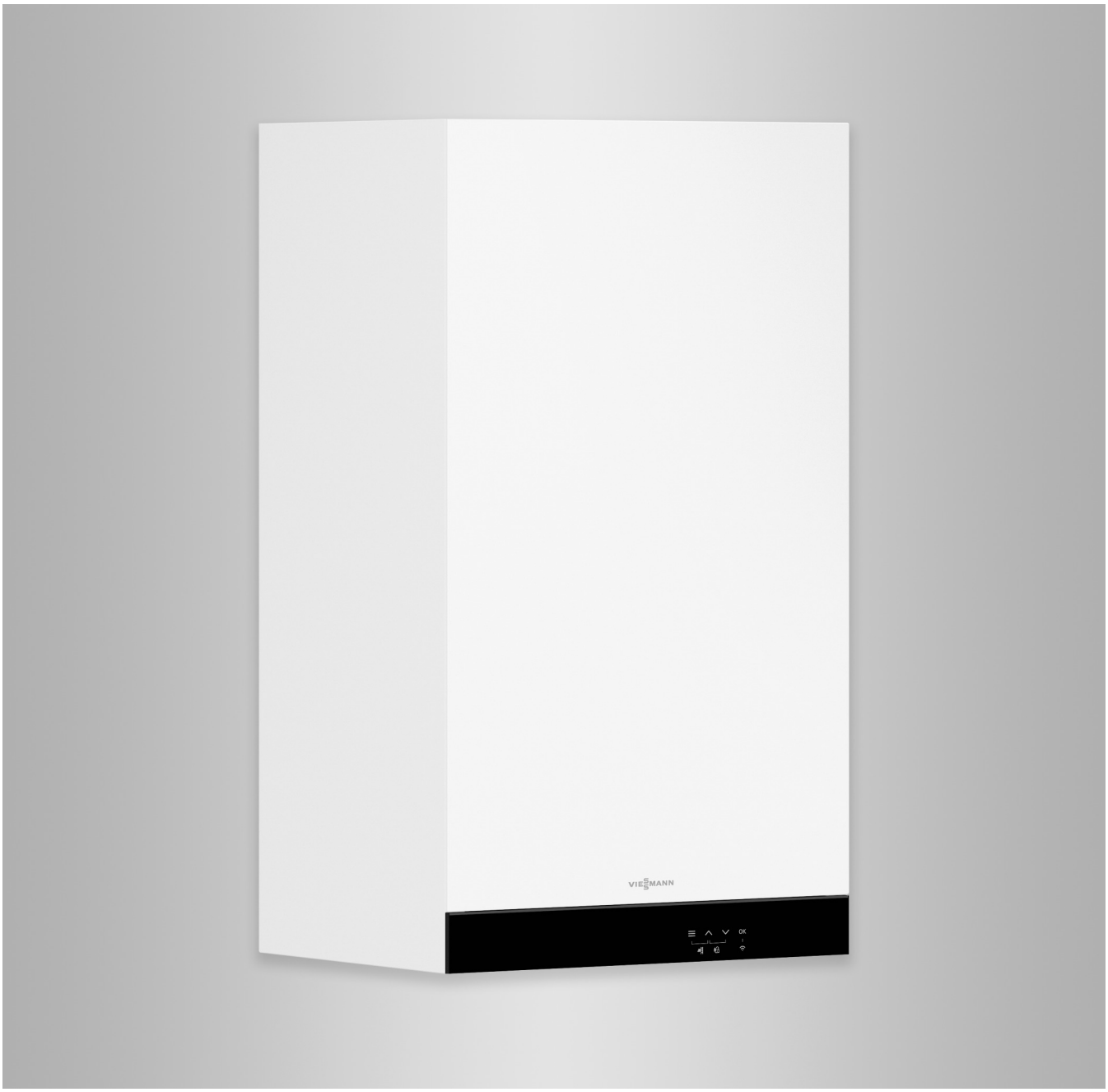
Installation and service instructions

for contractors

Vitodens 050-W
Type B0KA, BPKA, 3.2 to 25 kW
Type B0KA-M (for multiple connection), 7.0 to 25 kW
Wall mounted gas condensing boiler
Natural gas version

Gas Council No.
- B0KA: 47-819-55, 47-819-57
- B0KA-M: 47-819-56

VITODENS 050-W



6173886 GB 6/2021

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 may only be carried out by a registered gas fitter.
- Work on electrical equipment may 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 to be observed

- National installation regulations
- Statutory regulations for the prevention of accidents
- Statutory regulations for environmental protection
- Codes of practice of the relevant trade associations
- Relevant country-specific safety regulations

Safety instructions for working on the system

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.
- Wear suitable personal protective equipment when carrying out any work.

Safety instructions (cont.)

⚠ **Danger**
Hot surfaces and fluids can lead to burns or scalding.
- Before maintenance and 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. Prior to commencing work, touch earthed objects such as heating or water pipes to discharge static loads.

Repair work

! **Please note**
Repairing components that fulfil a safety function can compromise the safe operation of the system. Replace faulty components only with genuine 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 our warranty.
For replacements, use only original spare parts supplied or approved by Viessmann.

Safety instructions (cont.)

Safety instructions for operating the system

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. Never 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 supply utility from outside the building.
- Have the power supply to the building shut off from a safe place (outside the building).

If you smell flue gas

⚠ **Danger**
Flue gas can lead to life threatening poisoning.
- Shut down the heating system.
- Ventilate the installation site.
- Close doors to living spaces to prevent flue gases from spreading.

What to do if water escapes from the appliance

⚠ **Danger**
If water escapes from the appliance there is a risk of electrocution.
Switch OFF the heating system at the external isolator (e.g. fuse box, domestic distribution board).

⚠ **Danger**
If water escapes from the appliance there is a risk of scalding.
Never touch hot heating water.

Condensate

⚠ **Danger**
Contact with condensate can be harmful to health.
Never let condensate touch your skin or eyes and do not swallow it.

Flue systems and combustion air

Ensure that flue systems are clear and cannot be sealed, for instance due to accumulation of condensate or other external causes.
Ensure an adequate supply of combustion air.
Inform 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 inadequate supply of combustion air can cause life threatening poisoning from carbon monoxide in the flue gas.
Ensure the flue system is in good working order. Vents for supplying combustion air must be non-sealable.

Extractors

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

Safety instructions (cont.)

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

Index

Index (cont.)

Disposal of packaging

Please dispose of packaging waste in line with statutory regulations.

Gas Council No.

Type	Gas Council Number:
Vitodens 050-W, B0KA, 25 kW	**47-819-55**
Vitodens 050-W, B0KA, 30 kW	**47-819-57**
Vitodens 050-W, B0KA-M, 25 kW	**47-819-56**

Symbols

Symbol	Meaning
	Reference to other document containing further information
	Step in a diagram: The numbers correspond to the order in which the steps are carried out.
	Warning of material losses and environmental pollution
	Live electrical area
	Pay particular attention.
	▪ Component must audibly click into place. or ▪ Acoustic signal
	▪ Fit new component. or ▪ In conjunction with a tool: Clean the surface.
	Dispose of component correctly.
	Dispose of component at a suitable collection point. Do **not** dispose of component in domestic waste.

The steps in connection with commissioning, inspection and maintenance are found in the "Commissioning, inspection and maintenance" section and identified as follows:

Symbol	Meaning
	Steps required during commissioning
	Not required during commissioning
	Steps required during inspection
	Not required during inspection
	Steps required during maintenance
	Not required during maintenance

Intended use

The appliance is intended solely for installation and operation in sealed unvented heating systems that comply with EN 12828 (as well as CECS215-2017 and CE: CS215-2017 in relation to CN), with due attention paid to the associated installation, service and operating instructions. It is only designed for heating up heating water that is of potable water quality.

Intended use 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 shall be deemed inappropriate.

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

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

Product information

Wall mounted gas condensing boiler with Inox-Radial heat exchanger and the following integrated components:

- Modulating MatriX-Plus burner for natural gas
- Hydraulics with 3-way diverter valve and variable speed high efficiency circulation pump
- Type BPKA, B0KA: Plate heat exchanger for DHW heating
- Weather-compensated or constant temperature control unit
- Integral diaphragm expansion vessel (8 l capacity)

The selected gas category in the delivered condition and the associated nominal gas pressure are given on the boiler type plate. The type plate also shows the other gas types and pressures with which the boiler can be operated. A conversion within the stated natural gas groups is not required.

Type plate

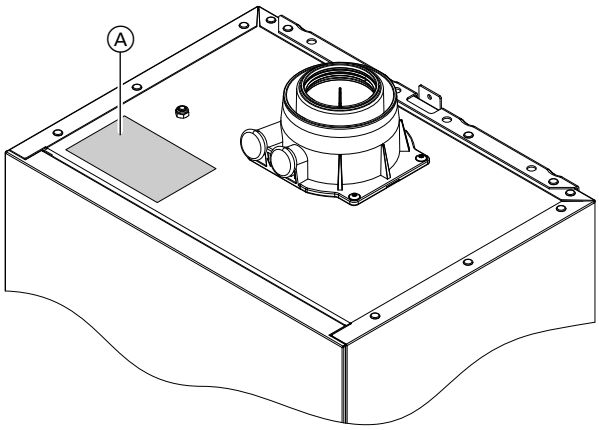


Fig. 1

Ⓐ Type plate with access code for appliance registration

The type plate of the heat generator contains extensive product information and an appliance-specific **access code with the marking "i"** for direct access to product-specific information and product registration on the internet.
The access code contains the credentials for the registration and product information portal, and the 16-digit serial number.

Note
A further label with the access code is enclosed with the heat generator.
Stick the label in the installation and service instructions so it can be easily found again for later use.

The Vitodens may generally only be delivered to the countries listed on the type plate. For deliveries to other countries, approved contractors must arrange individual approval on their own initiative and in accordance with the law of the country in question.

System examples

System examples with hydraulic and electrical connection diagrams and function descriptions are available to help setting up the heating system.

Detailed information on system examples can be found at: **www.viessmann-schemes.com**

Spare parts lists

Information about spare parts can be found at **www.viessmann.com/etapp** or in the Viessmann spare part app.

Download on the App Store

GET IT ON Google Play

Preparing for installation

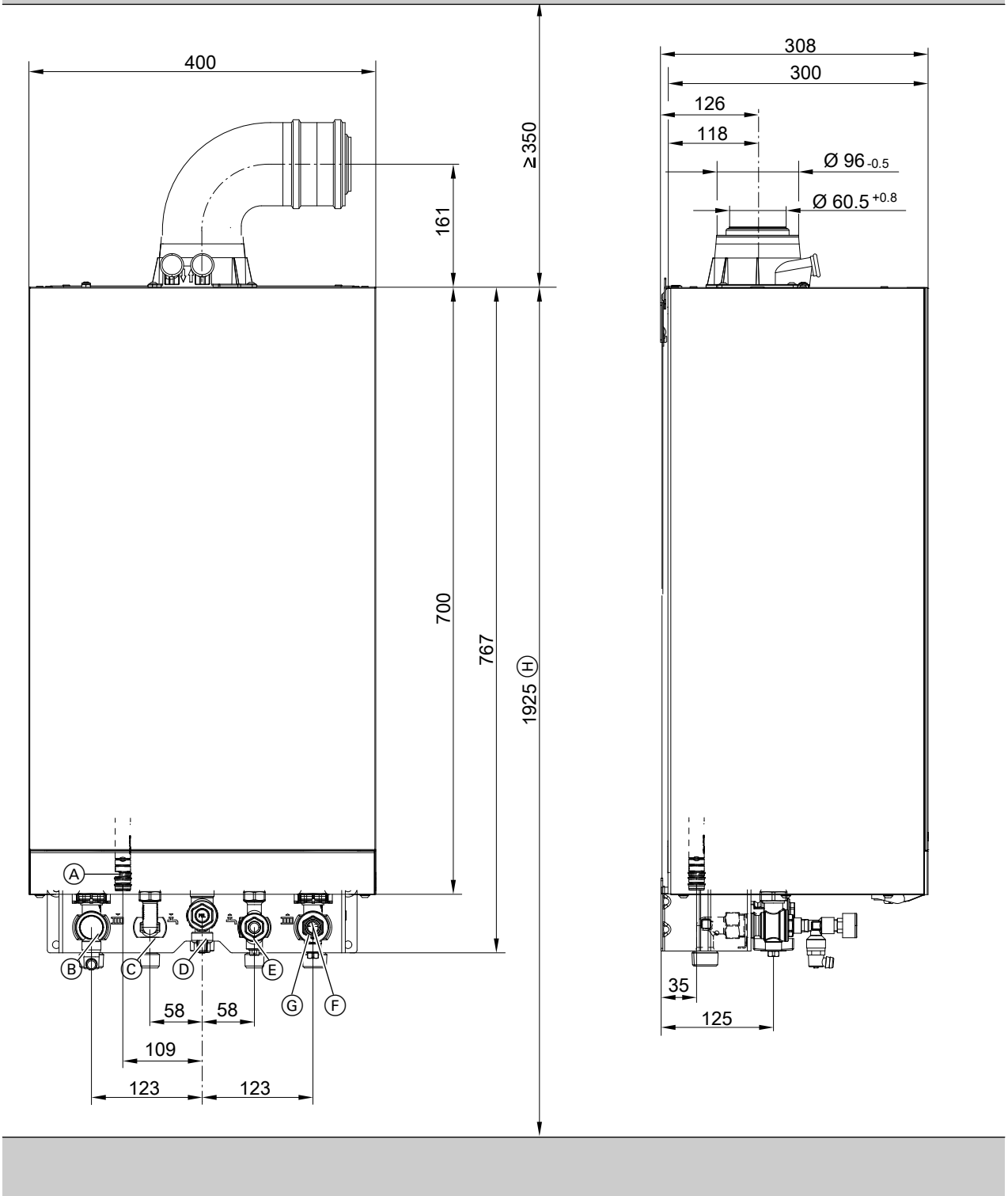


Fig. 2 Illustration shows a gas condensing combi boiler

Ⓐ Condensate drain
Ⓑ Heating flow
Ⓒ DHW (gas condensing combi boiler)
Cylinder flow (gas condensing system boiler)
Ⓓ Gas connection
Ⓔ Cold water (gas condensing combi boiler)
Cylinder return (gas condensing system boiler)
Ⓕ Heating return
Ⓖ Filling/draining
Ⓗ Dimension for siting with DHW cylinder below the boiler

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Preparing for installation (cont.)

Note
This boiler (IP rating: IP X4) is approved for installation in wet rooms inside safety zone 1, to DIN VDE 0100.
Exposure to jets of water must be prevented.
For open flue operation, the boiler may only be operated with a splash cover.
Observe the requirements of DIN VDE 0100.

1. Subject to order: Fit supplied pre-plumbing jig, mounting frame or wall mounting bracket in the relevant installation location.

   Installation instructions for pre-plumbing jig or mounting frame

   Note
   Check the condition of the wall where the boiler is to be installed. For the suitability of the supplied rawl plugs for various building materials, see manufacturer's instructions: Fischer expansion plugs SX 10 x 80
   For other construction materials, use fixing materials with sufficient load bearing capacity.

2. Prepare the water connections to the valves/fittings of the mounting bracket.
   Thoroughly flush the heating system.

   Please note
   To prevent damage to the appliance, connect all pipework so that it is free of load and torque stress.

   Note
   If an on-site expansion vessel also has to be installed: Install this expansion vessel in the cylinder return, as the 3-way diverter valve is located in the heating flow.
   Not possible with type B0KA, BPKA

3. Prepare the gas connection according to TRGI or TRF [or local regulations].

4. Prepare the electrical connections.
   - The appliance is delivered fitted with a power cable (approx. 2 m long).
     Note
     Connect the power cable to the electricity supply using a fixed connection.
   - Power supply: 230 V, 50 Hz, fuse rating max. 16 A
   - Accessory cables: 0.75 mm^2 flexible PVC cable with required number of cores for external connections
     Accessory cables: 1.5 mm^2 flexible PVC cable with required number of cores for external connections

Connection on the DHW side for gas condensing combi boiler

Cold water installation

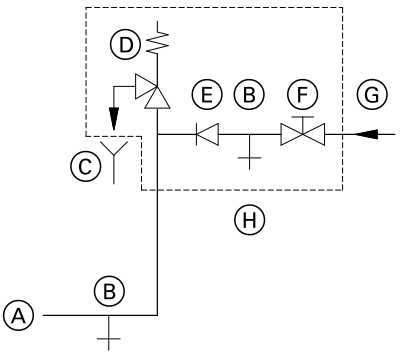

Fig. 3

Ⓐ Cold water connection of boiler
Ⓑ Drain outlet
Ⓒ Visible discharge pipe outlet point
Ⓓ Safety valve
Ⓔ Non-return valve
Ⓕ Shut-off valve
Ⓖ Cold water
Ⓗ Safety assembly

Safety assembly Ⓗ is included in the standard delivery and requires installing.
Only use a non-return valve or a combined shut-off and non-return valve in conjunction with a safety valve.
If the safety valve is used, the cold water shut-off valve on the boiler must not be shut off.
Remove the toggle on the cold water shut-off valve (if installed) to prevent manual shut-off.

Preparing for installation (cont.)

Shock arrestor

If draw-off points likely to cause water hammer are connected to the boiler's DHW network (e.g. flush valves, washing machines, dishwashers): Shock arrestors should be installed close to the cause of the water hammer.

Removing the boiler from the packaging

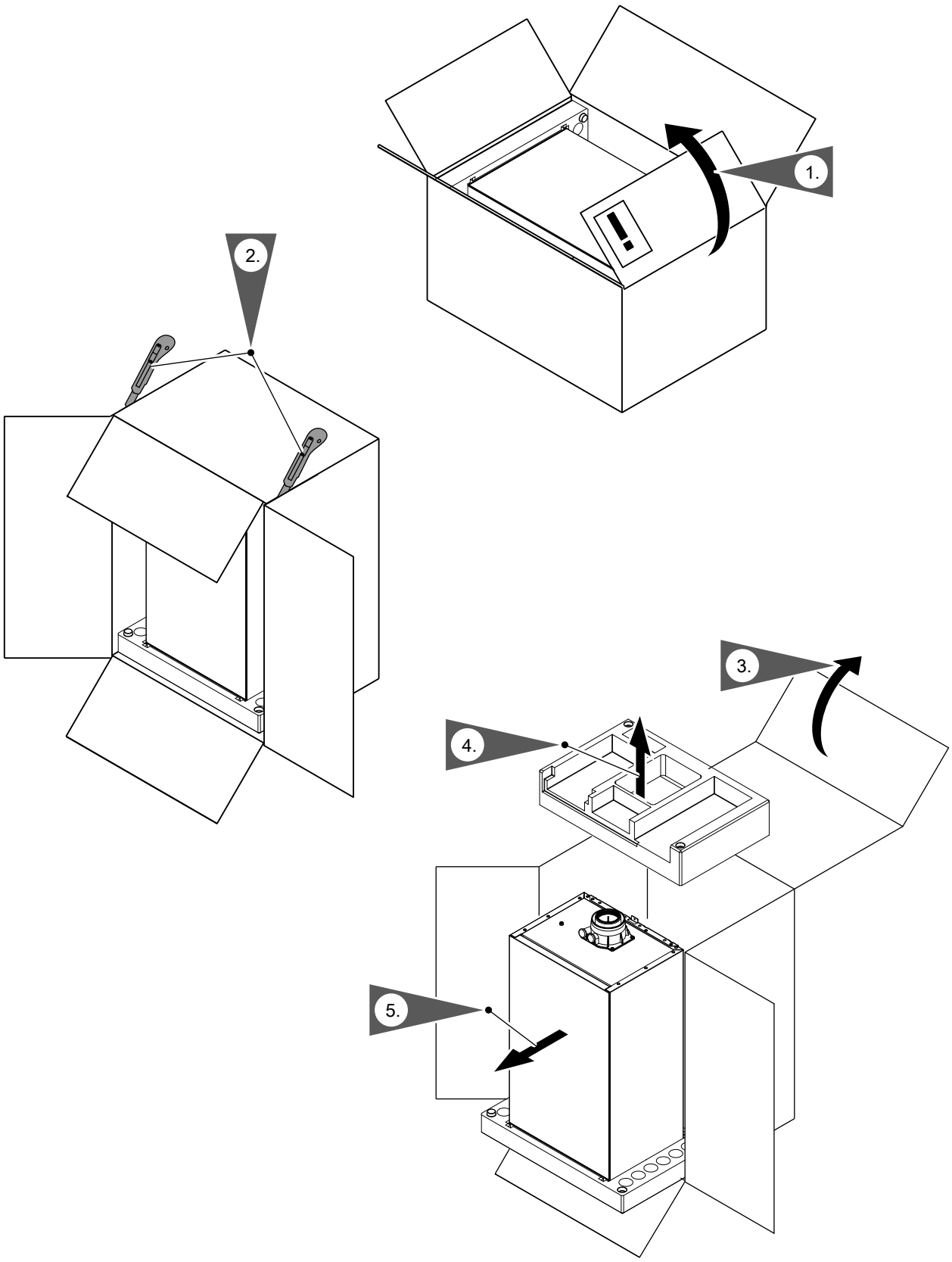

Fig. 4

Mounting the boiler and making connections

Removing the front panel

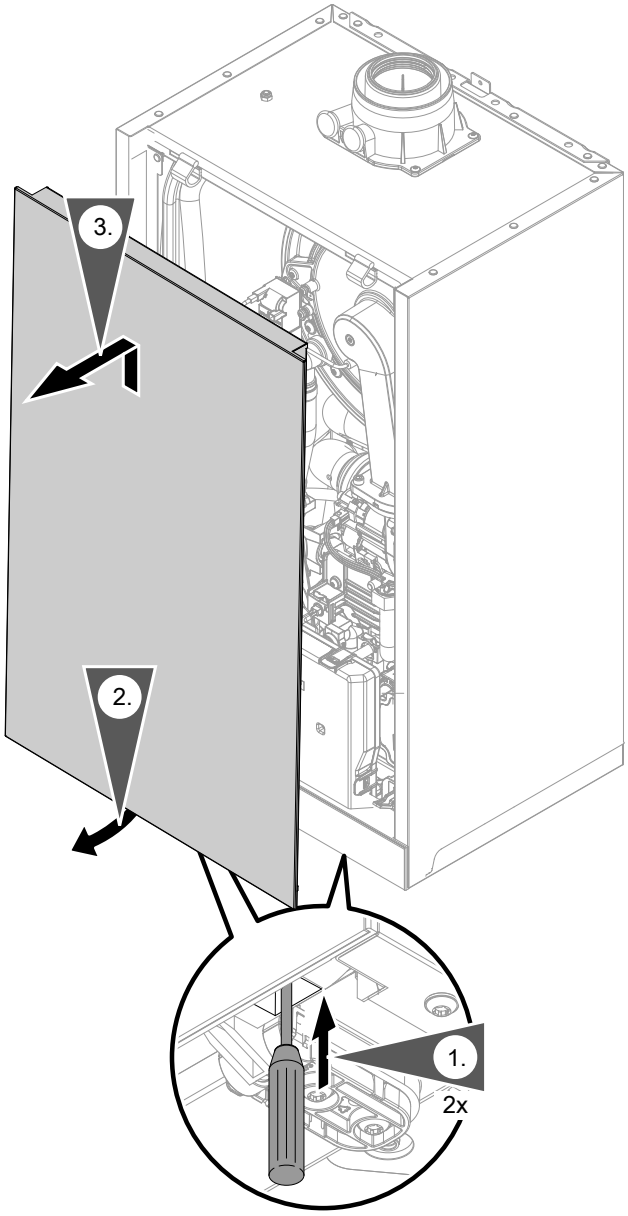

Fig. 5

1. Unlock the front panel on the underside (push in), using a screwdriver or similar tool.

2. Swivel the front panel forwards slightly and lift away upwards.

Mounting the boiler on the pre-plumbing jig or mounting frame

Note
Various installation components can be found in a separate pack. Keep the installation components safe, as they will be required for later installation.

