

Vitodens 025-W

Type BPKB-24, BPKB-28, 5.0 to 25 kW

Wall mounted gas condensing boiler

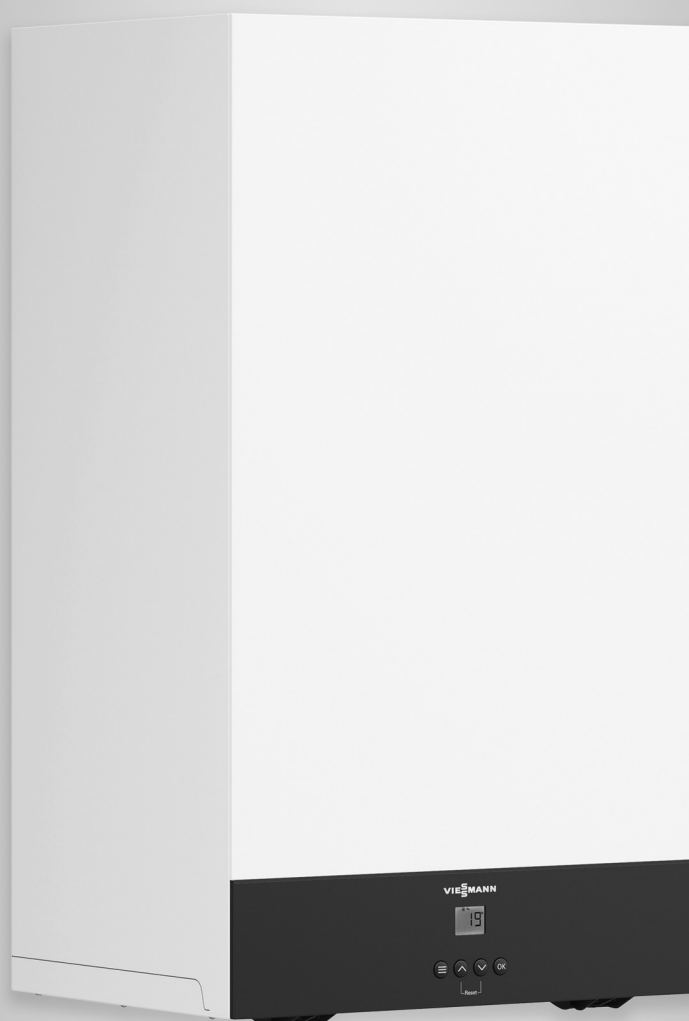
Natural gas version

Gas Council No.

- BPKB-24:
47-819-64
- BPKB-28
47-819-65



VITODENS 025-W



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.

Note

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



Please note

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

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.

Auxiliary components, spare and wearing parts**Please note**

Auxiliary components, spare parts 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 installation and replacements, use only Viessmann original parts or parts approved by Viessmann.

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.

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/pipe-work 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 extract air to the outside (extractor hoods, extractors, air conditioning units, central vacuum cleaning systems, 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.

1. Information	Disposal of packaging	8
	Gas Council No.	8
	Symbols	8
	Intended use	9
	■ Standards	9
	Product information	9
	■ Type plate	10
	System examples	10
	Maintenance parts and spare parts	10
	■ Viessmann Partnership	11
	■ Viessmann spare part app	11
2. Preparing for installation	Fitting the pre-plumbing jig	13
	Connection on the DHW side for gas condensing combi boiler	14
	■ Cold water installation	14
	■ Shock arrestor	14
3. Installation sequence	Removing the boiler from the packaging	15
	Mounting the boiler and making connections	16
	■ Removing the front panel	16
	■ Mounting the boiler on the pre-plumbing jig or mounting frame	16
	■ Fitting the boiler to the wall mounting bracket	18
	■ Heating water and DHW connections	20
	Condensate connection, topping up heating water	21
	■ Filling the trap with water	21
	Flue gas connection	22
	■ Connecting several Vitodens to a shared flue system	22
	■ Multiple connection (cascade utilisation)	22
	■ Increased partial load	22
	Gas connection	23
	■ Gas installation to BS 6891:2005	23
	Electrical connections	24
	■ Opening the wiring chamber	24
	■ Overview of electrical connections	25
	■ On-site connections on the ICB heat management unit	26
	■ Outside temperature sensor	26
	■ Power supply	27
	■ Routing connecting cables	27
	Closing the wiring chamber	28
	Mounting the front panel	28
4. Commissioning, inspection, maintenance	Steps - commissioning, inspection and maintenance	29
5. System configuration (parameters)	Calling up parameters	50
	Parameters	50
	■ 4 Max. speed of speed-controlled primary/heating circuit pump in standard mode, heating circuit 1	50
	■ 6 Minimum heating output	50
	■ 7 Maximum heating output	50
	■ 8 Maximum flow temperature limit, heating circuit 1	50
6. Diagnostics and service checks	Service menu	51
	■ Calling up the service menu	51
	■ Exiting the service menu	51
	Diagnostics	51
	■ Checking operating data	51
7. Troubleshooting	Fault display on the programming unit	52
	Resetting the burner	52

Index (cont.)

	Overview of electronics modules	52
	Fault messages	53
	■ F02	53
	■ F03	53
	■ F04	53
	■ F05	53
	■ F07	54
	■ F08	54
	■ F09	54
	■ F10	54
	■ F18	54
	■ FF1	55
	■ F30	55
	■ F31	55
	■ F38	55
	■ F39	55
	■ F51	56
	■ F58	56
	■ Fb8	56
	■ Fb0	56
	■ FA9	56
	■ F0b	56
	■ F0C	57
	Repairs	57
	■ Shutting down the boiler	57
	■ Removing the boiler from the pre-plumbing jig or mounting frame	58
	■ Checking the temperature sensors	59
	■ Replacing the power cable	60
	■ Checking the plate heat exchanger	61
	■ Removing the hydraulic unit	62
	■ Checking the fuse	63
8. Function description	Appliance functions	64
	■ Heating mode	64
	■ OpenTherm controller	64
	■ Venting program	64
	■ Filling program	64
	■ Heating curve	64
9. Connection and wiring diagram	ICB heat management unit	66
10. Commissioning/service reports	Report	68
11. Specification	Gas condensing combi boiler	69
12. Disposal	Final decommissioning and disposal	72
13. Certificates	Declaration of conformity	73
14. Keyword index	74











Disposal of packaging

Please dispose of packaging waste in line with statutory regulations.







Gas Council No.

Type	Gas Council No.:
Vitodens 025-W, BPKB-24	47-819-64
Vitodens 025-W, BPKB-28	47-819-65

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 personal injury
	Warning of material losses and environmental pollution
	Live electrical area
	Pay particular attention.
	<ul style="list-style-type: none"> Component must audibly click into place. or Acoustic signal
	<ul style="list-style-type: none"> 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, with due attention paid to CECS215-2017 and 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).

Standards

The appliance is only approved for installation in GB and IE and should be installed according to the applicable regulations. In GB, installation must be carried out by a Gas Safe Registered Engineer. Installation must be performed in accordance with the relevant requirements of the following regulations:

- Gas Safety (Installation and Use) Regulations
- The country-specific building regulations of Great Britain, Scotland or Northern Ireland
- The Water Fittings Regulations or Water Byelaws in Scotland
- The current IEEE Wiring Regulations
- British Standard Code of Practice

In IE, the installation must be carried out by a registered gas installer (RGII) and in accordance with the current edition of IS813 Domestic Gas Installations. Follow the building regulations and guidelines of the current ETCI rules for electrical installation. Observe the following British Standard Codes of Practice and regulations:

- BS 5440:1
Chimneys, flue pipes and ventilation for gas appliances of rated input ≤ 70 kW net
- BS 5440:2
Flueing and ventilation for gas appliances of rated input ≤ 70 kW net
- BSEN 12828:2003
Heating systems in buildings: Design for water-based heating systems

- BSEN 12831:2003
Heating systems in buildings: Method for calculation of the design heat load
 - BSEN 14336:2004
Heating systems in buildings: Installation and commissioning of water based heating systems
 - BS 5546
Installation of gas fired water-heating appliances for domestic purposes (2nd family gas)
 - BS 6798
Installation of gas fired boilers of rated input ≤ 70 kW net
 - BS 6891
Low pressure gas installation pipework
 - Health and Safety document no 635
 - The Electricity at Work Regulations, 1989
- The appliance is CE designated for safety and performance reasons. It is therefore important that no external control devices, such as flue dampers, economisers, etc., are connected directly to the appliance. Only the external control devices listed in these installation and service instructions may be connected. In addition, control devices that are listed as compatible in other product documentation from the manufacturer may also be connected.
- If a control device that is not authorised by the manufacturer is connected directly, the CE designation and the appliance warranty will be invalidated.

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
- Gas condensing combi boiler with integral plate heat exchanger for DHW heating
- Weather-compensated or constant temperature control unit
- Integral diaphragm expansion vessel (8 l capacity)

Product information (cont.)

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

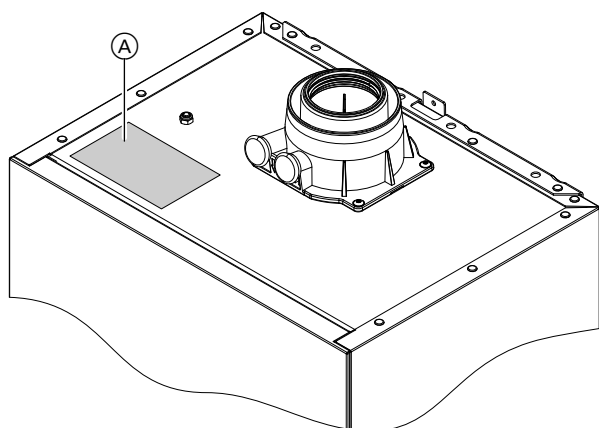


Fig. 1

- Ⓐ 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 heat generator may generally only be delivered to countries listed on the type plate.

For operation in 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 regarding system examples:
www.viessmann-schemes.com

Maintenance parts and spare parts

You can identify and order maintenance parts and spare parts directly online.

Maintenance parts and spare parts (cont.)**Viessmann Partnershop**

Login:

<https://shop.viessmann.com/>**Viessmann spare part app**

Web application

www.viessmann.com/etapp

ViParts app



Preparing for installation

(cont.)

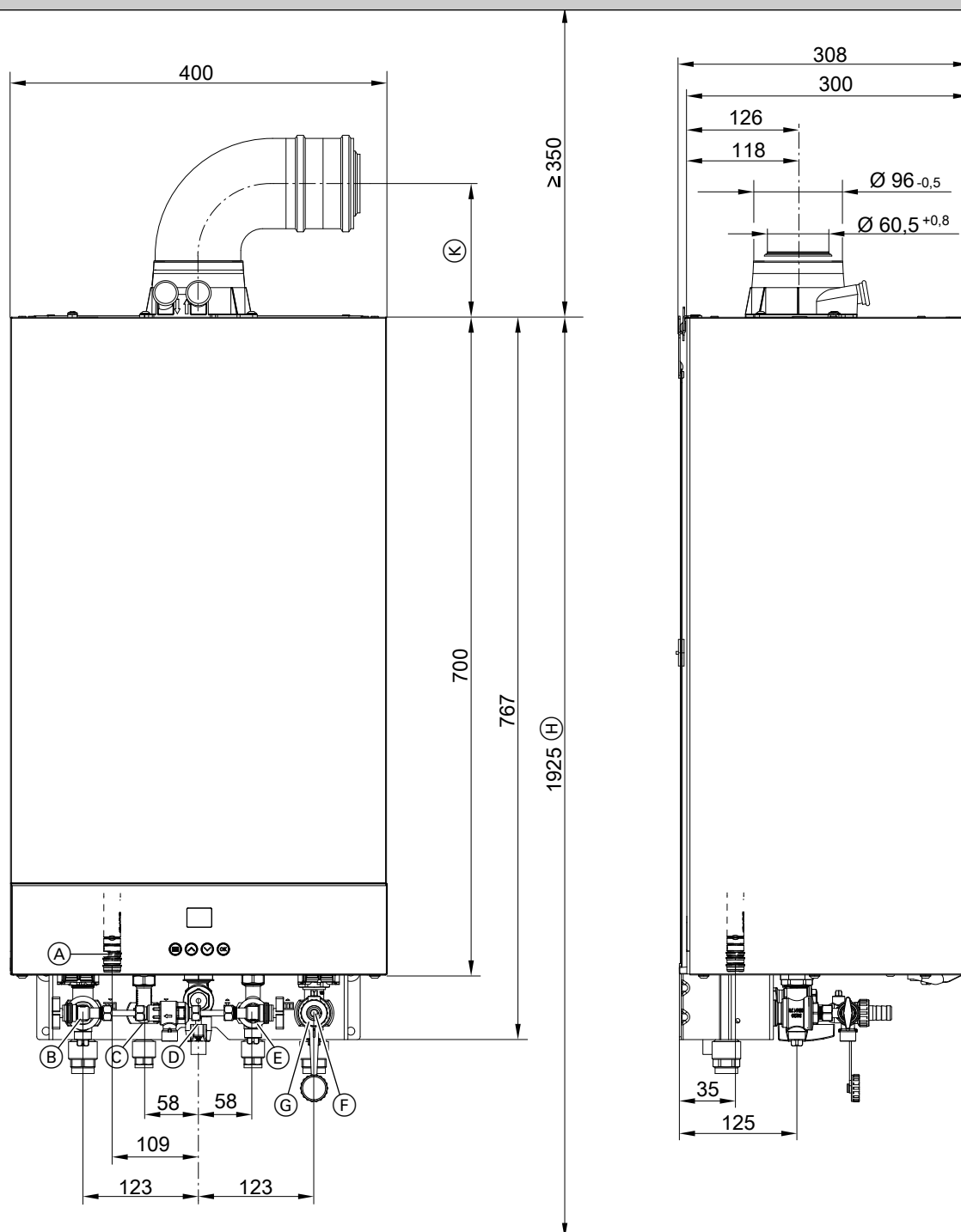


Fig. 2

- (A) Condensate drain
- (B) Heating flow
- (C) DHW
- (D) Gas connection
- (E) Cold water
- (F) Heating return

- (G) Filling/draining
- (H) Installation height (recommended)
- (K) Dimension: 161 mm – for external wall connection, part no. 7441467, 7411961
Dimension: 131 mm – for external wall connection, part no. 7946886 (with reduced flue bend)

(cont.)

Note

- This boiler (IP rating IP X4D) 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.
- The country-specific standards for electrical safety for installations must be complied with.

Fitting the pre-plumbing jig

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 appliance damage:
Connect all pipework so that it is free of load and torque stress.

3. Prepare the gas connection in accordance with TRGI or TRF.

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 permanent connection.

- Power supply: 230 V, 50 Hz, fuse rating max. 16 A
For effective protection, a 4 A or 8 A fuse should be used.
- Accessory cables: 0.75 mm² flexible PVC cable with required number of cores for external connections

Connection on the DHW side for gas condensing combi boiler

Cold water installation

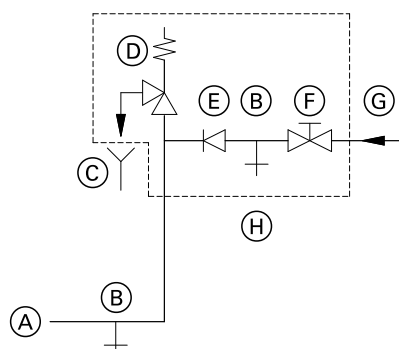


Fig. 3

- Ⓐ 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 it being shut off manually.

Shock arrestor

If draw-off points likely to cause water hammer are connected to the boiler's drinking water network (e.g. flush valves, washing machines, dishwashers), we recommend installing shock arrestors.

