Installation and service instructions

for contractors

Vitodens 111-W
Type B1LA, 6.5 to 35.0 kW
Gas condensing storage combi boiler
Natural gas and LPG version
Gas Council no.: 47-819-23; 47-819-24; 47-819-25

For applicability, see the last page

VITODENS 111-W

5618 648 GB 3/2012

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 designed for qualified personnel.
- Work on gas equipment must only be carried out by a qualified 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
- all legal instructions regarding the prevention of accidents,
- all legal instructions 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 Regulation either the Building regulations, the Building Regulation (Scotland), Building Regulations (Northern Ireland),
  - the Water Fittings Regulation or Water 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.
- Never smoke. Prevent naked flames and sparks. Never switch lights or electrical appliances ON or OFF.
- Close the gas shut-off valve.
- Open windows and doors.
- Remove all people from the danger zone.
- Notify your gas or electricity supplier 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 boiler room.
- Close all doors leading to the living space.

Working on the system

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

Please note
Electronic modules can be damaged by electro-static discharges.
Touch earthed objects, such as heating or water pipes, to discharge static loads.

Repair work

Please note
Repairing components which fulfil a safety function can compromise the safe operation of your heating system.
Replace faulty components only with original Viessmann spare parts.

Ancillary components, spare and wearing parts

Please note
Spare and wearing parts which have not been tested together with the heating system can compromise its function. Installing non-authorised components and non-approved modifications/conversion can compromise safety and may invalidate our warranty. For replacements, use only original spare parts from Viessmann or those which are approved by Viessmann.

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Product information

Vitodens 111-W, type B1LA

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

Conversion for other countries

The Vitodens 111-W should generally only be supplied to countries listed on the type plate. For deliveries to alternative countries, an approved contractor must arrange individual approval on his own initiative and in accordance with the law of the country in question.

Product description

The Vitodens 111-W is equipped with a cylinder and an integral plate heat exchanger as primary store system for DHW heating. For the connection of heating circuits and the DHW line, see from page 11.
In the delivered condition, the Vitodens 111-W is set up for operation with constant boiler water temperature. By connecting an outside temperature sensor (accessory), the boiler can be operated in weather-compensated mode.

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
- Safety valve
- Heating water expansion vessel and DHW expansion vessel
- Cylinder and plate heat exchanger for DHW heating

Accessory connection

Outside temperature sensor and time switch are connected with low voltage to the control unit.

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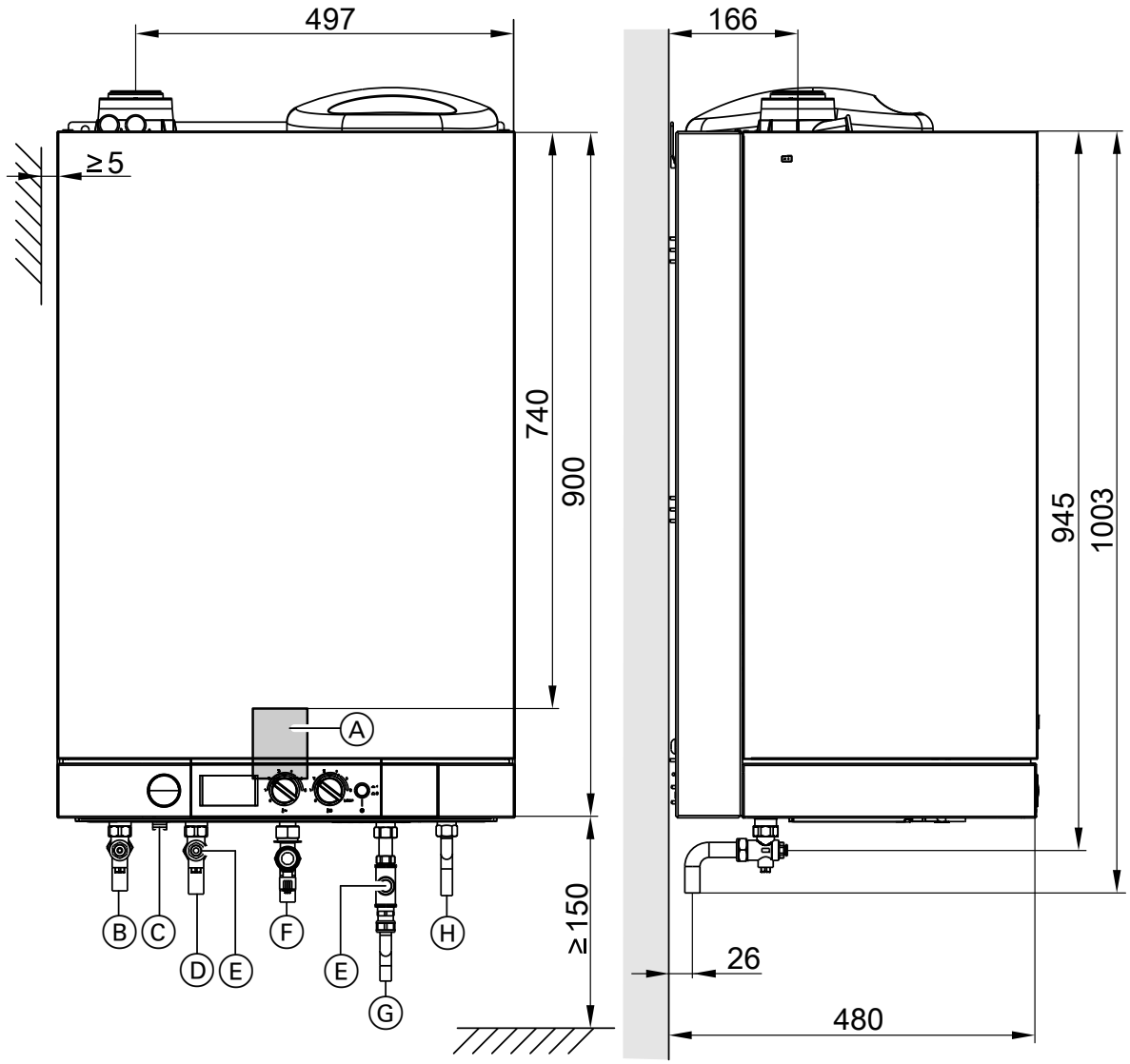
Preparing for the boiler installation

Dimensions and connections



Ⓐ Area for electrical connections
Ⓑ Heating flow ∅ 22 mm
Ⓒ Condensate drain
Ⓓ Heating return ∅ 22 mm
Ⓔ Filling loop
Ⓕ Gas connection ∅ 22 mm
Ⓖ Cold water ∅ 15 mm
Ⓗ DHW ∅ 15 mm

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Preparing for the boiler installation (cont.)

Preparing the connections

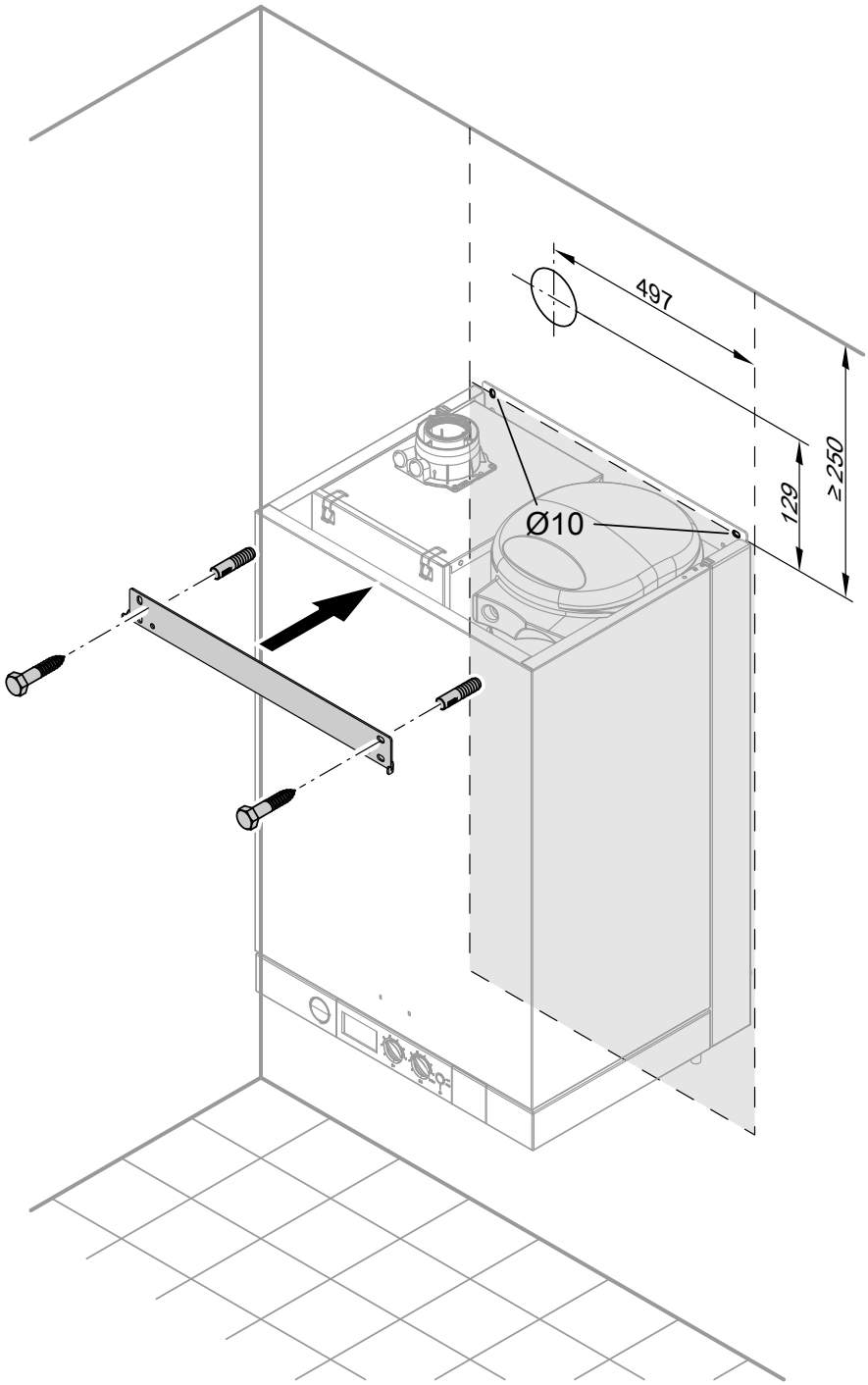
Note
This boiler (IP rating: IP X4 D) is approved for installation in wet rooms inside safety zone 1 in accordance with IEEE Wiring Regulations, providing the occurrence of hosed water can be ruled out.
Observe the IEEE Wiring Regulations.

1. Prepare the water connections. Flush the heating system.

2. Prepare the gas connection.

3. Prepare the electrical connections.
   - In the delivered condition, the power cable with mains plug is connected inside the control unit.
   - Accessory cables:
     NYM-O two-core min. 0.5 mm^2.

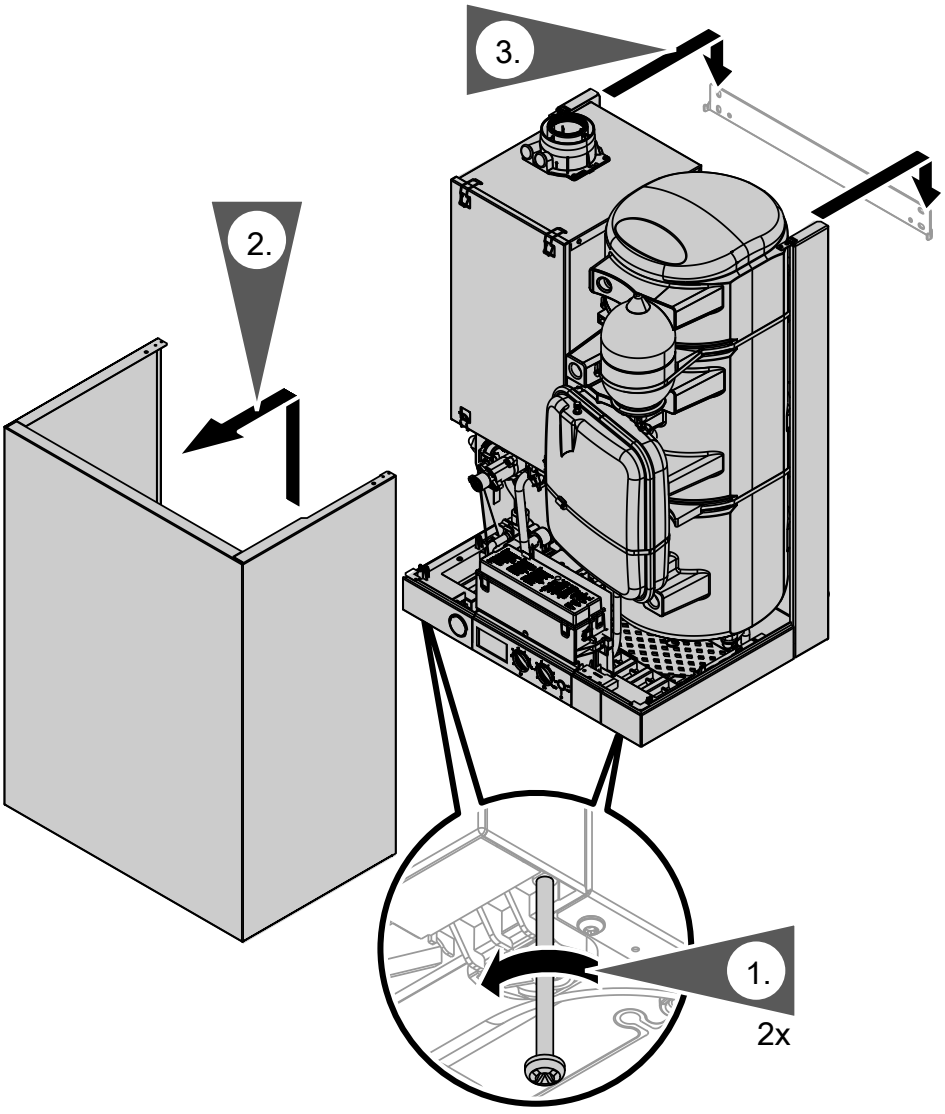
Fitting the wall mounting bracket



Fitting the boiler and making connections

Removing the front panel and mounting the boiler

Note
When mounting on the wall, observe the following: Weight excl. packaging: approx. 65 kg.



1. Undo screws at the bottom of the boiler; do not remove completely.
2. Remove front panel.
3. Hook the boiler into the wall mounting bracket.

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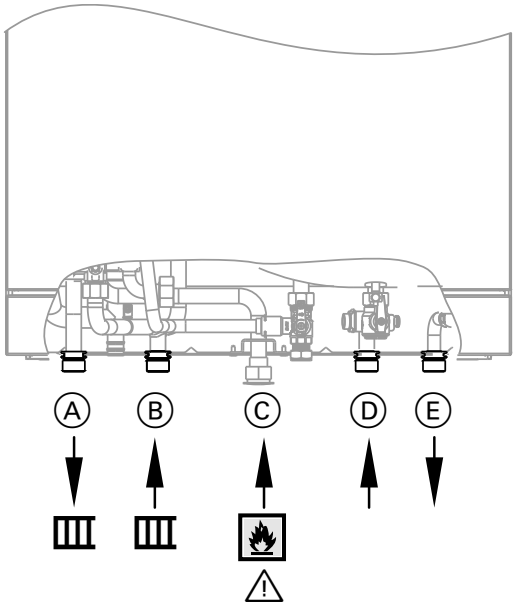
Fitting the boiler and making connections (cont.)

Making the connections on the water side

For fittings on the heating water side and DHW side, see separate installation instructions.

Please note
To prevent equipment damage, install all pipework free of load and torque stresses.



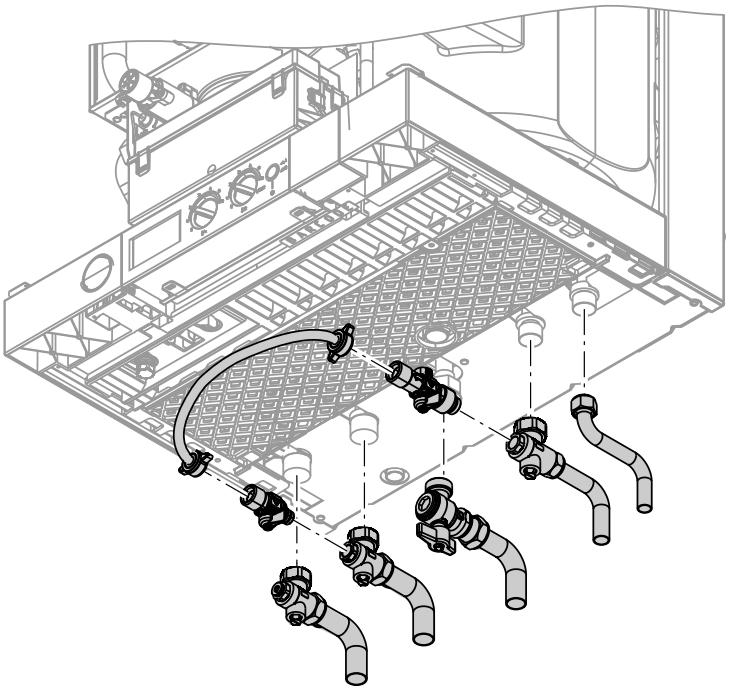
Ⓐ Heating flow
Ⓑ Heating return
Ⓒ Gas connection
Ⓓ Cold water
Ⓔ DHW

DHW connection

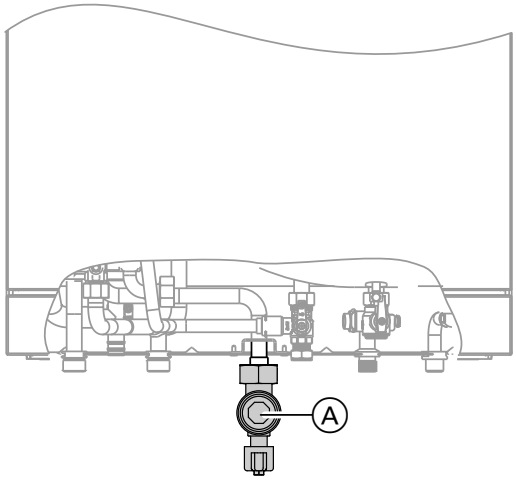
Permiss. operating pressure, cylinder: 10 bar.
A safety valve and pressure reducer manifold is provided as standard and has to be fitted into the cold water supply.
The blow off pipe of the safety valve can be routed into the household drain pipe.
No flow limiter is fitted into the cold water supply.

Fitting the boiler and making connections (cont.)

Fitting the connection set



Gas connection



1. Connect gas shut-off valve to connection Ⓐ.

Fitting the boiler and making connections (cont.)

2. Carry out a tightness test.

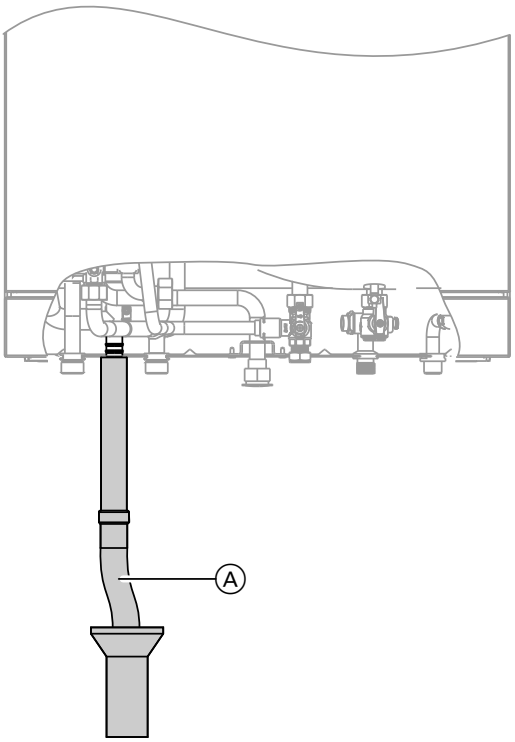
   Note
   For tightness tests, use only approved leak detection agents (EN 14291) and devices. Leak detection agents with unsuitable constituents (e.g. nitrites, sulphides) can cause material damage.
   Remove residues of the leak detection agent after testing.

