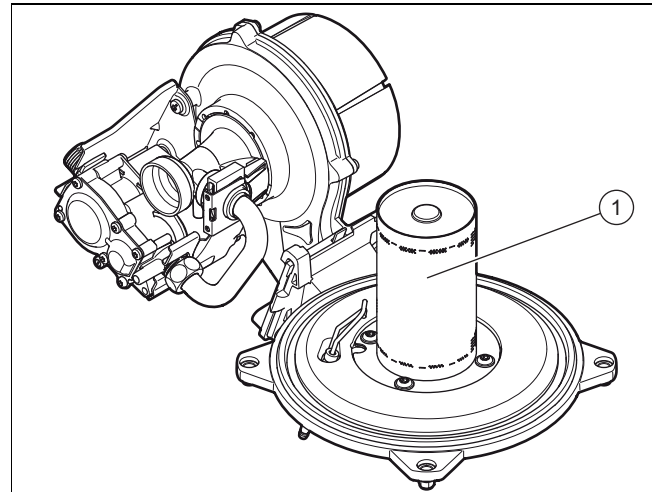
1. Protect the folded-down electronics box against sprayed water.



2. The four nuts on the threaded pins (4) must never be loosened or tightened.
3. Clean the heating coil (2) on the heat exchanger (3) using water or, if required, vinegar (maximum 5% acid). Allow the vinegar to act on the heat exchanger for 20 minutes.

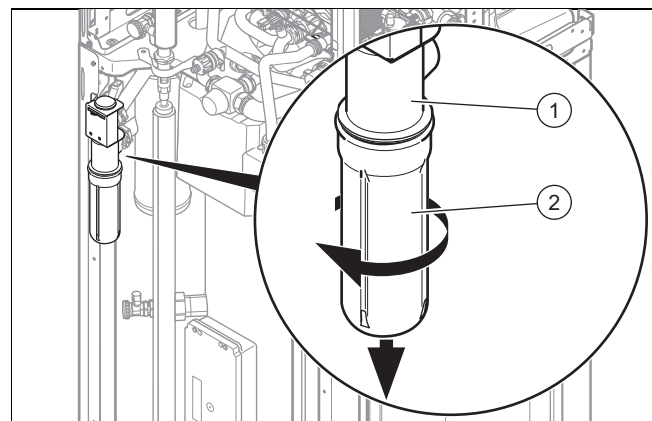
4. Rinse away any loose dirt with a sharp jet of water or use a plastic brush. Do not point the water jet directly at the heat insulation (1) on the back of the heat exchanger.
 - ◁ The water flows via the condensate siphon and out of the heat exchanger.

9.8 Checking the burner



- Check the surface of the burner (1) for damage. If you see any damage, replace the burner.

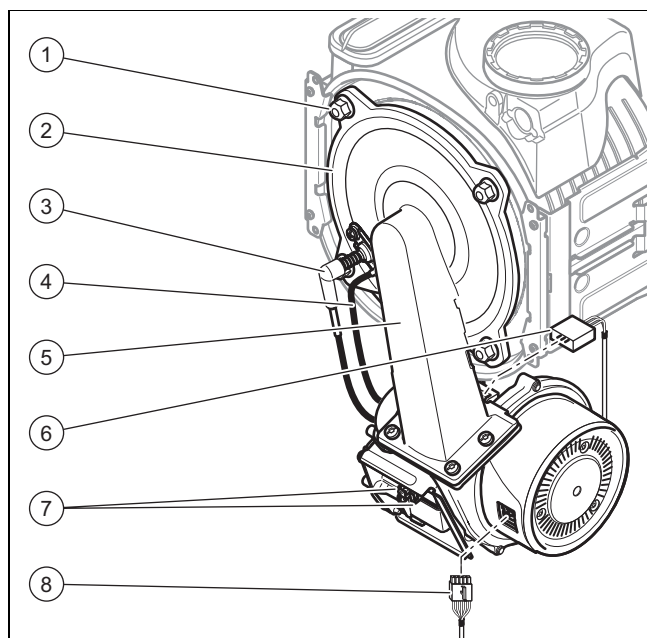
9.9 Cleaning the condensate siphon



1. Remove the lower section of the siphon (1) by turning the bayonet fitting anti-clockwise.
2. Flush the lower section of the condensate siphon with water.
3. Fill the lower section with water up to about 10 mm below the upper edge.
4. Screw the lower section back onto the condensate siphon.

9 Inspection and maintenance

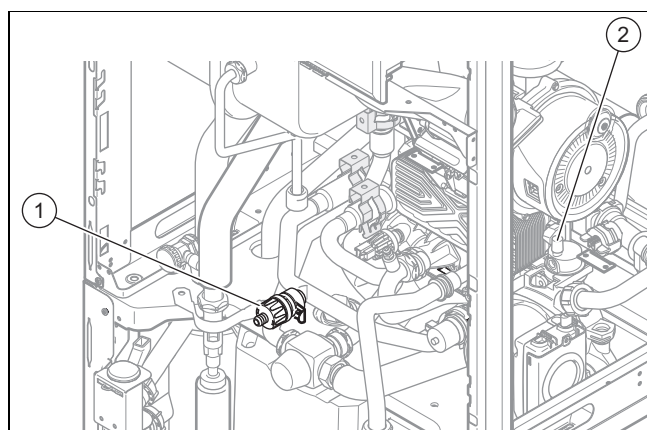
9.10 Installing the compact thermal module



1. Attach the compact thermal module **(5)** to the heat exchanger .
2. Tighten the four nuts **(1)** in a cross-wise pattern until the burner door **(2)** sits tightly against the bearing surfaces.
 - Tightening torque: 6 Nm
3. Reconnect the plugs **(3)**, **(4)**, **(6)**, **(7)** and **(8)**.
4. Connect the gas line with a new seal.
5. Open the gas isolator cock.
6. Make sure that there are no leaks.
7. Check whether the air intake pipe's sealing ring has been fitting correctly.
8. Reconnect the air intake pipe to the intake nozzle.
9. Secure the air intake pipe with the retaining screw.
10. Check the gas connection pressure (gas flow pressure). (→ Page 26)

9.11 Draining

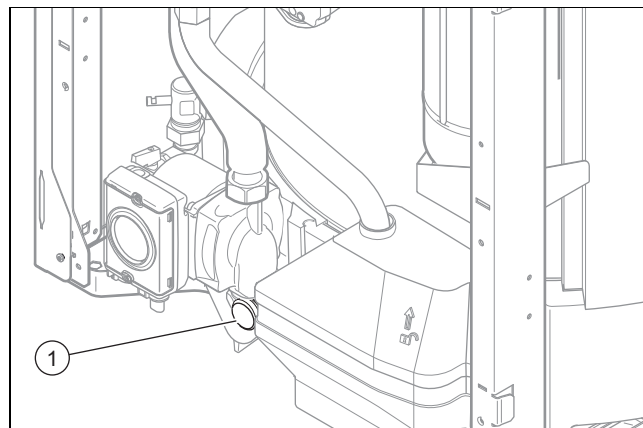
9.11.1 Draining the unit's heating circuit



1. Close the service valves in the heating flow and in the heating return.
2. Remove the front casing. (→ Page 11)
3. Move the electronics box into the upper position (→ Page 11).

4. Connect a hose to the drain cock **(1)** and guide the free end of the hose to a suitable outflow location.
5. Open the drain cock to fully drain the unit's heating circuit.
6. Open the purging valve **(2)**.

9.11.2 Draining the unit's process water circuit

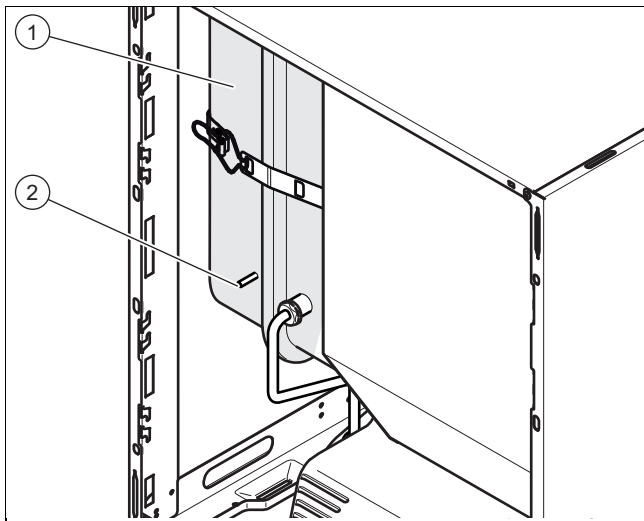


1. Close the drinking water valves.
2. Remove the front casing. (→ Page 11)
3. Connect a hose to the connection on the drain cock **(2)** and route the free end of the hose to a suitable outflow location.
4. Open the drain cock **(1)** to fully drain the unit's process water circuit.
5. Open the purging valve on the hot water circuit.

9.11.3 Draining the system

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

9.12 Checking the pre-charge pressure of the expansion vessel



1. Close the service valves and drain the product.
2. Measure the initial pressure of the expansion vessel (1) at the valve (2).
3. If the initial pressure is below 0.75 bar (depending on the static pressure height of the heating installation), use nitrogen to fill the expansion vessel. If this is not available, use air. Check that the drain valve is open when topping up.
4. If water escapes from the valve of the expansion vessel, replace the heating expansion vessel. (→ Page 40)
5. Fill and purge the heating installation. (→ Page 25)

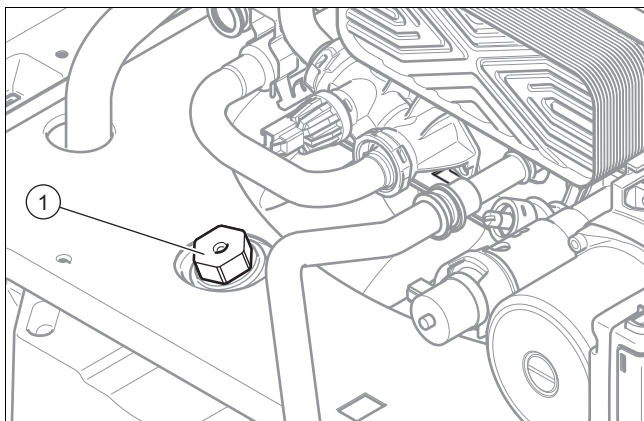
9.13 Checking the magnesium protection anode



Note

The domestic hot water cylinder is equipped with a magnesium protection anode. Its condition must be checked for the first time after two years and then every year.

To avoid having to maintain the magnesium protection anode, an electrical protection anode which requires no maintenance is optionally available.



1. Drain the unit's process water circuit. (→ Page 34)

- End the draining process as soon as the anode connection projects from the water.
2. Unscrew the magnesium protection anode (1) from the cylinder and check the extent to which it has corroded.
 3. If the anode is more than 60% worn, replace it.
 4. Clean the domestic hot water cylinder. (→ Page 35)
 5. Screw the anode back onto the cylinder after inspection.
 6. Fill the cylinder and then check whether the threaded connection of the anode is leak-tight.
 7. Purge the circuit (→ Page 21).