Mounting the boiler and making connections (cont.)

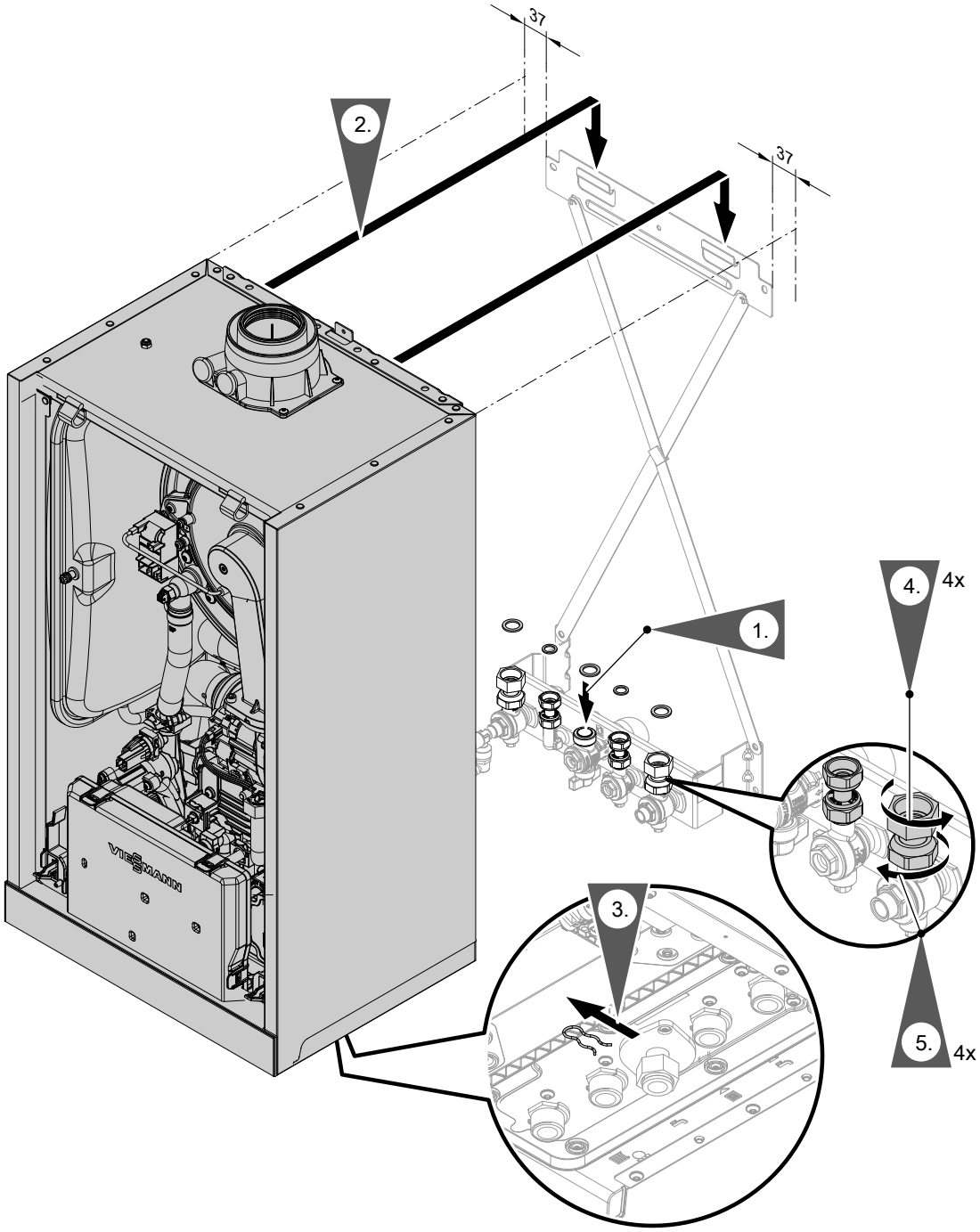

Fig. 6

Note
The diagram shows installation on a pre-plumbing jig for a gas condensing combi boiler.

The boiler can be installed on the following accessories:
- *Pre-plumbing jig*
- *Mounting frame*
- *Plumbing wall mounting frame*

1. Replace gaskets.

Internal gasket diameter:
- Gas connection Ø 18.5 mm
- Heating water side connections Ø 17.0 mm

Note
Gasket for gas connection is attached to the gas shut-off valve.

2. Suspend the Vitodens from the wall mounting bracket.

Note
After mounting, ensure correct seating.

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Mounting the boiler and making connections (cont.)

3. ***Note***
   Only remove the locking clip under the gas pipe union nut once the appliance has been installed. Clip is no longer required.

4. Tighten union nuts so that they form a tight seal.
   Tighten the union nuts as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Check for gas tightness to BSI 6891.

   Torque settings:
   - Union nuts G ¾: 30 Nm
   - Union nuts G ½: 24 Nm

   When carrying out any work on gas connection fittings, hold with a suitable tool. Never transfer any forces to the internal components.

5. Tighten locking ring fittings so that they form a tight seal:
   One turn beyond finger-tight.

Fitting the boiler to the wall mounting bracket

Note
Various installation components can be found in a separate pack. Keep the installation components safe, as they will be required for later installation.

Mounting the boiler and making connections (cont.)

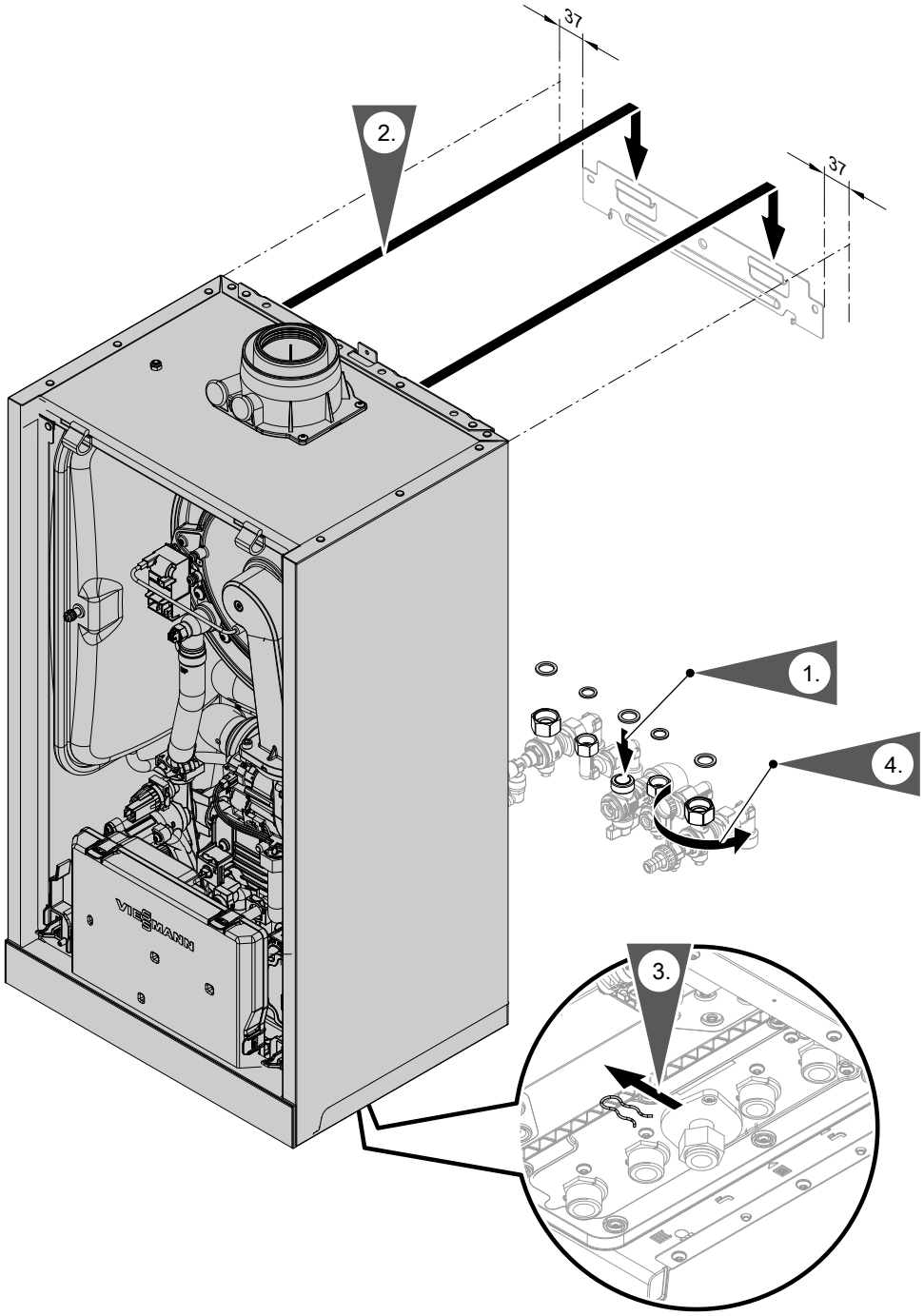

Fig. 7

1. Replace gaskets. Fit valves and gas shut-off valve.

Internal gasket diameter:
- Gas connection Ø 18.5 mm
- Connections on the heating water side Ø 17.0 mm

Note
Gasket for gas connection is attached to the gas shut-off valve.

2. Suspend the Vitodens from the wall mounting bracket.

3. ***Note***
Only remove the locking clip under the gas pipe union nut once the appliance has been installed. Clip is no longer required.

Mounting the boiler and making connections (cont.)

4. Tighten union nuts so that they form a tight seal. Tighten the union nuts as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life. Observe torque settings if a torque wrench is available.
Check for gas tightness to BSI 6891.

Torque settings:
- Union nuts G ¾: 30 Nm
- Union nuts G ½: 24 Nm

When carrying out any work on gas connection fittings, hold with a suitable tool. Never transfer any forces to the internal components.

Connections on the heating water and DHW sides

If the connections have not been fitted previously, make the connections on the heating water and DHW sides.

Gas condensing system boiler

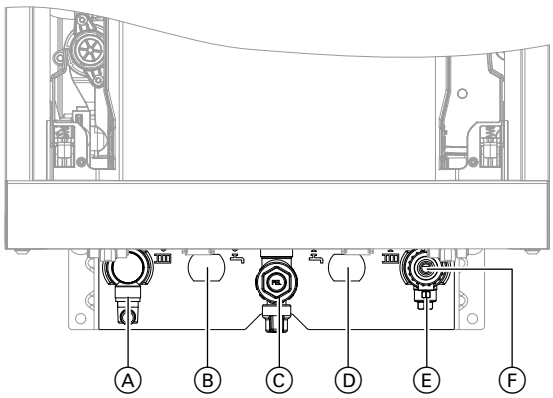

Fig. 8 Specifications for threads in conjunction with connection accessories

Ⓐ Heating flow R ¾ (male thread)
Ⓑ Cylinder flow G ¾ (male thread)
Ⓒ Gas connection R ¾ (male thread)
Ⓓ Cylinder return G ¾ (male thread)
Ⓔ Heating return R ¾ (male thread)
Ⓕ Filling/draining

Connection on the heating water side of the DHW cylinder:
The required intermediate pieces (Rp ¾, female thread) on the cylinder flow and return are part of the connection set for the DHW cylinder.
If no DHW cylinder is being connected, seal off the connections with caps.

Gas condensing combi boiler

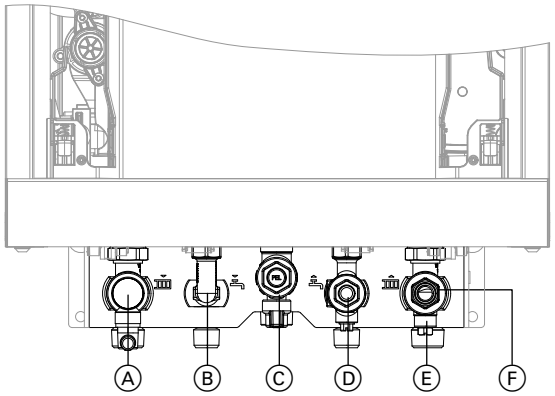

Fig. 9 Specifications for threads in conjunction with connection accessories

Ⓐ Heating flow R ¾ (male thread)
Ⓑ DHW R ½ (male thread)
Ⓒ Gas connection R ¾ (male thread)
Ⓓ Cold water R ½ (male thread)
Ⓔ Heating return R ¾ (male thread)
Ⓕ Filling/draining

Scald protection

DHW temperatures of over 60 °C can occur with gas condensing combi boilers. As a result, scald protection should be installed on site in the DHW pipe.

Condensate connection

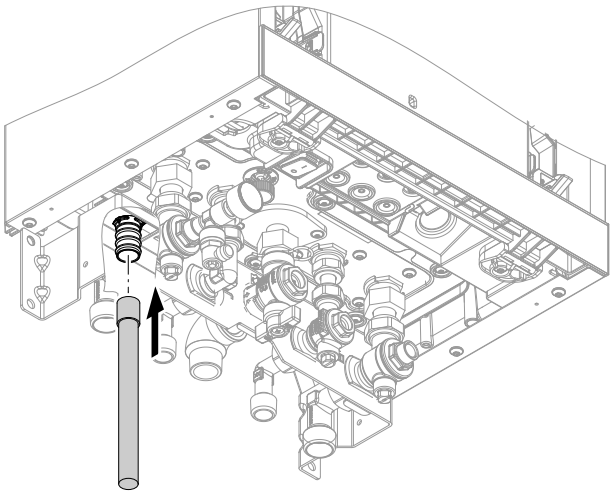

Fig. 10

1. Push the supplied drain hose on to the drain connector.

2. Connect the drain hose with a constant fall and a pipe vent to the drain network or a neutralising system.

Note
Route the onward drain line inside the building as far as possible.

If the onward drain line is routed outside the building:
- *Use a min. Ø 30 mm line.*
- *Protect the line from frost.*
- *Keep the line as short as possible.*

! **Please note**
The drain hose is used to route away any hot water discharged from the safety valve. Lay and secure the drain hose in a way that prevents any risk of scalding.

Note
Observe local waste water regulations.

Filling the trap with water

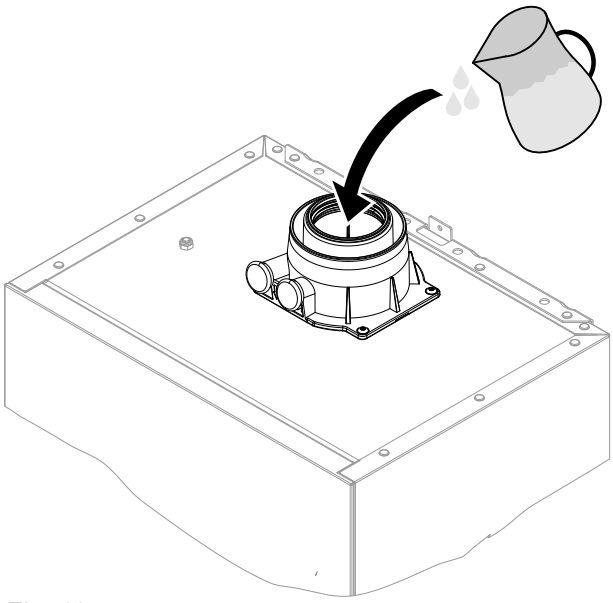

Fig. 11

Pour at least 0.3 l of water into the flue gas connection.

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

Note
If there is a risk of frost, only fill the trap just before commissioning.

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Flue gas connection

Note
The labels "System certificate" and "Skoberne GmbH or Groppalli flue system" enclosed with the technical documentation may only be used in conjunction with the Viessmann flue system made by Skoberne or Groppalli.

Connecting the balanced flue pipe
Flue system installation instructions

Connecting several Vitodens to a shared flue system

If multiple Vitodens are to be connected to a common flue system, suitable Vitodens appliances are available.

Note
Not all appliance types are approved for "multiple connection".
*Please order **suitable** Vitodens appliances; see pricelist.*

Note
In appliances for "multiple connection", a special back draught safety device is installed in the mixing shaft of the burner, downstream of the fan.
A further back draught safety device (order separately) must be installed in the flue system above the boiler flue connection.

Only carry out **commissioning** when the following conditions have been met:
- Unrestricted flow in the flue gas routes.
- Positive pressure flue system is gas-tight.
- Inspection port covers checked for secure and tight seating.
- Apertures for supplying sufficient combustion air are open and cannot be closed.
- All current regulations on installing and commissioning flue systems have been observed.

Danger
Leaking or blocked flue systems, or an inadequate supply of combustion air can cause life threatening poisoning from carbon monoxide in the flue gas.
Ensure the flue system is in good working order.
Vents for interconnected combustion air supply must be non-sealable.
Prevent condensate drainage via a wind protector.

Gas connection

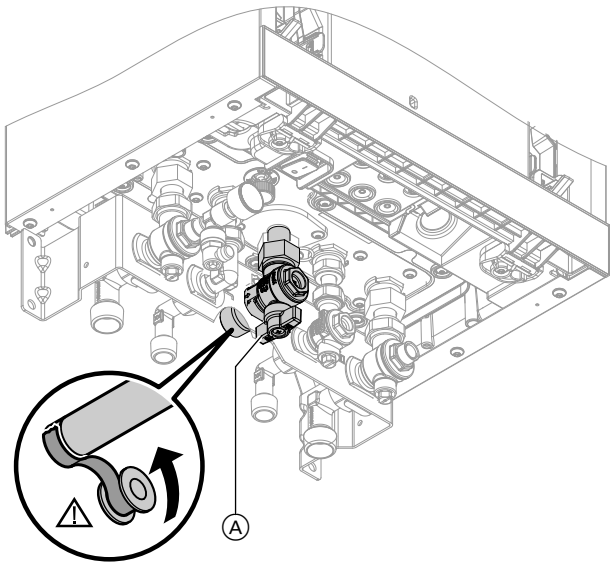

Fig. 12

1. If the gas connection has not been fitted previously, seal gas shut-off valve Ⓐ to the gas connection.
When carrying out any work on gas connection fittings, hold with a suitable tool. Never transfer any forces to the internal components.

2. Check for leaks.

Danger
Escaping gas leads to a risk of explosion.
Check all connections on the gas side (also inside the appliance) for tightness.

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

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

3. Purge the gas line.

Electrical connections

Opening the wiring chamber

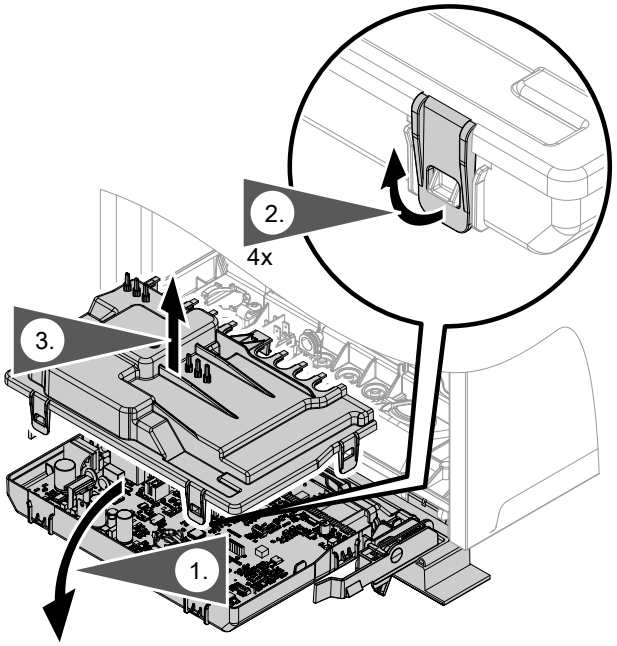

Fig. 13

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.

Layout of the electrical connections

Note
For further information on the connections, see the following chapters.

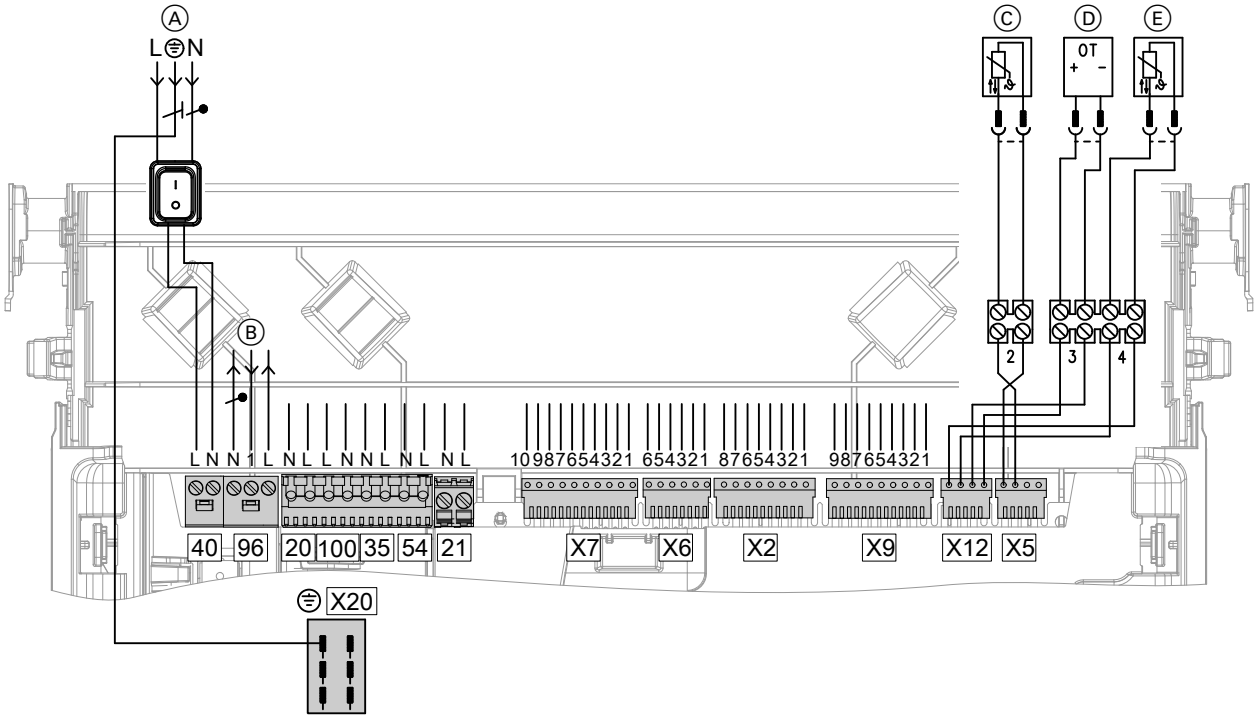

Fig. 14

Electrical connections (cont.)

