Installation and service instructions

for contractors

Vitodens 050-W
Type BPJC, 6.5 to 35.0 kW
Wall mounted gas condensing boiler
For natural gas and LPG
Gas Council no.: 47 819 31, 47 819 32

For applicability, see the last page

VITODENS 050-W

5513 085 GB 2/2014

Please keep safe.

Safety instructions

Please follow these safety instructions closely to prevent accidents and material losses.

Safety instructions explained

Danger
This symbol warns against the risk of injury.

Please note
This symbol warns against the risk of material losses and environmental pollution.

Note
Details identified by the word "Note" contain additional information.

Target group

These instructions are exclusively intended for qualified contractors.
- Work on gas installations must only be carried out by a registered gas fitter.
- Work on electrical equipment must only be carried out by a qualified electrician.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.

Regulations

Observe the following when working on this system:
- Statutory regulations regarding the prevention of accidents
- Statutory regulations regarding environmental protection
- The Code of Practice of relevant trade associations
- All current safety regulations as defined by DIN, EN, DVGW, TRGI, TRF, VDE and all locally applicable standards,
  Gas Safety (Installation & Use) Regulations the appropriate Building Regulationeither the Building regulations, theBuilding Regulation (Scotland), Building Regulations (Northern Ireland), the Water Fittings Regulation orWater Bylaws in Scotland, the current I.E.E. Wiring Regulations.

If you smell gas

Danger
Escaping gas can lead to explosions which may result in serious injury.
- Do not smoke. Prevent naked flames and sparks. Do not switch lights or electrical appliances on or off.
- Close the gas shut-off valve.
- Open windows and doors.
- Evacuate any people from the danger zone.
- Notify your gas or electricity supplier and your local heating contractor from outside the building.
- Shut off the electricity supply to the building from a safe place (outside the building).

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Safety instructions (cont.)

If you smell flue gas

Danger
Flue gas can lead to life threatening poisoning.
- Shut down the heating system.
- Ventilate the installation site.
- Close all doors in the living space.

Flue systems and combustion air

Ensure that flue systems are clear and cannot be sealed, for instance due to accumulation of condensate or other causes. Ensure a sufficient supply of combustion air.
Instruct system users that subsequent modifications to the building characteristics are not permissible (e.g. cable/pipework routing, cladding or partitions).

Danger
Leaking or blocked flue systems, or an insufficient supply of combustion air can cause life threatening poisoning from carbon monoxide in the flue gas.
Ensure the flue system is in proper working order. Apertures for supplying combustion air must be non-closable.

Extractors

Operating appliances that extract air to the outside (cooker hoods, extractors, air conditioning units, etc.) can create negative pressure. If the boiler is operated at the same time, this can lead to reverse flow of the flue gas.

Danger
The simultaneous operation of the boiler and appliances that extract air to the outside can result in life threatening poisoning due to reverse flow of the flue gas.
Fit an interlock circuit or take suitable steps to ensure a sufficient supply of combustion air.

Working on the system

- Where gas is used as the fuel, close the main gas shut-off valve and safeguard it against unintentional reopening.
- Isolate the system from the power supply (e.g. by removing the separate fuse or by means of a mains isolator) and check that it is no longer 'live'.
- Safeguard the system against reconnection.

Danger
Hot surfaces can cause burns.
- Before maintenance or service work, switch OFF the appliance and let it cool down.
- Never touch hot surfaces on the boiler, burner, flue system or pipework.

Please note
Electronic assemblies can be damaged by electrostatic discharge.
Before beginning work, touch earthed objects, such as heating or water pipes, to discharge static loads.

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Safety instructions (cont.)

Repair work

Please note
Repairing components that fulfil a safety function can compromise the safe operation of the system.
Faulty components must be replaced with original Viessmann spare parts.

Auxiliary components, spare and wearing parts

Please note
Spare and wearing parts that have not been tested together with the system can compromise its function. Installing non-authorised components and making non-approved modifications or conversions can compromise safety and may invalidate the warranty.
For replacements, use only original spare parts supplied or approved by Viessmann.

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Installation instructions

Service instructions

Preparing for installation

Intended use

The appliance is only intended to be installed and operated in sealed unvented heating systems that comply with EN 12828, with due attention paid to the associated installation, service and operating instructions. It is only designed for the heating of water that is of potable water quality.

Intended usage presupposes that a fixed installation in conjunction with permissible, system-specific components has been carried out.

Commercial or industrial usage for a purpose other than heating the building or DHW does not comply with regulations.

Any usage beyond this must be approved by the manufacturer for the individual case.

Incorrect usage or operation of the appliance (e.g. the appliance being opened by the system user) is prohibited and results in an exclusion of liability. Incorrect usage also occurs if the components in the heating system are modified from their intended function (e.g. if the flue gas and ventilation air paths are sealed).

Product information

Vitodens 050-W, type BPJC

Preset for operation with natural gas. Conversion to LPG P requires a gas conversion kit.

Gas Council no.
- 29 kW combi: 47 819 31
- 35 kW combi: 47 819 32

Conversion for other countries

The Vitodens 050-W must only be delivered to the countries specified on the type plate. For deliveries to alternative countries, an approved contractor must arrange individual approval on his/her own initiative and in accordance with the law of the country in question.

Product description

The Vitodens 050-W is available as a gas condensing combi boiler with integral plate heat exchanger for DHW heating. For the connection of heating circuits and the DHW line, see from page 11.
The Vitodens 050-W is set up for operation with a constant boiler water temperature.
The following are integrated: one sealed unvented hydraulic system with 2 connections for heating flow and return and 2 connections for DHW heating.

The following components are integrated into the hydraulic system:
- Circulation pump
- 3-way diverter valve

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Preparing for installation (cont.)

- Safety valve
- Diaphragm expansion vessel
- Plate heat exchanger for DHW heating

Accessory connection

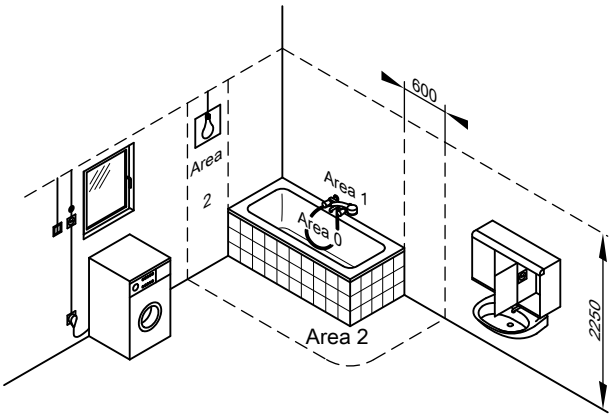
A time switch (accessory) can be connected to the control unit and supplied with low voltage.

Siting

Siting is possible, for example, in the following locations:
- Recreation rooms and other living spaces
- Ancillary rooms without their own ventilation
- Compartments (open at the top)
- Recesses without compulsory clearance towards combustible materials
- Attic rooms (pitched attics) where the balanced flue can be routed directly through the roof

Since the flue pipe connection for room-sealed operation is surrounded by combustion air (coaxial pipe), maintaining clearances from combustible materials is not required. For further details, see the technical guide "Flue systems for the Vitodens".
The installation area must be safe from the risk of frost.

Operation of the Vitodens 050-W in wet rooms



The Vitodens is approved for installation in wet rooms (e.g. bathroom or shower rooms) (protection IP X4 D, splash-proof).

When installing the Vitodens in wet areas, observe the safety zones and minimum wall clearances according to regulation (see also "Electrical safety zone"). The Vitodens may be installed **in safety zone 1** if hosed water (e.g. from massage showers) is prevented.

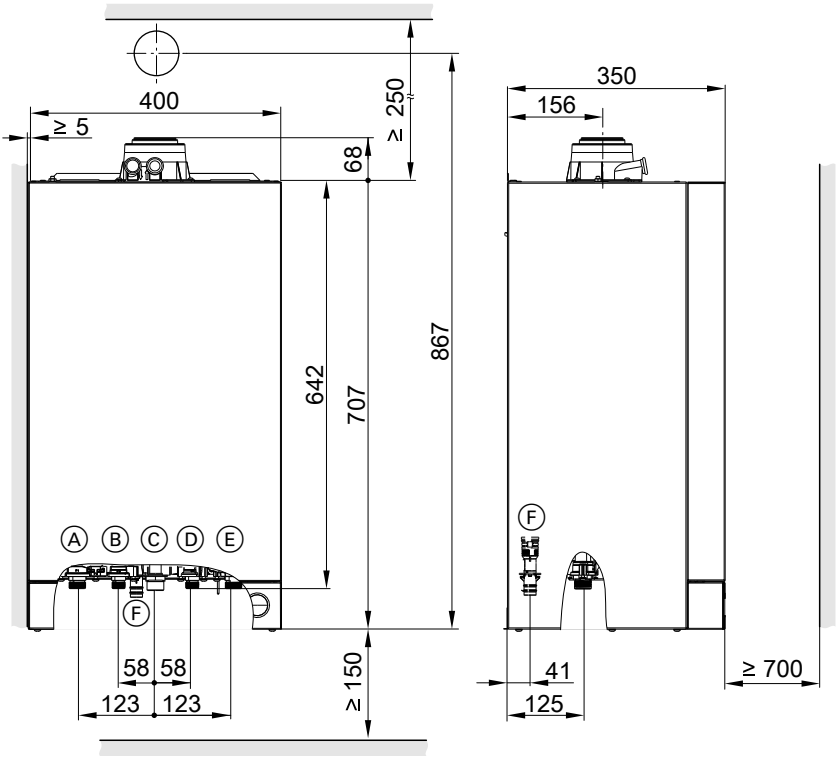
Preparing for installation (cont.)

Electrical equipment in rooms containing a bathtub or a shower must be installed in such a way that users cannot be exposed to dangerous body currents.

The IEEE Regulation specifies that cables supplying permanently installed consumers in zones 1 and 2 should only be run vertically and routed into the equipment from the back.

Preparing for boiler installation

Dimensions and connections



Shown without fittings

Ⓐ Heating flow ∅ 22 mm
Ⓑ DHW ∅ 15 mm
Ⓒ Gas connection ∅ 22 mm
Ⓓ Cold water ∅ 15 mm
Ⓔ Heating return ∅ 22 mm

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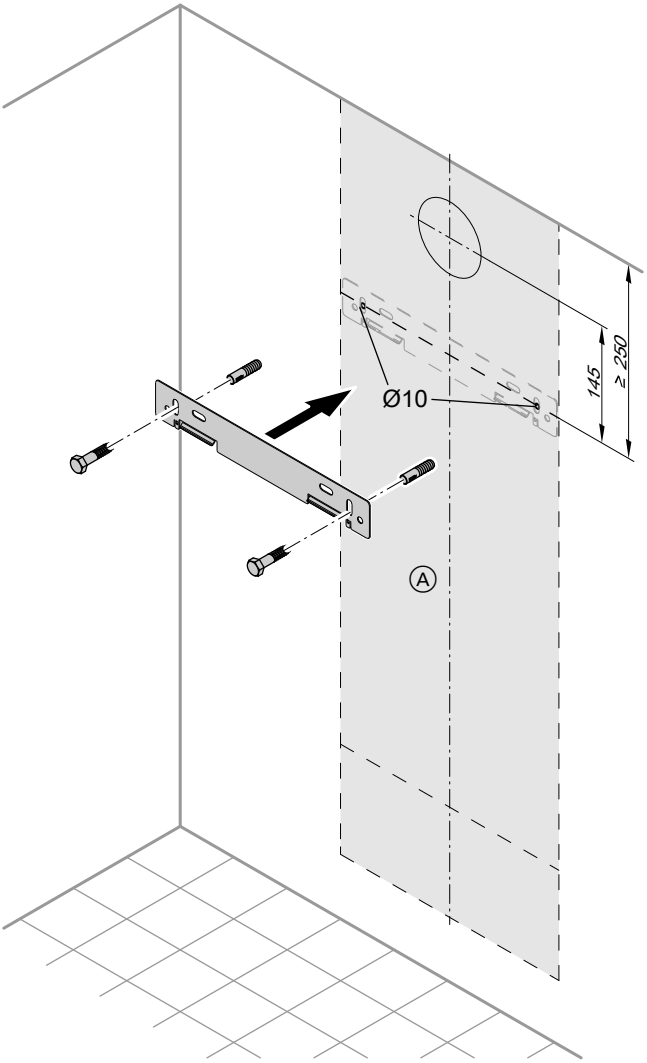
Preparing for installation (cont.)

Ⓕ Condensate drain/safety valve
drain: Plastic hose ∅ 22 mm

Preparing for installation (cont.)

Fitting the wall mounting bracket



Ⓐ Vitodens installation template

Preparing for installation (cont.)

1. Position the supplied installation template on the wall.
2. Mark out the rawl plug holes.
3. Drill ∅ 10 mm holes and insert the rawl plugs supplied.
4. Fit wall mounting bracket with screws supplied.

Fitting pre-plumbing jig or mounting frame

Pre-plumbing jig or mounting frame installation instructions

Preparing the connections

! **Please note**
To prevent appliance damage, connect all pipework free of load and torque stress.