9.14 Cleaning the domestic hot water cylinder

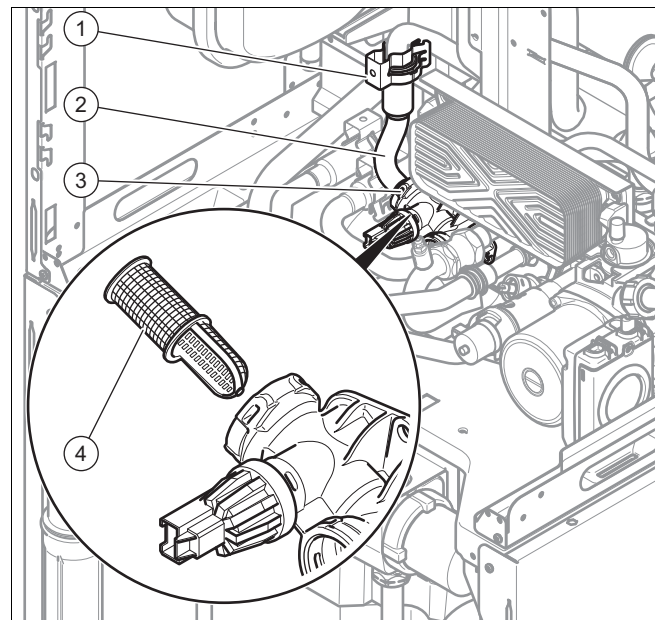


Note

As the process water circuit in the cylinder tank is being cleaned, ensure that the cleaning agents used satisfy hygiene requirements.

1. Drain the domestic hot water cylinder.
2. Remove the protection anode from the cylinder.
3. Use a spray of water through the anode opening on the cylinder to clean the cylinder interior.
4. Rinse sufficiently and allow the water used for cleaning to flow out via the cylinder drain cock.
5. Close the drain cock.
6. Refit the protection anode to the cylinder.
7. Fill the cylinder with water and check whether it is leak-tight.

9.15 Cleaning the heating filter



1. Drain the unit's heating circuit. (→ Page 34)
2. Remove the fastening clips (1) and (3).
3. Remove the connecting piece (2).
4. Remove the heating filter (4) and then clean it.
5. Put the filter back in.
6. Replace the seals.
7. Reattach the connecting piece and the two fastening clips.
8. Fill and purge the unit and, if required, the heating system.

10 Troubleshooting

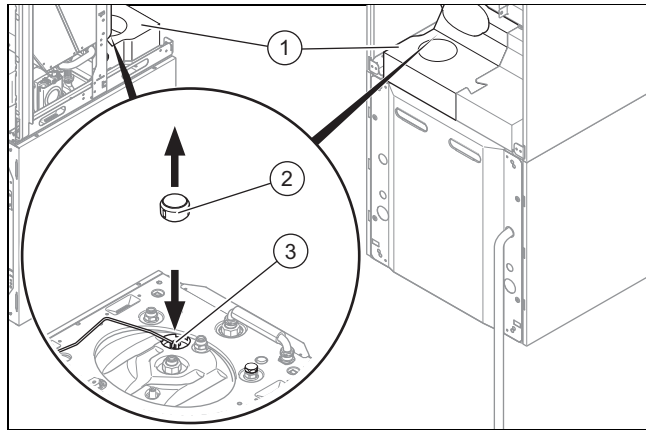
9.16 Inspection and maintenance

- ▶ Carry out all inspection and maintenance work in the order shown in the table "Overview of inspection and maintenance work".
Inspection and maintenance work – Overview
(→ Page 48)

9.16.1 Checking the product for leak-tightness

- ▶ Check that the product is leak-tight. (→ Page 27)

9.17 Installation position of the safety cut-out



Note

If the product overheats, it switches itself off. Once the operating temperature has dropped back down, the safety cut-out must be reset before starting up the product again.

Conditions: **S.40** is displayed

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

- ▶ To establish whether or not a component is defective, read the fault memory (→ Page 36).



Note

If no fault message is present, the product will automatically switch back to normal operating mode after a certain time.

10.3 Reading off the fault codes

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

Fault codes have priority over all other displays.

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

- ▶ Rectify the fault.
- ▶ To restart the product, press the fault clearance key (Operating instructions).
- ▶ If you are unable to remedy the fault and the fault recurs despite several fault clearance attempts, contact Vaillant Customer Service.

10.4 Querying the fault memory

Menu → Installer level Fault list

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

The display shows:

- The number of faults that have occurred
 - The fault currently selected with fault number **F.xx**
 - A plain text display explaining the fault.
- ▶ Use the or button to display the last ten faults that occurred.

Overview of fault codes (→ Page 50)

10.5 Resetting the fault memory

- ▶ To delete the entire fault list, press (**Delete, OK**) twice.

10.6 Performing diagnostics

- ▶ You can use the function menu (→ Page 31) to actuate and test individual components of the product during the fault diagnostics.

10 Troubleshooting

You can find an overview of the fault codes in the appendix.

Overview of fault codes (→ Page 50)

10.1 Contacting your service partner

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

- The fault code that is displayed (**F.xx**),
- The unit status (**S.xx**) that is displayed in the Live Monitor (→ Page 19).

10.2 Calling up service messages

If the maintenance symbol appears in the display, there is a service message.

The maintenance symbol appears if you have set a maintenance interval, for example, and it has elapsed. The product is not in fault mode.

- ▶ To obtain more information about the service message, call up the **Live Monitor** (→ Page 19).

10.7 Using check programmes

You can also use check programmes (→ Page 23) for troubleshooting.

10.8 Resetting parameters to factory settings

- To reset all parameters simultaneously to the default settings, set **D.096** to **1**.

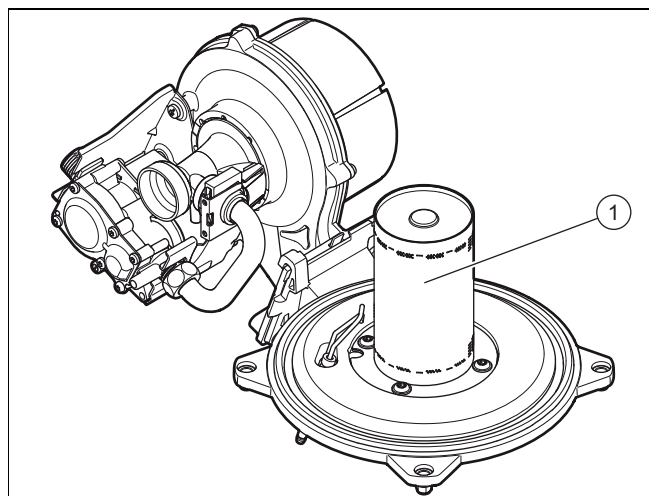
10.9 Preparing the repair work

1. Decommission the product.
2. Disconnect the product from the power mains.
3. Remove the front casing.
4. Close the gas isolator cock.
5. Close the service valves in the heating flow and in the heating return.
6. Close the service valve in the cold water pipe.
7. Drain the product if you want to replace water-bearing components of the product.
8. Make sure that water does not drip on live components (e.g. the electronics box).
9. Use only new seals.

10.10 Replacing defective components

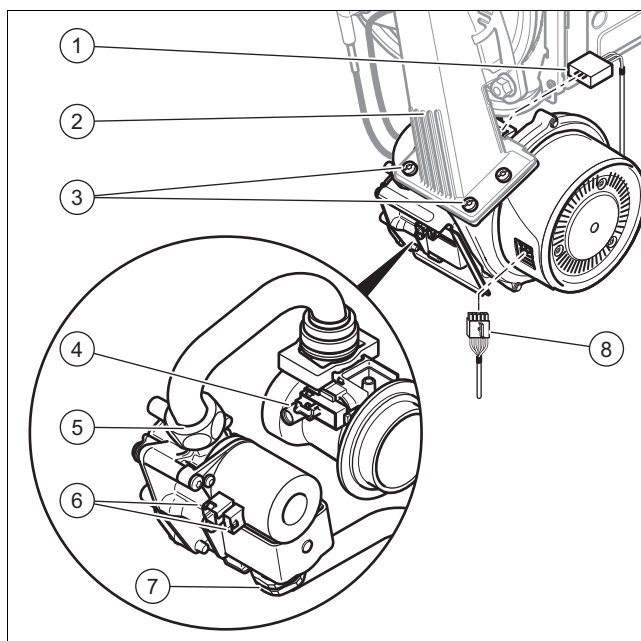
10.10.1 Replacing the burner

1. Remove the compact thermal module. (→ Page 32)

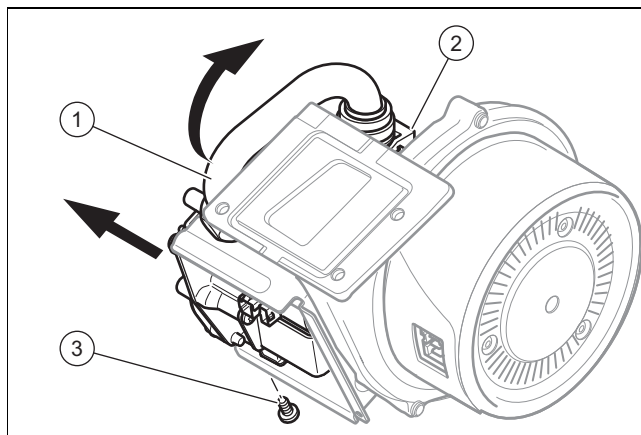


2. Undo the four screws on the burner (1).
3. Remove the burner.
4. Fit the new burner with a new seal.
5. Ensure that the recesses on the seal and burner are aligned with the sight glass on the burner door.
6. Install the compact thermal module. (→ Page 34)

10.10.2 Replacing the fan

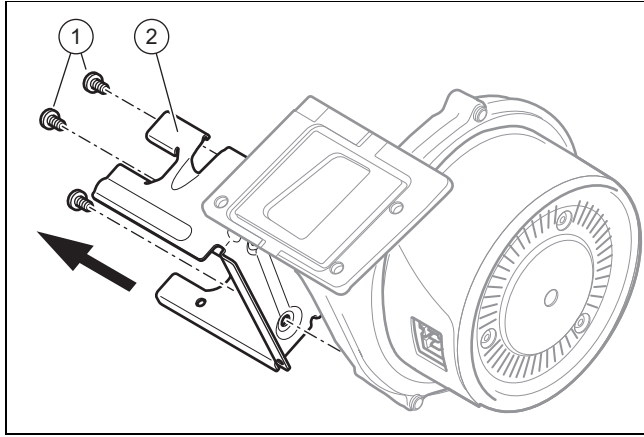


1. Remove the air intake pipe.
2. Remove the three plugs (1) and (6) from the gas valve.
3. Remove the plug from the sensor on the Venturi jet (4) by pressing on the locking lug.
4. Remove the plug(s) (depending on the unit version) (8) from the fan motor by pressing on the locking lug.
5. Undo the two cap nuts (5) and (7) on the gas valve. Hold on to the gas valve when loosening the cap nuts.
6. Undo the three screws (3) between the mixer tube (2) and the fan flange.