   ! **Please note**
   Excessive test pressure may damage the boiler and the gas valve.
   Max. test pressure 150 mbar.
   Where higher pressure is required for tightness tests, disconnect the boiler and the gas valves from the gas supply pipe (undo the fitting).

3. Vent the gas line.

Fitting the boiler and making connections (cont.)

Condensate drain connection



- The condensate pipe is connected to the safety valve discharge pipe. The condensate hose supplied meets the temperature requirements that are part of the CE certification.
- We recommend the internal connection of the condensate pipe to the domestic drain, either directly or via a tundish.

Filling the siphon with water

Please note
At commissioning, flue gas may be emitted from the condensate drain.
Fill the siphon with water before commissioning.

- 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 outdoor pipework.

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

- Observe local building regulations.

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

Note
Fill the siphon with water before commissioning.

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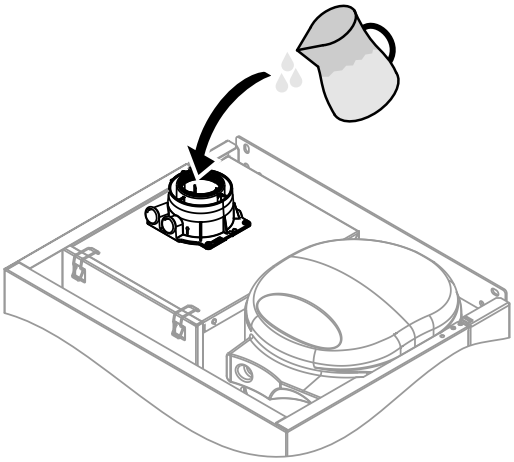
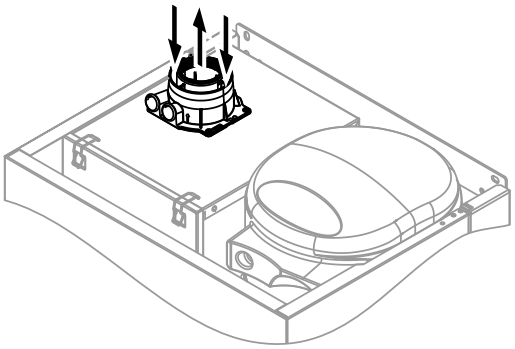
Fitting the boiler and making connections (cont.)



Fill the flue outlet with at least 0.3 l of water.

Please note
Water in the ventilation air supply can be detrimental to the combustion quality.
Never pour water into the external vent.

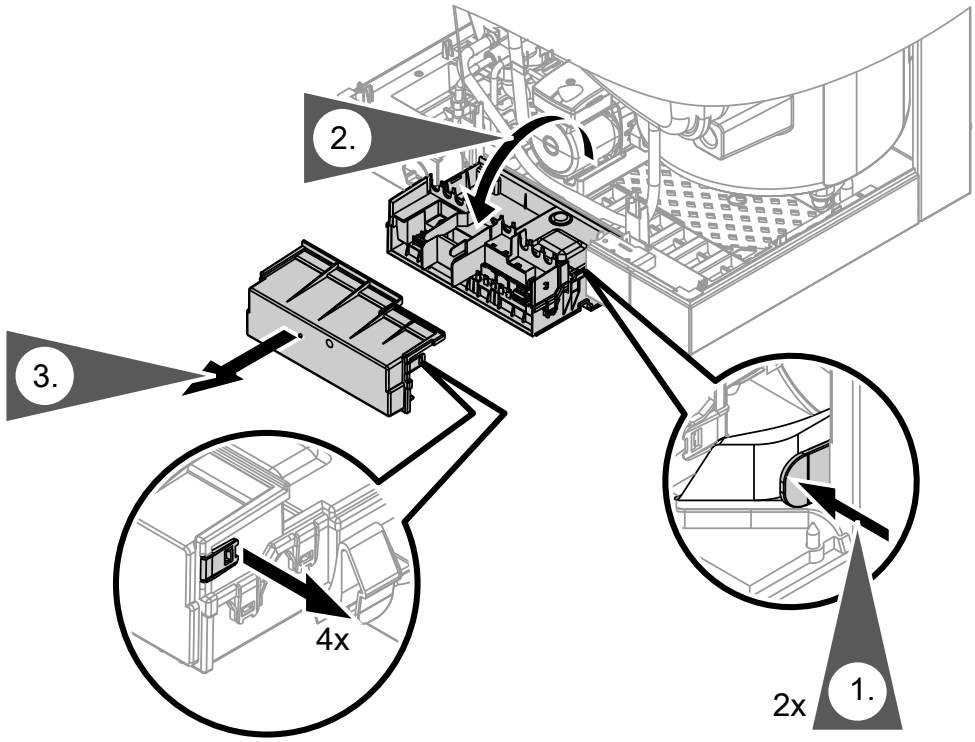
Balanced flue connection



Connect the balanced flue.
During installation and positioning of the flue system, observe building regulations part L and BS 5440.

Flue system installation instructions.

Opening the control unit enclosure

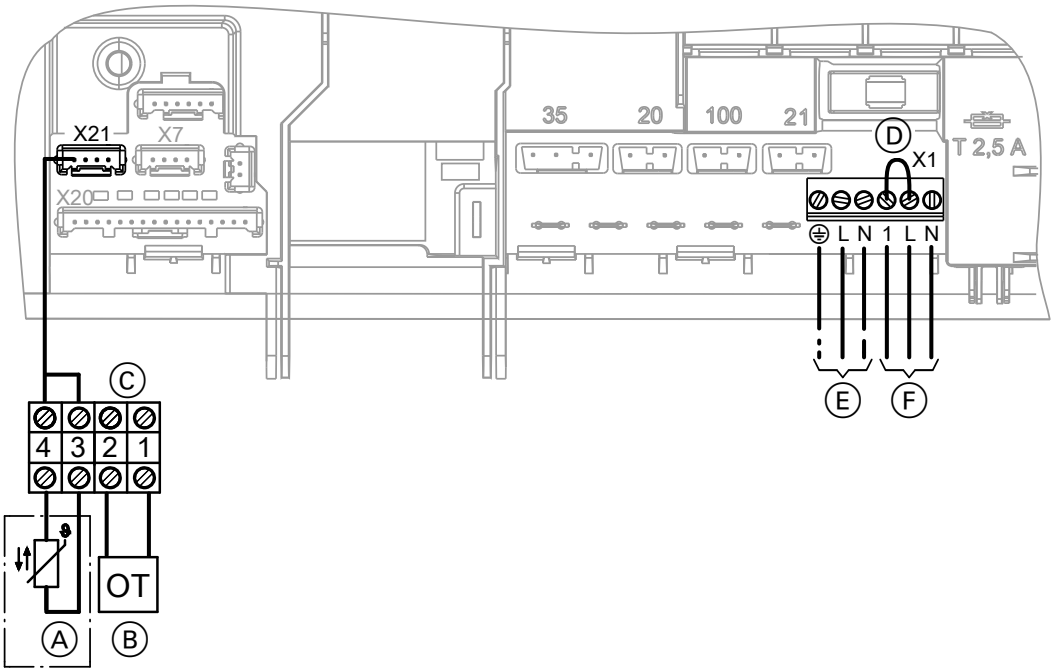


Please note
Electronic assemblies can be damaged by electrostatic discharge.
Before beginning work, touch earthed objects, such as heating or water pipes, to discharge static loads.

Electrical connections

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

Electrical connections (cont.)



Ⓐ Only for weather-compensated mode:
Outside temperature sensor (accessory)

Ⓑ OpenTherm device
Remove jumper Ⓓ when making this connection.

Ⓒ Connecting cable (accessory)

Ⓓ Jumper

Ⓔ Power supply (230 V, 50 Hz).
See page 18.

Ⓕ Vitotrol 100 or on-site room temperature controller (switched 230 V input)
Remove jumper Ⓓ when making this connection.

Separate installation instructions

Accessory connection

Accessory installation instructions

When connecting a Vitotrol 100 or an OpenTherm remote control, remove the jumper across L and 1.

Outside temperature sensor (accessory)

1. Fit outside temperature sensor.

Electrical connections (cont.)

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 ventilation outlets
- Not immediately below balconies or gutters
- Never render over
- Connection:
  Two-core lead, length max. 35 m with a cross-section of 1.5 mm^2

2. Plug the power cable supplied with the outside temperature sensor into slot "X21".

3. Connect the outside temperature sensor to terminals 3 and 4 (see page 17).

Power supply

Regulations and directives

Danger
Incorrect 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
- IEEE Wiring Regulations
- Connection requirements specified by your local power supply utility

Install an isolator in the power supply line that simultaneously isolates all non-earthed conductors from the mains with at least 3 mm contact separation.

We additionally recommend installing an AC/DC-sensitive RCD (RCD class B ⏦ ⎓) for DC (fault) currents that can occur with energy efficient equipment. 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
The absence of component earthing in the system can lead to serious injury from electrical current if an electrical fault occurs.
Connect the appliance and pipework to the equipotential bonding of the building in question.

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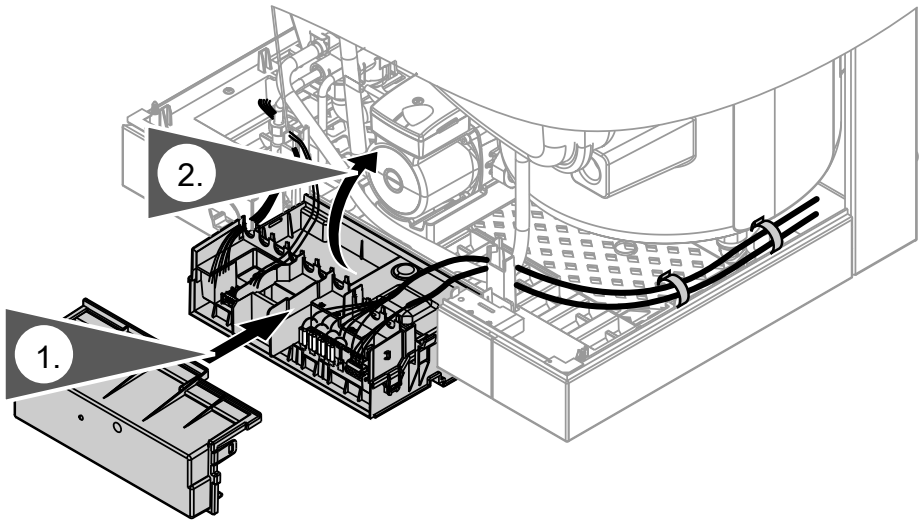
Electrical connections (cont.)

Routing connecting cables and closing the control unit enclosure

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 temperatures for these cables/leads are not exceeded.



Steps - commissioning, inspection and maintenance

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

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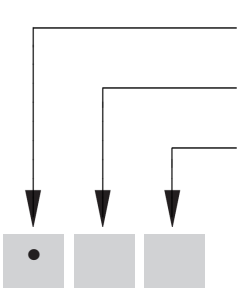
Steps - commissioning, inspection and… (cont.)



Commissioning steps

Inspection steps

Maintenance steps

Page

Service

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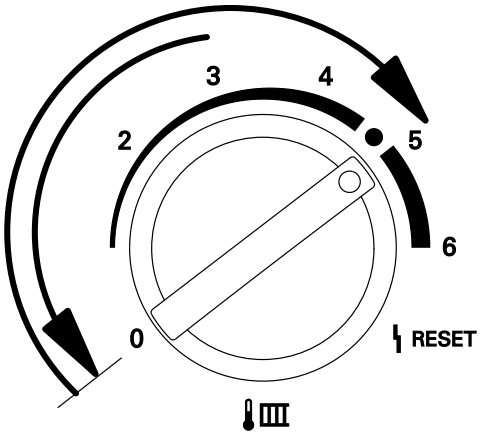
Further details regarding the individual steps

Filling the heating system

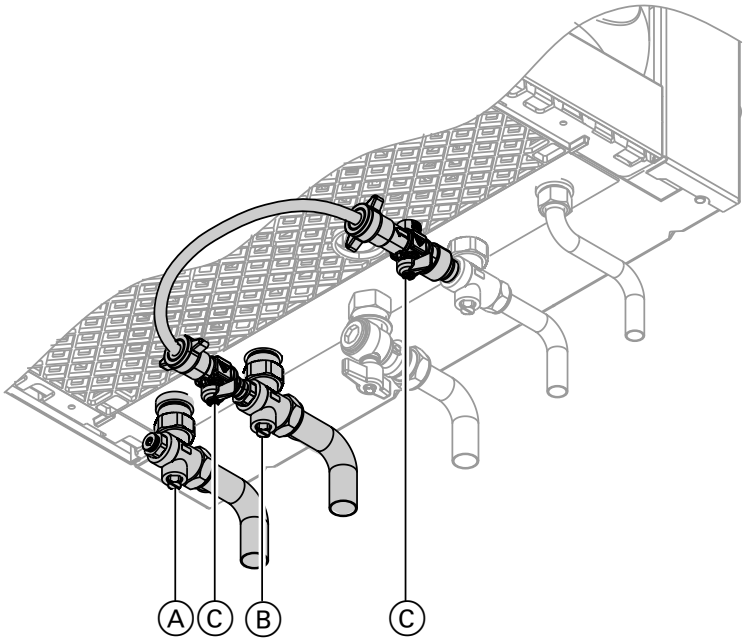
Please note
Unsuitable fill water increases the level of deposits and corrosion and may lead to boiler damage.

- Thoroughly flush the entire heating system prior to filling it with water.
- Only fill with water of potable quality.
- Soften fill water harder than 300 ppm.
- An antifreeze additive suitable for heating systems can be added to the fill water.



1. Close the gas shut-off valve.
2. Switch ON power and wait until the display shows the boiler water temperature.
3. Turn rotary selector "🔥" fully anti-clockwise, until the display shows **"SERV"**.
   Within 2 s return the rotary selector to the r.h. control range.
   The display shows **"🔥"** and "🚿".
   Filling is active.
   This function will end automatically after 20 min or after the ON/OFF switch has been turned off.

Further details regarding the individual steps (cont.)



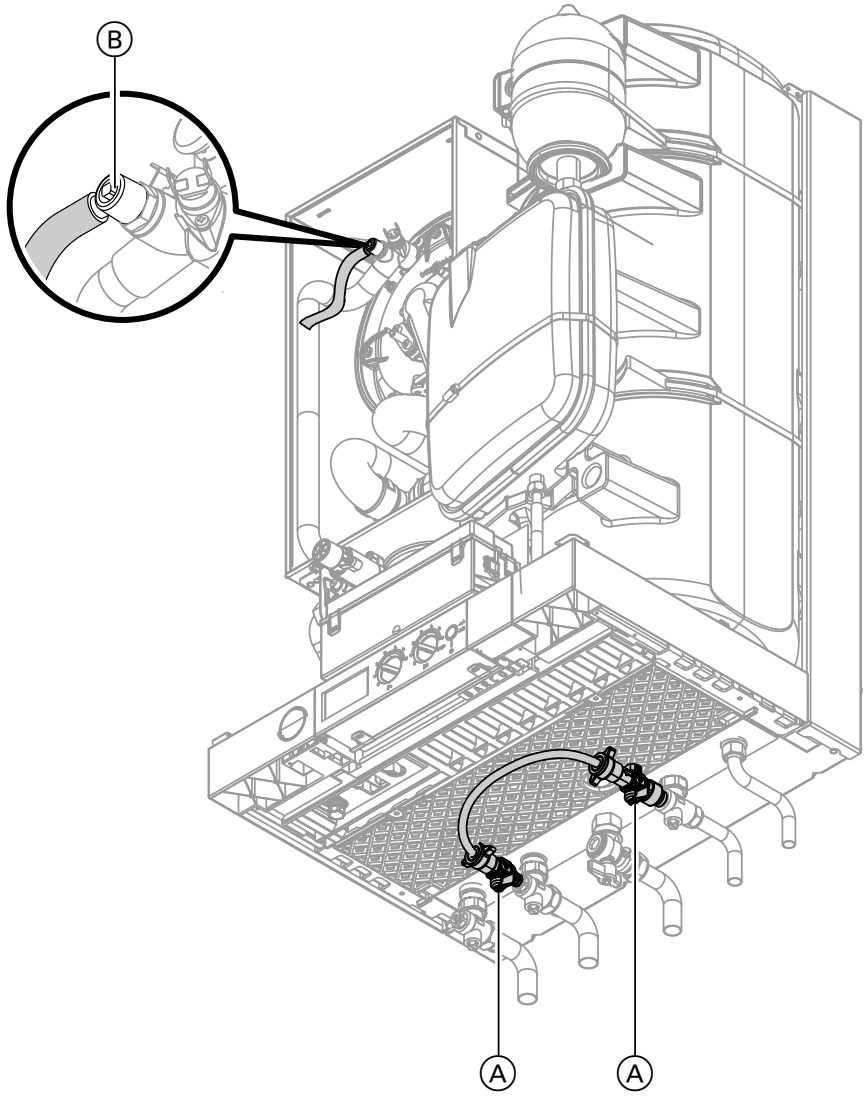
4. Open shut-off valves Ⓐ and Ⓑ.

5. Open taps Ⓒ and fill the heating system. (Minimum system pressure > 0.8 bar).

6. Close taps Ⓒ.

Further details regarding the individual steps (cont.)

Venting the boiler by flushing



1. Close the shut-off valves on the heating water side.
2. Connect the drain hose between top tap Ⓑ and a drain.
3. Open taps Ⓐ and Ⓑ and vent at mains pressure, until no sound of escaping air can be heard.
4. Close taps Ⓐ and Ⓑ, open the shut-off valves on the heating water side.
5. Remove the line between taps Ⓐ and keep safe. This will be required for topping up.

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Further details regarding the individual steps (cont.)

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 convert the gas type in the control unit.

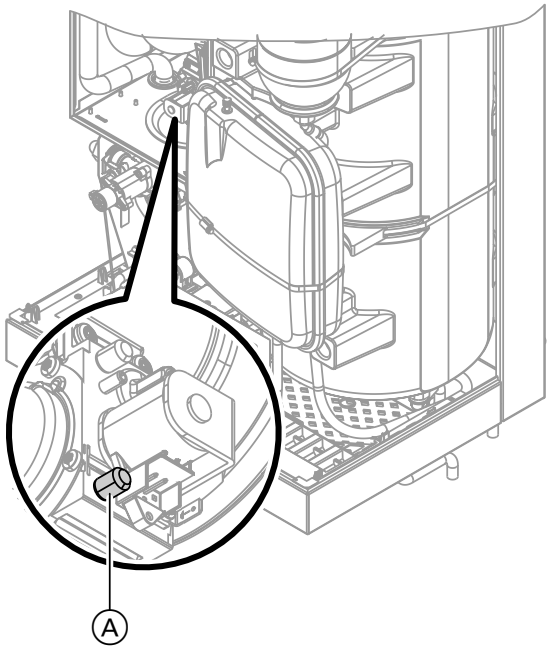
Separate installation instructions.

Changing from LPG to natural gas - see page 56.

Checking the static and supply pressure

Danger
CO build-up 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
Flush the LPG tank twice during commissioning or replacement. Purge the tank and gas supply line thoroughly after flushing.



1. Close the gas shut-off valve.
2. Release screw inside test nipple Ⓐ on the gas train, but do not remove it; then connect the pressure gauge.
3. Open the gas shut-off valve.
4. Check the static pressure.
   Set value: max. 57.5 mbar
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.*

6. Check the supply (flow) pressure.

   Set value:
   - Natural gas: 20 mbar
   - LPG: 37 mbar

   Note
   Use a suitable measuring device with a resolution of at least 0.1 mbar to measure the supply pressure.

7. Take the action shown in the following table.

Further details regarding the individual steps (cont.)