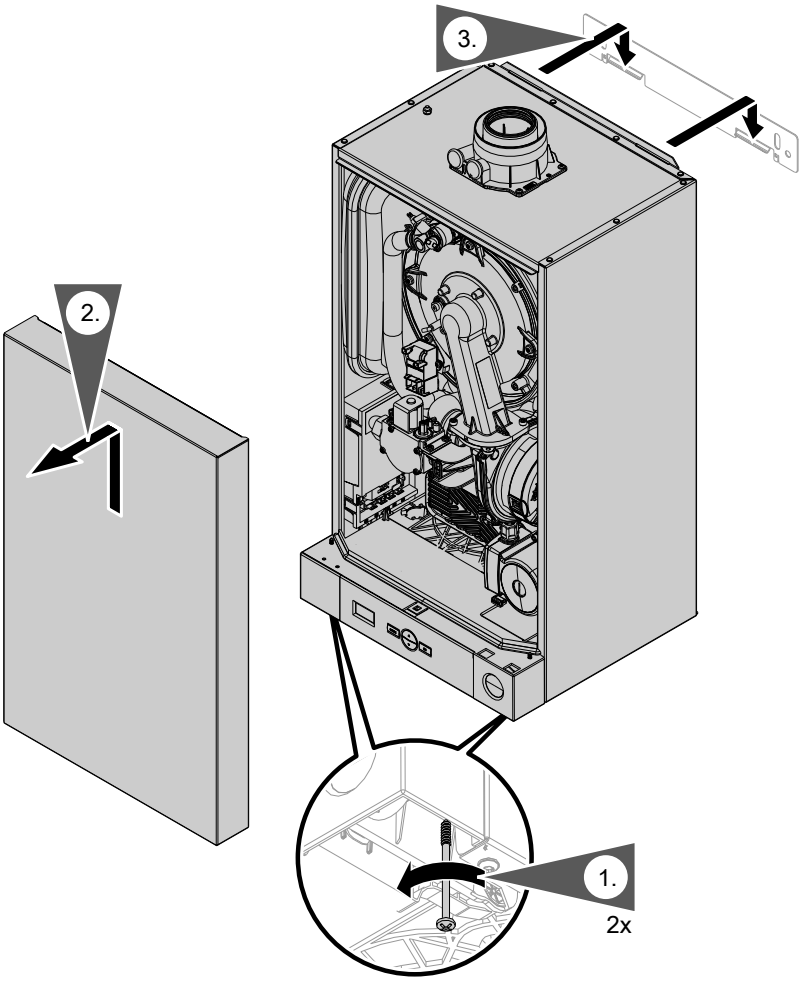
1. Prepare the water connections. Flush the heating system.
2. Prepare the gas connection.
3. Prepare the electrical connections.
   - A 1.5 m long power cable is fitted in the delivered condition: NYM-J 3 x 1.5 mm^2
   - Accessory cables: NYM-O 2-core min. 0.5 mm^2 or 2-core cable for LV

Compartment installation

A compartment used to enclose the appliance must be designed and constructed specifically for this purpose. An existing cupboard or compartment may be used provided it is modified accordingly. The Vitodens range does not require compartment ventilation.

Mounting the boiler and making connections

Removing the front panel and mounting the boiler



1. Undo screws at the bottom of the boiler; do not remove completely.

2. Remove front panel.

3. Hook the boiler onto the wall mounting bracket.

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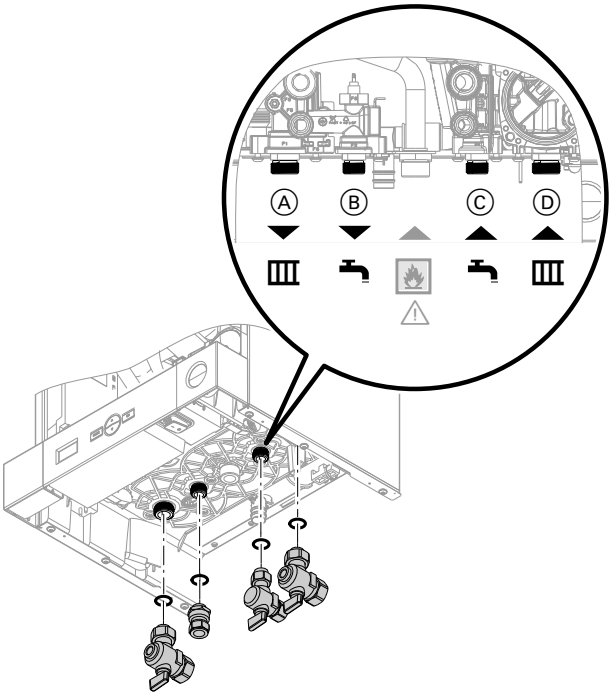
Mounting the boiler and making connections (cont.)

Making the connections on the water side



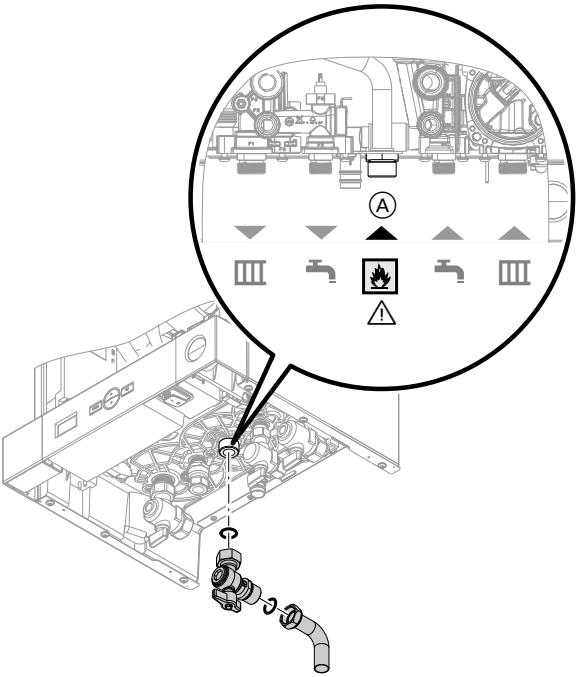
Ⓐ Heating flow G¾
Ⓑ DHW G½
Ⓒ Cold water G½
Ⓓ Heating return G¾

1. Mount fittings with gaskets.

2. Install filling equipment on site.
The filling equipment must meet Fittings Directive G24.2a.

Mounting the boiler and making connections (cont.)

Gas connection



1. Mount gas shut-off valve with bend to connection Ⓐ.
2. Connect gas supply to connection Ⓐ.
3. Carry out a tightness test.

Note
Only use suitable and approved leak detection agents (EN 14291) and devices for the tightness test. Leak detection agents with unsuitable constituents (e.g. nitrides, sulphides) can cause material damage.
Remove residues of the leak detection agent after testing.

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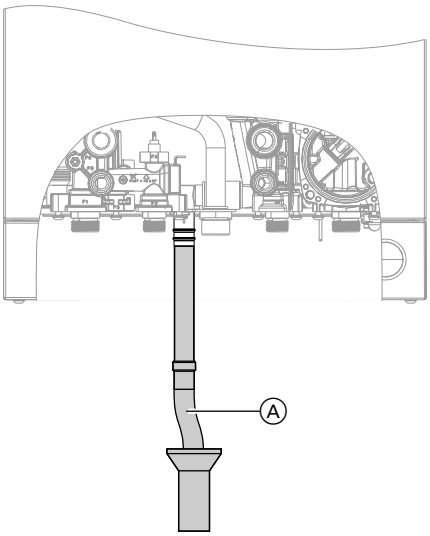
Mounting the boiler and making connections (cont.)

Please note
Excessive test pressure will damage the boiler and the gas train.
Max. test pressure 150 mbar (15 kPa). Where higher pressure is required for tightness tests, disconnect the boiler and the gas train from the main supply pipe (undo the fitting).

4. Purge the gas line.

Connection, safety valve and condensate drain



- The condensate pipe is connected with the discharge pipe of the safety valve. The condensate hose supplied meets the temperature requirements that are part of the CE certification.
- Connecting the condensate pipe internally to the domestic waste water system, either directly or via a tundish, is recommended.
- If the condensate pipe is routed outside the building, use a pipe with at least ∅ 30 mm and protect this pipe from frost. Avoid long external pipelines. Install a tundish.

Please note
A frozen condensate pipe can result in faults and damage to the boiler.
Always insulate condensate pipes against frost.

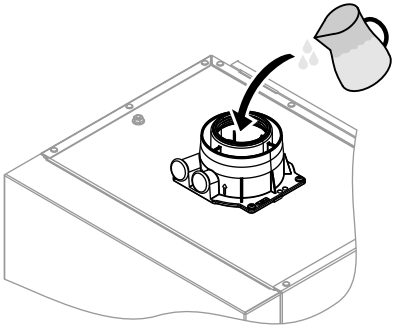
- Observe local building regulations.

Connect condensate pipe Ⓐ to the public sewage system with a constant fall and a pipe vent.
Observe the local waste water regulations.

Note
Fill the trap with water before commissioning.

Mounting the boiler and making connections (cont.)

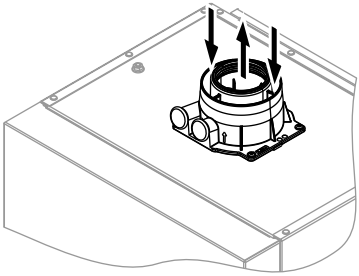
Filling the trap with water



Pour at least 0.3 l of water into the flue outlet.

Please note
During commissioning, flue gas may escape from the condensate drain.
Always fill the trap with water before commissioning.

Balanced flue connection



Connect the balanced flue.

Flue system installation instructions

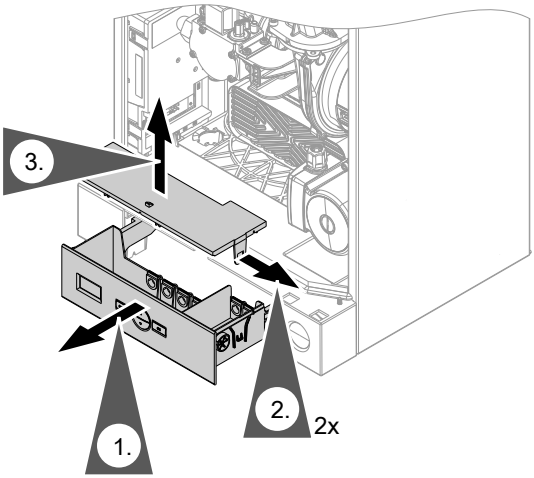
Do not carry out **commissioning** until the following conditions are met:

- Free passage through the flue gas pipes.
- Flue system with positive pressure is gas-tight.
- Apertures for ensuring sufficient combustion air supply are open and cannot be closed off.
- Applicable regulations on installing and commissioning flue systems have been followed.

Danger
Leaking or blocked flue systems or an insufficient supply of combustion air cause life threatening poisoning due to carbon monoxide in the flue gas.
Ensure the flue system functions correctly. Apertures for combustion air supply must not be able to be closed off.

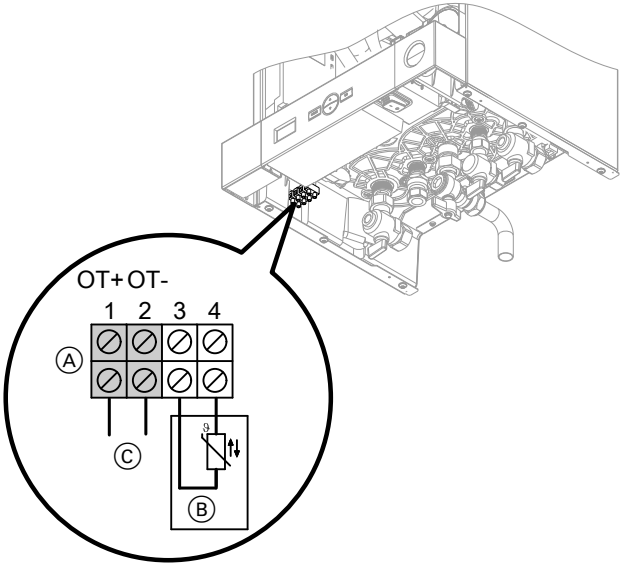
Opening the programming unit

Only required if a wireless receiver or time switch (accessories) is to be connected.



Please note
Electronic assemblies can be damaged by electrostatic discharge.
Prior to commencing any work, touch earthed objects, such as heating or water pipes to discharge static loads.

Electrical connections



Ⓐ Terminals at bottom of appliance
Ⓑ Outside temperature sensor
Ⓒ Vitotrol 100 or on-site room temperature controller with LV (Low voltage) switching contact and low transition resistance
Note: This is not a 240V switched live input

Separate installation instructions

Information on connecting accessories
When connecting accessories observe the separate installation instructions provided with them.

Electrical connections (cont.)

Outside temperature sensor (accessory)

1. Fit outside temperature sensor.

Installation site:
- North or north-westerly wall, 2 to 2.5 m above ground level; in multi storey buildings, in the upper half of the second floor
- Not above windows, doors or vents
- Not immediately below balconies or gutters
- Never render over
- Connection:
  2-core lead, length up to 35 m with a cross-section of 1.5 mm^2

2. Connect the outside temperature sensor across terminals 3 and 4 (underneath the appliance).

Power supply

Connect the power cable to the building mains.

Regulations and Directives

Danger
Incorrectly executed electrical installations can result in injuries from electrical current and in appliance damage.

Connect the power supply and implement all safety measures (e.g. RCD circuit) in accordance with the following regulations:
- IEC 60364-4-41
- VDE regulations
- Connection conditions specified by your local power supply utility

Install an isolator in the power cable which simultaneously isolates all non-earthed conductors from the mains with contact separation of at least 3 mm. Protect the power cable with an external 3 A fuse to BS 1362.

Danger
Incorrect core allocation can result in serious injury and damage to the appliance.
Take care **not** to interchange wires "L1" and "N".

Danger
If system components are not earthed, serious injury from electric current can result if an electrical fault occurs.
Connect the appliance and pipework to the equipotential bonding of the building in question.

Electrical connections (cont.)

Routing the connecting cables

!

Please note
Connecting cables will be damaged if they touch hot components.
When routing and securing cables/leads on site, ensure that the maximum permissible temperature for these cables/leads is not exceeded.

Steps - commissioning, inspection and maintenance

For further information regarding the individual steps, see the page indicated

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Further details regarding the individual steps

Filling the heating system

Please note
Unsuitable fill water increases the level of deposits and corrosion and may lead to boiler damage.

- Flush the heating system thoroughly before filling.
- Only fill with water of potable quality.
- Soften fill water harder than 300 ppm.
- Antifreeze suitable for heating systems can be added to the fill water.