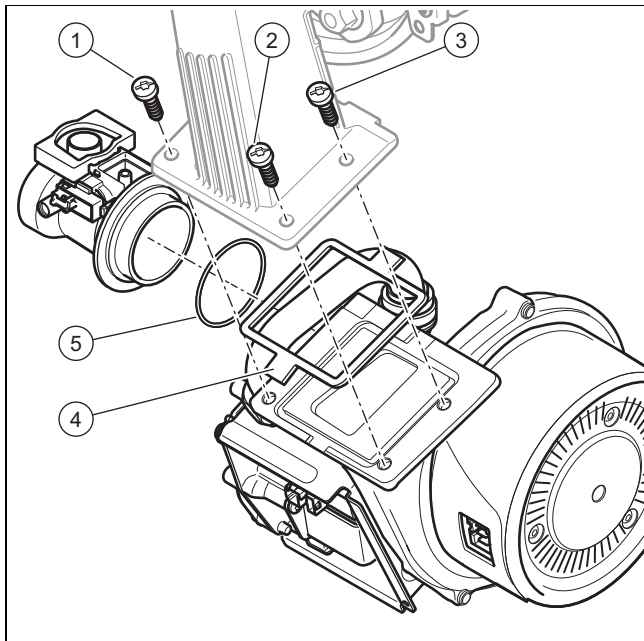


7. Remove the assembly (which is made up of the fan, Venturi jet and gas valve) from the unit.
8. Loosen the gas valve's fixing screw (3) from the bracket.
9. Remove the gas valve from the retainer.
10. Remove the Venturi jet (2) and the gas connection pipe (1) from the fan by turning the bayonet fitting on the Venturi jet as far as it will go anti-clockwise and then pulling the Venturi jet out of the fan.

10 Troubleshooting



11. Remove the gas valve's bracket (2) from the fan by loosening the three screws (1).
12. Replace the defective fan.



13. Reinstall the components in the reverse order. You must use new seals at position (4) and (5). Follow the tightening sequence for the three screws that connect the fan to the mixer tube by following the numbering (1), (2) and (3).
14. Screw the gas pipe onto the gas valve. Use new seals for this.
15. Hold on to the gas valve when tightening the cap nuts.
16. After installing the new fan, check the type of gas.

10.10.3 Replacing the gas valve



Caution.

Risk of material damage caused by making unauthorised settings.

- Never modify the factory setting of the gas pressure regulator of the gas valve.



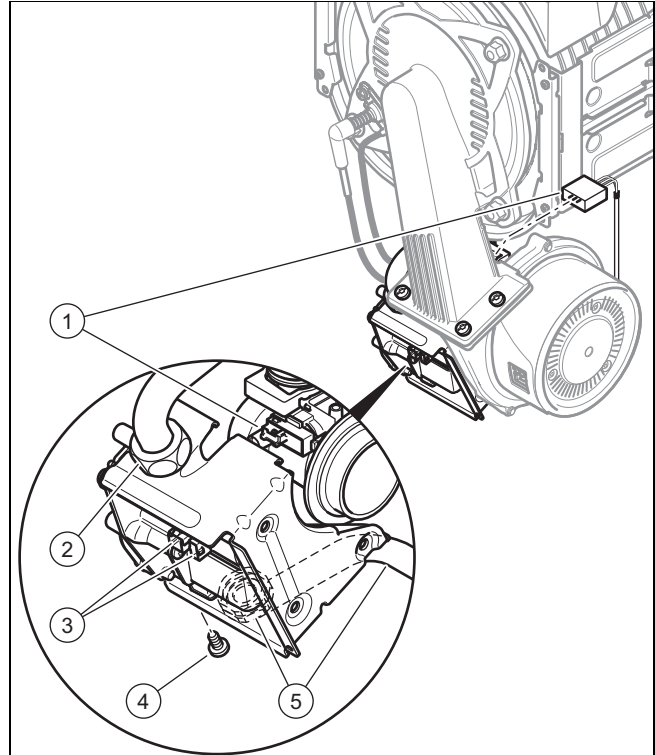
Note

Some products are fitted with gas valves that do not have a gas pressure regulator.



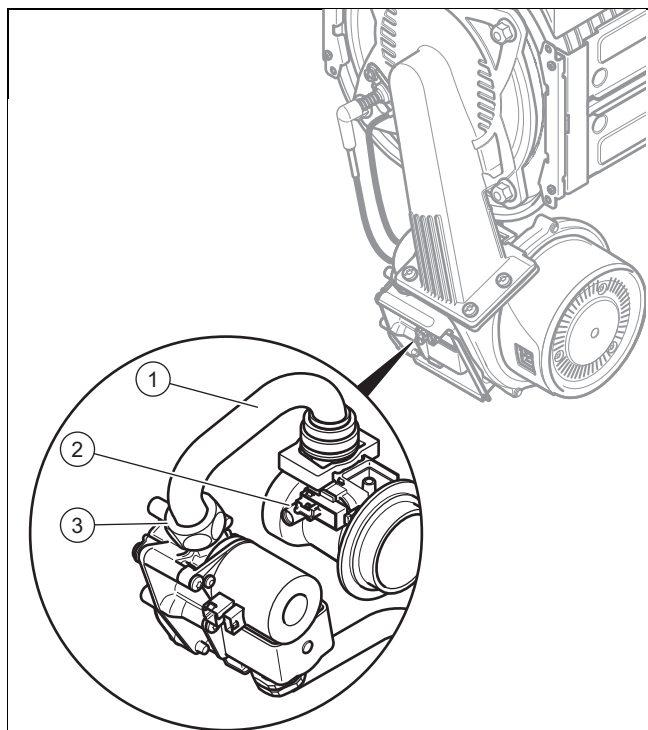
Note

Each destroyed seal must be restored.

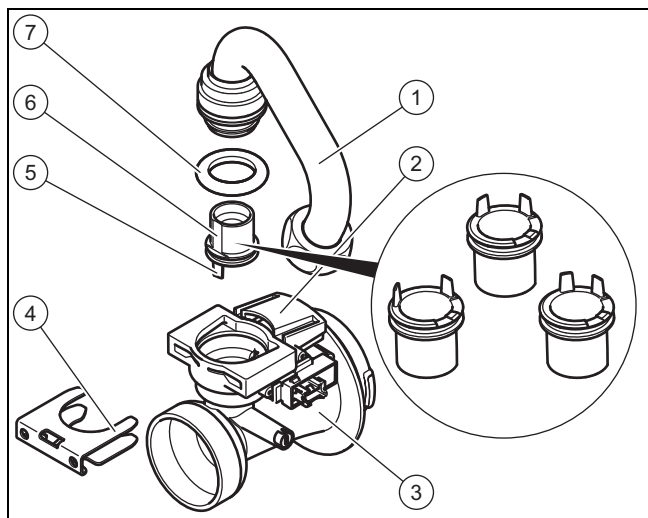


1. Remove the air intake pipe.
2. Remove the plugs (3) from the gas valve.
3. Remove the plug from the sensor on the Venturi (1) by pushing in the latching lug.
4. Undo the two cap nuts (5) and (2) on the gas valve. Hold on to the gas valve when loosening the cap nuts.
5. Loosen the gas valve's fixing screw (4) from the bracket.
6. Remove the gas valve from the retainer.
7. Reinstall the new gas valve in the reverse order. Use new seals for this.
8. Hold on to the gas valve when tightening the cap nuts.
9. After the new gas valve has been installed, carry out a leak-tightness check (Leak-tightness check (→ Page 27)), check the type of gas and set the gas ratio.

10.10.4 Replacing the Venturi



1. Remove the air intake pipe.
2. Remove the plug from the sensor on the Venturi jet (2) by pressing on the locking lug.
3. Undo the cap nut (3) for the gas connection pipe (1) on the gas valve.
4. Remove the Venturi jet and the gas connection pipe from the fan by turning the bayonet fitting on the Venturi jet as far as it will go anti-clockwise and then pulling the Venturi jet out of the fan.



5. Remove the gas connection pipe (1) from the Venturi (3) by removing the clamp (4) and pulling the gas connection pipe out vertically. Dispose of the seal (7).
6. Pull the burner jet (6) straight off and keep it for re-use.
7. Check whether the Venturi is free of residue at the gas inlet side.



Danger!

Risk of poisoning due to increased CO values.

An incorrect gas restrictor size can lead to increased CO values.

- When replacing the Venturi, ensure that you use the correct gas restrictor (colour coding and position of pins on the underside of the gas restrictor).



Caution.

Risk of material damage to the product.

Lubricant can block function-related channels in the Venturi.

- Do not use lubricant when installing the gas restrictor.

8. Insert the gas restrictor for the gas group in question (which may have been replaced) into the (new) Venturi.

Type of gas	Colour of the gas restrictor
G20 natural gas	Yellow
G25 natural gas	Blue
G31 propane	Grey



Note

Make sure that the colour of the gas restrictor matches the colour of the coding resistor on the PCB.

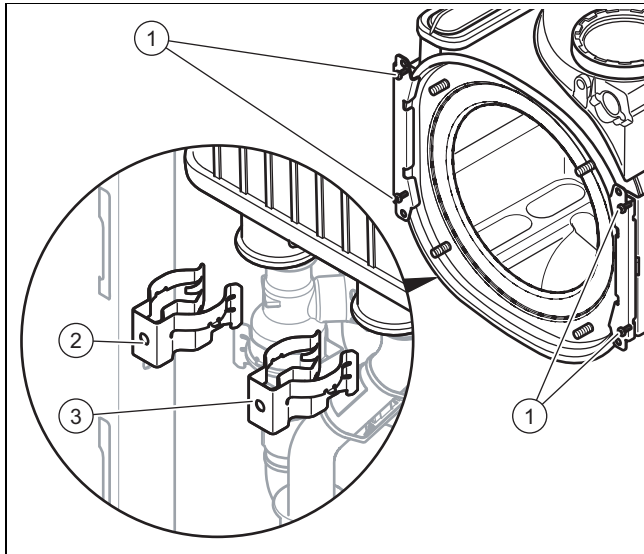
When inserting the gas restrictor, ensure that the gas restrictor is correctly aligned using the indicated position marks on the upper side of the Venturi and also the positioning pins (5) on the underside of the gas restrictor.

9. Reinstall the components in the reverse order. Use new seals for this.
10. After installing the new Venturi jet, check the type of gas and set the gas ratio (→ Page 20).
11. If you cannot adjust the CO₂ content, the gas restrictor has been damaged during installation. In this case, replace the gas restrictor with an appropriate spare part.

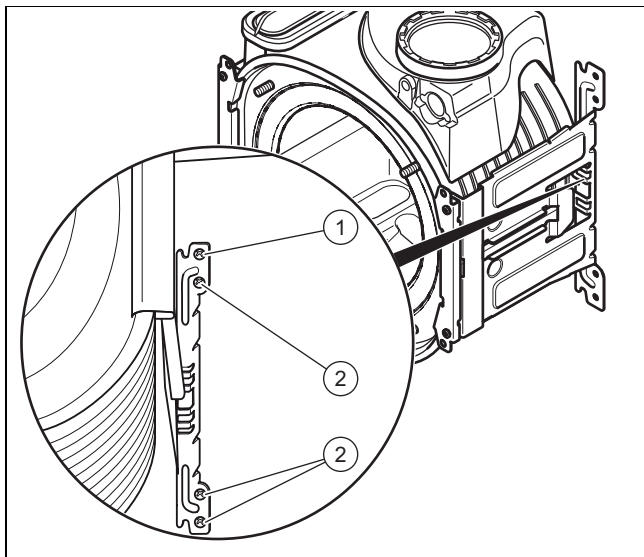
10.10.5 Replacing the heat exchanger

1. Empty the product
2. Remove the compact thermal module. (→ Page 32)
3. Detach the condensate drain hose from the heat exchanger.