Connections to 230 V~ plugs

Ⓐ Power supply 40
Ⓑ Configurable floating input 96, 230 V, 230 V output
Room thermostat connection 230 V
Ⓒ Cylinder temperature sensor (system boiler)
Ⓓ Remote control (OpenTherm controller)
Ⓔ Outside temperature sensor
20 Heating circuit pump
100 Fan motor
35 Gas solenoid valve
54 Ignition unit/ionisation
21 No function assigned
X20 Equipotential bonding (earth conductor)

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

On-site connections on the HBMU heat management unit

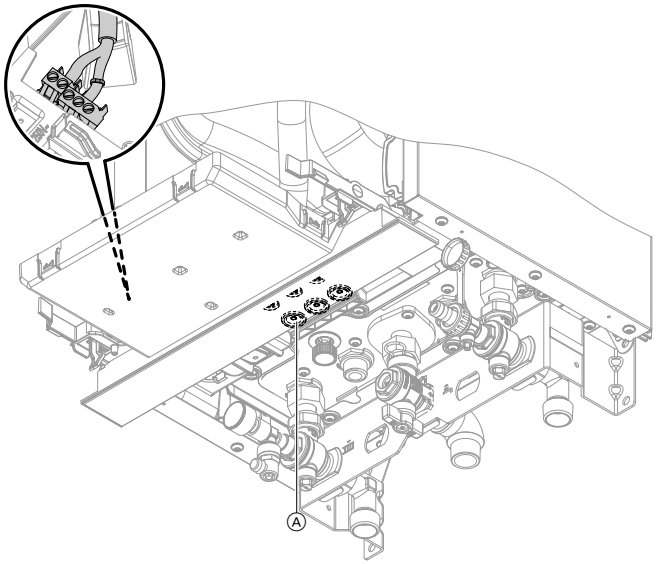

Fig. 15

Ⓐ Diaphragm grommets for cables

- Open diaphragm grommets as required. Thread through only one cable at a time without a plug. Ensure diaphragm grommets are airtight. If required, remove plug from cable. After threading the cable through, re-fit the plug to the wire ferrules.
- For cables without strain relief bushings, provide strain relief in the wiring chamber in the form of cable ties.

Outside temperature sensor

Fitting location for outside temperature sensor

- 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.

Outside temperature sensor connection

See page 23
2-core lead, length up to 35 m with a cross-section of 1.5 mm^2

Connecting the cylinder temperature sensor

Connect cylinder temperature sensor to terminals Ⓔ.
See page 23.

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Electrical connections (cont.)

Power supply 40

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

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 Regulation; BS 7671:2018
- Connection conditions of the local grid operator

- Install an isolator in the power cable to provide omnipolar separation from the mains for all active conductors, corresponding to overvoltage category III (3 mm) for complete isolation. The isolator must be fitted in the permanent electrical installation, in line with installation requirements.
  We also recommend installing a pulse current-sensitive RCD (RCD class A).
- Connect the power cable to the electricity supply using a fixed connection.
- If the power supply to the appliance is connected with a flexible power cable, ensure that the live conductors are pulled taut before the earth conductor in the event of strain relief failure. The length of the earth conductor wire will depend on the design.
- Max. fuse rating 16 A.

Danger
The absence of system component earthing can lead to serious injury from electric current if an electrical fault occurs.
The appliance and pipework must be connected to the equipotential bonding of the building.

Routing connecting cables/leads

Please note
If closures or diaphragm grommets are damaged, splashproofing is no longer ensured.
Never open or damage closures or unused diaphragm grommets on the underside of the appliance. Seal cable entries with fitted diaphragm grommets.

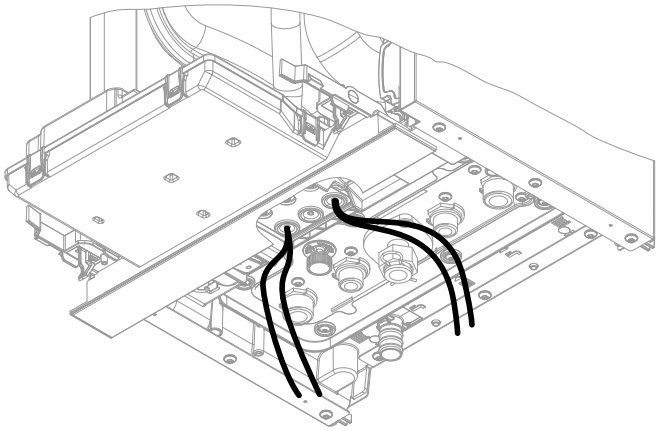

Fig. 16

Bundle cables using the supplied cable clips.
Route extra low voltage (ELV) leads < 42 V separately from cables > 42 V/230 V~.
Secure the cable clips on the underside using the supplied screws.
Do not route cables/leads over sharp edges and lying against the casing (sound transmission).

Please note
If connecting cables/leads come into contact with hot components, they will be damaged.
When routing and securing cables/leads on site, ensure that the maximum permissible temperatures for these cables/leads are not exceeded.

WiFi operational reliability and system requirements

WiFi router system requirement
- WiFi router with activated WiFi:
  The WiFi router must be protected by a sufficiently secure WPA2 password.
  The WiFi router must always have the latest firmware update.
  Do not use unencrypted connections between the heat generator and the WiFi router.
- Internet connection with high availability:
  Flat rate (flat rate tariff **without** restriction on time or data volume)
- Dynamic IP addressing (DHCP, delivered condition) in the network (WiFi):
  Have this checked on site, and if required set up, by an IT expert **prior to** commissioning.
- Set routing and security parameters in the IP network (LAN):
  Enable port 80, port 123, port 443 and port 8883 for direct outward connections.
  Have this checked and, if necessary, set up on site by an IT expert **before** commissioning.

Wireless signal range of WiFi connection

The range of wireless signals may be reduced by walls, ceilings and interior fixtures. These weaken the wireless signal, causing poor reception due to the following circumstances.
- On their way between transmitter and receiver, wireless signals are **damped**, e.g. by air or when penetrating walls.
- Wireless signals are **reflected** by metallic objects e.g. reinforcements embedded in walls, metal foil of thermal insulation and thermal glazing with metallised thermal vapour deposit.
- Wireless signals are **isolated** by service ducts and lift shafts.
- Wireless signals are **disrupted** by devices that also operate with high frequency signals. Maintain a distance of **at least 2 m** from these devices:
  - Computers
  - Audio and video systems
  - Devices with active WiFi connection
  - Electronic transformers
  - Pre-ballasts

Install the heat generator as close as possible to the WiFi router to ensure a good WiFi connection. The signal strength can be displayed on the heat generator (see the operating instructions).

Note
The WiFi signal strength can be increased with commercially available WiFi repeaters.

Angle of penetration

The reception quality remains best if radio signals hit the walls vertically.
Depending on the angle of penetration, the effective wall thickness changes and so does the extent to which the electromagnetic waves are damped.

Flat (unfavourable) angle of penetration

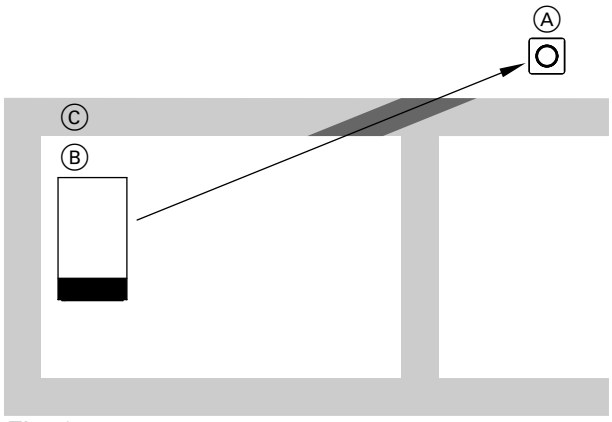

Fig. 17

Ⓐ WiFi router
Ⓑ Heat generator
Ⓒ Wall

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WiFi operational reliability and system… (cont.)

Ideal angle of penetration

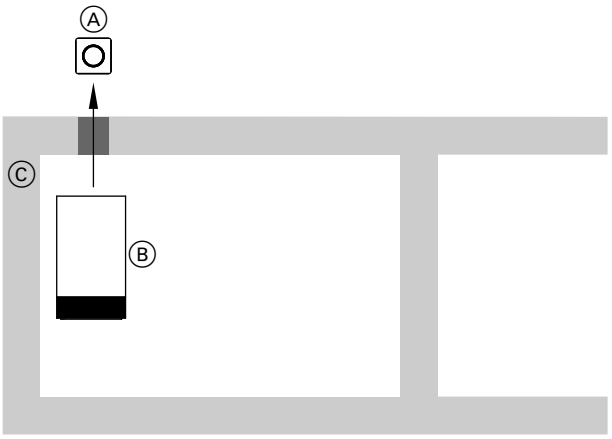

Fig. 18

Ⓐ WiFi router
Ⓑ Heat generator
Ⓒ Wall

Closing the wiring chamber

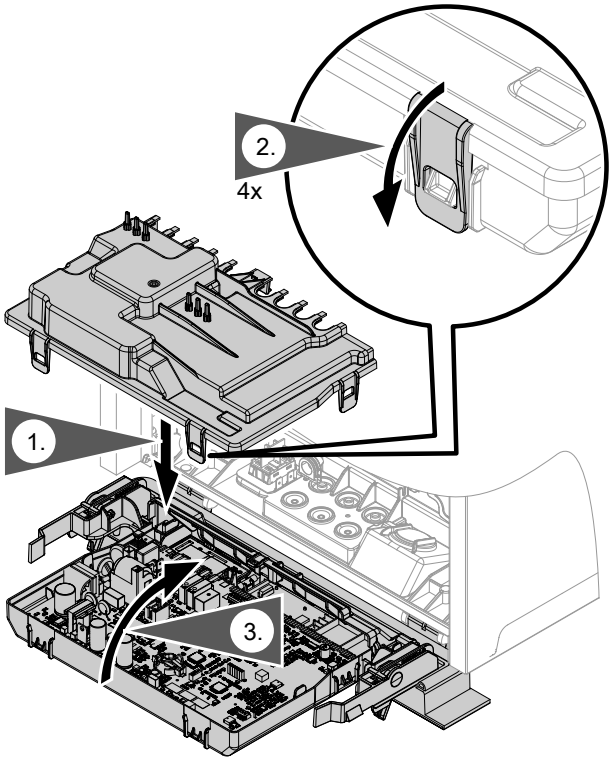

Fig. 19

Fitting the front panel

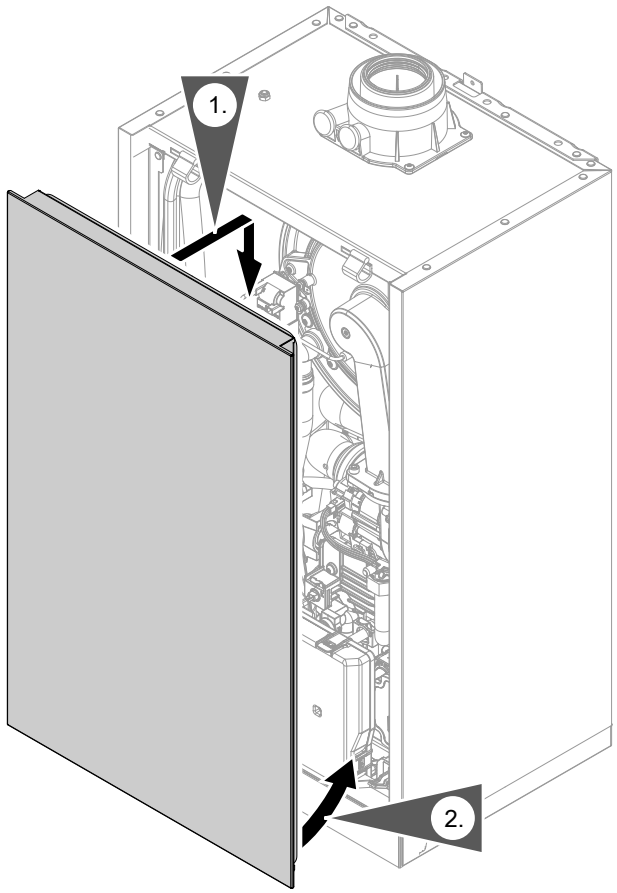

Fig. 20

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Steps - commissioning, inspection and maintenance

Commissioning steps
Inspection steps
Maintenance steps

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Commissioning the system

Please note
Only commission the appliance with a fully filled trap.
Check that the trap has been filled with water.

Commissioning via commissioning assistant

1. Open the gas shut-off valve.

2. If the appliance has not been switched on yet: Turn on the ON/OFF switch.
   Calling up the commissioning assistant:
   1. ☰ and **OK** should be pressed simultaneously for approx. 4 s.
   2. Use ∧/∨ to select **"b.5"** and confirm with **"OK"**.
      Note
      ***AP** and ((·)) appear on the display. Confirm with **OK** to start the connection with the software tool: See chapter "Commissioning via software tool".*
   3. ☰ should be pressed for 4 s to start the commissioning assistant via the heat generator display.

3. For further steps, see commissioning assistant in the following overview.

Commissioning via software tool

Note
Apps for commissioning and service are available for iOS and Android devices.

Download on the App Store

GET IT ON Google Play

1. Open the gas shut-off valve.

2. **AP** and ((·)) appear on the display.
   Press **OK** to carry out commissioning with the software tool.

3. Select **ON** and confirm with **OK**.

4. Follow the instructions in the software tool.

Commissioning the system (cont.)

Commissioning assistant sequence	Explanations and references
Commissioning	
"C.1" Filling program	ON = on OF = off ***Note*** *It is possible to interrupt or end the process while a rotating rectangle alternating with the current system pressure is displayed; to do so, press ≡ for 3 s.*
"C.2" Venting program	ON = on OF = off ***Note*** *It is possible to interrupt or end the process while a rotating rectangle alternating with the current system pressure is displayed; to do so, press ≡ for 3 s.*
"C.3" Gas type	2 - Natural gas CPG
"C.5" Flue system	1 - Open flue 60 mm 2 - Room sealed 60/100 mm 3 - Open flue 80/125 mm 4 - Room sealed 80/125 mm
"C.6" Flue length	Given in full metres (round up if necessary) ***Note*** *An additional length of 1 m must be factored in for every flue bend.*
"C.7" Operating mode	4 - Weather-compensated 13 - Constant operation with optional room thermostat 14 - OpenTherm 15 - Individual room control 16 - Individual room control with modulation ***Note*** *Operating modes 15 and 16 can only be set via the software tool.*
"C.8" System scheme (depending on appliance type, not all schemes possible)	1 - 1 direct heating circuit without low loss header 3 - 1 direct heating circuit without low loss header with DHW cylinder
"C.9" External heating circuit hook-up	***Note*** *Only for weather-compensated operation.* 0 - No external heating circuit hook-up 1 - External heating circuit hook-up HC1
	After the final setting has been completed, **"En"** appears on the display. Confirm with **"OK"**. When commissioning is started, the flue temperature sensor test is launched and **"Fs"** appears on the display.
The system carries out a restart.	

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Commissioning the system (cont.)

Automatic flue gas temperature sensor check

The display shows: **"Er"**
If the flue gas temperature sensor is not positioned correctly, fault message 416 appears.
For further details regarding the flue gas temperature sensor test, see "Repairs".
If fault message 416 appears, reposition the flue gas temperature sensor in the flue gas connection. Check for leaks on the flue gas side.

Note
The burner remains locked out until the test has been passed.

When the fault has been remedied, turn the ON/OFF switch off and back on again.

Switching WiFi ON/OFF

The appliance is equipped with an integrated WiFi communication module with extended type plate.
The internal communication module supports commissioning of the heat generator with the "Vitoguide app", connectivity with the "ViCare app" and the connection to the "Vitoguide" digital service centre.
The access details required for establishing a connection are recorded in the form of an access code with **"WiFi symbol"**. Three copies of this code are located on the rear of the programming unit.
Before installing the programming unit, remove the access code labels from the rear. For commissioning, affix one label to the space marked out on the type plate.
Switch on the WiFi connection and establish a connection to the router; see also page 26.

Note
*If **"E10"** is displayed, the connection to the home network could not be established. Check the router and the network password.*
*If **"E12"** is displayed, the connection to the server could not be established. Re-establish the connection at a later time.*

Activating the internet connection:

Operating instructions

Affix a further credentials label here, so it can be found for subsequent use:

Fig. 21

Affix a label in the operating instructions.

Note
If the communication module is to be switched on or off, press ∧ ∨ simultaneously for 4 s.

Filling the heating system

Fill water

As a heat transfer medium for DHW heating, the heating water must meet fluid category ≤ 3. This requirement is met if water of potable quality is used as heating water. For example, if additives are used, the additive manufacturer must specify which category the treated heating water comes under.

Please note
Unsuitable fill water increases the level of deposits and corrosion and may lead to appliance damage.
- Flush the heating system thoroughly before filling.
- Only use fill water of potable water quality.
- Special antifreeze suitable for heating systems can be added to the fill water. The antifreeze manufacturer must verify its suitability.
- Fill and top-up water with a water hardness in excess of over 300 ppm must be softened, e.g. with a small softening system for heating water.

Filling the heating system (cont.)

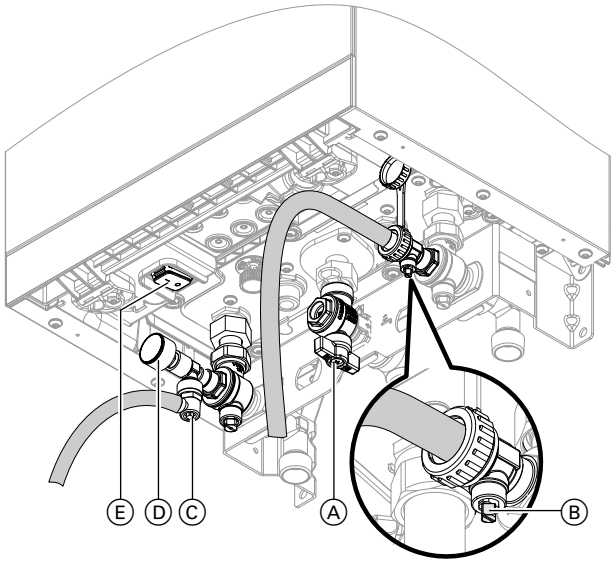

Fig. 22

Ⓔ ON/OFF switch

1. Check the pre-charge pressure of the expansion vessel.
2. Close gas shut-off valve Ⓐ.
3. Activate the filling function (see commissioning assistant or following chapter).
4. Fill the heating system at boiler drain & fill valve Ⓑ in the heating return (on the connection set or on site). Minimum system pressure > 1.0 bar (0.1 MPa). Check the system pressure at pressure gauge Ⓓ. The indicator must be in the green band. If necessary, open the on-site air vent valves.

   Note
   Ensure that the safety valve does not respond when you are filling the system. If the flow rate through the safety valve becomes too high, water may enter the combustion chamber.

5. Fit hose to air vent valve Ⓒ. Route the hose into a suitable container or drain outlet.
6. Close the shut-off valves on the heating water side.
7. Open air vent valve Ⓒ and fill valve Ⓑ in the heating return. Vent (flush) under mains pressure until no more air noise is audible.
8. Close air vent valve Ⓒ and boiler drain & fill valve Ⓑ.
   Check the system pressure at pressure gauge Ⓓ. The indicator must be in the green band.
9. Open the shut-off valves on the heating water side.

Activating the filling function

If the filling function is to be activated after commissioning.

Tap the following buttons:

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.5"** for the commissioning assistant.
3. **OK**
4. The display shows **"AP"**.
   Press ☰ for 4 s.
5. Use ∧/∨ to select **"C.1"** for the filling function.
6. **OK**
7. ∧/∨ to select **"ON"** for filling.

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Filling the heating system (cont.)

8. **OK**
   The filling function is activated. The display shows a rotating rectangle.
   The filling function ends automatically after 20 min or press ☰ for 4 s.

Checking all connections on the heating water and DHW sides for leaks

⚠ **Danger**
Risk of electric shock from escaping heating water or DHW.
When commissioning and after carrying out maintenance work, check all water side connections for leaks.

Venting the heating system

1. Close the gas shut-off valve and switch the appliance ON.
2. Activate the venting program (see commissioning assistant or following chapter).
3. Adjust the system pressure.
   The display shows the system pressure.
4. Disconnect the supply hose from the boiler drain & fill valve.
5. Open the gas shut-off valve.

Activating the venting function

If the venting function is to be activated after commissioning.

Tap the following buttons:

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.5"** for the commissioning assistant.
3. **OK**
4. The display shows **"AP"**.
   Press ☰ for 4 s.
5. Use ∧/∨ to select **"C.2"** for ventilation.
6. **OK**
7. ∧/∨ should be used to select **"ON"** to switch on the ventilation.
8. **OK**
   The venting function is activated. The display shows a rotating rectangle.
   The venting function ends automatically after 20 min, or press ☰ for 4 s.

Checking the gas type

The boiler is equipped with an electronic combustion controller that adjusts the burner for optimum combustion in accordance with the prevailing gas quality.

- For operation with natural gas, no adjustment is therefore required across the entire Wobbe index range. The boiler can be operated within the Wobbe index range 9.5 to 15.2 kWh/m³ (34.2 to 54.7 MJ/m³).

1. Check with your gas supply utility regarding the gas type and Wobbe index.
2. Record the gas type in the service report.

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Removing the front panel

Danger
Contact with live components can lead to serious injury from electric current. Some components on PCBs remain live even after the power supply has been switched off.

- **Never touch** the wiring chambers (control unit and power supply connections).
- When working on the appliance, isolate the system from the power supply, e.g. at a separate MCB/fuse or a mains isolator. Check the system is no longer live and safeguard against reconnection.
- Prior to working on the appliance, wait at least 4 min until the voltage has completely dropped out.