1. Close the gas shut-off valve.
2. Switch ON the power supply and ON/OFF switch Ⓐ.
3. Activate the filling function.

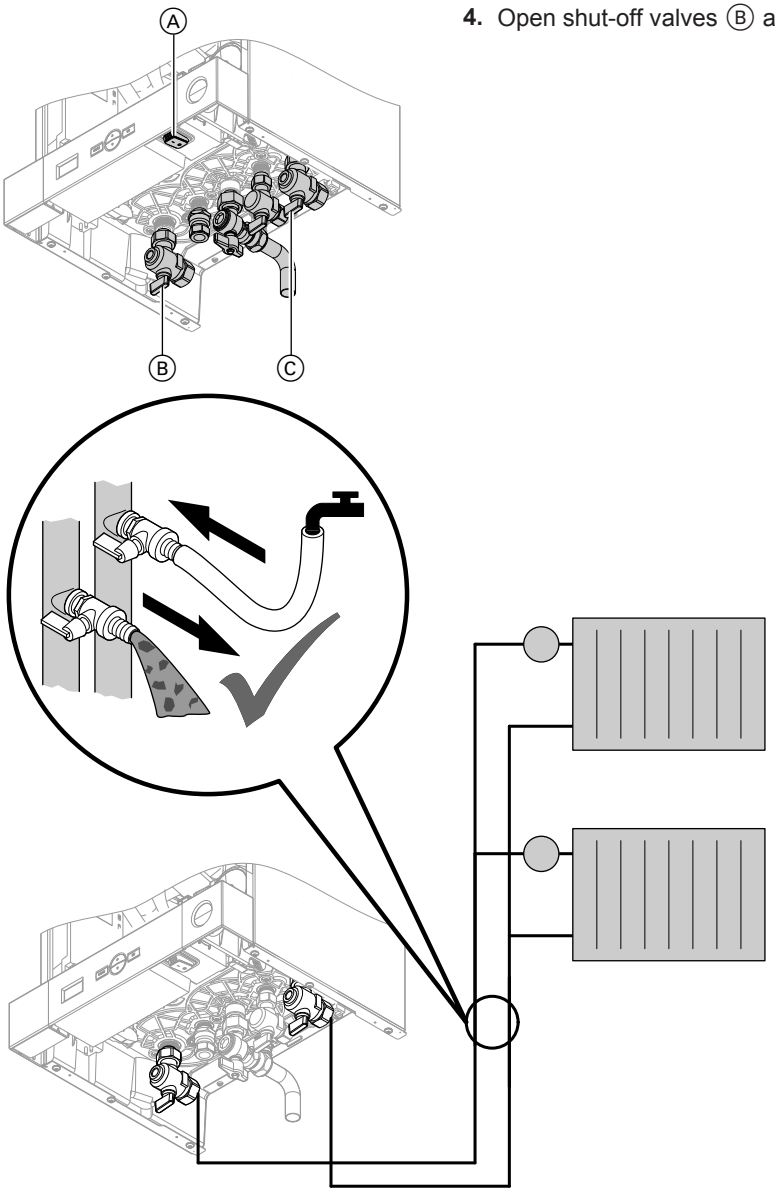
   Press the following keys:

   MODE and ▲ simultaneously for approx. 3 s.
   "SERV" is displayed and **"I"** flashes.

   OK to confirm; the filling function is activated.

   This function terminates automatically after 30 min or after the ON/OFF switch has been switched OFF.

Further details regarding the individual steps (cont.)



4. Open shut-off valves Ⓑ and Ⓒ.

Further details regarding the individual steps (cont.)

5. Fill and vent the heating system using the on-site valve. System pressure 0.8 to 1.2 bar (0.08 to 0.1 MPa)).

Changing to operation with LPG

In the delivered condition, the boiler is set up for operation with natural gas. For operation with LPG, change the gas nozzle and switch to the correct gas type in the control unit.

Separate installation instructions

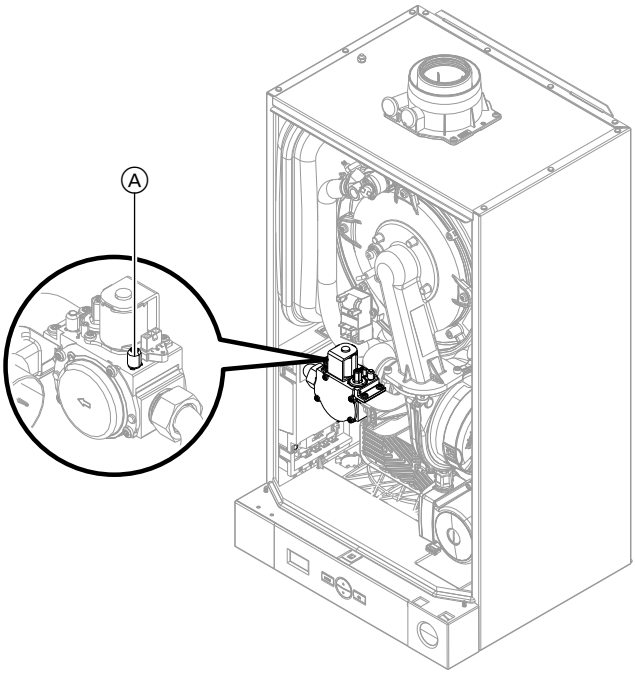
Conversion from LPG to natural gas, see page 53.

Checking the static and supply pressure

Danger
CO formation as a result of incorrect burner adjustment can have serious health implications.
Carry out a CO test before and after work on gas appliances.

Operation with LPG
Purge the LPG tank twice during commissioning or replacement. Vent the tank and gas connection line thoroughly after purging.

Further details regarding the individual steps (cont.)



Gas train viewed from the back.

1. Close the gas shut-off valve.
2. Undo screw Ⓐ inside test connector "IN" on the gas train, but do not remove it. Connect the pressure gauge.
3. Open the gas shut-off valve.
4. Check the static pressure.
   Set value: max. 57.5 mbar (5.75 kPa)
5. Start the boiler.

   Note
   *During commissioning, the boiler can enter a fault state because of airlocks in the gas line. After approx. 5 s, press **Reset** to reset the burner.*

Further details regarding the individual steps (cont.)

6. Check the supply (flow) pressure.

Set value:
- Natural gas: 20 mbar (2.0 kPa)
- LPG: 37 mbar (3.7 kPa)

Note
Use a suitable measuring instrument with a resolution of at least 0.1 mbar (0.01 kPa) to check the supply pressure.

7. Take action as shown in the following table.

8. Shut down the boiler, close the gas shut-off valve, remove the pressure gauge and tighten the screw in test connector Ⓐ.

9. Open the gas shut-off valve and start the appliance.

Danger
Gas escaping from the test connector leads to a risk of explosion.
Check gas tightness at test connector Ⓐ.

Supply pressure (flow pressure)		Actions
for natural gas	**for LPG**	
below 17.4 mbar (1.74 kPa)	below 25 mbar (2.5 kPa)	Do not commission the boiler. Notify your gas supply utility or LPG supplier.
17.4 to 25 mbar (1.74 to 2.5 kPa)	25 to 47 mbar (2.5 to 4.7 kPa)	Start the boiler.
above 25 mbar (2.5 kPa)	above 47 mbar (4.7 kPa)	Install a separate gas pressure governor upstream of the system and regulate the supply pressure to 20 mbar (2.0 kPa) for natural gas or 37 mbar (3.7 kPa) for LPG. Notify your gas supply utility or LPG supplier.

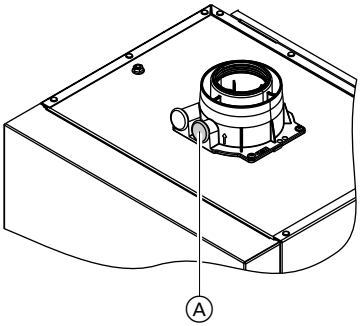
Checking the CO_2 content

The Vitodens 050-W is factory-set for natural gas. During commissioning or maintenance, the CO_2 and CO have to be measured at the boiler flue adaptor test port to check the flue integrity. Subject to the Wobbe index, the CO_2 content fluctuates between 7.0 % and 10.5 %.

If flue installation is OK, change the gas valve.

Note
Operate the appliance with uncontaminated combustion air to prevent operating faults and damage.

Further details regarding the individual steps (cont.)



1. Connect a flue gas analyser at flue gas port Ⓐ on the boiler flue connection.

2. Start the boiler and check for tightness.

   Danger
   Escaping gas leads to a risk of explosion.
   Check all gas equipment for tightness.

3. The burner output can be set manually in order to check the CO_2 content.
   1. Press MODE.
   2. ▲/▼ until **"SERV"** is displayed.
   3. OK as confirmation.
      "OFF" appears on the display.
   4. Set the burner output with ▲/▼:

      Display indication:
      _ : 20 %
      _ _ : 40 %
      _ _ _ : 60 %
      _ _ _ _ : 80 %
      _ _ _ _ _ : 100 %
   5. Confirm your settings with OK.

   This function terminates automatically after 30 min or set the burner output to **"OFF"** with ▲/▼.

4. Set the higher heating output and check the CO_2 content.
   The CO_2 content must be between 7.0 and 10.5 %.

Further details regarding the individual steps (cont.)

5. Set the lower heating output and check the CO_2 content.
   The CO_2 content must be between 0.3 and 0.9 % below the value for the upper heating output.

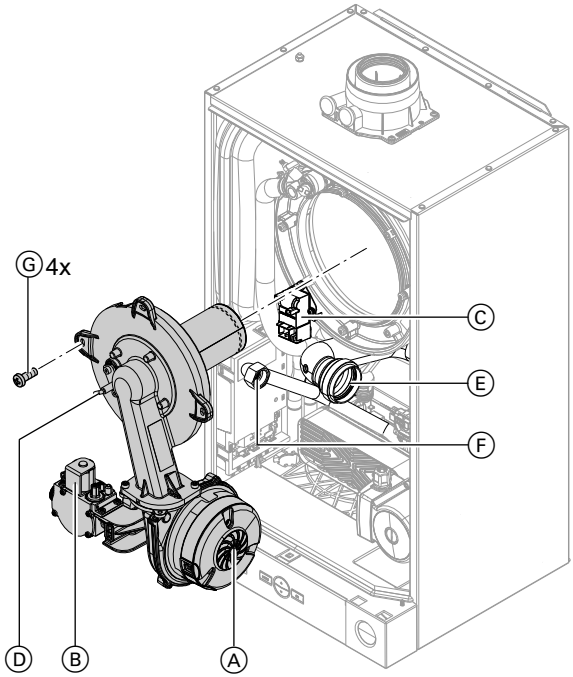
6. ■ If the CO_2 content is within the given range, continue with point 8.
   ■ If the CO_2 content is **outside** the given range, check the balanced flue system for tightness; remedy any leaks.
   Replace gas train if required.

7. Check the CO_2 content again for upper and lower heating output.

8. Shut down the boiler, remove the flue gas analyser and cap flue gas test port Ⓐ.

Further details regarding the individual steps (cont.)

Burner removal



1. Switch off the power supply.
2. Shut off the gas supply.
3. Pull the power and speed control cables from fan motor Ⓐ, gas train Ⓑ, ignition unit Ⓒ and electrodes Ⓓ.
4. Pull venturi extension Ⓔ from the fan.
5. Undo the fitting from gas supply pipe Ⓕ.
6. Undo 4 screws Ⓖ and remove the burner.

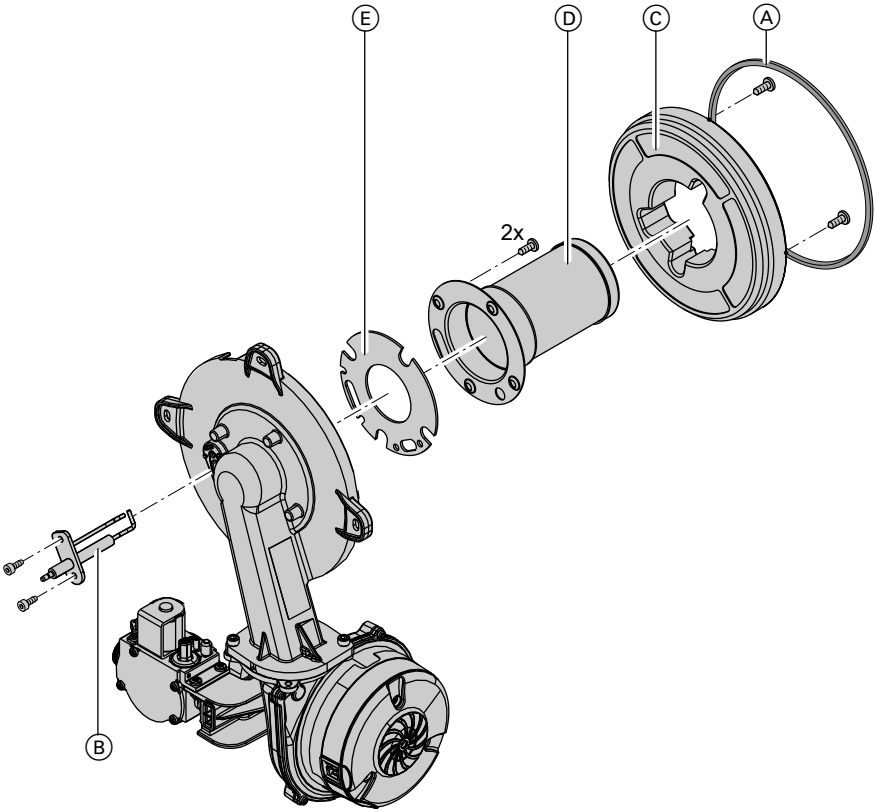
! **Please note**
Prevent damage.
Never rest the burner on the burner gauze assembly.

Checking the burner gasket and burner gauze assembly

Check burner gasket Ⓐ for damage and replace if required.

Replace the burner gauze assembly if it is damaged.

Further details regarding the individual steps (cont.)



1. Remove electrode Ⓑ.
2. Undo the 2 Torx screws and remove thermal insulation ring Ⓒ.
3. Undo the 2 Torx screws and remove burner gauze assembly Ⓓ with gasket Ⓔ.
4. Insert and secure new burner gauze assembly Ⓓ with new gasket Ⓔ.

! **Please note**
Tighten screws just enough to ensure the components are not being damaged and are functioning correctly.

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Further details regarding the individual steps (cont.)

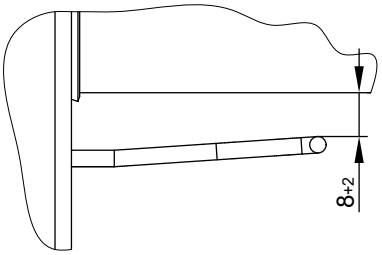
5. Mount thermal insulation ring Ⓒ.

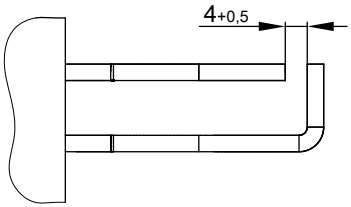
Please note
Tighten screws just enough to ensure the components are not being damaged and are functioning correctly.

6. Fit electrode Ⓑ.

Please note
Tighten screws just enough to ensure the components are not being damaged and are functioning correctly.

Checking and adjusting electrode





1. Check the electrode for wear and contamination.

2. Clean the electrode with a small brush (not with a wire brush) or emery paper.

3. Check the electrode gaps. If the gaps are not as specified or the electrode is damaged, replace electrode with gasket and realign the electrode. Tighten electrode fixing screws.

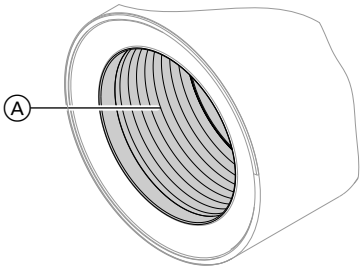
Please note
Tighten screws just enough to ensure the components are not being damaged and are functioning correctly.