10 Troubleshooting



4. Remove the clamps (2) and (3) from the flow connection and the return connection.
5. Detach the flow connection.
6. Detach the return connection.
7. Remove two screws (1) on each of the two retainers.



8. Disconnect the plug connection (2) of the thermal fuse.
9. Remove the lower three screws (3) on the rear section of the retainer.
10. Swing the retainer to the side around the top screw (1).
11. Pull the heat exchanger downwards and to the right, and remove it from the product.
12. Install the new heat exchanger in reverse order.
13. With the new heat exchanger, ensure that you use the cable with a coding resistor and the correct plug.



Caution.

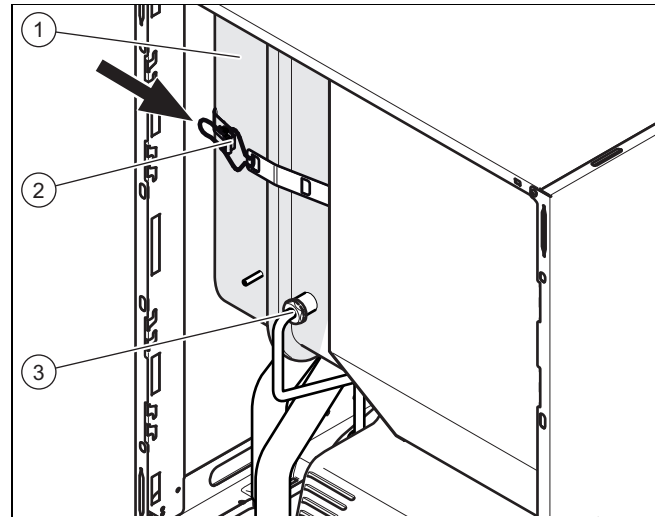
Risk of poisoning due to escaping flue gas.

Mineral-oil-based greases can damage the seals.

- Instead of grease, use only water or commercially available soft soap to aid installation.

14. Replace the seals.
15. Insert the flow and return connections into the heat exchanger as far as they will go.
16. Make sure that the brackets are seated correctly on the flow and return connections.
17. Install the compact thermal module. (→ Page 34)
18. Fill and purge the product and, if necessary, the heating installation.

10.10.6 Replacing the expansion vessel



1. Empty the product
2. Detach the connection (3).
3. Undo the strap handle (2).
4. Pull the expansion vessel (1) out towards the front.
5. Insert the new expansion vessel into the product.
6. Screw the new expansion vessel to the water connection. Use a new seal for this.
7. Attach the support plate using both screws (1).
8. If necessary, adjust the pressure to the static height of the heating installation.
9. Fill and purge the product and, if necessary, the heating installation.

10.10.7 Replacing the PCB and/or the display



Caution.

Risk of material damage caused by incorrect repairs.

Using an incorrect replacement display may cause damage to the electronics.

- Before replacing, check that the correct replacement display is available.
- Never use another replacement display.



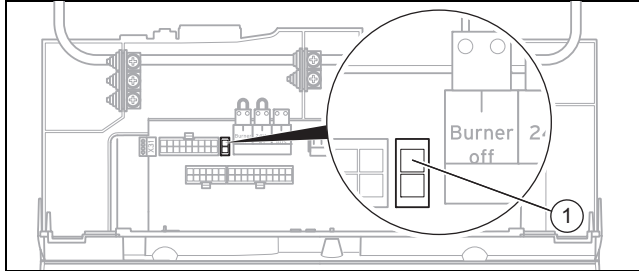
Note

If you are replacing only one component, the set parameters are transferred automatically. When the product is switched on, the new component adopts the previously set parameters from the unreplaced component.

1. Disconnect the unit from the power mains and secure it against being switched back on again.

Conditions: Replacing the display or PCB

- ▶ Replace the PCB or display according to the assembly and installation instructions supplied.



- ▶ If you are replacing the PCB, remove the coding resistance (1) (plug X24) from the old PCB and plug the plug onto the new PCB.

Conditions: Replacing the PCB and display at the same time

- ▶ Remove the coding resistance (1) (plug X24) from the old PCB and plug the plug into the new PCB.
- ▶ If you are replacing both components at the same time, the product switches directly to the menu to select the language after switching on. The default language setting is English.
- ▶ Select the required language.
- ▶ Confirm the setting by pressing (OK).
- ▶ Set the Device Specific Number **D.093**.
- ▶ Confirm your setting.
 - ◀ The electronics are now set to the product type and the parameters of all diagnostics codes are set to default settings.
 - ◀ The display automatically restarts with the installation assistant.
- ▶ Make the system-specific settings.

10.11 Completing repair work

- ▶ Check that the product functions correctly and check the leak-tightness (→ Page 27).

11 Decommissioning

11.1 Decommissioning the product

- ▶ Switch off the product.
- ▶ Disconnect the product from the power mains.
- ▶ Close the gas isolator cock.
- ▶ Close the cold water stop cock.
- ▶ Close the heating stop cock.
- ▶ Drain the unit's heating circuit. (→ Page 34)

12 Recycling and disposal

Disposing of the packaging

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

13 Customer service

13.1 Customer service

Auftragsannahme Vaillant Kundendienst: 021 91 5767901

Appendix

Appendix

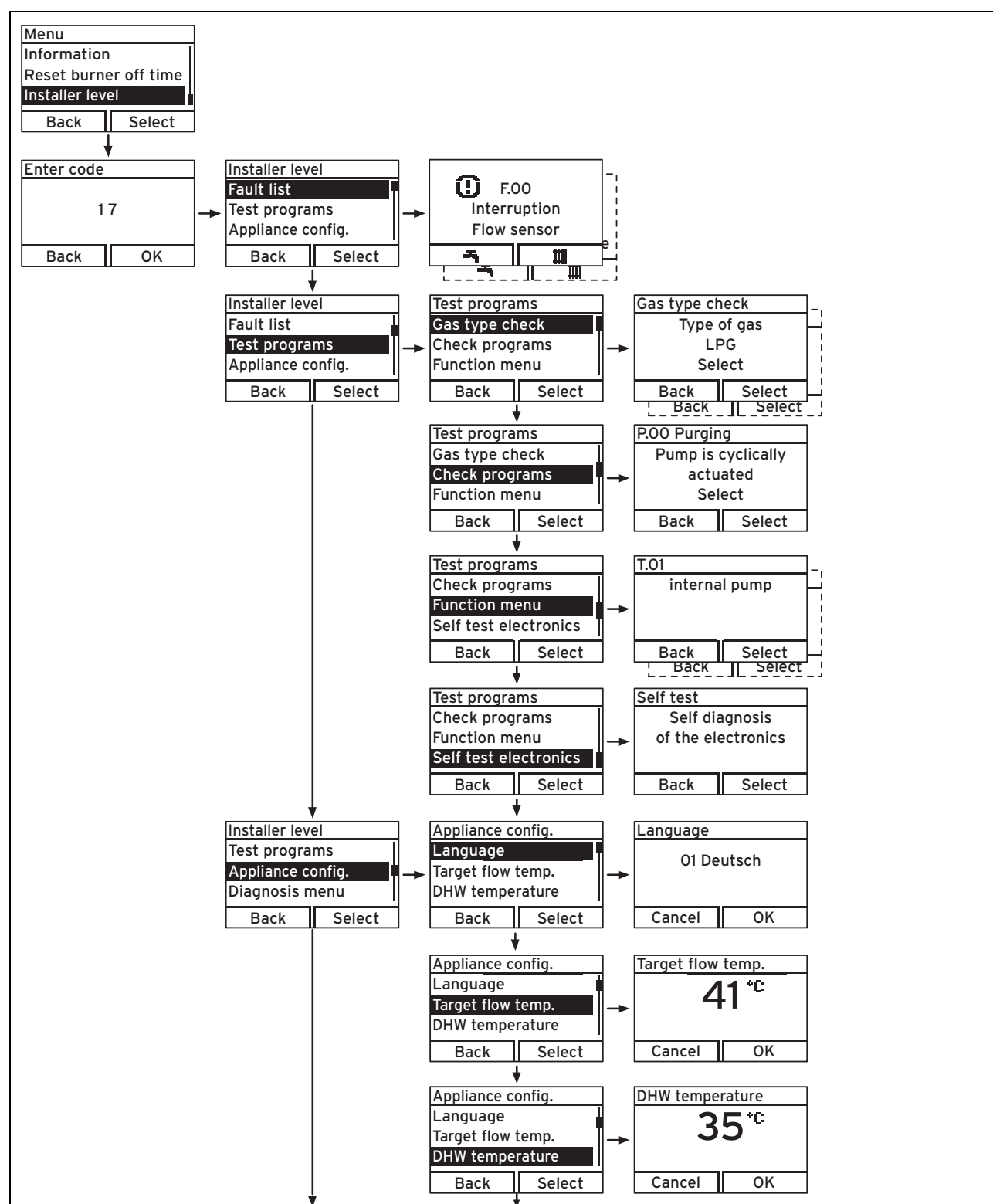
A Pipe lengths in the B23P installation

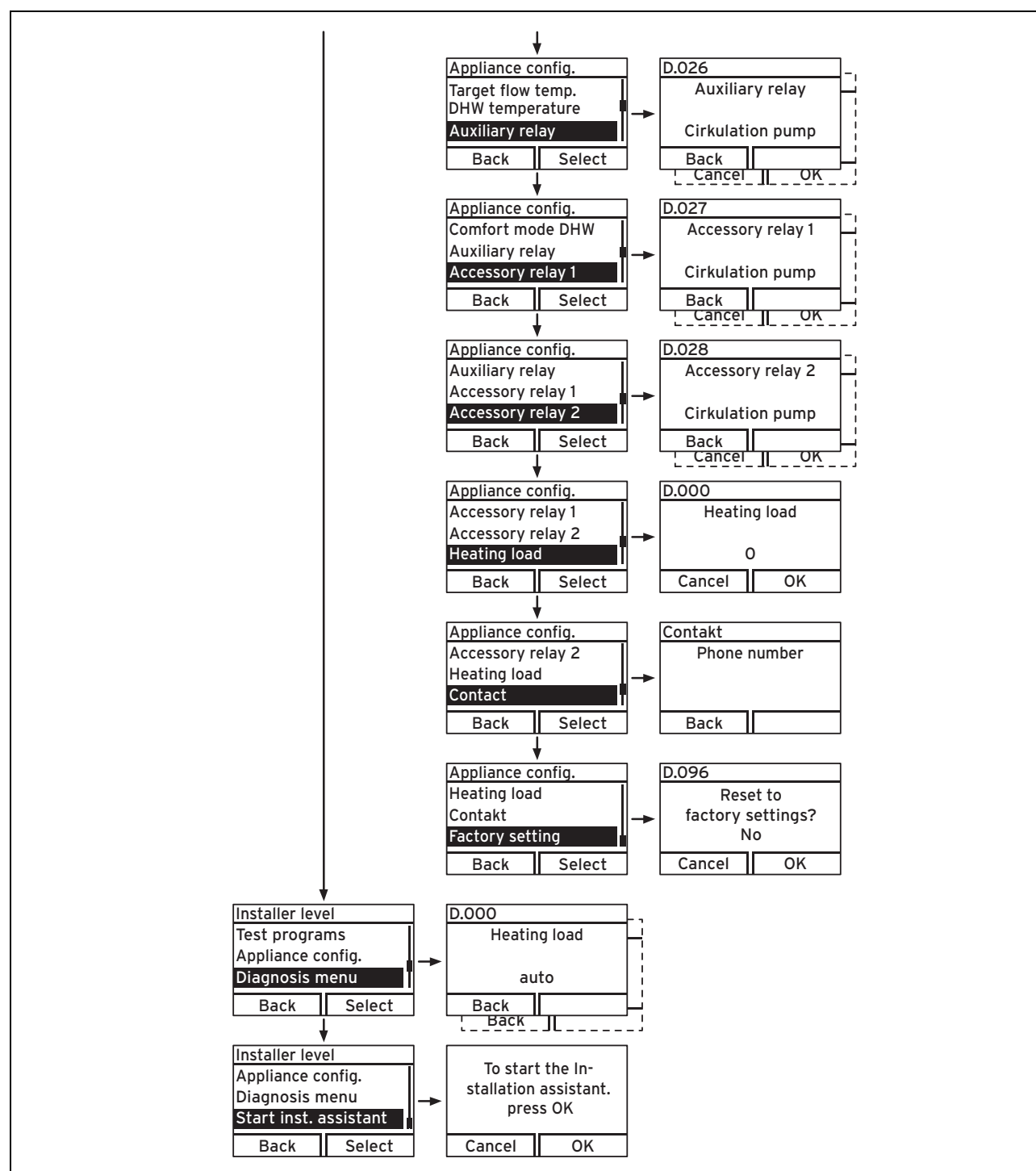
**Note**

The maximum pipe length (straight pipe only) corresponds to the maximum permitted flue pipe length without any elbows. If elbows are used, the maximum pipe length must be reduced in accordance with the dynamic flow characteristics of the elbows. Elbows must not be connected directly after one another as this method dramatically increases pressure losses.