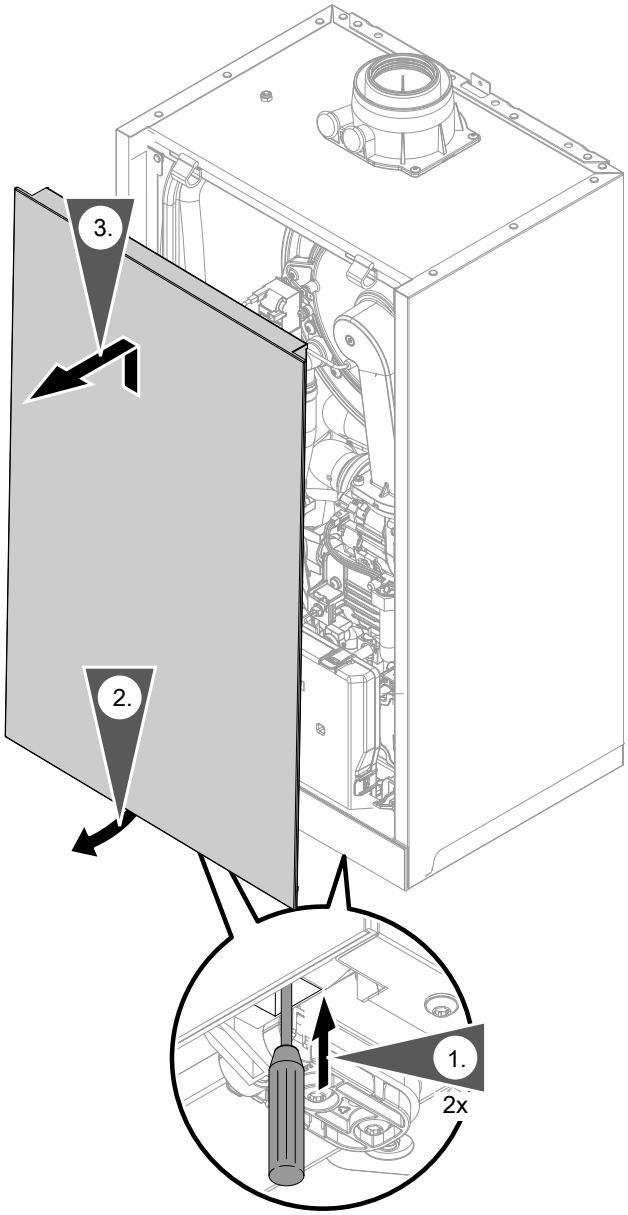

Fig. 23

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Checking the static pressure and supply pressure

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

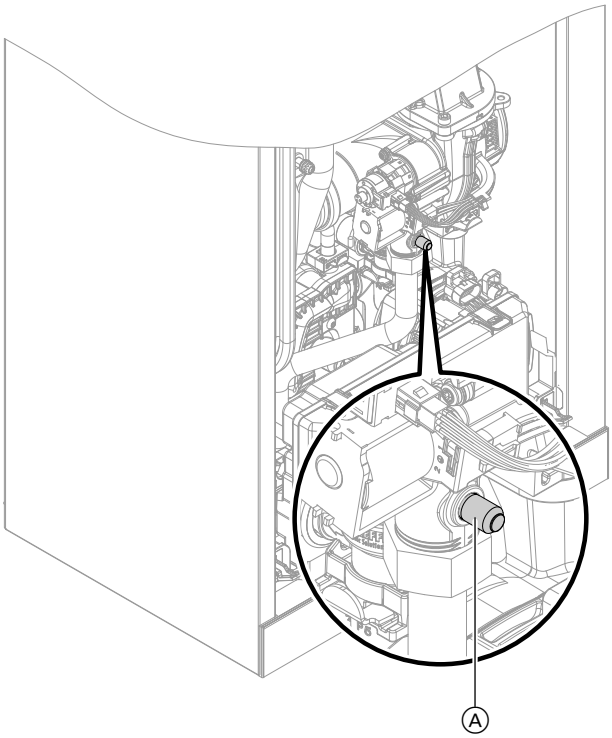


Fig. 24

1. Turn off the ON/OFF switch.
2. Close gas shut-off valve.
3. Undo screw Ⓐ inside test connector on the gas solenoid valve, but do not remove it. Connect the pressure gauge.
4. Open the gas shut-off valve.
5. Measure the static pressure and record it in the report.
   Set value: Max. 57.5 mbar (5.75 kPa).
6. Turn on the ON/OFF switch and start the boiler.

   Note
   During commissioning, the appliance can enter a fault state if there are airlocks in the gas line. Reset the appliance after approx. 5 s (see operating instructions).
7. Measure the supply (flow) pressure. For set values, see the following table.

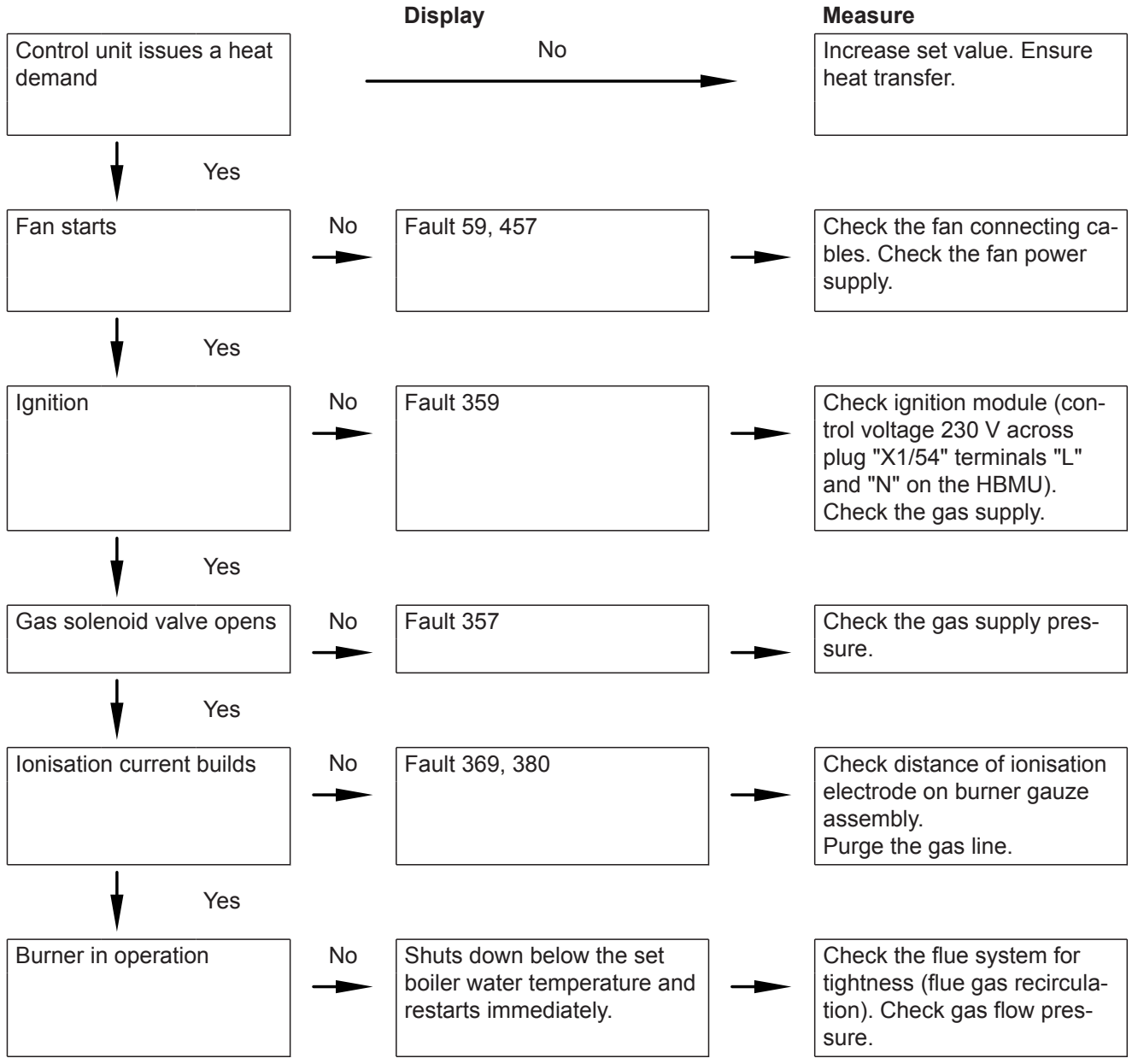
   Note
   Use a suitable measuring device with a resolution of at least 0.1 mbar (0.01 kPa) to check the supply pressure.
8. Record the measured value in the report. Implement measures as indicated in the table below.
9. Shut down the boiler. Close gas shut-off valve. Remove pressure gauge. Close test connector Ⓐ with the screw.
10. 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 Ⓐ.
11. Fit front panel (see installation sequence).

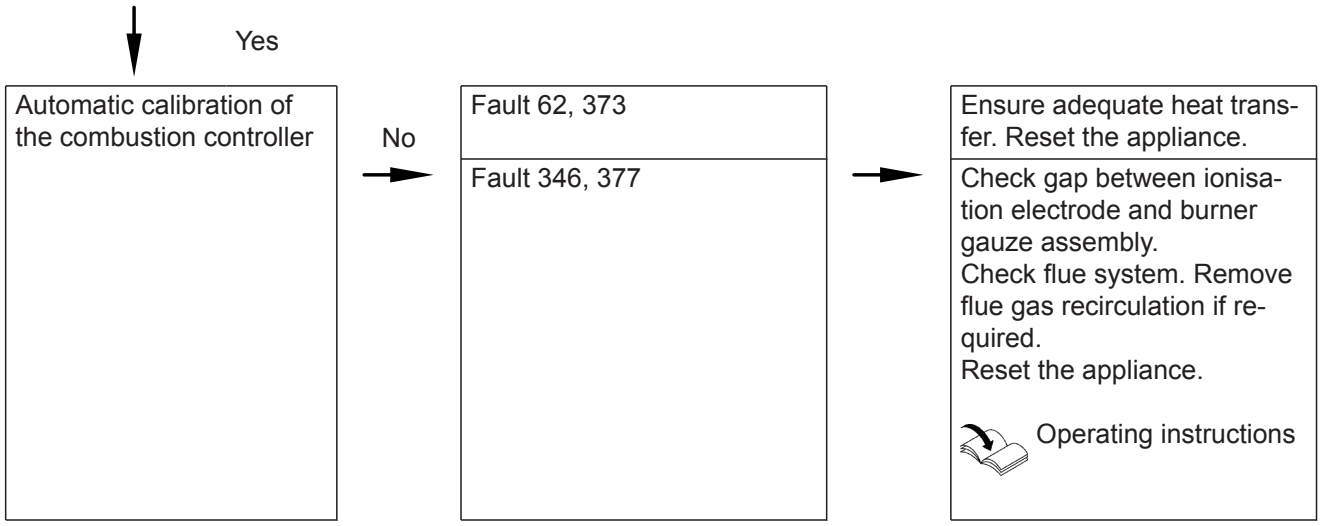
Checking the static pressure and supply pressure (cont.)

Supply pressure (flow pressure)	Measures
For natural gas	
< 20 mbar (2.0 kPa)	Do not start the boiler. Notify the gas supply utility.
20 - 25 mbar (2.0 - 2.5 kPa)	Start the boiler.
> 25 mbar (2.5 kPa)	Install a separate gas pressure governor upstream of the system. Set the pre-charge pressure to 20 mbar (2.0 kPa) for natural gas. Notify the gas supply utility.

Function sequence and possible faults



Function sequence and possible faults (cont.)



For further details regarding faults, see "Troubleshooting".

Setting the maximum heating output

A limit can be set on the maximum heating output for **heating mode**. The limit is set via the modulation range.

Note
The flow rate must be checked before the max. heating output can be adjusted. Ensure adequate heat transfer.

Tap the following buttons:

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.2"** for system configuration.
3. **OK**
4. Use ∧/∨ to select **"7"** for max. heating output.
5. **OK**
6. Use ∧/∨ to set the required value in % of rated heating output. Delivered condition 100 % (100 % = **"HI"** on the display).
7. **OK**

Performing an actuator test

The actuator test can only be set via the software tool.

Adjusting pump rate of integral circulation pump

Operation of the integral circulation pump as heating circuit pump for heating circuit 1

The pump speed and consequently the pump rate are controlled subject to the outside temperature and the switching times for heating mode or reduced mode. The max. speed for heating mode can be matched to the existing heating system at the control unit.

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Adjusting pump rate of integral circulation pump (cont.)

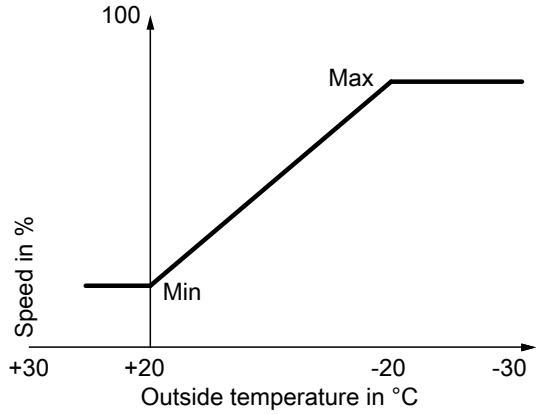

Fig. 25

- In the delivered condition, the minimum pump rate and the maximum pump rate are set to the following values:

Rated heating output in kW	Speed settings in the delivered condition in %	
	Min. pump rate	Max. pump rate
19	40	100
25	40	100

- In the following system conditions, the internal circulation pump is operated at a constant speed:
  – Constant operation

Setting (%) in system configuration: See page 51.

Residual head of integral circulation pump

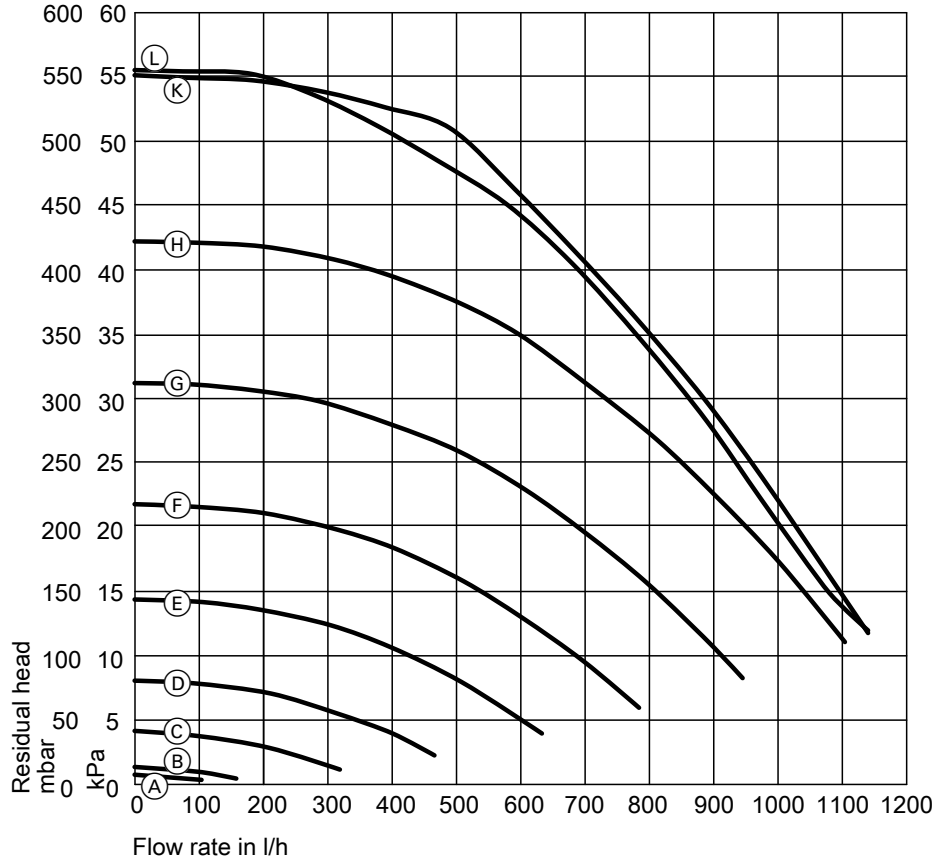

Fig. 26

Adjusting pump rate of integral circulation pump (cont.)

Curve	Pump rate of circulation pump
Ⓐ	10 %
Ⓑ	20 %
Ⓒ	30 %
Ⓓ	40 %
Ⓔ	50 %
Ⓕ	60 %
Ⓖ	70 %
Ⓗ	80 %
Ⓚ	90 %
Ⓛ	100 %

Leak test on balanced flue system (annular gap check)

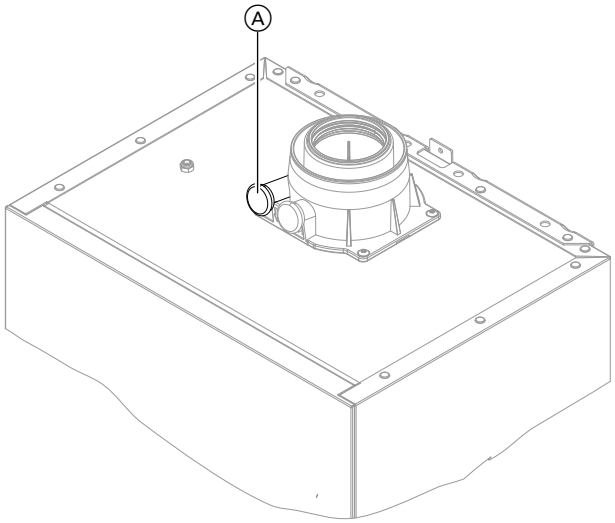

Fig. 27

Ⓐ Combustion air aperture

For balanced flue systems tested together with the heat generator, there is no requirement for a tightness test (overpressure test) during commissioning by the flue gas inspector.
In this case, we recommend that a simple tightness test is carried out during system commissioning. For this, check the CO_2 or O_2 concentration in the combustion air at the annular gap of the balanced flue pipe.
If the CO_2 concentration is less than 0.2 % or the O_2 concentration is greater than 20.6 %, the flue pipe is deemed to be sufficiently gas-tight.

If actual CO_2 values are greater or O_2 values are lower, then pressure test the flue pipe with a static pressure of 200 Pa.

Please note
If the test port is not sealed, combustion air is drawn in from the room.
After the tightness test, re-seal the test port with the plug.

Burner adjustment when connecting multiple flues to a shared flue system

Note
Only make this adjustment on appliances suitable for multiple connection.
For suitable Vitodens appliances, see pricelist.

When connecting several Vitodens 050-W to a common flue system:

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Burner adjustment when connecting multiple… (cont.)

For multiple connection, in the **commissioning assistant** use **"C.5"** and **"C.6"** to match the burner setting to the flue system. See page 30.

System conditions:
- Shared flue in shaft ∅ 100 mm
- Balanced flue connection pipe from boiler to shaft, ∅ 80/125 mm
- Minimum shaft cross-section
  - Square: 175 x 175 mm
  - Round: ∅ 195 mm
- Height between floors min. 2.5 m
- Max. 6 boilers with the same rated heating output connected to the flue system

Removing the burner

Danger
Contact with live components can lead to serious injury from electric current. Some components on PCBs remain live even after the power supply has been switched off.
- **Never touch** the wiring chambers (control unit and power supply connections).
- When working on the appliance, isolate the system from the power supply, e.g. at a separate MCB/fuse or a mains isolator. Check the system is no longer live and safeguard against reconnection.
- Prior to working on the appliance, wait at least 4 min until the voltage has completely dropped out.

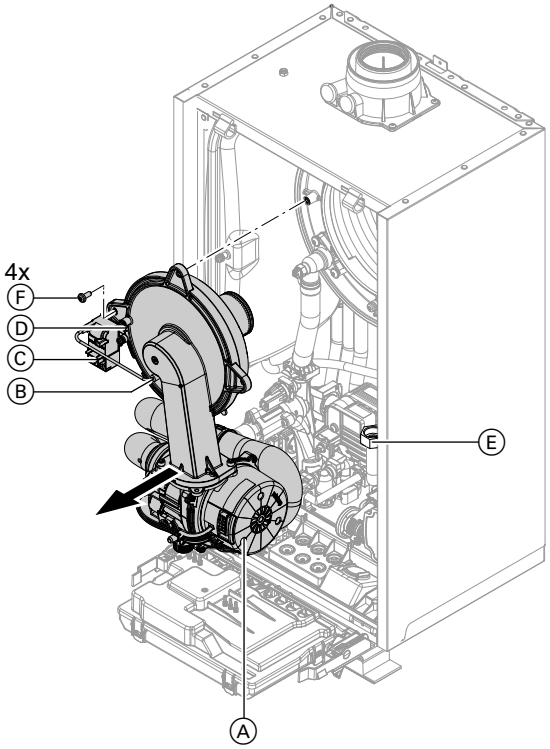

Fig. 28

1. Turn off the ON/OFF switch.
2. Close the gas shut-off valve and safeguard against reopening.
3. Disconnect cables and leads from:
   - Fan motor Ⓐ (2 plugs)
   - Ionisation electrode Ⓑ
   - Ignition unit Ⓒ
   - Earth Ⓓ
4. Undo gas supply pipe fitting Ⓔ.
5. Undo 4 screws Ⓕ and remove the burner.

Note
Cover gas connection Ⓔ so that no small parts can fall into it.

Checking the burner gasket and burner gauze assembly

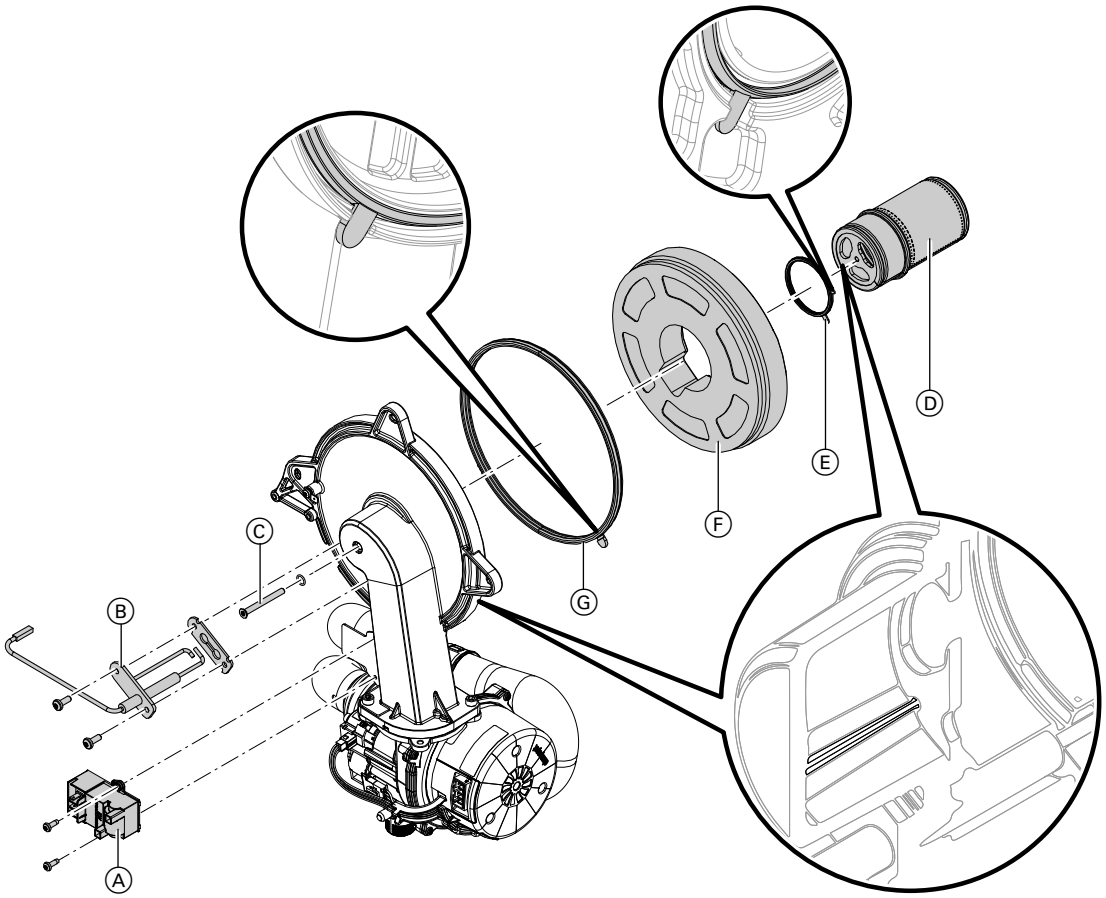

Fig. 29

Check burner gauze assembly Ⓓ, electrodes Ⓑ, thermal insulation ring Ⓕ and gasket Ⓖ for damage. Only remove and replace components if they are damaged or worn.

Note
If replacing the burner gauze assembly, also replace the gauze assembly gasket and the fixing screw.