Further details regarding the individual steps (cont.)

Cleaning the heat exchanger

Please note
Do not damage the surfaces of the heat exchanger that come into contact with hot gas. This can lead to corrosion damage.
Never use brushes to clean the heat exchanger.
Brushing can cause deposits to become lodged in the gaps between the coils.

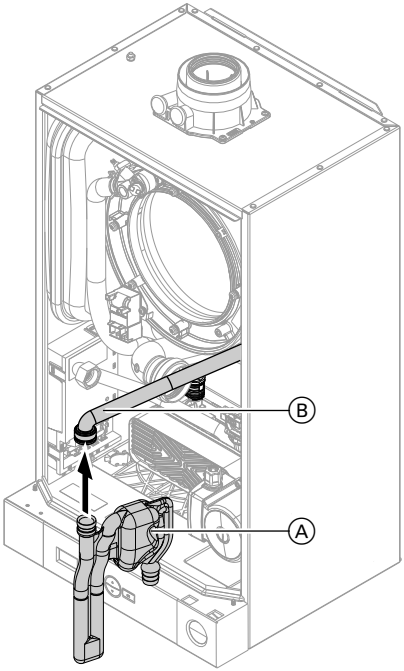
Note
Discolouration on the heat exchanger surface is a normal sign of use. It has no bearing on the function and service life of the heat exchanger.
The use of chemical cleaning agents is not required.



1. Use a vacuum cleaner to remove combustion residues from heating surface Ⓐ of the heat exchanger.
2. Flush heating surface Ⓐ with water.
3. Check condensate drain and clean siphon. See the following chapter.
4. Flush the heating surface again with water (the siphon is also filled with water in the process).

Further details regarding the individual steps (cont.)

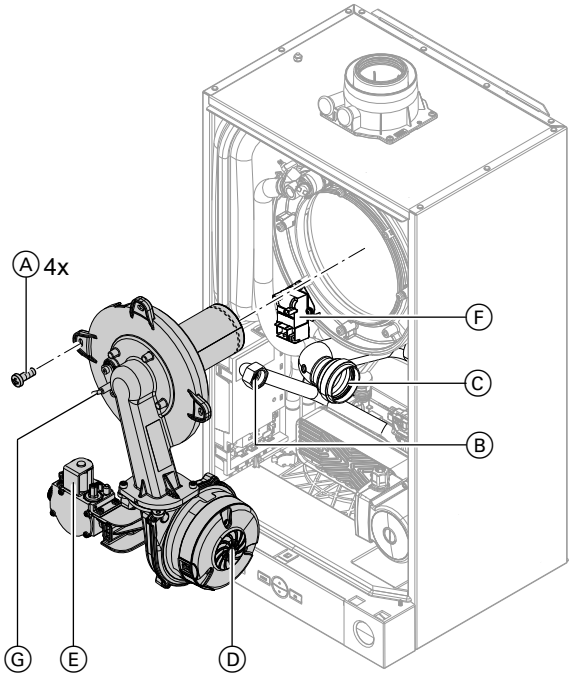
Checking the condensate drain and cleaning the trap



1. Pull trap Ⓐ upwards out of the drain connection.
2. Pull supply hose Ⓑ off trap Ⓐ.
3. Clean trap Ⓐ.
4. Reconnect supply hose Ⓑ.
5. Refit trap Ⓐ to the drain connection.
6. Fill trap Ⓐ with water. For this, pour approx. 0.3 l of water into the combustion chamber.
7. Check that condensate can drain freely and that the connections are tight.

Further details regarding the individual steps (cont.)

Installing the burner



1. Fit burner and tighten 4 screws Ⓐ diagonally.

   Please note
   Tighten screws just enough to ensure the components are not being damaged and are functioning correctly.

2. Insert new gasket and tighten the fitting on gas supply pipe Ⓑ.

3. Plug venturi extension Ⓒ into the fan.

4. Install the power and speed control cables of fan motor Ⓓ, gas train Ⓔ, ignition unit Ⓕ and electrodes Ⓖ.

5. Reopen gas supply and switch on power supply.

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Further details regarding the individual steps (cont.)

6. Check the gas connections for tightness.

Danger
Escaping gas leads to a risk of explosion.
Check the fitting for gas tightness.

Please note
The use of leak detection spray can result in faulty operation.
Leak detection spray must not come into contact with electrical contacts and the diaphragm opening on the gas valve has to be covered.

Checking the diaphragm expansion vessel and system pressure

Note
The expansion vessel can lose some of its charge pressure after some time in use. When the boiler heats up, the pressure gauge will indicate a higher pressure of 2 or 3 bar (0.2 or 0.3 MPa). The safety valve can respond and discharge excess pressure.
For this reason, check the expansion vessel pre-charge pressure annually.

Check whether the installed expansion vessel is adequate for the system water volume (GB only).
Carry out this test on a cold system.

1. Drain the system until the pressure gauge shows "0".
Alternatively, close the cap valve on the expansion vessel and reduce the pressure until the pressure gauge indicates "0".

2. If the pre-charge pressure of the expansion vessel is lower than the static system pressure, top up with nitrogen until the pre-charge pressure is 0.1 to 0.2 bar (10 to 20 kPa) higher than the static system pressure.

3. Top up with water until the charge pressure of the cooled system is at least 1.0 bar (0.1 MPa), and is 0.1 to 0.2 bar (10 to 20 kPa) higher than the pre-charge pressure of the expansion vessel.
Permiss. operating pressure: 3 bar (0.3 MPa)

Checking all gas equipment for tightness at operating pressure

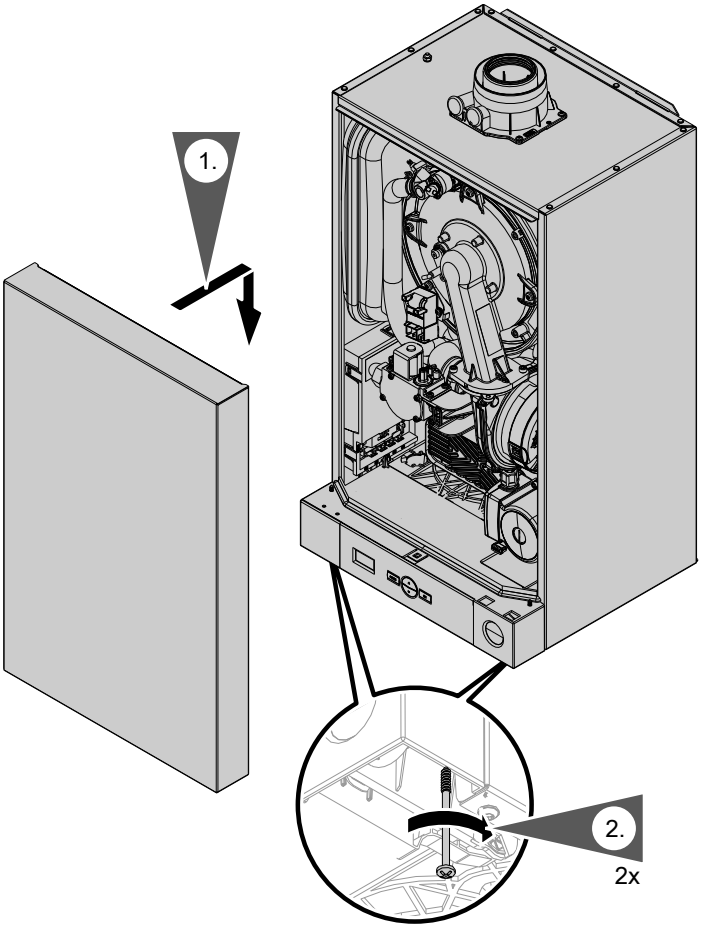
Danger
Escaping gas leads to a risk of explosion.
Check all gas equipment for tightness.

Please note
The use of leak detection spray can result in faulty operation.

Further details regarding the individual steps (cont.)

Leak detection spray must not come into contact with electrical contacts and the diaphragm opening on the gas valve has to be covered

Fitting the front panel



1. Hook the front panel into place.

2. Tighten screws at the bottom.

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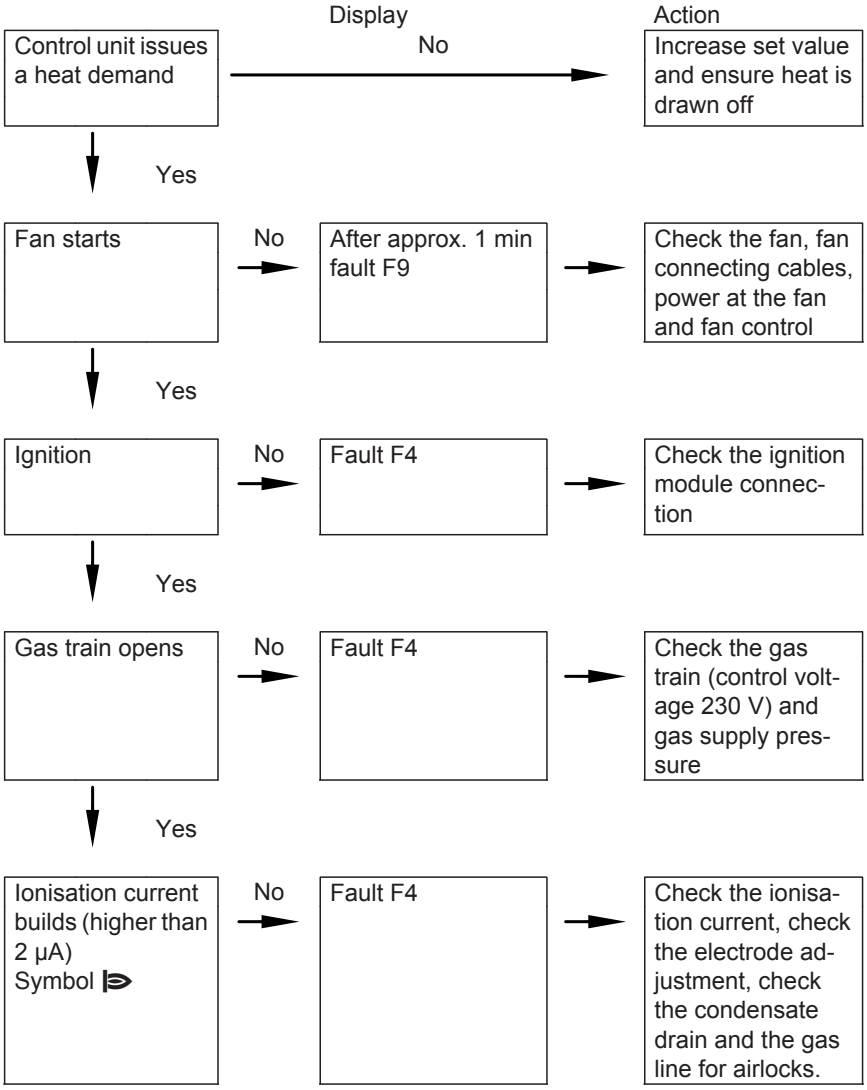
Further details regarding the individual steps (cont.)

Instructing the system user

The system installer should hand the operating instructions to the system user and instruct the user in operating the system.

Function sequence and possible faults



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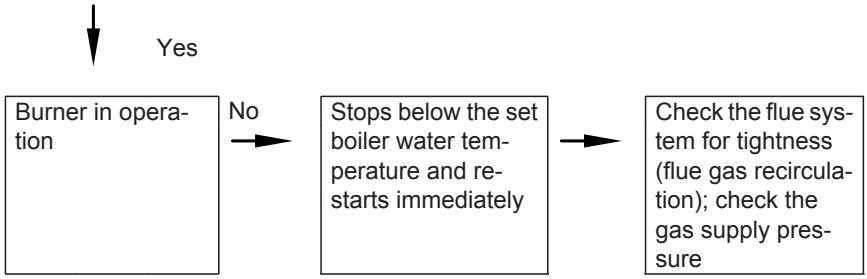
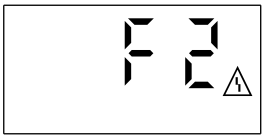
Function sequence and possible faults (cont.)



Fault display showing



Example

Display
- Faults with lower priority:
  Fault code (e.g. "51") is displayed permanently and fault symbol "⚠" flashes
- Faults with higher priority:
  Fault code (e.g. "F2") flashes and fault symbol "⚠" flashes

For an explanation of the fault codes, see the following table.

Fault code showing	System characteristics	Cause	Measures
10	Constant temperature mode	Short circuit, outside temperature sensor	Check the outside temperature sensor and lead (see page 44).
18	Constant temperature mode	Lead break, outside temperature sensor	Check the outside temperature sensor and lead (see page 44).
30	Burner blocked	Short circuit, boiler water temperature sensor	Check boiler water temperature sensor (see page 45).
38	Burner blocked	Lead break, boiler water temperature sensor	Check boiler water temperature sensor (see page 45).

Fault display showing (cont.)

Fault code showing	System characteristics	Cause	Measures
51	No DHW heating	Short circuit, outlet temperature sensor	Check sensor (see page 47).
52	Burner blocked	Short circuit, flow sensor	Check connections and lead; replace sensor if required.
59	No DHW heating	Lead break, outlet temperature sensor	Check sensor (see page 47).
5A	Burner blocked	Lead break, flow sensor	Check connections and lead; replace sensor if required.
A9	Control mode without OpenTherm influence	Communication error, OpenTherm	Check connections and cable; replace OpenTherm if required.
b0	Burner blocked	Short circuit, flue gas temperature sensor	Check sensor (see page 48).
b8	Burner blocked	Lead break, flue gas temperature sensor	Check sensor (see page 48).
E3	Burner in a fault state	Fault in safety chain	Check the temperature limiter and connecting cables (see page 46).
E5	Burner blocked	Internal error	Check the ionisation electrode and connecting cables.
F0	Burner blocked	Internal error	Replace control unit.
F1	Burner in a fault state	Max. flue gas temperature exceeded	Check heating system fill level. Check circulation pump. Vent the system.
F2	Burner in a fault state	Temperature limiter has responded	Check heating system fill level. Check circulation pump. Vent the system. Check the temperature limiter and connecting cables (see page 46). Press "Reset" (see page 42).

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Fault display showing (cont.)