	VSC D 146/4-5	VSC D 206/4-5
Length in m, diameter $\geq$ 80 mm	40	32

B Installer level menu structure – Overview





C Overview of diagnostics codes



Note

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

Code	Parameter	Values or explanations	Default setting	User-specific setting
D.000	Maximum heating output	Adjustable maximum heating output in kW Auto: Product automatically adjusts max. partial load to current system demand	15 kW	
D.001	Overrun time of internal heating pump for heating mode	1 ... 60 min	5 min	

Code	Parameter	Values or explanations	Default setting	User-specific setting
D.002	Max. burner anti-cycling time heating at 20 °C flow temperature	2 ... 60 min	20 min	
D.003	Domestic hot water temperature at the plate heat exchanger outlet	In °C		Not adjustable
D.004	Cylinder domestic hot water temperature	In °C		Not adjustable
D.005	Heating flow temperature, target value (or return target value)	In °C, the target heating value is set at the operating display or is transferred by an eBUS control (if connected).		Not adjustable
D.007	Domestic hot water temperature target value	35 ... 65 °C		Not adjustable
D.009	Heating flow temperature, target value from external eBUS control	In °C, the target heating value is calculated by the eBUS control (if connected).		Not adjustable
D.010	Status of internal heating pump	On, Off		Not adjustable
D.011	Status of external heating pump	On, Off		Not adjustable
D.012	Status of the cylinder charging pump	On, Off		Not adjustable
D.013	Status of the domestic hot water circulation pump	On, Off		Not adjustable
D.014	Target pump speed (high-efficiency pump)	Target value of internal high-efficiency pump in %. Possible settings: 0 = Auto 1 = 53 2 = 60 3 = 70 4 = 85 5 = 100 6 = Auto (proKlima) 7 = Fixed (KfW) 8 = Auto (pump boost)	0 = Auto	
D.015	Actual pump speed (high-efficiency pump)	Actual value for internal high-efficiency pump in %		Not adjustable
D.016	24 V DC room thermostat open/closed	Heating mode off/on		Not adjustable
D.017	Heating flow/return temperature control changeover	Control type: 0 = Flow, 1 = Return	0 = Flow	
D.018	Pump mode setting	1 = Comfort (continuously operating pump) 3 = Eco (intermittently operating pump)	3 = Eco	
D.020	Max. set value for target cylinder value	Adjustment range: 35-65 °C	55 °C	
D.022	Domestic hot water demand	On, Off		Not adjustable
D.023	Summer/winter mode (heating off/on)	Heating on, heating off (summer mode)		Not adjustable
D.025	Domestic hot water generation enabled by eBUS control	On, Off		Not adjustable
D.026	Additional relay actuation	1 = Circulation pump 2 = External pump 3 = Cylinder charging pump (not activated) 4 = Flue non-return flap 5 = External solenoid valve 6 = External fault message 7 = Solar pump (not active) 8 = eBUS remote control (not active) 9 = Anti-legionella pump (not activated). If the anti-legionella function option is activated and the cylinder has reached a sufficiently high temperature, the pump cycle is moved to the following. 10 = Solar valve (not active)	1 = Circulation pump	

Appendix

Code	Parameter	Values or explanations	Default setting	User-specific setting
D.027	Switching from relay 1 to VR 40 2 in 7 multi-functional module	1 = Circulation pump 2 = External pump 3 = Cylinder charging pump (not activated) 4 = Flue non-return flap 5 = External solenoid valve 6 = External fault message 7 = Solar pump (not active) 8 = eBUS remote control (not active) 9 = Anti-legionella pump (not activated)	1 = Circulation pump	
D.028	Switching from relay 2 to VR 40 2 in 7 multi-functional module	1 = Circulation pump 2 = External pump 3 = Cylinder charging pump (not activated) 4 = Flue non-return flap 5 = External solenoid valve 6 = External fault message 7 = Solar pump (not active) 8 = eBUS remote control (not active) 9 = Anti-legionella pump (not activated)	2 = External pump	
D.029	Heating throughput	In l/min		Not adjustable
D.033	Fan speed, target value	In rpm		Not adjustable
D.034	Fan speed, actual value	In rpm		Not adjustable
D.035	Position of the 3-port valve	0 = Heating mode 1 = Parallel operation 2 = Domestic hot water mode		Not adjustable
D.040	Heating flow temperature	Actual value in °C		Not adjustable
D.041	Return temperature	Actual value in °C		Not adjustable
D.044	Digitised ionisation value	Display field 0 to 1020 > 800 no flame < 400 good flame		Not adjustable
D.050	Offset for minimum speed	In rpm, adjustment range: 0 to 3000	Nominal value set in factory	
D.051	Offset for maximum speed	In rpm, adjustment range: -990 to 0	Nominal value set in factory	
D.060	Number of temperature cut-out shutdowns	Number of shutdowns		Not adjustable
D.061	Number of flame sequence control faults	Number of unsuccessful ignitions in the last attempt		Not adjustable
D.064	Average ignition time	In seconds		Not adjustable
D.065	Maximum ignition time	In seconds		Not adjustable
D.067	Remaining burner anti-cycling time	In minutes		Not adjustable
D.068	Unsuccessful ignitions at 1st attempt	Number of unsuccessful ignitions		Not adjustable
D.069	Unsuccessful ignitions at 2nd attempt	Number of unsuccessful ignitions		Not adjustable
D.071	Target value maximum heating flow temperature	30 ... 80 °C	75 °C	
D.074	Anti-legionella function	0 = Off 1 = O: Thermal disinfection is carried out every 24 hours.	0	
D.075	Maximum charging time for the domestic hot water cylinder	20 to 90 min.: Maximum charging time to enable a heating mode phase	45 mins	

Code	Parameter	Values or explanations	Default setting	User-specific setting
D.076	Device specific number	Unit variant display (DSN)		Not adjustable
D.080	Operating hours of the burner in heating mode	In hours (h)		Not adjustable
D.081	Operating hours of the burner for domestic hot water generation	In hours (h)		Not adjustable
D.082	Number of burner start-ups in heating mode	Number of burner start-ups		Not adjustable
D.083	Number of burner starts in domestic hot water mode	Number of burner start-ups		Not adjustable
D.085	Minimum unit output	In kW		
D.090	Status of digital control	Recognised, not recognised		Not adjustable
D.091	Status of DCF with outdoor temperature sensor connected	No reception Reception Synchronised Valid		Not adjustable
D.093	DSN code	The three-digit DSN code is located on the product's data plate.		
D.094	Delete fault history	Delete fault list 0 = No 1 = Yes		
D.095	Software version of PeBUS components	PCB (BMU) Display (AI) Solar card (SMU)		Not adjustable
D.096	Default setting	Reset all adjustable parameters to factory setting 0 = No 1 = Yes		
D.098	Value of coding resistors for gas group and output range	Display xx.yy xx = Coding resistor 1 in cable harness for output range: 08 = Up to 25 kW 09 = up to 30 kW 10 = up to 34 kW yy = Coding resistor 2 on PCB for gas type (read gas category of the unit): 02 = P gas or G31 03 = E gas or G20 07 = L gas or G25		Not adjustable
D.121	Enriching the air/gas mixture at min. output	0 = Normal 1 = Enriched 2 = Slightly enriched		0 = Normal
D.122	Limited available pressure	In mbar, for proKlima only		
D.123	Time cylinder was last charged	In min.		Not adjustable
D.124	Domestic hot water cylinder in ECO mode	0 = Eco mode deactivated 1 = ECO mode activated	0 = Function deactivated	Not adjustable
D.125	Domestic hot water temperature at the cylinder outlet	Actual value in °C		Not adjustable
D.126	Time delay of gas auxiliary heating for cylinder charging	Cylinder charging is delayed by 30 minutes when the solar pump is in operation.	0 = Function deactivated	
D.127	Status of the external current anode	0 = Function deactivated or no anode present 1 = Anode present and in operation 2 = Anode present, but faulty	0 = Function deactivated	
D.200	Solar function	0 = Function activated 1 = Function deactivated	0 = Function activated	
D.201	Temperature sensor on the lower part of the cylinder	-99 ... 120 °C		Not adjustable
D.202	Collector temperature sensor	-99 ... 155 °C		Not adjustable

Appendix

Code	Parameter	Values or explanations	Default setting	User-specific setting
D.203	Speed of solar pump 1	In %, adjustment range: 0 to 100		Not adjustable
D.204	Speed of solar pump 2	In %, adjustment range: 0 to 100		Not adjustable
D.206	Maximum cylinder temperature with solar energy	20 ... 80 °C	80 °C	
D.209	Operating hours of the solar pump	In hours		Not adjustable
D.212	Delta T between the cylinder temperature and solar panel in operation	7 ... 20 °C	15	
D.213	Delta T between the cylinder temperature and solar panel when the system is idle	2 ... 5 °C	3	
D.214	Additional filling time	From 0 to 1000 s	0 s	
D.215	Additional solar pump	0 = Function deactivated 1 = Function activated	0	
D.217	Collector surface area	In M ² , from 1 to 10 M ² : Permitted in order to determine the filling time. 1 M ² = 60 s	4	

