# Installation and service instructions

**for contractors**

**Vitodens 111-W**
**Type B1LG**, 3.2 to 32 kW
**Type B1LG-M (for multiple connection)**, 5.7 to 32 kW
Wall mounted gas condensing boiler
Natural gas and LPG version
Gas Council No.: 47-819-53, 47-819-54

## VITODENS 111-W

6241595 GB 3/2025

**Please keep safe.**

## Safety instructions

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

### Safety instructions explained

⚠ **Danger**
This symbol warns against the risk of injury.

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

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

### Target group

These instructions are exclusively intended for qualified contractors.

- Work on gas installations may only be carried out by a registered gas fitter.
- Work on electrical equipment may only be carried out by a qualified electrician.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.

### Regulations to be observed

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

### Safety instructions for working on the system

#### Working on the system

- Where gas is used as the fuel, close the main gas shut-off valve and safeguard it against unintentional reopening.
- Isolate the system from the power supply, e.g. by removing the separate fuse or by means of a mains isolator, and check that it is no longer live.
- Safeguard the system against reconnection.
- Wear suitable personal protective equipment when carrying out any work.

## Safety instructions (cont.)

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

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

### Repair work

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

### 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 original parts from the manufacturer or components approved by the manufacturer.

## Safety instructions (cont.)

### Safety instructions for operating the system

#### If you smell gas

**Danger**
Escaping gas can lead to explosions which may result in serious injury.
- Do not smoke. Prevent naked flames and sparks. Never switch lights or electrical appliances on or off.
- Close the gas shut-off valve.
- Open windows and doors.
- Evacuate any people from the danger zone.
- Notify your gas or electricity supply utility from outside the building.
- Have the power supply to the building shut off from a safe place (outside the building).

#### If you smell flue gas

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

#### What to do if water escapes from the appliance

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

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

#### Condensate

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

#### Flue systems and combustion air

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

**Danger**
Leaking or blocked flue systems, or an inadequate supply of combustion air can cause life threatening poisoning from carbon monoxide in the flue gas.
Ensure the flue system is in good working order. Vents for supplying combustion air must be non-sealable.

#### Extractors

Operating appliances that extract air to the outside (extractor hoods, extractors, air conditioning units, central vacuum cleaning systems) 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.

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## Disposal of packaging

Please dispose of packaging waste in line with statutory regulations.

## Gas Council No.

| Type | Gas Council Number: |
|---|---|
| Vitodens 111-W, B1LG, 25 kW storage combi | **47-819-53** |
| Vitodens 111-W, B1LG, 32 kW storage combi | **47-819-54** |

## Symbols

| Symbol | Meaning |
|---|---|
|  | Reference to other document containing further information |
|  | Step in a diagram:<br>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. |
|  | ▪ Component must audibly click into place.<br>or<br>▪ Acoustic signal |
|  | ▪ Fit new component.<br>or<br>▪ 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).

## Product information

### Vitodens 111-W, type B1LG

Gas condensing storage combi boiler with Inox-Radial heat exchanger and the following integrated components:

- Modulating MatriX-Plus burner for natural gas and LPG
- Stainless steel loading cylinder, 46 l capacity
- Hydraulics with 3-way diverter valve and variable speed high efficiency circulation pump
- Weather-compensated or constant temperature control unit
- Integral diaphragm expansion vessel (10 l capacity)

The selected gas category in the delivered condition and the associated nominal gas pressure are given on the boiler type plate. The type plate also shows the other gas types and pressures with which the boiler can be operated. A conversion within the stated natural gas groups is not required. For conversion to LPG (without conversion kit), see "Commissioning, inspection and maintenance".
The Vitodens 111-W may only be delivered to countries listed on the type plate. For deliveries to other countries, approved contractors must arrange individual approval on their own initiative and in accordance with the law of the country in question.

## System examples

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

Detailed information 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:
**shop.viessmann-climatesolutions.com**

### Viessmann spare part app

**Web application**

**www.viessmann.com/etapp**

**ViParts app**

## Preparing for installation

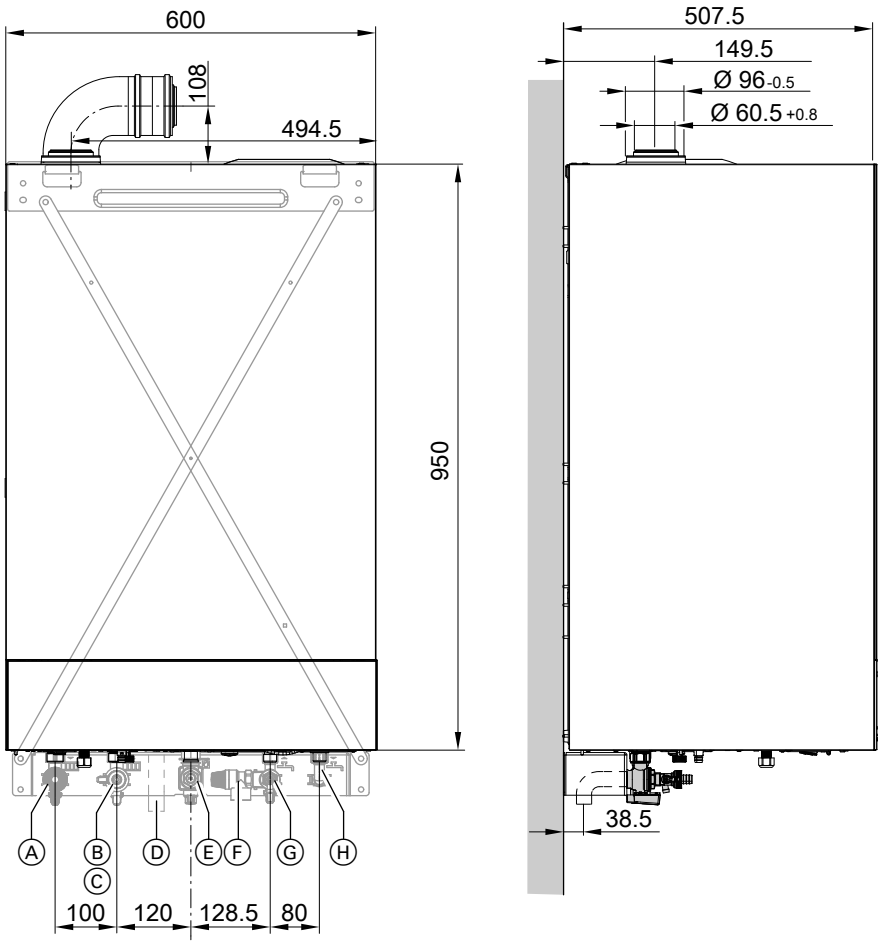


*Fig. 1*

Ⓐ Heating flow
Ⓑ Heating return
Ⓒ Filling/draining
Ⓓ Condensate drain
Ⓔ Gas connection
Ⓕ Safety valve
Ⓖ Cold water
Ⓗ DHW

***Note***
*The boiler (IP rating IP X1) is approved for installation in wet rooms in safety zone 3. Exposure to water jets and spray must be prevented.*
*For open flue operation, the boiler may only be operated with a splash cover.*
*Observe the requirements of DIN VDE 0100.*

## Preparing for installation (cont.)



### Installation

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 Spreizdübel 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.

   ***Note***
   *If an on-site expansion vessel also has to be installed: Install this expansion vessel in the cylinder return, as the 3-way diverter valve is located in the heating flow.*
   *Not possible with type B1KG*

   ***Note***
   *An additional ball valve can be fitted in the DHW pipe when installing a combi boiler in a basement to facilitate maintenance work.*

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

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

### Connection on the DHW side

**Cold water installation**

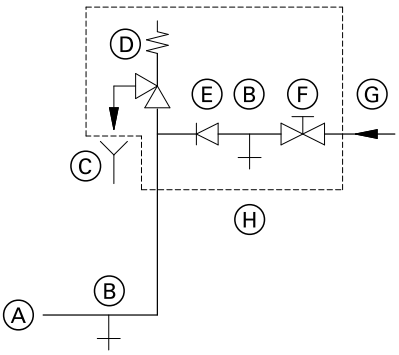


*Fig. 2*

Ⓐ 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.

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## Removing the boiler from the packaging

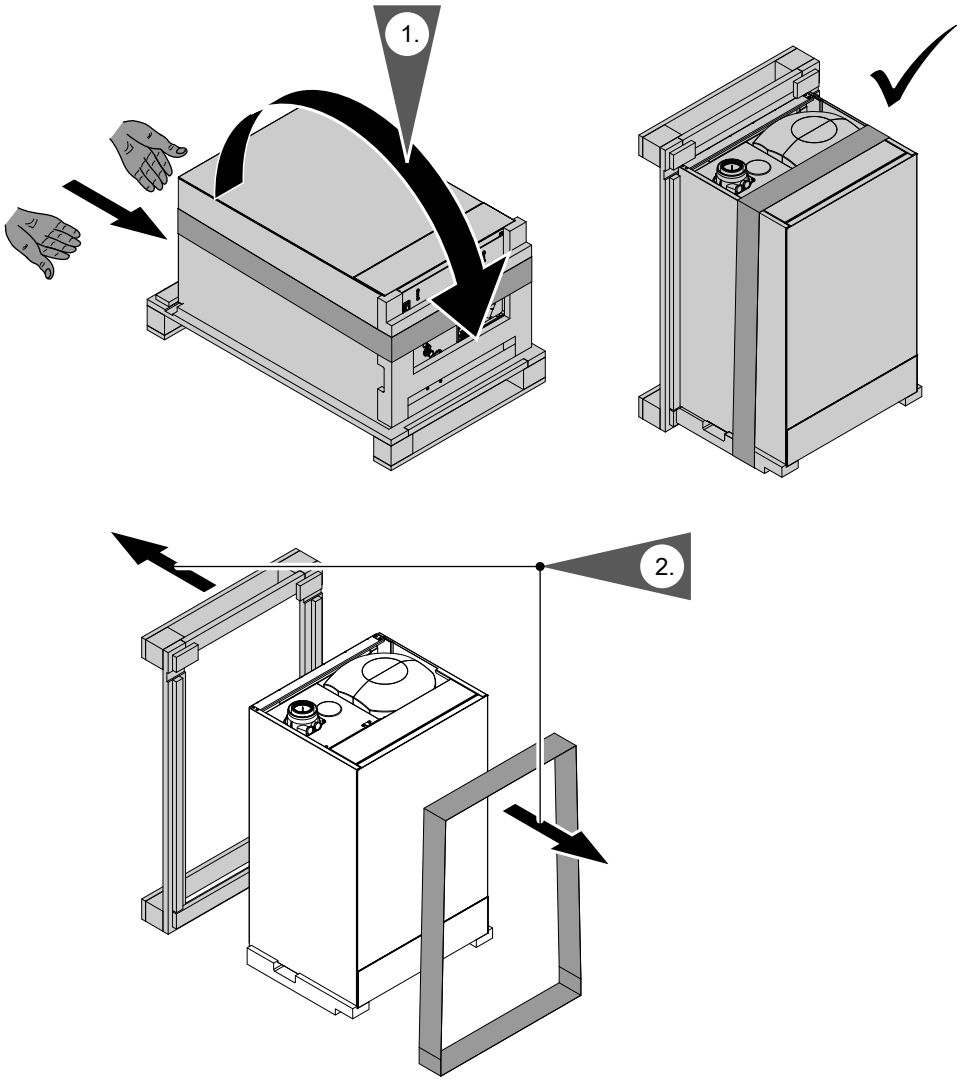


*Fig. 3*

## Mounting the boiler and making connections

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

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

## Mounting the boiler and making connections (cont.)



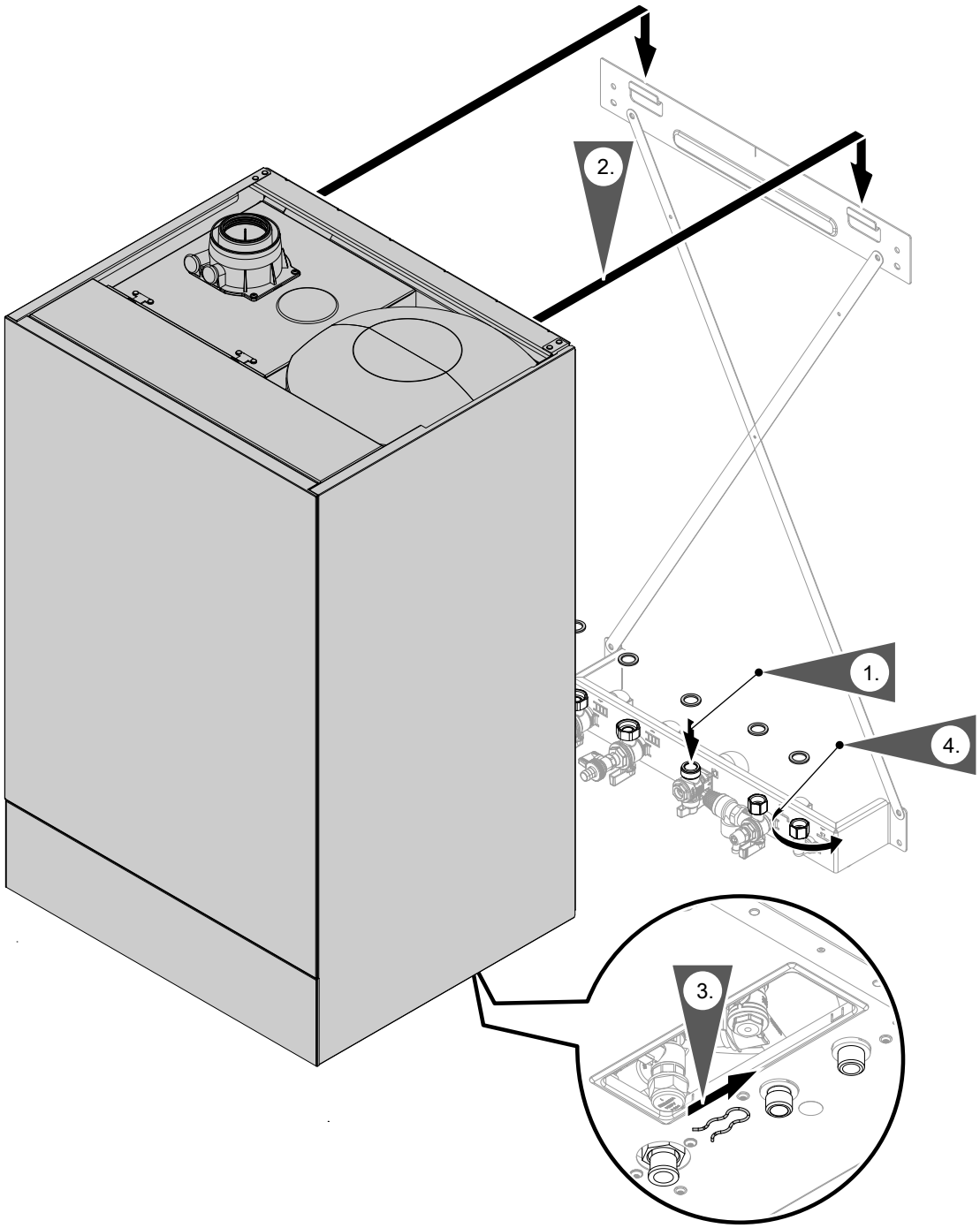


*Fig. 4*

***Note***
*The diagram shows installation on a pre-plumbing jig.*

*The boiler can be installed on the following accessories:*
- *Pre-plumbing jig*
- *Pre-plumbing jig for sub-mounting kit*
- *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.*

**2.** After mounting, check for correct positioning.

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## Mounting the boiler and making connections (cont.)