1. Disconnect plug with ignition electrode leads from ignition unit Ⓐ.
2. Remove electrodes Ⓑ.
3. Undo Torx screw Ⓒ. Hold onto burner gauze assembly Ⓓ when undoing the screw.
4. Remove burner gauze assembly Ⓓ with gasket Ⓔ and thermal insulation ring Ⓕ. Check components for damage.
5. Install new burner gasket Ⓖ. Observe correct installation position. Align the tab as per the diagram.
6. Insert thermal insulation ring Ⓕ and burner gauze assembly Ⓓ with gasket Ⓔ. Observe correct installation position. Align the tab as per the diagram.
7. Align the hole in burner gauze assembly Ⓓ with the burner door pin.
   Secure burner gauze assembly Ⓓ and gasket Ⓔ with Torx screw Ⓒ.
   Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Torque: 3.0 Nm.
8. Check thermal insulation ring Ⓕ for firm seating.
9. Fit electrodes Ⓑ. Check clearances, see following chapter.
   Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Torque: 4.5 Nm.

Checking and adjusting the ignition and ionisation electrodes

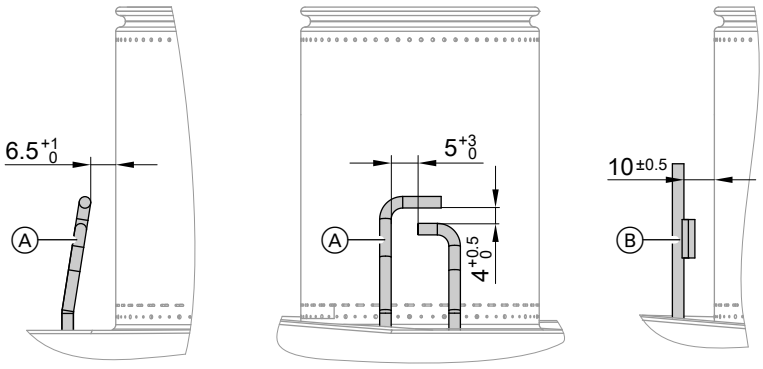

Fig. 30

Ⓐ Ignition electrodes
Ⓑ Ionisation electrode

1. Check the electrodes for wear and contamination.
2. Clean the electrodes with a small brush (not a wire brush) or sandpaper.
3. Check the electrode gaps. If the gaps are not as specified or the electrodes are damaged, replace the electrodes and gaskets and adjust them as required.
   Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Tighten the electrode fixing screws to a torque of 4.5 Nm.

Checking the back draught safety devices

Only for multiple connection to a flue system or multi boiler systems with a flue gas cascade

Back draught safety device in the mixing shaft of the burner

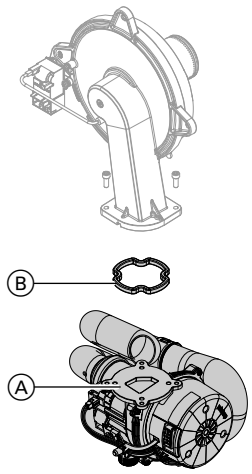

Fig. 31

1. Undo 2 screws and remove fan Ⓐ.
2. Remove back draught safety device Ⓑ.
3. Check the damper and gasket for dirt and damage. Replace if necessary.
4. Refit back draught safety device Ⓑ.

   Note
   Observe correct installation position.

5. Refit fan Ⓐ and secure with 2 screws.
   Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Torque: 4.0 Nm

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Checking the back draught safety devices (cont.)

Back draught safety device in the flue gas connection

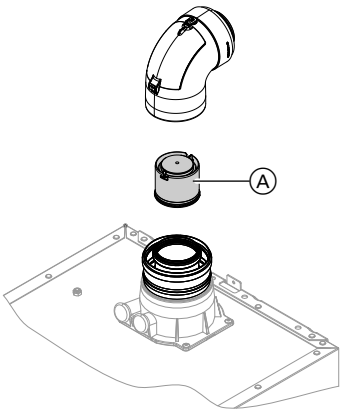

Fig. 32

1. Remove the balanced flue system.

   Note
   If the balanced flue system cannot be removed, clean and check the back draught safety device via the inspection cover.

2. Check back draught safety device Ⓐ for dirt, ease of movement and function.

3. Refit the balanced flue system.

4. Pour a small amount of water through the inspection port to ensure the back draught safety device is working.

Cleaning the heating surfaces

! **Please note**
Scratches to the surfaces of the heat exchanger that come into contact with hot gas can result in corrosion damage. Brushing can cause deposits to become lodged in the gaps between the coils. **Do not use brushes to clean the heating surfaces.**

! **Please note**
Prevent damage due to cleaning water.
Cover electronic components with suitable watertight material.

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

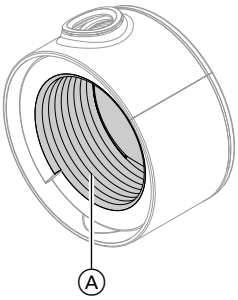

Fig. 33

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. Clean the trap: See the following chapter.

4. Check the thermal insulation mat (if installed) in the heat exchanger for damage; replace if necessary.

Checking the condensate drain and cleaning the trap

! **Please note**
Prevent damage due to condensate.
Cover electronic components with suitable watertight material.

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Checking the condensate drain and cleaning the… (cont.)

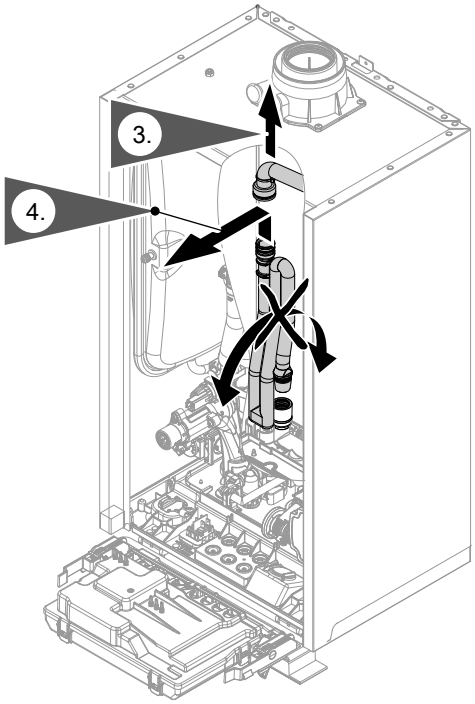

Fig. 34

1. Pivot the HBMU heat management unit forwards.
2. Cover electronic components with suitable watertight material.
3. Remove the black supply hose.
4. Pull trap upwards out of the drain hose.
5. Hold trap as straight as possible and remove. Ensure that no condensate runs out.
6. Clean the trap.
7. Fill the trap with water and refit it on the drain hose.

   Please note
   If the trap is not filled with water, flue gas can escape.
   Only start the appliance when the trap has been filled.
   Check that the trap is seated correctly.

8. Refit supply hose.
9. **Danger**
   Risk of electric shock from escaping condensate.
   Check the connections for leaks and check that the trap is seated correctly.

Note
Route the drain hose without any bends and with a constant fall.

Multi boiler system:
Clean the trap in the flue gas collector as well.

Installing the burner

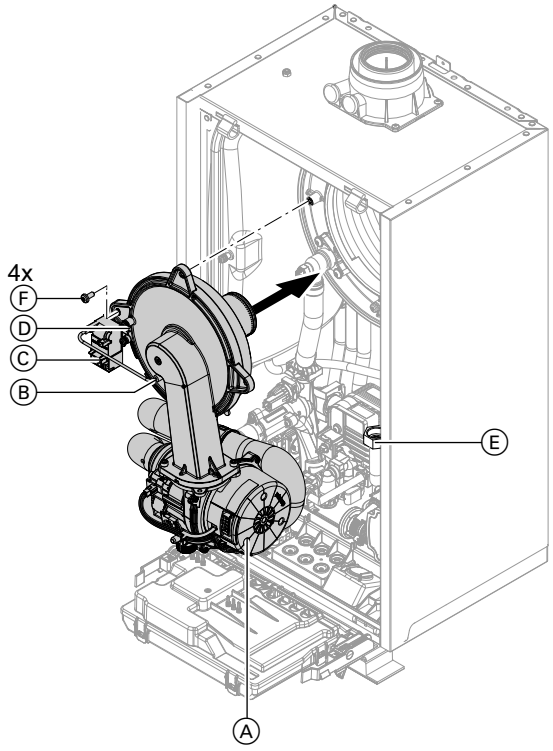

Fig. 35

1. Insert the burner. Tighten screws Ⓕ diagonally. Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Torque: 6.5 Nm

2. Fit gas supply pipe Ⓔ with a new gasket. Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Check for gas tightness to BSI 6891.
   Torque: 30 Nm

3. Check the gas connections for leaks.

   Danger
   Escaping gas leads to a risk of explosion. Check all fittings for gas tightness. In the case of wall mounted appliances, also check the gas shut-off valve fitting on the underside.

4. Connect the cables/leads:
   - Fan motor Ⓐ (2 plugs)
   - Ionisation electrode Ⓑ
   - Ignition unit Ⓒ
   - Earth Ⓓ

Checking the neutralising system (if installed)

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Checking the flow limiter (only for gas condensing combi boiler)

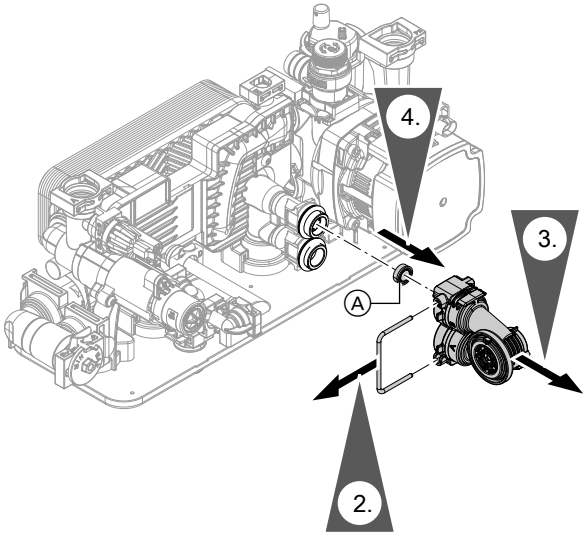

Fig. 36

1. Drain the boiler on the DHW side.
2. Remove the spring clip.
3. Remove the DHW flow sensor.
4. Check flow limiter Ⓐ. Replace in case of excessive scaling or damage. Reinsert.
5. Mount DHW flow sensor with new gaskets.

Danger
Risk of electric shock from escaping heating water or DHW
Check all water side connections for tightness.

Flow limiter

Device type	Serial no. (type plate)	Flow rate l/min	Colour
B0KA-19	7721280	12	Red
	7721282	12	Red
	7721284	12	Red
	7721286	12	Red
BPKA-19	7721975	12	Red
B0KA-25	7721281	14	Pink
	7721283	14	Pink
	7721285	14	Pink
	7721287	14	Pink
B0KA-25-M	7721980	14	Pink
	7721982	14	Pink
	7721984	14	Pink
BPKA-25	7721976	14	Pink

Checking the expansion vessel and system pressure

Note
The expansion vessel can lose some of its charge pressure over time. When the boiler heats up, the pressure rises to 2 or 3 bar (0.2 or 0.3 MPa). The safety valve may also respond and discharge the excess pressure.
Therefore check the expansion vessel pre-charge pressure annually.

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

1. Drain the system until "0" is shown on the display.

   Note
   For pressure indicator on the home screen, repeatedly until the pressure gauge symbol is displayed.

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

Checking the expansion vessel and system… (cont.)

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)

   Note
   The expansion vessel is supplied from the factory with a pre-charge pressure of 0.7 bar.
   Do not allow the pre-charge pressure to fall below this value (boiling noises). This also applies to single floor heating systems or attic heating centres (no static pressure).
   Top up with water until the charge pressure is 0.1 to 0.2 bar above the pre-charge pressure.

Checking the safety valve function

Checking the electrical connections for firm seating

Danger
Contact with live components can lead to serious injury from electric current. Some components on PCBs remain live even after the power supply has been switched off.

- **Never touch** the wiring chambers (control unit and power supply connections).
- When working on the appliance, isolate the system from the power supply, e.g. at a separate MCB/fuse or a mains isolator. Check the system is no longer live and safeguard against reconnection.
- Prior to working on the appliance, wait at least 4 min until the voltage has completely dropped out.

Checking all gas equipment for leaks at operating pressure

Danger
Escaping gas leads to a risk of explosion.
Check gas equipment (including inside the appliance) for leaks.

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.

Fitting the front panel

See page 28.

Checking the combustion quality

The electronic combustion controller automatically ensures optimum combustion quality. During commissioning/maintenance, only the combustion values need to be checked. To do this, test the CO content and CO_2 or O_2 content, and record these in the report on page 86.

Note
To prevent operating faults and damage, operate the appliance with uncontaminated combustion air.

Permissible CO content

The CO content must be < 1000 ppm for all gas types.

Permissible CO_2 or O_2 content

Operation with natural gas

Rated heating output (kW)	CO_2 content (%)		O_2 content (%)	
	Upper heating output	Lower heating output	Upper heating output	Lower heating output
19	7.3 - 10.5	7.3 - 10.5	2.1 - 8.4	2.1 - 8.4
25	7.3 - 10.5	7.3 - 10.5	2.1 - 8.4	2.1 - 8.4

If the actual CO, CO_2 or O_2 values lie outside their respective ranges, proceed as follows:
- Check the balanced flue system for leaks: See page 40.
- Check the ionisation electrode and connecting cable: See page 43.

Note
During commissioning, the combustion controller carries out an automatic calibration. Allow approx. 50 s after the burner has started before testing the emissions.

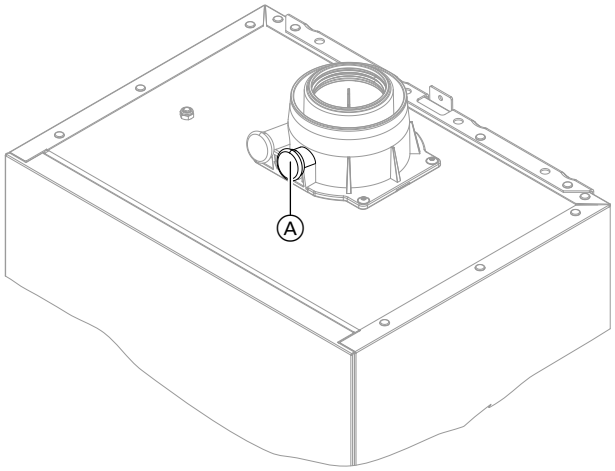

Fig. 37

1. Connect a flue gas analyser at flue gas port Ⓐ on the boiler flue connection.
2. Open the gas shut-off valve. Start the boiler. Create a heat demand.
3. Adjust the lower heating output. See the following chapter.
4. Check the CO_2 content. If the actual value deviates from the permissible ranges, implement steps listed above.
5. Enter the actual value into the report.
6. Adjust the upper heating output. See the following chapter.
7. Check the CO_2 content. If the actual value deviates from the permissible ranges by more than 1 %, implement steps listed above.
8. Enter the actual value into the report.
9. Re-seal test port Ⓐ.

Danger
Escaping flue gas can damage your health. Check test port Ⓐ for leaks.

Checking the combustion quality (cont.)

Regulating to the upper/lower heating output

Note
Ensure adequate heat transfer.

Tap the following buttons:

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.6"** for the upper/lower heating output.
3. **OK**
4. Use ∧/∨ to set the value.
   "0" - OFF
   "1" - Min. heating output
   "2" - Max. heating output
5. **OK**
   Burner is operating with correspondingly adjusted heating output.

Checking the flue system for unrestricted flow and leaks

Matching the control unit to the heating system

The control unit must be matched to the system equipment level.
Set the parameters according to the accessories fitted:

Accessories installation and service instructions

Adjusting the heating curves

Tap the following buttons:

1. ☰
2. Use ∧/∨ to select **"P.3"** for the heating curve.
3. **OK**
4. Use ∧/∨ to set the slope.
5. **OK**
6. Use ∧/∨ to set the level.
7. **OK** to confirm

Instructing the system user

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

This includes all components installed as accessories, e.g. remote control units. In addition, the system installer must make the user aware of the required maintenance work.

DHW hygiene

For optimum DHW hygiene, avoid DHW temperatures that are < 50 °C. For larger systems and systems with low water exchange, the temperature should not drop below < 60 °C.

Inform the system user what DHW temperatures should be set and the risks associated with having a raised outlet temperature at the draw-off points.

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Calling up parameters

Note
The display and setting of some parameters is dependent on:
- *Heat generator*
- *Connected accessories and the functions associated with them*

Tap the following buttons:

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.2"** for system configuration.
3. **OK**
4. Use ∧/∨ to select the parameter for adjustment. See tables below.
5. **OK**
6. ∧/∨ for the required value.
7. **OK**

Parameters

Note
*Parameter values in **bold** are factory settings.*

3 "Scald protection"

Setting		Explanations
		The adjustable DHW temperature is limited to a maximum value.
Off	0	Scald protection off ⚠ **Danger** Risk of injury due to increased DHW temperature. Inform the system user of the risk from the raised outlet temperature at the draw-off points.
On	**1**	Scald protection on (maximum DHW temperature 60 °C) ***Note*** *Even with the scald protection switched on, higher outlet temperatures may occur at the draw-off points in the following cases:* ▪ *While the appliance is being calibrated*

4 "Max. speed of speed-controlled primary/heating circuit pump in standard mode, heating circuit 1"

Setting		Explanations
		Maximum speed of the internal circulation pump in heating mode with standard room temperature
	...	Delivered condition specified by settings specific to the heat generator
	0 to 100	Maximum speed adjustable from 0 to 100 %

Parameters (cont.)

6 "Minimum heating output"

Setting		Explanations
		A limit can be set on the minimum heating output for heating mode.
	...	Delivered condition specified by settings specific to the appliance
	0 to 100	Adjustable from 0 to 100 %

7 "Maximum heating output"

Setting		Explanations
		A limit can be set on the maximum heating output for heating mode.
	100	Heating output in the delivered condition 100 %
	0 to 100	Adjustable from 0 to 100 %

9 "Maximum flow temperature limit, heating circuit 1"

Setting		Explanations
		Maximum flow temperature limit for the heating circuit Maximum limit in the delivered condition 82 °C Setting range limited by heat generator-specific parameters

Energy saving functions (setting only via software tool)

2426.1 Weather-compensated heating circuit pump logic function (only for weather-compensated control units).

Setting		Explanations
		If the outside temperature is above the threshold value (selected set room temperature plus hysteresis in K), the heating circuit pump is switched off. If the outside temperature is above the threshold value (selected set room temperature plus hysteresis in K), the heating circuit pump is switched off.

2426.2 Room temperature-dependent heating circuit pump logic (only for weather-compensated control units with room temperature hook-up).

Setting		Explanations
Only activate this function for the heating circuit with mixer or if there is only one direct heating circuit in the system.		If the outside temperature is above the threshold value (selected set room temperature plus hysteresis in K), the heating circuit pump is switched off. If the outside temperature is above the threshold value (selected set room temperature plus hysteresis in K), the heating circuit pump is switched off.

Parameters (cont.)

1667.0 Pump activation, heating circuit pump in standby mode (via software tool)

Setting		Explanations
		Operating mode heating circuit pump (only for constant operation)
	0	In "Standby mode" = permanently switched off
	1 - 24	In "Standby mode", started 1 to 24 times per day for 10 min each time

Service menu

Calling up the service menu

Tap the following buttons:

1. ☰ and **OK** simultaneously for approx. 4 s, then release.

2. Select the required menu section (e.g. **"b.1"** Connect with software tool).

   Note
   Not all menu areas will be available, depending on the system equipment level.

Note
Tap "☰" to return to the service menu.

Service menu overview

Service			
Er Active messages			
b.1 Connect with software tool			
b.2 System configuration			
b.3 Diagnostics			
	d.1 Outside temperature		
	d.2 Heat generator flow temperature		
	d.3 Primary pump speed %		
	d.4 Flue gas temperature		
	d.5 Burner hours run		
	d.6 Burner output		
	d.7 3-way valve position		
		0 = Heating	
		1 = Middle position (if installed)	
		2 = DHW	
	d.8 Serial number of heat generator		
	d.9 Heating circuit 1 flow temperature		
b.4 Message history			
b.5 Commissioning assistant			
b.6 Start upper/lower heating output for test mode			

Exiting the service menu

Tap the following buttons:

"☰" several times.

Note
The system exits the service menu automatically after 30 min.

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Diagnosis

Checking operating data

Operating data can be checked in various areas. See **"Diagnosis"** in the service menu overview.
Operating data on heating circuits with mixer can only be called up if such components are installed in the system.

Note
*If a called up sensor is faulty, **"- - -"** appears on the display.*

Calling up operating data

Tap the following buttons:

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.3"** for diagnostics.
3. **OK**
4. Use ∧/∨ to select the required entry.

   Note
   "d.8" Use ∧∨ to view the heat generator serial number in sections.
5. **OK**

Fault display on the programming unit

A fault in the burner control unit causes the display to show **"⚠"**.

Note
If a central fault message facility is connected, this is switched on.

Calling up fault messages

Tap the following buttons:

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. ∧/∨ for **"Er"** message list
3. **OK**
4. ∧/∨ to select fault entry **"E.1, E.2..."**.
5. **OK**
6. Fault code is displayed.

   Note
   If the fault code has 3 digits, the first two digits are shown first and then the last digit.

Acknowledging the fault display

Calling up the fault in the **"Er"** menu automatically acknowledges the fault display.

Calling up acknowledged fault messages

Tap the following buttons:

1. "☰"
2. ∧/∨ to select **"Er"**.
3. **OK**
4. ∧/∨ to call up fault entry **"E.1 to E.5"**.
5. **OK**
6. ∧/∨ to display the fault code.

Calling up fault messages from the fault memory (message history)

The 5 most recent faults (including those remedied) are saved and can be called up.
Faults are sorted by date.