Fault code showing	System characteristics	Cause	Measures
F3	Burner in a fault state	Flame signal is already present at burner start	Check ionisation electrode and connecting cable. Press "Reset" (see page 42).
F4	Burner in a fault state	No flame signal detected	Check the ignition/ionisation electrode and connecting cables, check the gas pressure, check the gas train, ignition, ignition module and condensate drain. Press "Reset" (see page 42).
F8	Burner in a fault state	Fuel valve closes too late	Check gas train. Check both control paths. Press "Reset" (see page 42).
F9	Burner in a fault state	Fan speed too low during burner start	Check fan, fan connecting cables and power supply; check fan control. Press "Reset" (see page 42).
FA	Burner in a fault state	Fan idle state not reached	Check fan, fan connecting cables and power supply; check fan control. Press "Reset" (see page 42).
FC	Burner blocked	Electrical fan control (control unit) faulty	Check fan connecting cable; replace if required, or replace control unit.

Fault display showing (cont.)

Fault code showing	System characteristics	Cause	Measures
Fd	Burner blocked	Fault, burner control unit	Check ignition electrodes and connecting cables. Check whether a strong interference (EMC) field exists near the appliance. Press "Reset" (see page 42). Replace control unit if fault persists.
FF	Burner blocked	Fault, burner control unit	Check ignition electrodes and connecting cables. Check whether a strong interference (EMC) field exists near the appliance. Press "Reset" (see page 42). Replace control unit if fault persists.
——⚠	Burner blocked	Communication error between burner control unit and programming unit	Check connecting cables. Press "Reset" (see page 42). Replace burner control unit or programming unit if the fault persists.

Reset (reset burner control unit)

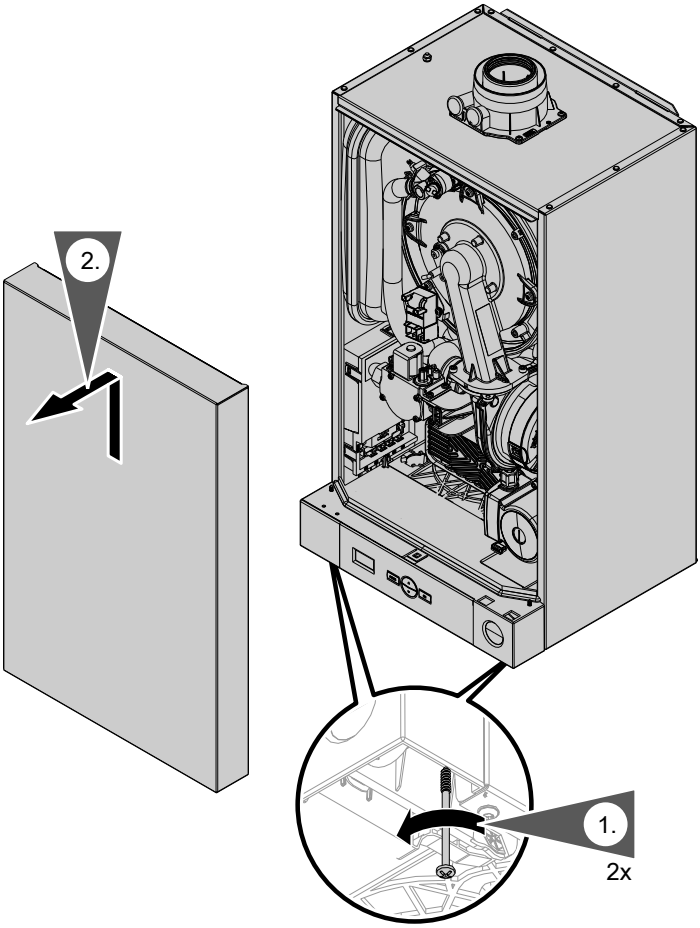
Press MODE and OK simultaneously.
—— is displayed.
"⚠" extinguishes and the default display is shown if the fault has been removed.
Alternatively further faults will be displayed.

Scanning the software version on the programming unit

Press MODE and ▼ simultaneously.

Repairs

Removing the front panel

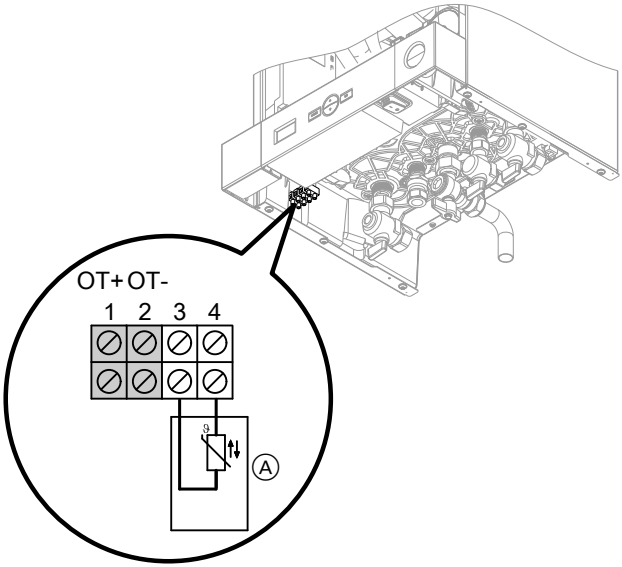


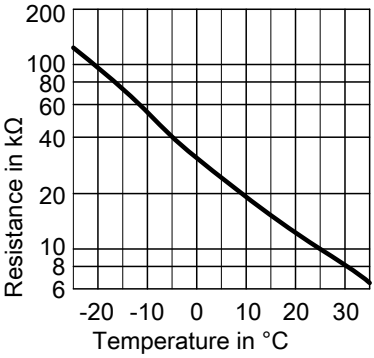
1. Undo screws at the bottom of the boiler; do not remove completely.

2. Remove front panel.

Repairs (cont.)

Outside temperature sensor



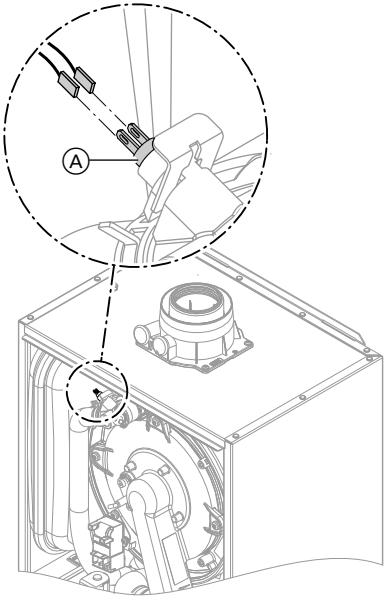


1. Disconnect leads from outside temperature sensor Ⓐ.
2. Check the sensor resistance and compare it with the curve.
3. Replace the sensor in the case of severe deviation.

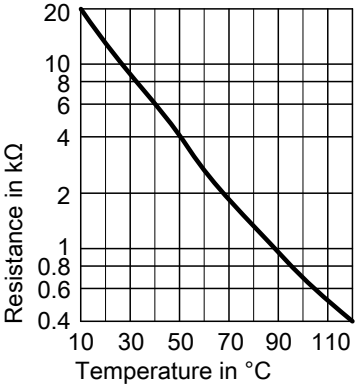
Sensor type: NTC 10 kΩ

Repairs (cont.)

Boiler water temperature sensor



1. Pull the leads from boiler water temperature sensor Ⓐ and check the resistance.



2. Check the sensor resistance and compare it with the curve.

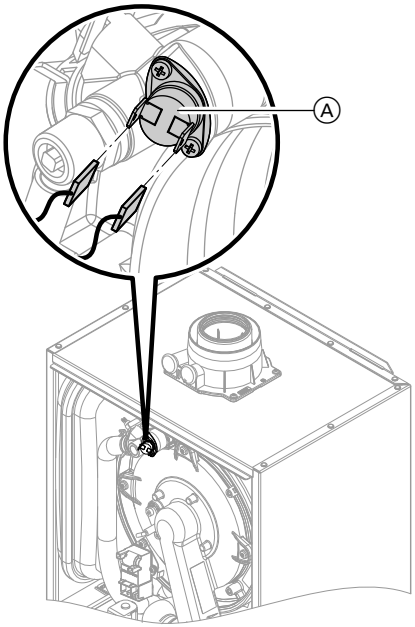
3. In the case of severe deviation, drain the boiler on the heating water side and replace the sensor.

Danger
The boiler water temperature sensor is immersed in heating water (risk of scalding).
Drain the boiler before replacing the sensor.

Sensor type: NTC 10 kΩ

Repairs (cont.)

Checking the temperature limiter

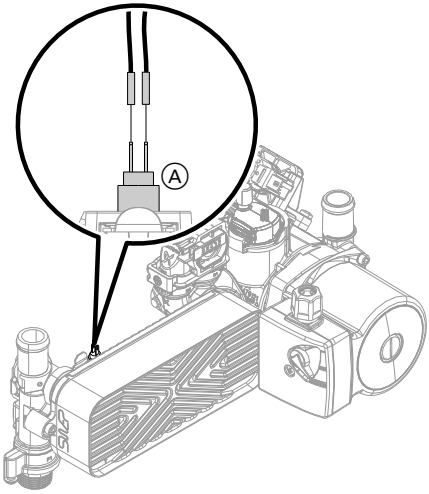


Check the temperature limiter if the burner control unit cannot be reset after a fault shutdown, although the boiler water temperature is below approx. 95 °C.

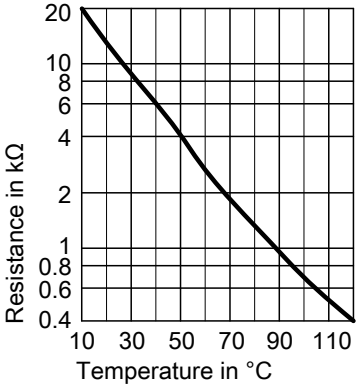
1. Pull the leads from temperature limiter Ⓐ.
2. Check the continuity of the temperature limiter with a multimeter.
3. Remove the faulty temperature limiter.
4. Install a new temperature limiter.
5. Reset by pressing "Reset" on the control unit to (see page 42).

Repairs (cont.)

Checking the outlet temperature sensor



1. Pull leads from outlet temperature sensor Ⓐ.
2. Check the sensor resistance and compare it with the curve.



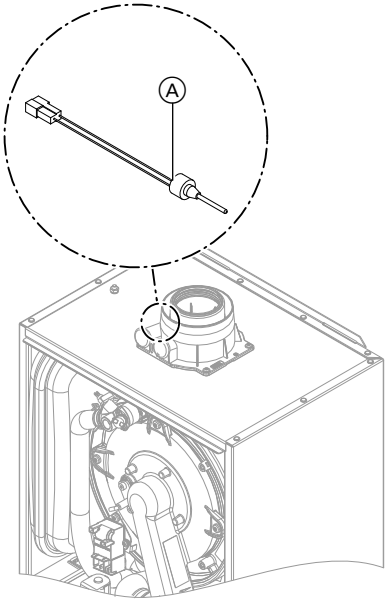
Sensor type: NTC 10 kΩ

3. Replace the sensor in the case of severe deviation.

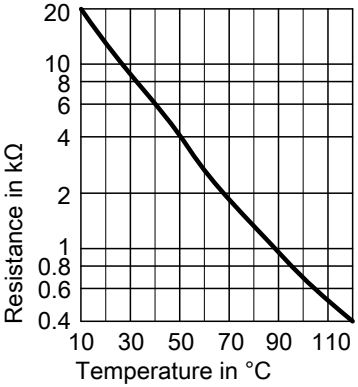
Note
Water can leak when replacing the outlet temperature sensor. Shut off the cold water supply. Drain the DHW line and the plate heat exchanger (on the DHW side).

Repairs (cont.)

Check flue gas temperature sensor



1. Pull leads from flue gas temperature sensor Ⓐ.
2. Check the sensor resistance and compare it with the curve.



3. Replace the sensor in the case of severe deviation.

Sensor type: NTC 10 kΩ

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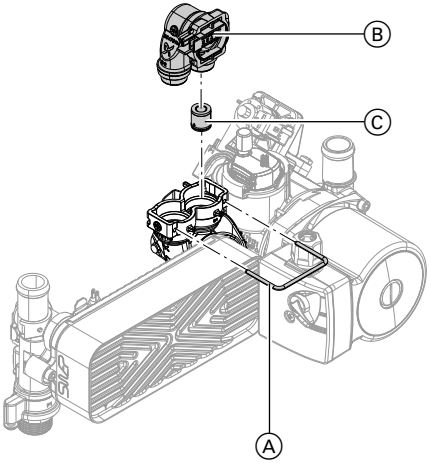
Repairs (cont.)

Replacing flow limiter



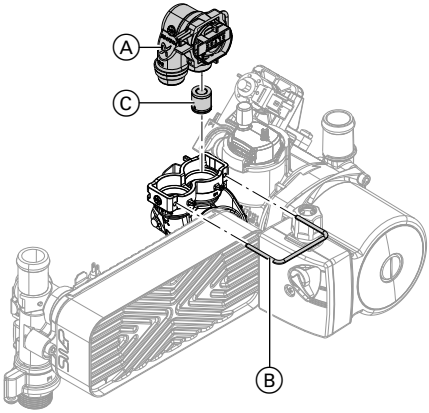
1. Drain the boiler from the DHW side.
2. Pull off spring clip Ⓐ.
3. Remove flow sensor Ⓑ.
4. Remove faulty flow limiter Ⓒ.
5. Select a new flow limiter Ⓒ from the following table.

Serial no. (type plate)	Flow rate l/min	Colour
7537906	10	Light blue
7537947	14	Light pink

6. Insert new flow limiter Ⓒ.
7. Mount flow sensor Ⓑ with new gaskets.

Repairs (cont.)

Replacing the flow sensor



1. Drain the boiler from the DHW side.
2. Pull the leads off faulty flow sensor Ⓐ.
3. Pull off spring clip Ⓑ.
4. Remove faulty flow sensor Ⓐ.
5. Select a new flow limiter Ⓒ from the table on page.
6. Install new flow limiter Ⓒ on new flow sensor Ⓐ.
7. Install new flow sensor Ⓐ with new gaskets. Attach leads.
8. Position spring clip Ⓑ.