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

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

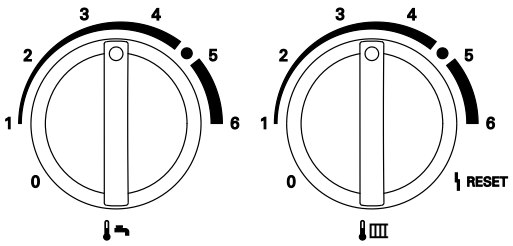
Danger
Gas escaping from the test nipple leads to a risk of explosion.
Check gas tightness at test nipple Ⓐ.

Note
The maximum pressure drop between the gas shut-off valve and test nipple Ⓐ at the gas train is 0.5 mbar.

Supply pressure (flow pressure)		Action
For natural gas	**For LPG**	
below 17.4 mbar	below 25 mbar	Do not start the boiler. Notify your gas supply utility or LPG supplier.
17.4 to 25 mbar	25 to 47 mbar	Start the boiler.
above 25 mbar	above 47 mbar	Install a separate gas pressure governor upstream of the system and regulate the pre-charge pressure to 20 mbar for natural gas or 37 mbar for LPG. Notify your gas supply utility or LPG supplier.

Matching the burner output to the flue system

To match the burner output to the system's flue pipe length, a correction factor can be set.



1. Turn on the ON/OFF switch.

2. Turn both rotary selectors "🌡🚿" and "🌡▥" simultaneously into their respective central positions.
"SERV" appears on the display.

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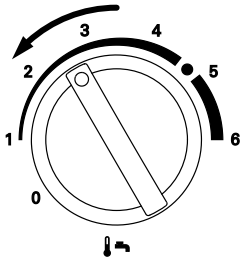
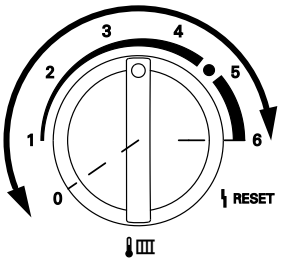
Further details regarding the individual steps (cont.)





3. Refer to the following table for the correction factor required for the connected flue system.

4. Within 2 s, turn rotary selector "🌡🚿" to the top left range.
The display then shows "🌡", "🚿", "👁" and the selected correction factor begins to flash.
In the delivered condition, factor 0 has been set.

5. Within 15 s, set rotary selector "🌡" to the required correction factor.

6. The set correction factor is saved when the value stops flashing, and the control unit returns to standard mode.

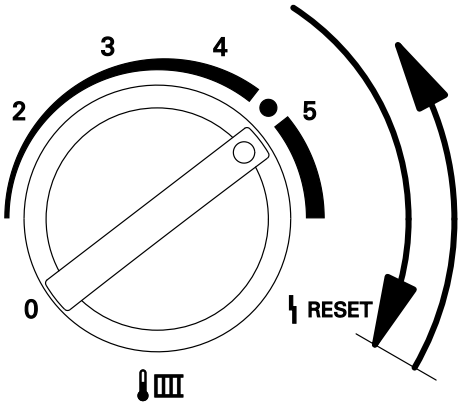
Correction factor		**1**	**2**	**3**	**4**	**5**	**6**
Flue system	**Rated heating output (kW)**	**Max. run length (m)**					
Open flue operation ∅ 60 mm	26	2	8	13.5	18.5	22	25
	35	5	12	18	23	—	—
Balanced flue operation ∅ 60/100 mm **coaxial**	26	1	4	7	10	12	13.5
	35	3	6	9	12	14	17

Observe max. flue pipe lengths in the pricelist. If the max. flue pipe lengths in the pricelist are exceeded, calculated performance verification is required.

Reducing the max. heating output

The max. heating output can be reduced according to the system requirements.

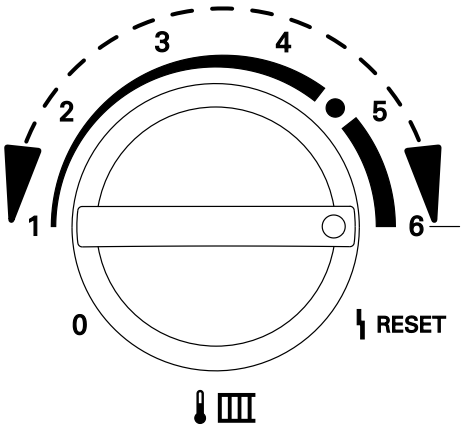
Further details regarding the individual steps (cont.)



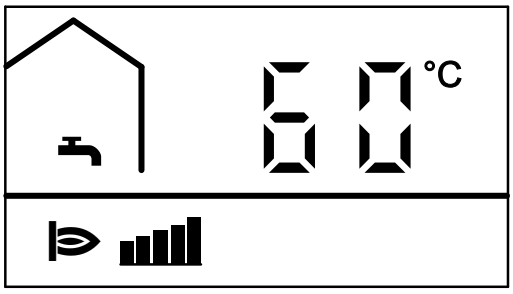
1. Turn on the ON/OFF switch.

Note
The heating output can only be changed with the burner in operation.

2. Turn rotary selector "🌡" fully clockwise, until the display shows **"SERV"**.
Within 2 s return the rotary selector to the r.h. control range. The display shows "🔥".



3. Select the required max. heating output with rotary selector "🌡".
Bars for the selected heating output flash on the display.



- Position 1 (1 bar) = lower heating output.
- Position 6 (5 bars) = upper heating output.

4. Test selected heating output by measuring the gas throughput.

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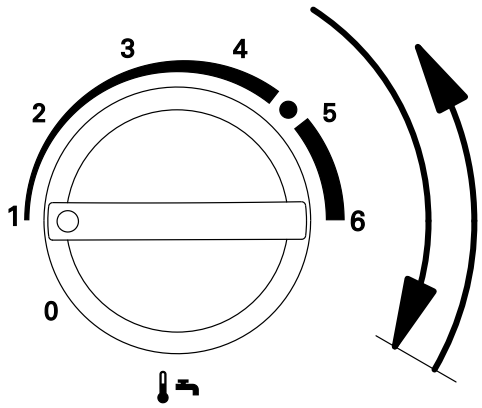
Further details regarding the individual steps (cont.)

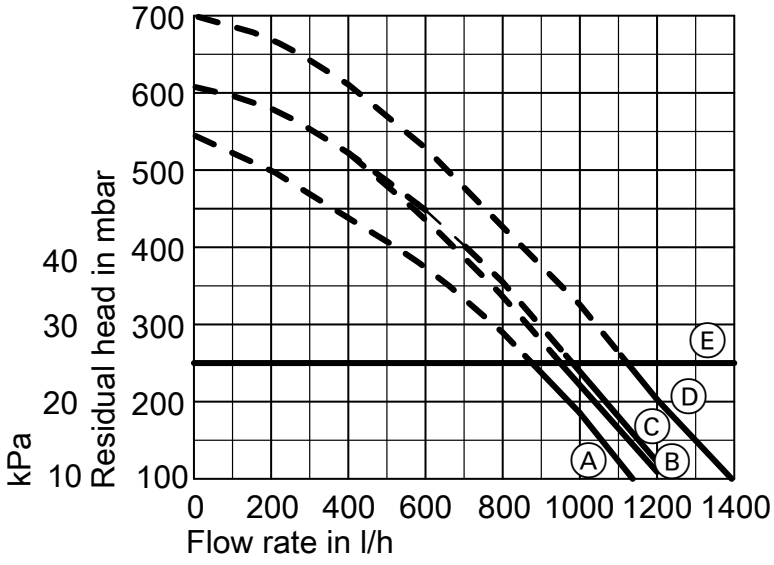


5. Transfer selected heating output:
   Turn rotary selector "🌡🚰" for less than 2 s fully clockwise and then back into the r.h. control range.
   During the transfer, **"– . – . –"** will be displayed.

6. Shut down the boiler.

Adjusting the circulation pump to the heating system

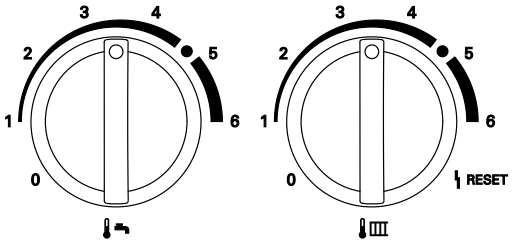
Only for gas condensing combi boilers:
In the delivered condition, the circulation pump in heating mode is set to stage 1.
If necessary to suit the heating system, the circulation pump can be changed over to stage 2.



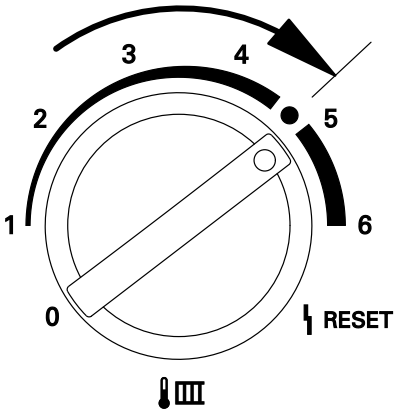
Ⓐ 26 kW, pump stage 1
Ⓑ 35 kW, pump stage 1
Ⓒ 26 kW, pump stage 2
Ⓓ 35 kW, pump stage 2
Ⓔ Upper operational limit

1. Turn on the ON/OFF switch.

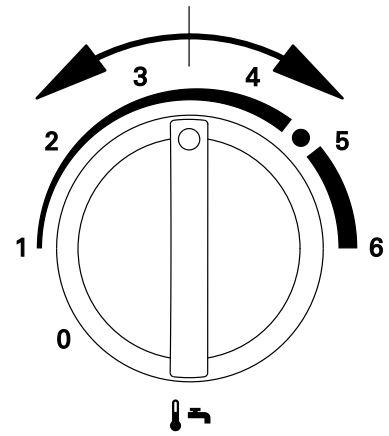
Further details regarding the individual steps (cont.)



2. Turn both rotary selectors "🌡🚰" and "🌡▥" simultaneously into their respective central positions.
"SERV" appears on the display.



3. Within 2 s, turn rotary selector "🌡▥" to the top right range.
"▥" is displayed and the set value flashes.



4. Adjust the control unit to stage 1 or 2 by turning rotary selector "🌡🚰".
The display shows:
   - **"1"** for operation with stage 1
   or
   - **"2"** for operation with stage 2.

5. The set operating mode is saved when the value stops flashing, and the control unit returns to standard mode.

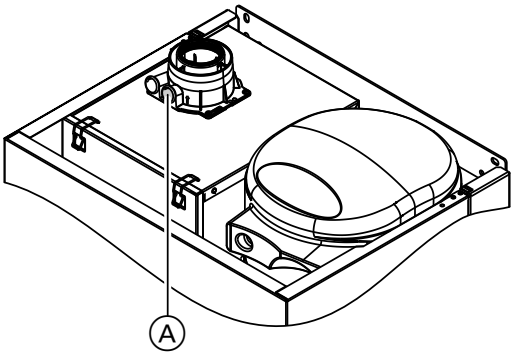
Further details regarding the individual steps (cont.)

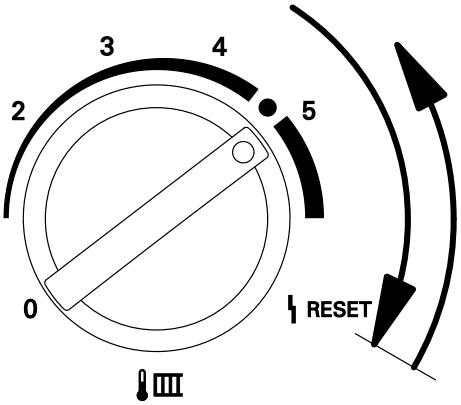
Checking the CO_2 content

The Vitodens 111-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 point to check the flue integrity. Subject to the Wobbe index, the CO_2 content fluctuates between 7.4 % and 10.5 %. CO of up to 500 ppm during start-up is acceptable.
We recommend measuring O_2 as the value is unmistakable regarding lambda (air/gas). The O_2 content fluctuates between 7.5 % and 3.2 %. The CO/CO_2 ratio has to be less than 0.004.

If the actual CO_2 or O_2 and CO values deviate from the stated range, check the balanced flue systems for leaks. If flue installation is OK, change the gas valve.

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





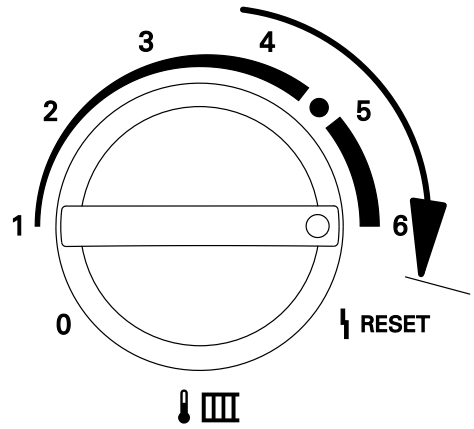
1. Connect a flue gas analyser to flue gas port Ⓐ on the boiler flue connection.

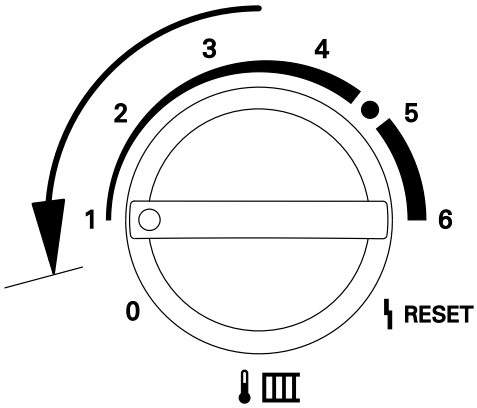
2. Start the boiler and check for leaks.

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

3. Turn rotary selector "🌡" fully clockwise, until the display shows **"SERV"**.
   Within 2 s return the rotary selector to the r.h. control range. The display shows "⚙".

Further details regarding the individual steps (cont.)





4. Adjust the upper heating output: Turn rotary selector "🌡" fully clockwise, until the display shows 5 bars for the upper heating output.

5. Check the CO_2 content for the upper heating output.
   The CO_2 content must be between 7.0 and 10.5 %.

6. Adjust the lower heating output: Turn rotary selector "🌡" fully anti-clockwise, until the display shows 1 bar for the lower heating output.

7. Check the CO_2 content for lower heating output.
   The CO_2 content must be between 0.3 and 0.9 % below the value for the upper heating output.

8. ■ If the CO_2 content is within the given range, continue with point 10.
   ■ If the CO_2 content is **outside** the given range, check the balanced flue system for tightness; remove any leaks.
   Replace gas train if required.

9. Test the CO_2 content for upper and lower heating output again.

10. Shut the boiler down, remove flue gas analyser and close flue gas port Ⓐ.

11. Turn both rotary selectors "🌡🚿" and "🌡" simultaneously into their original positions.

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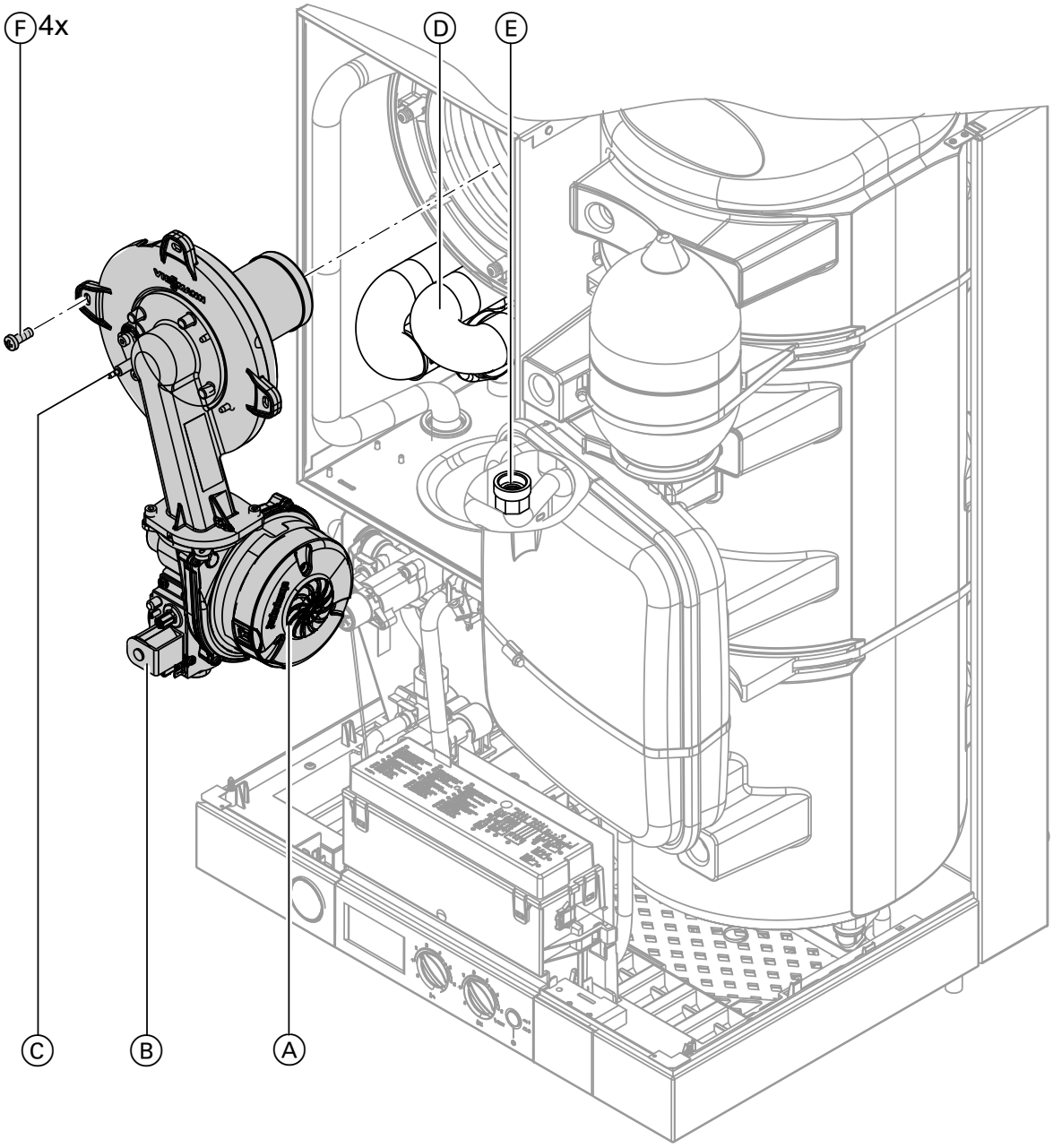
Further details regarding the individual steps (cont.)

Burner removal



1. Switch the power OFF.
2. Shut off the gas supply.
3. Pull electrical cables from fan motor Ⓐ, gas valve Ⓑ and electrodes Ⓒ.
4. Push U-bend Ⓓ down.
5. Undo gas supply pipe fitting Ⓔ.