Removing the boiler from the packaging

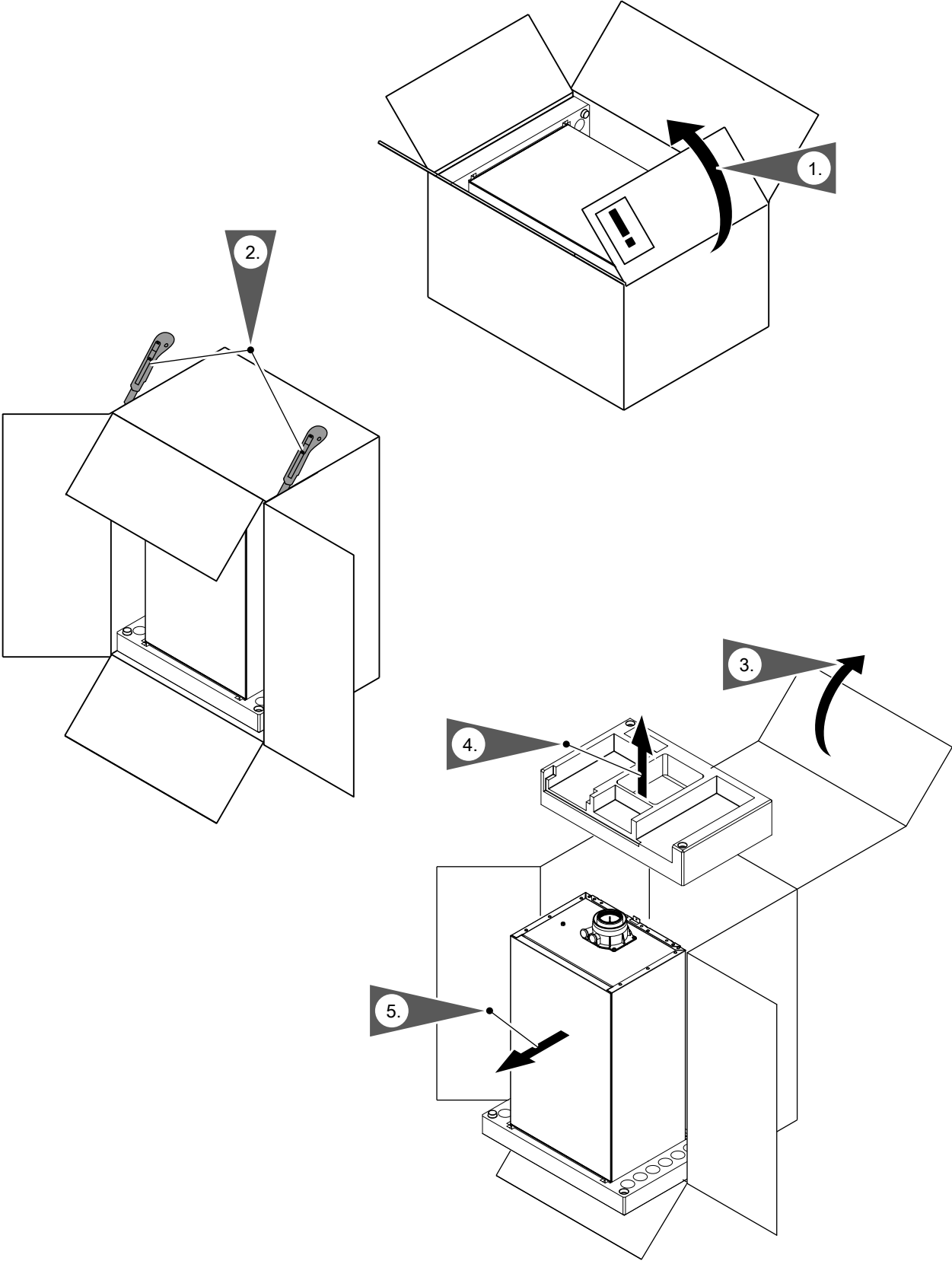


Fig. 4

Mounting the boiler and making connections

Removing the front panel

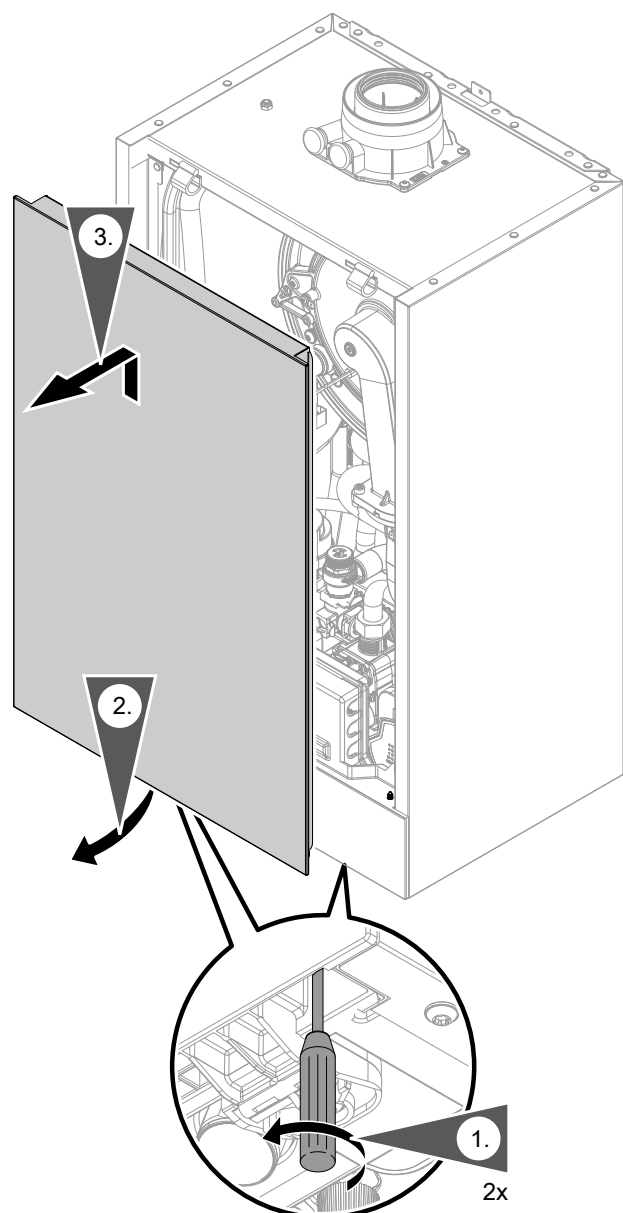


Fig. 5

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 installation later on.

Mounting the boiler and making connections (cont.)

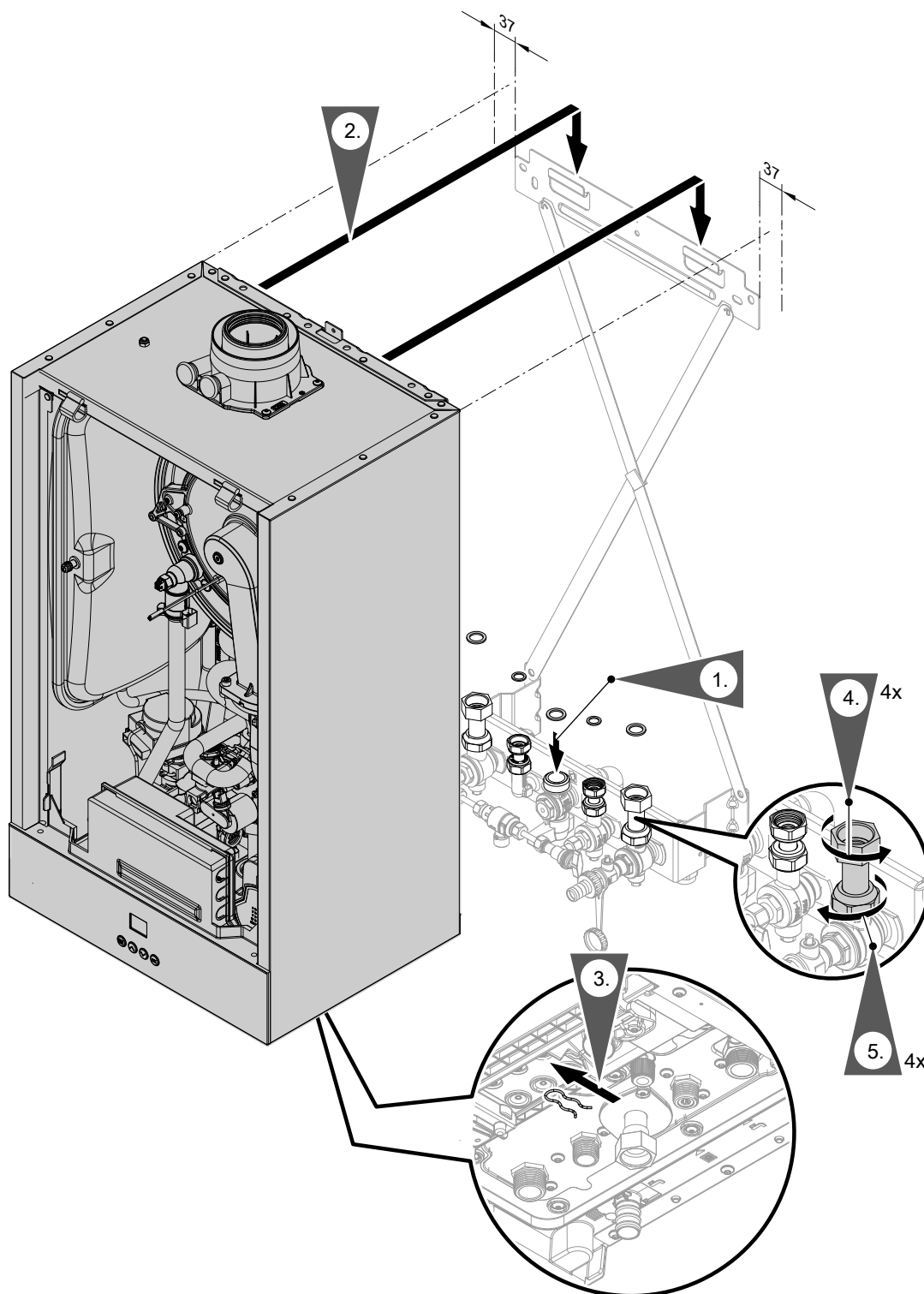


Fig. 6

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
- Connections on the heating water side Ø 17.0 mm

Note

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

Mounting the boiler and making connections (cont.)

2. Suspend the Vitodens from the wall mounting bracket.
After mounting, ensure correct seating.
3. 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 union nuts as much as necessary and ensure that the components are undamaged and are functioning correctly throughout their service life.
Observe torque settings if a torque wrench is available.
Check for gas tightness to BSI 6891.
5. Tighten locking ring fittings so that they form a tight seal:
1 turn beyond finger-tight

Torque settings:

- Union nuts G $\frac{3}{4}$: 30 Nm
- Union nuts G $\frac{1}{2}$: 24 Nm

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

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 installation later on.

Mounting the boiler and making connections (cont.)

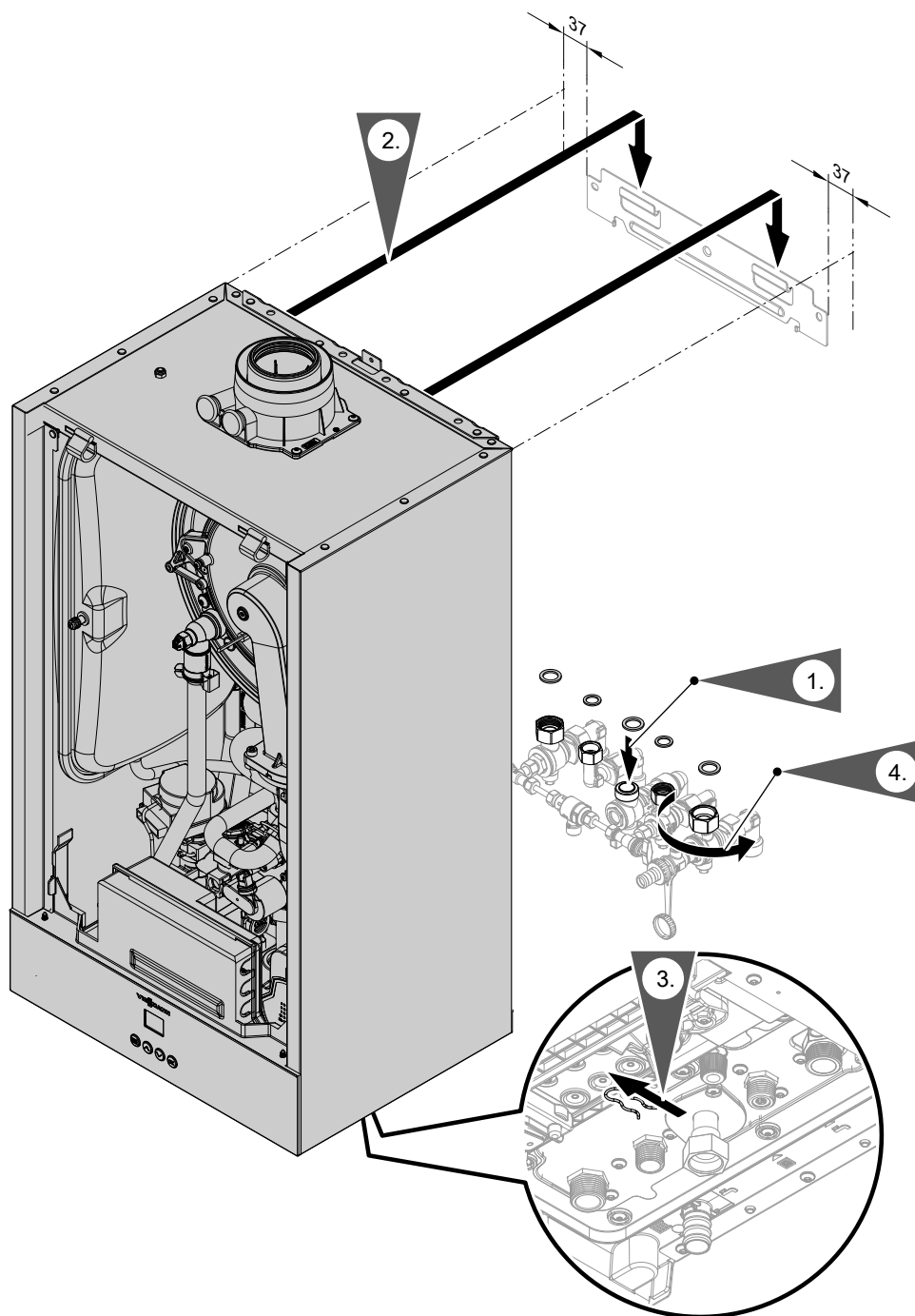


Fig. 7

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 union nuts as much as necessary and ensure that the components are undamaged and are functioning correctly throughout their service life.
Observe torque settings if a torque wrench is available.
Check for gas tightness to BSI 6891.

Torque settings:

- Union nuts G $\frac{3}{4}$: 30 Nm
- Union nuts G $\frac{1}{2}$: 24 Nm

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

Heating water and DHW connections

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

- Ⓒ Gas connection R $\frac{3}{4}$ (male thread)
- Ⓓ Cold water R $\frac{1}{2}$ (male thread)
- Ⓔ Heating return R $\frac{3}{4}$ (male thread)
- Ⓕ Filling/draining

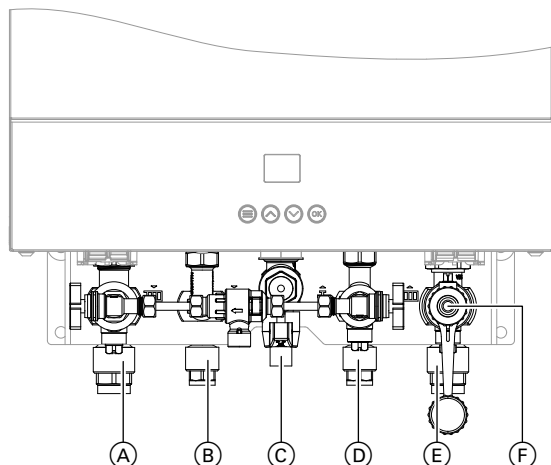


Fig. 8 Specifications for threads in conjunction with connection accessories

- Ⓐ Heating flow R $\frac{3}{4}$ (male thread)
- Ⓑ DHW R $\frac{1}{2}$ (male thread)

Condensate connection, topping up heating water

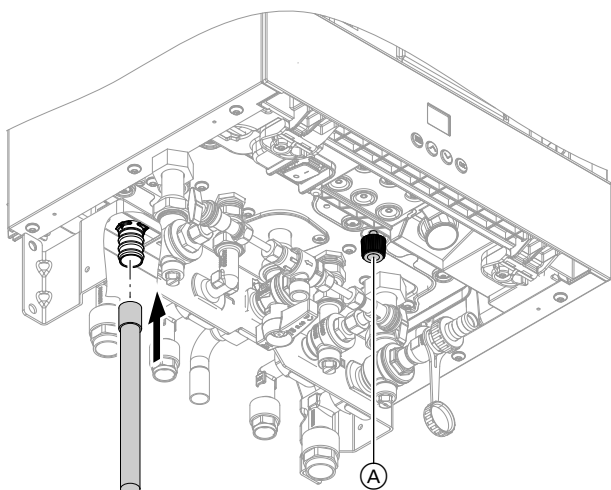


Fig. 9

1. Note

If a disconnecter is used, set the top-up facility to the "ON" position.
Remove blue cover (A).

2. Push the supplied condensate drain hose on to the drain connector.

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 line with min. Ø 30 mm.
- 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

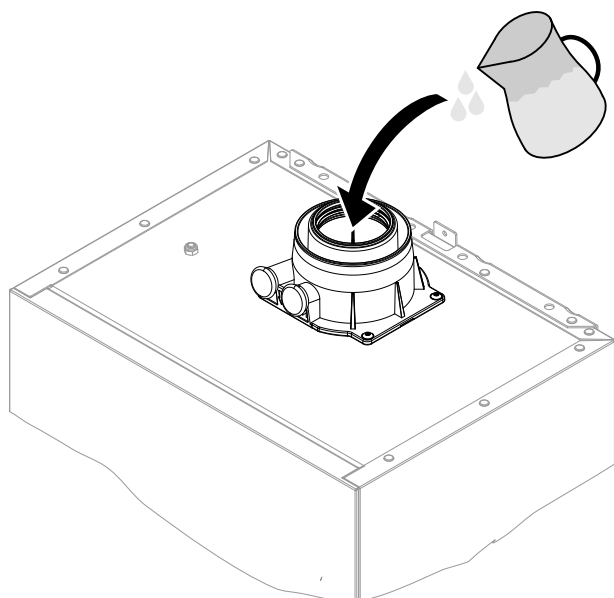


Fig. 10

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.

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

Installation instructions for the flue system

Connecting several Vitodens to a shared flue system

If several Vitodens boilers are being connected to a flue system at positive pressure in accordance with routing type C₁₀, C₁₃ or C₁₄ Vitodens models suitable for multiple connection are available for this purpose.

Note

Appliance models **suitable for multiple connection** must be ordered for this; see pricelist.

- 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.

Commissioning should be carried out only once the following conditions have been met:

- Unrestricted flow along 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. Apertures for combustion air supply must be non-sealable.

Prevent condensate drainage via a wind protector.