D Inspection and maintenance work – Overview

No.	Work	Inspection (annual)	Maintenance (at least every 2 years)
1	Check the air/flue pipe for leak-tightness and to ensure that it is fastened correctly. Make sure that it is not blocked or damaged and has been installed in accordance with the relevant Installation Manual.	X	X
2	Check the general condition of the unit. Remove dirt from the product and from the combustion chamber.	X	X
3	Visually inspect the general condition of the heating block. In doing so, pay particular attention to signs of corrosion, rust and other defects. If you notice any damage, carry out maintenance work.	X	X
4	Check the gas connection pressure at maximum heat input. If the gas connection pressure is not within the specified range, carry out maintenance work.	X	X
5	Check the CO ₂ content (the air ratio) of the product and, if necessary, adjust it. Keep a record of this procedure.	X	X
6	Disconnect the product from the power mains. Check that the electrical plug connections and other connections are seated correctly and correct these if necessary.	X	X
7	Close the gas isolator cock and the service valves.		X
8	Drain the product's heating circuit. Check the pre-charge pressure of the expansion vessel and top up the vessel, if necessary (approx. 0.3 bar below the system filling pressure).		X
9	Allow the pressure in the hot water circuit to fall. Check the pre-charge pressure of the expansion vessel in the shift-load cylinder (if installed). Correct the pressure, if necessary.	X	X
10	Check the extent to which the anode is corroded and replace it if necessary.	X	X
11	Remove the compact thermal module.		X
12	Check all seals in the combustion area, in particular the seal on the burner door. If you see any damage, replace the seals.		X
13	Clean the heat exchanger.		X
14	Check that the burner is not damaged and, if required, replace it.		X
15	Check the condensate siphon in the product, clean and fill if necessary.	X	X
16	Install the compact thermal module. Caution: Replace the seals.		X
17	If the volume of water is insufficient or the outlet temperature is not reached, replace the secondary heat exchanger if necessary.		X
18	Open the gas isolator cock, reconnect the product to the power mains and switch the product on.	X	X
19	Open the service valves, fill up the unit/heating installation so that the pressure is 1,0-1,5 bar (depending on the static height of the system) and start the purge programme.		X

No.	Work	Inspection (annual)	Maintenance (at least every 2 years)
20	Perform a test operation of the product and heating installation, including hot water generation, and purge the system once more if necessary.	X	X
21	Check the type of gas.		X
22	Carry out a visual inspection to check the ignition and combustion.	X	X
23	Check the CO ₂ content (the air ratio) of the product again.		X
24	Ensure that there is no gas, flue gas, hot water, condensate or solar fluid leaking from the product. If required, intercept the leakage.	X	X
25	Check the solar fluid level and top it up, if necessary.	X	
26	Check the fill level in the glycol container and the pressure in the glycol circuit. If the pressure is below 1 bar, manually actuate the air trap and correct the glycol fill level.	X	X
27	Record the inspection/maintenance work carried out.	X	X

E Status codes – Overview

Status code	Meaning
Heating mode	
S.00	Heating mode: No heat demand.
S.01	Heating mode: Fan start-up.
S.02	Heating mode: Pump start.
S.03	Heating mode: Burner ignition.
S.04	Heating mode: Burner on.
S.05	Heating mode: Pump/fan overrun.
S.06	Heating mode: Fan overrun
S.07	Heating mode: Pump overrun
S.08	Heating mode: Remaining burner anti-cycling time.
S.09	Heating calibration routine/modulation cut-off time.
DHW mode	
S.20	DHW demand.
S.21	DHW mode: Fan start-up.
S.22	DHW mode: Pump pre-run.
S.23	DHW mode: Burner ignition.
S.24	DHW mode: Burner on.
S.25	DHW mode: Pump/fan overrun.
S.26	DHW mode: Fan overrun
S.27	DHW mode: Pump overrun
S.28	Hot water burner anti-cycling time.
S.29	Hot water calibration routine/modulation cut-off time.
Special cases	
S.30	Room thermostat is blocking heating mode.
S.31	Summer mode activated or no heat requirement from the eBUS controller.
S.32	Waiting mode because of fan speed deviation.
S.34	Frost protection mode active.
S.35	Unit in waiting period because of fan block due to speed being too high or too low.
S.36	Controller target value constantly < 20 °C, the external controller is blocking heating mode.
S.37	Fan speed deviation in operation too high.
S.39	The burner's stop contact (e.g. safety thermostat for underfloor heating or condensate pump) has been triggered.
S.40	Operation in comfort protection mode: Unit in operation, limited heating comfort. For example, underfloor heating (contact thermostat).

Appendix

Status code	Meaning
S.41	Water pressure > 2.8 bar.
S.42	Feedback from the flue non-return flap is blocking burner operation (only in conjunction with multi-functional module accessory) or condensate pump defective, heat requirement being blocked.
S.46	Operation in comfort protection mode, flame goes out at minimum load.
S.53	Unit in waiting period due to modulation block/operation block as a result of low water pressure (spread between flow and return too high).
S.54	Unit in waiting period due to operation block as a result of low water pressure (temperature gradient).
S.57	Waiting mode, operation in comfort protection mode.
S.58	Burner modulation due to noise emission/wind.
S.59	Waiting period: Minimum water circulation volume not achieved.
S.61	Gas family check unsuccessful: The coding resistance on the PCB does not match the entered gas group (see also F.92).
S.62	Gas family check unsuccessful: CO/CO ₂ values at limit. Check combustion.
S.63	Gas family check unsuccessful: Combustion quality outside permissible range (see F.93). Check combustion.
S.76	System pressure too low. Top up water.
S.92	Flow rate sensor test running, heating demands are blocked.
S.96	Return sensor test running, heating demands are blocked.
S.97	Water pressure sensor test running, heating demands are blocked.
S.98	Flow/return sensor test running, heating demands are blocked.
S.105	Low heating flow rate, carry out purging P00 again. (Proklima)

F Overview of fault codes

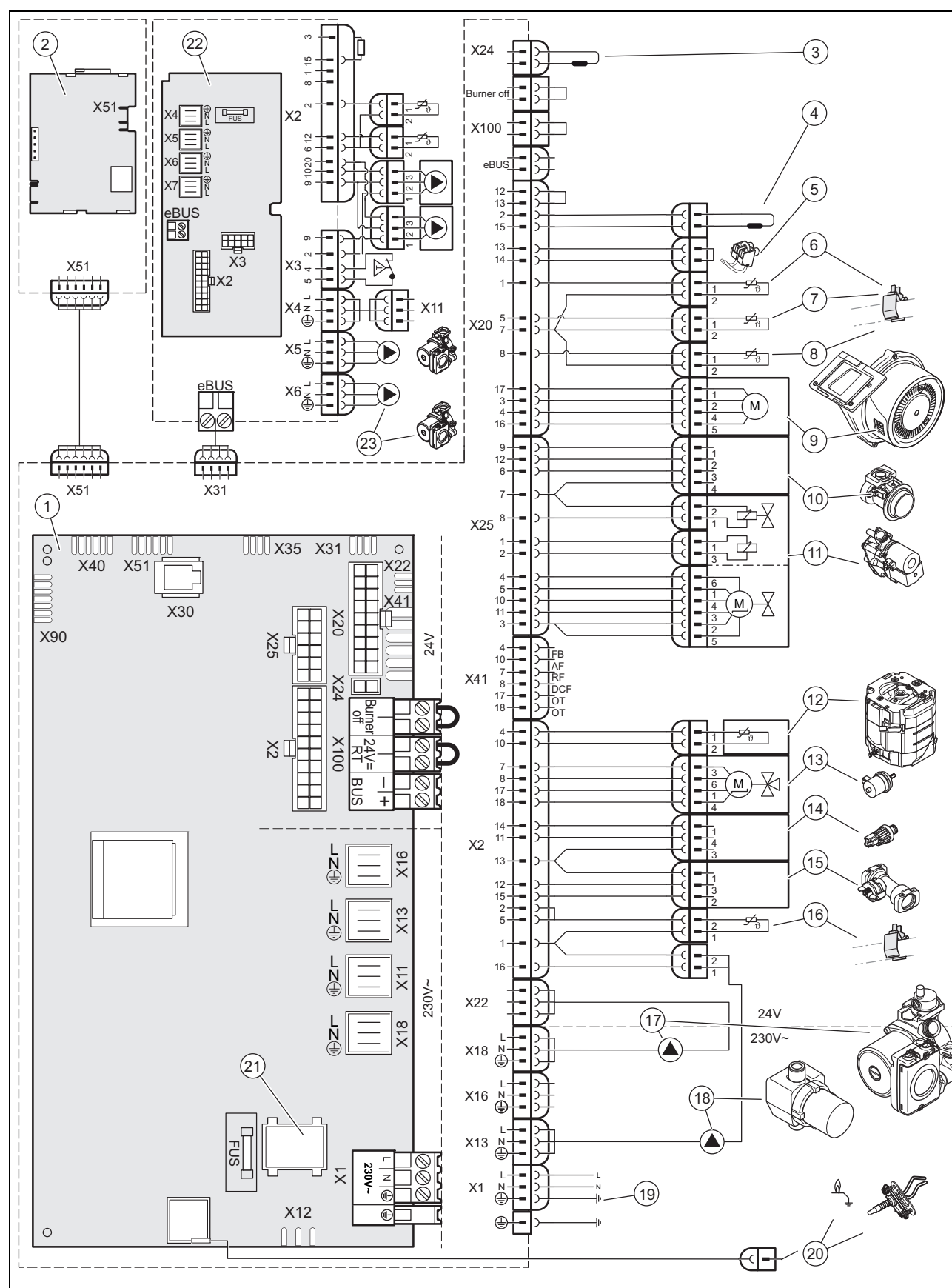
Code	Meaning	Cause
F.00	Flow temperature sensor interruption	NTC plug not plugged in or has come loose, multiple plug on the PCB not plugged in correctly, interruption in cable harness, NTC defective
F.01	Return temperature sensor interruption	NTC plug not plugged in or has come loose, multiple plug on the PCB not plugged in correctly, interruption in cable harness, NTC defective
F.02	Separation of the cylinder charging sensor in the plate heat exchanger outlet	NTC defective, NTC cable defective, defective plug connection on NTC
F.03	Cylinder sensor fault	NTC defective, NTC cable defective, defective plug connection on NTC
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	Separation of the cylinder charging sensor in the plate heat exchanger outlet	NTC defective, short circuit in cable harness, cable/housing
F.13	Cylinder sensor short circuit	NTC defective, short circuit in cable harness, cable/housing
F.20	Safety shutdown: Temperature cut-out	Incorrect earth connection between the cable harness and unit, flow or return NTC sensor defective (loose connection), stray spark via ignition cable, ignition plug or ignition electrode, pump blocked, air present
F.22	Safety shutdown: Water deficiency	No or insufficient water in the product, water pressure sensor defective, cable to pump or 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	Safety shutdown: Flue gas temperature limiter (accessory for Austria) or other safety components on the pre-fitted plug on X20	Break in plug connection for optional flue gas safety cut-out (SCO), break in cable harness
F.26	Fault: Gas valve assembly without function	Gas valve assembly stepper motor not connected, multiple plug on the PCB not plugged in correctly, interruption in cable harness, gas valve assembly stepper motor defective, electronics defective
F.27	Safety shutdown: Recording incorrect flames	Moisture on the electronics, electronics (flame monitor) defective, gas solenoid valve leaking