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

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

   Torque for union nuts
   - G ½: 24 Nm
   - G ¾: 30 Nm

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

## Mounting the boiler and making connections (cont.)

### Fitting the boiler to the wall mounting bracket

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



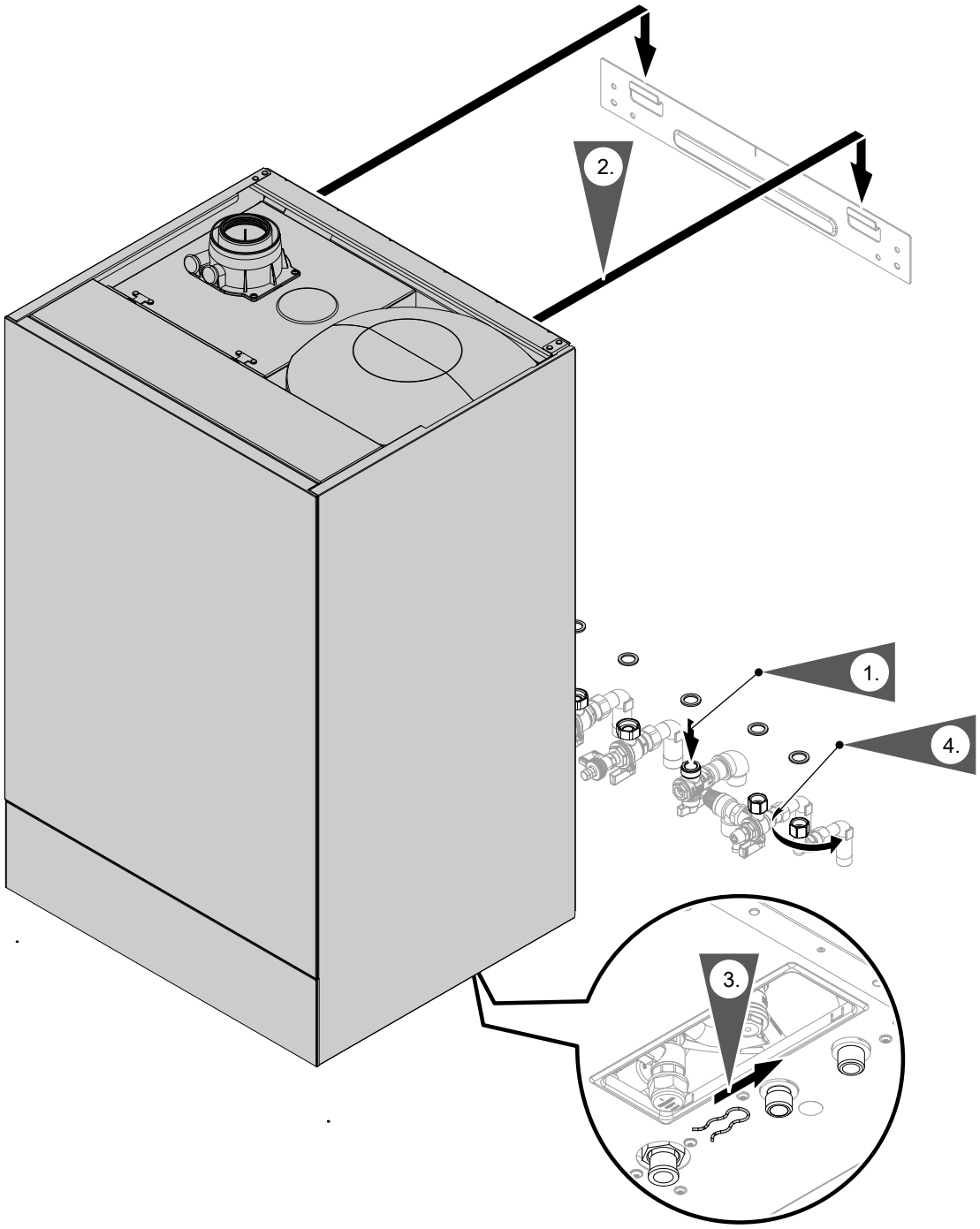


*Fig. 5*

## Mounting the boiler and making connections (cont.)

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

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

Torque for union nuts
- G ½: 24 Nm
- G ¾: 30 Nm

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

## Mounting the boiler and making connections (cont.)



### Removing the front panel

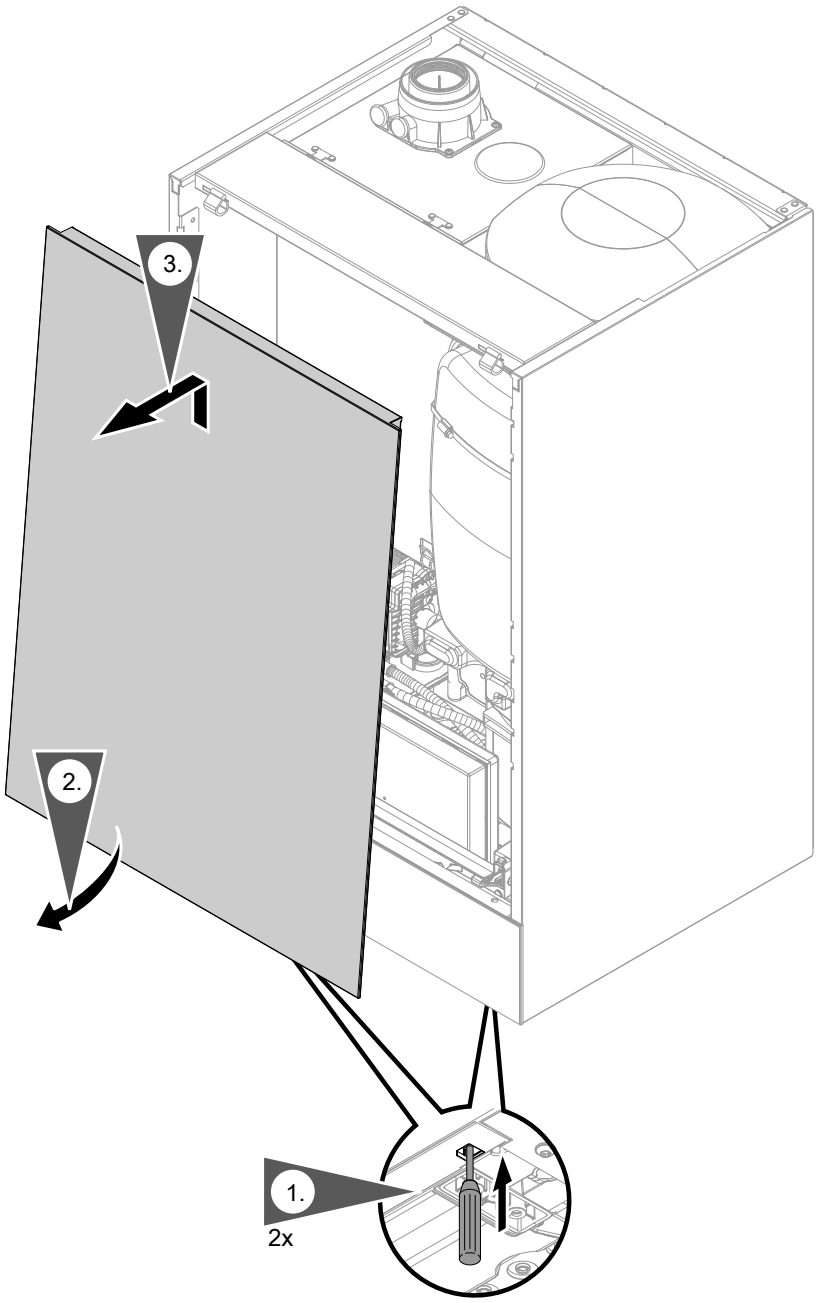


*Fig. 6*

## Type plate

***Note***
*The type plate is attached to cover panel Ⓐ in the appliance: See page 45.*

**Additional type plate with access code (QR code) marked with "i"**

The type plate of the heat generator contains extensive product information and an appliance-specific QR code marked with "i" for direct access to product-specific information and product registration on the internet.

The QR code contains the credentials for the registration and product information portal, and the 16-digit serial number.

**Attaching the additional type plate**

## Mounting the boiler and making connections (cont.)

1. Take the additional type plate from the supplied documentation.

   ***Note***
   *The documentation with the additional type plate and QR code marked with "i" can be found on top of the appliance.*

2. In consultation with the system user, affix the additional type plate to the outside of the appliance.
   The additional type plate must be visible to the flue gas inspector.
   Affix another QR code to the installation and service instructions.

### Connecting on the heating water and DHW sides

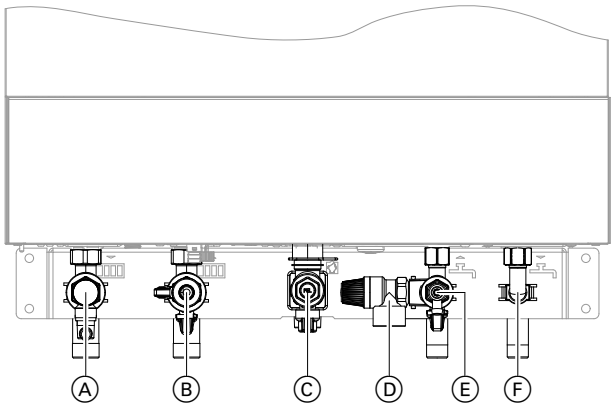


*Fig. 7*

Ⓐ Heating flow
Ⓑ Heating return and fill/drain valve
Ⓒ Gas connection
Ⓓ Safety valve
Ⓔ Cold water
Ⓕ DHW

If the connections have not been fitted previously, make the connections on the heating water and DHW sides.
Connection accessories with locking ring fitting included in standard delivery

## Connecting the condensate drain

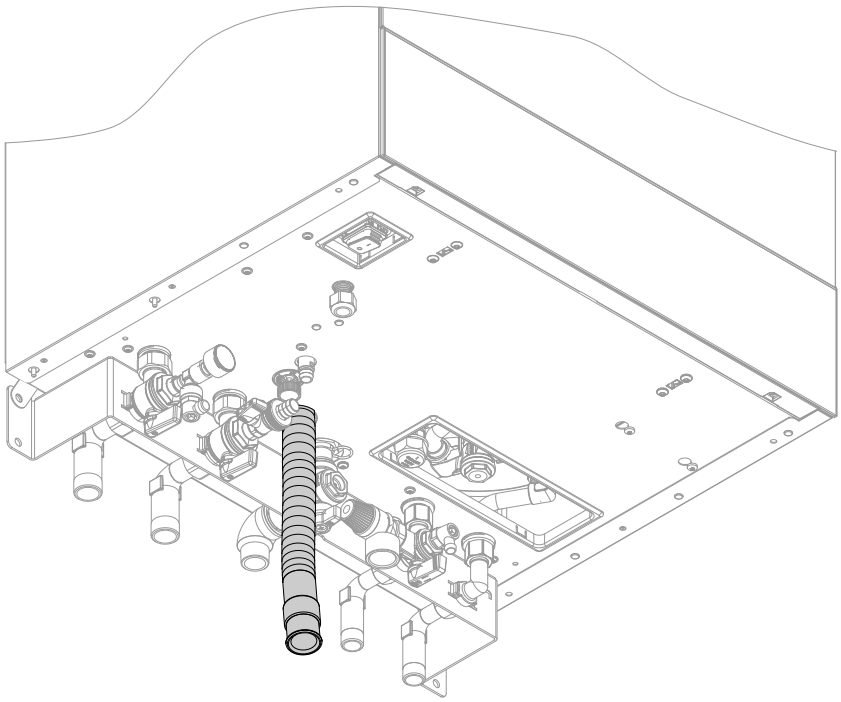

*Fig. 8*

## Connecting the condensate drain (cont.)

Connect the drain hose with a constant fall and a pipe vent to the drain network or a neutralising system.
Drain hose: Ø 19 x 800 mm

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

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

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

***Note***
*Observe local waste water regulations.*

### Filling the trap with water

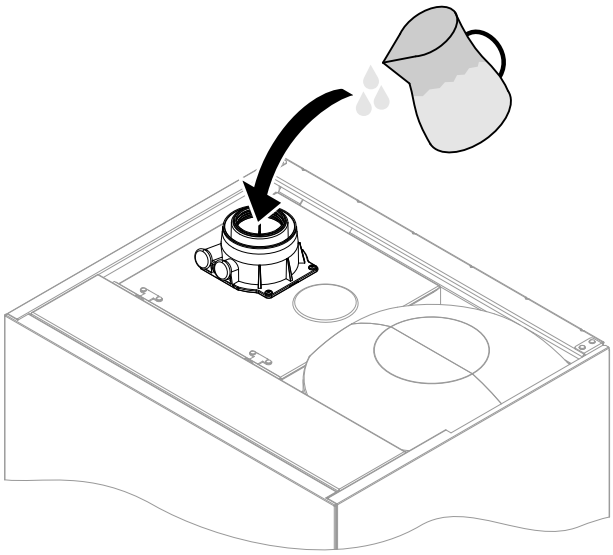

*Fig. 9*

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.*

## Connecting the balanced flue pipe

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

**Connecting the balanced flue pipe**
Flue system installation instructions

## Connecting the balanced flue pipe (cont.)

**Connecting several gas condensing boilers to a shared flue system**

If several gas condensing boilers are connected to a shared flue system at positive pressure using routing type $C_{10}$, $C_{11}$, $C_{13}$ or $C_{14}$:
For each boiler, install one back draught safety device (accessories) in the flue gas connection and one in the mixing shaft of the burner.

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

***Note***
*In appliances for "multiple connection", a special back draught safety device is installed in the mixing shaft of the burner, downstream of the fan.*
*A further back draught safety device is installed in the flue system.*

Installing the back draught safety devices:

Installation instructions for back draught safety device

Only carry out **commissioning** when 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.
Vents for supplying combustion air must be non-sealable.
Prevent condensate drainage via a wind protector.

## Connecting the gas line

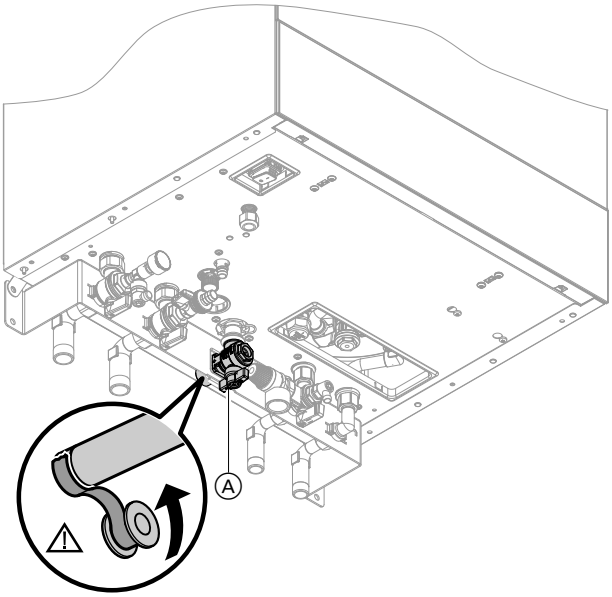


*Fig. 10*

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

***Information on operation with LPG***
*Install an external safety solenoid valve if the boiler is installed below ground level.*
*An EM-EA1 extension (accessories) is required to connect the safety solenoid valve.*

**2.** Check for leaks.

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

***Note***
*Only use suitable and approved leak detection agents (EN 14291) and devices for the 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.*

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

**3.** Purge the gas line.

## Connecting the gas line (cont.)

### 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 minimum gas pressure at the gas fitting in accordance with the table – see page 46

## Electrical connections

! **Please note**
Electronic assemblies can be damaged by electrostatic discharge.
Before beginning work, touch an earthed object, e.g. a heating or water pipe, to discharge any static.