Multiple connection (cascade utilisation)

	1 appliance per floor		2 appliances per floor		
Rated heat input for DHW heating (Q _{nw})	29.1 kW		29.1 kW		
Number of appliances	2	3	2	3	4
Correction level:	Flue pipe length (m):		Flue pipe length (m):		
CD0	≤ 5	—	≤ 3	—	—
CD1	> 5 ≤ 25	≤ 14	> 3 ≤ 15	≤ 10	—
CD2	—	> 14 ≤ 23	—	> 10 ≤ 15	≤ 8
CD3	—	—	—	—	—
CD4	—	—	—	—	—
CD5	—	—	—	—	—

Increased partial load

	CD0:	CD1:	CD2:
Q _n (Hi) at 23.6 kW	5.1	6.9	8.2
Q _{nw} (Hi) at 29.1 kW	5.1	6.9	8.2
P _n (80/60 °C) (rated heating output)	4.9	6.6	7.9
P (50/30 °C)	5.6	7.4	8.8
B ₂₃ , C(10) ₃ , C(10) _{3X} , C(11) ₃ , C(11) _{3X} , C(13) ₃ , C(13) _{3X} , C(14) ₃ , C(14) _{3X}			

Gas connection

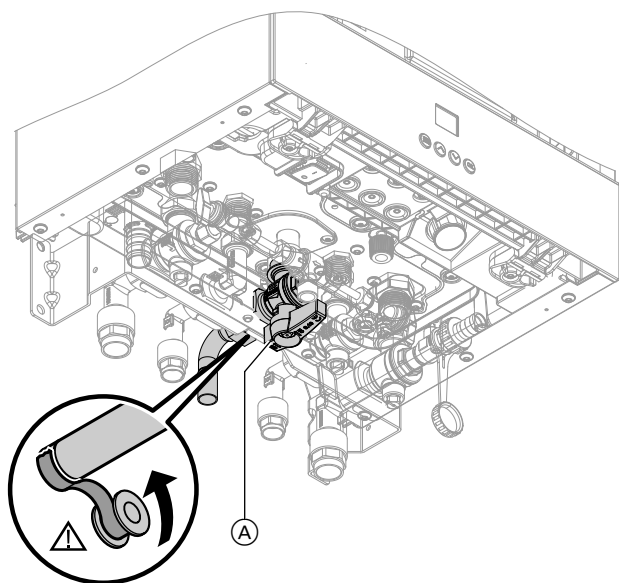


Fig. 11

1. If the gas connection has not been fitted previously, seal gas shut-off valve (A) to the gas connection.
Gas connection locking ring with nut M 22x1.5 (male thread)
Insert a gasket for gas connection G $\frac{3}{4}$.
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 leaks.

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 detection, disconnect the boiler and the gas solenoid valve from the main supply pipe (undo the fitting).

3. Purge the gas line.

Gas installation to BS 6891:2005

It is the gas installer's responsibility to size the gas installation lines in accordance with BS 6891:2005. If it is determined that the operating pressure falls below the minimum outlet level for the measuring device of 19 mbar: Check and ensure that the gas pressure is sufficient for correct and safe operation. Taking into account a pressure drop from the installation lines of no more than 1 mbar, it can be assumed that a permissible minimum pressure of 18 mbar is present at the appliance's gas connection (reference BS 6400-1 Section 6.2, Pressure absorption).

The external gas tap may reduce operating pressure further if measured at its test point. The pressure drop is relative to the heat input of the boiler (kW). Observe the minimum gas pressure at the gas solenoid valve in accordance with the table: See page 35

Opening the wiring chamber

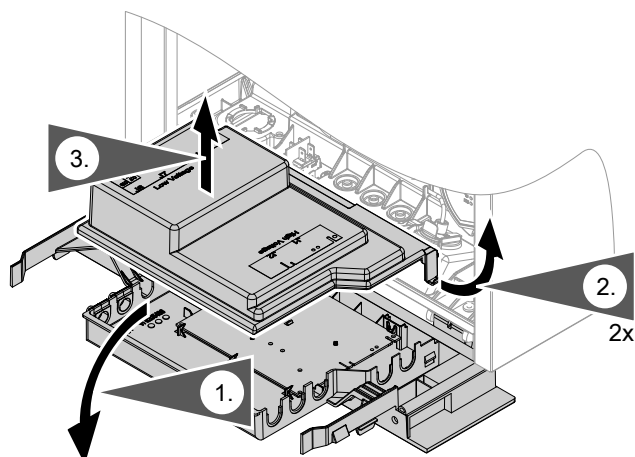


Fig. 12



Please note

Electronic assemblies can be damaged by electrostatic discharge.

Prior to commencing any work, touch earthed objects such as heating or water pipes to discharge static loads.

Electrical connections (cont.)

Overview of electrical connections

Note

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

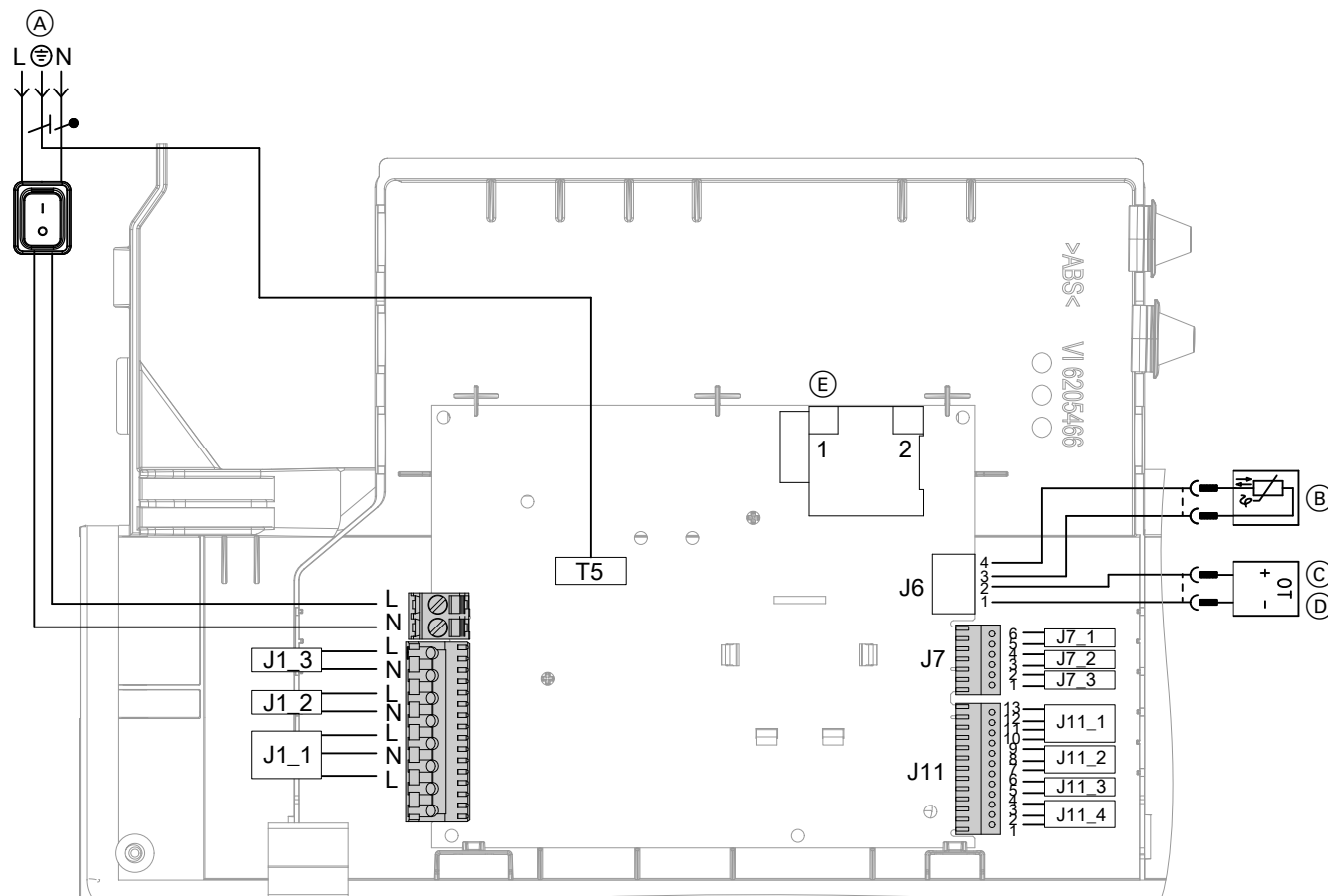


Fig. 13

- (A) Power supply
- (B) Outside temperature sensor
- (C) Remote control (OpenTherm controller)
- (D) 24 V DC room thermostat
- (E) Power supply unit
- J1_1 Heating circuit pump
- J1_2 Fan motor
- J1_3 3-way valve
- J7_1 Boiler temperature sensor
- J7_2 Flue gas temperature sensor
- J11_1 Fan-PWM connection
- J11_2 Pump-PWM connection
- J11_3 DHW temperature sensor
- J11_4 Flow sensor

Electrical connections (cont.)



Note on connecting accessories

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

All accessories have a low voltage connection.

Pin 1 and pin 2 in block J6 contain a jumper.

The jumper must be removed before an OT or room TH connection is established.

The jumper is inserted into the pins of the terminal blocks using a pointed tool and pulled upwards.

If the accessory is removed, the jumper must be reconnected to pin 1 and pin 2 of block J6. Otherwise operation of the appliance will not be possible.

On-site connections on the ICB heat management unit

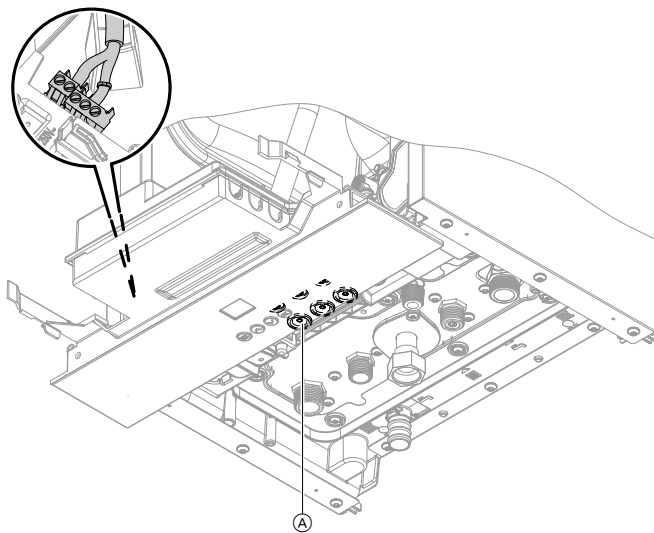


Fig. 14

Ⓐ 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, refit the plug with 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 25.

2-core cable, up to 35 m long with 1.5 mm² cross-section

Electrical connections (cont.)

Power supply

Power supply




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



Please note

If closures or diaphragm grommets are damaged, splashproofing is no longer ensured. Do not open or damage closures or unused diaphragm grommets on the underside of the appliance. Seal cable entries with fitted diaphragm grommets.

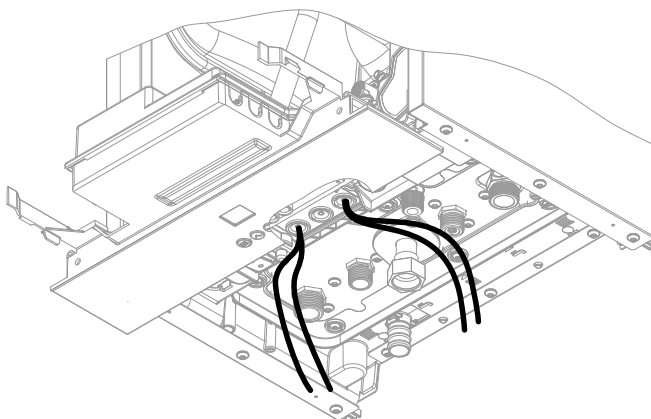


Fig. 15

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 over sharp edges or against the casing (sound transmission).



Please note

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

Closing the wiring chamber

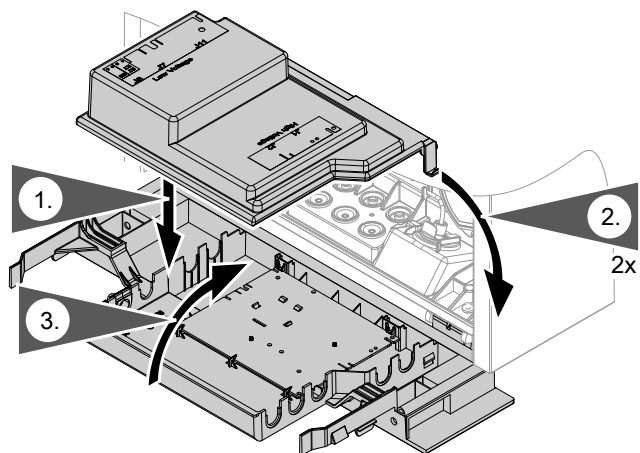


Fig. 16

Mounting the front panel

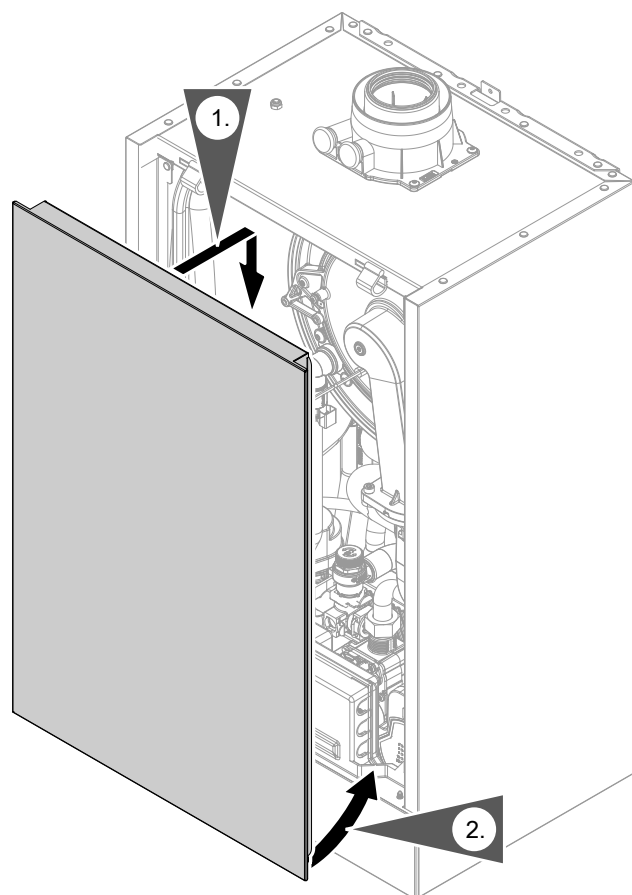


Fig. 17



Steps - commissioning, inspection and maintenance

				Page
			Commissioning steps	
			Inspection steps	
			Maintenance steps	
•			1. Commissioning the system.....	30
•		•	2. Filling the heating system.....	31
•	•	•	3. Checking all connections on the heating water and DHW sides for leaks.....	32
•			4. Venting the heating system.....	32
•			5. Checking the gas type.....	33
•	•	•	6. Removing the front panel.....	33
•	•	•	7. Checking the static pressure and supply pressure.....	34
•			8. Function sequence and possible faults.....	36
•			9. Setting the maximum heating output.....	36
•			10. Adjusting the integral circulation pump rate.....	37
•			11. Checking the balanced flue system for leaks (annular gap test).....	38
•			12. Burner adjustment when connecting multiple flues to a shared flue system.....	38
		•	13. Removing the burner.....	39
	•	•	14. Checking the burner gasket and burner gauze assembly.....	40
	•	•	15. Checking and adjusting the ignition and ionisation electrodes.....	42
	•	•	16. Checking the back draught safety devices.....	42
	•		17. Cleaning the heating surfaces.....	43
	•	•	18. Checking the condensate drain and cleaning the trap.....	43
	•	•	19. Installing the burner.....	45
	•	•	20. Checking the neutralising system (if installed).....	46
	•		21. Checking the flow limiter.....	46
•	•	•	22. Checking the expansion vessel and system pressure.....	46
•	•	•	23. Checking the safety valve function.....	
•	•	•	24. Checking the electrical connections for firm seating.....	47
•	•	•	25. Checking all gas equipment for leaks at operating pressure.....	47
•	•	•	26. Fitting the front panel.....	47
•		•	27. Checking the combustion quality.....	48
•	•	•	28. Checking the flue system for unrestricted flow and leaks.....	
•			29. Matching the control unit to the heating system.....	49
•			30. Instructing the system user.....	49



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.
Call up the commissioning assistant:
1. **≡** and **OK** simultaneously for approx. 4 s.
2. Use **^**/**v** to select **"C"** and confirm with **"OK"**.
3. The configuration menu is shown.
3. Further steps can be found in the commissioning assistant: See following overview.

Commissioning assistant sequence	Explanations and references
Commissioning	
"C.1" Max. heating water temperature	30 to 82 °C
"C.2" ^{*1} Max. output (heating)	rpm x 40 100 to 148 (4000 to 5920 rpm) depending on cascade operation
"C.3" ^{*1} Max. output (DHW)	rpm x 40 100 to 183 (4000 to 7320 rpm) depending on cascade operation
"C.4" ^{*1} Min. output	rpm x 40 40 to 50 (1600 to 2000 rpm) depending on cascade operation
"C.5" Max. pump rate in %	65 to 100
"C.6" Cascade operation	SD: Single appliance Cd0 to Cd5: Cascade appliance operating mode

Testing the flue gas temperature sensor

When the appliance is switched on for the first time, the display shows **"FLU"** to prompt the user to test the flue gas temperature sensor.

1. **To start the test, press the following buttons:**
^ and **v**, and hold for 3 s until **"FLU"** begins to flash on the display.
 - The test starts and takes around 3 minutes.
 - Once the test is complete, the results are shown on the display:
 - **"FLU + P"** = test successful
 - **"FLU + nP"** = test unsuccessful
2. If the test was successful, press **"OK"** for 3 s.
 - The test has been successfully completed and **"FLU"** is no longer shown on the display.

Note

Repeat the test if it was unsuccessful. Press **^** and **v** for 3 s.