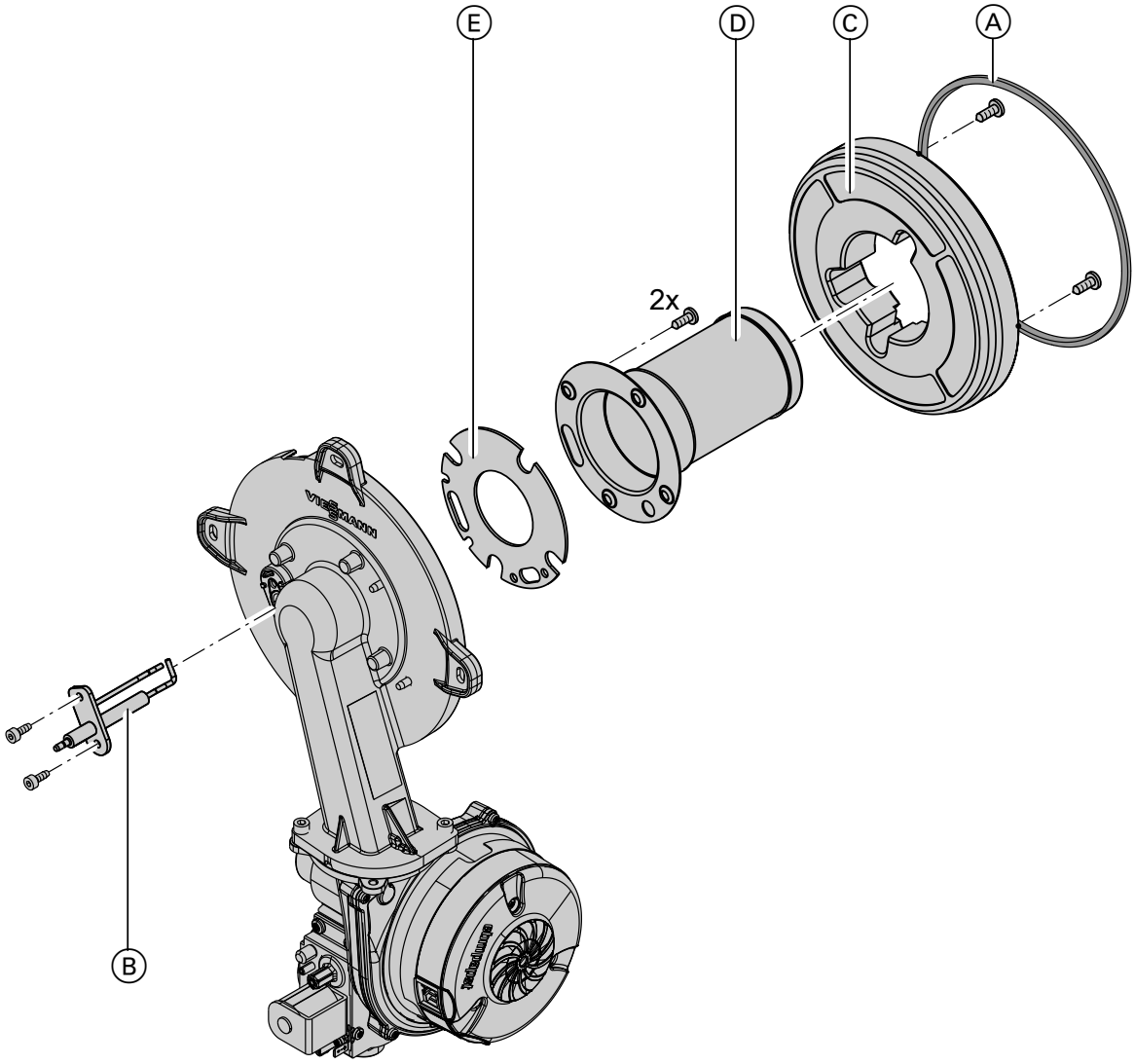
Further details regarding the individual steps (cont.)

6. Undo four screws Ⓕ and remove the burner.

Please note
To prevent any damage, never rest the burner on the burner gauze assembly.

Checking the burner gasket and burner gauze assembly

Check burner gasket Ⓐ and burner gauze assembly Ⓓ for possible damage and replace if required.



1. Remove electrode Ⓑ.
2. Undo two Torx screws and remove thermal insulation ring Ⓒ.

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Further details regarding the individual steps (cont.)

3. Undo two Torx screws and remove burner gauze assembly Ⓓ with its gasket Ⓔ.

4. Insert a new gasket Ⓔ into the new burner gauze assembly Ⓓ and secure.

   Please note
   Tighten screws far enough that the components are not damaged and to ensure their correct function.

5. Mount thermal insulation ring Ⓒ.

   Please note
   Tighten screws far enough that the components are not damaged and to ensure their correct function.

6. Fit electrode Ⓑ.

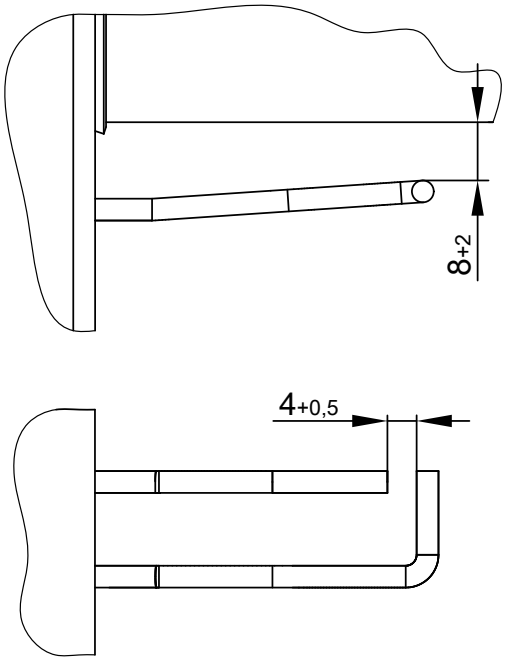
   Please note
   Tighten screws far enough that the components are not damaged and to ensure their correct function.

Checking and adjusting the electrode

1. Check the electrode for wear and contamination.

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

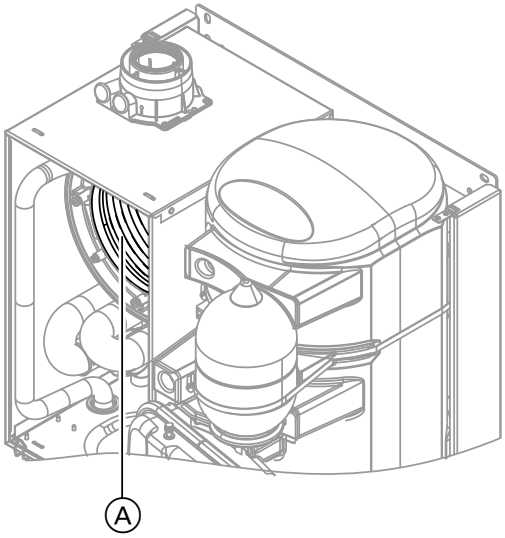
Further details regarding the individual steps (cont.)



3. Check the electrode gaps. If the gaps are not as specified or the electrode is damaged, replace and align the electrode together with a new gasket.

Please note
Tighten screws far enough that the components are not damaged and to ensure their correct function.

Cleaning the heat exchanger



1. **Please note**
Scratches on parts that are in contact with flue gas can lead to corrosion.
Never use brushes to clean the heat exchanger.

Use a vacuum cleaner to remove residues from heat exchanger Ⓐ inside the combustion chamber.

2. If required, spray slightly acidic, chloride-free cleaning agents based on phosphoric acid onto heat exchanger Ⓐ and let the solution soak in for at least 20 min.

3. Thoroughly flush heat exchanger Ⓐ with water.

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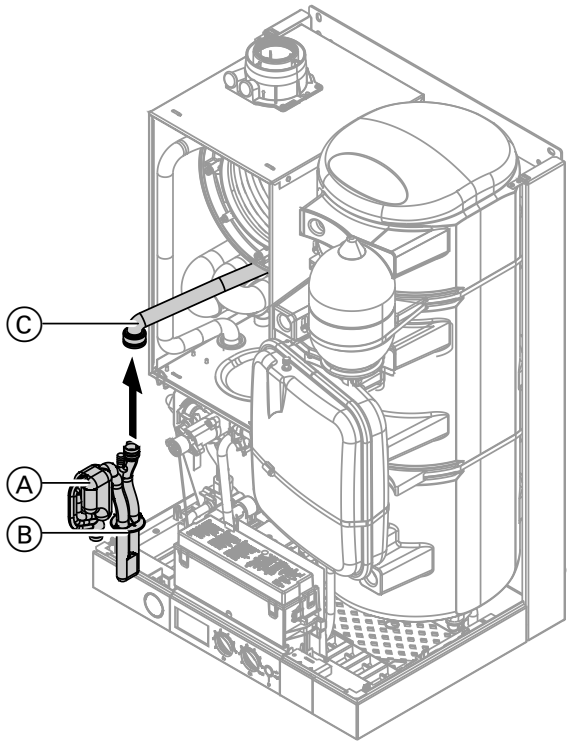
Further details regarding the individual steps (cont.)

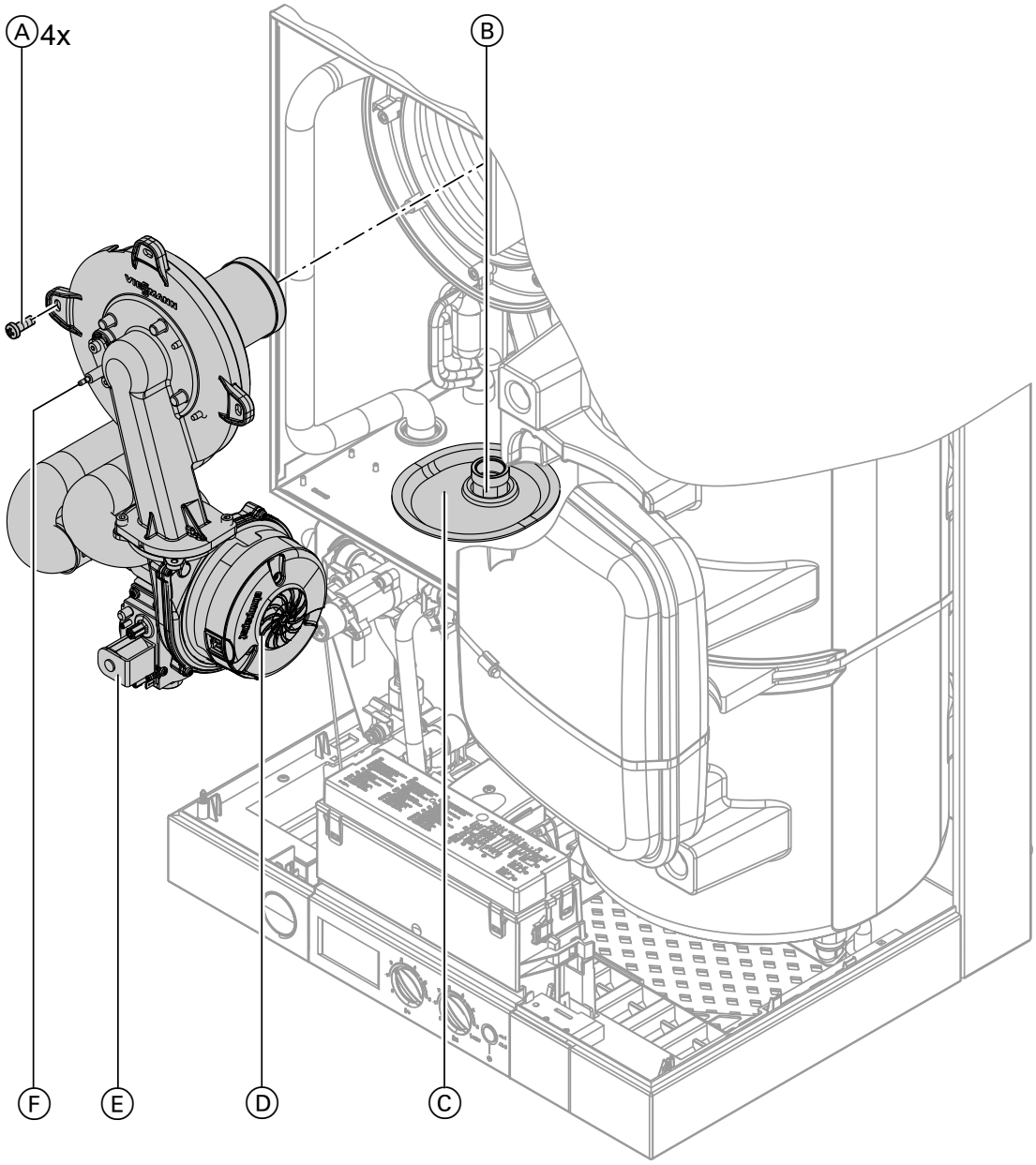
Checking the condensate drain and cleaning the siphon



1. Release hook and remove siphon Ⓐ with sealing piece Ⓑ.
   Pull siphon Ⓐ upwards away from the drain connection.
2. Remove supply hose Ⓒ from siphon Ⓐ.
3. Clean siphon Ⓐ.
4. Insert siphon Ⓐ with sealing piece Ⓑ.
   Refit siphon Ⓒ to the drain connection.
5. Refit supply hose Ⓒ.
6. Fill siphon Ⓐ 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.)

Burner installation



1. Mount burner and secure with four screws Ⓐ.
2. Insert new gasket and tighten the fittings on gas supply pipe Ⓑ.
3. Tighten four screws Ⓐ diagonally.

Please note
Tighten screws far enough that the components are not damaged and to ensure their correct function.

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Further details regarding the individual steps (cont.)

4. Fit electrical cables to fan motor Ⓓ, gas valve Ⓔ and ignition unit Ⓕ.

5. Reopen gas supply and switch on power supply.

6. Check the gas connections for tightness.

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

Please note
The use of leak detection spray can result in incorrect functions.
Leak detection spray must not reach electrical contacts or seal diaphragm openings on the gas valve.

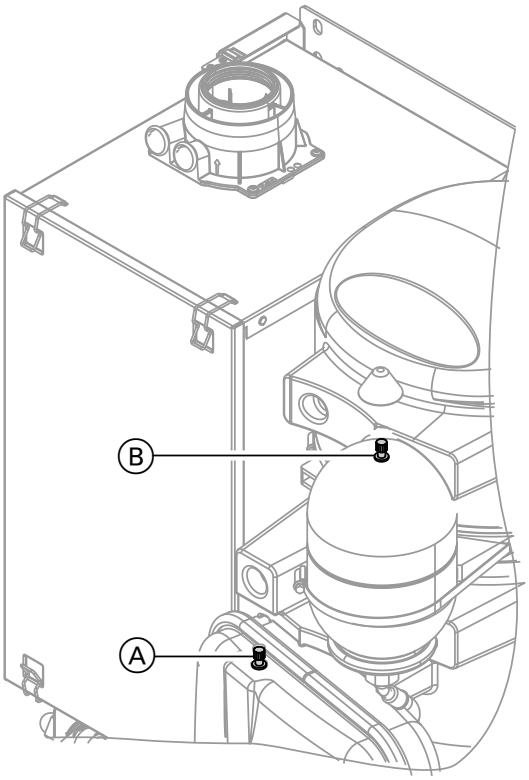
7. Push U-bend Ⓒ up again.

Checking the diaphragm expansion vessel and system pressure

Note
The diaphragm expansion vessel can lose some charge pressure over a time in use. When the boiler heats up, the pressure gauge will indicate a higher pressure of 2 or 3 bar. The safety valve too can respond and discharge excess pressure.

Check whether the installed diaphragm expansion vessel on the heating water side is adequate for the system water volume.
Carry out this check with a cold system.

Further details regarding the individual steps (cont.)



Ⓐ Test nipple, heating water expansion vessel
Ⓑ Test nipple, DHW expansion vessel

1. Drain the system until the pressure gauge indicates "0".

2. If the pre-charge pressure of the diaphragm expansion vessel is lower than the static system pressure, top up with nitrogen until the pre-charge pressure is raised by 0.1 to 0.2 bar.

3. Top up with water until the charge pressure of the cooled system is at least 1.0 bar and 0.1 to 0.2 bar higher than the pre-charge pressure of the diaphragm expansion vessel. Permiss. operating pressure on the heating water side: 3 bar

Checking gas equipment for tightness at operating pressure

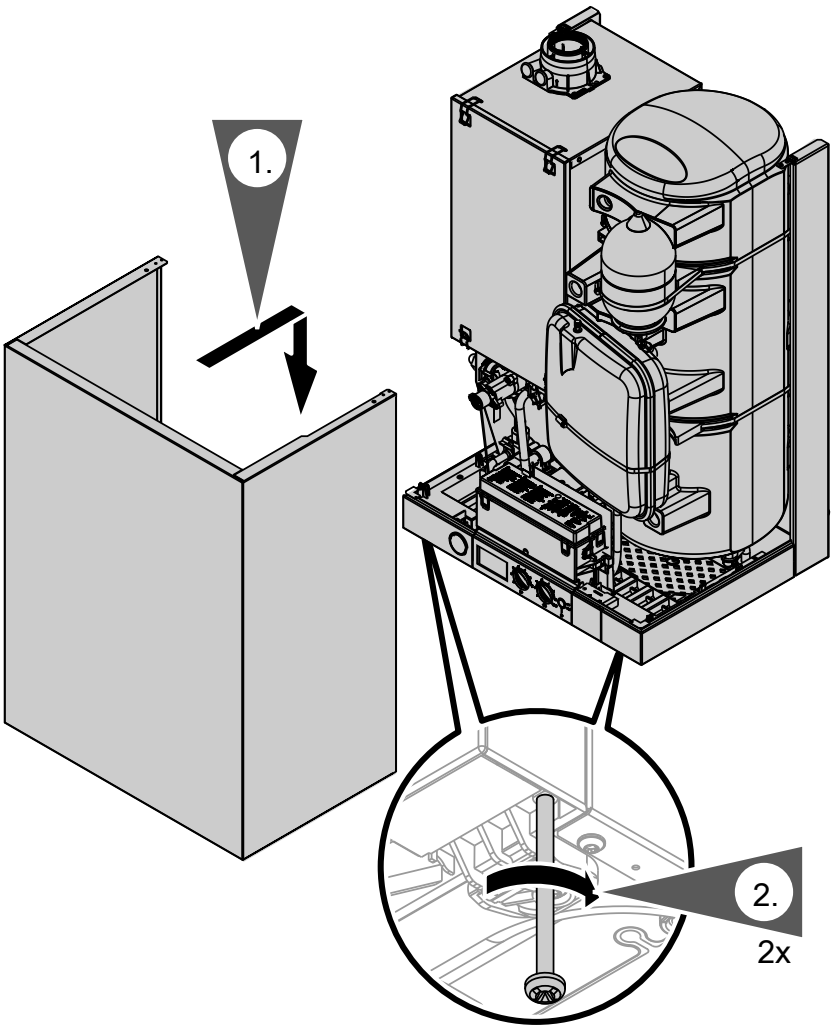
Danger
Escaping gas leads to a risk of explosion.
Check gas equipment for tightness.

Please note
The use of leak detection spray can result in incorrect functions. Leak detection spray must not reach electrical contacts or seal diaphragm openings on the gas valve.

The DHW expansion vessel is to be checked too. Ensure that the pre-charge pressure is at least 3bar. A depleted expansion vessel is indicated by a dripping safety valve located in the cold water supply pipe.

Further details regarding the individual steps (cont.)