Code	Meaning	Cause
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, condensate route blocked, incorrect gas injector, incorrect spare part 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
F.29	Failure during operation: Re-ignition unsuccessful	Gas supply temporarily stopped, flue gas recirculation, condensate route blocked, defective earthing of product, ignition transformer has spark failure
F.32	Fan fault	Plug on fan not correctly plugged in, multiple plug on PCB not correctly plugged in, break in cable harness, fan blocked, Hall sensor defective, electronics defective
F.35	Lack of air in combustion unit	Fan speed not correct, air supply or smoke outlet blocked, plug not correctly connected to fan, multiple plug on PCB not correctly connected, break in cable harness, fan blocked, Hall sensor defective, electronics defective
F.42	Coding resistor fault (possible in combination with F.70)	Short circuit/interruption in output range coding resistor (in cable harness at heat exchanger) or gas group resistor (on PCB)
F.47	Detachment of domestic hot water sensor in cylinder outlet (flow rate detection)	NTC defective, NTC cable defective, defective plug connection on NTC
F.48	Domestic hot water sensor short circuit at cylinder outlet (flow rate detection)	NTC defective, short circuit in cable harness, cable/housing
F.49	Fault: eBUS	Short circuit on eBUS, eBUS overload or two power supplies with different polarities on the eBUS
F.52	Mass flow sensor connection fault	Mass flow sensor not connected/disconnected, plug not connected or incorrectly connected
F.53	Mass flow sensor fault	Gas flow pressure too low, filter under Venturi filter cap wet or blocked, mass flow sensor defective, internal pressure measuring point in Venturi blocked (do not use lubricant on Venturi O-ring.)
F.54	Gas pressure fault (in combination with F.28/F.29)	No or insufficient gas inlet pressure, gas stopcock closed
F.56	Fault: Mass flow sensor control	Gas valve assembly defective, cable harness to gas valve assembly defective
F.57	Fault during comfort protection mode	Ignition electrode highly corroded
F.61	Gas valve assembly control system fault	– 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	Gas valve assembly fault, switch-off delay	– Delayed shutdown of gas valve assembly – Delayed extinguishing of flame signal – Gas valve assembly leaking – Electronics defective
F.63	Fault: EEPROM	Electronics defective
F.64	Fault: Electronics/NTC	Flow or return NTC short circuited, electronics defective
F.65	Fault: Electronics temp.	Electronics overheating due to external influences, electronics defective
F.67	Fault: Electronics/flame	Implausible flame signal, electronics defective
F.68	Fault: Unstable flame signal	Air in gas, gas flow pressure too low, incorrect air ratio, condensate route blocked, incorrect burner jet, ionisation flow interruption (cable, electrode), flue gas recirculation, condensate route, electronics defective
F.70	Invalid device specific number (DSN)	If spare parts fitted: Display and PCB replaced at same time and DSN not reset, incorrect or missing output range coding resistor
F.71	Flow temperature sensor fault	Flow temperature sensor signalling constant value: – Flow temperature sensor incorrectly positioned on the 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	Water pressure sensor signal in the wrong range (too low)	Interruption/short circuit of water pressure sensor, interruption/short circuit to GND in supply line to water pressure sensor or water pressure sensor defective

Appendix

Code	Meaning	Cause
F.74	Water pressure sensor signal outside correct range (too high)	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: Insufficient throughput on pump start-up.	Pump defective, air in heating installation, too little water in unit, mass flow sensor defective
F.77	Fault: Flue non-return flap/condensate pump	No response from flue non-return flap or condensate pump defective
F.82	External current anode fault (if installed as an accessory)	Anode connection or external current anode PCB defective
F.83	Fault: Flow and/or return temperature sensor temperature change	When the burner starts, the temperature change registered at the flow and/or return temperature sensor is non-existent or too small – Insufficient water in product – Flow or return temperature sensor not in correct position at pipe
F.84	Fault: Flow/return temperature sensor temperature difference implausible	Flow and return temperature sensors returning implausible values. – Flow and return temperature sensors have been inverted – Flow and return temperature sensors have not been correctly installed
F.85	Fault: Flow and return temperature sensors incorrectly installed	The flow and/or return temperature sensors have been installed on the same pipe/incorrect pipe
F.86	Fault: Floor contact	Safety thermostat when underfloor heating is switched on: Setting the target heating value
F.90	Fault: No communication between SMU and BMU	Interruption between BMU and SMU, faulty product code
F.92	Gas coding resistor fault	The coding resistor on the PCB does not match the entered gas group: Check the resistance, repeat the gas family check and enter the correct gas group.
F.93	Gas group fault	Combustion quality outside the permitted range: Incorrect gas injector, recirculation, incorrect gas group, internal pressure measuring point in Venturi blocked (do not use lubricant on the O-ring in the Venturi).
Communication fault	No communication with the PCB	Communication fault between display and PCB in the electronics box
F.1018	Actuation fault in solar pump no. 1	Pump control cable harness disconnected.
F.1019	Actuation fault in solar pump no. 2	Pump control cable harness disconnected.
F.1020	Safety shutdown: Temperature cut-out	Solar cylinder temperature too high.
F.1021	Dry running of solar pump no. 1	Lack of solar fluid in solar circuit.
F.1022	Dry running of solar pump no. 2	Lack of solar fluid in solar circuit.
F.1070	Configuration fault in the SMU solar PCB	Incorrect coding resistor identified
F.1273	Electronics fault in solar pump 1	Connection fault, fault in pump PCB
F.1274	Electronics fault in solar pump 2	Connection fault, fault in pump PCB
F.1276	Solar pump 1 blocked	Solar pump 1 defective
F.1277	Solar pump 2 blocked	Solar pump 2 defective
F.1278	Panel sensor fault	Sensor incorrectly connected or defective
F.1279	Fault in sensor on lower part of cylinder	Sensor incorrectly connected or defective

G Wiring diagram



- | | | | |
|---|-----------------------------------|---|---|
| 1 | Main PCB | 4 | Coding resistor output range |
| 2 | Interface PCB | 5 | Pre-fitted plug for safety temperature limiters |
| 3 | Coding resistor for the gas group | 6 | Temperature sensor for the hot water flow |

Appendix

7	Heating flow temperature sensor	16	Domestic hot water temperature sensor at the cylinder outlet
8	Heating return temperature sensor	17	Heating pump
9	Fan	18	Domestic hot water pump
10	Venturi	19	Main power supply
11	Gas valve assembly	20	Ignition electrode
12	Temperature sensor in the cylinder	21	On/off button
13	3-port valve	22	Solar electronics PCB
14	Pressure sensor	23	Additional solar pump (as an option)
15	Volume flow sensor		

H Gas adjustment values as set at the factory

Settings	Unit	G20 natural gas	G25 natural gas	G31 propane
CO ₂ after 5 minutes in full load mode with front casing closed	Vol.	9.2 ± 1.0	9.1 ± 1.0	10.4 ± 0.5
CO ₂ after 5 minutes in full load mode with front casing removed	Vol.	9.0 ± 1.0	8.9 ± 1.0	10.2 ± 0.5
Set for Wobbe index W ₀	kWh/m ³	14.09	11.53	21.41
O ₂ after 5 minutes in full load mode with front casing closed	Vol.	4.5 ± 1.8	4.3 ± 1.8	5.1 ± 0.8

I Technical data

Technical data – Heating

	VSC D 146/4-5 150	VSC D 146/4-5 150 (LL)	VSC D 146/4-5 190	VSC D 206/4-5 150	VSC D 206/4-5 150 (LL)
Maximum heating flow temperature	80 °C	80 °C	80 °C	80 °C	80 °C
Max. flow temperature adjustment range (default setting: 75 °C)	30 ... 80 °C	30 ... 80 °C	30 ... 80 °C	30 ... 80 °C	30 ... 80 °C
Maximum permissible pressure	0.3 MPa	0.3 MPa	0.3 MPa	0.3 MPa	0.3 MPa
Maximum heat output (factory setting – D.000)	10 kW	10 kW	10 kW	15 kW	15 kW
Nominal water flow (ΔT = 20 K)	603 l/h	603 l/h	603 l/h	861 l/h	861 l/h
Nominal water flow (ΔT = 30 K)	402 l/h	402 l/h	402 l/h	574 l/h	574 l/h
Approximate value for the condensate volume (pH value between 3.5 and 4.0) at 50/30 °C	1.467 l/h	1.467 l/h	1.467 l/h	1.82 l/h	1.82 l/h
ΔP heating at nominal flow (ΔT = 30 K)	0.035 MPa	0.035 MPa	0.035 MPa	0.029 MPa	0.029 MPa

	VSC D 206/4-5 190
Maximum heating flow temperature	80 °C
Max. flow temperature adjustment range (default setting: 75 °C)	30 ... 80 °C
Maximum permissible pressure	0.3 MPa
Maximum heat output (factory setting – D.000)	15 kW
Nominal water flow (ΔT = 20 K)	861 l/h
Nominal water flow (ΔT = 30 K)	574 l/h

	VSC D 206/4-5 190
Approximate value for the condensate volume (pH value between 3.5 and 4.0) at 50/30 °C	1.82 l/h
ΔP heating at nominal flow ($\Delta T = 30$ K)	0.029 MPa

Technical data – G20 power/loading G20

	VSC D 146/4-5 150	VSC D 146/4-5 150 (LL)	VSC D 146/4-5 190	VSC D 206/4-5 150	VSC D 206/4-5 150 (LL)
Effective output range (P) at 50/30 °C	3.3 ... 15.2 kW	3.3 ... 15.2 kW	3.3 ... 15.2 kW	4.3 ... 21.5 kW	4.3 ... 21.5 kW
Effective output range (P) at 80/60 °C	3.0 ... 14.0 kW	3.0 ... 14.0 kW	3.0 ... 14.0 kW	3.8 ... 20.0 kW	3.8 ... 20.0 kW
Hot water heat output range (P)	3.0 ... 16.0 kW	3.0 ... 16.0 kW	3.0 ... 16.0 kW	3.8 ... 24.0 kW	3.8 ... 24.0 kW
Maximum heat input – heating (Q)	14.3 kW	14.3 kW	14.3 kW	20.4 kW	20.4 kW
Minimum heat input – heating (Q)	3.2 kW	3.2 kW	3.2 kW	4.0 kW	4.0 kW
Maximum heat input – hot water (Q)	16.3 kW	16.3 kW	16.3 kW	24.5 kW	24.5 kW
Minimum heat input – hot water (Q)	3.2 kW	3.2 kW	3.2 kW	4.0 kW	4.0 kW

	VSC D 206/4-5 190
Effective output range (P) at 50/30 °C	4.3 ... 21.5 kW
Effective output range (P) at 80/60 °C	3.8 ... 20.0 kW
Hot water heat output range (P)	3.8 ... 24.0 kW
Maximum heat input – heating (Q)	20.4 kW
Minimum heat input – heating (Q)	4.0 kW
Maximum heat input – hot water (Q)	24.5 kW
Minimum heat input – hot water (Q)	4.0 kW

Technical data – Power/loading G25

	VSC D 146/4-5 150	VSC D 146/4-5 150 (LL)	VSC D 146/4-5 190	VSC D 206/4-5 150	VSC D 206/4-5 150 (LL)
Effective output range (P) at 50/30 °C	3.3 ... 15.2 kW	3.3 ... 15.2 kW	3.3 ... 15.2 kW	4.3 ... 21.5 kW	4.3 ... 21.5 kW
Effective output range (P) at 80/60 °C	3.0 ... 14.0 kW	3.0 ... 14.0 kW	3.0 ... 14.0 kW	3.8 ... 20.0 kW	3.8 ... 20.0 kW
Domestic hot water heat output range (P)	3.0 ... 16.0 kW	3.0 ... 16.0 kW	3.0 ... 16.0 kW	3.8 ... 24.0 kW	3.8 ... 24.0 kW
Maximum heat input – heating (Q)	14.3 kW	14.3 kW	14.3 kW	20.4 kW	20.4 kW
Minimum heat input – heating (Q)	3.2 kW	3.2 kW	3.2 kW	4.0 kW	4.0 kW
Maximum heat input – domestic hot water (Q)	16.3 kW	16.3 kW	16.3 kW	24.5 kW	24.5 kW
Minimum heat input – domestic hot water (Q)	3.2 kW	3.2 kW	3.2 kW	4.0 kW	4.0 kW