### Opening the wiring chamber

***Note***
*If only PlusBus and the outside temperature sensor are connected to the boiler, the wiring chamber does not need to be opened.*

## Electrical connections (cont.)



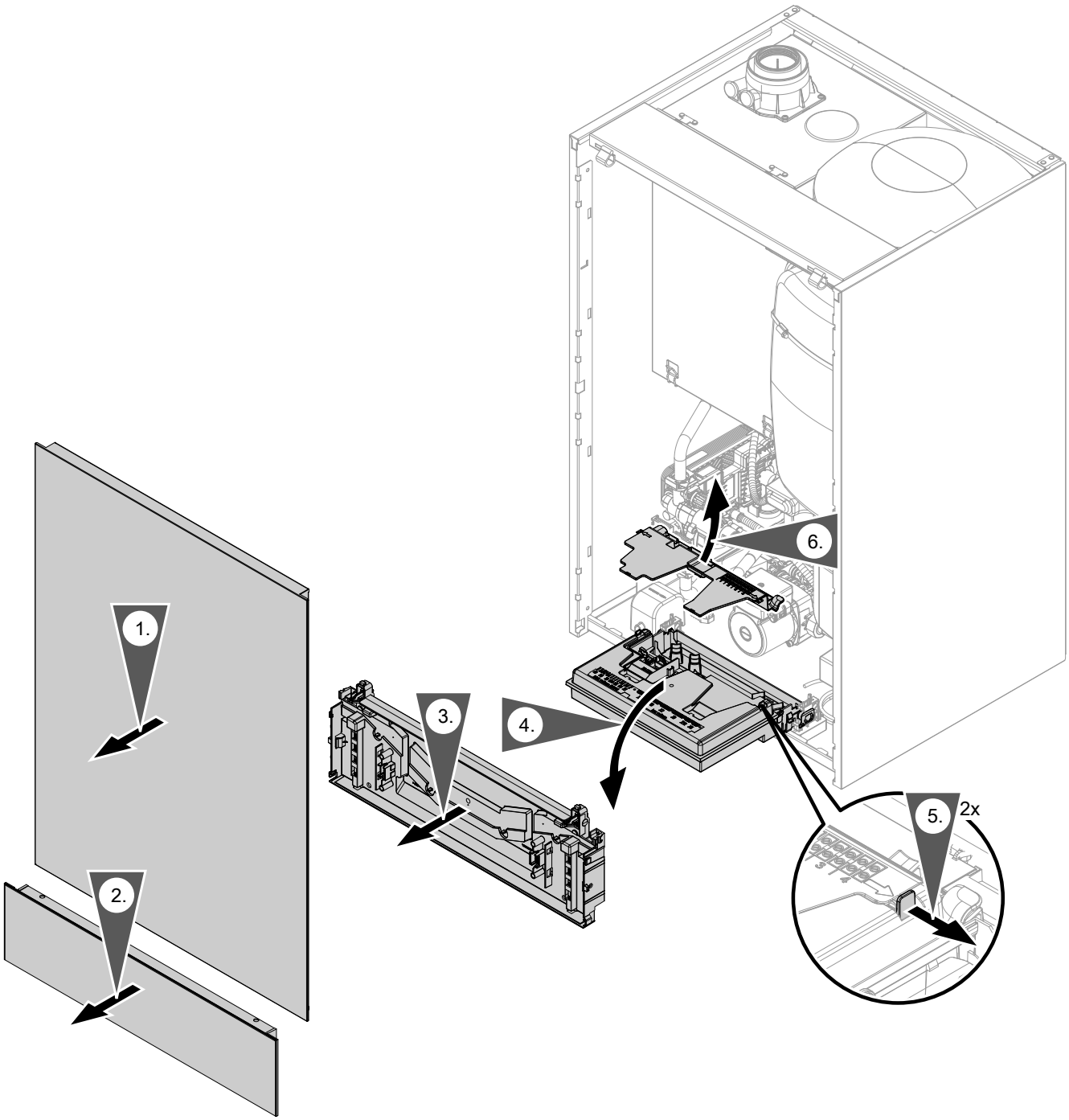


*Fig. 11*

***Note***
*Do not disconnect the plug from the mounting panel. Do not change the position of the cable or its fixture (fixing point on casing).*

### Layout of the electrical connections

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

## Electrical connections (cont.)

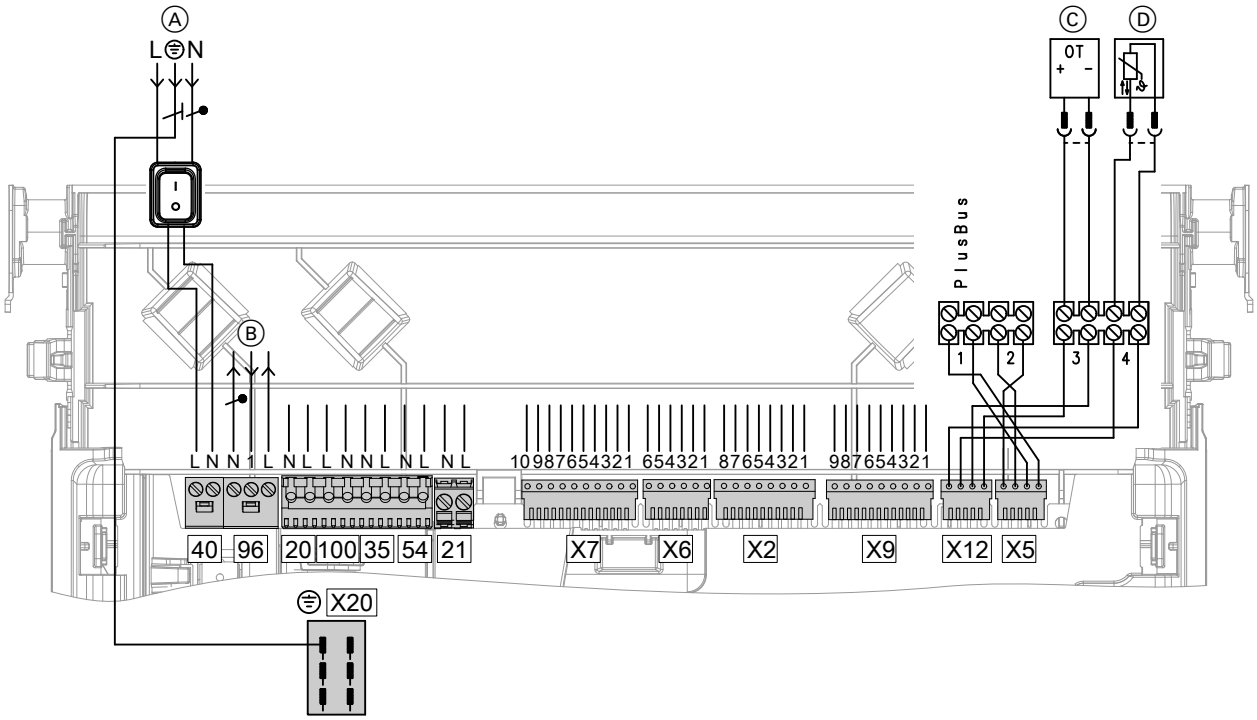


*Fig. 12*

**Connections to 230 V~ plugs**

Ⓐ Power supply 40
Ⓑ Configurable floating input 96, 230 V
230 V output
230 V room thermostat connection
20 Heating circuit pump
100 Fan motor
35 Gas solenoid valve
54 Ignition unit/ionisation
21 Cylinder loading pump
Ⓒ Remote control (OpenTherm device)
Ⓓ Outside temperature sensor
X20 Equipotential bonding (earth conductor)

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

## Electrical connections (cont.)

### On-site connections on the HMBU heat management unit

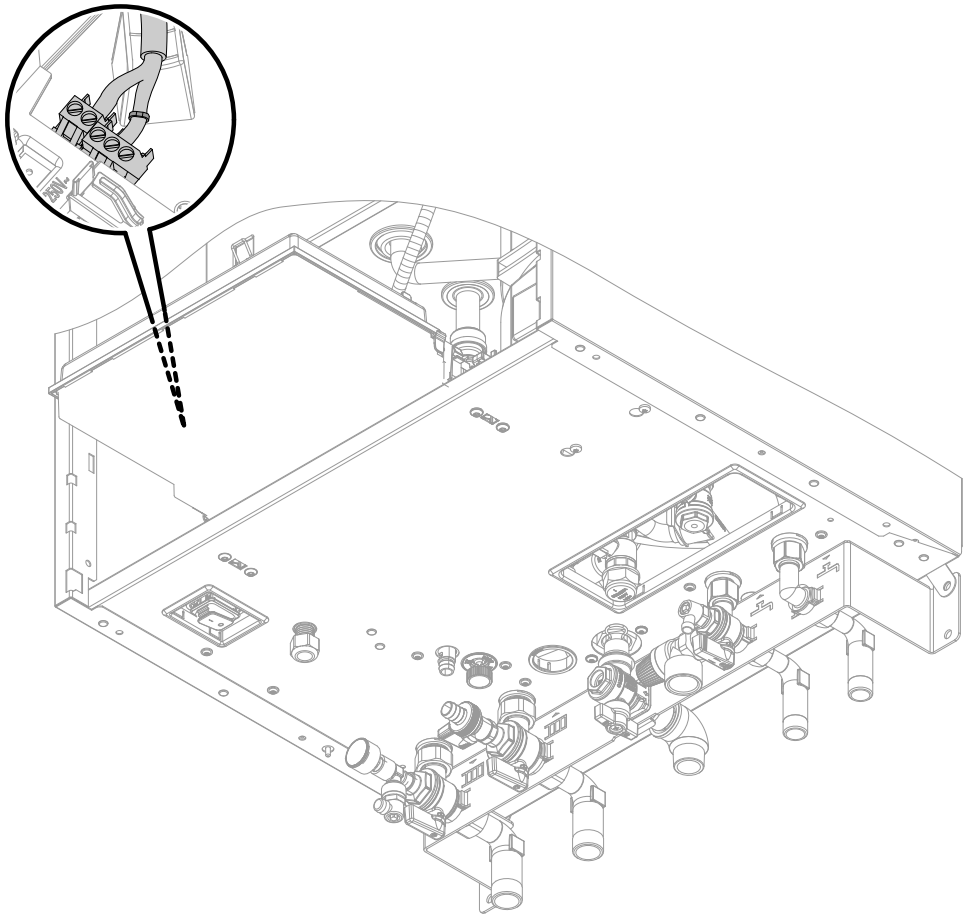

*Fig. 13*

For cables without strain relief bushings, provide strain relief in the wiring chamber in the form of cable ties.

### Connecting the 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
- Do not render over.

**Outside temperature sensor connection**

See page 26
2-core lead, length up to 35 m with a cross-section of 1.5 $mm^2$

### Connecting the floating switching contact

Connection at plug 96

**One** of the following functions can be connected:
- **"0"** No function or room thermostat
- **"2"** DHW circulation pump external demand (push-button function, pump runs for 5 min). Not for type 111-W
- **"4"** External demand
- **"5"** External blocking or alternatively connection for external heating circuit hook-up (if no more than one heating circuit hook-up is configured on commissioning. If more than one heating circuit hook-up is required, connect to EM-EA1 accessory.)

## Electrical connections (cont.)

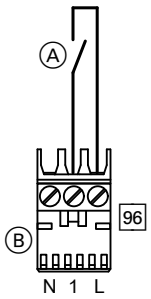


*Fig. 14*

Ⓐ Floating switching contact
Ⓑ Plug 96

**Notes on connecting PlusBus subscribers**

As a maximum, the following PlusBus subscribers can be connected to the control unit (terminal 1):
- 1 EM-M1 or EM- MX extensions
- 1 Vitotrol 200-E
- 1 EM-EA1 extension
- 1 EM-S1 extension
- 1 EM-P1 extension

**Accessories mains connection, connect plug to external power supply**

Connect one or more extensions via an ON/OFF switch directly to the mains supply (see next chapter).

Accessories with direct mains connection

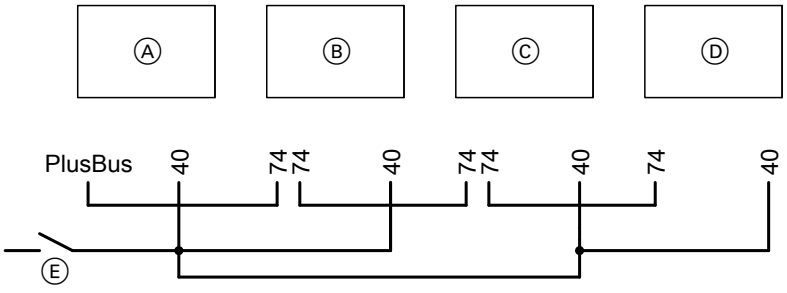


*Fig. 15*

Ⓐ HBMU heat management unit heat generator
Ⓑ Mixer extension kit
Ⓒ EM-EA1 extension and/or EM-S1 extension
Ⓓ EM-P1 extension
Ⓔ External ON/OFF switch
40 Mains input
74 PlusBus

***Note***
*PlusBus system length max. 50 m for 0.34 mm² cable cross-section and unshielded cable.*
*If the current flowing to the connected working parts (e.g. circulation pumps) is higher than the fuse rating of the accessory: Only use the output concerned to control an on-site relay.*

**Assigning functions in the commissioning assistant**

See commissioning assistant in "Commissioning".

***Note***
*The number of PlusBus subscribers is limited: Max. one Vitotrol 200-E plus a maximum of 3 additional extensions, e.g. EM-M1 or EM-EA1.*
*Example: 1 x Vitotrol 200-E + 1 x EM-M1 + 1 x EM-EA1*
*If no Vitotrol 200-E is connected, 4 extensions can be connected.*

The max. total length of the PlusBus lead is 50 m. With an unscreened lead, 2-core, 0.34 mm².

***Note***
*Use addressing for S1 rotary selector. See also the information in chapter "Notes on connecting PlusBus subscribers".*

## Electrical connections (cont.)

| Accessories | Internal fuse protection |
|---|---|
| EM-M1, EM-MX mixer extension kit | 2 A |
| EM-EA1 extension | 2 A |
| EM-S1 extension (not for type 111) | 2 A |

**Danger**
Incorrect wiring can lead to serious injury from electrical current and result in appliance damage.
- Route extra low voltage (ELV) leads < 42 V separately from cables > 42 V/230 V~.
- Strip as little of the insulation as possible, directly before the terminals, and bundle close to the corresponding terminals.
- Secure cables/leads with cable ties.



### Power supply 40

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

Connect the power supply and implement all safety measures (e.g. RCD circuit) in accordance with the following regulations:
- IEC 60364-4-41
- IEEE Wiring Regulation; BS 7671:2018
- Connection conditions of the local grid operator

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

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

### Routing connecting cables/leads

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

## Electrical connections (cont.)

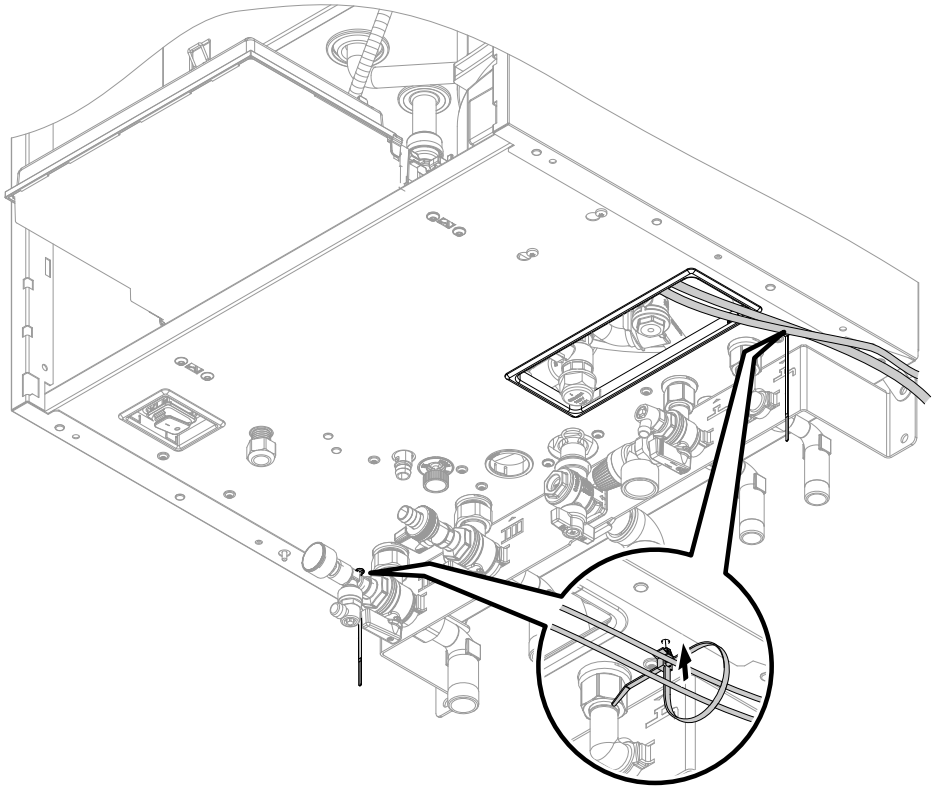

*Fig. 16*

Bundle cables using the supplied cable ties. Secure the cable ties to the underside.
Do not route cables/leads over sharp edges and lying against the casing (sound transmission).