If **"FLU + nP"** appears again, reposition the flue gas temperature sensor in the flue gas connection.
Check for leaks on the flue gas side.
Allow the appliance to cool down.

Note

*The burner remains locked out until the test has been successfully completed.
The test must be completed once with a positive result when commissioned for the first time!*

If it is necessary to interrupt the flue gas temperature sensor test, press **≡** for 3 s. The appliance will automatically revert back to test mode again after 20 minutes and the display will once again show **"FLU"**.

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

^{*1} This function can only be set for the BPKB-28 appliance.



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 above 300 ppm must be softened, e.g. with a small softening system for heating water.

1. Check the pre-charge pressure of the expansion vessel.
2. Close gas shut-off valve (A).
3. Activate the filling function (see next chapter).
4. Fill the heating system at boiler drain & fill valve (B) 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 (D). 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.

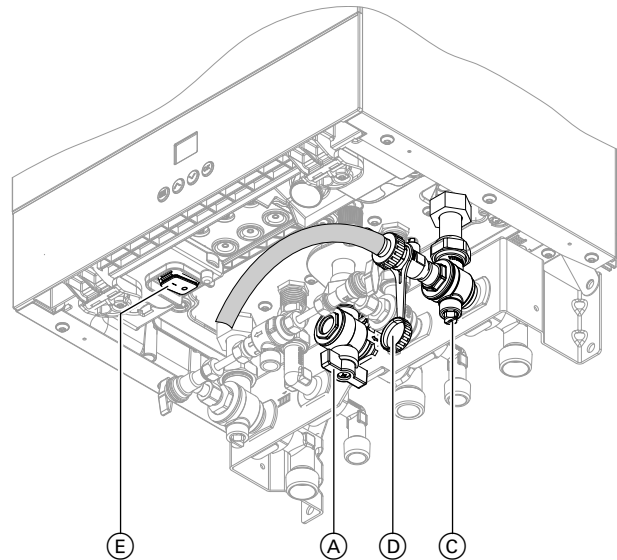


Fig. 18

(E) ON/OFF switch

5. Fit the hose to air vent valve (C). 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 (C) in the heating return. Vent (flush) under mains pressure until no more air noise is audible.
8. Close air vent valve (C). Check the system pressure at pressure gauge (D). 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 simultaneously for approx. 4 s.
2. Use to select "S" for the service menu.
3. OK
4. Use to select "S2" for the filling function.
5. OK
6. to select "ON" for filling.



Filling the heating system (cont.)

7. OK



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



Danger

There is a 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.



Please note

Leaking hydraulic connections lead to appliance damage.

- Check the internal and on-site hydraulic connections for leaks.
- In the event of leaks, switch off the appliance immediately. Drain the heating water. Check the seating of seal rings. **Always** replace displaced seal rings.



Venting the heating system

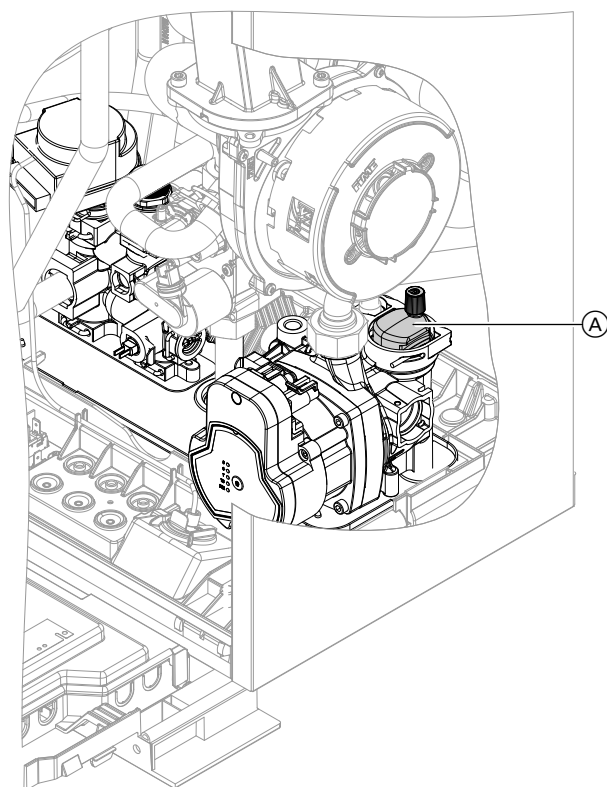


Fig. 19

1. Check whether the air vent screw in quick-action air vent valve (A) of the heating circuit pump is open.
2. Close the gas shut-off valve. Switch the appliance on.
3. Activate the venting program.
4. Adjust the system pressure.
The pressure gauge shows the system pressure.
5. Disconnect the supply hose from the boiler drain & fill valve.
6. Open the gas shut-off valve.

Note

Leave the quick-action air vent valve open once the venting program has finished.



Checking the gas type

The boiler is equipped with a pneumatic combustion controller that adjusts the burner for optimum combustion in accordance with the prevailing gas quality:

- Operation with natural gas therefore requires no adjustment across the entire Wobbe index range.
- The boiler can be operated within the Wobbe index range 10.9 to 15.2 kWh/m³ (39.1 to 54.7 MJ/m³).



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.

- **Do not touch** the wiring chambers (control unit and mains connections).
- When working on the appliance, isolate the system from the power supply, e.g. at a separate fuse or a main switch. Check the system is no longer live and safeguard against reconnection.
- Before working on the appliance, wait at least 4 min until the voltage has dropped out.





Removing the front panel (cont.)

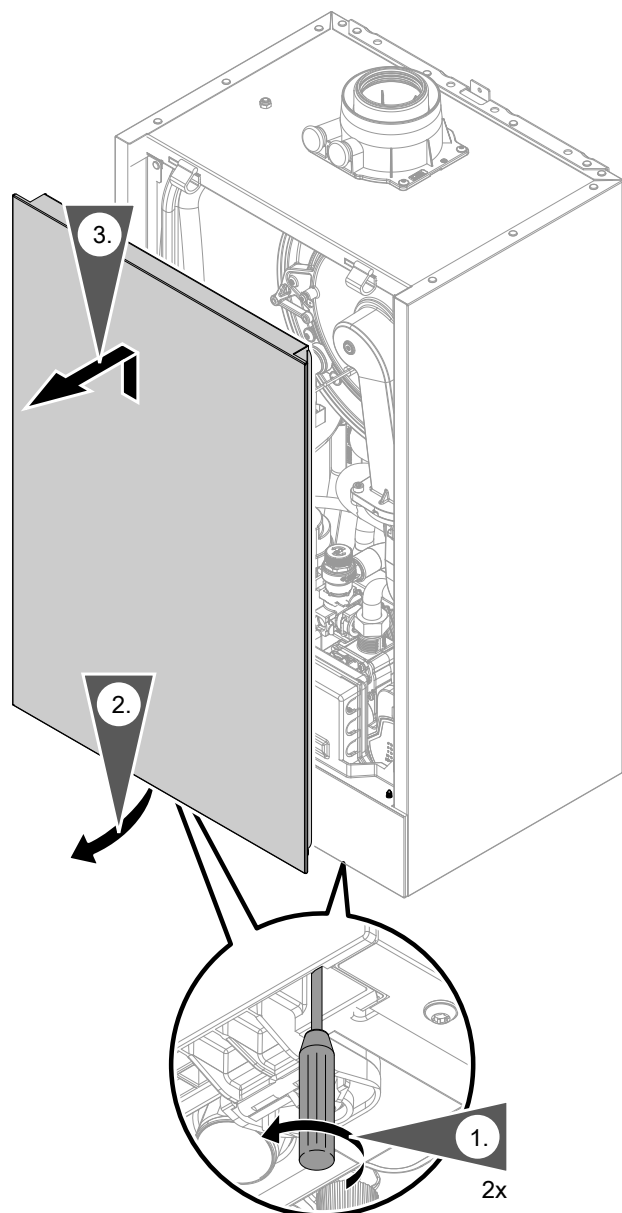


Fig. 20



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.



Checking the static pressure and supply pressure (cont.)

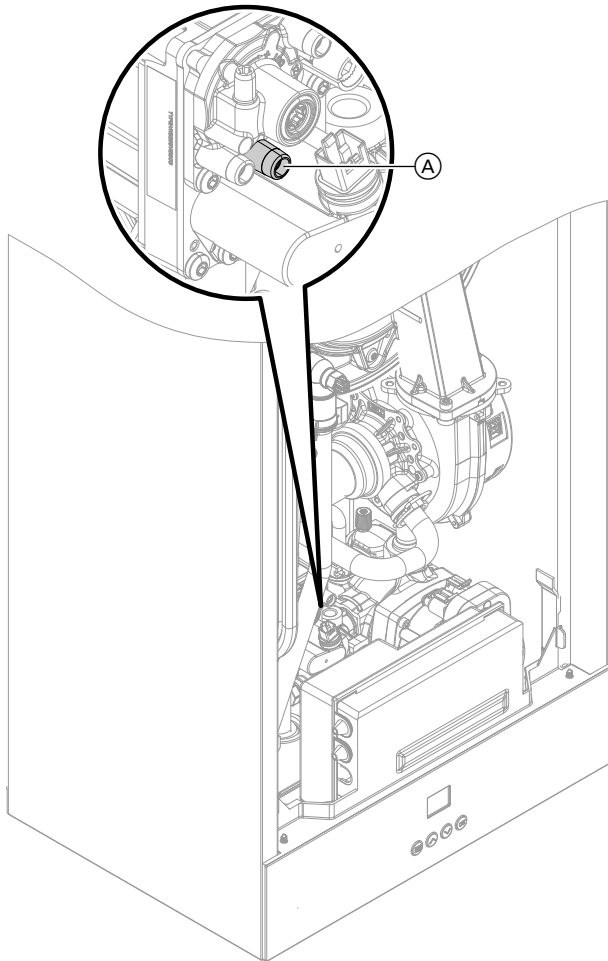


Fig. 21

1. Turn off the ON/OFF switch.
2. Close the gas shut-off valve.
3. Undo screw (A) in the test connector on the gas solenoid valve. Do not remove. Connect the pressure gauge.
4. Open the gas shut-off valve.
5. Check the static pressure. Record the reading in the report.
Set value: Max. 57.5 mbar (5.75 kPa).
6. Turn on the ON/OFF switch. 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 pressure (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 reading in the report.
Implement measures as indicated in the table below.
9. Shut down the boiler. Close the gas shut-off valve. Remove the pressure gauge. Use the screw to close test connector (A).
10. Open the gas shut-off valve. Start up the appliance.



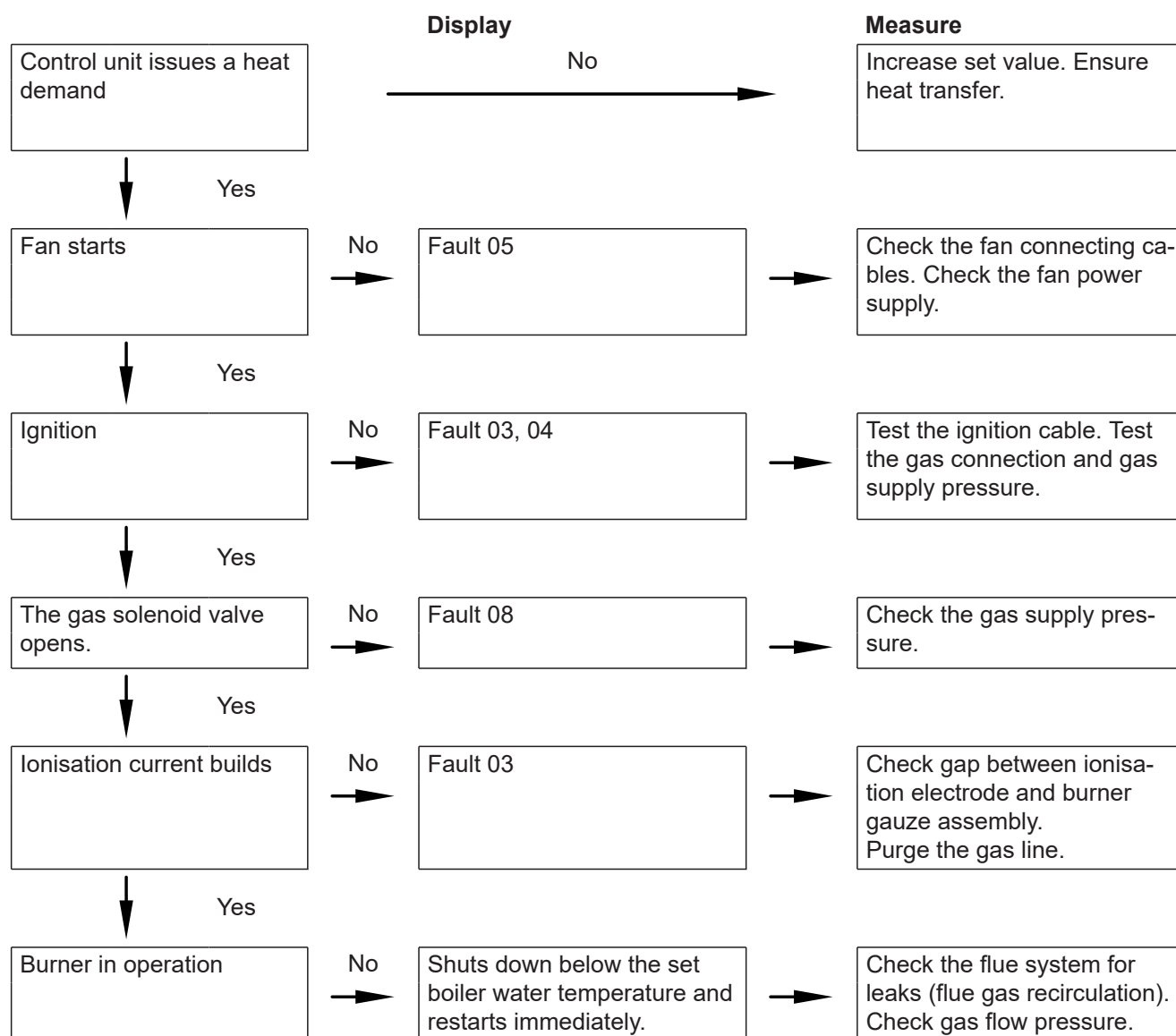
Danger

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

Supply pressure (flow pressure)	Measures
13 to 25 mbar (1.3 to 2.5 kPa)	Start the boiler.
> 25 mbar (2.5 kPa)	Connect a separate gas pressure governor upstream of the system. Set the pre-charge pressure to 20 mbar (2.0 kPa). Notify the gas supply utility.



Function sequence and possible faults



For further details regarding faults, see chapter "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 simultaneously for approx. 4 s, then release.

2. Use to select "C" for system configuration.
3. OK
4. Use to select "C.3" 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).



Setting the maximum heating output (cont.)

7. OK



Adjusting the integral circulation pump rate

Operation of the integral circulation pump

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.

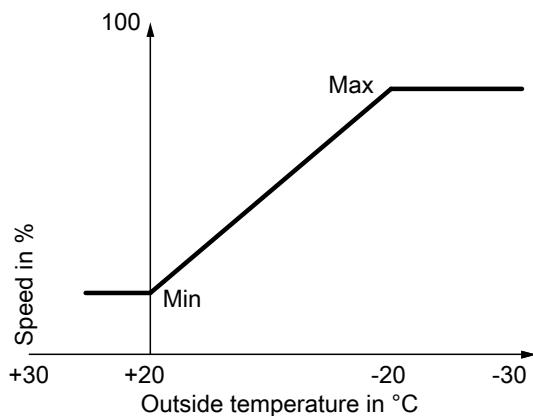


Fig. 22

Setting (%) in system configuration: See page 50.

- 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
20	65	100
25	65	100

Note

Opening pressure for overflow valve 190 mbar /19 kPa.

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

Residual head of the integral circulation pump

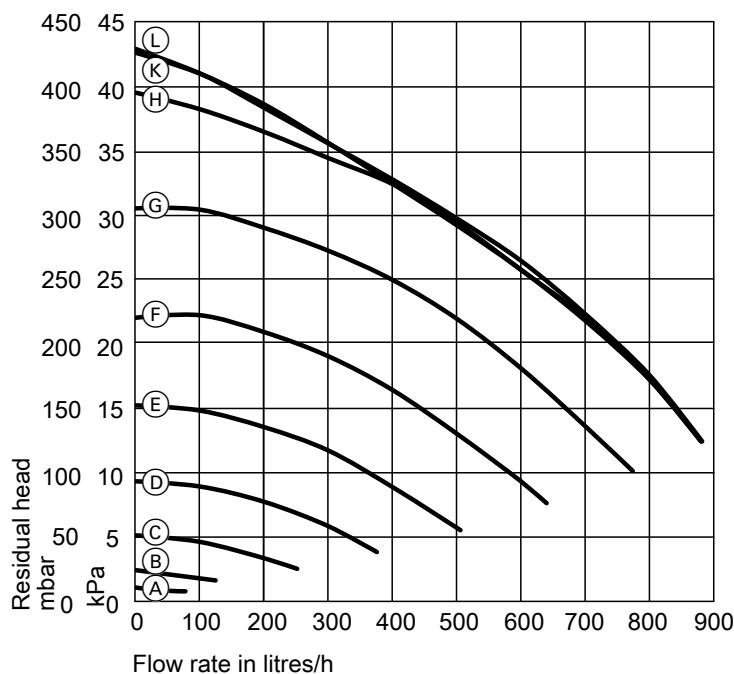


Fig. 23



Adjusting the integral circulation pump rate (cont.)