Fitting the front panel



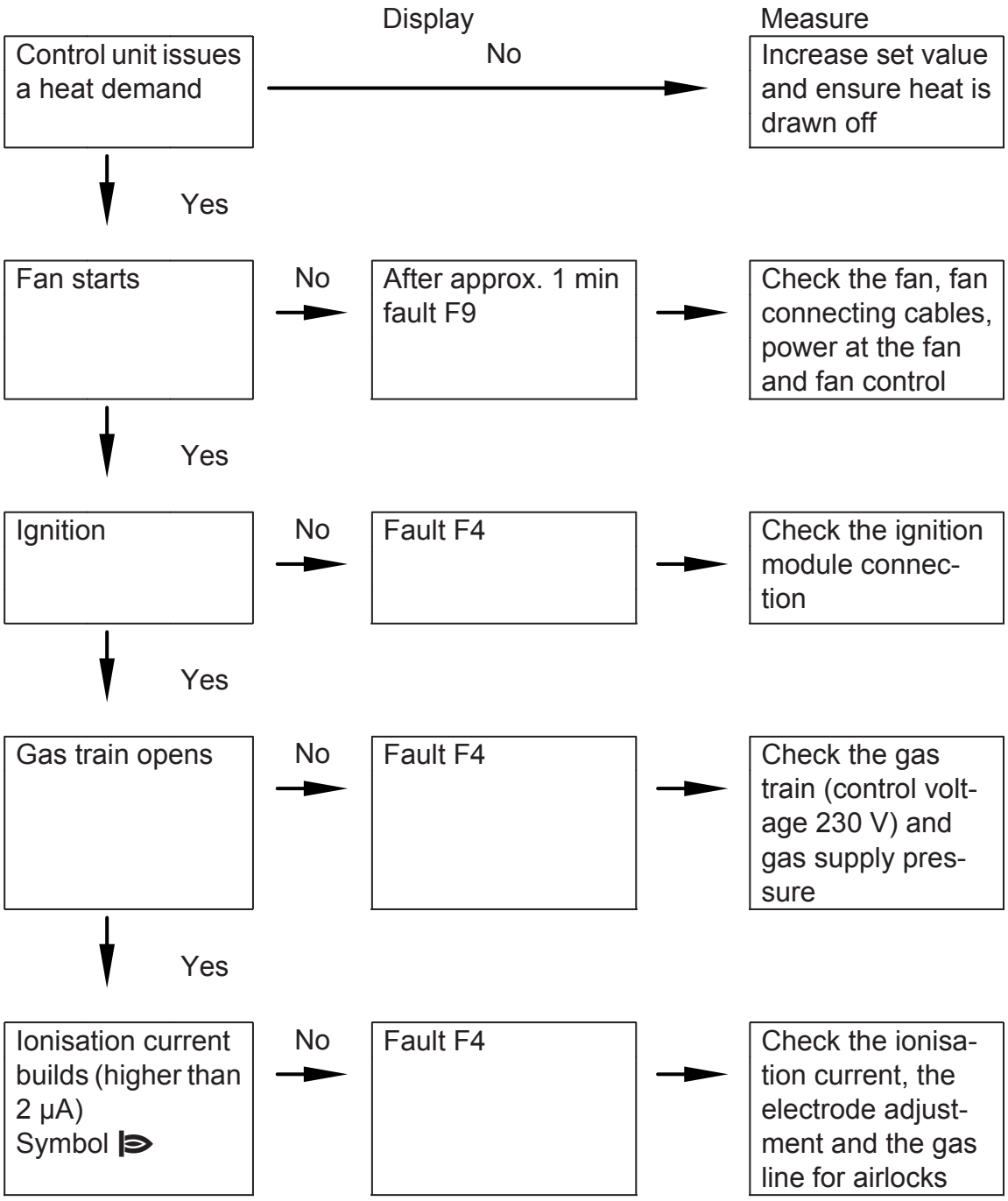
1. Hook the front panel into place.

2. Tighten screws at the bottom.

Instructing the system user

The system installer must hand the operating instructions to the system user and instruct the user in the operation of the system.

Function sequence and possible faults



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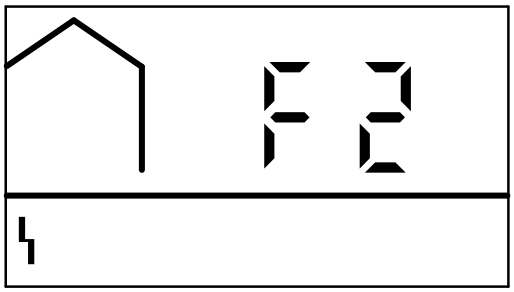
Function sequence and possible faults (cont.)

Yes

Burner in operation → No → Stops below the set boiler water temperature and restarts immediately → Check the flue system for tightness (flue gas recirculation); check the gas flow pressure

Fault messages on the display



Faults are indicated by a flashing fault code with fault symbol "ϟ" on the display.
For fault code explanations see the following table.

Displayed fault code	System characteristics	Cause	Measures
0C	Burner blocked	Mains voltage too low	Check power supply.
10	Constant mode	Short circuit, outside temperature sensor	Check the outside temperature sensor and lead (see page 47).
18	Constant mode	Lead break, outside temperature sensor	Check the outside temperature sensor and lead (see page 47).
30	Burner blocked	Short circuit, boiler water temperature sensor	Check the boiler water temperature sensor (see page 49).
38	Burner blocked	Lead break, boiler water temperature sensor	Check the boiler water temperature sensor (see page 49).
50	No DHW heating	Short circuit, cylinder temperature sensor	Check the sensor (see page 50).

Fault messages on the display (cont.)

Displayed fault code	System characteristics	Cause	Measures
51	No DHW heating	Short circuit, outlet temperature sensor	Check the sensor (see page 51).
58	No DHW heating	Lead break, cylinder temperature sensor	Check the sensor (see page 50).
59	No DHW heating	Lead break, outlet temperature sensor	Check the sensor (see page 51).
A9	Control mode without OpenTherm device	Communication error, OpenTherm device	Check connections and cable; replace OpenTherm device if required.
b0	Burner blocked	Short circuit, flue gas temperature sensor	Check the sensor (see page 53).
b8	Burner blocked	Lead break, flue gas temperature sensor	Check the sensor (see page 53).
E3	Burner in a fault state	Fault in safety chain.	Check the temperature limiter and connecting leads (see page 52). Check the control unit, and replace if required.
E5	Burner blocked	Internal fault	Check the ionisation electrode and connecting cables. Press "RESET" (see page 46).
F0	Burner blocked	Internal fault	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. Press "RESET" (see page 46).

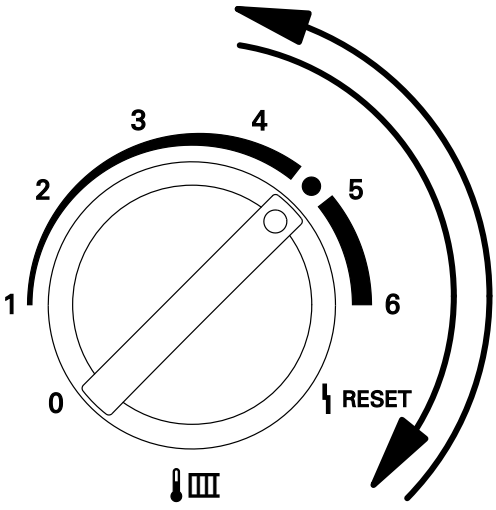
Fault messages on the display (cont.)

Displayed fault code	System characteristics	Cause	Measures
F2	Burner in a fault state	The temperature limiter has responded	Check heating system fill level. Check circulation pump. Vent the system. Check the temperature limiter and connecting leads (see page 52). Press "RESET" (see page 46).
F3	Burner in a fault state	Flame signal is already present at burner start	Check ionisation electrode and connecting cable. Press "RESET" (see page 46).
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 and condensate drain. Press "RESET" (see page 46).
F8	Burner in a fault state	Fuel valve closes too late	Check gas train. Check both control paths. Press "RESET" (see page 46).
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 46).
FA	Burner in a fault state	Fan not at standstill	Check fan, fan connecting cables and fan control. Press "RESET" (see page 46).
FC	Burner blocked	Electrical fan control (control unit) faulty	Check fan connecting cable; if required, replace cable or replace control unit.

Fault messages on the display (cont.)

Displayed fault code	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 46). 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 46). Replace control unit if fault persists.

Pressing reset



Turn rotary selector "🌡" to "↯ RESET" until **"SERV"** is shown.
Within 2 s return the rotary selector to the control range.

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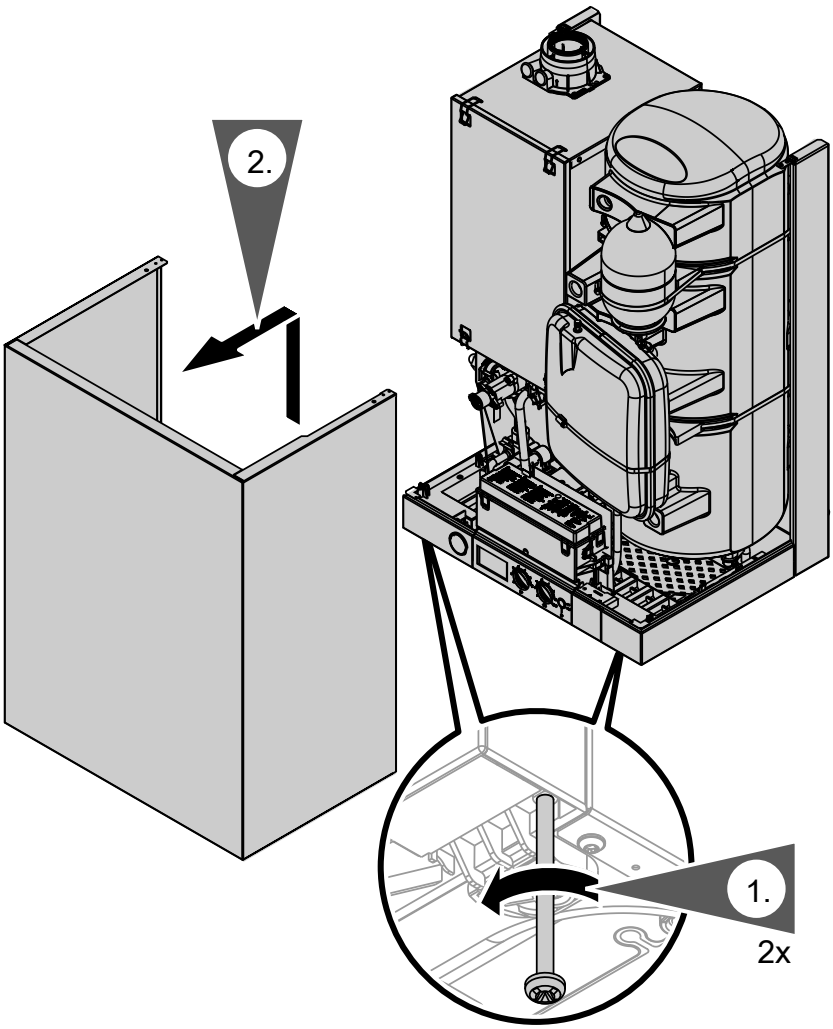
Repairs

Removing the front panel

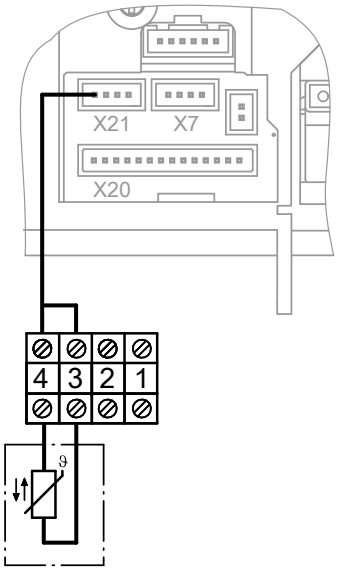


1. Undo screws at the bottom of the boiler; do not remove completely.
2. Remove front panel.

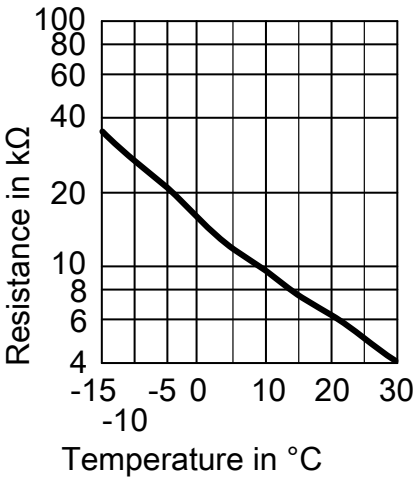
Outside temperature sensor

1. Open the control unit enclosure. See page 16.

Repairs (cont.)



2. Disconnect leads from outside temperature sensor.

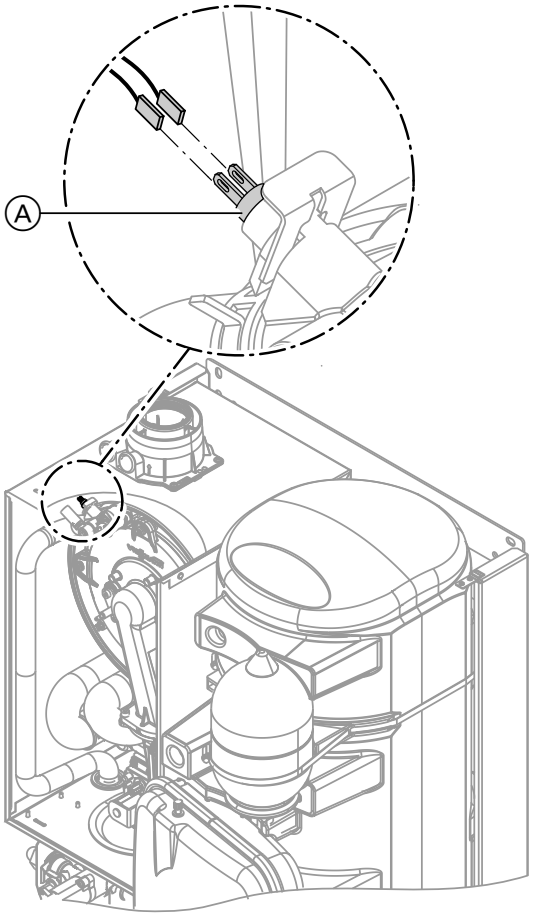


3. Check the sensor resistance and compare it with the curve.

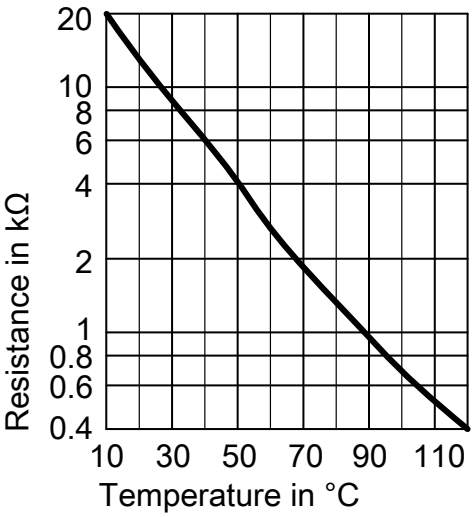
4. Replace the sensor in the case of severe deviation.

Repairs (cont.)

Boiler water temperature sensor



1. Pull the leads off 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 boiler on the heating water side and replace the sensor.

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

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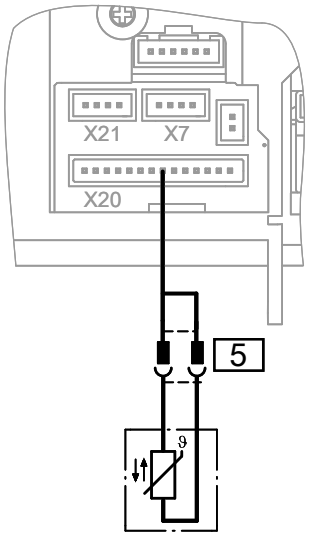
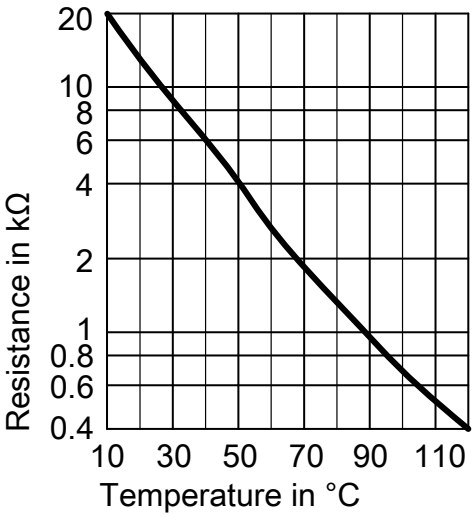
Repairs (cont.)

Checking cylinder temperature sensor



1. Pull plug [5] from the cable harness.

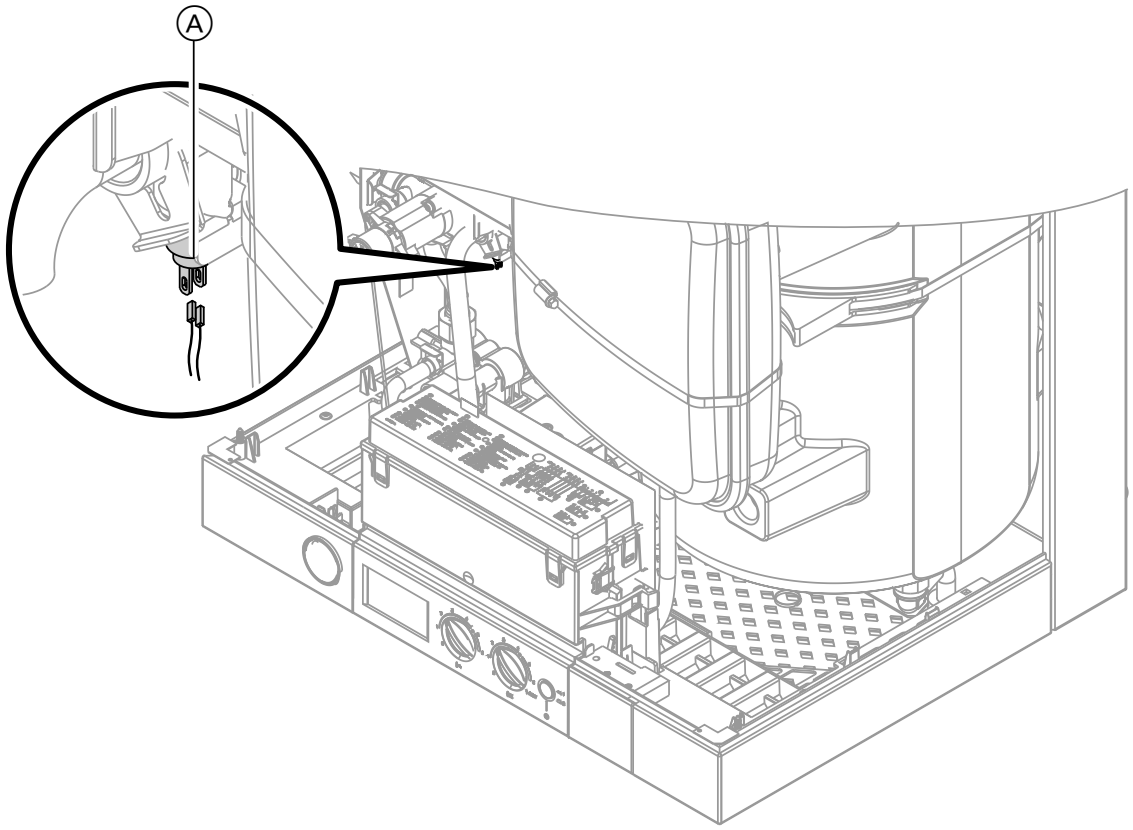


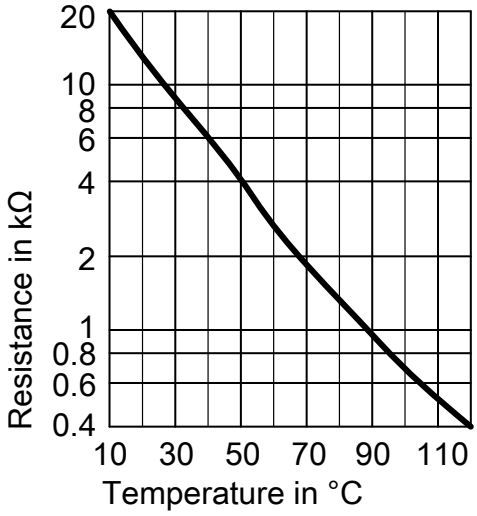
2. Check the sensor resistance and compare it with the curve.

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

Repairs (cont.)

Checking the outlet temperature sensor





Sensor type: NTC 10 kΩ

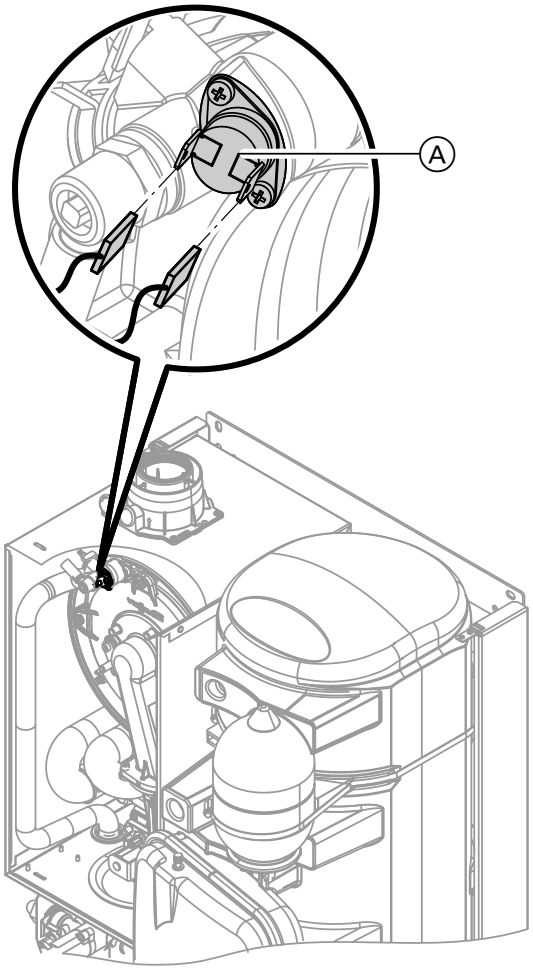
1. Pull leads from outlet temperature sensor Ⓐ.
2. Check the sensor resistance and compare it with the curve.
3. Replace the sensor in the case of severe deviation.