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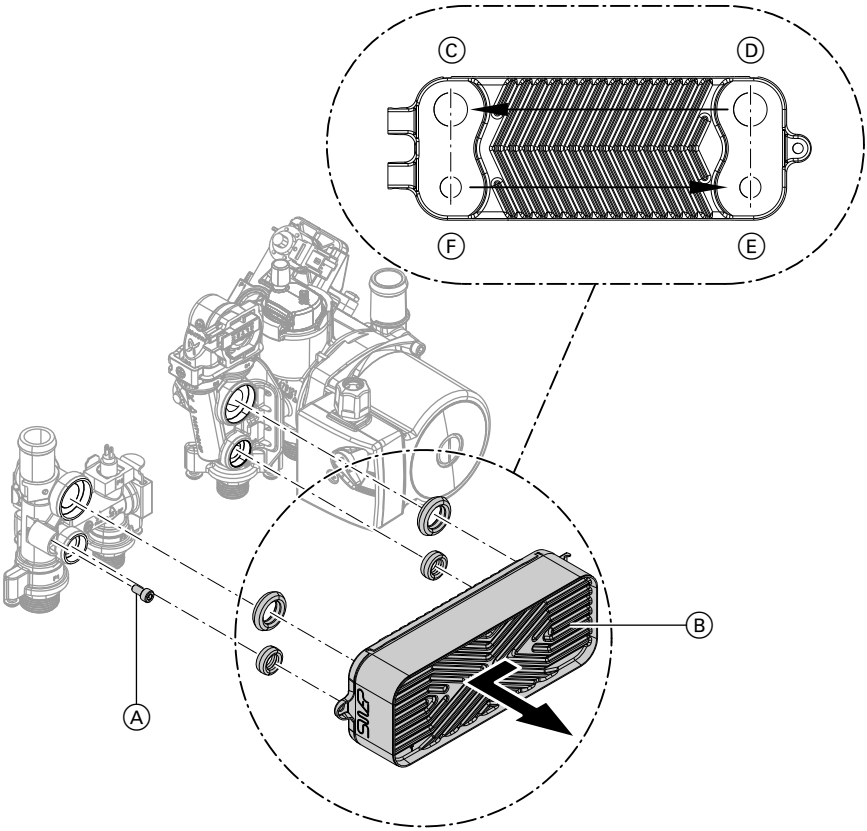
Repairs (cont.)

Checking or replacing the plate heat exchanger



Ⓒ Heating water return
Ⓓ Heating water flow
Ⓔ DHW
Ⓕ Cold water

1. Shut off and drain the boiler on the heating water and the DHW side.

2. Undo screw Ⓐ on the plate heat exchanger and remove plate heat exchanger Ⓑ with gaskets.

Note
During and after removal, small amounts of water may trickle from the plate heat exchanger.

Repairs (cont.)

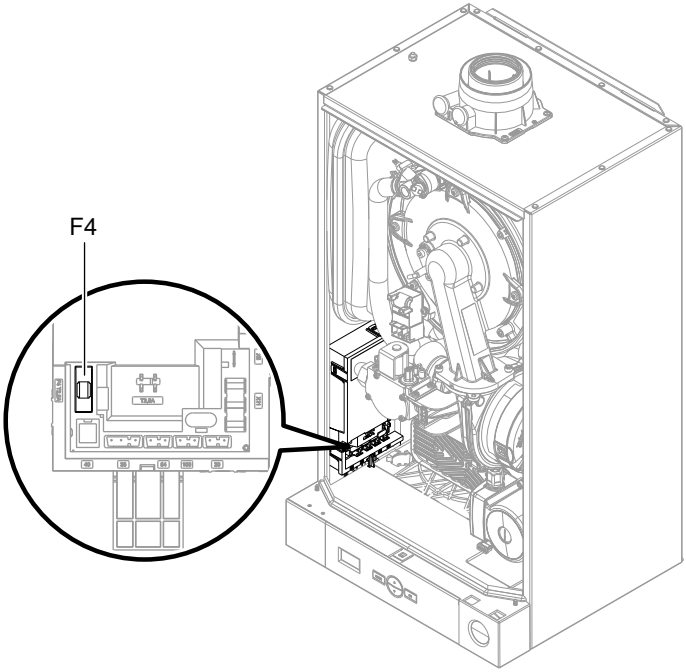
3. Check the connections on the DHW side for scaling; clean or replace the plate heat exchanger if required.

4. Check the connections on the heating water side for contamination; clean or replace the plate heat exchanger if required.

5. Install in reverse order using new gaskets.

Note
During installation, ensure the fixing holes are aligned and the gaskets are positioned correctly. Mount the plate heat exchanger with the correct orientation.

Checking the fuse



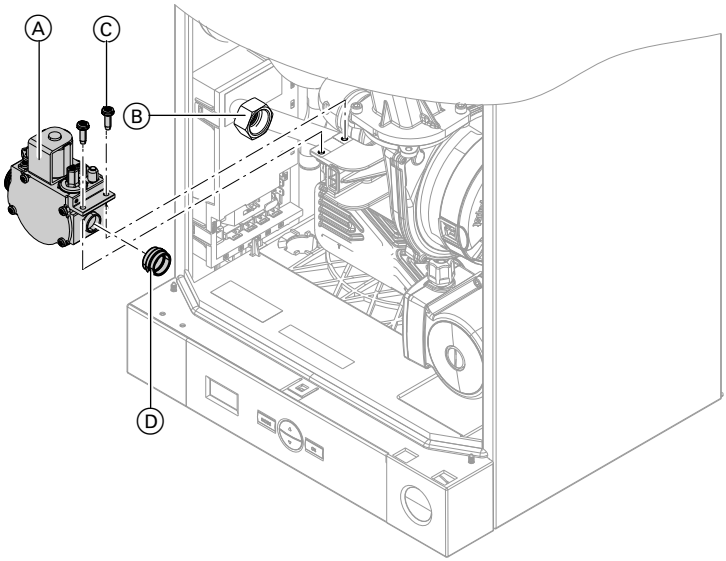
1. Switch off the power supply.

2. Open the control unit enclosure.

3. Check fuse F4.

Converting from LPG to natural gas

Removing gas restrictor



1. Pull cable from gas train Ⓐ.
2. Undo union nut Ⓑ.
3. Undo 2 screws Ⓒ and remove gas train Ⓐ.
4. Remove gas restrictor Ⓓ from gas train Ⓐ.
5. Mount gas train Ⓐ with new gaskets Ⓔ and Ⓕ.

Please note
Tighten screws just enough to ensure the components are not being damaged and are functioning correctly.

6. Remove or void gas type sticker on the top of the boiler (next to the type plate).
7. Start the boiler and check for tightness.

Danger
Escaping gas leads to a risk of explosion.
Check all gas equipment for tightness.

Converting from LPG to natural gas (cont.)

Changing the gas type at the control unit

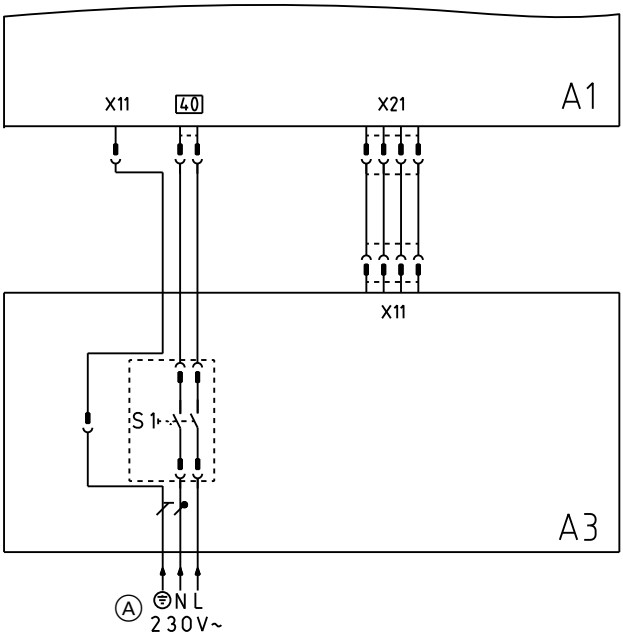
1. Switch ON the ON/OFF switch.
2. Press MODE and ▲ simultaneously for 3 s.
   "SERV" is displayed and **"I"** flashes.
3. Select **"5"** with ▲/▼ and confirm with OK.
   "1" flashes on the display.
4. Select **"0"** with ▲/▼ and confirm with OK.
   The burner has been converted to operation with natural gas.
5. Press MODE and ▲ simultaneously for 3 s.
   Service mode is terminating. Service mode also terminates automatically after 30 min.

Checking the CO_2 content

See page 26.

Connection and wiring diagrams

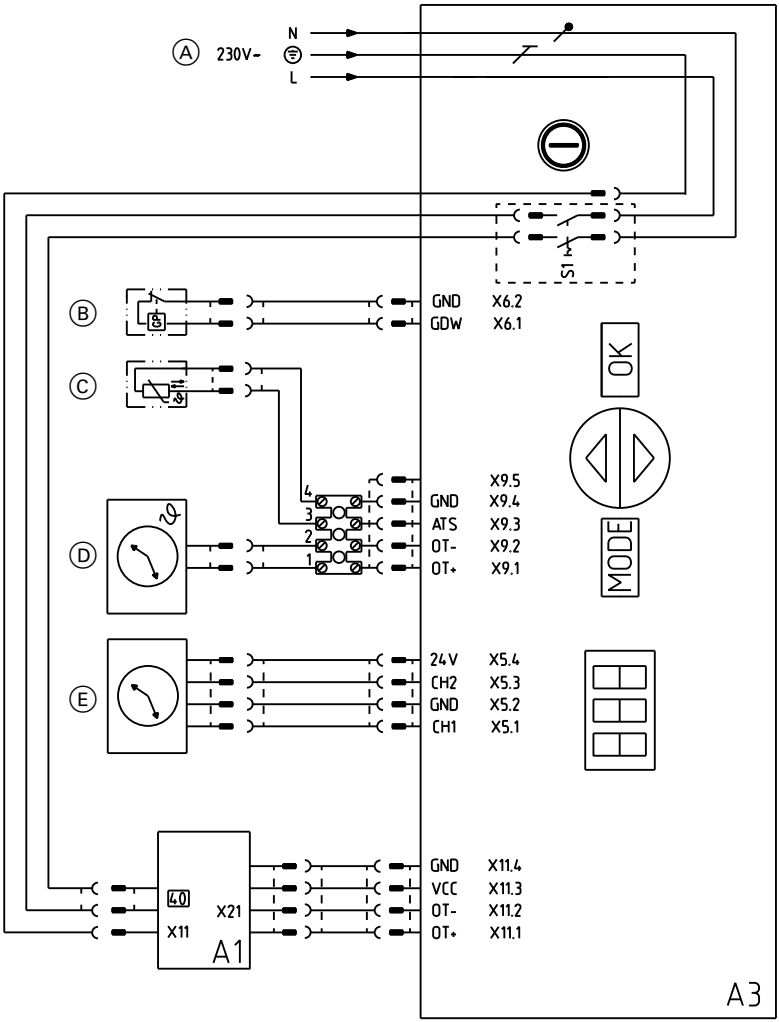
Overview



Ⓐ Power supply
A1 Main PCB
A3 Programming unit
S1 ON/OFF switch
X ... Electrical interface

Connection and wiring diagrams (cont.)

Programming unit



Ⓐ Power supply
Ⓑ Gas pressure switch (accessory)
Ⓒ Outside temperature sensor (accessory)
Ⓓ Room temperature controller (accessory)
Ⓔ Time switch (accessory)
A1 Main PCB
A3 Programming unit

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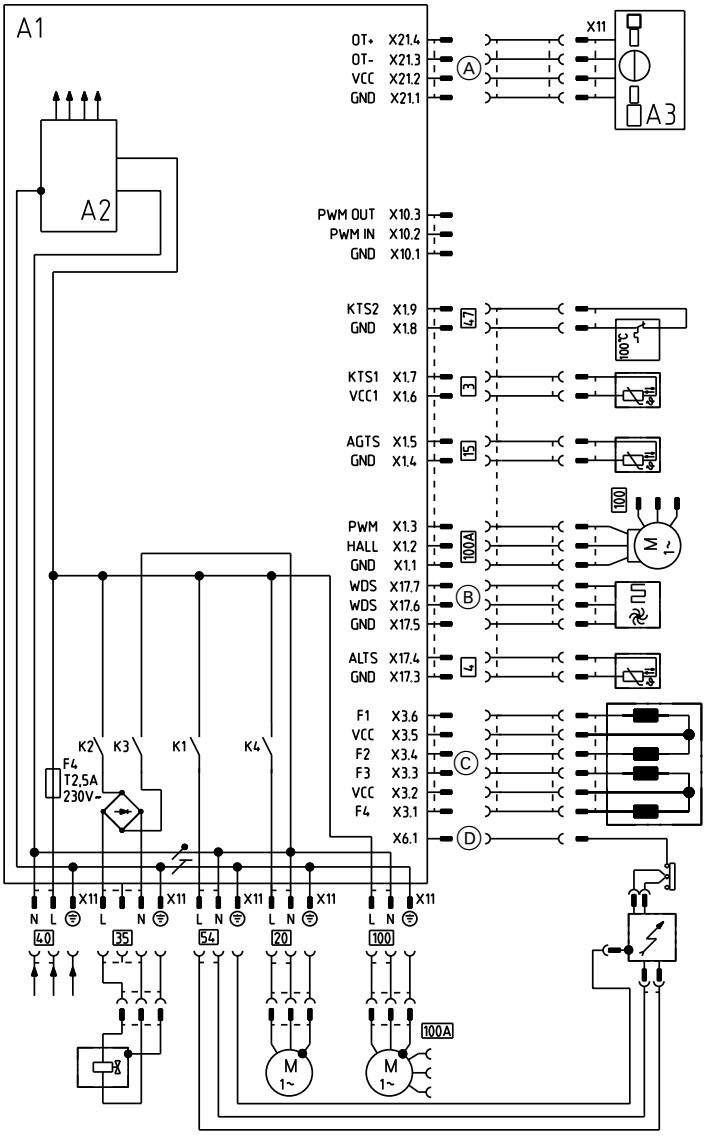
Connection and wiring diagrams (cont.)

S1 ON/OFF switch

X ... Electrical interface

Connection and wiring diagrams (cont.)

Control unit



Ⓐ Programming unit connection

Ⓑ Flow sensor

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Connection and wiring diagrams (cont.)