## WiFi operational reliability and system requirements

WiFi router system requirement

- WiFi router with activated WiFi:
  The WiFi router must be protected by a sufficiently secure WPA2 password.
  ***Note***
  - *The WPA2 password is a sequence of 8 to 63 characters.*
  - *Upper and lower case letters, numbers and special characters in ASCII are permitted.*

  The WiFi router must always have the latest firmware update.
  Do not use unencrypted connections between the heat generator and the WiFi router.
- Internet connection with high availability:
  "Flat rate" (flat rate tariff without restriction on time or data volume)
- Set the WiFi frequency to 2.4 GHz.
- Dynamic IP addressing (DHCP, delivered condition) in the network (WiFi):
  Have this checked on site by an IT expert **prior** to commissioning. Arrange for set up if required.
- Set routing and security parameters in the IP network (LAN).
  ***Note***
  *Length of password and permitted special characters depend on the respective router.*
  Enable the following ports for direct outgoing connections:
  - Port 80
  - Port 123
  - Port 443
  - Port 8883

  Have this checked on site by an IT expert **prior** to commissioning. Arrange for enabling if required.

## WiFi operational reliability and system… (cont.)

### Wireless signal range of WiFi connection

The range of wireless signals may be reduced by walls, ceilings and interior fixtures. The following circumstances will reduce the strength of the wireless signal and can disrupt reception:

- On their way between transmitter and receiver, wireless signals are **damped**, e.g. by air or when penetrating walls.
- Wireless signals are **reflected** by metallic objects, e.g. reinforcements embedded in walls, metal foil of thermal insulation and thermal glazing with metallised thermal vapour deposit.
- Wireless signals are **isolated** by service ducts and lift shafts.
- Wireless signals are **disrupted** by devices that also operate with high frequency signals. Distance to such appliances: **Min. 2 m**.
  Examples of devices with high frequency signals:
  - Computers
  - Audio and video systems
  - Devices with active WiFi connection
  - Electronic transformers
  - Pre-ballasts

Install the heat generator as close as possible to the WiFi router to ensure a good WiFi connection. The signal strength can be displayed on the programming unit: See operating instructions.

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

### Angle of penetration

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

**Flat (unfavourable) angle of penetration**

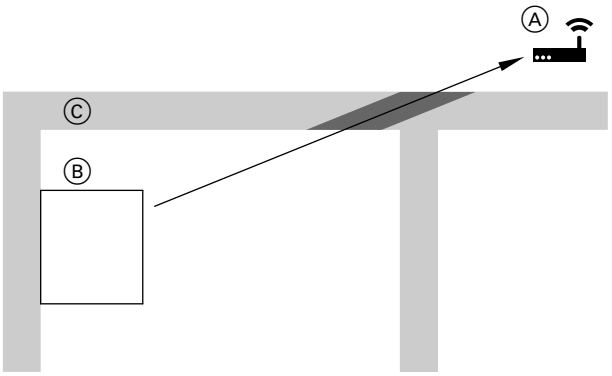


*Fig. 17*

Ⓐ WiFi router
Ⓑ Heat generator
Ⓒ Wall

**Ideal angle of penetration**

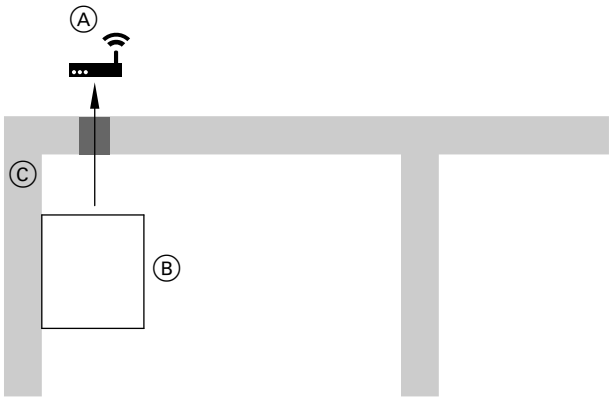


*Fig. 18*

Ⓐ WiFi router
Ⓑ Heat generator
Ⓒ Wall



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## Closing the wiring chamber and fitting the front panel

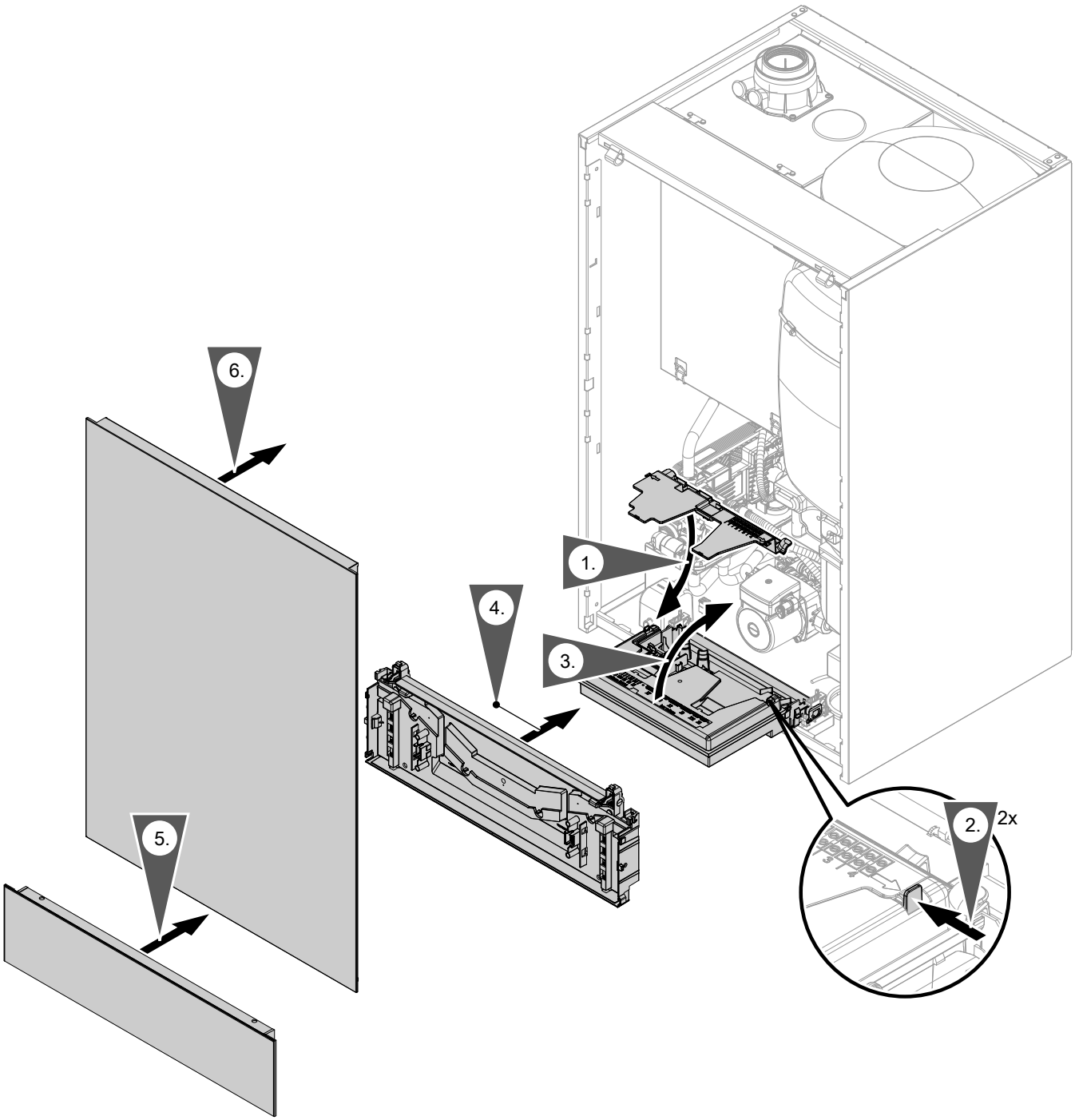


*Fig. 19*

## Steps - commissioning, inspection and maintenance

Commissioning steps
Inspection steps
Maintenance steps


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## Commissioning the system with the commissioning assistant

**Please note**
Only start 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:
   1. Turn on the ON/OFF switch.
   2. **AP** and appear on the display.
   3. Press menu button for 4 s to start the commissioning assistant.

   If the appliance has already been switched on, you can call up the commissioning assistant yourself:
   1. and **OK** simultaneously for approx. 4 s.
   2. Use /  to select **"b.5"**. Confirm with **"OK"**.
      ***Note***
      ***AP** and appear on the display. Confirm with **OK** to start the connection with the software tool: See chapter "Commissioning via software tool".*
   3. for 4 s to start the commissioning assistant.

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

### Commissioning via software tool

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

Download on the App Store

GET IT ON Google Play

1. Open the gas shut-off valve.

2. **AP** and appear on the display.
   Press **OK** and enter the password for the heat generator to carry out commissioning with the software tool.

3. Select **ON**. Confirm with **OK**.

4. Follow the instructions in the software tool.

## Commissioning the system with the commissioning… (cont.)

| Commissioning assistant sequence | Explanations and references |
|---|---|
| **Commissioning** | |
| **"C.1"**<br>Date (day, month, year) | |
| **"C.2"**<br>Time (hours, minutes) | |
| **"C.3"**<br>Autom. summer/winter-time changeover | ON = on<br>OFF = off |
| **"C.4"**<br>Operating mode | 1 - Constant mode with time program<br>4 - Weather-compensated<br>13 - Constant mode with optional room thermostat<br>14 - OpenTherm<br>15 - Individual room control<br>16 - Individual room control with modulation<br><br>***Note***<br>*Operating modes 15 and 16 can only be set via the software tool.*<br>*If operating mode 15 or 16 is set, low power radio cannot be switched off!* |
| **"C.5"**<br>Filling program | ON = on<br>OFF = off<br><br>***Note***<br>*It is possible to interrupt or end the process while a rotating rectangle alternating with the current system pressure is displayed; to do so, press ☰ for 3 s.* |
| **"C.6"**<br>Venting program | ON = on<br>OFF = off<br><br>***Note***<br>*It is possible to interrupt or end the process while a rotating rectangle alternating with the current system pressure is displayed; to do so, press ☰ for 3 s.* |
| "Adv" commissioning | **"End"** appears after **"C.6"**. If this is confirmed with OK, the Advanced Setup is skipped and the flue gas temperature sensor test starts.<br>If the up arrow button is pressed (continue) while **"End"** is shown, **"Adv"** appears on the display. If this is confirmed with OK, the Advanced Setup starts with **"C.7"**. |
| **"C.7"**[*1]<br>Gas type | 2 - Natural gas<br>3 - LPG |
| **"C.8"**[*2][*1]<br>Flue system | 1 - Open flue 60 mm, rigid<br>2 - Room sealed 60/100 mm, rigid<br>3 - Open flue 80 mm, rigid<br>4 - Room sealed 80/125 mm, rigid<br>5 - Flexible 60 mm (room sealed or open flue) max. 10 m<br>6 - Flexible 80 mm (room sealed or open flue) max. 15 m |

*[*1] This setting is not required for appliances with multiple flue connection "M".*
*The gas type is preset to natural gas; the flue system and flue pipe length are automatically set correctly via the integral mass flow correction.*

*[*2] C5/C6 cannot be selected via the software tool*



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## Commissioning the system with the commissioning… (cont.)

| Commissioning assistant sequence | Explanations and references |
|---|---|
| **"C.9"**[*2*1]<br>Flue length | Given in full metres (round up if necessary)<br><br>***Note***<br>*An additional length of 1 m must be factored in for every flue bend.* |
| **"C.10"**<br>System scheme (depending on appliance type, not all schemes possible) | 1 - 1 direct heating circuit without low loss header<br>2 - 1 direct heating circuit with low loss header<br>3 - 1 direct heating circuit without low loss header with DHW cylinder<br>4 - 1 direct heating circuit with low loss header and DHW cylinder upstream of low loss header<br>5 - 1 direct heating circuit + 1 heating circuit with mixer and low loss header + DHW cylinder<br>6 - 1 direct heating circuit with low loss header + DHW cylinder upstream of low loss header + solar DHW cylinder<br>7 - 1 direct heating circuit + 1 heating circuit with mixer and low loss header + DHW cylinder upstream of low loss header + solar DHW cylinder<br>8 - 1 direct heating circuit + 1 heating circuit with mixer and low loss header<br>9 - 1 heating circuit with mixer and low loss header + DHW cylinder upstream of low loss header<br>10 - 1 direct heating circuit without low loss header + DHW cylinder + solar DHW cylinder<br><br>***Note***<br>*System schemes 11 - 18 and the DHW circulation pump can be set via the software tool.*<br><br>11 - 1 heating circuit with mixer without low loss header<br>12 - 1 heating circuit with mixer with low loss header<br>13 - 1 heating circuit with mixer without low loss header + DHW cylinder<br>14 - 1 direct heating circuit + 1 heating circuit with mixer without low loss header + DHW cylinder<br>15 - 1 heating circuit with mixer with low loss header + DHW cylinder + solar DHW cylinder<br>16 - 1 heating circuit with mixer without low loss header + DHW cylinder + solar DHW cylinder<br>17 - 1 direct heating circuit + 1 heating circuit with mixer without low loss header + DHW cylinder + solar DHW cylinder<br>18 - 1 direct heating circuit + 1 heating circuit with mixer without low loss header<br><br>***Note***<br>*If a DHW circulation pump has been configured via the software tool, it is shown with a "C" after the system scheme number.* |
| **"C.11"**<br>External heating circuit hook-up | ***Note***<br>*Only for weather-compensated mode*<br><br>0 - No external heating circuit hook-up<br>1 - External heating circuit hook-up HC1<br>2 - External heating circuit hook-up HC2<br>3 - External heating circuit hook-up HC1 and HC2 (EM-EA1 extension (DIO) required) |

*[*2] C5/C6 cannot be selected via the software tool*

*[*1] This setting is not required for appliances with multiple flue connection "M".*
*The gas type is preset to natural gas; the flue system and flue pipe length are automatically set correctly via the integral mass flow correction.*

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## Commissioning the system with the commissioning… (cont.)

| Commissioning assistant sequence | Explanations and references |
|---|---|
| **"C.12"**<br>EM-EA1 (DIO) function<br><br>***Note***<br>*If "C.11" is set to 3, then no setting is required at "C.12".* | 0 - No function<br>4 - External set flow temperature 0–10 V<br>5 - External default output<br>8 - 230 V fault message input and fault message output (without system blocking)<br>9 - External LPG valve<br>10 - External extractor (e.g. cooker hood)<br>11 - Operating mode changeover<br>14 - 24 V fault message input and system blocking (e.g. condensate removal pump).<br>17 - 230 V fault message input and system blocking.<br>18 - External demand (digital)<br>19 - External blocking |
| **"C.13"**<br>Plug 96 function | 0 - No function<br>2 - External demand DHW circulation pump<br>4 - External demand<br>5 - External blocking<br>If only one HC was configured with external hook-up, the setting for plug 96 is automatically applied for this. No selection or other function is then possible. |
| **"C.14"**<br>Remote control | Off - not installed<br>ON - Vitotrol 200-E with subscriber number 1 installed (all installed heating circuits can be controlled via the Vitotrol 200-E) |
| | After the final setting (C.14) has been completed, **"End"** appears on the display. Confirm with **"OK"**.<br>When commissioning starts, the flue gas temperature sensor test begins and **"Fst"** is shown on the display. |
| **Maintenance** | |
| Interval in burner hours run until next maintenance | Can be adjusted via the software tool (notification also via software tool) |
| Interval until the next maintenance | Can be adjusted via the software tool (notification also via software tool) |
| The system carries out a restart. | |

### Automatic flue gas temperature sensor check

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

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

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

### Switching WiFi on/off

The appliance is equipped with an integrated (2.4 GHz) WiFi communication module with extended type plate.