Danger
The outlet temperature sensor is immersed in the DHW (risk of scalding).
Drain the DHW side of the boiler before replacing the sensor.

Repairs (cont.)

Checking 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, check the temperature limiter.



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. Press "RESET" at the control unit (see page 46).

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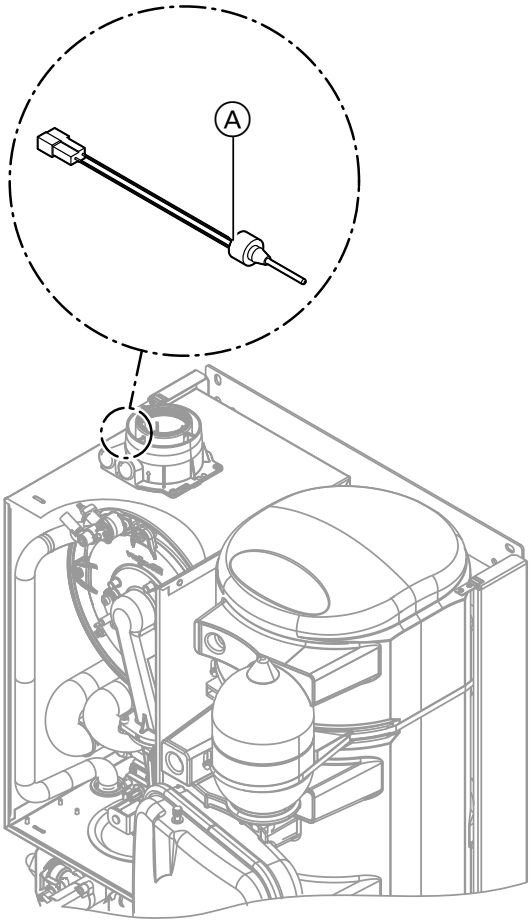
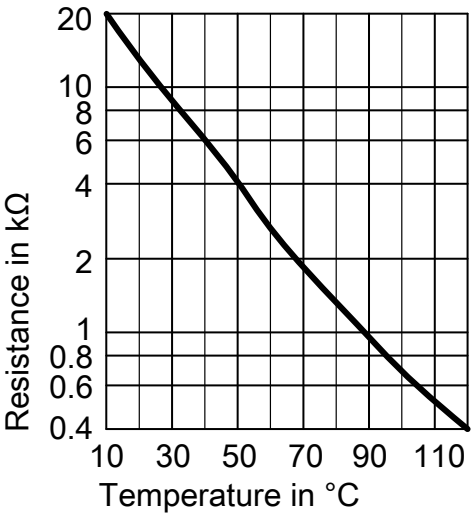
Repairs (cont.)

Checking the 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.

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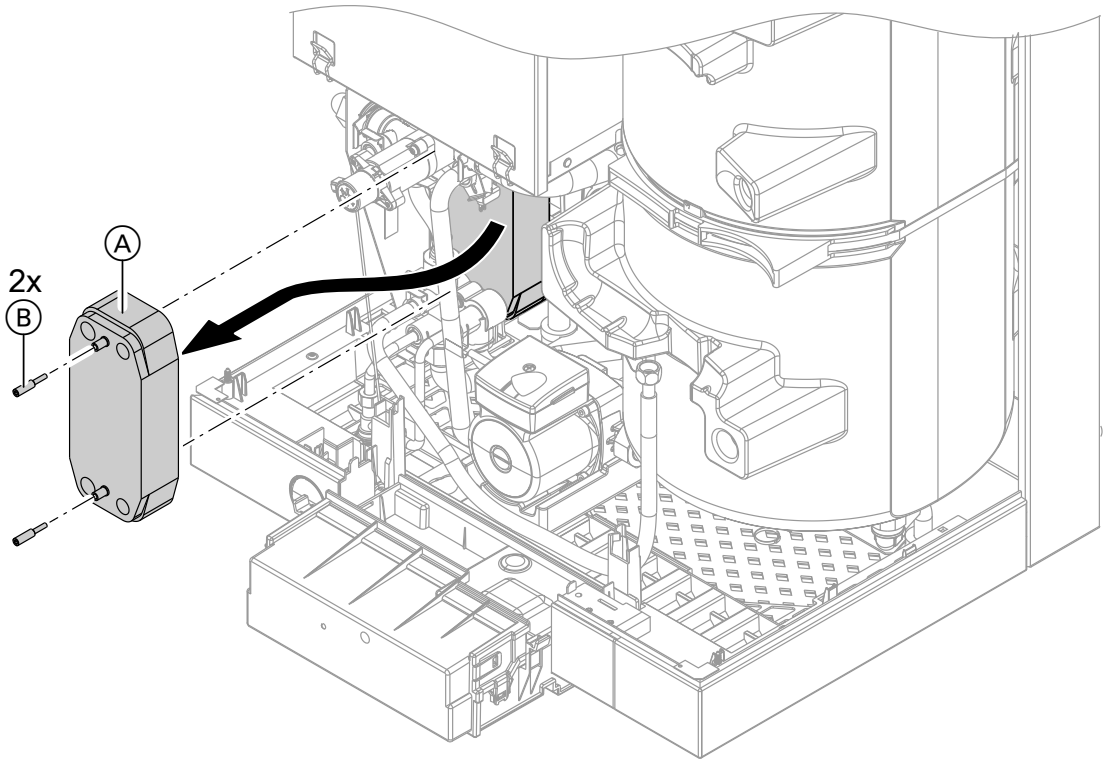
Repairs (cont.)

Checking and cleaning the plate heat exchanger

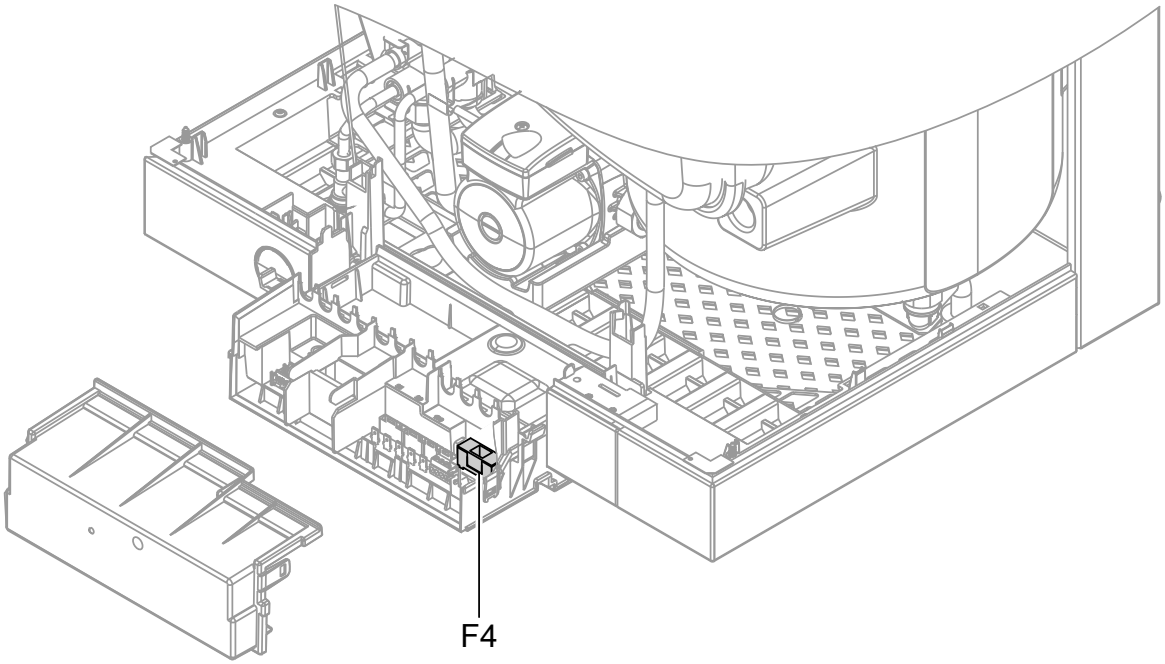
Note
Drain the boiler on its heating water and DHW side.



1. Undo plate heat exchanger Ⓐ (screws Ⓑ) and pull out of the front.
2. Check the connections on the heating water and DHW side for contamination and scaling; if required, replace the plate heat exchanger.
3. Install in reverse order with new gaskets.

Repairs (cont.)

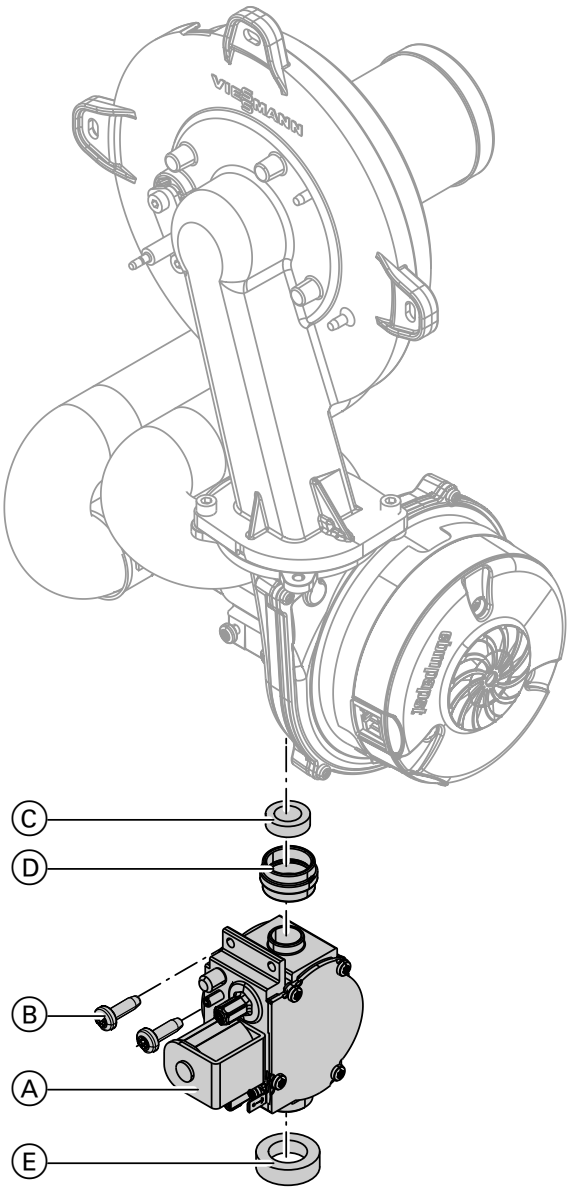
Checking the fuse



1. Switch the power OFF.
2. Open control unit enclosure (see page 16).
3. Check fuse F4.

Converting from LPG to natural gas

Removing gas restrictor



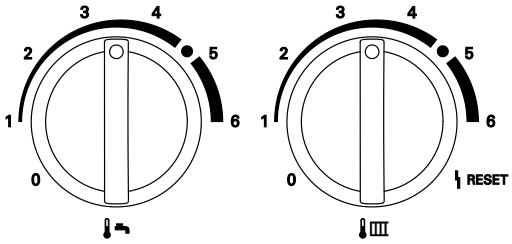
1. Remove the burner (see "Commissioning, inspection and maintenance").
2. Pull cable from gas train Ⓐ.
3. Undo two screws Ⓑ and remove gas train Ⓐ.
4. Remove gas restrictor Ⓒ from gas train Ⓐ.
5. Mount gas train Ⓐ with new gasket Ⓓ.
   Torque for fixing screw Ⓑ: 3 Nm.
6. Refit the burner with new gasket Ⓔ.
7. Remove or void gas type sticker on the top of the boiler (next to the type plate).
8. Fit the burner (see "Commissioning, inspection and maintenance").
9. Start the boiler and check for leaks.

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

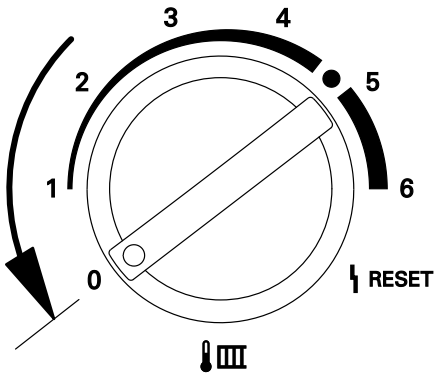
Converting the gas type at the control unit

1. Turn on the ON/OFF switch.

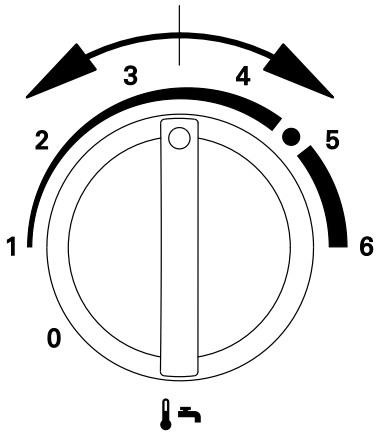
Converting from LPG to natural gas (cont.)



2. Turn both rotary selectors "🌡🚰" and "🌡▥" simultaneously into their respective central positions.
"SERV" appears on the display.



3. Turn rotary selector "🌡▥" within 2 s fully anti-clockwise.
The display shows **"🍃"** and the set value flashes.



4. Adjust the control unit to natural gas or LPG by turning rotary selector "🌡🚰".
The display shows:
   - **"0"** for operation with natural gas
     or
   - **"1"** for operation with LPG.

5. The set operating mode is saved when the value stops flashing, and the control unit returns to standard mode.

Checking the CO_2 content

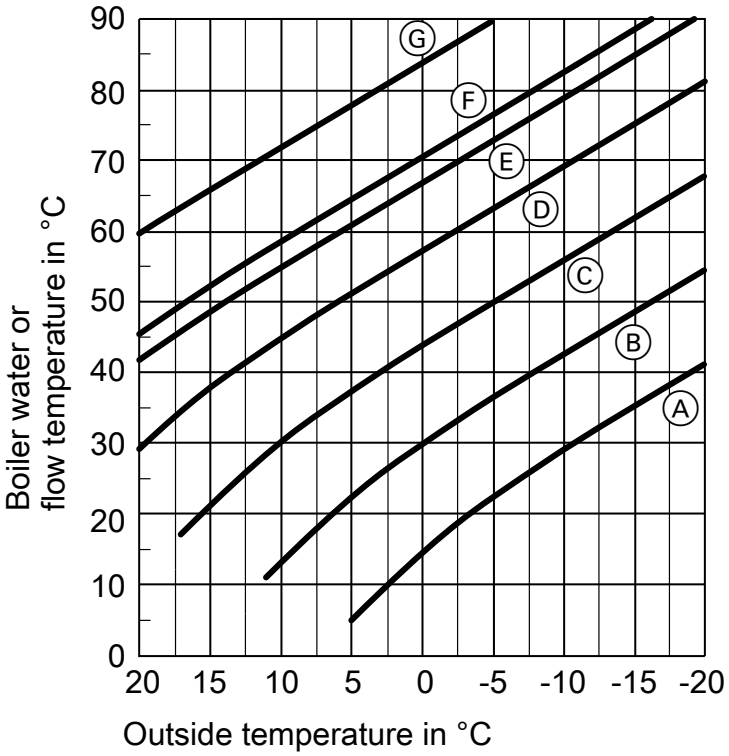
See "Commissioning, inspection and maintenance".

Functions and operating conditions in weather-compensated mode

Heating mode

In weather-compensated mode, the boiler water temperature is regulated subject to the outside temperature.

Heating curve of weather-compensated control unit



Setting of rotary selector "🌡"
- Ⓐ = 1
- Ⓑ = 2
- Ⓒ = 3
- Ⓓ = 4
- Ⓔ = delivered condition
- Ⓕ = 5
- Ⓖ = 6

Frost protection function

Frost protection function is only possible when an outside temperature sensor is connected. Frost protection function is active at outside temperatures of < 5 °C. The burner starts and the boiler water temperature is held at 20 °C.

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Functions and operating conditions in… (cont.)

DHW heating

Heating the DHW primary store from cold

The heating circulation pump is switched on and the 3-way diverter valve will be changed over if the cylinder temperature sensor captures a temperature lower than the defaulted set value.

- The cylinder primary pump is switched on if the boiler water temperature ≥ set DHW temperature.
- The burner is switched on if the boiler water temperature ≤ set DHW temperature, and the cylinder primary pump is switched on when the required boiler water temperature is reached.

The primary store is heated up to the set DHW temperature. Heating stops when the specified temperature has been reached at the cylinder temperature sensor.
After heating, the cylinder primary pump and the 3-way diverter valve remain on for a further 30 s.

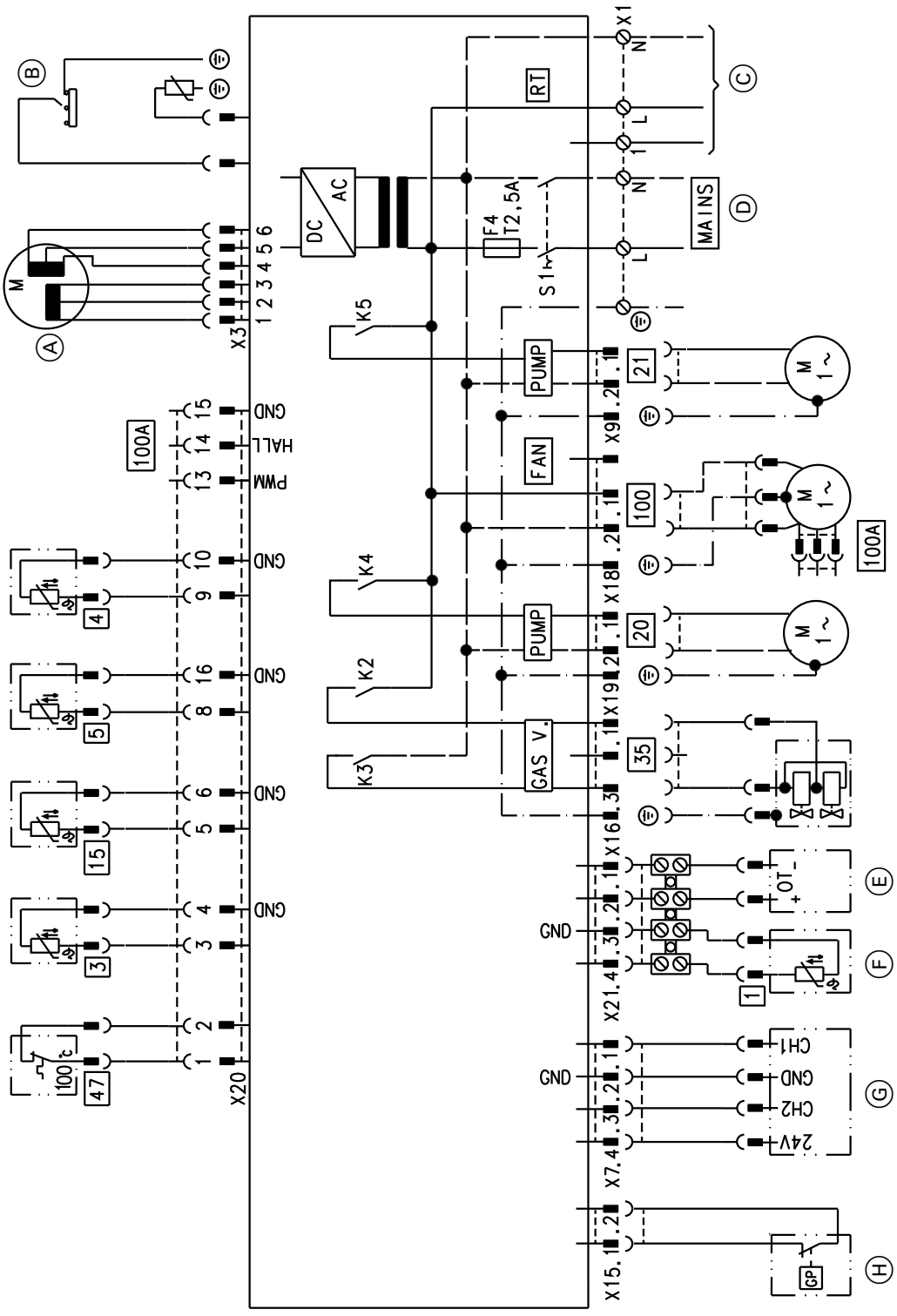
Reheating when DHW is drawn off

When DHW is drawn off, cold water enters at the bottom of the primary store.
The heating circulation pump is switched on and the 3-way diverter valve is changed over if the cylinder temperature sensor recognises a temperature lower than the set value.