Curve	Pump rate of circulation pump
(A)	0 %
(B)	10 %
(C)	20 %
(D)	30 %
(E)	40 %
(F)	50 %
(G)	60 %
(H)	70 %
(K)	80 %
(L)	90 %



Checking the balanced flue system for leaks (annular gap test)

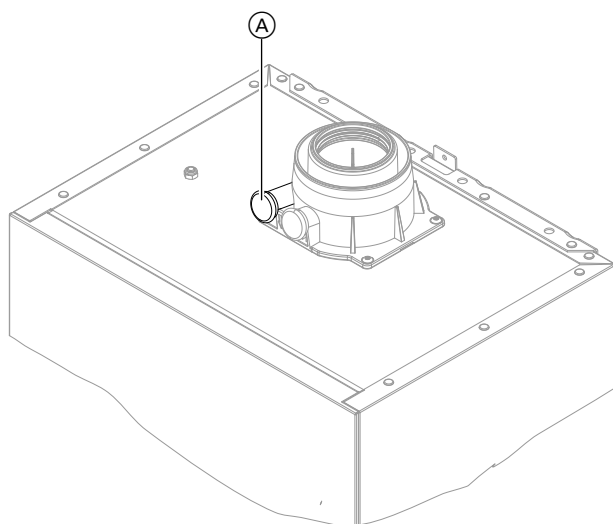


Fig. 24

(A) 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 CO₂ or O₂ concentration in the combustion air at the annular gap of the balanced flue pipe. If the CO₂ concentration is less than 0.2 % or the O₂ concentration is greater than 20.6 %, the flue pipe is deemed to be sufficiently gas-tight.

If actual CO₂ values are greater or O₂ 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 boilers to a shared flue system:



Burner adjustment when connecting multiple... (cont.)

For multiple connection, in the **configuration menu** use **"C.1 to C.6"** to match the burner setting to the flue system.

System conditions:

- Shared flue in shaft \varnothing 100 mm
- Balanced flue from boiler to shaft \varnothing 80/125 mm
- Minimum shaft cross-section
 - Square 175 x 175 mm
 - Round \varnothing 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.

- **Do not touch** the wiring chambers (control unit and mains connections).
- When working on the appliance, isolate the system from the power supply, e.g. at a separate fuse or a main switch. Check the system is no longer live and safeguard against reconnection.
- Before working on the appliance, wait at least 4 min until the voltage has dropped out.

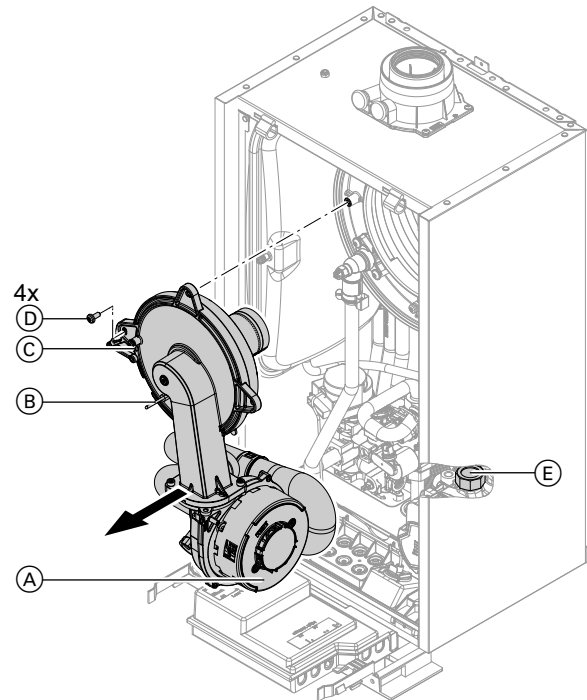


Fig. 25

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 (A) (2 plugs)
 - Ionisation electrode (B)
 - Ignition unit (C)
4. Undo gas connection pipe fitting (E).



Removing the burner (cont.)

5. Undo 4 screws ① and remove the burner.

Note

Cover gas connection ⑤ so that no small parts can fall into it.



Checking the burner gasket and burner gauze assembly

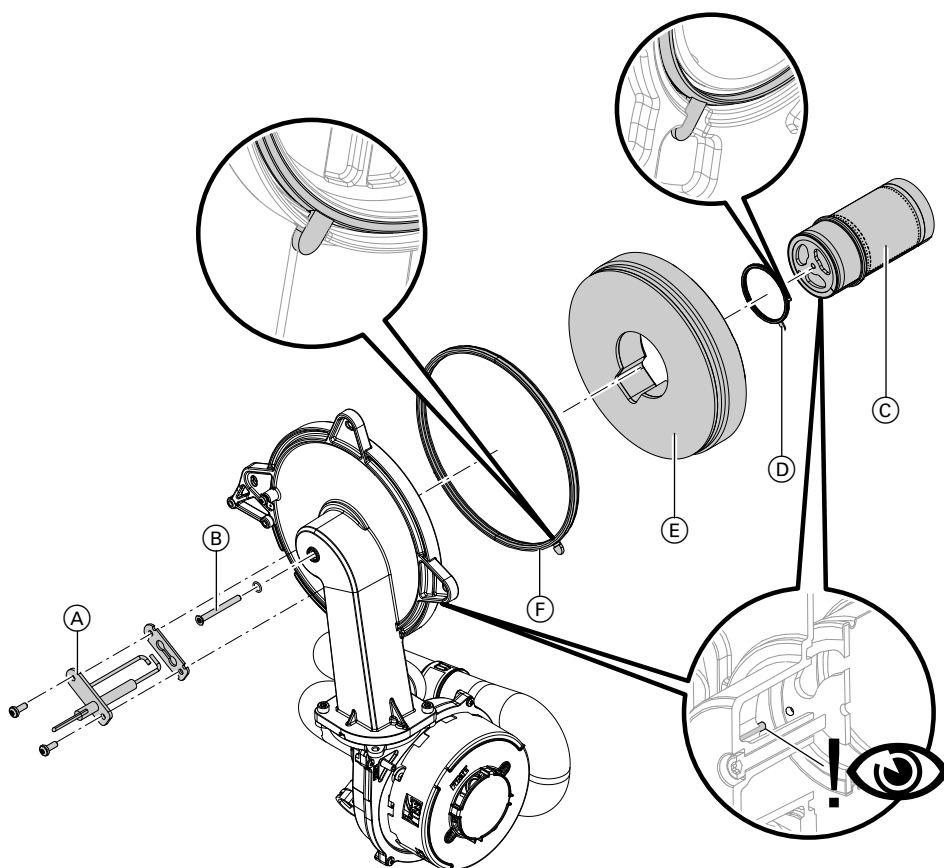


Fig. 26

Check electrodes ①, burner gauze assembly ③, thermal insulation ring ④ and gasket ② 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 ①.
3. Undo Torx screw ②. Hold onto burner gauze assembly ③ when undoing the screw.
4. Remove burner gauze assembly ③ with gasket ② and thermal insulation ring ④. Check components for damage.
5. Install new burner gasket ⑤. Ensure the correct installation position. Align the tab as per the diagram.
6. Insert thermal insulation ring ④ and burner gauze assembly ③ with gasket ②. Ensure the correct installation position. Align the tab as per the diagram.



Checking the burner gasket and burner gauze... (cont.)

7. Align the hole in burner gauze assembly (C) with the burner door pin.
Secure burner gauze assembly (C) and gasket (D) with Torx screw (B).
Tighten screws as much as necessary and ensure that the components are undamaged and function correctly throughout their service life.
Observe torque settings if a torque wrench is available.
Torque: 3.0 Nm.
8. Check thermal insulation ring (E) for firm seating.
9. Fit electrodes (A). Check clearances; see following chapter.
Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout their service life.
Observe torque settings if a torque wrench is available.
Torque: 4.5 Nm.



Please note

Incorrect positioning of the burner gauze assembly will cause damage to the burner door.
Insert the burner door pin into the hole in the burner gauze assembly. See chapter "Installing the burner gauze assembly", page 41

Installing the burner gauze assembly

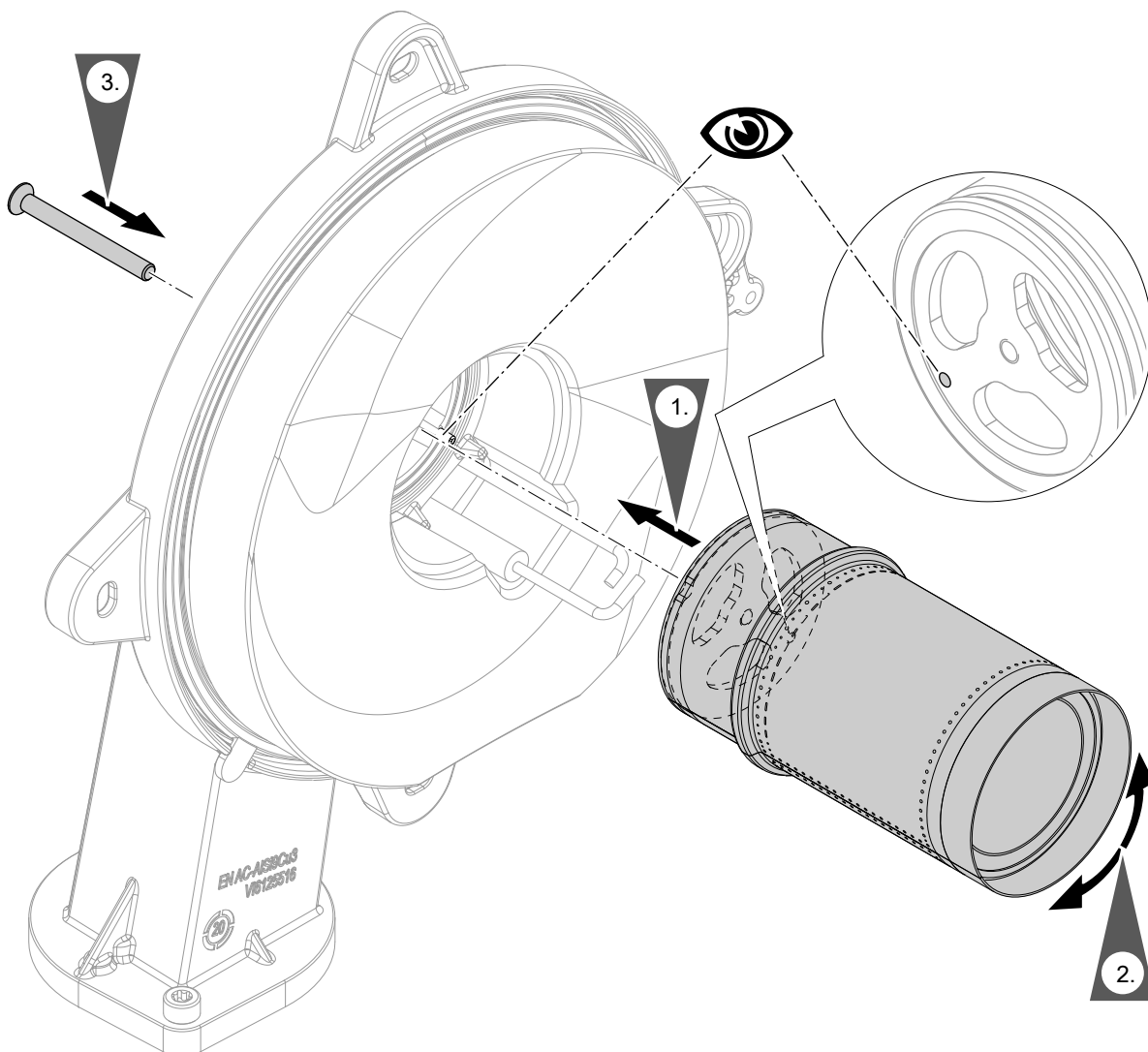


Fig. 27



Checking and adjusting the ignition and ionisation electrodes

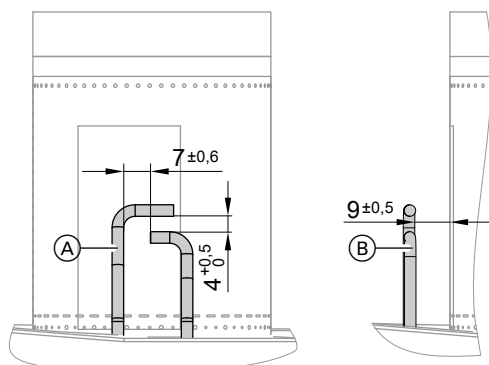


Fig. 28

- (A) Ignition electrodes
- (B) 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 their 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 shared flue system.

Back draught safety device in the mixing shaft of the burner

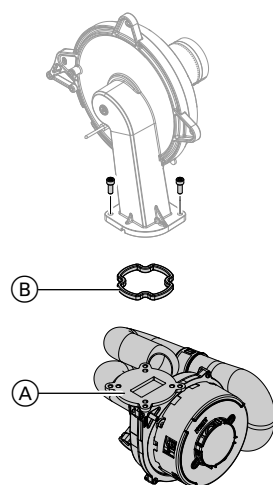


Fig. 29

1. Undo 2 screws and remove fan (A).
2. Remove back draught safety device (B).

3. Check the damper and gasket for dirt and damage.
Replace if necessary.
4. Refit back draught safety device (B).

Note

Observe correct installation position!

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



Checking the back draught safety devices (cont.)

Back draught safety device in the flue gas connection

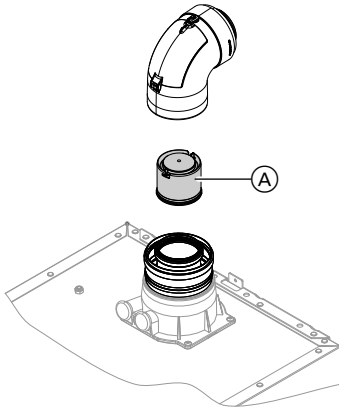


Fig. 30

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 (A) 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.

1. Use a vacuum cleaner to remove combustion residues from heating surface (A) of the heat exchanger.
2. Flush heating surface (A) with water.
3. Check condensate drain. Clean the trap: See the following chapter.
4. Check the thermal insulation mat (if fitted) in the heat exchanger for damage; replace if necessary.

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.

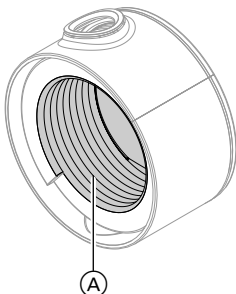


Fig. 31



Checking the condensate drain and cleaning the trap



Please note

Prevent damage due to condensate. Cover electronic components with suitable watertight material.

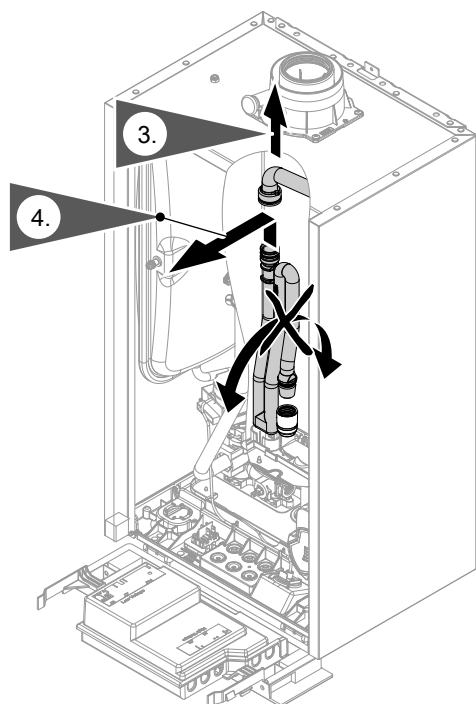



Fig. 32

1. Pivot the ICB heat management unit forwards.
 2. Cover electronic components with suitable water-tight 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.



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

9. **Danger**
 Leaking condensate can lead to an electric shock.
 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.



Installing the burner

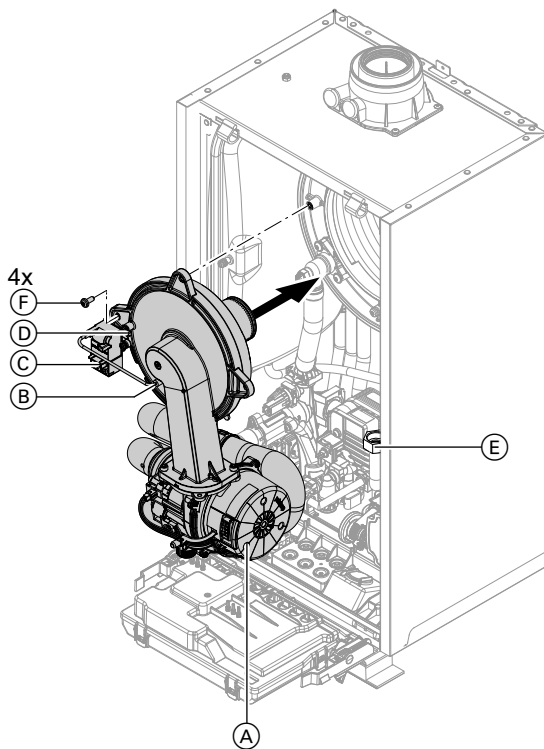


Fig. 33

1. Insert the burner. Tighten screws ⑥ 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 connection pipe ⑤ 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



Installing the burner (cont.)

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 under-side.

4. Connect the cables/leads:

- Fan motor (A) (2 plugs)
- Ionisation electrode (B)
- Ignition unit (C)
- Earth (D)



Checking the neutralising system (if installed)

Follow the service information from the manufacturer.