This WiFi communication module supports commissioning, maintenance and servicing with "ViGuide"/"ViGuide app" as well as operation via the "ViCare app".

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## Commissioning the system with the commissioning… (cont.)

Three labels with the access details required for establishing the connection are attached at the factory to the front of the programming unit. The access code is marked with a "WiFi symbol" .

Remove these 3 labels. Apply the labels in the following positions:
- For commissioning, affix a label to the place marked on the type plate.
- Affix a label in the space provided in the operating instructions.
- For later use, affix a label here:

*Fig. 20*

Switch on the WiFi connection. Establish a connection to the router:
- Information on WiFi: See chapter "WiFi operational reliability and system requirements".
- **Establishing an internet connection** Operating instructions

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

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

### Calling up the commissioning assistant at a later point

If you need to continue commissioning later, the commissioning assistant can be reactivated at any time.

**Tap the following buttons:**

1. ≡ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.5"** and confirm with **"OK"**. For further steps: See "Commissioning assistant".

## Filling the heating system

According to EN 1717, 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 fill with water of potable quality.
- Fill water with a hardness above 300 ppm must be softened.
- Special antifreeze suitable for heating systems can be added to the fill water. The antifreeze manufacturer must verify its suitability.

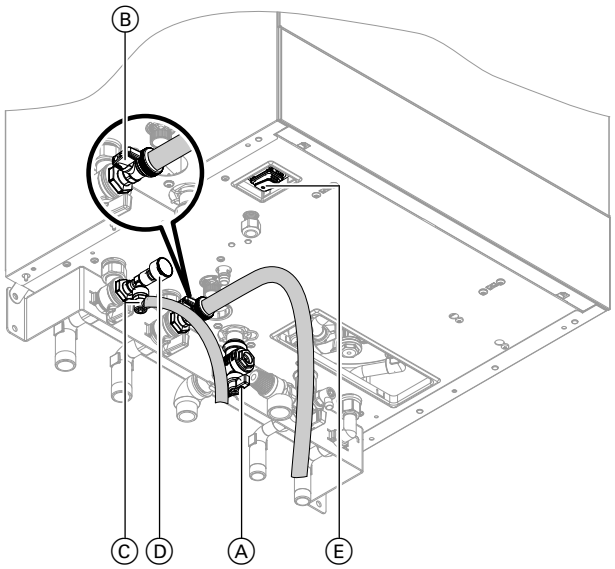


*Fig. 21*

Ⓔ ON/OFF switch

## Filling the heating system (cont.)

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

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

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

### Activating the filling function

If the filling function is to be activated after commissioning.

**Tap the following buttons:**

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

## Filling the heating system (cont.)

8. **OK**
   The filling function is activated. The display shows the current system pressure.
   The filling function ends automatically after 20 min or when you tap **OK**.

## Filling the loading cylinder on the DHW side

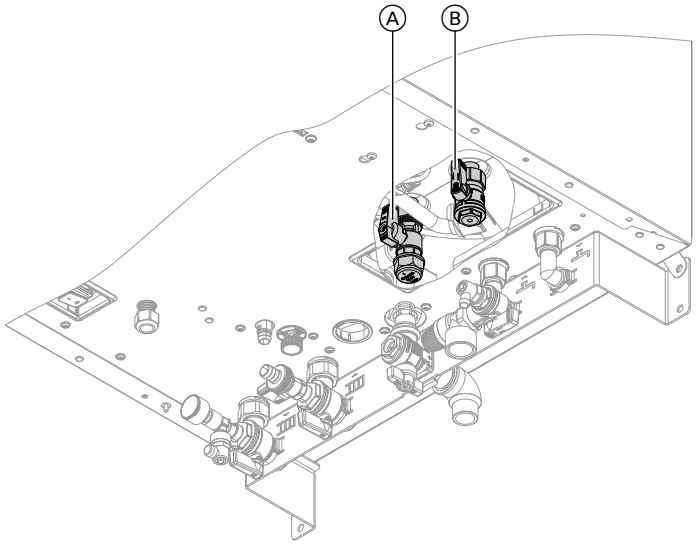


*Fig. 22*

1. Valves Ⓐ and Ⓑ must be in the "top" position.
2. Open the cold water line and a DHW draw-off point.
3. Once air stops coming out of the DHW draw-off point, the loading cylinder is completely filled.

## 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

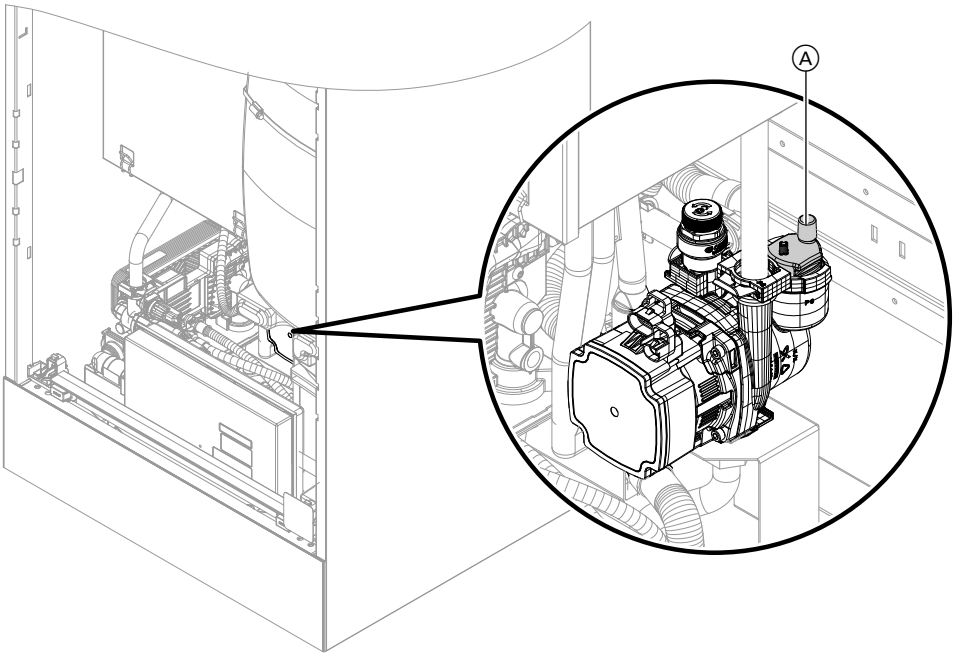


*Fig. 23*

1. Check whether the air vent screw in quick-action air vent valve Ⓐ of the heating circuit pump is open.
2. Close the gas shut-off valve. Switch the appliance on.
3. Activate venting function (see following steps).
4. Call up the pressure display with **"System overview"**.
   Check the system pressure.

### Activating the venting function

If the venting function is to be activated after commissioning.

**Tap the following buttons:**

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.5"** for the commissioning assistant.
3. **OK**
4. The display shows **"AP"**.
   Press ☰ for 4 s.
5. Use ∧/∨ to select **"C.2"** for venting.
6. **OK**
7. ∧/∨ to select **"ON"** to switch on venting.
8. **OK**
   The venting function is activated. The display shows the current system pressure.
   The venting function ends automatically after 20 min or when you tap **OK**.

## Checking the gas type

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

- For operation with natural gas, no adjustment is therefore required across the entire Wobbe index range. The boiler can be operated within the Wobbe index range 9.5 to 15.2 kWh/m$^3$ (34.2 to 54.7 MJ/m$^3$).
- For operation with LPG, the gas type needs to be changed on the control unit (see following chapter).

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## Checking the gas type (cont.)

1. Determine the gas type and Wobbe index by asking your local gas supply utility or LPG supplier.
2. Record the gas type in the service report.

## Converting the gas type for operation with LPG

1. To change the gas type on the control unit, see "Commissioning the system with the commissioning assistant"

   ***Note***
   *No mechanical adjustments are made to the gas solenoid valve.*

2. Affix label "G31" (supplied with the technical documentation) adjacent to the type plate on the cover panel.

## 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.
- Prior to working on the appliance, wait at least 4 min until the voltage has completely dropped out.

## Removing the front panel (cont.)

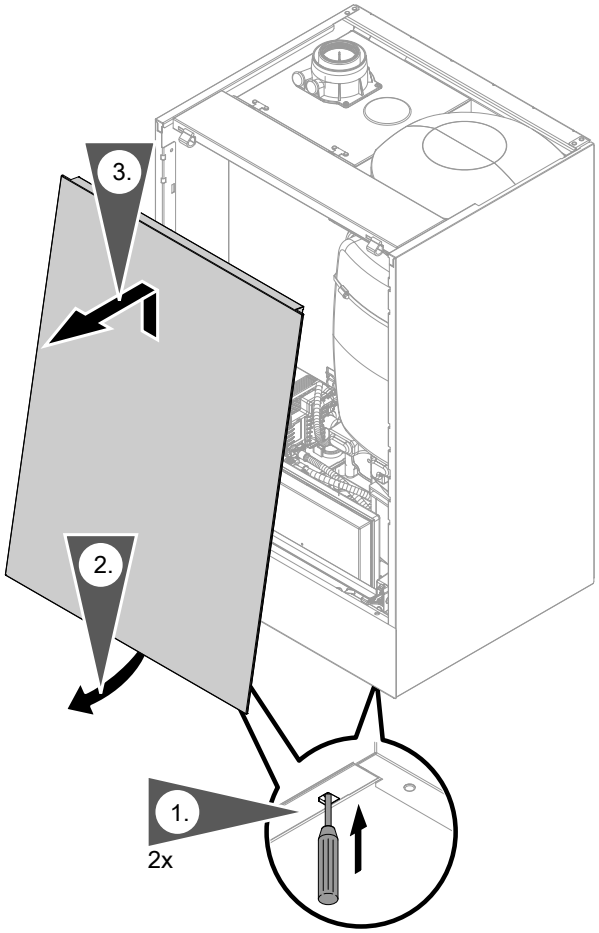



*Fig. 24*

## Checking the static pressure and supply pressure

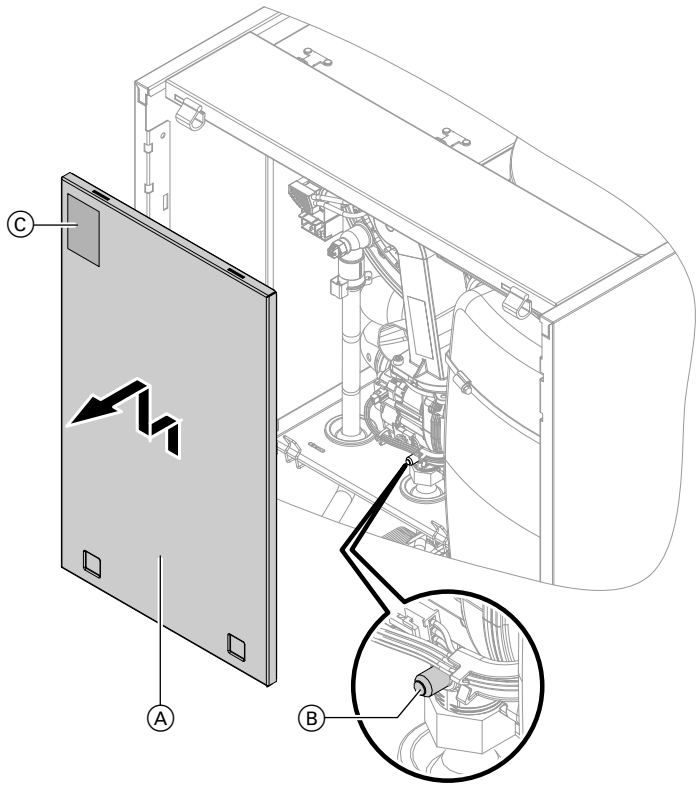



*Fig. 25*

Ⓐ Cover panel
Ⓒ Type plate

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

### 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).

### Operation with LPG

Purge the LPG tank twice on commissioning/replacement. Vent the tank and gas connection line thoroughly after purging.

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

## Checking the static pressure and supply pressure (cont.)

7. Turn on the ON/OFF switch and start the boiler.

   ***Note***
   *During commissioning, the appliance can enter a fault state if there are airlocks in the gas line. Reset the appliance after approx. 5 s (see operating instructions).*

8. Check the supply (flow) pressure. For set values, see the following table.

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

9. Record the value in the report.
   Implement measures as indicated in the table below.

10. Shut down the boiler. Close the gas shut-off valve. Remove the pressure gauge. Close test connector Ⓑ with the screw.

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

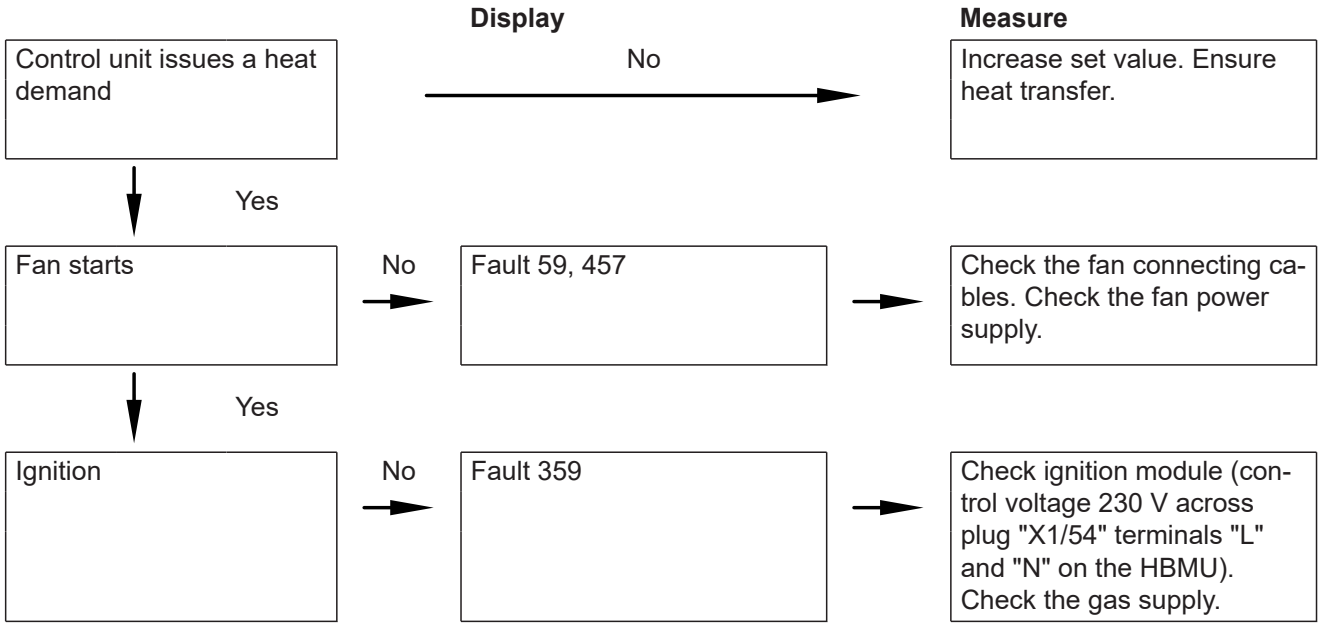
    ⚠ **Danger**
    Gas escaping from the test connector leads to a risk of explosion.
    Check gas tightness at test connector Ⓑ.