- The cylinder primary pump is switched on if the boiler water temperature ≥ set DHW temperature.
- The burner is switched on if the boiler water temperature ≤ set DHW temperature, and the cylinder primary pump is switched on when the required boiler water temperature is reached.

DHW is regulated to the set temperature via the outlet temperature sensor.
The primary store continues to be heated up after the draw-off process has terminated until the set DHW temperature has been reached at the cylinder temperature sensor.
The cylinder primary pump and the 3-way diverter valve remain on for a further 30 s.

Connection and wiring diagram



Ⓐ Stepper motor diverter valve
Ⓑ Ignition/ionisation

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Connection and wiring diagram (cont.)

Ⓒ Vitotrol 100
- ■ Type RT
- ■ Type UTA
- ■ Type UTDB
- ■ Type UTDB-RF

Ⓓ Power input 230 V/50 Hz
Ⓔ Remote control (OpenTherm device)
Ⓕ Outside temperature sensor (accessory)
Ⓖ Time switch (accessory)
Ⓗ Gas pressure switch (accessory)

X ... Electrical interface
[3] Boiler water temperature sensor
[4] Outlet temperature sensor (gas condensing combi boiler)
[5] Cylinder temperature sensor (gas condensing boiler)
[15] Flue gas temperature sensor
[20] Circulation pump (heating water)
[21] Cylinder primary pump
[35] Gas solenoid valve
[47] Temperature limiter
[100] Fan motor 230 V~
[100]A Fan control

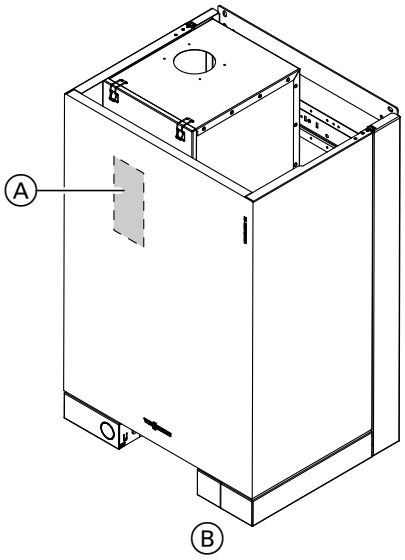
Ordering parts

The following information is required:

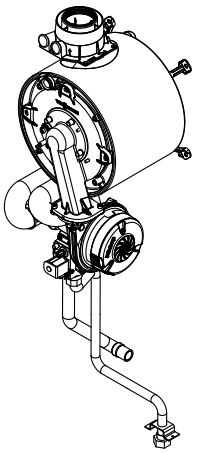
- Serial no. (see type plate Ⓐ)
- Assembly (from this parts list)
- Position number of the individual part within the assembly (from this parts list)

Standard parts are available from your local supplier.

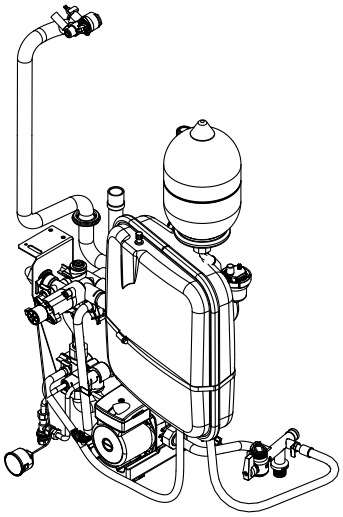
Overview of the assemblies



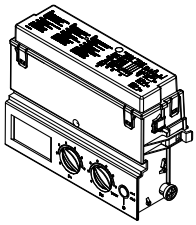
B



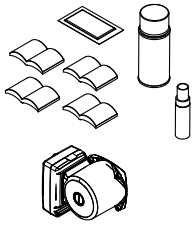
C



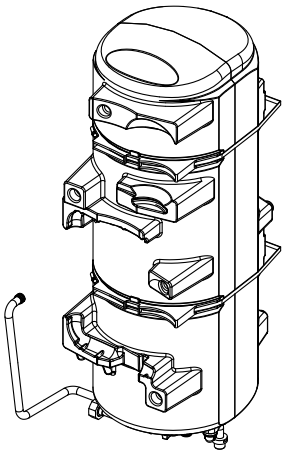
D



E



F



G

Ⓐ Type plate (on the cover panel)
Ⓑ Casing assembly
Ⓒ Heat cell assembly
Ⓓ Hydraulic assembly
Ⓔ Control unit assembly
Ⓕ Miscellaneous assembly

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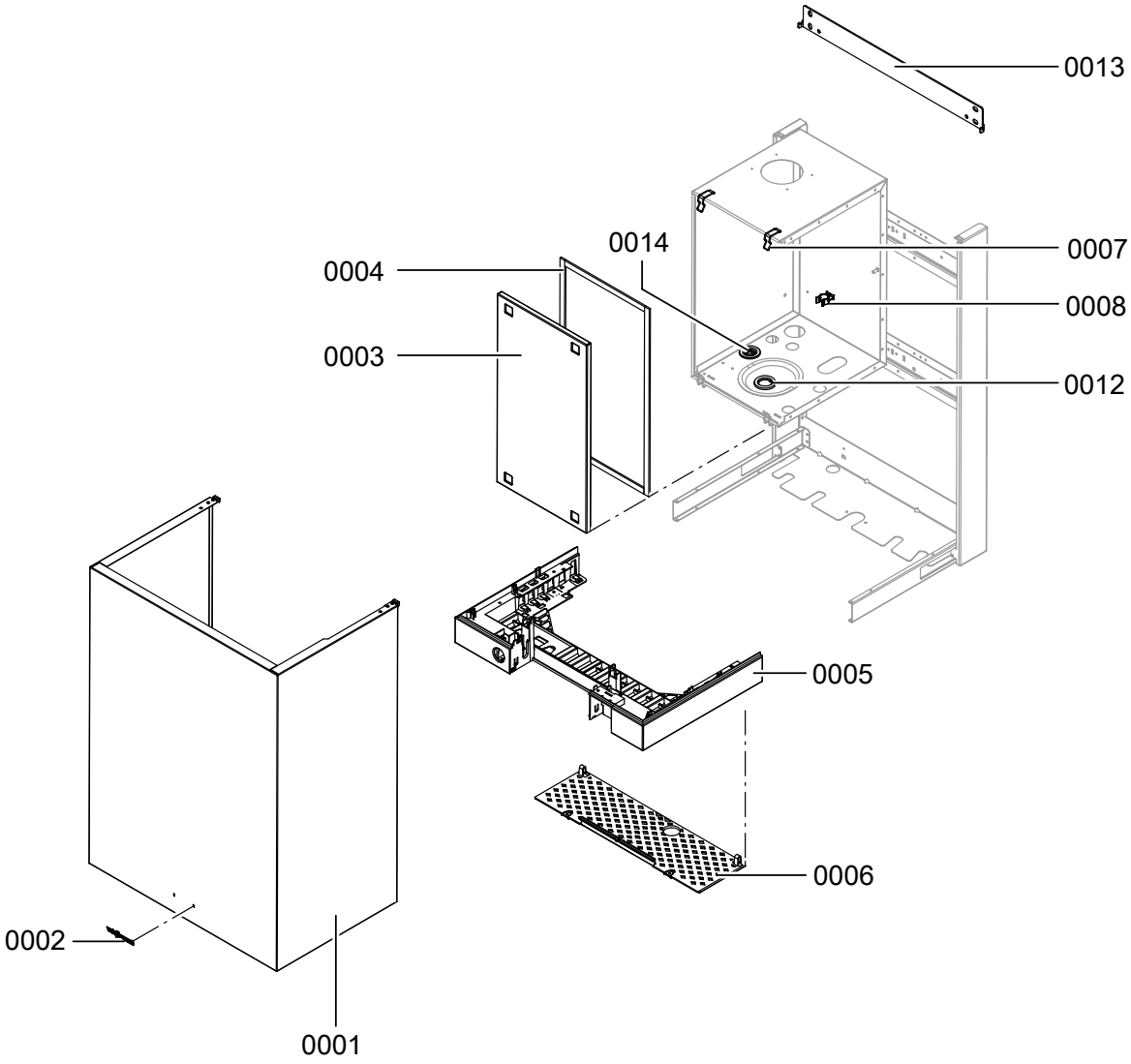
Service

Overview of the assemblies (cont.)

Ⓖ Cylinder assembly

Casing assembly

0001 Front panel
0002 Logo
0003 Cover panel with gasket
0004 Profiled seal
0005 Control unit support
0006 Safety guard
0007 Toggle fastener (set)
0008 Pipe clip Ø 18
0012 Air box gasket, gas pipe
0013 Wall mounting bracket
0014 Diaphragm grommets (5 pce)



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Heat cell assembly

0001 Gasket DN 60
0002 Boiler flue connection
0003 Boiler flue connection plug
0004 Flue gas gasket
0005 Flue gas temperature sensor
0006 Heat exchanger
0007 Thermal insulation block
0008 Moulded hose heating water return
0009 Condensate hose
0010 Splash siphon
0013 Condensate hose
0015 Gas supply pipe
0016 Gasket 17 x 24 x 2 (set)
0019 Burner
0020 Tee
0021 Hose 19 x 600 mm, corrugated
0023 Hose clip DN 25

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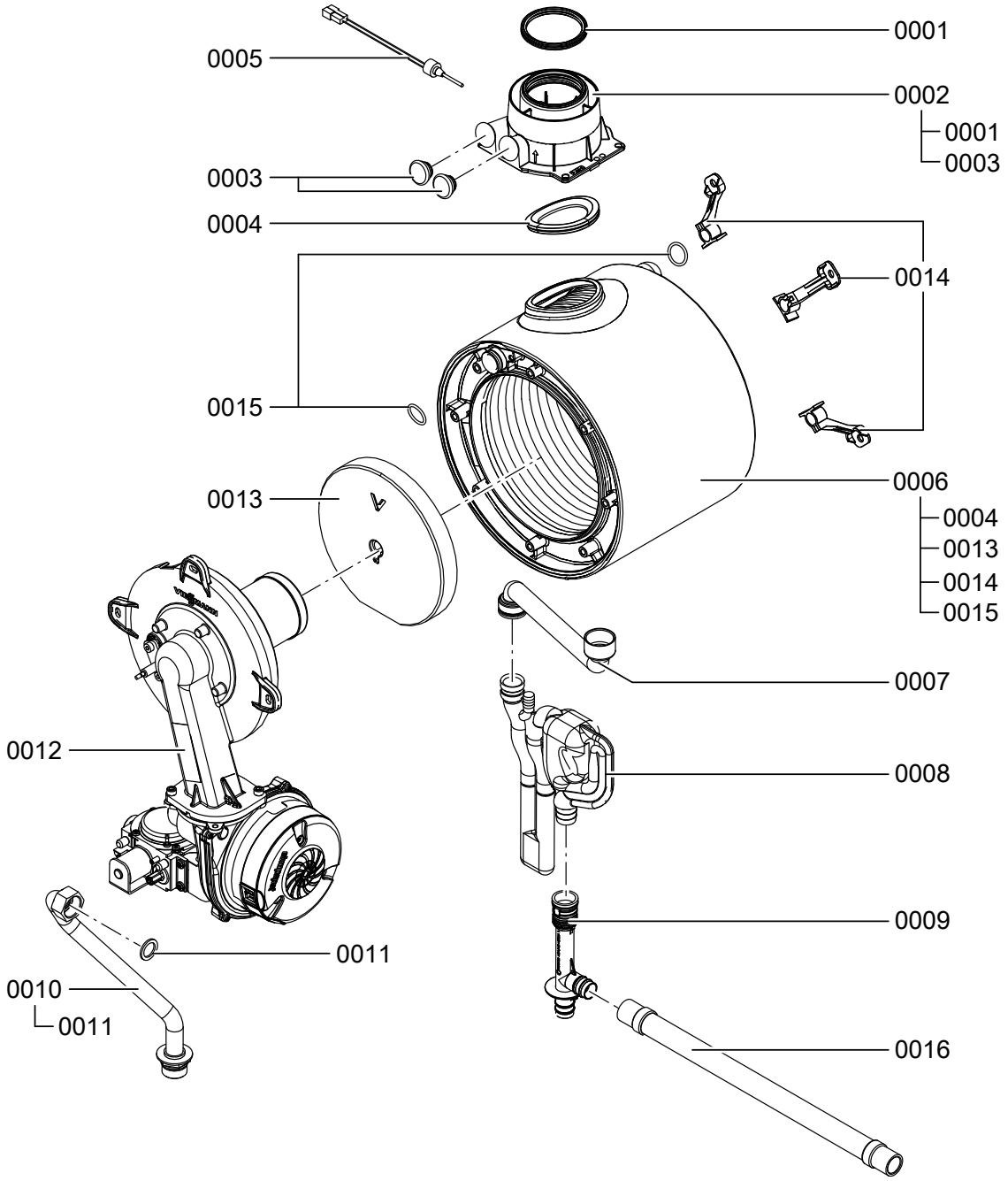
Heat cell assembly (cont.)



Burner assembly

0001 Burner gasket
0002 Thermal insulation ring
0003 Cylinder burner gauze assembly
0004 Burner gauze assembly gasket
0005 Burner door
0006 Ionisation electrode gasket
0007 Ignition and ionisation electrode
0008 Burner door flange gasket

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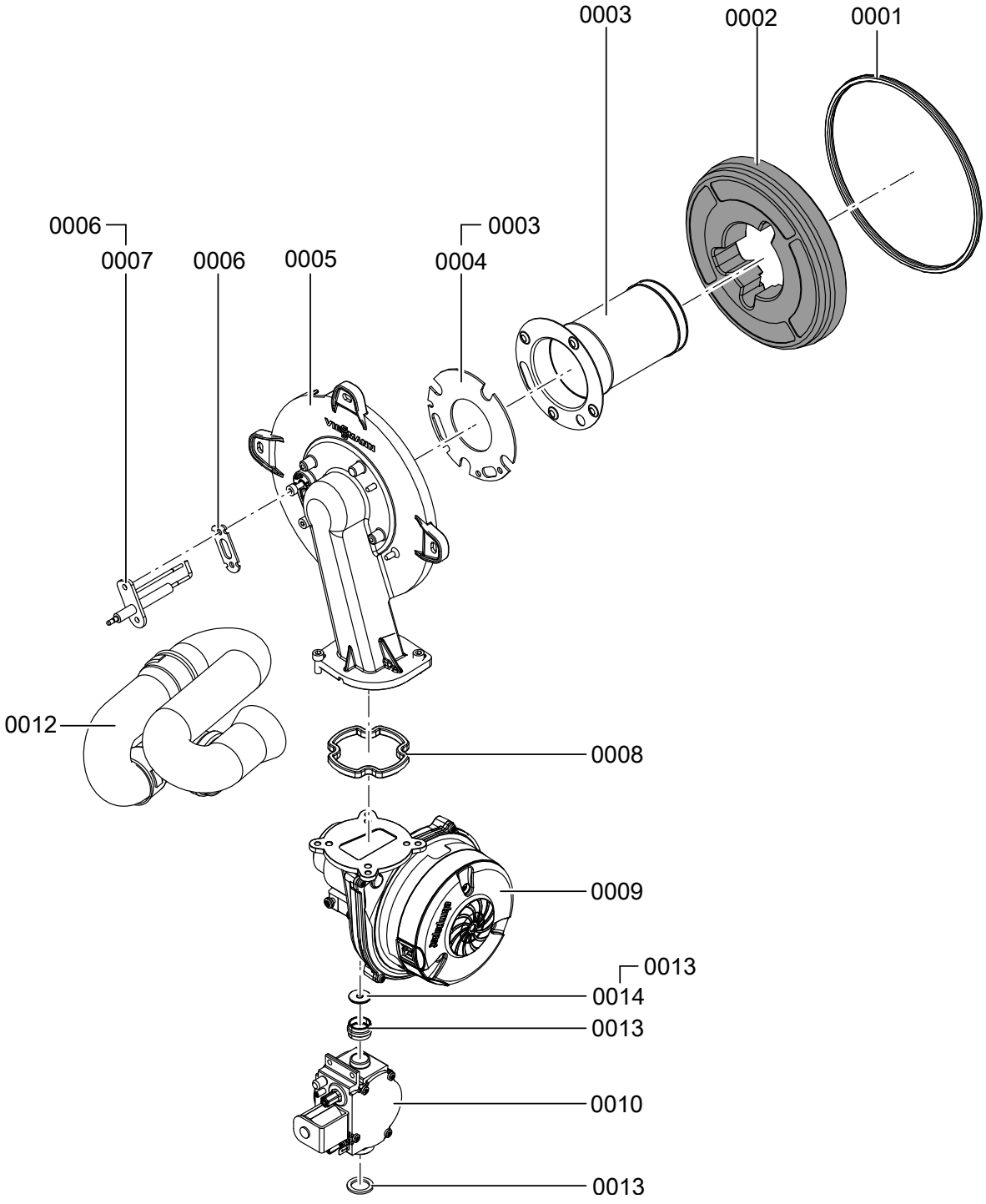
Burner assembly (cont.)