Ⓒ	Diverter valve stepper motor
Ⓓ	Ionisation electrode
A1	Main PCB
A2	Power supply unit
A3	Programming unit
PWM	Circulation pump switching
X ...	Electrical interface
3	Boiler water temperature sensor
4	Outlet temperature sensor
15	Flue gas temperature sensor
20	Circulation pump 230 V~
35	Gas solenoid valve
40	Power supply
47	Temperature limiter
54	Ignition
100	Fan motor 230 V~
100A	Fan control

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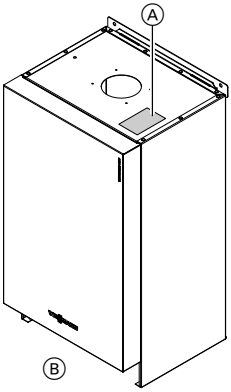
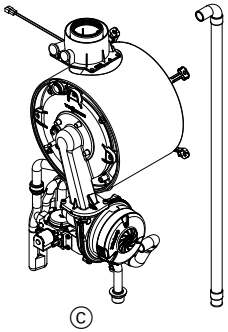
Ordering parts

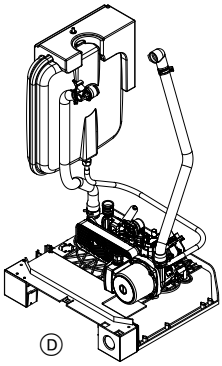
- Serial no. (see type plate Ⓐ)
- Assembly (from this parts list)
- Part number of the individual part within the assembly in line with the boiler serial no.

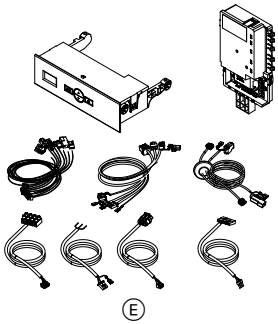
Standard parts are available from your local supplier.

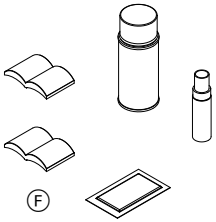
Overview of the assemblies











Ⓐ Type plate
Ⓑ Casing assembly
Ⓒ Heat cell assembly
Ⓓ Hydraulic assembly
Ⓔ Control unit assembly
Ⓕ Miscellaneous assembly

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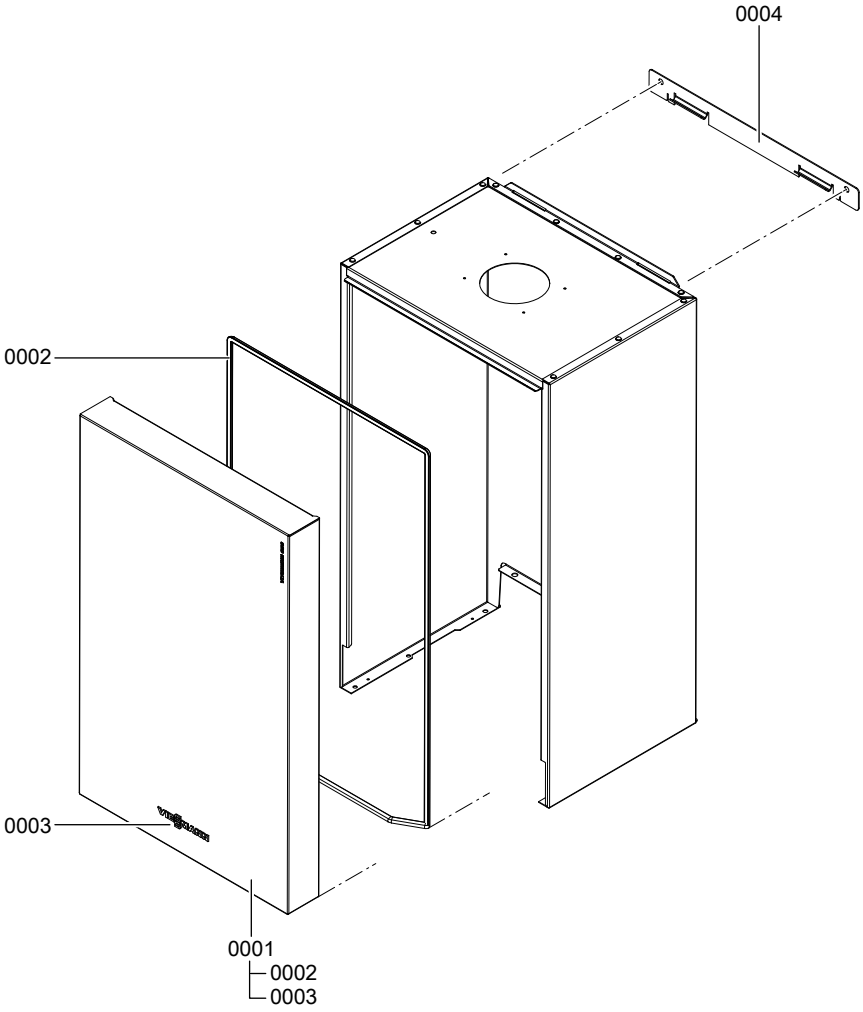
Casing assembly

Pos.	Component	Serial no. (see type plate)	
		7537906	7537947
		Part no. of individual part	
0001	Front panel	7841736	7841736
0002	Profiled seal	7836227	7836227
0003	Viessmann logo	7839162	7839162
0004	Wall mounting bracket	7841656	7841656

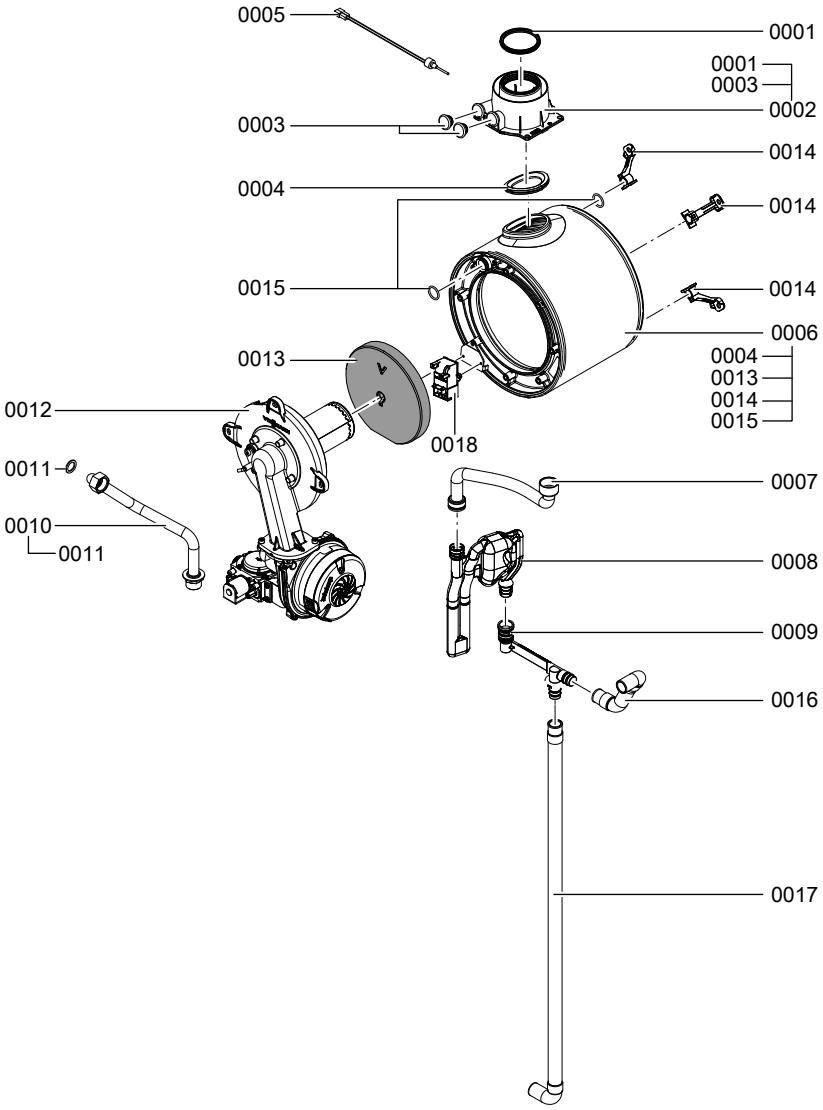
Casing assembly (cont.)



Heat cell assembly

Pos.	Component	Serial no. (see type plate)	
		7537906	7537947
		Part no. of individual part	
0001	Gasket DN60	7826471	7826471
0002	Boiler flue connection	7826466	7826466
0003	Boiler flue connection plug	7822742	7822742
0004	Flue gasket	7828645	7828645
0005	Flue gas temperature sensor	7822767	7822767
0006	Heat exchanger	7826461	7828634
0007	Condensate hose	7841752	7841752
0008	Splash siphon	7841759	7841759
0009	Tee connector ∅ 19	7841767	7841767
0010	Gas connection	7841760	7841742
0011	Gasket A 17 x 24 x 2 (5 pce)	7826217	7826217
0012	Burner	7124461	7124524
0013	Thermal insulation block	7830016	7830016
0014	Heat exchanger mounting (set)	7823849	7823849
0015	O-ring 20.63 x 2.62 (5 pce)	7826214	7826214
0016	Corrugated hose 19 x 155 with ferrule/bend	7841876	7841876
0017	Corrugated hose 19 x 800 with ferrule/bend	7841062	7841062
0018	Ignition transformer	7842085	7842085

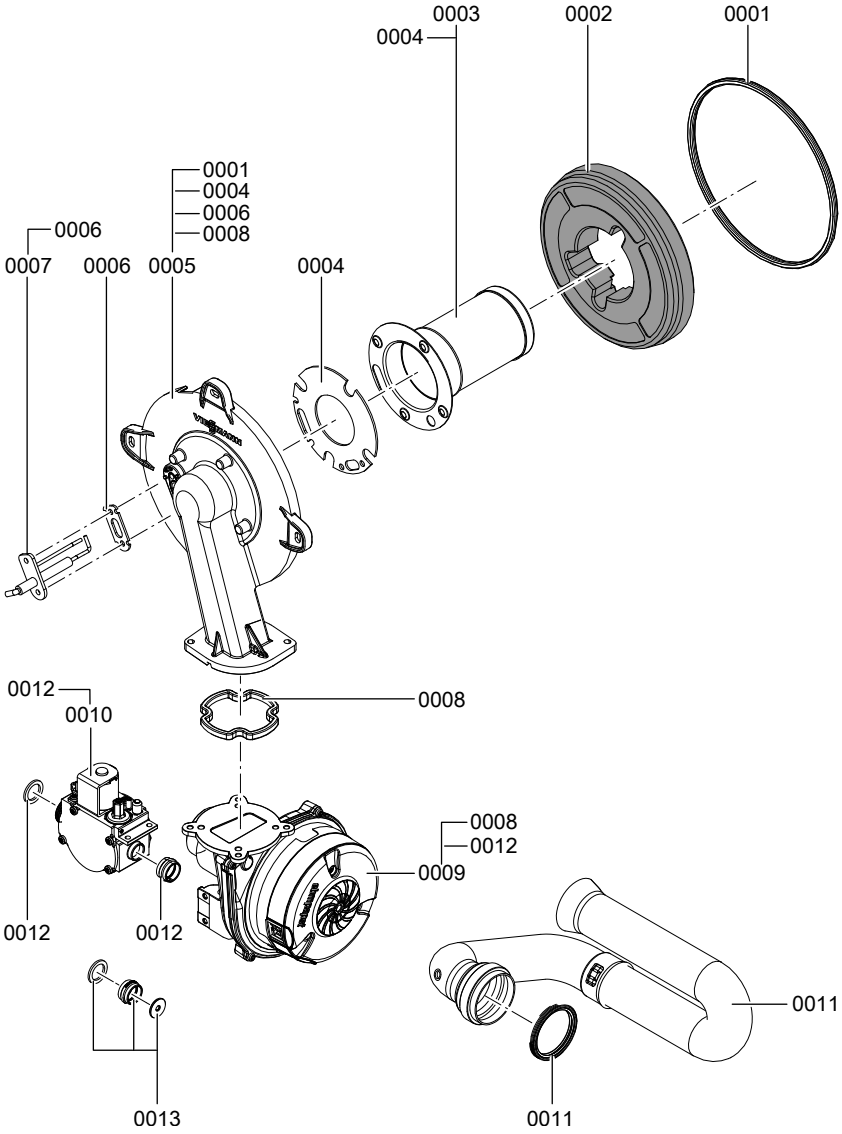
Heat cell assembly (cont.)



Burner assembly

Pos.	Component	Serial no. (see type plate)	
		7537906	7537947
		Part no. of individual part	
0001	Burner gasket ∅ 187	7836177	7836177
0002	Thermal insulation ring	7834987	7834987
0003	Cylinder burner gauze assembly	7841764	7841764
0004	Burner gauze assembly gasket	7826514	7826514
0005	Burner door	7837257	7837257
0006	Gasket, ionisation electrode (5 pce)	7827024	7827024
0007	Ignition/ionisation electrode	7841762	7841762
0008	Burner door flange gasket	7829796	7829796
0009	Centrifugal fan NRG 118 24 kW	7841664	7841665
0010	Gas valve GB-ND 055 E01	7841668	7841669
0011	Venturi extension	7841745	7841745
0012	Gasket set G20/G31	7841672	7841673
0013	Conversion kit G20/G31	7841678	7841679

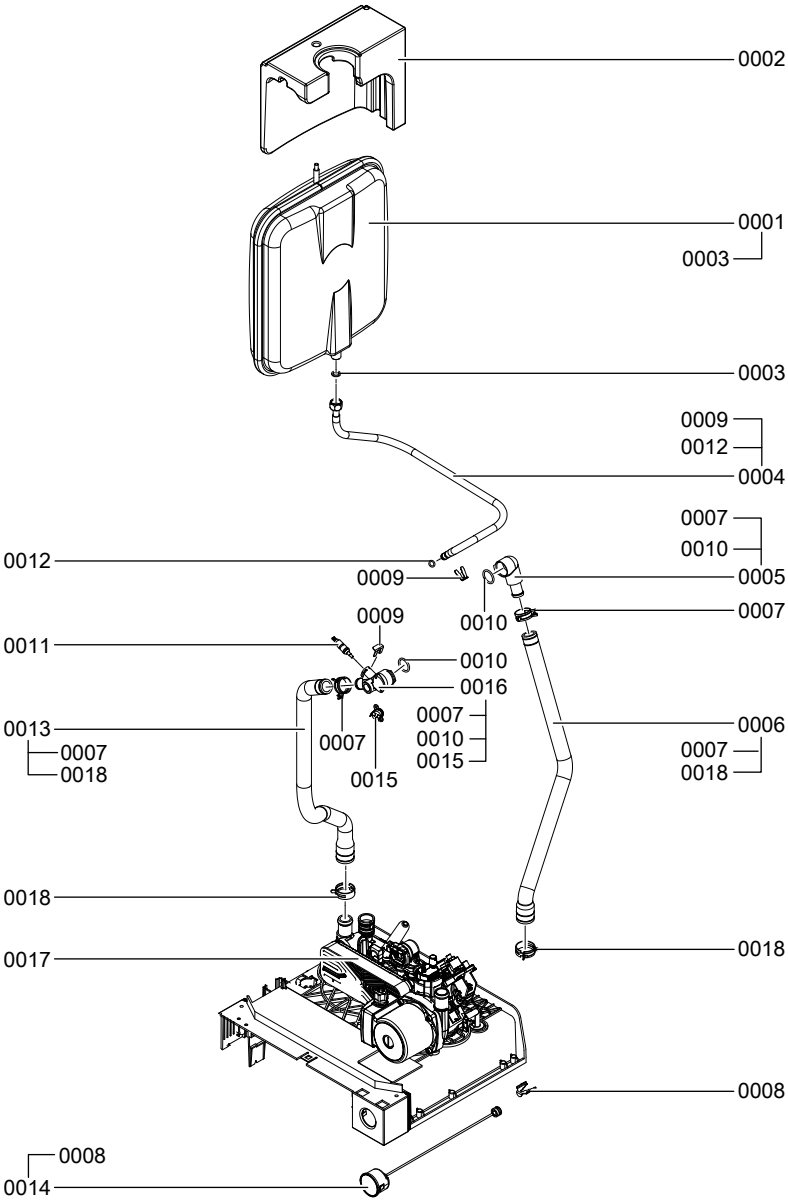
Burner assembly (cont.)