12. Fit cover panel Ⓐ.

13. Fit front panel (see installation sequence).

| Supply pressure (flow pressure) | | Measures |
|---|---|---|
| **For natural gas** | **For LPG** | |
| < 13 mbar (1.3 kPa) | < 25 mbar (2.5 kPa) | Do not start the boiler. Notify the gas supply utility or LPG supplier. |
| 13 to 25 mbar (1.3 to 2.5 kPa) | 25 to 57.5 mbar (2.5 to 5.75 kPa) | Start the boiler. |
| > 25 mbar (2.5 kPa) | > 57.5 mbar (5.75 kPa) | Install a separate gas pressure governor upstream of the system. Set the pre-charge pressure to 20 mbar (2.0 kPa) for natural gas and 50 mbar (5.0 kPa) for LPG. Notify the gas supply utility or LPG supplier. |

## Function sequence and possible faults

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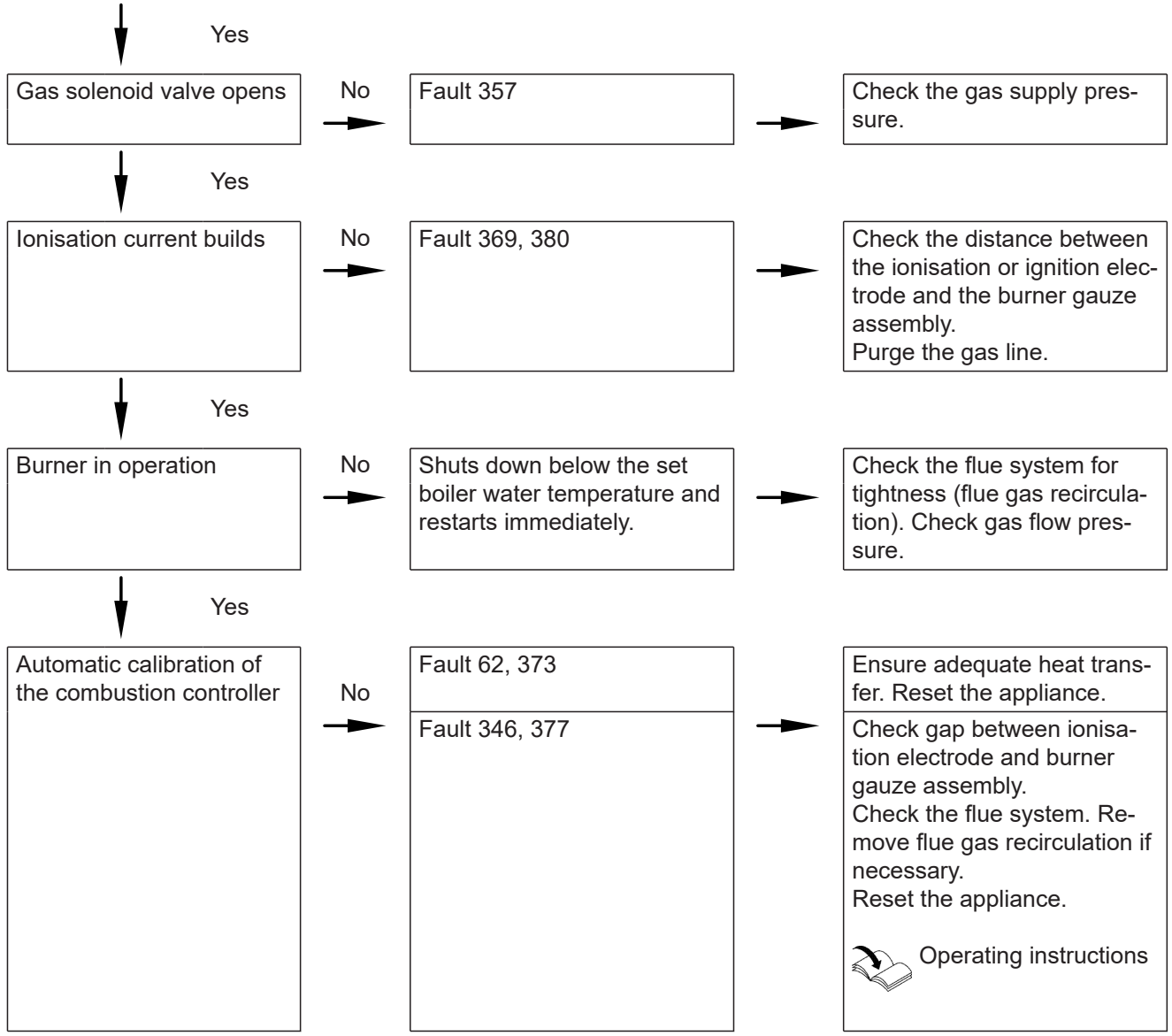
## Function sequence and possible faults (cont.)




For further details regarding faults, see "Troubleshooting".

## Setting the max. heating output

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

**Tap the following buttons:**

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.2"** for system configuration.
3. **OK**
4. Use ∧/∨ to select **"7"** for max. heating output.
5. **OK**

## Setting the max. heating output (cont.)

6. Use ∧/∨ to set the required value in % of rated heating output. Factory setting 100 %.
7. **OK**

## Performing an actuator test

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

## Adjusting pump rate of integral circulation pump

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

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

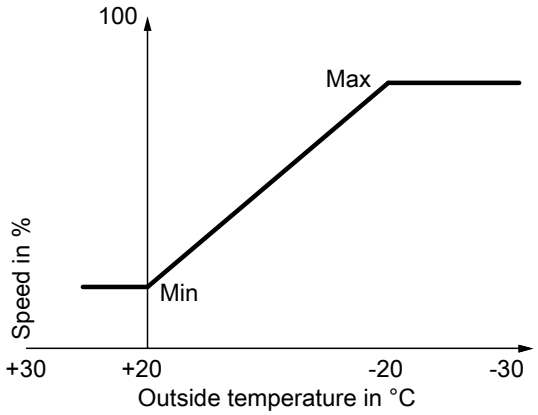



*Fig. 26*

Setting (%) in Heating circuit 1 group:
- Min. speed: Parameter 1102.0
- Max. speed: Parameter 1102.1



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## Adjusting pump rate of integral circulation pump (cont.)

- In the delivered condition, the minimum pump rate and the maximum pump rate are set to the following values:
  ***Note***
  *The minimum speed of 60 % is not undershot, in order to ensure the required flow rate via the internal overflow valve. Having the minimum pump rate set to 40 % ensures that the pump works more energy efficiently in weather-compensated mode.*

| Rated heating output in kW | Speed settings in the delivered condition in % | |
|---|---|---|
| | Min. pump rate | Max. pump rate |
| 11 | 40 | 60 |
| 19 | 40 | 65 |
| 25 | 40 | 75 |
| 32 | 40 | 100 |

- In the following system conditions, the internal circulation pump is operated at a constant speed:
  - Low loss header or heating water buffer cylinder and heating circuits with mixer
  - Continuous operation

  Speed setting (%): Parameter 1100.2 in the Boiler group

**Residual head of integral circulation pump**

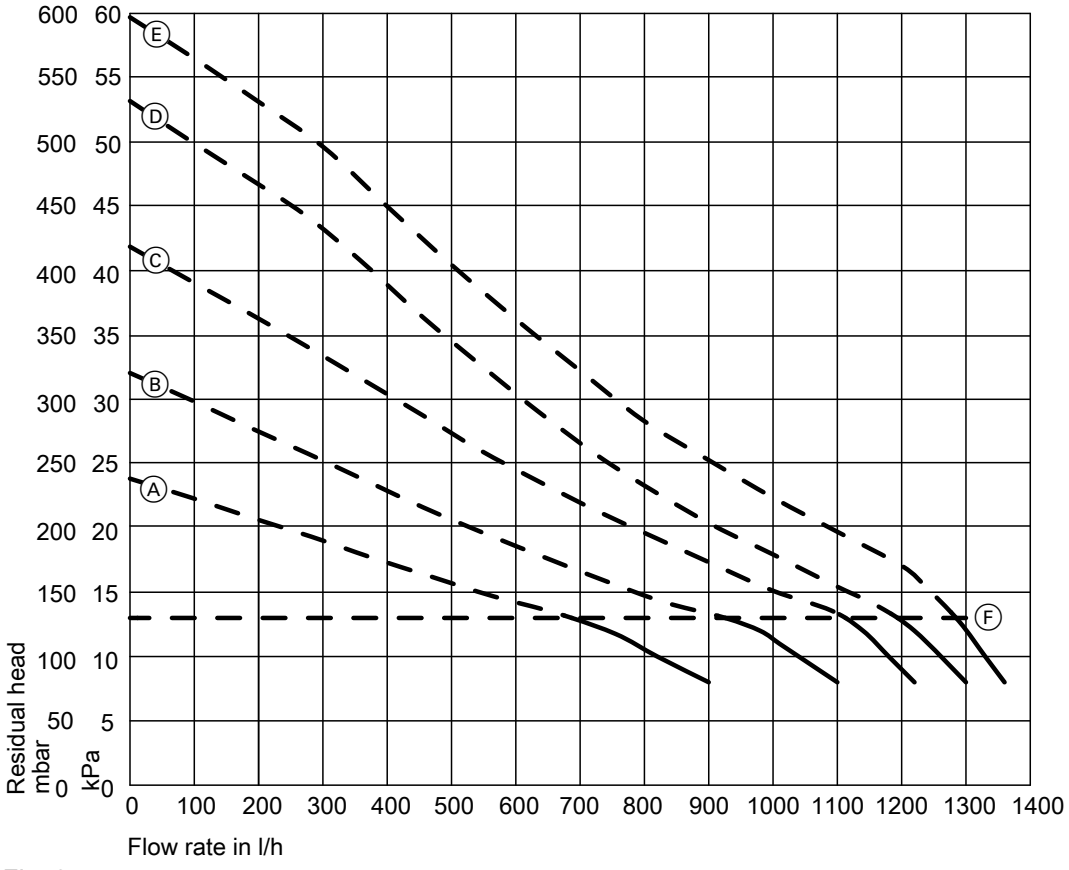


*Fig. 27*

Ⓕ Upper operational limit (integral bypass opens)

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## Adjusting pump rate of integral circulation pump (cont.)

| Curve | Pump rate of circulation pump |
|---|---|
| Ⓐ | 60 % |
| Ⓑ | 70 % |
| Ⓒ | 80 % |
| Ⓓ | 90 % |
| Ⓔ | 100 % |

## Activating screed drying

### Screed drying

Six different temperature profiles can be set for screed drying:
Default temperature profiles can be set in **"System configuration"**.
For further details, see "Function description".

***Note***
*Screed drying applies to all connected heating circuits simultaneously! DHW heating is not possible during screed drying.*

## Leak test on balanced flue system (annular gap check)

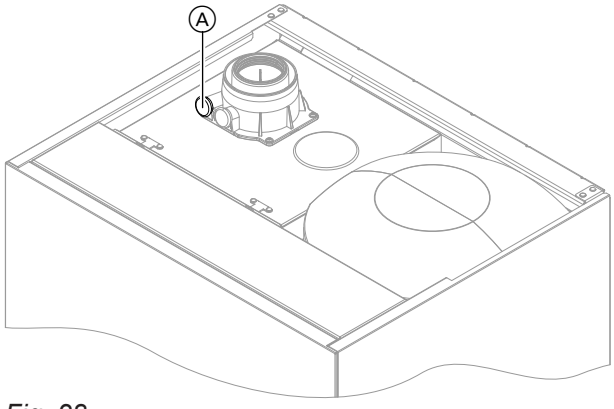


*Fig. 28*

Ⓐ Combustion air aperture

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

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

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

## Burner adjustment when connecting multiple flues to a shared flue system

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

When connecting several Vitodens 111-W to a common flue system:
For multiple connection, in the **commissioning assistant** use **"C.4"**, **"C.5"** and **"C.6"** to match the burner setting to the flue system. See page 35