0009 Radial fan
0010 Gas valve
0012 Venturi extension
0013 Gaskets (set)
0014 Conversion kit G31



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Hydraulic assembly

0001 Temperature sensor
0002 Thermal circuit breaker
0003 Air vent valve G ⅜
0004 Hose Ø 10 x 1.5 x 750
0005 Clip Ø 8 (5 pce)
0006 Heat exchanger connection pipe
0008 Hose clip DN 25
0009 Hose connector adaptor
0010 Clip Ø 18 (5 pce)
0011 Diaphragm grommet
0012 Gasket set A 17 x 24 x 2
0013 Heating water flow connection pipe
0014 Pressure gauge
0015 O-ring 9.6 x 2.4
0016 Connection line; diaphragm expansion vessel
0017 O-ring 14.3 x 2.4
0018 Clip Ø 15 (5 pce)
0019 Connection pipe, circulation pump
0020 Gasket 23 x 30 x 2
0021 Circulation pump VIUP-30
0022 Circulation pump motor VIUP-30
0023 Support, cylinder primary pump
0024 Connection pipe, cold water
0025 Connection manifold, cold water
0026 Flat gasket
0027 Circular sealing ring 8 x 2 (5 pce)
0028 Clip Ø 10 (5 pce)
0029 Return pipe
0030 Safety valve
0031 Condensate hose
0032 Circulation pump UPS 60 (19 - 26 kW)
0033 Quick-action air vent valve
0034 Circulation pump motor UPS 60 (19 - 26 kW)
0035 Circulation pump UPS 70 (35 kW)
0036 Circulation pump motor UPS 70 (35 kW)
0037 Heating water return connection pipe
0038 Diaphragm expansion vessel
0039 Hose clip Ø 220-240 x 9
0040 Gasket A 10 x 15 x 1.5 (set)
0041 Connection line; diaphragm expansion vessel
0042 Aqua-plate
0043 Connection pipe, heating water filling
0044 Connection pipe, filling loop, DHW
0045 Gasket A 6 x 11 x 1
0046 Fill valve
0047 Expansion vessel
0048 Clip Ø 140-160
0051 Plug Ø 8/10

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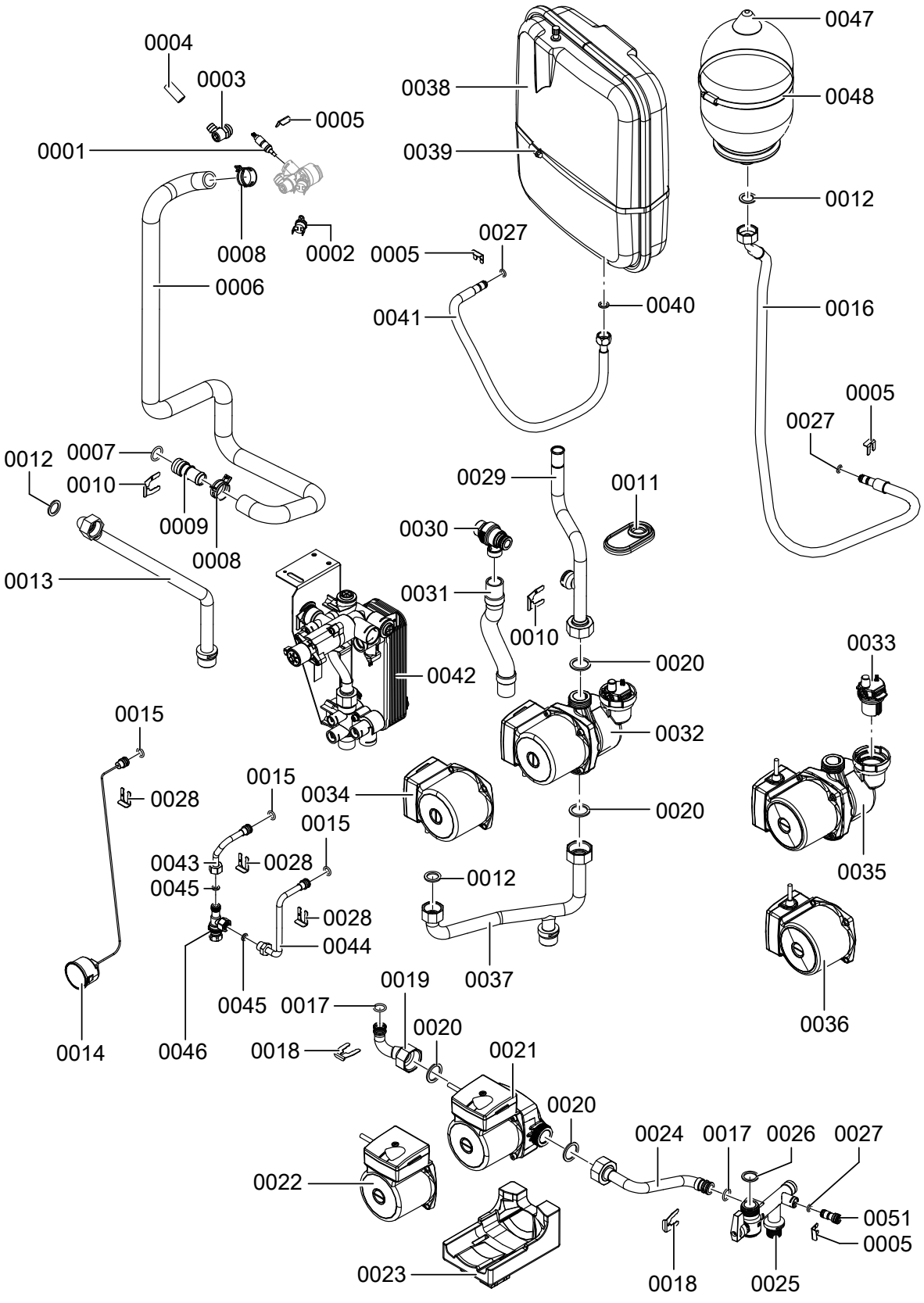
Hydraulic assembly (cont.)



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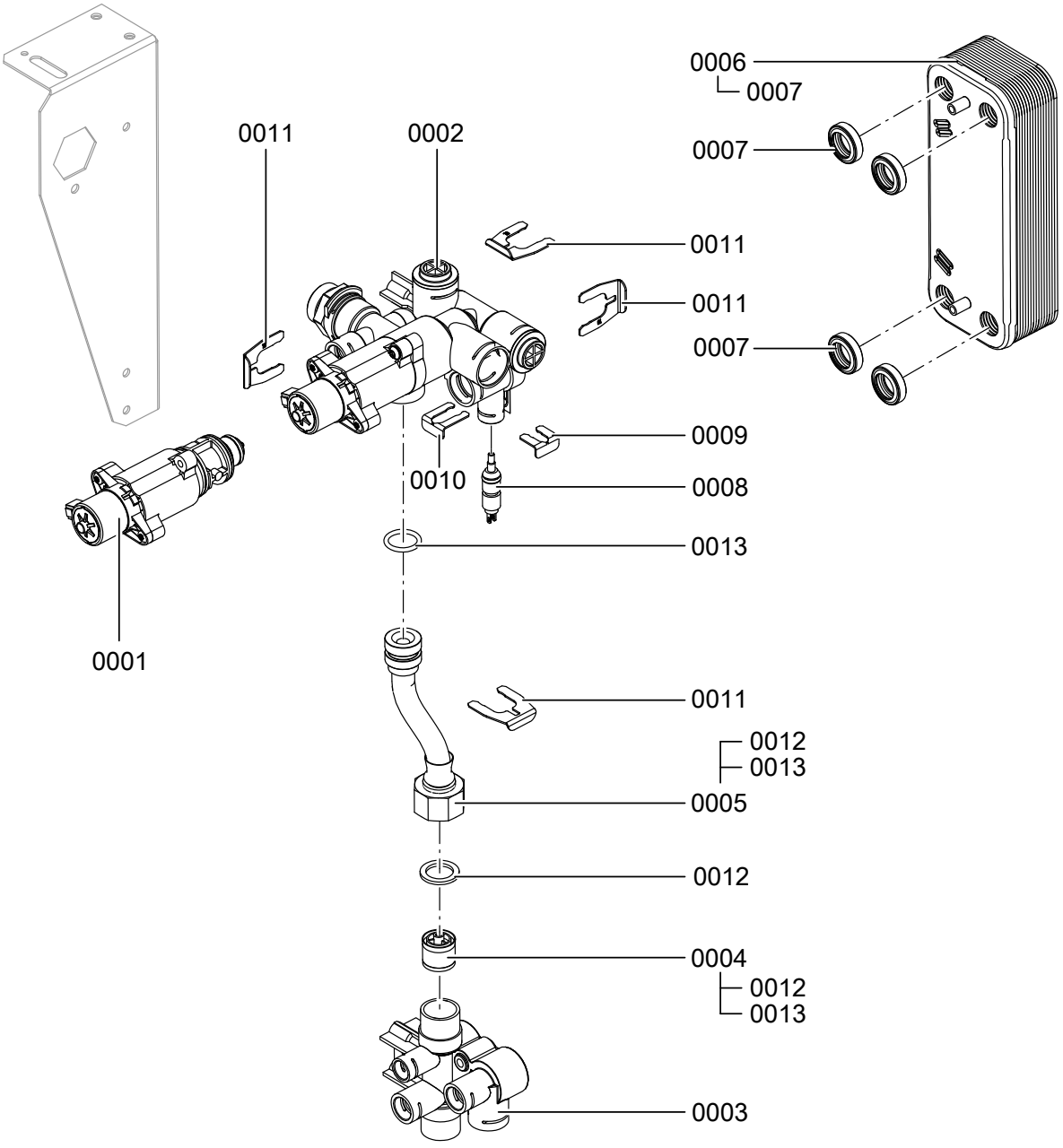
Service

Aqua-plate assembly

0001 Valve insert
0002 Flow unit
0003 Return unit
0004 Overflow valve
0005 Overflow pipe
0006 Plate heat exchanger
0007 Profiled gasket
0008 Temperature sensor
0009 Clip Ø 8 (5 pce)
0010 Clip Ø 10 (5 pce)
0011 Pipe clip Ø 18 (5 pce)
0012 Gasket A 17 x 24 x 2 (set)
0013 Gasket, O-ring 17.86 x 2.62 (set)



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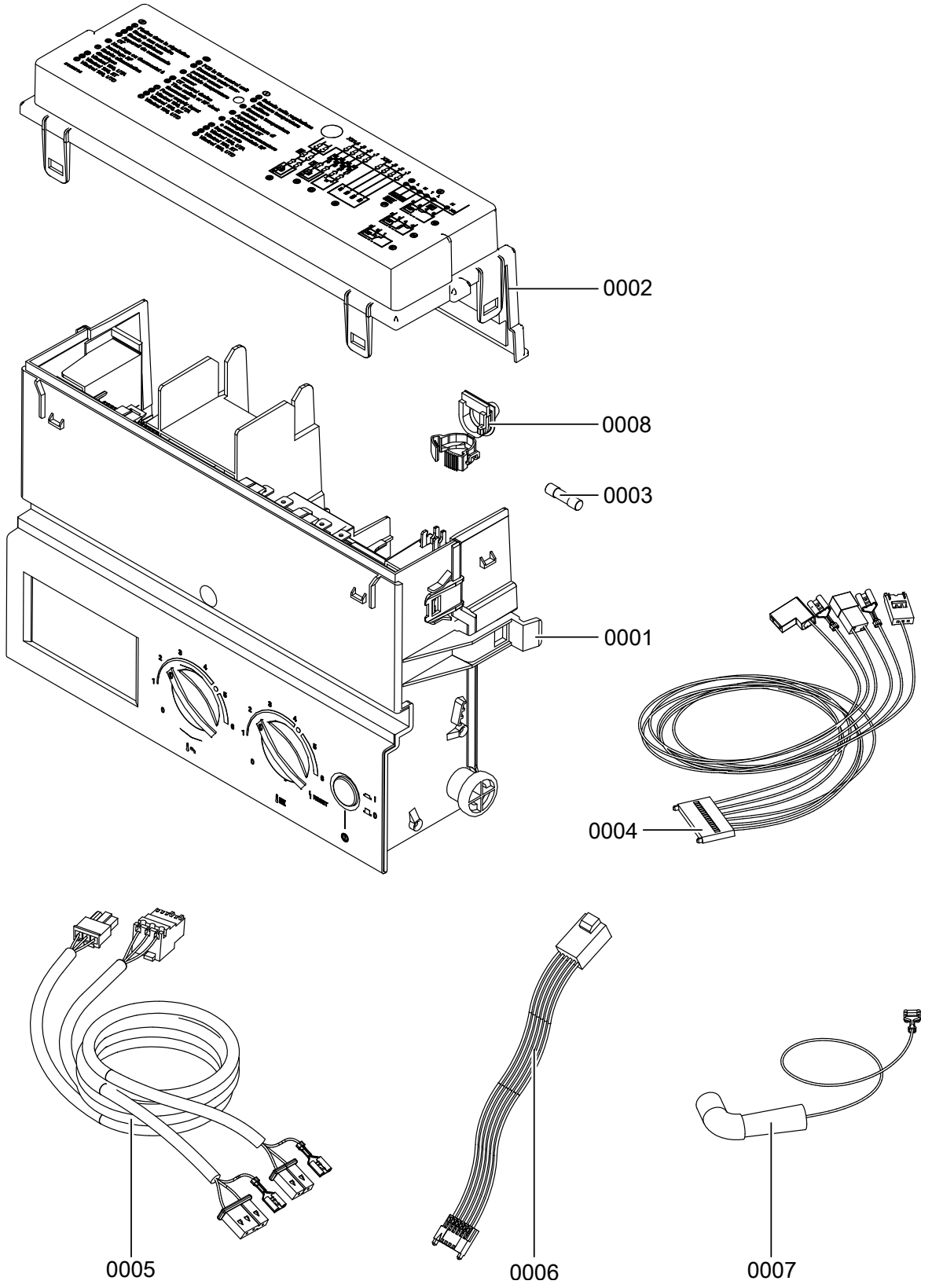
Control unit assembly

0001 Control unit
0002 Cover, wiring chamber
0003 Fuse 2.5 A (slow) 250 V
0004 Cable harness X20
0005 Cable harness 100/35
0006 Cable harness stepper motor
0007 Ignition cable with angled plug 5 kΩ
0008 Cable fixing

Control unit assembly (cont.)



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Cylinder assembly

0001 O-ring 14.3 x 2.4 (set)
0002 Clip Ø 15 (5 pce)
0003 DHW connection pipe
0004 Non-return valve (cartridge)
0005 Shut-off elbow, cylinder
0006 DHW connection pipe
0007 Flat gasket
0008 Protective profile
0009 Hose clip Ø 340 - 360 x 9
0010 Cylinder
0011 Thermal insulation EPS, front
0012 Thermal insulation EPS, back
0014 Strain relief
0015 Cylinder temperature sensor NTC

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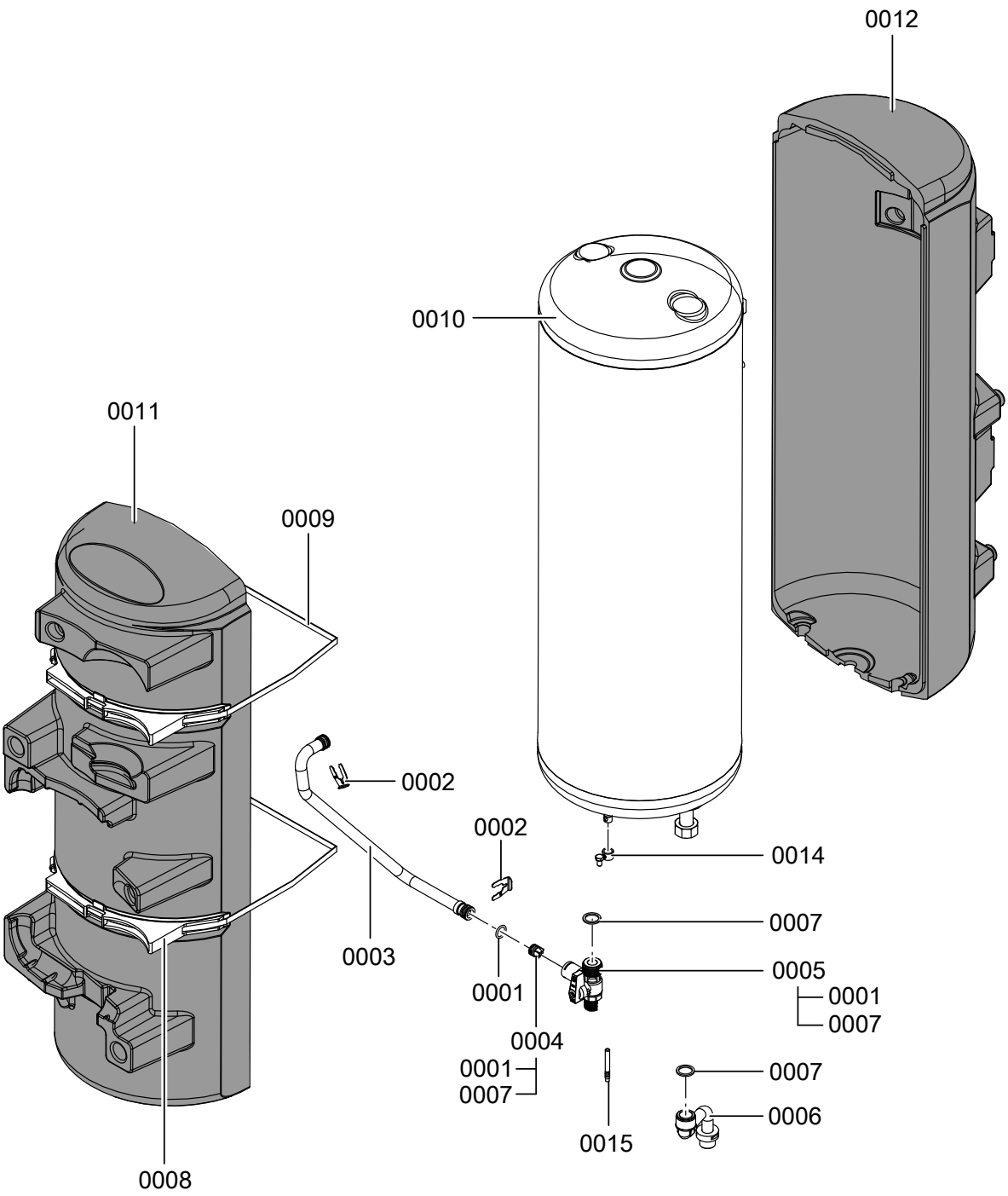
Cylinder assembly (cont.)



Miscellaneous assembly

0001 Special grease
0002 Touch-up spray paint, white
0003 Touch-up paint stick, white

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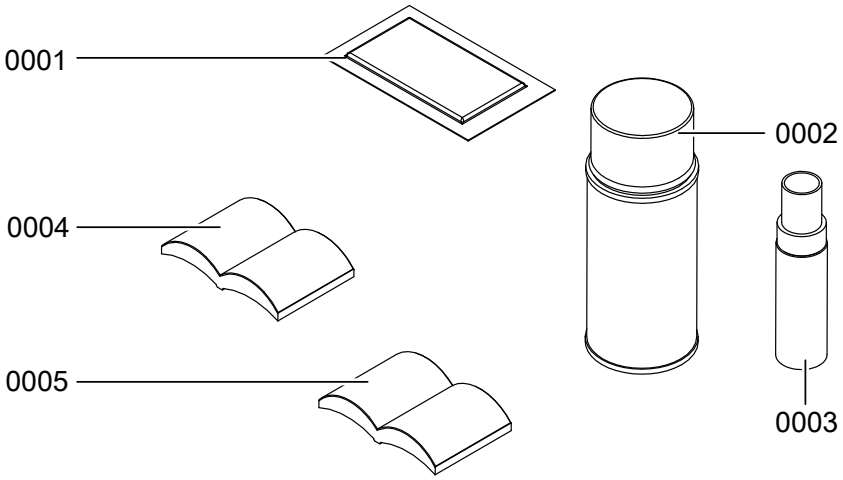
Miscellaneous assembly (cont.)

0004 Installation and service instructions
0005 Operating instructions



Specification

Rated voltage:	230 V~	Temperature limiter setting:	100 °C (fixed)
Rated frequency:	50 Hz		
Rated current:	2.0 A~	Backup fuse (power supply):	max. 3 A
Safety category:	I		
IP rating:	IP X4D to EN 60529		

Permissible ambient temperature
- during operation: 0 to +40 °C
- during storage and transport: -20 to +65 °C

Rated heating output range in heating mode			
T_V/T_R 50/30 °C	**kW**	**6.5 – 26**	**8.8 – 35**
T_V/T_R 80/60 °C	**kW**	**5.9 – 23.7**	**8.0 – 31.9**
Rated heating output range for DHW heating	kW	5.9 – 29.3	8.0 – 35.0
Rated heat input range	kW	6.1 – 30.5	8.2 – 36.5
Supply values relative to the max. load with:			
- Natural gas E	m^3/h	3.23	3.86
- LPG P	kg/h	2.39	2.86
Power consumption (max.)	W	160	185
Product ID		CE-0085BT0029	

Note

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

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Declaration of conformity

Declaration of Conformity for the Vitodens 111-W

We, Viessmann Werke GmbH & Co. KG, D-35107 Allendorf, confirm as sole responsible body that the product **Vitodens 111-W** complies with the following standards:

DIN 4753
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 with **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 March 2012

Viessmann Werke GmbH & Co. KG

Authorised signatory Manfred Sommer

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Keyword index

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Keyword index (cont.)

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Applicability

Serial No.:
7499484 7499485

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5618 648 GB Subject to technical modifications.