Tap the following buttons:

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. ∧/∨ for **"b.4"** message history
3. **OK**
4. Use ∧/∨ to select fault entry **"E.1, E.2... or E. 5"**.
   For messages, see chapter on further messages.
5. **OK**
6. ∧/∨ for the required message
7. **OK**

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Overview of electronics modules

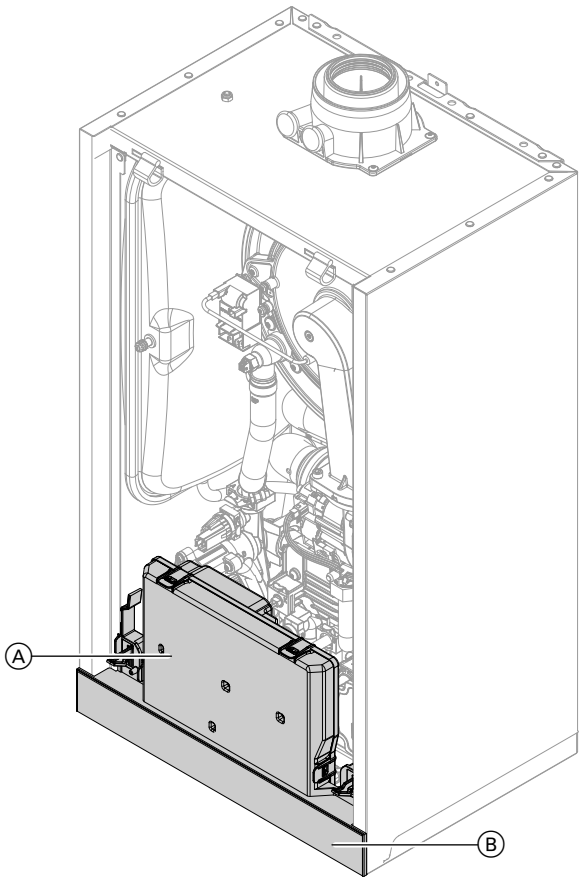

Fig. 38

Ⓐ HBMU heat management unit
Ⓑ Programming unit with TCU 100 communication module

Fault messages

Note
For diagnosis and troubleshooting, see chapter "Repairs".
Fault messages dependent on appliance equipment level

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
7	No DHW heating	Lead break, cylinder temperature sensor	▪ Check DHW setting in the commissioning assistant and correct if required. ▪ Check the cylinder temperature sensor (terminal 2). ▪ Measure voltage at sensor input on HBMU heat management unit. Set value: 3.3 V– with sensor disconnected Replace faulty component if required.
8	No DHW heating	Short circuit, cylinder temperature sensor	Check the cylinder temperature sensor (terminal 2). Replace faulty component if required.
13	Regulates as if the outside temperature were 0 °C.	Lead break, outside temperature sensor	▪ Check operating mode setting in commissioning assistant and remedy if required. ▪ Check outside temperature sensor and connection to sensor (terminal 4). ▪ Measure voltage at sensor input on HBMU heat management unit. Set value: 3.3 V– with sensor disconnected Replace faulty component if required.
14	Regulates as if the outside temperature were 0 °C.	Short circuit, outside temperature sensor	Check outside temperature sensor and connection to sensor (terminal 4). Replace faulty components if necessary.
49	Burner in a fault state	Lead break, flue gas temperature sensor	Check flue gas temperature sensor. Reset the appliance.
50	Burner in a fault state	Short circuit, flue gas temperature sensor	Check flue gas temperature sensor. Reset the appliance.
57	Normal operation without room influence	Lead break, room temperature sensor	▪ Check commissioning setting of remote control. ▪ Check plug and cable of external room temperature sensor, heating circuit. ▪ If no external room temperature sensor installed, replace Vitotrol programming unit.
58	Normal operation without room influence	Short circuit, room temperature sensor	Check plug and cable of external room temperature sensor, heating circuit. If no external room temperature sensor installed, replace Vitotrol programming unit.
59	Burner blocked, boiler circuit pump off. No central heating, no DHW heating	Power supply, low voltage	Check mains voltage. If voltage is correct and the fault occurs repeatedly, replace the fan unit.

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
62	Burner in a fault state	High limit safety cut-out has responded.	▪ Check heating system fill level. ▪ Check pre-charge pressure in diaphragm expansion vessel. Adjust to required system pressure. ▪ Check whether flow rate is sufficient (circulation pump). ▪ Check function of 3-way diverter valve. Vent the system. Reset the appliance.
63	Burner in a fault state	Flue gas temperature limiter has responded.	▪ Check heating system fill level. ▪ Check pre-charge pressure in diaphragm expansion vessel. Adjust to required system pressure. ▪ Check whether flow rate is sufficient (circulation pump). ▪ Check function of 3-way diverter valve. Vent the system. Reset the appliance once the flue system has cooled down.
67	Burner in a fault state	Ionisation current lies outside the permissible range	Check gas supply (gas pressure and gas flow switch), check gas solenoid valve and inlet strainer. Check ionisation electrode for the following: ▪ Clearance to burner gauze assembly ▪ Check the electrode/burner gauze assembly for dirt. If specified measures don't help, replace fan unit. Reset the appliance.
68	Burner in a fault state	Flame signal is already present at burner start.	Close gas shut-off valve. Remove connecting cable of the ionisation electrode. Reset the appliance. If the fault persists, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
69	Burner in a fault state	Ionisation current lies outside the permissible range	Check ionisation electrode for the following: ▪ Check whether insulation block is touching electrode ceramic. ▪ To check the gas solenoid valve: In the service menu under "b.6", set the burner output to the lower heating output for approx. 4 min. If the fault occurs, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". ▪ In the service menu under "b.6", switch the burner output from the lower to the upper heating output. If this fault occurs during modulation, check the inlet strainer for dirt. Replace the fan unit if necessary.
70	Burner in a fault state	HBMU heat management unit internal fault	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
71	Burner in a fault state	Fan speed too low	▪ Check fan for blockage. ▪ Check setting for gas type and flue system. Reset the appliance.
73	Burner in a fault state	Internal communication error	Reset the appliance. If the fault occurs repeatedly, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
74	Burner locked out. Internal circulation pump off. No central heating and no DHW heating	System pressure too low	Top up with water. Vent the system. If the fault occurs repeatedly: ▪ Check system pressure sensor with external pressure gauge. ▪ Check diaphragm expansion vessel pre-charge pressure. ▪ Check settings for set system pressure and range.
77	Burner in a fault state	HBMU heat management unit data memory	Reset the appliance. If the fault occurs repeatedly, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
89	No central heating and no DHW heating	Internal circulation pump blocked	Check circulation pump. Replace if necessary.
91	Function of affected extension in emergency mode	DIO electronics module communication error	Check connections to DIO electronics module and connection to HBMU heat management unit.

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
92	Function of the relevant electronics module in emergency mode	ADIO electronics module communication error	▪ Check setting in the commissioning assistant and correct if required. ▪ Check connections and leads to the ADIO electronics module. ▪ Check PlusBus voltage level (24 to 28 V). ▪ Check subscriber number on rotary switch S1 and correct if required.
95	Burner off	OpenTherm remote control unit not connected	▪ Check connection to the OpenTherm remote control. unit. ▪ If OpenTherm is not required, set C.7 in the commissioning assistant to a value other than 14.
100	Electronics modules connected to PlusBus not functioning	Voltage error PlusBus	Check whether the PlusBus power supply on the HBMU heat management unit is OK: Remove all connected PlusBus components and reconnect one by one. Check that no more than 1 Vitotrol 200-E is connected to the HBMU. Check whether there is a short circuit at the PlusBus cable.
102	No internet connection	Error with communication module	Check cables and plug-in connections between heat management unit and communication module.
103	Normal operation	Internal communication error, programming unit	Check cables and plug-in connections between heat management unit and HMI programming unit.
104	Depending on configuration of EM-EA1 extension (DIO electronics module)	External fault message input active	Check connected external device.
142	Burner in a fault state	Communication restriction on CAN bus INR	Check the fan unit for correct function. For this, check the stepper motor of the fan unit (reference run with mains ON). If the fault persists, check the plug-in connections and cables of the CAN bus. Check further CAN bus subscribers. If fault occurs repeatedly, replace fan unit.
160	Burner in a fault state	Communication error, CAN bus	Check connections to CAN bus subscribers (INR, HBMU). Check connections to external CAN bus subscribers.
161	Burner in a fault state	HBMU heat management unit data memory access fault	Reset the appliance. If the fault occurs repeatedly, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
163	Burner in a fault state	Checksum error, data memory access, HBMU heat management unit	Reset the appliance. If the fault occurs repeatedly, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
182	No DHW heating	Short circuit, outlet temperature sensor (if installed)	Check outlet temperature sensor (plug X7, cores 3 and 4). Measure sensor input on HBMU heat management unit. Set value: 3.3 V– with sensor disconnected
183	No DHW heating	Lead break, outlet temperature sensor (if installed)	Check outlet temperature sensor (plug X7, cores 3 and 4).
184	Burner in a fault state	Short circuit, flow temperature sensor/high limit safety cut-out	Check the flow temperature sensor/high limit safety cut-out. Check sensor lead. Replace faulty component if required. Reset the appliance.
185	Burner in a fault state	Lead break, flow temperature sensor/high limit safety cut-out	Check the flow temperature sensor/high limit safety cut-out. Replace faulty component if required. Reset the appliance.
345	Burner locked out, automatic enabling after appliance cool-down. Independent restart	Temperature limiter has responded.	▪ Ensure adequate heat transfer. ▪ Check heating system fill level. ▪ Check pre-charge pressure in diaphragm expansion vessel. Adjust to required system pressure. ▪ Check whether flow rate is sufficient (pump). ▪ Check function of 3-way diverter valve. Vent the system. If the fault occurs during DHW heating: Check the DHW cylinder or plate heat exchanger for dirt and scaling.
346	Burner in a fault state	Ionisation current calibration error	▪ Check the gas supply pressure. ▪ Check gas solenoid valve inlet strainer for dirt. ▪ Check ionisation electrode for contamination. ▪ Check flue system. Remove flue gas recirculation if required. ▪ Check the condensate drain (condensate blockage). Reset the appliance.
348	Burner in a fault state	Gas modulation valve	If several heat generators are connected to a common flue system: Check whether **"Multiple connection"** is set in the commissioning assistant. Check the flue system for unrestricted flow. If fault remains, replace gas fan unit.

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
349	Burner in a fault state	Air mass rate flow not detected correctly in fan unit.	▪ Check for dust contamination in the ventilation air. ▪ Check burner gauze assembly for contamination. Reset the appliance. If the fault occurs repeatedly, replace the gas fan unit.
350, 351	Burner in a fault state	Ionisation current lies outside the permissible range	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
352	Burner in a fault state	Combustion CO limit exceeded	Check entire flue gas path for the following: ▪ Leaks ▪ Flue gas back pressure caused by water pocket (if flue system fall is insufficient) ▪ Constrictions ▪ Blockages Repair flue system if necessary. Reset the appliance.
353	Shutdown with restart if demand exists	Insufficient gas supply, burner output reduced	Check the gas supply. Visually check the inlet strainer in the gas solenoid valve for dirt. Reset the appliance.
354	Burner in a fault state	Gas modulation valve tolerance outside permissible range	Replace gas fan unit.
355	Burner in a fault state	Analogue signal reference check: Flame signal is already present at burner start.	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
357	Burner in a fault state	Insufficient gas supply	▪ Check that the main gas valve and the gas shut-off valve are open. ▪ Test static gas pressure and gas flow pressure. ▪ Check that on-site gas line and gas flow switch are correctly sized. ***Note*** *If the building pressure regulator has a leak, you may notice rising pressure when the burner is idle. When the system is restarted, the gas flow switch may trip.* ▪ If the static pressure doesn't drop, check cable to the fan unit. Check that the coil resistance at the fuel valve is approx. 4 kΩ (plug 35). ▪ Check the ignition electrode for damaged insulation. Reset the appliance.

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
359	Burner in a fault state	No ignition spark	▪ Check whether the ignition electrode insulation is damaged. ▪ Check for a voltage of 230 V~ at the ignition module during the ignition phase. If not, replace the HBMU heat management unit. ▪ If 230 V~ is present at the ignition module but there is still a fault, replace the ignition module. ▪ Check connection cables and leads from ignition module and ignition electrode. Reset the appliance.
361	Burner in a fault state	Flame signal is not present or insufficient at burner start.	Check ionisation electrode and connecting cable. Check plug-in connections for loose contacts. ***Note*** *Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits. For example: Laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney)* Reset the appliance.
365	Burner in a fault state	Gas valve relay contact feedback implausible (relay contact is "welded up")	Replace the HBMU heat management unit.
366, 367	Burner in a fault state	Gas valve electricity supply does not turn off.	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
369	Burner in a fault state	Flame is lost immediately after flame formation (during safety time)	Check gas supply (gas pressure and gas flow switch). Check balanced flue system for flue gas recirculation. Check ionisation electrode for the following: ▪ Clearance to burner gauze assembly ▪ Contamination on electrode Reset the appliance.
370	Burner in a fault state	Gas valve or modulation valve will not close.	Reset the appliance. If fault occurs repeatedly, replace fan unit.

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
372	Burner in a fault state	Repeated flame loss during calibration	▪ Check ionisation electrode and connecting cable. ▪ Check plug-in connections for loose contacts. ▪ Check flue system. Remove flue gas recirculation if required. ▪ Check system for condensate backup. ▪ Visually inspect the gas solenoid valve inlet and the inlet strainer for dirt. ***Note*** *To prevent water damage, detach fan unit before removing the burner. Deposits on the electrodes indicate foreign bodies in the combustion air.* Check the installation room and flue system for causes of the deposits. For example: Laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney). If burner gauze assembly and ionisation electrode have been replaced, also clean fan unit, gas/air channel and Venturi extension. Reset the appliance.
373	Burner in a fault state	Heat transfer too low during calibration Temperature limiter has shut down.	▪ Ensure adequate heat transfer. ▪ Check circulation pump for faults, scale or blockages. ▪ Check function of 3-way diverter valve. Vent the system. ▪ Check function of flow sensor. Reset the appliance.
377	Burner in a fault state	Post-processing ionisation current calibration: Stabilisation conditions for post-calibration not reached	Check gas type setting. If the fault occurs repeatedly, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
378	Burner in a fault state	Flame loss during stabilisation or operating phase	▪ Check gas supply (gas pressure and gas flow switch). ▪ Check flue gas recirculation. ▪ Check for contamination of ionisation electrode and burner gauze assembly. Reset the appliance.
379	Burner in a fault state	Flame signal not present or insufficient	▪ Check ionisation electrode connecting cable for damage and firm seating. ▪ Check ionisation electrode, replace if necessary. Reset the appliance.

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
380	Burner in a fault state	Flame is lost immediately after flame formation (during safety time)	Check gas supply (gas pressure and gas flow switch). Check balanced flue system for flue gas recirculation. Check ionisation electrode, burner gauze assembly: ▪ Clearance to burner gauze assembly ▪ Contamination on electrode Reset the appliance.
381	Burner in a fault state	Flame loss during operating phase	Check gas supply (gas pressure and gas flow switch). Check balanced flue system for flue gas recirculation. Check ionisation electrode, burner gauze assembly: ▪ Clearance to burner gauze assembly ▪ Contamination on electrode Reset the appliance.
382	Burner in a fault state	Fault counter has exceeded limit.	Reset the appliance. Work through fault analysis using fault history.
383, 384	Burner in a fault state	Possible contamination of gas line	▪ Check gas line for contamination. ▪ Check the gas supply pressure. ▪ Replace gas fan if required. Reset the appliance.
385	Burner in a fault state	Short circuit, signal 1, ionisation current HBMU heat management unit faulty	Check IO electrode for earth fault. If the fault persists, replace the HBMU heat management unit. Reset the appliance.
386	Burner in a fault state	HBMU heat management unit faulty	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
387	Burner in a fault state	Earth fault, ionisation current. HBMU heat management unit faulty.	Check ionisation electrode and connecting cable. If the fault persists, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
388	Burner in a fault state	HBMU heat management unit faulty	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
395	Burner in a fault state	IO electrode earth fault, HBMU heat management unit faulty	Check ignition electrode for earth fault. If the fault persists, replace the HBMU heat management unit. Reset the appliance.

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
396	Burner in a fault state	HBMU heat management unit faulty	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
399	Burner in a fault state	IO electrode earth fault, HBMU heat management unit faulty	Check IO electrode for earth fault. If the fault persists, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
400	Burner in a fault state	HBMU heat management unit faulty	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
401	Burner in a fault state	IO electrode earth fault, HBMU heat management unit faulty	Check IO electrode for earth fault. If the fault persists, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
402	Burner in a fault state	HBMU heat management unit faulty	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
403	Burner in a fault state	Ionisation electrode earth fault, HBMU heat management unit faulty	Check IO electrode for earth fault. If the fault persists, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
404	Burner in a fault state	HBMU heat management unit faulty	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
405	Burner in a fault state	Ionisation electrode earth fault, HBMU heat management unit faulty	Check IO electrode for earth fault. If the fault persists, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
406, 408, 410	Burner in a fault state	HBMU heat management unit faulty	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
416	Burner locked out	Flue gas temperature sensor incorrectly positioned	Fit flue gas temperature sensor correctly. See "Repairs". Carry out mains reset after fault has been remedied.
417, 418	Burner in a fault state	HBMU heat management unit faulty	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
425	System in control mode, calculation out of operation Calculation values can be viewed via software tool.	Time synchronisation failed	Set the time.
446	Burner in a fault state	Deviation, heat generator flow temperature sensor/ high limit safety cut-out	Check the flow temperature sensor/high limit safety cut-out. Check plug-in connection and lead to sensor. Reset the appliance.
447, 448	Burner in a fault state	Deviation, ionisation voltage signal/ionisation current	Replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit". Reset the appliance.
449, 450, 451, 452	Burner in a fault state	Error in scheduled program run monitoring	Reset the appliance. If the fault occurs repeatedly, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
453	Burner in a fault state	Synchronisation error, sequence	Reset the appliance. If the fault occurs repeatedly, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
454	Burner in a fault state	Incorrect HBMU heat management unit parameter set	Flash correct HBMU heat management unit parameter set.
455, 456	Burner in a fault state	Error in program run monitoring	Reset the appliance. If the fault occurs repeatedly, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
457	Burner in a fault state	Fan sluggish or blocked.	Reset the appliance. Check fan for sluggishness. In the case of severe contamination or grinding noises, replace fan unit.
463	Burner in a fault state	Contaminated combustion air, flue gas recirculation	Check flue system for contamination and flue gas recirculation. Clean flue system if required. Reset the burner. ***Note*** *Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits. For example: Laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).* *If burner gauze assembly and ionisation electrode have been replaced, also clean fan unit, gas/air channel and Venturi extension.* *Reset the appliance.*

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
464	Burner in a fault state	Ionisation current too low during calibration. Differential compared to previous value not plausible.	▪ Check ionisation electrode and connecting cable. Check plug-in connections for loose contacts. ▪ Check whether there is a lot of dust in the ventilation air (e.g. from construction work). ▪ Check flue system. Remove flue gas recirculation if required. ▪ Check system for condensate backup. Reset the appliance. ***Note*** *To prevent water damage, detach fan unit before removing the burner.* If the fault is constantly present, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit." ***Note*** *Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits. For example: Laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).* *If burner gauze assembly and ionisation electrode have been replaced, also clean fan unit, gas/air channel and Venturi extension.*
467	Burner in a fault state	Gas supply insufficient during calibration. Contaminated or insufficiently sized gas line.	▪ Test static gas pressure and gas flow pressure. ▪ Check that on-site gas line and gas flow switch are correctly sized. ▪ Visually inspect the gas solenoid valve inlet and the inlet strainer for dirt. Reset the appliance. ***Note*** *Contamination from a brazed gas line, for example, can block up the gas solenoid valve inlet strainer.*

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
468	Burner in a fault state	Ionisation current too high during calibration	Check gap between ionisation electrode and burner gauze assembly. Check whether there is a lot of dust in the ventilation air (e.g. from construction work). Reset the appliance. ***Note*** *Deposits on the electrodes indicate foreign bodies in the ventilation air. Check the installation room and flue system for causes of the deposits. For example: Laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).* *If burner gauze assembly and ionisation electrode have been replaced, also clean fan unit, gas/air channel and Venturi extension.*
471	No heat demand	System pressure sensor not available, lead break or short circuit	▪ Check system pressure sensor (plug 163). ▪ Check lead and plug-in connection. ▪ Measure the supply voltage to the sensor to see if it is 5 V–.
474	Burner in a fault state	Error in scheduled program run monitoring	Reset the appliance. If the fault occurs repeatedly, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
517	Normal operation, remote control unit not functioning	Lead break, PlusBus cable, incorrect appliance address set, remote control faulty	▪ Check setting in the commissioning assistant and correct as necessary. ▪ Check remote control cable. ▪ Check remote control subscriber number. Replace faulty remote control if applicable.
527, 528	Burner in a fault state	Incorrect HBMU heat management unit parameter set	Overwrite (flash) the HBMU heat management unit with the correct parameter set.

Fault messages (cont.)

Displayed fault code	System characteristics	Cause	Measures
540	Burner in a fault state	Condensate backup in the heat cell	▪ Check system for condensate backup. ▪ Check the condensate drain and trap. ▪ Replace insulation blocks, electrodes and burner gauze assembly if required. ***Note*** *To prevent water damage, detach fan unit before removing the burner.* Reset the appliance.
544	Emergency function operating mode is activated for heating circuit 2: Mixer closes. Heating circuit pump is operational.	Lead break, flow temperature sensor, heating circuit 2 with mixer Incorrect setting during commissioning	Check flow temperature sensor, mixer 2. Measure voltage at sensor input on electronics module. Set value: 3.3 V– with sensor disconnected. Check setting in the commissioning assistant and correct if required. Checking setting of ADIO rotary switch.
545	Emergency function operating mode is activated for heating circuit 2: Mixer closes. Heating circuit pump is operational.	Short circuit, flow temperature sensor for heating circuit 2 with mixer	Check flow temperature sensor, mixer 2. Measure voltage at sensor input on electronics module. Set value: 3.3 V– with sensor disconnected
738	Normal operation	OpenTherm remote control unit connected but not configured	Set C.7 in the commissioning assistant to a value of 14.

Repairs

Please note
Residual water will escape when the boiler or one of the following components is fitted or removed:
- Water-filled pipework
- Heat exchanger
- Circulation pumps
- Plate heat exchanger
- Components fitted in the heating water or DHW circuit.

Water ingress can result in damage to other components.

Protect the following components against ingress of water:
- Control unit components (especially in the service position)
- Electrical components
- Plug-in connections
- Cables and leads

Repairs (cont.)

Shutting down the boiler

1. Turn off the power supply at the ON/OFF switch.
2. Shut off the gas supply.
3. If the boiler needs to be removed:
   - 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.
   - Disconnect the balanced flue system.
   - Drain the boiler on the heating water and DHW sides.
   - Disconnect the on-site cables/leads.

Removing the boiler from the pre-plumbing jig or mounting frame

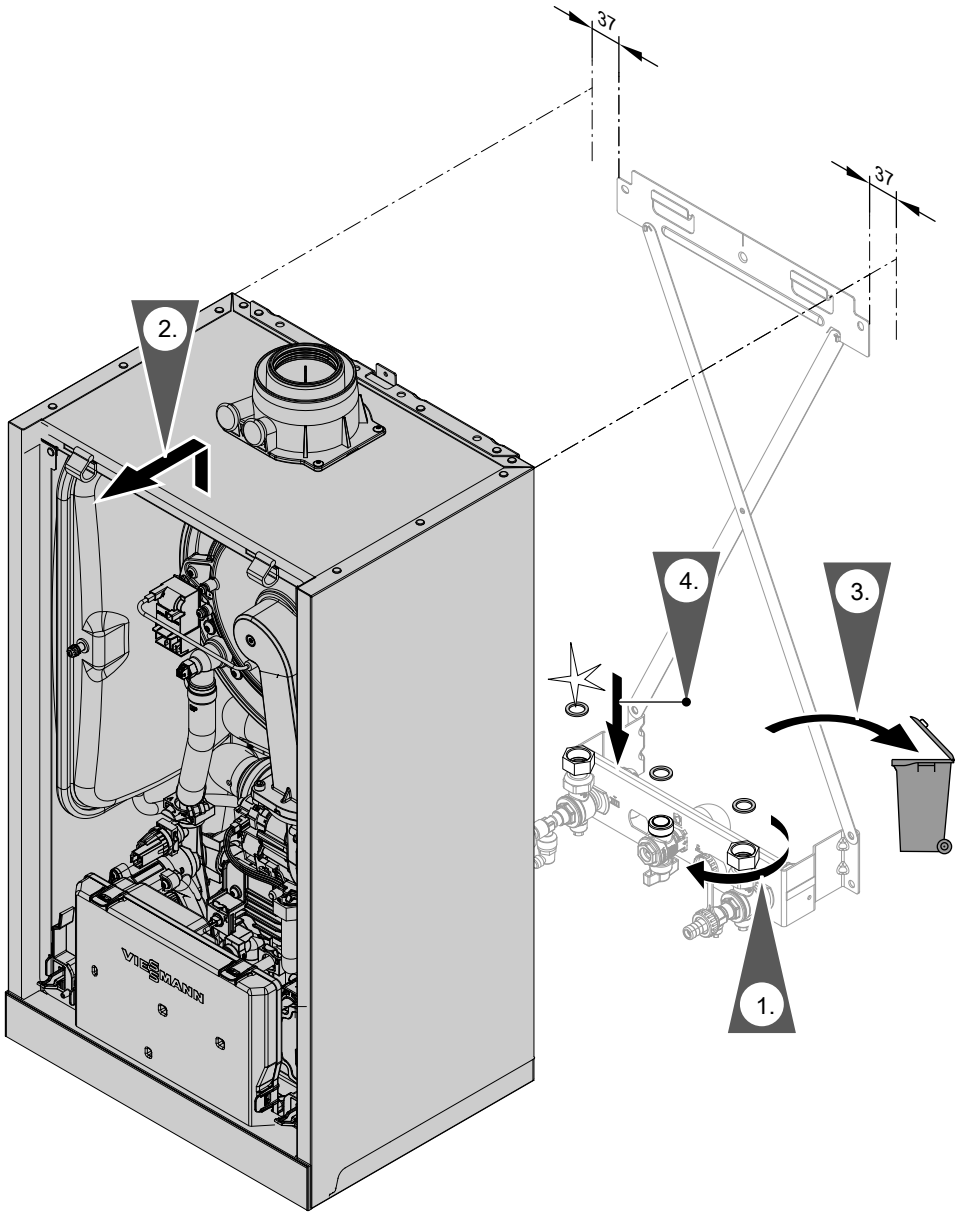

Fig. 39

Repairs (cont.)