Hydraulic assembly

Pos.	Component	Serial no. (see type plate)	
		7537906	7537947
		Part no. of individual part	
0001	Diaphragm expansion vessel CRI 8	7837231	7837231
0002	DEV pad	7841761	7841761
0003	Gasket A 10 x 15 x 1.5 (5 pce)	7828002	7828002
0004	DEV connection line G 3/8	7841773	7841773
0005	Connection elbow HR brass	7828639	7828639
0006	Profile hose HR	7841766	7841766
0007	Spring clip DN25 (5 pce)	7827429	7827429
0008	Clip ∅ 10 (5 pce)	7828759	7828759
0009	Clip ∅ 8	7827425	7827425
0010	O-ring 20.63 x 2.62 (5 pce)	7826214	7826214
0011	Temperature sensor	7819967	7819967
0012	Circular seal washer 8 x 2 (5 pce)	7831409	7831409
0013	Profile hose HF	7841765	7841765
0014	Pressure gauge	7834985	7834985
0015	Thermal circuit breaker	7825487	7825487
0016	Connection elbow HF	7838128	7838128
0017	Grundfos hydraulics	7124530	7124568
0018	Spring clip DN30	7838958	7838958

Hydraulic assembly (cont.)



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Grundfos hydraulic assembly

Pos.	Component	Serial no. (see type plate)	
		7537906	7537947
		Part no. of individual part	
0001	Flow casing EU1	7841809	7841809
0002	Temperature sensor	7836553	7836553
0003	Expansion tank	7829297	7829297
0004	O-ring 19.8 x 3.6 (5 pce)	7831415	7831415
0005	O-ring 16 x 3 (5 pce)	7831407	7831407
0006	Clip ∅ 8 narrow (5 pce)	7836270	7836270
0008	Plate heat exchanger	7841770	7841779
0009	Circulation pump motor	7828741	7836443
0010	Return casing	7841820	7841820
0011	Flow limiter	7841821	7841823
0012	Stepper motor	7841824	7841824
0015	Air vent valve	7828750	7828750
0018	Flow sensor	7841830	7841830
0019	Clip ∅ 8	7841816	7841816
0020	Clip ∅ 16	7841831	7841831
0022	Connection elbow	7841775	7841775
0023	Air box floor	7841771	7841771
0025	Dummy adaptor, time switch	7841777	7841777
0030	Tee connector ∅ 19	7841767	7841767

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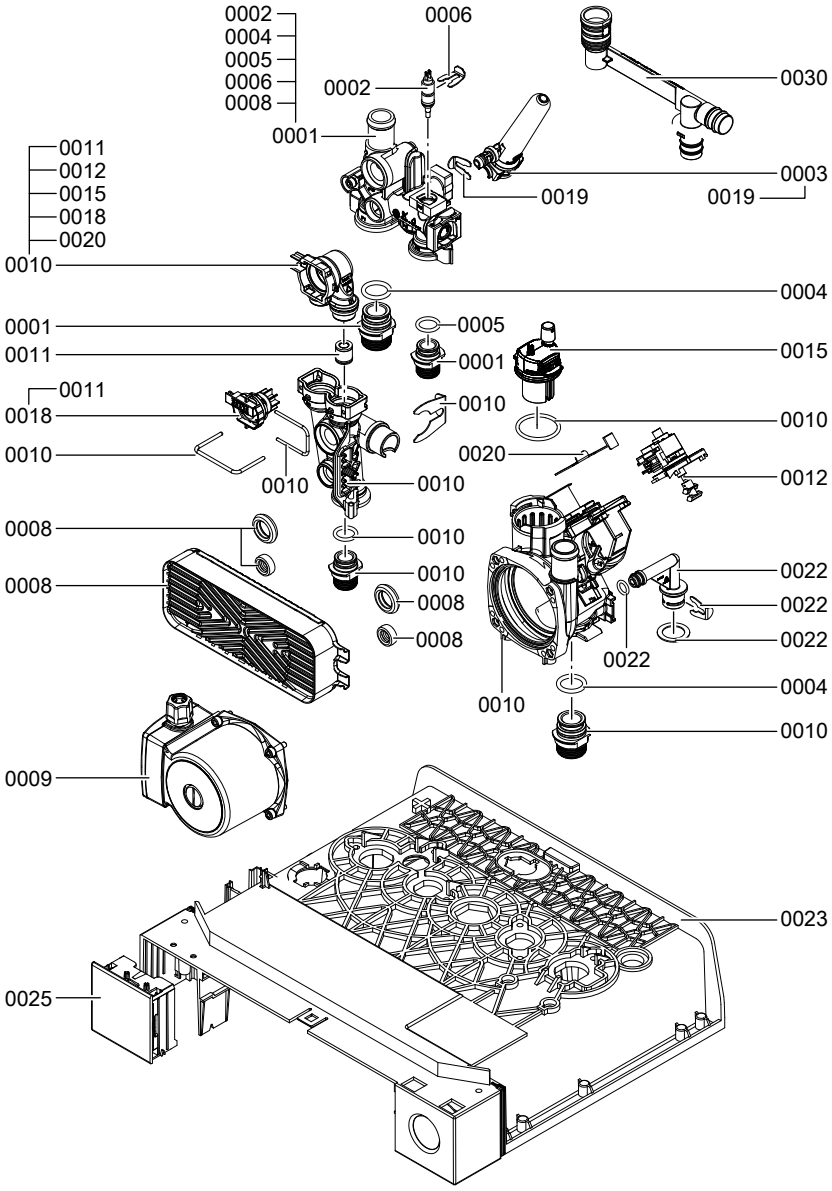
Grundfos hydraulic assembly (cont.)



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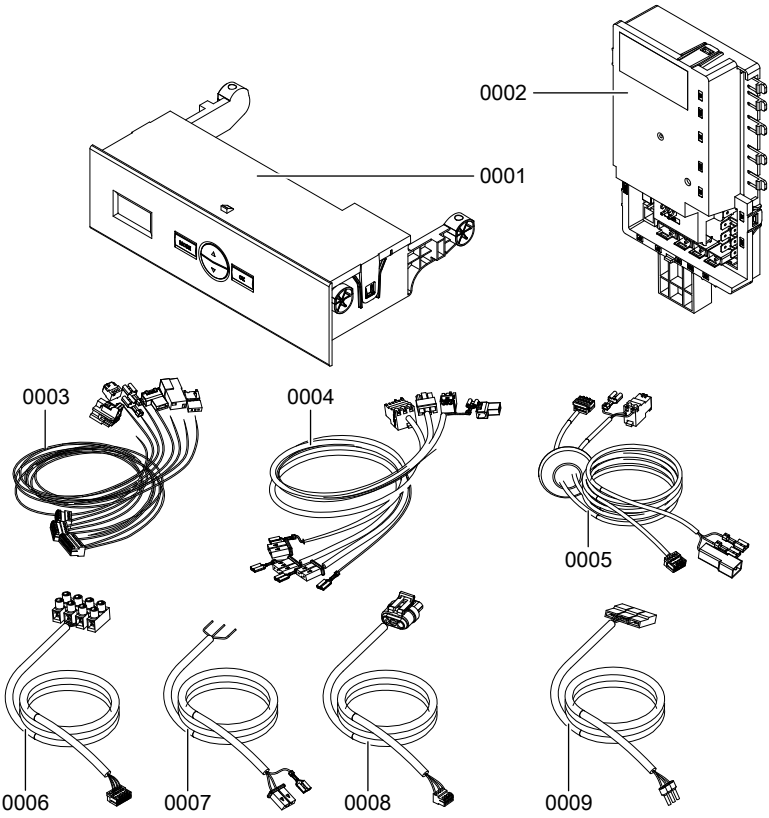
Control unit assembly

Pos.	Component	Serial no. (see type plate)	
		7537906	7537947
		Part no. of individual part	
0001	Programming unit	7841887	7841887
0002	Burner control unit	7841888	7841888
0003	Cable harness X1/X17/stepper motor	7841880	7841880
0004	Cable harness 100/35/54/ion	7841881	7841881
0005	Cable harness, connecting cable X21/GFA/ programming unit	7841882	7841882
0006	Outside temperature sensor lead	7841883	7841883
0007	Heating circuit pump connecting cable 20	7841884	7841884
0008	PWM BUS	7841885	7841885
0009	Power cable	7841886	7841886

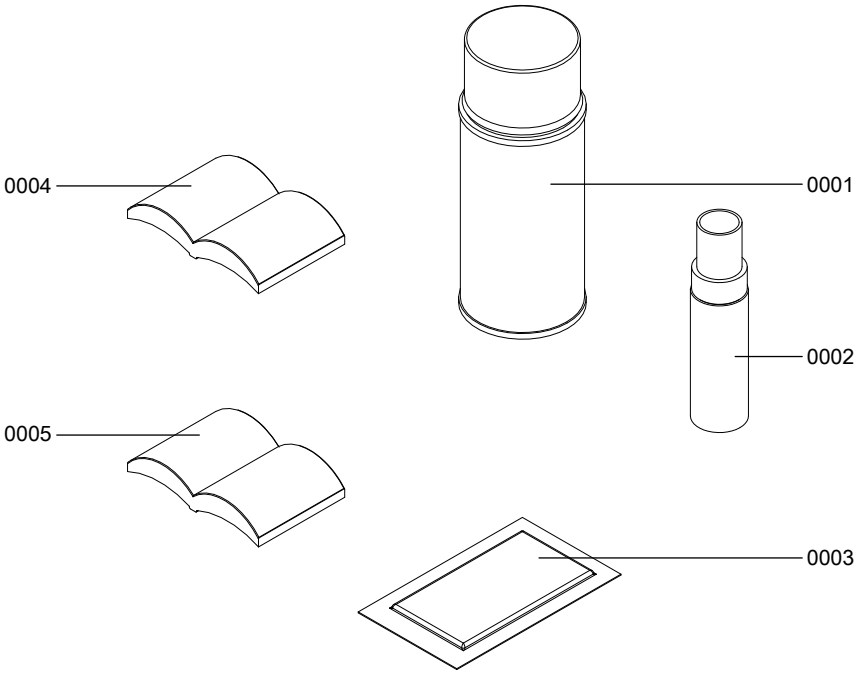
Control unit assembly (cont.)



Miscellaneous assembly

Pos.	Component	Serial no. (see type plate) 7537906	7537947
		Part no. of individual part	
0001	Touch-up spray paint, Vitowhite, 150 ml can	7822681	7822681
0002	Touch-up paint stick, Vitowhite	7822682	7822682
0003	Special grease	7819602	7819602
0004	Operating instructions	5848875	5848875
0005	Installation and service instructions	5583985	5583985

Miscellaneous assembly (cont.)



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Specification

Rated voltage:	230 V~	Temperature limiter setting:	100 °C (fixed)
Rated frequency:	50 Hz		
Rated current:	2.0 A~	Backup fuse (power supply):	3 A
Safety category:	I		
IP rating:	IP X4 to EN 60529		

Permissible ambient temperature
- During operation: -5 to +40 °C
- During storage and transport: -35 to +65 °C

Gas boiler, category II $_{2H3P}$

Rated heating output range in heating mode			
T_F/T_R 50/30 °C	**kW**	**6.5 – 24**	**8.8 – 33**
T_F/T_R 80/60 °C	**kW**	**5.9 – 21.9**	**8.0 – 30.1**
Rated heating output range for DHW heating	kW	5.9 – 29	8.0 – 35
Rated heat input range	kW	6.1 – 22.4	8.2 – 30.9
Supply values *1 relative to the max. CH load with:			
- Natural gas H	m^3/h	2.37	3.28
- LPG P	kg/h	1.71	2.36
Power consumption (max.)	W	97	97
DHW heating			
Permiss. operating pressure	bar	10	10
	MPa	1.0	1.0
Min. operating pressure, cold water	bar	1	1
	MPa	0.1	0.1
Rated water volume at ΔT 35 K (to EN 13203)	l/min	11.8	14.3
Set flow rate (max.)	l/min	12	14
Min. flow rate	l/min	2.5	2.5
Product ID		CE-0085CP0029	

*1 *The supply values are only for reference (e.g. in the gas contract application) or for a supplementary, rough estimate to check the volumetric settings. Due to the factory settings, the gas pressure must not be altered from these values. Reference: 15 °C, 1013 mbar (101.3 kPa).*

Declaration of conformity

Declaration of Conformity for the Vitodens 050-W

We, Viessmann Werke GmbH&Co KG, D-35107 Allendorf, confirm as sole responsible body that the product **Vitodens 050-W** complies with the following standards:

EN 297
EN 483
EN 625
EN 677
EN 806
EN 12 897
EN 55 014-1
EN 55 014-2
EN 60 335-1
EN 60 335-2-102
EN 61 000-3-2
EN 61 000-3-3
EN 62 223

In accordance with the following Directives, this product is designated **CE-0085**:

92/42/EEC
2004/108/EC
2006/95/EC
2009/142/EC

This product complies with the requirements of the Efficiency Directive (92/42/EEC) for **condensing boilers**.

Allendorf, 01 February 2014

Viessmann Werke GmbH&Co KG

Authorised signatory Manfred Sommer

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Keyword index

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Applicability

These service instructions apply for appliances with the following serial numbers (see type plate):
7537906 7537947

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5513 085 GB Subject to technical modifications.