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

## Removing the burner

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

***Note***
*Remove cover panel, see page 45.*

## Removing the burner (cont.)

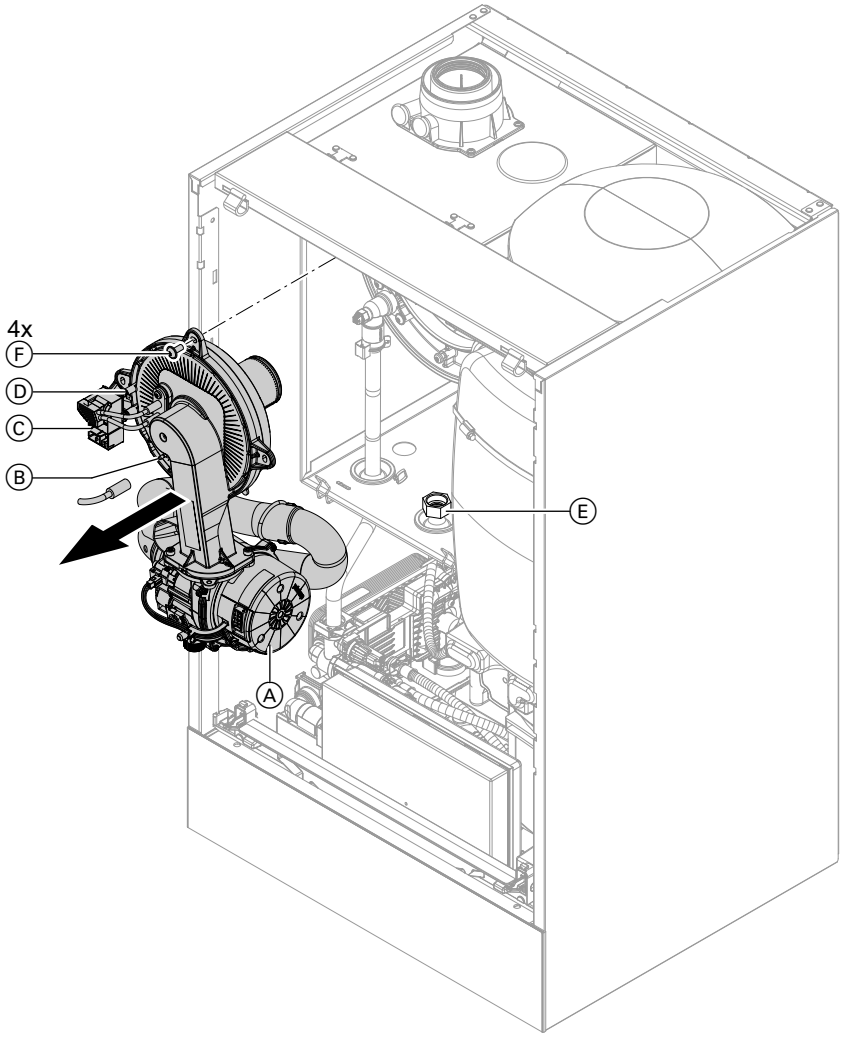


*Fig. 29*

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

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

## Checking the burner gasket and burner gauze assembly

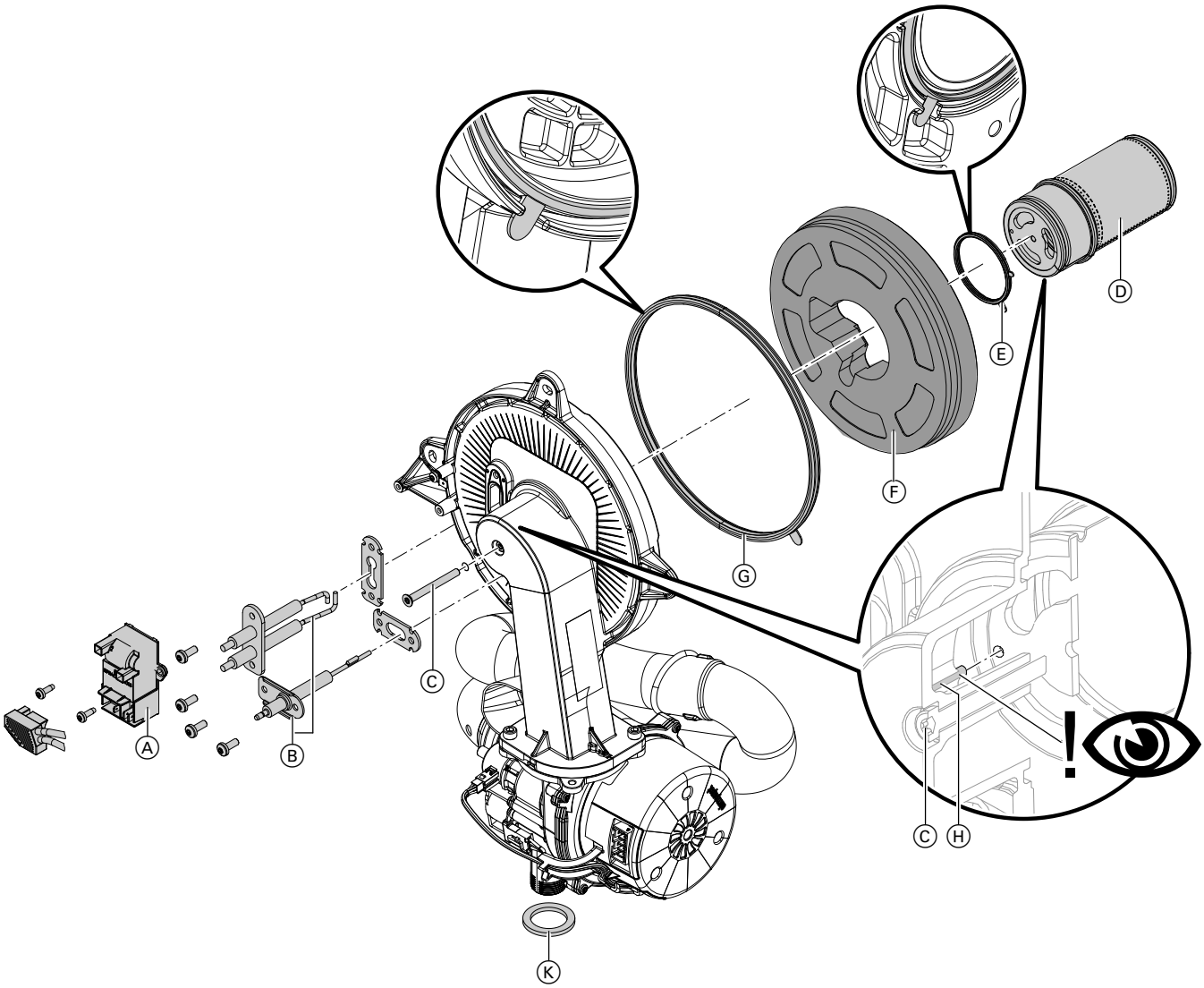


*Fig. 30*

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

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

1. Disconnect plug with ignition electrode leads from ignition unit Ⓐ.
2. Remove electrodes Ⓑ.
3. Undo Torx screw Ⓒ. Hold onto burner gauze assembly Ⓓ when undoing the screw.
4. Remove burner gauze assembly Ⓓ with gasket Ⓔ and thermal insulation ring Ⓕ. Check components for damage.
5. Install new burner gasket Ⓖ. Observe correct installation position. Align the tab as per the diagram.
6. Insert thermal insulation ring Ⓕ and burner gauze assembly Ⓓ with gasket Ⓔ. Observe correct installation position. Align the tab as per the diagram.

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

7. Align the hole in burner gauze assembly Ⓓ with burner door pin Ⓗ.

   **Please note**
   Incorrect positioning of the burner gauze assembly on the burner door 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"**, page 54.

   Secure burner gauze assembly Ⓓ and gasket Ⓔ with Torx screw Ⓒ.
   Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Torque: 3.0 Nm.

8. Check thermal insulation ring Ⓕ for firm seating.

9. Fit electrodes Ⓑ. Check clearances, see following chapter.
   Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Torque: 4.5 Nm.

10. Fit the gas connection with new gasket Ⓚ.
    See chapter "**Installing the burner**".

**Installing the burner gauze assembly**

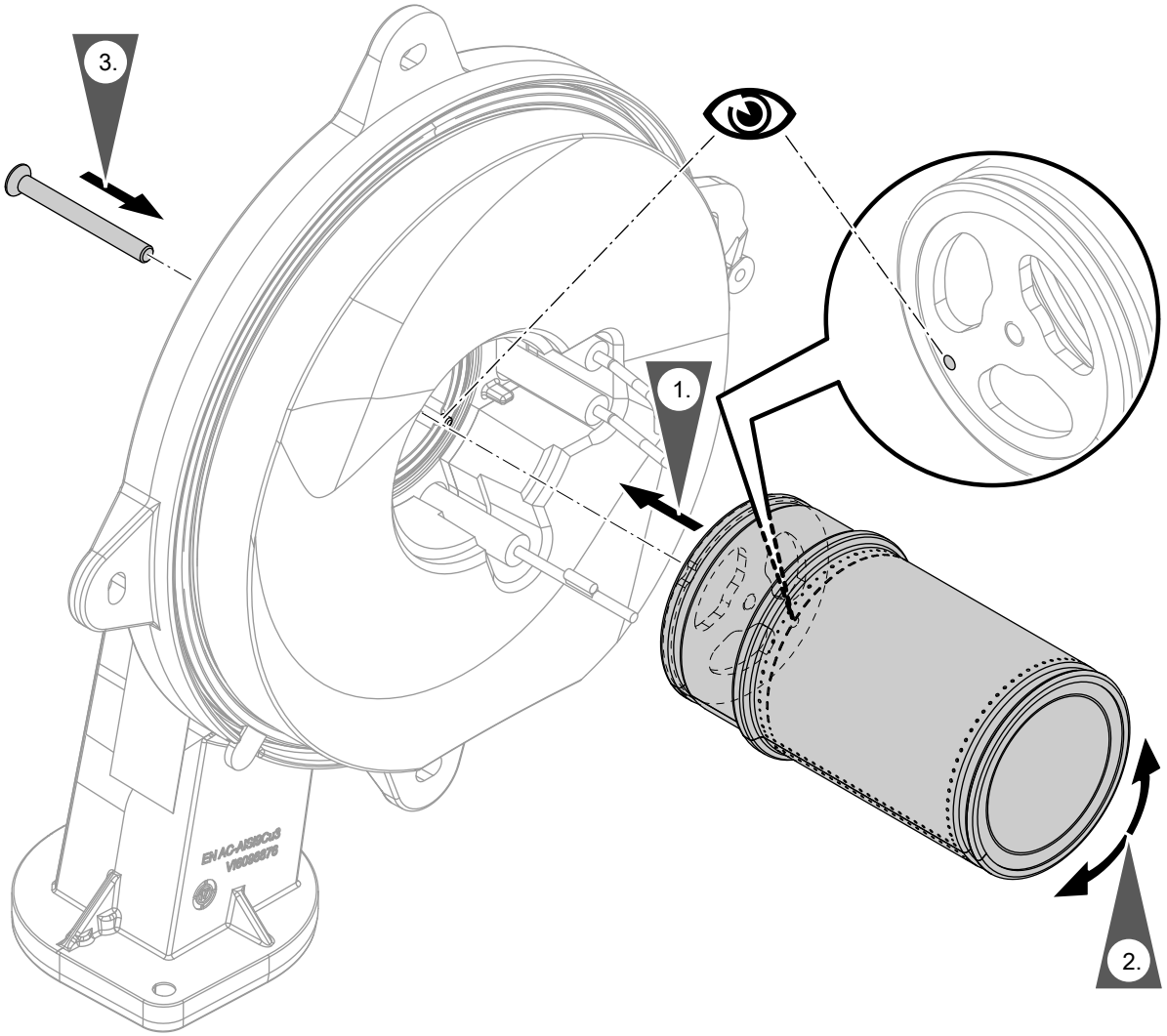


*Fig. 31*

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

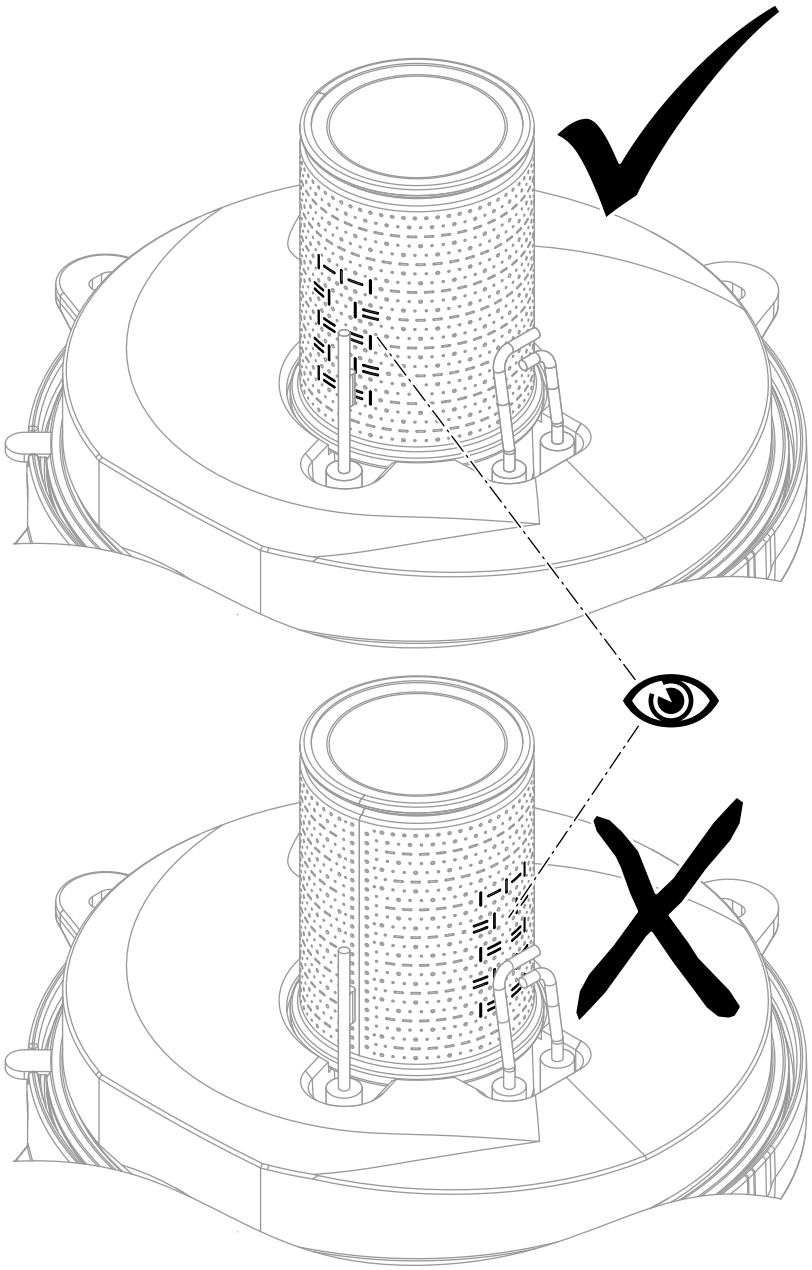

*Fig. 32*

## Checking and adjusting the ignition and ionisation electrodes

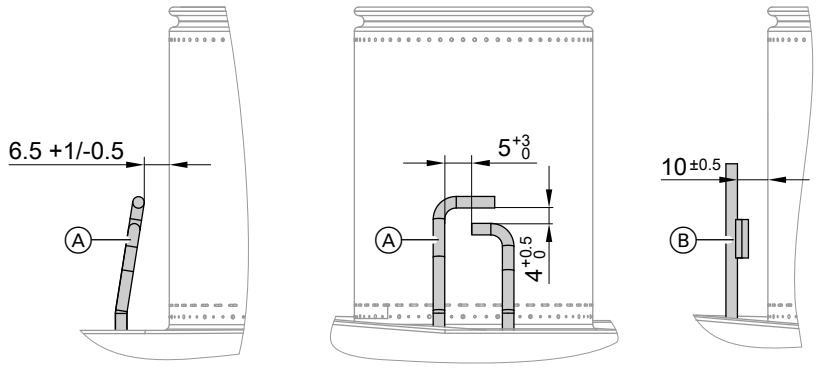


*Fig. 33*

Ⓐ Ignition electrode
Ⓑ 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 outside the tolerance range or the electrodes are damaged, replace and realign the electrodes together with new gaskets.
   Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Tighten the electrode fixing screws to a torque of 4.5 Nm.

## Checking the back draught safety devices

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

**Back draught safety device in the mixing shaft of the burner**

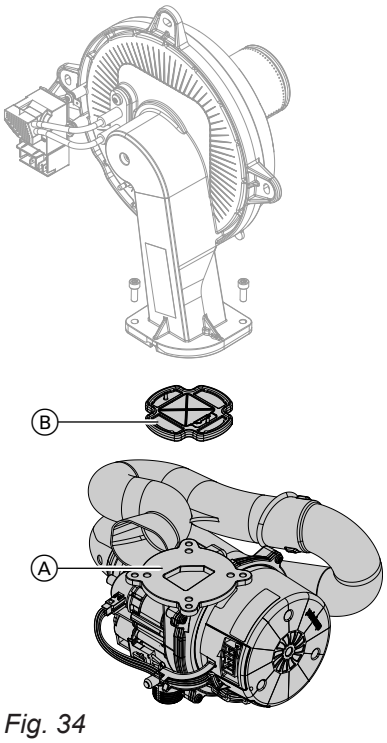


*Fig. 34*

## Checking the back draught safety devices (cont.)

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

   ***Note***
   *Observe correct installation position.*

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

**Back draught safety device in the flue gas connection**

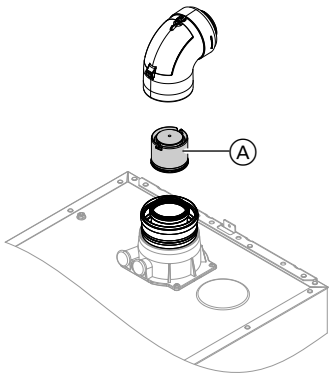


*Fig. 35*

1. Remove the balanced flue system.

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

2. Check back draught safety device Ⓐ for dirt, ease of movement and function.
3. Refit the balanced flue system.
4. Pour a small amount of water through the inspection port to ensure the back draught safety device is working.

## Cleaning the heating surfaces

! **Please note**
Scratches to the surface of the heat exchanger that comes into contact with hot gas can result in corrosion damage. Brushing can cause deposits to become lodged in the gaps between the coils.
**Never use brushes to clean the heating surfaces.**

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

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

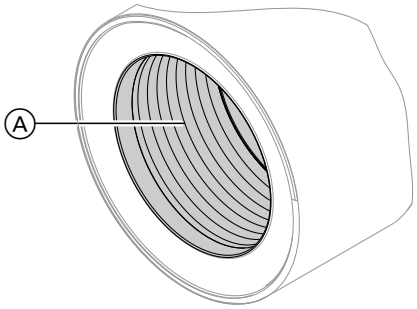


*Fig. 36*

1. Use a vacuum cleaner to remove combustion residues from heating surface Ⓐ of the heat exchanger.
2. Flush heating surface Ⓐ with water.

## Cleaning the heating surfaces (cont.)

3. Check condensate drain. Clean the trap: See the following chapter.
4. Check the thermal insulation block (if installed) in the heat exchanger for damage; replace if necessary.