Appendix

	VSC D 206/4-5 190	VSC D 146/4-5 150	VSC D 146/4-5 150 (LL)	VSC D 146/4-5 190	VSC D 206/4-5 150
Effective output range (P) at 50/30 °C	4.3 ... 21.5 kW	3.3 ... 15.2 kW	3.3 ... 15.2 kW	3.3 ... 15.2 kW	4.3 ... 21.5 kW
Effective output range (P) at 80/60 °C	3.8 ... 20.0 kW	3.0 ... 14.0 kW	3.0 ... 14.0 kW	3.0 ... 14.0 kW	3.8 ... 20.0 kW
Domestic hot water heat output range (P)	3.8 ... 24.0 kW	3.0 ... 16.0 kW	3.0 ... 16.0 kW	3.0 ... 16.0 kW	3.8 ... 24.0 kW
Maximum heat input – heating (Q)	20.4 kW	14.3 kW	14.3 kW	14.3 kW	20.4 kW
Minimum heat input – heat- ing (Q)	4.0 kW	3.2 kW	3.2 kW	3.2 kW	4.0 kW
Maximum heat input – do- mestic hot water (Q)	24.5 kW	16.3 kW	16.3 kW	16.3 kW	24.5 kW
Minimum heat input – do- mestic hot water (Q)	4.0 kW	3.2 kW	3.2 kW	3.2 kW	4.0 kW

	VSC D 206/4-5 150 (LL)	VSC D 206/4-5 190
Effective output range (P) at 50/30 °C	4.3 ... 21.5 kW	4.3 ... 21.5 kW
Effective output range (P) at 80/60 °C	3.8 ... 20.0 kW	3.8 ... 20.0 kW
Domestic hot water heat output range (P)	3.8 ... 24.0 kW	3.8 ... 24.0 kW
Maximum heat input – heating (Q)	20.4 kW	20.4 kW
Minimum heat input – heat- ing (Q)	4.0 kW	4.0 kW
Maximum heat input – do- mestic hot water (Q)	24.5 kW	24.5 kW
Minimum heat input – do- mestic hot water (Q)	4.0 kW	4.0 kW

Technical data – Power/loading G31

	VSC D 146/4-5 150	VSC D 146/4-5 150 (LL)	VSC D 146/4-5 190	VSC D 206/4-5 150	VSC D 206/4-5 150 (LL)
Effective output range (P) at 50/30 °C	5.6 ... 15.2 kW	5.6 ... 15.2 kW	5.6 ... 15.2 kW	5.6 ... 21.5 kW	5.6 ... 21.5 kW
Effective output range (P) at 80/60 °C	5.0 ... 14.0 kW	5.0 ... 14.0 kW	5.0 ... 14.0 kW	5.0 ... 20.0 kW	5.0 ... 20.0 kW
Hot water heat output range (P)	5.0 ... 16.0 kW	5.0 ... 16.0 kW	5.0 ... 16.0 kW	5.0 ... 24.0 kW	5.0 ... 24.0 kW
Maximum heat input – heating (Q)	14.3 kW	14.3 kW	14.3 kW	20.4 kW	20.4 kW
Minimum heat input – heat- ing (Q)	5.3 kW	5.3 kW	5.3 kW	5.3 kW	5.3 kW
Maximum heat input – hot water (Q)	16.3 kW	16.3 kW	16.3 kW	24.5 kW	24.5 kW
Minimum heat input – hot water (Q)	5.3 kW	5.3 kW	5.3 kW	6.4 kW	6.4 kW

	VSC D 206/4-5 190
Effective output range (P) at 50/30 °C	5.6 ... 21.5 kW
Effective output range (P) at 80/60 °C	5.0 ... 20.0 kW
Hot water heat output range (P)	5.0 ... 24.0 kW
Maximum heat input – heating (Q)	20.4 kW

	VSC D 206/4-5 190
Minimum heat input – heating (Q)	5.3 kW
Maximum heat input – hot water (Q)	24.5 kW
Minimum heat input – hot water (Q)	6.4 kW

Technical data – Domestic hot water

	VSC D 146/4-5 150	VSC D 146/4-5 150 (LL)	VSC D 146/4-5 190	VSC D 206/4-5 150	VSC D 206/4-5 150 (LL)
Specific flow rate (D) ($\Delta T = 30\text{ K}$) in accordance with EN 13203	18.8 l/min	18.8 l/min	19.5 l/min	21.7 l/min	21.7 l/min
Output characteristic figure in accordance with the standard DIN 4708 (NL)	1.3	1.3	1.5	1.8	1.8
Continuous flow rate ($\Delta T = 35\text{ K}$)	394 l/h	394 l/h	394 l/h	591 l/h	591 l/h
Specific flow rate ($\Delta T = 35\text{ K}$)	16.0 l/min	16.0 l/min	16.0 l/min	24.0 l/min	24.0 l/min
Maximum permissible pressure	1 MPa	1 MPa	1 MPa	1 MPa	1 MPa
Temperature range	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C	35 ... 65 °C
Cylinder capacity	141 l	141 l	188 l	141 l	141 l

	VSC D 206/4-5 190
Specific flow rate (D) ($\Delta T = 30\text{ K}$) in accordance with EN 13203	22.9 l/min
Output characteristic figure in accordance with the standard DIN 4708 (NL)	2.0
Continuous flow rate ($\Delta T = 35\text{ K}$)	591 l/h
Specific flow rate ($\Delta T = 35\text{ K}$)	24.0 l/min
Maximum permissible pressure	1 MPa
Temperature range	35 ... 65 °C
Cylinder capacity	188 l

Technical data – General

	VSC D 146/4-5 150	VSC D 146/4-5 150 (LL)	VSC D 146/4-5 190
Gas category	Germany	II _{2ELL3P}	II _{2ELL3P}
Diameter of the gas pipe	G 3/4 inch	G 3/4 inch	G 3/4 inch
Diameter of the heating pipe	G 3/4 inch	G 3/4 inch	G 3/4 inch
Expansion relief valve connector (min.)	24 mm	24 mm	24 mm
Condensed water discharge pipe (min.)	24 mm	24 mm	24 mm
Gas supply pressure (G20)	2 kPa	2 kPa	2 kPa
Gas supply pressure (G25)	2 kPa	2 kPa	2 kPa
CE number (PIN)	1312CO5870	1312CO5870	1312CO5870
Smoke mass flow in heating mode at P min.	1.5 g/s	1.5 g/s	1.5 g/s
Smoke mass flow in heating mode at P max.	6.4 g/s	6.4 g/s	6.4 g/s
Smoke mass flow in hot water handling mode at P max.	7.3 g/s	7.3 g/s	7.3 g/s

Appendix

		VSC D 146/4-5 150	VSC D 146/4-5 150 (LL)	VSC D 146/4-5 190
Released system types	Germany	C13x, C33x, C43x, C53x, C83x, C93x, B23P, B33P, B53P	C13x, C33x, C43x, C53x, C83x, C93x, B23P, B33P, B53P	C13x, C33x, C43x, C53x, C83x, C93x, B23P, B33P, B53P
Nominal efficiency at 80/60 °C		98 %	98 %	98 %
Nominal efficiency at 60/40 °C		103.1 %	103.1 %	103.1 %
Nominal efficiency at 50/30 °C		106.5 %	106.5 %	106.5 %
Efficiency in partial load operation (30%) at 40/30 °C		108 %	108 %	108 %
NOx class		5	5	5
Boiler dimension, width		599 mm	599 mm	599 mm
Boiler dimension, depth		693 mm	693 mm	693 mm
Boiler dimension, height		1,640 mm	1,640 mm	1,880 mm
Net weight		153 kg	153 kg	167 kg
Weight when filled with water		299 kg	299 kg	356 kg

		VSC D 206/4-5 150	VSC D 206/4-5 150 (LL)	VSC D 206/4-5 190
Gas category	Germany	II _{2ELL3P}	II _{2ELL3P}	II _{2ELL3P}
Diameter of the gas pipe		G 3/4 inch	G 3/4 inch	G 3/4 inch
Diameter of the heating pipe		G 3/4 inch	G 3/4 inch	G 3/4 inch
Expansion relief valve connector (min.)		24 mm	24 mm	24 mm
Condensed water discharge pipe (min.)		24 mm	24 mm	24 mm
Gas supply pressure (G20)		2 kPa	2 kPa	2 kPa
Gas supply pressure (G25)		2 kPa	2 kPa	2 kPa
CE number (PIN)		1312CO5870	1312CO5870	1312CO5870
Smoke mass flow in heating mode at P min.		1.8 g/s	1.8 g/s	1.8 g/s
Smoke mass flow in heating mode at P max.		9.2 g/s	9.2 g/s	9.2 g/s
Smoke mass flow in hot water handling mode at P max.		11.0 g/s	11.0 g/s	11.0 g/s
Released system types	Germany	C13x, C33x, C43x, C53x, C83x, C93x, B23P, B33P, B53P	C13x, C33x, C43x, C53x, C83x, C93x, B23P, B33P, B53P	C13x, C33x, C43x, C53x, C83x, C93x, B23P, B33P, B53P
Nominal efficiency at 80/60 °C		98 %	98 %	98 %
Nominal efficiency at 60/40 °C		101.9 %	101.9 %	101.9 %
Nominal efficiency at 50/30 °C		105.4 %	105.4 %	105.4 %
Efficiency in partial load operation (30%) at 40/30 °C		108 %	108 %	108 %
NOx class		5	5	5
Boiler dimension, width		599 mm	599 mm	599 mm
Boiler dimension, depth		693 mm	693 mm	693 mm
Boiler dimension, height		1,640 mm	1,640 mm	1,880 mm
Net weight		153 kg	153 kg	167 kg
Weight when filled with water		299 kg	299 kg	356 kg

Technical data – Electrics

	VSC D 146/4-5 150	VSC D 146/4-5 150 (LL)	VSC D 146/4-5 190	VSC D 206/4-5 150	VSC D 206/4-5 150 (LL)
Electric connection	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz
Built-in fuse (slow-blow)	T4A/250	T4A/250	T4A/250	T4A/250	T4A/250
Max. electrical power consumption	150 W	150 W	150 W	175 W	175 W

	VSC D 146/4-5 150	VSC D 146/4-5 150 (LL)	VSC D 146/4-5 190	VSC D 206/4-5 150	VSC D 206/4-5 150 (LL)
Standby electrical power consumption	4.2 W	4.2 W	4.2 W	4.2 W	4.2 W
Level of protection	IP X4 D	IP X4 D	IP X4 D	IP X4 D	IP X4 D

	VSC D 206/4-5 190
Electric connection	230 V / 50 Hz
Built-in fuse (slow-blow)	T4A/250
Max. electrical power consumption	175 W
Standby electrical power consumption	4.2 W
Level of protection	IP X4 D

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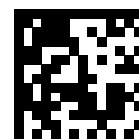
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