Note
Use new gaskets and, if required, new locking ring connections when assembling.

Internal gasket diameter:
- *Gas connection Ø 18.5 mm*
- *Heating water side connections Ø 17.0 mm*

Gaskets and locking ring connections are available as individual parts (if required).

Note
When carrying out any work on gas connection fittings, hold with a suitable tool. Never transfer any forces to the internal components.

⚠ **Danger**
Escaping gas leads to a risk of explosion.
Check all connections on the gas side (also inside the appliance) for tightness.

Checking the temperature sensors

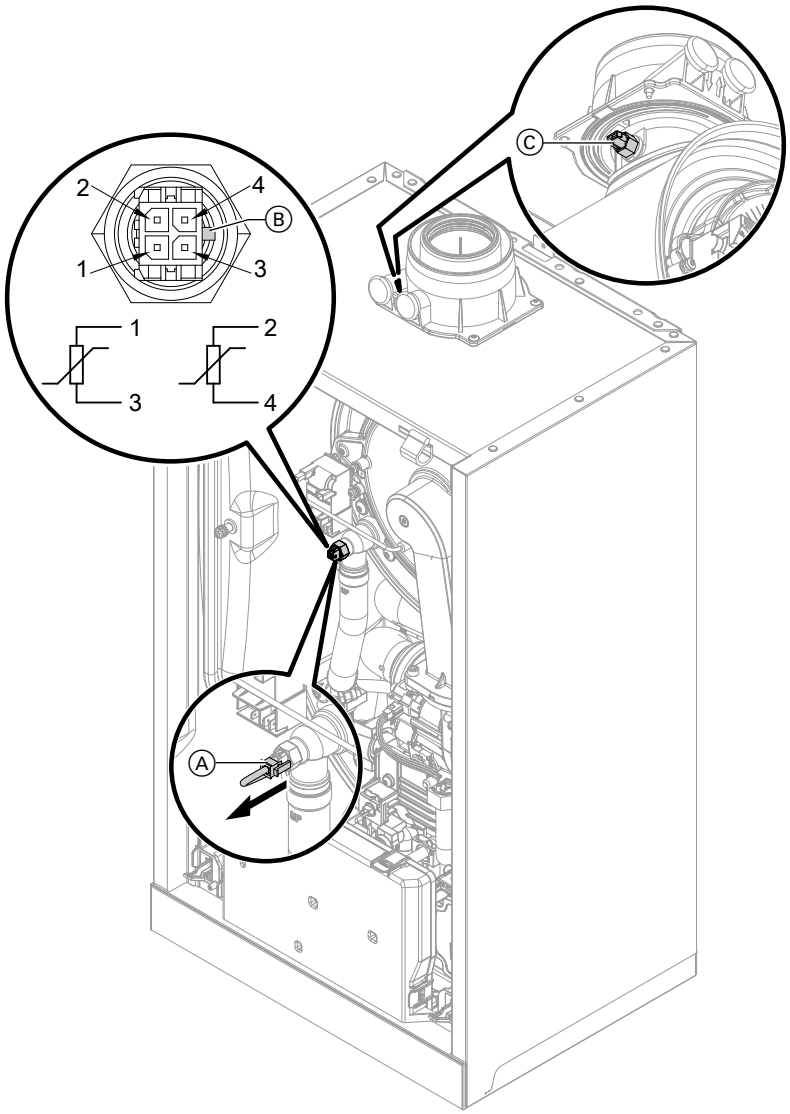

Fig. 40

Heat generator circuit flow temperature sensor (dual sensor)

1. Check the leads and plugs of flow temperature sensors Ⓐ.
2. Disconnect the leads from flow temperature sensors Ⓐ.

Repairs (cont.)

3. Check the sensor resistance. Note position of guide lug Ⓑ.
   - Sensor 1: Connections 1 and 3
   - Sensor 2: Connections 2 and 4

   Compare the resistances with the value for the current temperature from the following diagram. In the event of severe deviation (> 10 %), replace the dual sensor.

   Danger
   The dual sensor is directly immersed in the heating water (risk of scalding).
   Drain the boiler on the heating water side before replacing the sensor.

   Danger
   Risk of electric shock from escaping heating water
   Check the dual sensor for leaks.

Cylinder temperature sensor/outlet temperature sensor

1. Check lead and plug of the cylinder temperature sensor or outlet temperature sensor.
2. Disconnect wires of sensor plug.
3. Check the sensor resistance. Compare the resistance with the value for the current temperature from the following diagram.
   In the event of severe deviation (> 10 %), replace the sensor.

Outside temperature sensor

1. Check the lead and plug of the outside temperature sensor.
2. Disconnect wires 7 and 8 from terminal 4.
3. Check the sensor resistance. Compare the resistance with the value for the current temperature from the following diagram.
   If the results are very different from the curve (> 10 %), disconnect the wires from the sensor. Repeat the test directly on the sensor.
   Check the on-site lead. 2-core lead, length up to 35 m with a cross-section of 1.5 mm^2
   Depending on the test result, replace the lead or the outside temperature sensor.

Flue gas temperature sensor

1. Check the lead and plug of flue gas temperature sensor Ⓒ.
2. Disconnect leads, flue gas temperature sensor Ⓒ.
3. Rotate sensor (anti-clockwise) by ¼ turn to remove it (bayonet fitting).
4. Check the sensor resistance. Compare the resistance with the value for the currently recorded temperature from the following diagram.
   In the event of severe deviation (> 10 %), replace the sensor.
5. Rotate sensor (clockwise) by ¼ turn to install it.

   Danger
   Escaping flue gas can cause poisoning.
   When restarting, check for leaks on the flue gas side.

6. Reconnect leads, flue gas temperature sensor Ⓒ.
7. If the permissible flue gas temperature has been exceeded, the flue gas temperature sensor locks out the appliance. Reset the burner on the programming unit once the flue system has cooled down.

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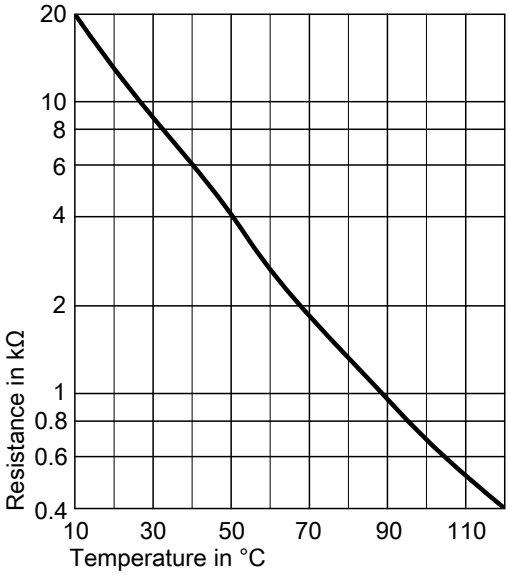
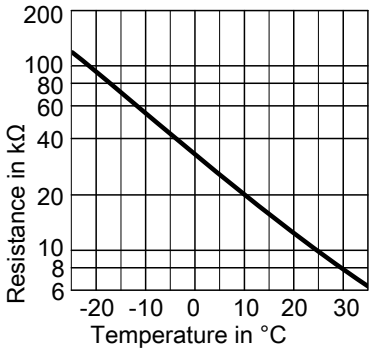
Repairs (cont.)

- Flue gas temperature sensor
- Flow temperature sensor
- Cylinder temperature sensor
- Outlet temperature sensor



Sensor type: NTC 10 kΩ

- Outside temperature sensor



Sensor type: NTC 10 kΩ

Fault during commissioning (fault message 416)

During commissioning, the control unit checks for correct placement of the flue gas temperature sensor. If fault message 416 is displayed:

1. Check whether the flue gas temperature sensor is correctly installed (bayonet fitting). See previous diagram.
2. If required, correct the position of the flue gas temperature sensor.
3. Check the flue gas temperature sensor resistance. See previous chapter. Replace faulty flue gas temperature sensor if required.
4. Turn off the ON/OFF switch.
5. Turn the ON/OFF switch back on.
   Restart the commissioning assistant.
6. Check for leaks on the flue gas side.

Note
If fault message 416 continues to be displayed although the flue gas temperature sensor is correctly positioned: Initial commissioning may result in burner faults e.g. caused by air in the gas line. Eliminate the fault and reset the appliance.

Information on replacing the HBMU heat management unit

If replacing the HBMU heat management unit, the "Vitoguide app" must be used.

See spare part installation instructions and internet address: **"www.vitoguide.info"**

Replacing the power cable

When replacing the power cable, only use the power cable available as an individual part from Viessmann.

Repairs (cont.)

Replacing the HMI connecting cable

Please note
Incorrect routing of the cable can lead to heat damage and impairment of the EMC properties. For positioning and securing of the cable (fixing point of the cable tie) see connecting cable installation instructions.

Checking the plate heat exchanger

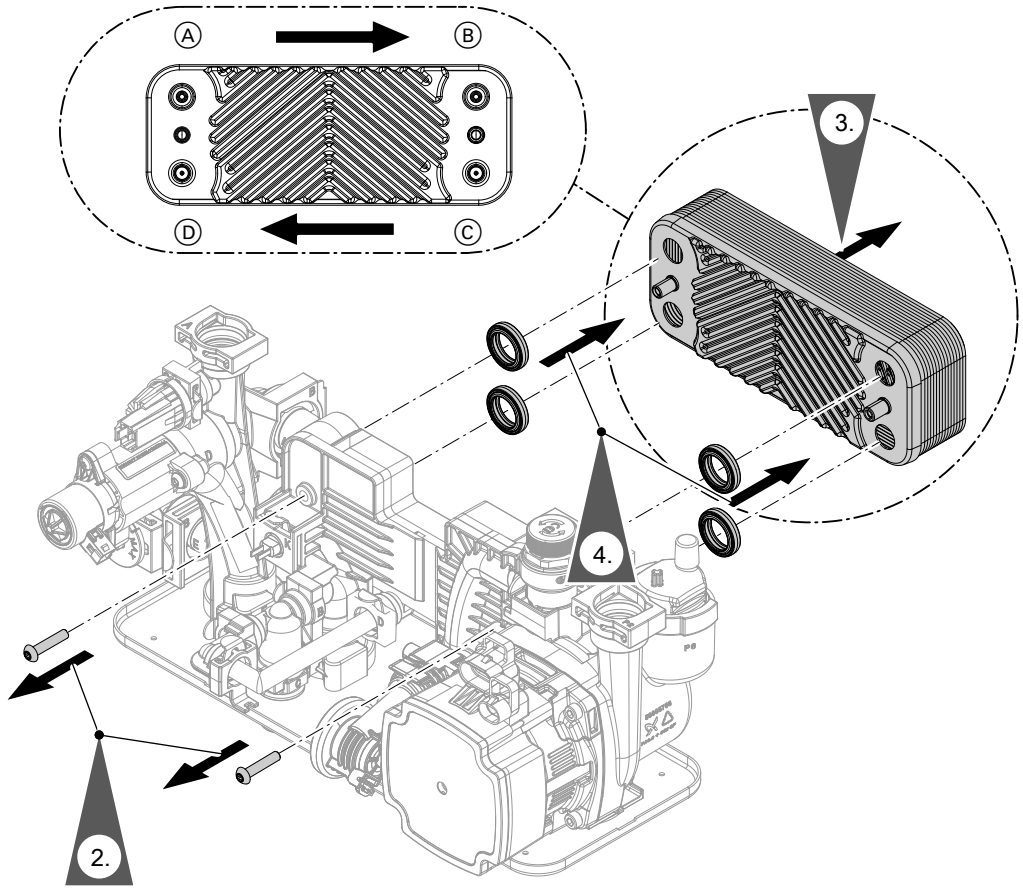


Fig. 41

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

1. Shut off and drain the boiler on the heating water and DHW sides.
2. Undo screws.
3. Remove plate heat exchanger.

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

4. Remove gaskets and dispose of them.
5. Check connections on the DHW side for scaling. Clean or replace the plate heat exchanger as required.
6. Check connections on the heating water side for contamination. Clean or replace the plate heat exchanger as required.

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Repairs (cont.)

7. Install plate heat exchanger in reverse order using new gaskets.
   Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Screw torque: 3.2 Nm ± 0.2

   Note
   During installation, ensure the connections are positioned and the gaskets seated correctly.

   Danger
   Risk of electric shock from escaping heating water or DHW
   Check all water side connections for tightness.

Removing the hydraulic unit

If components of the hydraulic unit have to be replaced.

Danger
Risk of electric shock from escaping heating water or DHW
After installation, check all connections on the water side for leaks.

Repairs (cont.)

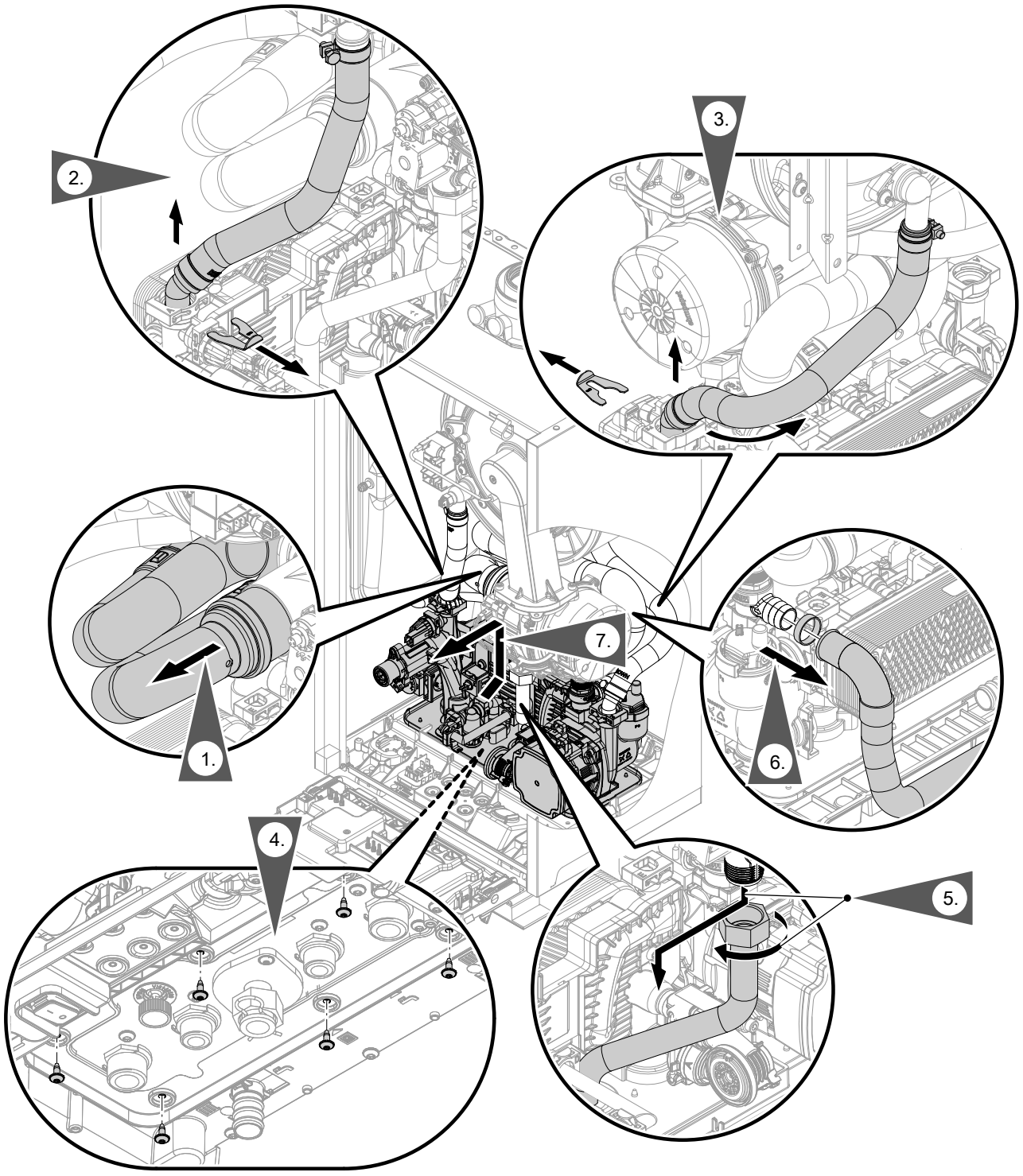

Fig. 42

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Repairs (cont.)

Checking the fuse

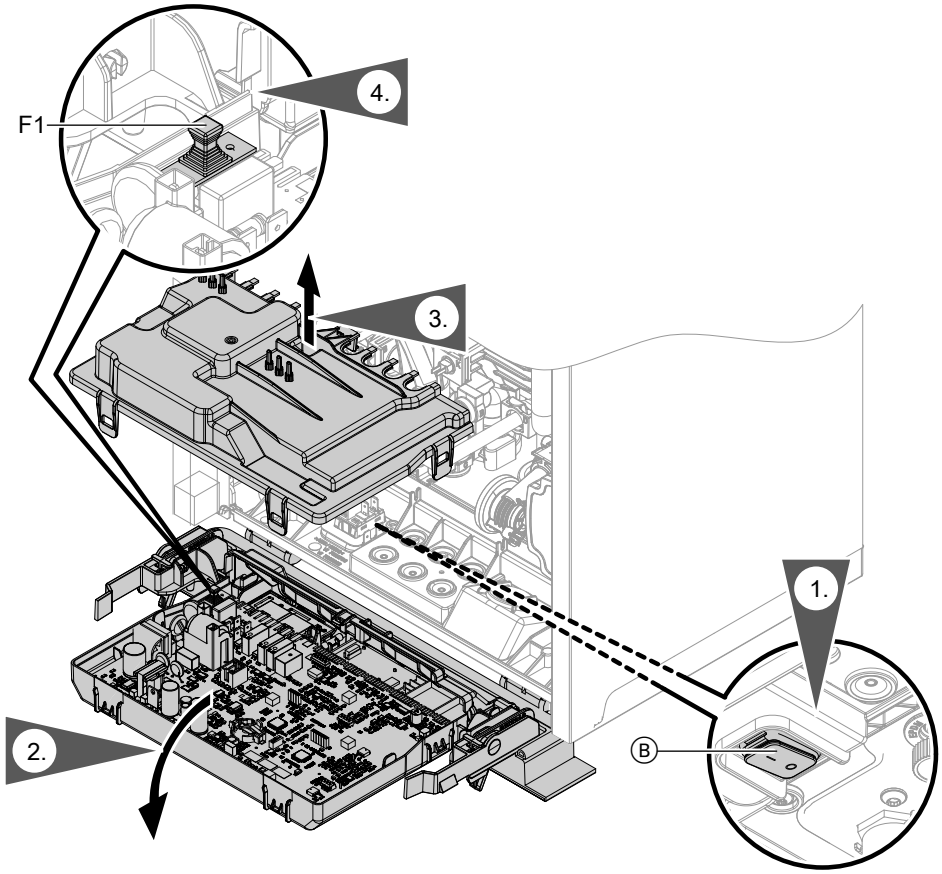

Fig. 43

1. Turn off the ON/OFF switch Ⓑ.
2. Remove the programming unit.
3. Pivot the HBMU heat management unit down.
4. Remove cover Ⓐ.
5. Check fuse F1 (see connection and wiring diagram).

Danger
Incorrect or improperly fitted fuses can lead to an increased risk of fire.
- Insert fuses without using any force. Position fuses correctly.
- Only use structurally identical types with the specified response characteristics.

Appliance functions

Heating mode

- **Weather-compensated operation:**
  The rooms are heated in accordance with the room temperature settings.
  The control unit determines a set flow temperature for the heat generator, subject to the outside temperature, the room temperature and the slope/level of the heating curve.
- **Room temperature-dependent operation (constant operation with room thermostat):**
  System with one heating circuit without mixer. The rooms are heated in accordance with the settings of the room temperature controller/room thermostat (accessories).
  If the room temperature controller/room thermostat issues a demand, the standard set flow temperature is maintained. If there is no demand, the frost protection function is active.
- **Constant operation without room thermostat:**
  The rooms are heated according to the set flow temperature settings.
- **OpenTherm:**
  Rooms are heated in accordance with the settings of the room temperature controller/room thermostat (accessories). The OpenTherm controller specifies the flow temperature for the heat generator.

OpenTherm controller

In systems with one heating circuit without mixer:

The flow temperature and the DHW temperature are based on the settings of the OpenTherm controller (accessories).

Venting program

During the venting program, the circulation pump will be alternately switched on and off for 30 s over a period of 20 min.
The 3-way diverter valve alternates between central heating and DHW heating for a certain period of time.
The burner is switched off during the venting program.

Activate venting program: See "Commissioning, inspection and maintenance".

Filling program

In the delivered condition, the 3-way diverter valve is set to its central position, so the system can be filled completely. After the control unit has been switched on, the 3-way diverter valve no longer goes into its central position.
If the system is to be filled with the control unit switched on, the 3-way diverter valve is moved to its central position in the filling program and the pump is started.

Activate filling program: See "Commissioning, inspection and maintenance".

In this position, the control unit can be switched off and the system can be filled completely. When the function is enabled, the burner shuts down. The program automatically becomes inactive after 20 min.

Heating curve

The heating curves represent the relationship between the outside temperature and the flow temperature.
Simplified: The lower the outside temperature, the higher the flow temperature must be in order to reach the set room temperature.

Factory settings:
- Slope = 1.4
- Level = 0

Appliance functions (cont.)