Checking the flow limiter

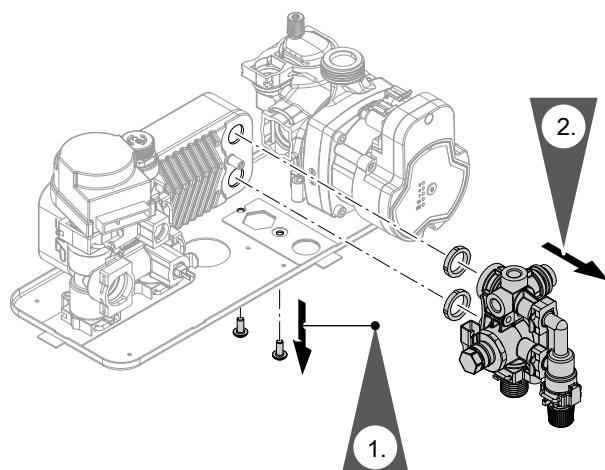


Fig. 34

1. Drain the boiler on the DHW side.
2. Remove the spring clip.
3. Remove the DHW flow limiter.
4. Mount DHW flow limiter with new gaskets.



Danger

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

Note

The flow rate should be set to a Δt of 35 K.

Flow limiter

Appliance type	Flow rate l/min	Colour
BPKB-24	12	Pink
BPKB-28	12	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 home screen, press **≡** repeatedly until the pressure gauge symbol appears.



Checking the expansion vessel and system... (cont.)

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.
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.

- **Do not touch** the wiring chambers (control unit and mains 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.

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 CO₂ or O₂ content

Operation with natural gas

Rated heating out-put (kW)	CO ₂ content (%)		O ₂ content (%)	
	Upper heating out-put	Lower heating out-put	Upper heating out-put	Lower heating out-put
21.2	9.1 to 9.5	8.0 to 8.6	3.8 to 4.9	5.5 to 7.4
25	9.1 to 9.5	8.0 to 8.6	3.8 to 4.9	5.5 to 7.4

If the actual CO, CO₂ or O₂ values lie outside their respective ranges, proceed as follows:

- Check the balanced flue system for leaks: See page 38.
- Check the ionisation electrode and connecting cable: See page 42.

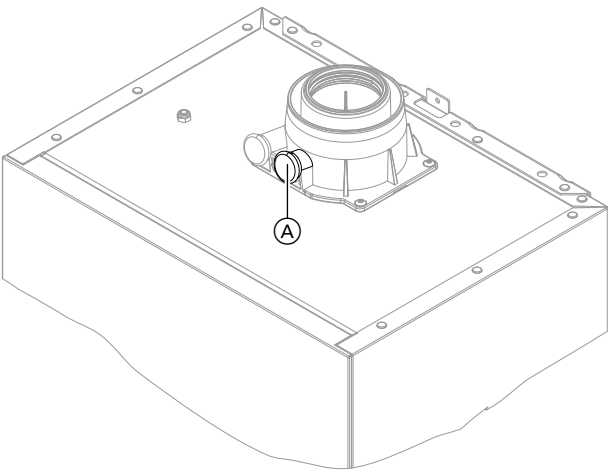


Fig. 35

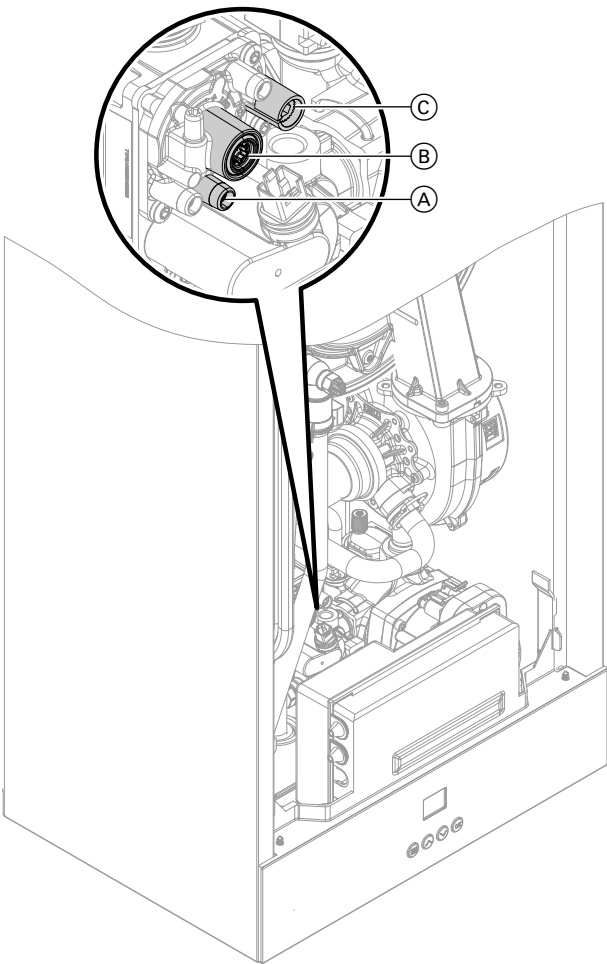


Fig. 36

- Ⓐ Test connector
- Ⓑ Partial load setting
- Ⓒ Full load setting

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.



Checking the combustion quality (cont.)

3. Adjust the lower heating output. See the following chapter.
4. Check the CO₂ 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 CO₂ 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 (A).



Danger

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

Setting the upper/lower heating output

Note

Ensure adequate heat transfer.

Tap the following buttons:

1. and simultaneously for approx. 4 s, then release.
2. Use to select "S" for the upper/lower heating output.
3. Use to select "S1".

4. OK

Use to set the value:

"OF" - off

"LO" - min. heating output

"HI" - 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:



Accessory installation instructions



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 higher outlet temperature at the draw-off points.



System configuration (parameters)

Calling up parameters

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

- 2. Use  to select "C" for system configuration.
- 3. OK

Tap the following buttons:

- 1.  and  simultaneously for approx. 5 s, then release.

Parameters

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

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

Maximum speed of the internal circulation pump in heating mode with standard room temperature

Value	Meaning
...	Delivered condition specified by settings specific to the heat generator
65 to 100	Maximum speed adjustable from 65 to 100 %

6 Minimum heating output

A limit can be set on the minimum heating output for heating mode.

Value	Meaning
...	Delivered condition specified by settings specific to the appliance
0 to 100	Adjustable from 0 to 100 %

7 Maximum heating output

A limit can be set on the maximum heating output for heating mode.

Value	Meaning
100	Heating output in the delivered condition 100 %
0 to 100	Adjustable from 0 to 100 %

8 Maximum flow temperature limit, heating circuit 1

Maximum flow temperature limit for the heating circuit

Value	Meaning
No setting!	Maximum limit in the delivered condition 82 °C Setting range limited by heat generator-specific parameters

Service menu

Calling up the service menu

Press the following buttons:

- 1. and simultaneously for approx. 5 s.
- 2. should then be pressed.
Select the required menu section (for example "S", "C" or "d").
- 3. OK

Service menu overview

Service	
d	Diagnostics
C	System configuration
S	Special menu

Exiting the service menu

Press the following buttons:

for 3 s.

Note

The system exits the service menu automatically after 15 min.

Diagnostics

Checking operating data

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

Note

If a sensor that you want to check is faulty, "---" appears on the display.

Calling up operating data

Tap the following buttons:

- 1. and simultaneously for approx. 5 s, then release.
- 2. Use to select "d" for diagnostics.
- 3. OK

Service/diagnostics overview

Service	
d Diagnostics	
d.1	Boiler water temperature (°C)
d.2	DHW temperature (°C)
d.3	Pump rate (%)
d.4	3-way valve position ("heating"/"---"/"DHW")
d.5	Fan speed (rpm x 100)
d.6	Outside temperature (°C)
d.7	DHW flow rate (l/min)
d.8	Heating water temperature (°C)
d.9	Flue gas temperature (°C)
d.10	Ionisation (ηA)

Fault display on the programming unit

If there is a fault in the heating system, the "hazard symbol" ▲ flashes and the fault code appears on the screen. The fault is still present. The fault is not cleared.

Resetting the burner

The display shows "F02" and ▲.
The burner is locked out due to a fault.
Reset the burner:

Note

The burner fault display can be closed by pressing ≡ for 4 s. The fault can be opened later by tapping ▲ and ▼ simultaneously.

A reset is only possible after the burner has cooled down.

Press the following buttons:

▲ and ▼ simultaneously for approx. 4 s.

A rotating bar appears on the display. The reset process has started.

If the fault no longer exists, the home screen will appear.

Overview of electronics modules

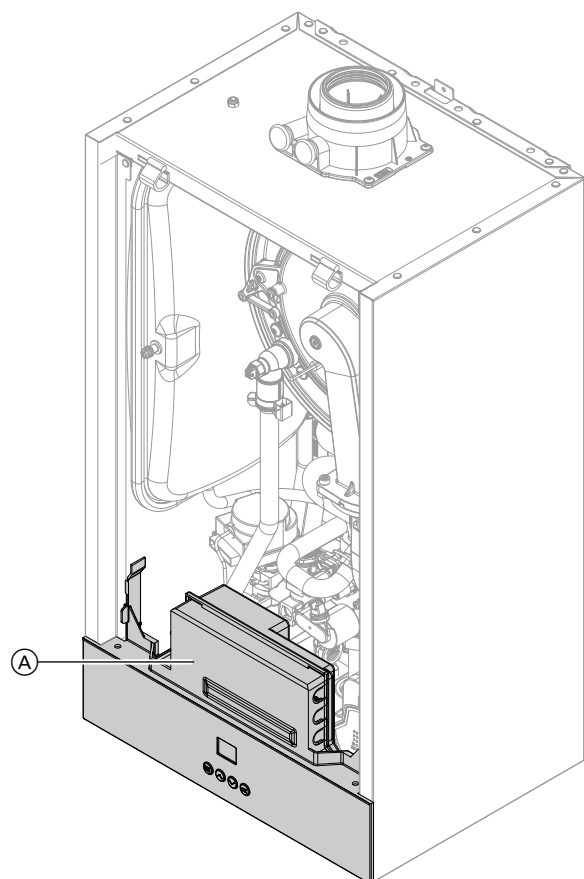


Fig. 37

Ⓐ ICB heat management unit

Fault messages

Note

For diagnostics and troubleshooting, see chapter "Repairs".

Fault messages dependent on appliance equipment level

F02

System characteristics

Burner in a fault state

Cause

Short circuit, flow temperature sensor/high limit temperature cut-out device

Measures

- Check the flow temperature sensor/high limit temperature cut-out device.
- Check heating system fill level.

- Check the flow rate; check that the circulation pump is working.
- Check sensor cable. Replace faulty component if necessary.
- Reset the appliance.

F03

System characteristics

Burner in a fault state

Cause

No ignition spark

Measures

- Check whether the ignition electrode insulation is damaged.
 - Check connecting cables from ignition module and ignition electrode.
- Reset the appliance.

F04

System characteristics

Burner in a fault state

Cause

Ionisation current is outside the permissible range

Measures

- Check ionisation electrode for the following:
- Clearance to burner gauze assembly
 - Check electrode/burner gauze assembly for dirt.

If the fault persists, replace the ICB heat management unit.
Reset the appliance.

F05

System characteristics

Burner in a fault state

Cause

Fan speed too low

Measures

- Check fan for blockage.
 - Check setting for gas type and flue system.
- Reset the appliance.

F07

System characteristics

Burner in a fault state

Cause

Feedback, boiler temperature sensor too hot (> 86 °C).
Burner shuts down.

Measures

- Check thermostatic radiator valves.
- Check water pressure.
- Clean the water circuit.
- Replace the boiler temperature sensor.

F08

System characteristics

Burner in a fault state

Cause

Gas valve relay contact feedback implausible (relay contact is "welded up")

Measures

Replace the ICB heat management unit.

F09

System characteristics

Burner locked out

Cause

Heating circuit pump failure. Pump feedback signal missing.

Measures

- Check the system pressure and top up with heating water if necessary.
- Check the power supply; pump switch-off due to low voltage.
- Check the pump impeller for secure seating.
- Replace the heating circuit pump if necessary.

F10

System characteristics

Regulates as if the outside temperature were 0 °C.

Cause

Short circuit, outside temperature sensor

Measures

Check outside temperature sensor and connection to sensor (plug J6, cores 3 and 4).
Replace faulty components if necessary.

F18

System characteristics

Regulates as if the outside temperature were 0 °C.

Cause

Lead break, outside temperature sensor

Measures

Check outside temperature sensor and connection to sensor (plug J6, cores 3 and 4).
Replace faulty component if necessary.

Fault messages (cont.)

FF1

System characteristics

Burner in a fault state

Cause

Flue gas temperature limiter has responded.

Measures

- 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.

F30

System characteristics

Burner in a fault state

Cause

Short circuit, outside temperature sensor

Measures

Check outside temperature sensor and connection to sensor (plug J6, cores 3 and 4). The input signal must be 24 V.

F31

System characteristics

Burner in a fault state

Cause

Short circuit, room temperature sensor

Measures

Check room temperature sensor and connection to sensor (plug J6, cores 1 and 2). The input signal must be 24 V.

F38

System characteristics

Burner in a fault state

Cause

Lead break, outside temperature sensor

Measures

Check outside temperature sensor and connection to sensor (plug J6, cores 3 and 4).

F39

System characteristics

Burner in a fault state

Cause

Lead break, room temperature sensor

Measures

Check room temperature sensor and connection to sensor (plug J6, cores 1 and 2).

Fault messages (cont.)

F51

System characteristics

No DHW heating

Cause

Short circuit, DHW temperature sensor

Measures

Check DHW temperature sensor (plug J11, cores 4 and 5). Measure sensor input on ICB heat management unit. Set value: 3.3 V– with sensor disconnected

F58

System characteristics

No DHW heating

Cause

Lead break, DHW temperature sensor

Measures

Check DHW temperature sensor (plug J11, cores 4 and 5).

Fb8

System characteristics

Burner in a fault state

Cause

Lead break, flue gas temperature sensor 2

Measures

Check flue gas temperature sensor 2.
Reset the appliance.

Fb0

System characteristics

Burner in a fault state

Cause

Short circuit, flue gas temperature sensor

Measures

Check flue gas temperature sensor.
Reset the appliance.

FA9

System characteristics

Burner not operational

Cause

OpenTherm remote control not connected

Measures

- Check connection to the OpenTherm remote control.
- If OpenTherm is not required, set "**S.2**" in the service menu to the value "Off".

F0b

System characteristics

Burner locked out

Cause

Short circuit, flow temperature sensor, heat generator circuit (dual sensor)

Fault messages (cont.)

Measures

Check the dual sensor and replace it if necessary.

F0C

System characteristics

Burner locked out, boiler circuit pump off. No room heating, no DHW heating

Cause

Undervoltage, power supply

Measures

Check mains voltage.
If voltage is correct and the fault occurs repeatedly, replace the fan unit.

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

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

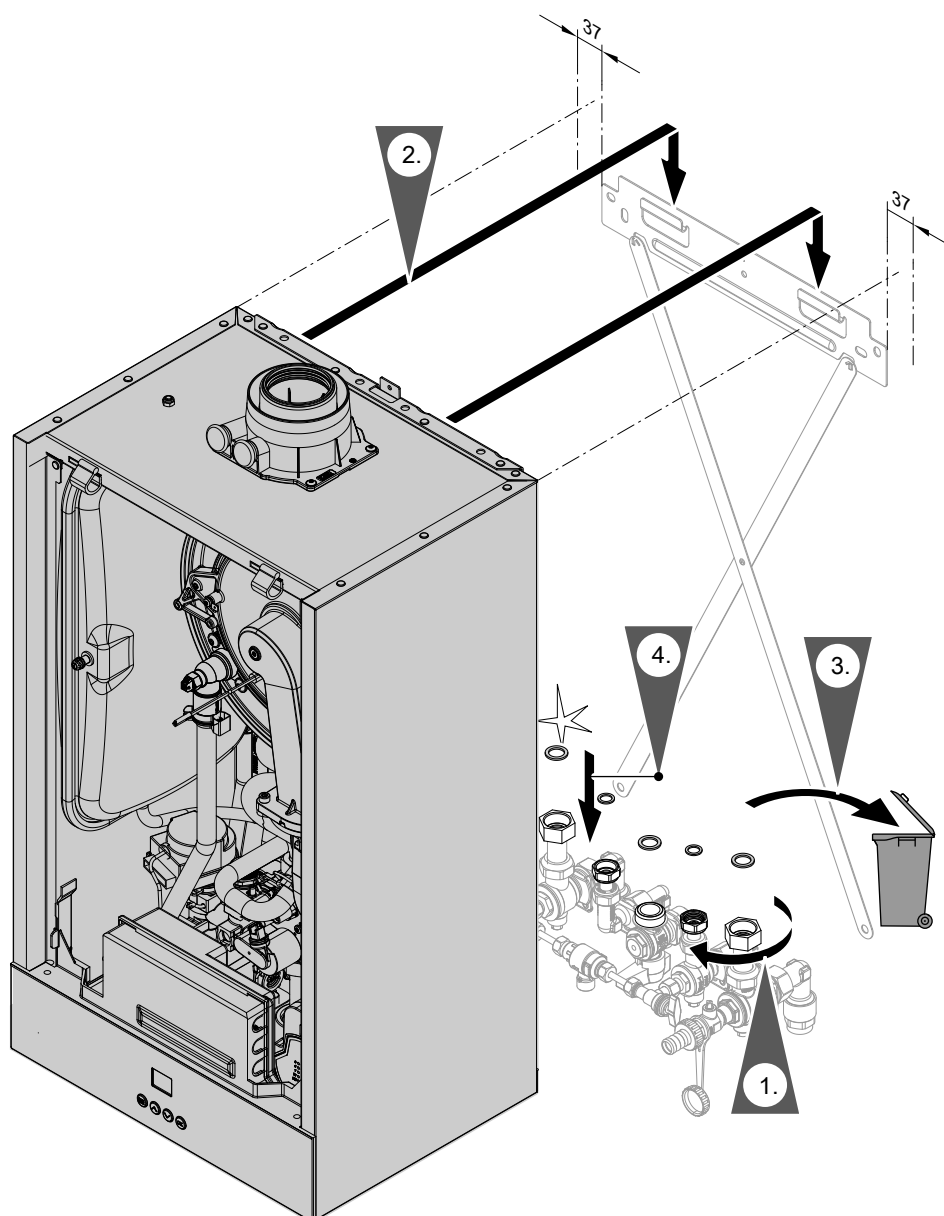


Fig. 38

Note

When assembling, use new gaskets and, if required, new locking ring fittings.

Internal gasket diameter:

- Gas connection Ø 18.5 mm
- Connections on the heating water side 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 leaks.

Repairs (cont.)

Checking the temperature sensors

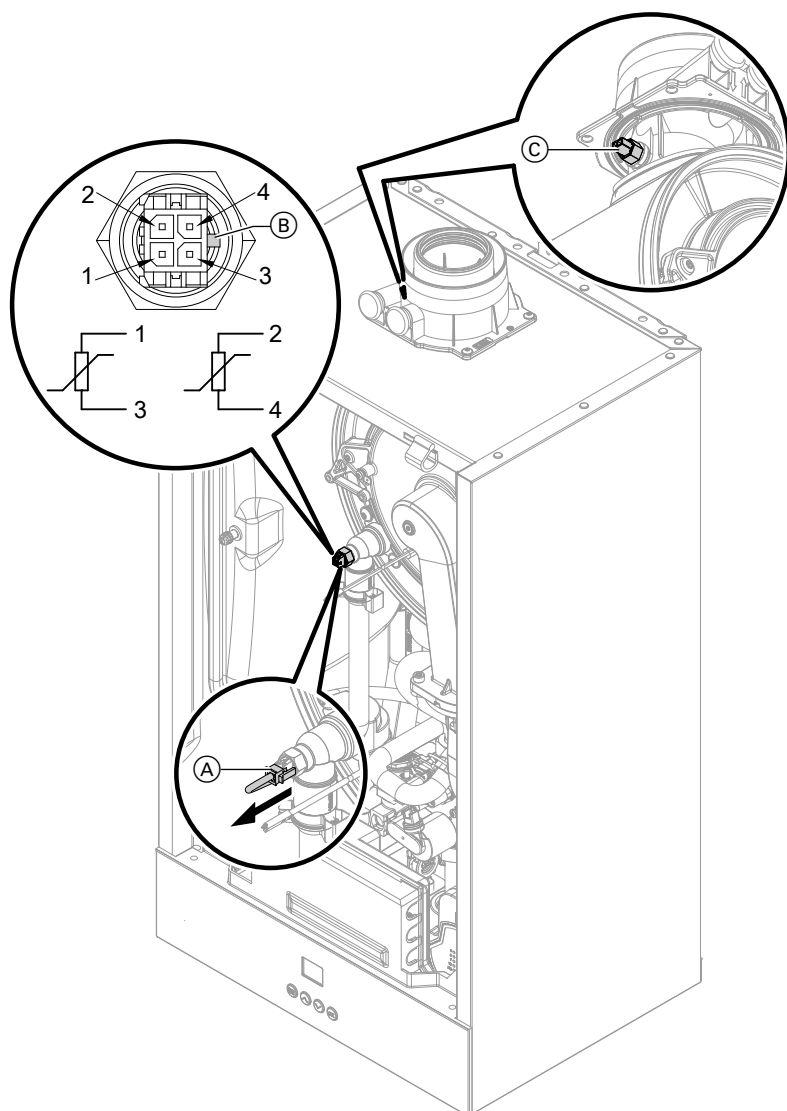


Fig. 39

Heat generator circuit flow temperature sensor (dual sensor)

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

3. Check the sensor resistance. Note position of guide lug (B).
 - 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

Leaking heating water can lead to an electric shock. Check the dual sensor for leaks.

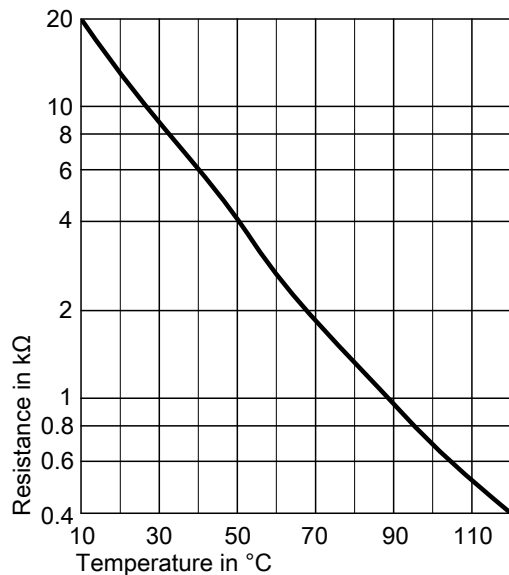
Outside temperature sensor

1. Check the lead and plug of the outside temperature sensor.
2. Disconnect wires 3 and 4 from terminal O.T.S.
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 cable, up to 35 m long with 1.5 mm² cross-section. 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. Pull leads from flue gas temperature sensor Ⓒ.

- Flue gas temperature sensor
- Flow temperature sensor
- DHW temperature sensor



Sensor type: NTC 10 kΩ

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.

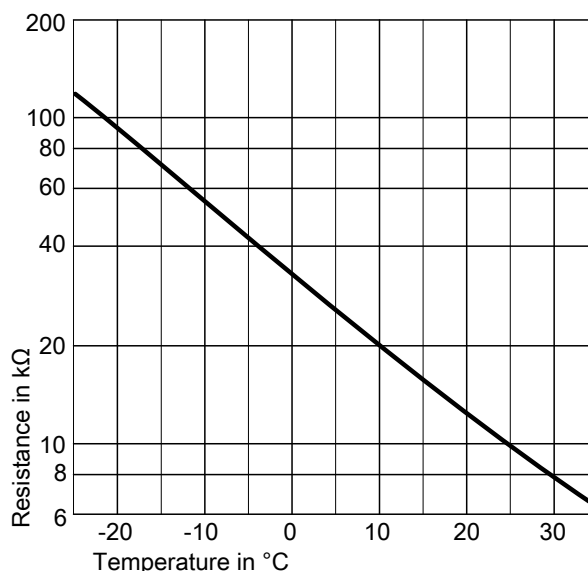


Danger

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

6. Reconnect the leads to 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.

- Outside temperature sensor



Sensor type: NTC 10 kΩ

Replacing the power cable

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

Repairs (cont.)

Checking the plate heat exchanger

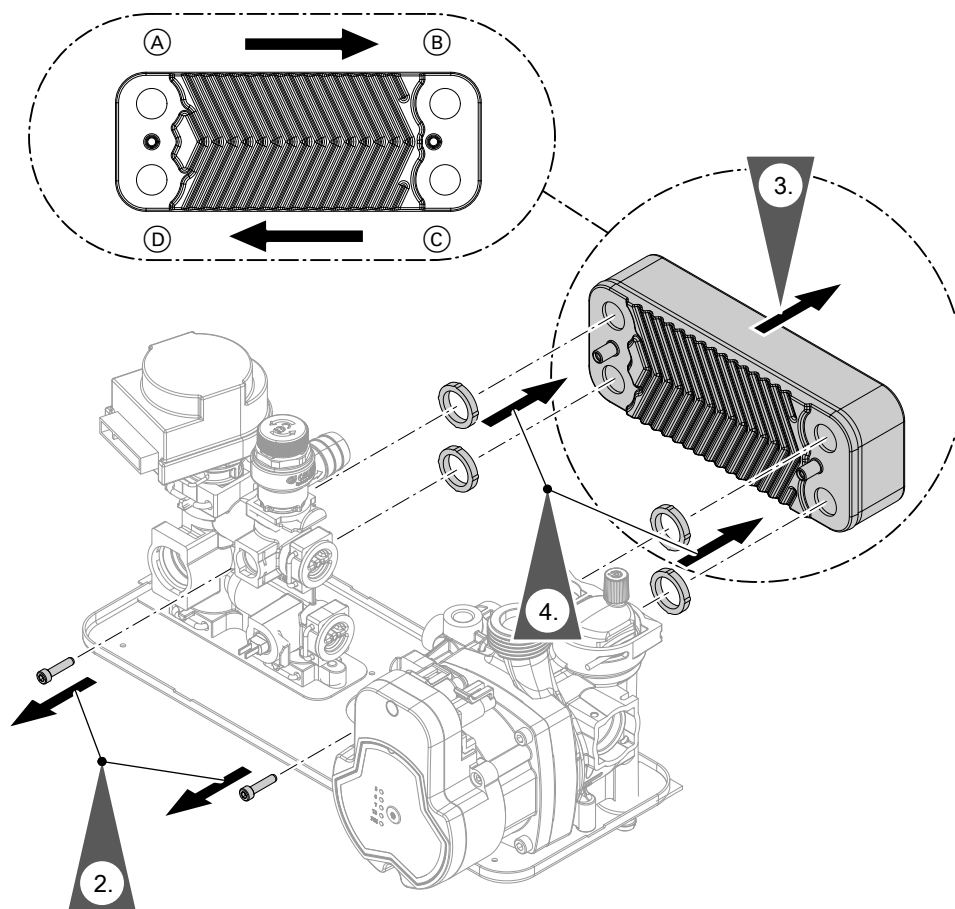


Fig. 40

- (A) Heating water flow
- (B) Heating water return

- (C) Cold water
- (D) DHW

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

2. Undo the 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.

7. Install plate heat exchanger in reverse order using new gaskets.

Tighten screws as much as necessary and ensure that the components are undamaged and function correctly throughout their 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 leaks.

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.

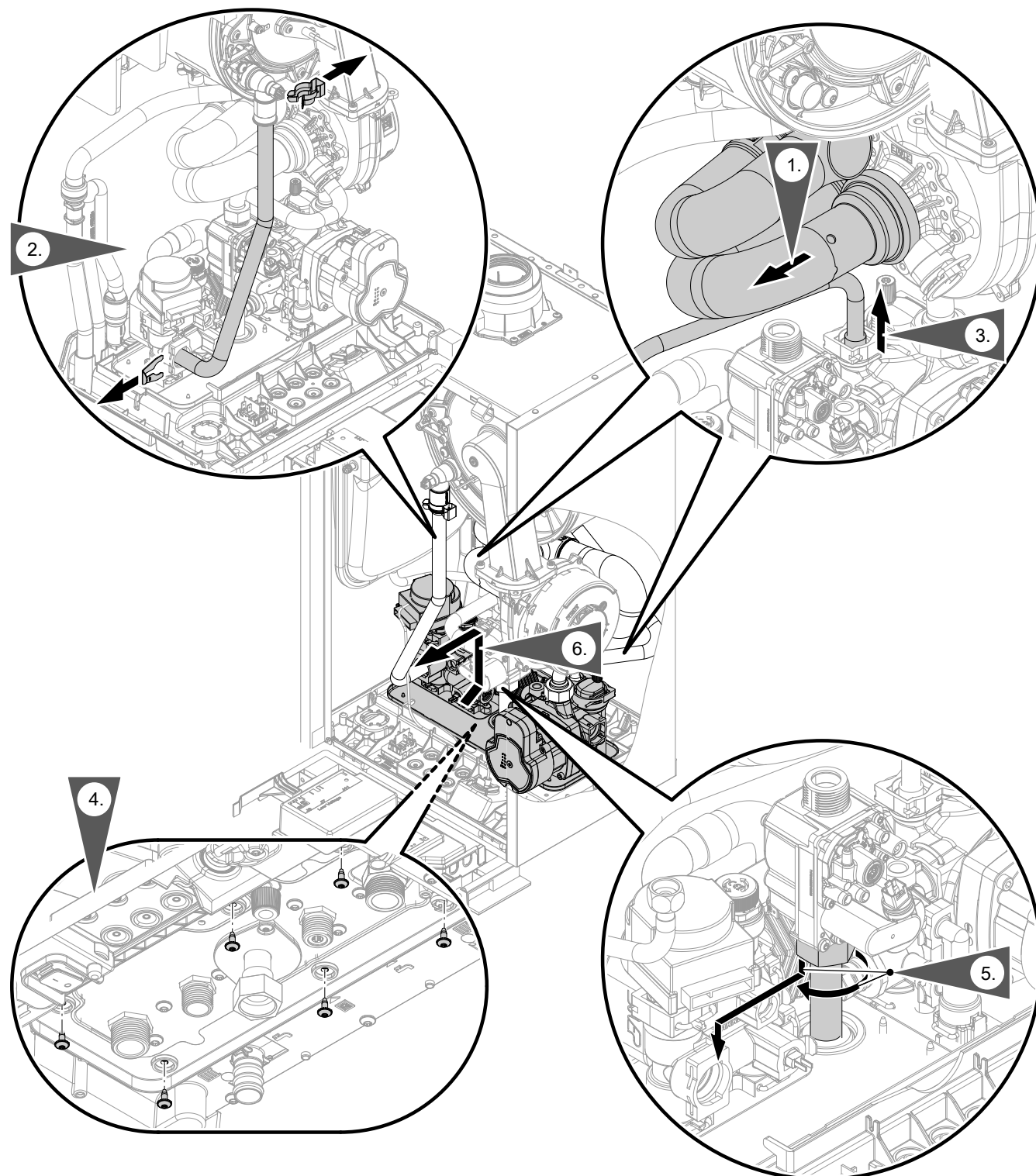


Fig. 41

Repairs (cont.)

Checking the fuse

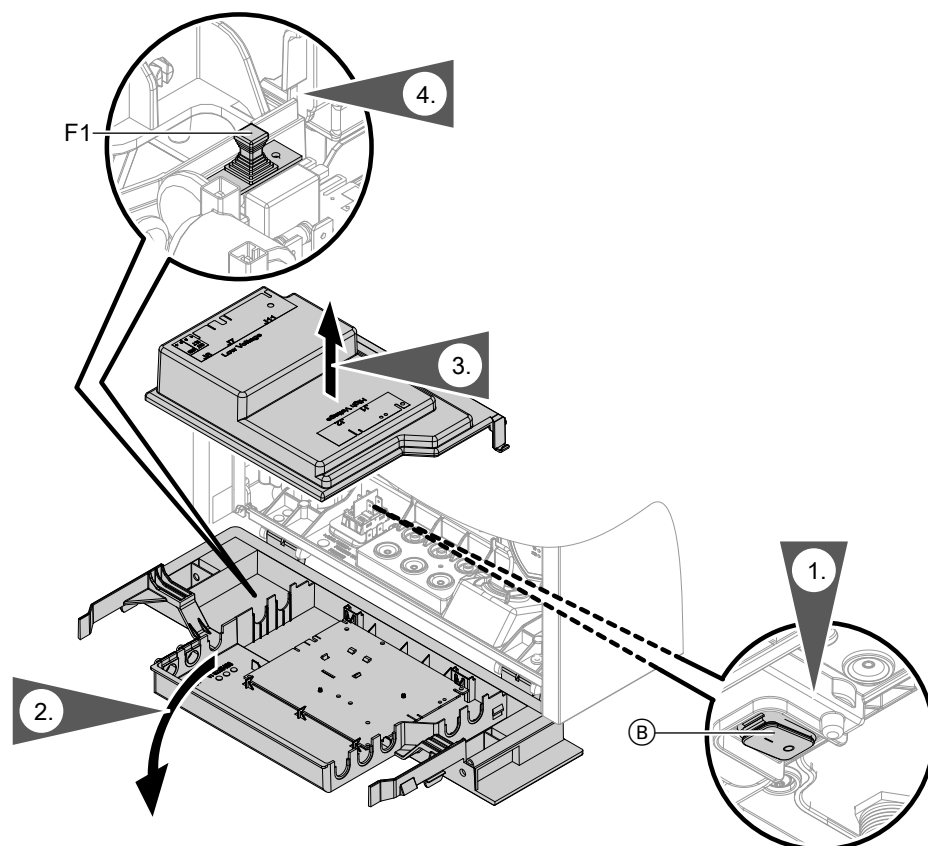


Fig. 42

1. Turn off ON/OFF switch (B).
2. Pivot the ICB heat management unit down.
3. Remove the cover.
4. 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 mode:

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 heating curve setting.



To adjust the heating curve setting, see operating instructions.

■ Room temperature-dependent mode (constant mode 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 mode 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 chapter "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 chapter "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.

Appliance functions (cont.)