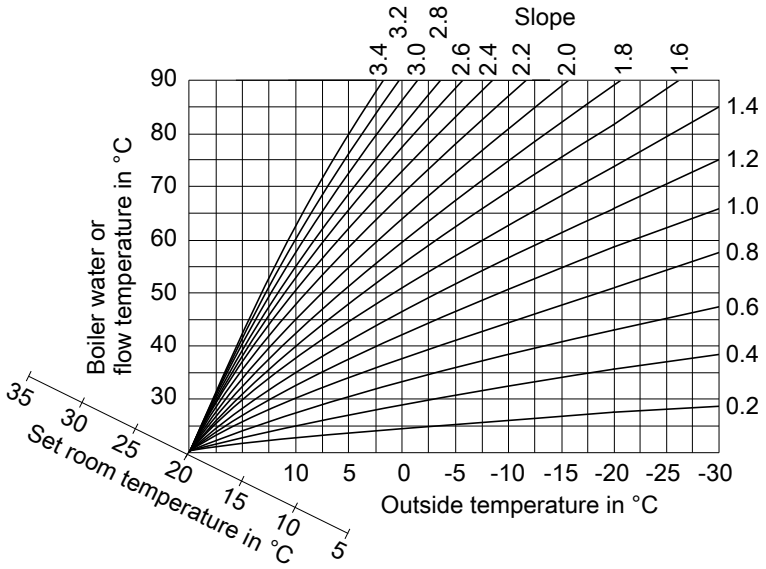

Fig. 44

Slope setting ranges:
- Underfloor heating systems: 0.2 to 0.8
- Low temperature heating systems: 0.8 to 1.6

Set room temperature

Standard room temperature

Individually adjustable for each heating circuit.
The heating curve is offset along the set room temperature axis. The start and stop points of the heating circuit pumps depend on the Heating limit, outside temperature, heating circuit... setting.

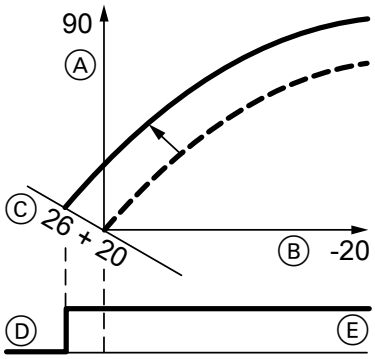

Fig. 45 Example 1: Changing the set room temperature from 20 to 26 °C

Ⓐ Flow temperature in °C
Ⓑ Outside temperature in °C
Ⓒ Set room temperature in °C
Ⓓ Heating circuit pump "OFF"
Ⓔ Heating circuit pump "ON"

Changing the set room temperature

Operating instructions

Changing the slope and level

Individually adjustable for each heating circuit

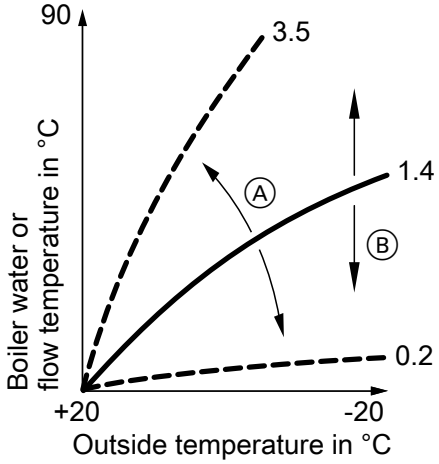

Fig. 46

Ⓐ Changing the slope
Ⓑ Changing the level (vertical parallel offset of the heating curve)

DHW heating

The burner, the circulation pump and the 3-way diverter valve are started or changed over if the cylinder temperature lies 2.5 K below the set cylinder temperature.
In the delivered condition, the set boiler water temperature is 20 K higher than the set cylinder temperature.
If the actual cylinder temperature exceeds the set cylinder temperature by 2.5 K, the burner shuts down and circulation pump run-on begins.

⚠ **Danger**
Risk of injury due to increased DHW temperature.

Inform the system user of the risk from the raised outlet temperature at the draw-off points.
- Gas condensing system boiler:
  If the set DHW temperature is set to over 60 °C
- Gas condensing combi boiler:
  If there are several draw-off events in quick succession or several appliance calibration processes

External heating circuit hook-up (if installed)

Note
Only in conjunction with weather-compensated operation.

- Function:
  - If the external demand is active, the heating circuit is supplied with heat.
  - If the external demand is inactive (contact open), heat supply to the heating circuit ends (regardless of the current set room temperature or the switching time).

    ! **Please note**

    There is no frost protection for the connected heating circuits.
- Connection:
  - If just one heating circuit is web connected, use plug 96.

HBMU heat management unit

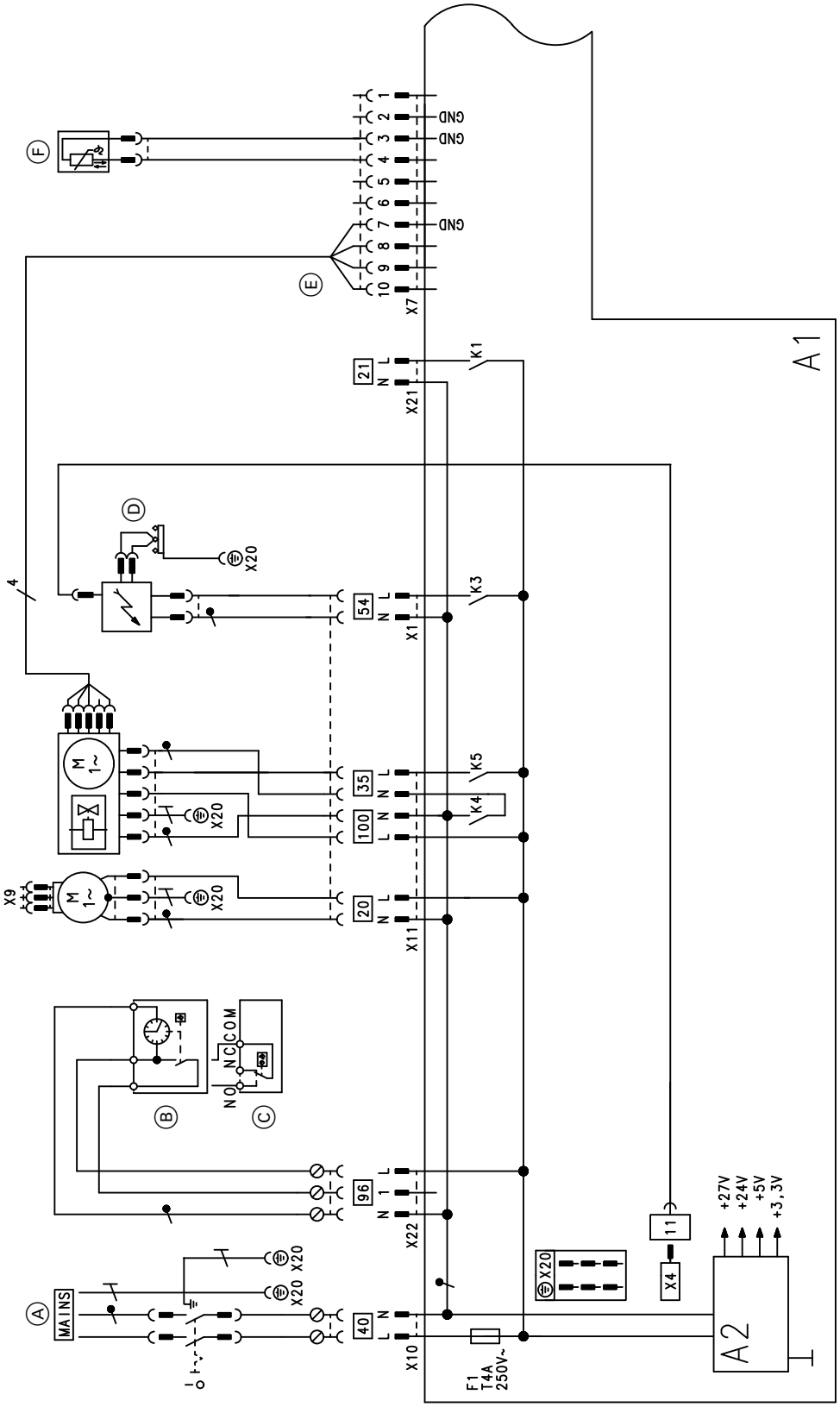

Fig. 47

A1 HBMU heat management unit
A2 Power supply unit
X... Electrical interfaces
Ⓐ Power supply 230 V/50 Hz
Ⓑ Vitotrol 100, type UTA
Ⓒ Vitotrol 100, type UTDB
Ⓓ Ignition unit/ionisation
Ⓔ Fan motor control
Ⓕ Outlet temperature sensor (combi boiler only)
96 Connection accessory 230 V
100 Fan motor 230 V
35 Gas solenoid valve
54 Ignition unit

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HBMU heat management unit (cont.)

40 Mains input
21 No function

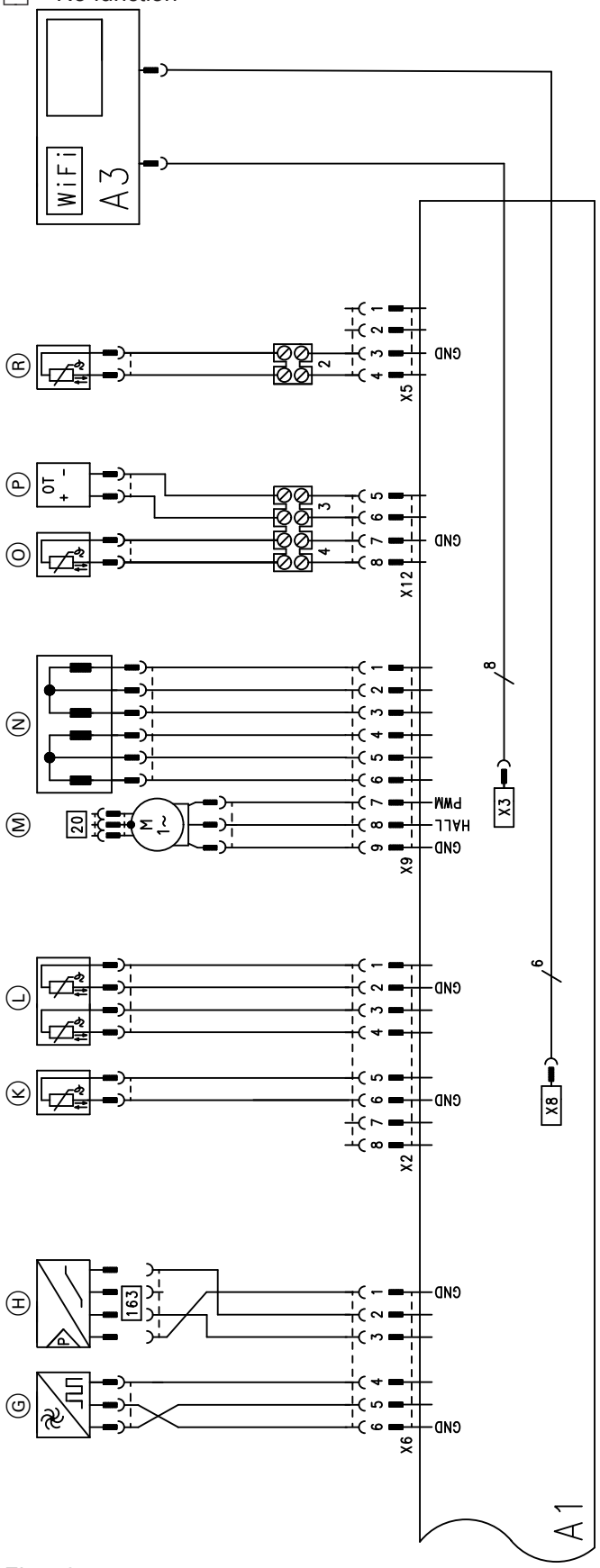

Fig. 48

A1 HBMU heat management unit
A3 Programming unit with communication module
X... Electrical interfaces
Ⓖ Flow sensor (combi boiler only)

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(cont.)

Ⓗ Water pressure sensor
Ⓚ Flue gas temperature sensor
Ⓛ Boiler water temperature sensor
Ⓜ Internal circulation pump (PWM)
Ⓝ Stepper motor for diverter valve
Ⓞ Outside temperature sensor
Ⓟ Remote control (OpenTherm controller)
Ⓡ Cylinder temperature sensor (system boiler only)

(cont.)

Settings and test values		Set value	Commissioning	Maintenance/ service	Maintenance/ service
Date					
Signature					
Static pressure	mbar kPa	≤ 57.5 ≤ 5.75			
Supply pressure (flow pressure)					
☐ For natural gas	mbar kPa	See table "Supply pressure" (Commissioning ...)			
☐ *Enter gas type*					
Carbon dioxide content CO_2 For natural gas					
▪ At lower heating output	% by vol.	See "Checking the combustion quality" (Commissioning ...)			
▪ At upper heating output	% by vol.				
Oxygen content O_2					
▪ At lower heating output	% by vol.				
▪ At upper heating output	% by vol.				
Carbon monoxide content CO					
▪ At lower heating output	ppm	< 1000			
▪ At upper heating output	ppm	< 1000			

Settings and test values		Set value	Commissioning	Maintenance/ service	Maintenance/ service
Date					
Signature					
Static pressure	mbar kPa	≤ 57.5 ≤ 5.75			
Supply pressure (flow pressure)					
☐ For natural gas	mbar kPa	See table "Supply pressure" (Commissioning ...)			
☐ *Enter gas type*					
Carbon dioxide content CO_2 For natural gas					

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(cont.)

Settings and test values		Set value	Commissioning	Maintenance/ service	Maintenance/ service
▪ At lower heating output	% by vol.	See "Checking the combustion quality" (Commissioning ...)			
▪ At upper heating output	% by vol.				
Oxygen content O_2					
▪ At lower heating output	% by vol.				
▪ At upper heating output	% by vol.				
Carbon monoxide content CO					
▪ At lower heating output	ppm	< 1000			
▪ At upper heating output	ppm	< 1000			

Gas condensing combi boiler

Gas boiler, type B and C, category I_{2N}/I_{2H}			
Type		**B0KA** **BPKA**	
Rated heating output range (details to EN 15502)			
T_F/T_R = 50/30 °C			
Natural gas	**kW**	**3.2 (7.0[*1]) - 19.0**	**3.2 (7.0[*1]) - 25.0**
T_F/T_R = 80/60 °C			
Natural gas	**kW**	**2.9 (6.3[*1]) - 17**	**2.9 (6.3[*1]) - 22.5**
Rated heating output for DHW heating			
Natural gas	kW	2.9 (6.3[*1]) - 25.4	2.9 (6.3[*1]) - 30
Rated heat input (Qn)			
Natural gas	kW	3.0 (6.5[*1]) - 18.0	3.0 (6.5[*1]) - 23.6
Rated heat input for DHW heating (Qnw)			
Natural gas	kW	3.0 (6.5[*1]) - 26.7	3.0 (6.5[*1]) - 31.5
Product ID		CE-0063DL3422	
IP rating to EN 60529		IP X4 to EN 60529 B1BA: IP X5 to EN 60529	
NO_x		6	6
Gas supply pressure			
Natural gas	mbar kPa	20 2	20 2
Max. permiss. gas supply pressure[*2]			
Natural gas	mbar kPa	25.0 2.5	25.0 2.5
Sound power level (to EN ISO 15036-1)			
At partial load	dB(A)	33	33
At rated heating output (DHW heating)	dB(A)	52	53
Power consumption (in the delivered condition)	W	45	64
Rated voltage	V	230	
Rated frequency	Hz	50	
Appliance fuse protection	A	4	
Backup fuse (power supply)	A	16	
Communication module (integral)			
WiFi frequency band	MHz	2400 - 2483.5	
Max. transmission power	dBm	20	
Low power radio frequency band	MHz	2400 - 2483.5	
Max. transmission power	dBm	10	
Supply voltage	V ⎓	24	
Power consumption	W	4	
Electronic temperature limiter setting (TN)	°C	91	
Electronic temperature cut-out setting	°C	110	
Permissible ambient temperature			
▪ During operation	°C	+5 to +40	
▪ During storage and transport	°C	-5 to +60	

*[*1] Appliances for multiple connection of type B0KA-[kW]-M*

*[*2] If the gas supply pressure is higher than the maximum permissible value, install a separate gas pressure governor upstream of the system.*

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Gas condensing combi boiler (cont.)

Gas boiler, type B and C, category I_{2N}/I_{2H}			
Type		**B0KA** **BPKA**	
Rated heating output range (details to EN 15502)			
T_F/T_R = 50/30 °C			
Natural gas	**kW**	**3.2 (7.0[*1]) - 19.0**	**3.2 (7.0[*1]) - 25.0**
T_F/T_R = 80/60 °C			
Natural gas	**kW**	**2.9 (6.3[*1]) - 17**	**2.9 (6.3[*1]) - 22.5**
Weight			
▪ Excl. heating water and packaging	kg	35	35
▪ Incl. heating water	kg	41	41
Water capacity (excl. diaphragm expansion vessel)	l	3.0	3.0
Max. flow temperature	°C	82	82
Max. flow rate (Limit for the use of hydraulic separation)	l/h	See residual head graphs	
Nominal circulating water volume At T_F/T_R = 80/60 °C	l/h	752	988
Diaphragm expansion vessel			
Capacity	l	8	8
Pre-charge pressure	bar kPa	0.75 75	0.75 75
Permiss. operating pressure	bar MPa	3 0.3	3 0.3
Connections (with connection accessories)			
Boiler flow and return	G	¾	¾
Cold water and DHW	G	½	½
Dimensions			
Length	mm	300	300
Width	mm	400	400
Height	mm	700	700
Gas connection	R	¾	¾
Supply values Relative to the max. load and 1013 mbar/15 °C			
Natural gas E	m^3/h	1.88	2.48
Natural gas LL	m^3/h	2.19	2.88
Flue gas parameters			
Temperature (at a return temperature of 30 °C)			
– At rated heating output	°C	41	46
– At partial load	°C	38	38
Temperature (at a return temperature of 60 °C, for DHW heating)	°C	65	67
Mass flow rate (for DHW heating)			
Natural gas			
– At rated heating output	kg/h	31.7	41.6
– At partial load	kg/h	5.6 (9.8)	5.6 (9.8)
Available draught	Pa	250	250
	mbar	2.5	2.5

[*1] *Appliances for multiple connection of type B0KA-[kW]-M*

Gas condensing combi boiler (cont.)

Gas boiler, type B and C, category I_{2N}/I_{2H}			
Type		**B0KA BPKA**	
Rated heating output range (details to EN 15502)			
T_F/T_R = 50/30 °C			
Natural gas	**kW**	**3.2 (7.0[*1]) - 19.0**	**3.2 (7.0[*1]) - 25.0**
T_F/T_R = 80/60 °C			
Natural gas	**kW**	**2.9 (6.3[*1]) - 17**	**2.9 (6.3[*1]) - 22.5**
Max. amount of condensate To DWA-A 251	l/h	3.8	4.4
Condensate connection (hose nozzle)	Ø mm	20 - 24	20 - 24
Flue gas connection	Ø mm	60	60
Ventilation air connection	Ø mm	100	100
Standard seasonal efficiency [to DIN] at			
T_F/T_R = 40/30 °C	%	Up to 98 (H_s) [gross cv]	
Energy efficiency class		A	A

Note
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 factory settings, the gas pressure must not be altered from these values. Reference: 15 °C, 1013 mbar (101.3 kPa).

Flue system types

Available in the following countries	Flue system types
AE, AM, AZ, BA, BG, BY, CH, CY, CZ, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, KG, KZ, LT, LV, MD, ME, MT, NL, NO, PL, PT, RO, RS, RU, SE, SK, TR, UA, UZ	B_{23}, B_{23P}, B_{33}, C_{13}, C_{33}, C_{53}, C_{63}, C_{83}, C_{83P}, C_{93} (C_{43}, C_{43P}, $C_{(10)3}$, $C_{(11)3}$, $C_{(13)3}$, $C_{(14)3}$[*3])
AU, BE, NZ	B_{23}, B_{23P}, B_{33}, C_{13}, C_{33}, C_{53}, C_{83}, C_{83P}, C_{93} (C_{43}, C_{43P}, $C_{(10)3}$, $C_{(11)3}$, $C_{(13)3}$, $C_{(14)3}$[*3])
DE, LU, SI	B_{23}, B_{23P}, B_{33}, C_{13X}, C_{33X}, C_{53X}, C_{63X}, C_{83X}, C_{93X} (C_{43}, C_{43P}, $C_{(10)3}$, $C_{(11)3}$, $C_{(13)3}$, $C_{(14)3}$[*3])
CN	C13

Gas categories

Available in the following countries	Gas categories	
AE, AM, AZ, BA, BG, BY,CY, CZ, DK, EE, ES, FI, GB, GR, HR, IE, IT, IS, KG, KZ, LT, LU, LV, MD, ME, MT, NO, PT, RO, RS, RU, SE, SK, TR, UA, UZ	I_{2N}/I_{2H}	2N/2H - G 20 - 20 mbar
AM, AZ, BY, MD, KG, KZ, RU, UA, UZ	I_{2N}/I_{2H}	2N/2H - G 20 - (13) 20 mbar

*[*1] Appliances for multiple connection of type B0KA-[kW]-M*
*[*3] Only for specifically marked appliances.*

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Gas categories (cont.)

Available in the following countries	Gas categories	
BE, FR	I_{2N}	2N - G 20/G 25 - 20/25 mbar
EN	I_{2N}	2N - G 20/G 25 - 20 mbar
HU	I_{2N}/I_{2H}	2N/2H - G 20 - 20 mbar
NL	I_{2EK}	2E - G 20 - 20 mbar 2K - G 25.3 - 25 mbar
PL	I_{2N}/I_{2ELw}	2N/2E - G 20 - 20 mbar 2N/2Lw - G 27 - 20 mbar

Electronic combustion control unit

The electronic combustion controller utilises the physical correlation between the level of the ionisation current and the air ratio λ. The maximum ionisation current is achieved at an air ratio of 1 for all gas qualities. The ionisation signal is evaluated by the combustion controller. The air ratio is regulated to a value that is between λ= 1.2 and 1.5. This range provides for an optimum combustion quality. Thereafter, the electronic gas train regulates the required gas volume subject to the prevailing gas quality.
To check the combustion quality, the CO_2 content or the O_2 content of the flue gas is measured. The prevailing air ratio is determined using the actual values.

To achieve optimum combustion control, the system regularly carries out an automatic self-calibration; also after power failures (shutdown). For this, the combustion is briefly regulated to maximum ionisation current (corresponding to air ratio λ=1). Self-calibration takes place shortly after the burner starts. The process lasts approx. 20 s during which higher than normal CO emissions may occur briefly.

Final decommissioning and disposal

Viessmann products can be recycled. Components and substances from the system are not part of ordinary domestic waste.

For decommissioning, isolate the system from the power supply and allow components to cool down where appropriate.
All components must be disposed of correctly.

Declaration of conformity

We, Viessmann Climate Solutions SE, D-35108 Allendorf, declare as sole responsible body that the named product complies with the European directives and supplementary national requirements in terms of its design and operational characteristics. Viessmann Climate Solutions SE, D-35108 Allendorf, hereby declares that the radio equipment type of the named product is in compliance with Directive 2014/53/EU.

Using the serial number, the full Declaration of Conformity can be found on the following website:
www.viessmann.co.uk/eu-conformity

Keyword index

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Keyword index (cont.)

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