Factory settings:

- Heating curve = 5

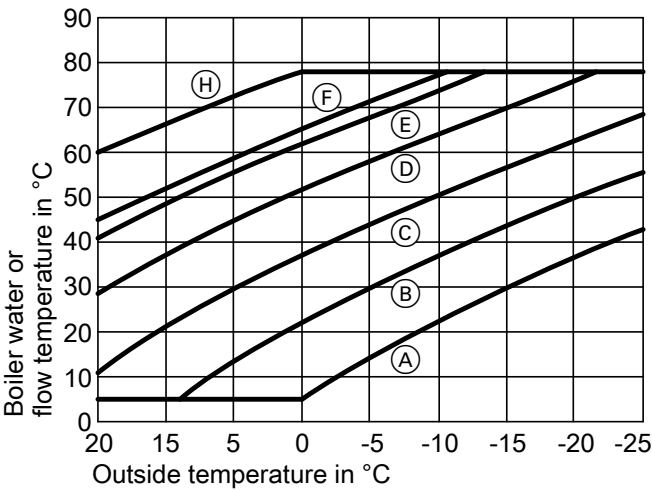


Fig. 43

- Ⓐ 1
- Ⓑ 2
- Ⓒ 3
- Ⓓ 4

- Ⓔ 5 (factory setting)
- Ⓕ 6
- Ⓖ 7

ICB heat management unit

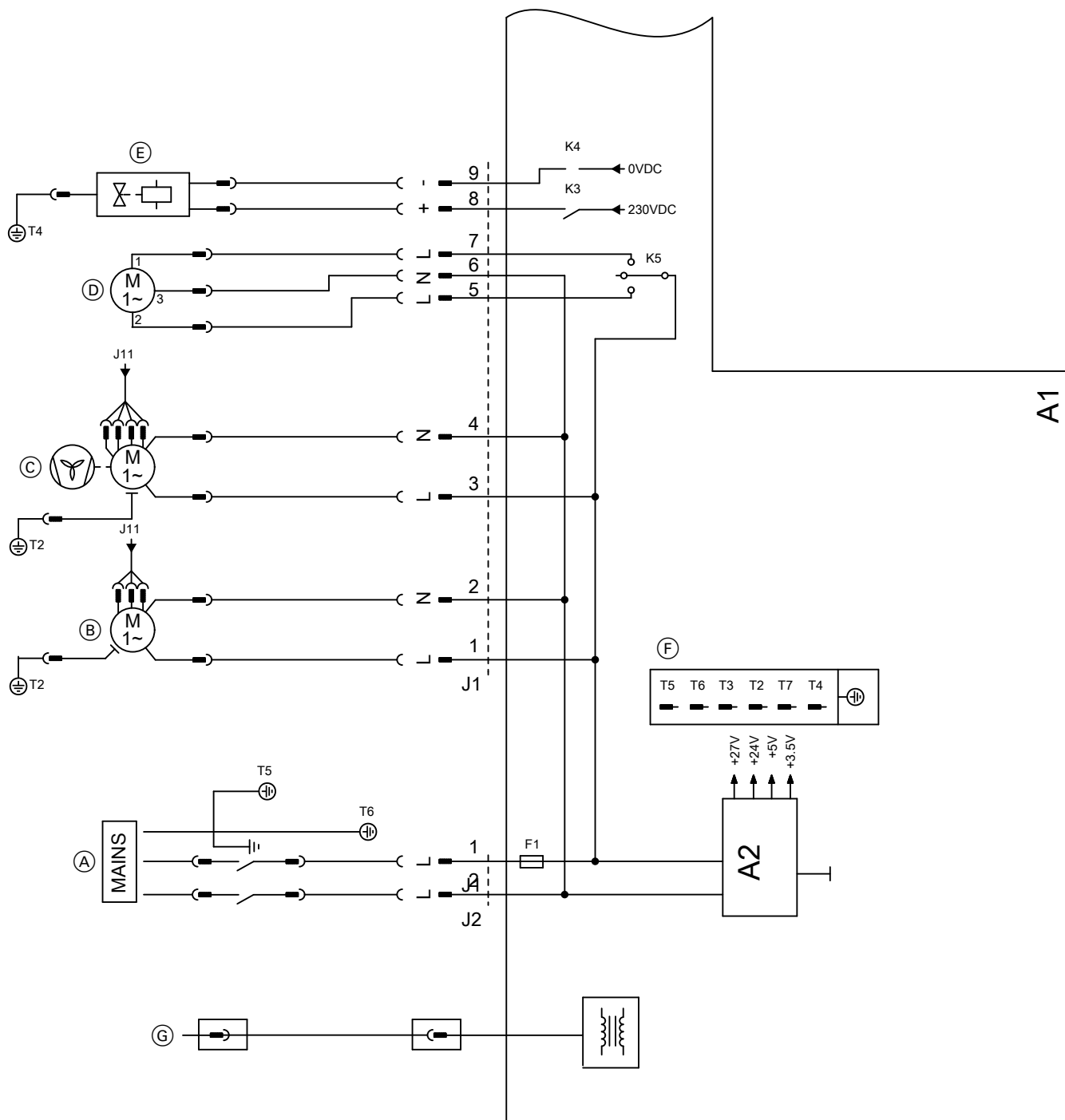


Fig. 44

- A1 ICB heat management unit
- A2 Power supply unit
- J... Electrical interfaces
- (A) Power supply 230 V/50 Hz
- (B) Heating circuit pump

- (C) Fan motor
- (D) 3-way valve
- (E) Gas solenoid valve
- (F) Earthing
- (G) Ignition unit/ionisation

ICB heat management unit (cont.)

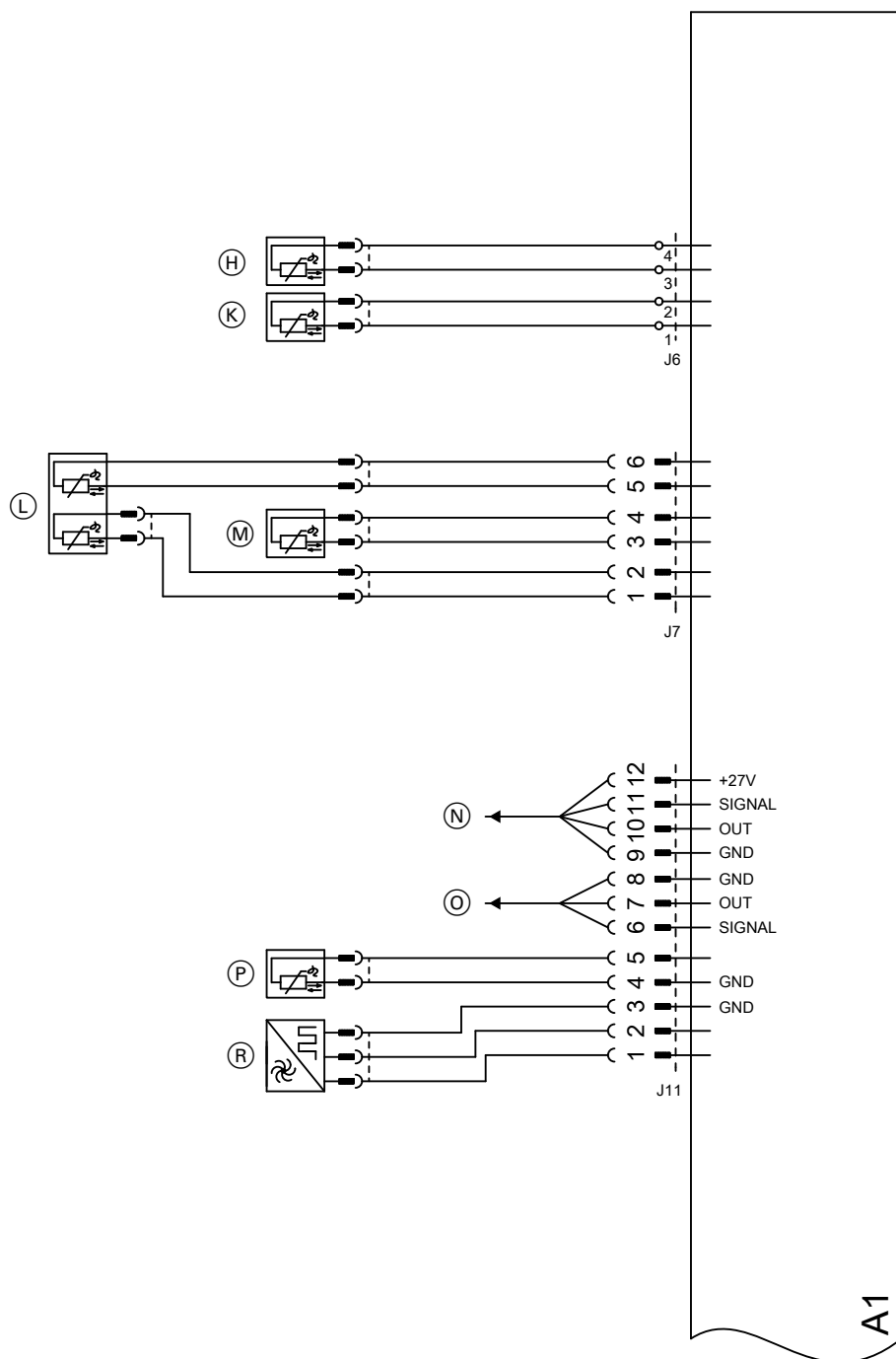


Fig. 45

A1 ICB heat management unit

J... Electrical interfaces

(H) Outside temperature sensor

(K) Remote control (OpenTherm) or room temperature sensor

(L) Boiler temperature sensor

(M) Flue gas temperature sensor

(N) Fan motor (PWM)

(O) Heating circuit pump (PWM)

(P) DHW temperature sensor

(R) Flow sensor

Report

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)				
<input type="checkbox"/> With natural gas mbar kPa	See table "Supply pressure" (Commissioning ...)			
<input type="checkbox"/> Enter gas type.				
Carbon dioxide content CO₂ For natural gas				
▪ At lower heating output % by vol.	See "Checking the combustion quality" (Commissioning ...)			
▪ At upper heating output % by vol.				
Oxygen content O₂				
▪ 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		BPKB-24	BPKB-28
Rated heating output range (to EN 15502)			
$T_F/T_R = 50/30\text{ °C}$			
Natural gas	kW	5.0 to 20.0	5.0 to 25.0
$T_F/T_R = 80/60\text{ °C}$			
Natural gas	kW	4.5 to 19.2	4.5 to 22.7
Rated heating output for DHW heating			
Natural gas	kW	4.5 to 24.0	4.5 to 28.0
Rated heat input (Q_n)			
Natural gas	kW	4.7 to 20.0	4.7 to 23.6
Rated heat input for DHW heating (Q_{nw})			
Natural gas	kW	4.7 to 25.0	4.7 to 29.1
Product ID		CE-0063DO3012	
IP rating		IPX4D to EN 60529	
NO_x		6	
Gas supply pressure			
Natural gas	mbar kPa	20 2	
Max. permiss. gas supply pressure^{*2}			
Natural gas	mbar kPa	25 2.5	
Sound power level (to EN ISO 15036-1)			
▪ At partial load	dB(A)	33.4	33.4
▪ At full load	dB(A)	49.3	49.3
▪ At rated heating output (DHW heating)	dB(A)	53.1	53.1
Power consumption (in the delivered condition)	W	69	76
Rated voltage	V	230	
Rated frequency	Hz	50	
Appliance fuse protection	A	2.5	
Electronic temperature limiter setting (TN)	°C	91	
Electronic temperature cut-out setting	°C	110	
Electronic flue gas temperature limiter setting	°C	95	
Permissible ambient temperature			
▪ During operation	°C	+5 to +40	
▪ During storage and transport	°C	-5 to +60	
Weight			
▪ Excl. heating water and packaging	kg	31	
▪ Incl. heating water	kg	35	
Water capacity (excl. diaphragm expansion vessel)	l	3.0	
Max. flow temperature	°C	82	
Max. flow rate (limit for the use of hydraulic separation)	l/h	See residual head graphs	
Nominal circulating water volume At $T_F/T_R = 80/60\text{ °C}$	l/h	990	

^{*2} If the gas supply pressure is higher than the maximum permitted value, install a separate gas pressure governor upstream of the system.

Gas condensing combi boiler (cont.)

Gas boiler, type B and C, category I _{2N} /I _{2H}			
Type		BPKB-24	BPKB-28
Rated heating output range (to EN 15502)			
T _F /T _R = 50/30 °C			
Natural gas	kW	5.0 to 20.0	5.0 to 25.0
T _F /T _R = 80/60 °C			
Natural gas	kW	4.5 to 19.2	4.5 to 22.7
Diaphragm expansion vessel			
▪ Capacity	l	8	
▪ Pre-charge pressure	bar	0.75	
	kPa	75	
Permiss. operating pressure			
	bar	3	
	MPa	0.3	
Connections (with connection accessories)			
▪ Boiler flow and return		G¾	
▪ Cold water and DHW		G½	
Dimensions			
▪ Length	mm	300	
▪ Width	mm	400	
▪ Height	mm	700	
Gas connection	R	¾	
Standby instantaneous water heater			
DHW and cold water connections	G	1/2	1/2
Permissible operating pressure (DHW side)	bar	10	10
	MPa	1	1
Minimum pressure, cold water connection	bar	1	1
	MPa	0.1	0.1
Outlet temperature, adjustable	°C	10 to 60	10 to 60
Continuous DHW output	kW	24	29.1
Spec. water flow rate (D) at ΔT = 30 K (EN 13203-1)	l/min	11.47	13.26
Supply values			
Relative to the max. load and 1013 mbar/15 °C			
Natural gas H	m³/h	2.13	2.53
Natural gas E	m³/h	2.13	2.53
Flue gas parameters			
Temperature (at a return temperature of 30 °C)			
▪ At rated heating output	°C	46.6	48.7
▪ At partial load	°C	38.5	38.5
Temperature (at a return temperature of 60 °C, for DHW heating)	°C	71.3	74.6
Overheating temperature	°C	120	120
Mass flow rate (for DHW heating)			
Natural gas			
▪ At max. rated heating output	kg/h	48.1	50.4
▪ At partial load	kg/h	8.6	8.6
Available draught (with single connection)	Pa	250	250
	mbar	2.5	2.5

Gas condensing combi boiler (cont.)

Gas boiler, type B and C, category I _{2N} /I _{2H}			
Type		BPKB-24	BPKB-28
Rated heating output range (to EN 15502)			
T _F /T _R = 50/30 °C			
Natural gas	kW	5.0 to 20.0	5.0 to 25.0
T _F /T _R = 80/60 °C			
Natural gas	kW	4.5 to 19.2	4.5 to 22.7
Max. amount of condensate To DWA-A 251	l/h	4.0	4.4
Condensate connection (hose nozzle)	Ø mm	20 to 24	
Flue gas connection	Ø mm	60	
Ventilation air connection	Ø mm	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	

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
TR, FR, HU, ES, IT, LT, LV, EE, GB, IE	B ₂₃ , B _{23P} , B ₃₃ , C ₁₃ , C ₃₃ , C ₅₃ , C ₆₃ , C ₈₃ , C ₉₃ (C ₄₃ , C _{43P} , C ₍₁₀₎₃ , C ₍₁₄₎₃ ^{*3})

Gas categories

Available in the following countries	Gas categories
TR, FR, HU, ES, IT, LT, LV, EE, GB, IE	I _{2H}

The gas condensing system boiler is suitable for operation with a hydrogen blend of up to 20 % by vol.

^{*3} Only for specifically marked appliances.

Disposal

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

We, Viessmann Limited, Hortenwood 30, Telford TF1 7YP, United Kingdom, declare as authorised representative of the manufacturer and in sole responsibility for the manufacturer, that the named product complies with the applicable UK regulations in terms of its design and operational characteristics. Viessmann Limited, Hortenwood 30, Telford TF1 7YP, United Kingdom, hereby declares that the radio equipment type of the named product is in compliance with The Radio Equipment Regulations 2017.

Using the serial number, the full Declaration of Conformity can be found on the following website:

www.viessmann.co.uk/conformity

Keyword index

B		H	
Back draught safety device.....	42	Heating curve.....	64
Boiler, fitting.....	16, 18	Heating output setting.....	36
Boiler, removing.....	58	Heating surface, cleaning.....	43
Boiler temperature sensor.....	59	Heating system, venting.....	31, 32
Burner gasket.....	40	Hydraulic unit removal.....	62
Burner gauze assembly.....	40		
Burner installation.....	45	I	
Burner removal.....	39	Ignition.....	42
Burner reset.....	52	Ignition electrodes.....	42
		Intended use.....	9
C		Ionisation electrode.....	42
Cable routing.....	26		
Circulation pump rate, adjusting.....	37	L	
Combustion chamber, cleaning.....	43	Language selection.....	30
Combustion quality, checking.....	48	Leak test, balanced flue system.....	38
Commissioning assistant.....	30		
Condensate connection.....	21	M	
Condensate drain.....	43	Mains isolator.....	47
Connecting cables, routing.....	27	Main switch.....	33, 39
Connections, water side.....	20	Multiple connection to shared flue system.....	38
Connection schemes.....	66		
Control unit		O	
– Connection diagram.....	66	OpenTherm controller.....	64
Control unit functions.....	64	Operating conditions, checking.....	51
Cylinder temperature sensor.....	59	Operating data, calling up.....	51
		Operating data, checking.....	51
D		Operating modes.....	64
DHW hygiene.....	49	Output adjustment	
DHW temperature, raised.....	49	– Multiple connection.....	38
		Outside temperature sensor.....	26, 59
E		Overview of electronics modules.....	52
Electrical connections.....	24, 25		
Expansion vessel.....	31, 46	P	
		Parameters.....	50
F		– Adjusting.....	50
Fault codes.....	53	– Calling up.....	50
Fault messages		– Max. speed, heating circuit pump.....	50
– Display.....	52	– Maximum flow temperature limit, heating circuit 1 .	50
Faults		– Maximum heating output.....	50
– Commissioning.....	36	– Minimum heating output.....	50
– Display.....	52	Parameters for commissioning.....	49
Filling function.....	31, 64	Plate heat exchanger.....	61
Fill water.....	31	Power supply.....	27
Flow limiter.....	46	Pre-plumbing jig, fitting.....	13
Flow pressure.....	35		
Flow temperature sensor.....	59	R	
Flue gas connection.....	22	Repairs.....	57
Flue gas temperature sensor.....	60	Report.....	68
Front panel, mounting.....	28		
Front panel removal.....	16, 33	S	
Function descriptions.....	64	Seal rings, replacing.....	32
Function sequence.....	36	Service menu.....	51
Fuse.....	63	– Calling up.....	51
		– Exiting.....	51
G		Specification.....	69
Gas connection.....	23	Standards.....	9
Gas solenoid valve.....	35	Static pressure.....	35
Gas supply pressure.....	35	Supply pressure.....	34, 35
Gas type.....	33	Symbols.....	8

Keyword index (cont.)

System configuration.....30, 50
 System filling..... 31
 System pressure..... 31
 System schemes.....49

T

Tightness test..... 32
 Trap.....21, 43
 Type plate..... 10

V

Venting program.....64

W

Wiring chamber, closing..... 28
 Wiring chamber, opening..... 24
 Wiring diagram..... 66

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