## Checking the condensate drain and cleaning the trap

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

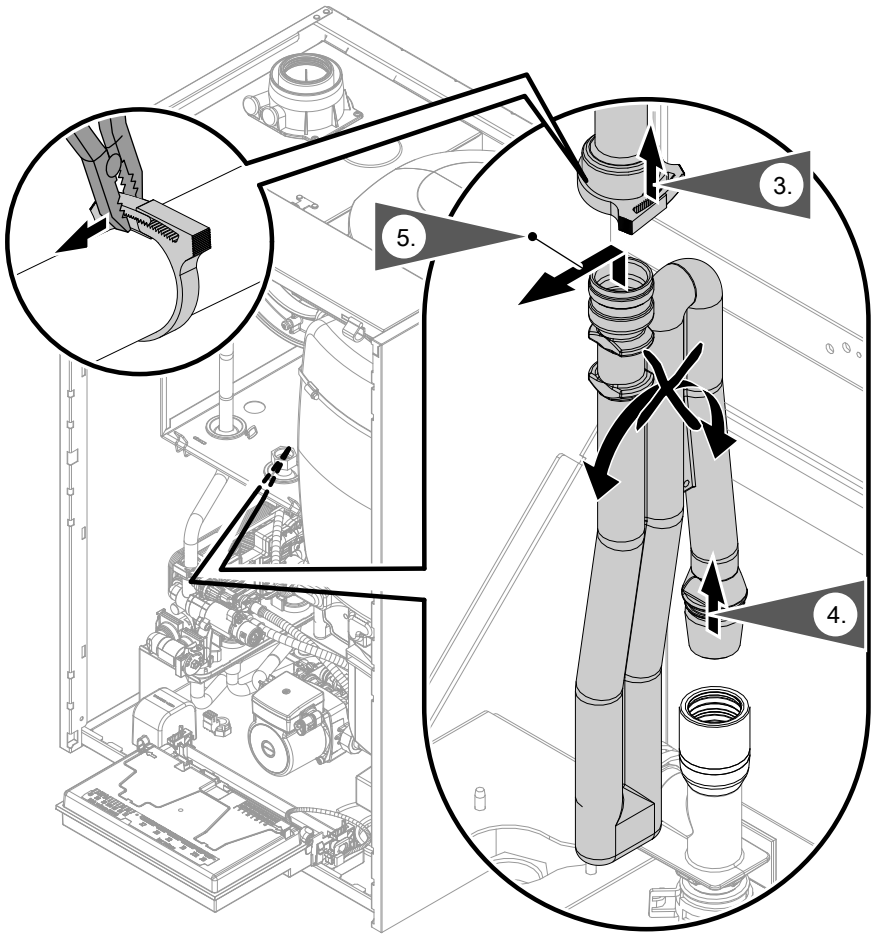


*Fig. 37*

1. Pivot the HBMU heat management unit forwards.
2. Cover electronic components with suitable watertight material.
3. Undo the hose clip. 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.

8. Reconnect the supply hose and secure in place with the hose clip. Check that connections on the trap and heat exchanger are seated correctly.

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

**9.** **Danger**
Risk of electric shock from escaping condensate and risk of poisoning from escaping flue gas.
Check the connections for leaks and check that the trap is seated correctly.

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

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

## Installing the burner

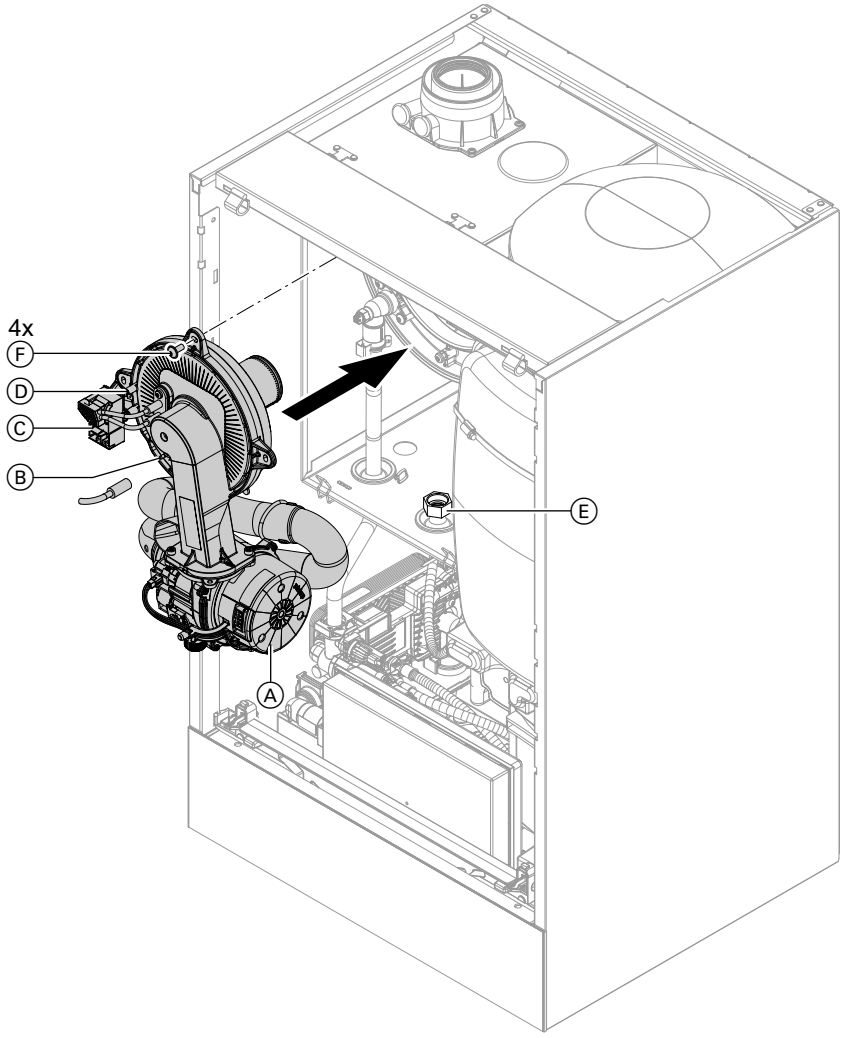


*Fig. 38*

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

## Installing the burner (cont.)

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

3. Check the gas connections for leaks.

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

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

## Checking the neutralising system (if installed)

## 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.

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 DHW expansion vessel (if installed) and pre-charge pressure

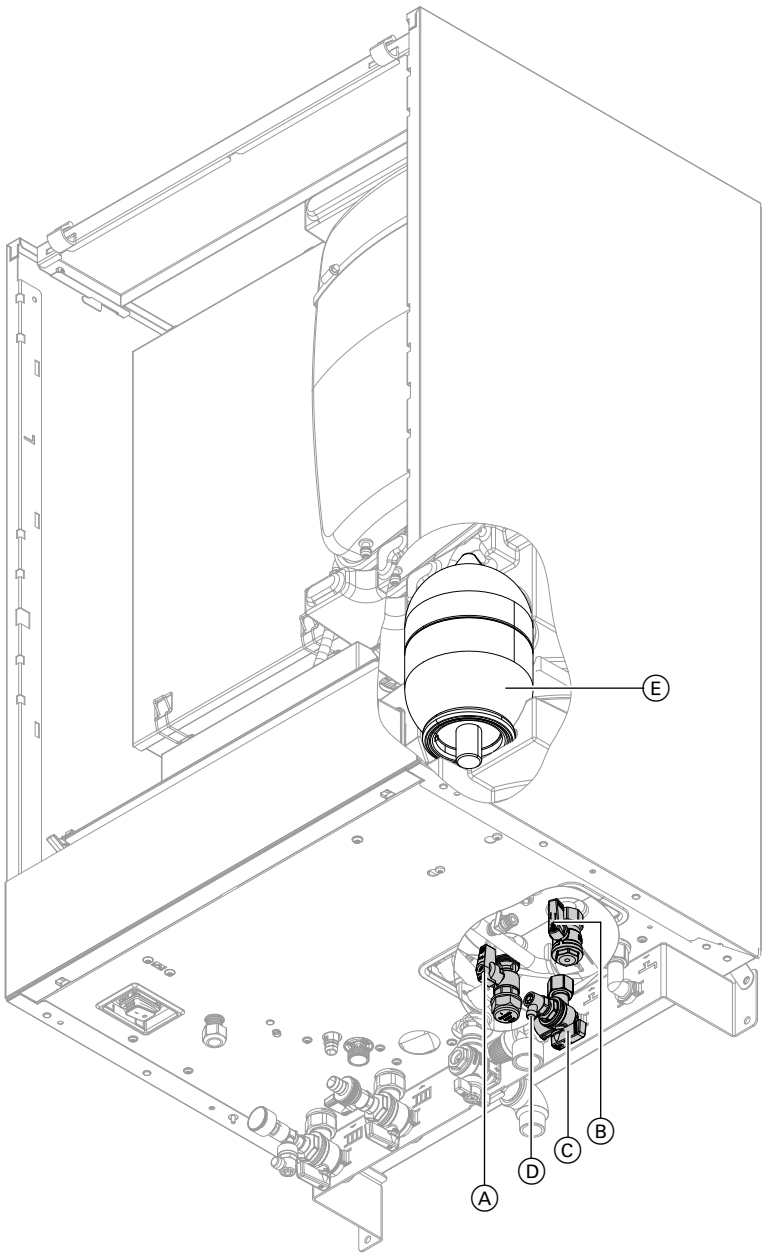


*Fig. 39*

1. Check the static pressure of the DHW line downstream of the pressure reducer and adjust if required. Set value: Max. 3.0 bar (0.3 MPa)
2. Close the on-site shut-off valve in the cold water line.
3. Turn levers on valves Ⓐ and Ⓑ to the "right-hand" position.
4. Close cold water supply Ⓒ.
5. Drain the pipe via air vent valve Ⓓ.
6. Check the pre-charge pressure of DHW expansion vessel Ⓔ and adjust if necessary. Set value: Static pressure minus 0.2 bar (20 kPa)
7. Return the levers of valves Ⓐ and Ⓑ to the "top" position. Open cold water supply Ⓒ and the on-site shut-off valve in the cold water line.

## Checking the safety valve function

## Checking the electrical connections for firm seating

## 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 33.

## Checking the combustion quality

The electronic combustion controller automatically ensures optimum combustion quality. During commissioning/maintenance, only the combustion values need to be checked. To do this, test the CO content and $CO_2$ or $O_2$ content, and record these in the report on page 138.

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

### Permissible CO content

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

### Permissible $CO_2$ or $O_2$ content

**Operation with natural gas**

| Rated heating output (kW) | $CO_2$ content (%) | | $O_2$ content (%) | |
|---|---|---|---|---|
| | Upper heating output | Lower heating output | Upper heating output | Lower heating output |
| 19 and 25 | 7.5 to 10.5 | 7.5 to 10.5 | 2.1 to 7.6 | 2.1 to 7.6 |
| 32 | 7.3 to 10.0 | 7.3 to 10.5 | 3.1 to 7.9 | 2.1 to 7.9 |

**Operation with LPG**

- $CO_2$ content: 8.4 to 11.8 %
- $O_2$ content: 3.1 to 8.1 %

If the actual CO, $CO_2$ or $O_2$ values lie outside their respective ranges, proceed as follows:
- Check the balanced flue system for leaks; see page 50.
- Check the ionisation electrode and connecting cable, see page 56.

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

## Checking the combustion quality (cont.)

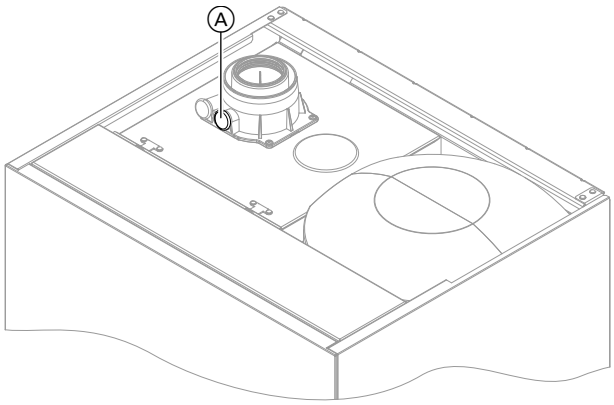


*Fig. 40*

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

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

### Regulating to the upper/lower heating output

***Note***
*Ensure adequate heat transfer.*

**Tap the following buttons:**

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

## Checking the flue system for unrestricted flow and leaks

## Checking the external LPG safety valve (if installed)

## 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

## Adjusting the heating curves

**Tap the following buttons:**

1. ☰
2. Use ∧/∨ to select **"P.3"** for heating curve.
3. **OK**
4. Use ∧/∨ to select **"HC1"** for "heating circuit 1" or **"HC2"** for "heating circuit 2".
5. **OK**
6. Use ∧/∨ to set the slope.
7. **OK**
8. Use ∧/∨ to set the level.
9. **OK** to confirm

## Instructing the system user

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

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

### DHW hygiene

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

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

## Calling up parameters

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

**Tap the following buttons:**

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

***Note***
*Further parameters can be called up via the software tool.*

## Parameter value

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

**1 Set flow temperature for external demand**
Parameter 528.0

| Setting | | Explanations |
|---|---|---|
| | | Set flow temperature for external demand |
| | **70** | Set flow temperature in the delivered condition 70 °C |
| | 20 to 82 | Set flow temperature adjustable from 20 to 82 °C in 1 °C increments |

**2 Primary pump operating mode**
Parameter 1240.0

| Setting | | Explanations |
|---|---|---|
| | **1** | "Automatic"<br>Switched on regardless of current temperature level |
| | 7 | Switched off in reduced mode (in conjunction with constant operation with time program) or if there is no demand via the room thermostat. |

## Parameter value (cont.)

**3 Scald protection**
Parameter 503.0

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

**4 Max. speed of speed-controlled primary/heating circuit pump in standard mode, heating circuit 1**
Parameter 1102.1

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

**5 Screed drying**
Parameter 897.0

| Setting | | Explanations |
|---|---|---|
| Not active | **0** | Screed drying can be set in accordance with selectable temperature/time profiles. For individual profile curves, see chapter "Function description". |
| Temperature profile A | 2 | |
| Temperature profile B | 3 | |
| Temperature profile C | 4 | |
| Temperature profile D | 5 | |
| Temperature profile E | 6 | |
| Temperature profile F | 7 | |

***Note***
*With the combi boiler (type B1KG), DHW heating is not possible during screed drying. With the system boiler (type B1HG with diverter valve) or storage combi boiler (types B1LG, B1TG, B1SG), DHW heating is suspended after 30 minutes for an hour (parameter 1087.1) in order to run the screed drying program.*

## Parameter value (cont.)

**6 Minimum heating output**
Parameter 1503.0

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

**7 Maximum heating output**
Parameter 596.0

| Setting | | Explanations |
|---|---|---|
| | | A limit can be set on the maximum heating output for heating mode. |
| | **100** | Heating output in the delivered condition 100 % |
| | 0 to 100 | Adjustable from 0 to 100 % (setting range limited by boiler-specific parameters) |

**8 Maximum flow temperature limit, heating circuit 1**
Parameter 1192.1

| Setting | | Explanations |
|---|---|---|
| | | Maximum flow temperature limit for the heating circuit |
| 82 °C | **82** | Maximum limit in the delivered condition 82 °C |
| | 20 to 82 | Setting range limited by heat generator-specific parameters |

**9 Operating mode, heating circuit 1**
Parameter 933.6

| Setting | | Explanations |
|---|---|---|
| | | Only adjust if there is just a single heating circuit in the system. |
| | **4** | Weather-compensated without room temperature influence |
| | 7 | Weather-compensated with room temperature influence: See also parameter 933.7; parameter 2426.7 is then automatically activated. |

**10 "Room influence factor, heating circuit 1"**
Parameter 933.7

| Setting | | Explanations |
|---|---|---|
| | | The higher the value, the greater the influence of the room temperature on the flow temperature of the heating circuit (heating curve). Operation with room temperature hook-up must be set for the heating circuit. Only change the value for systems with one heating circuit. For a sample calculation, see chapter "Heating curve" in the "Function description" |
| 8 | **8** | Maximum limit in the delivered condition |
| | 0 to 64 | Setting range |

## Parameter value (cont.)

### 11 Maximum flow temperature limit, heating circuit 2

Parameter 1193.1

| Setting | | Explanations |
|---|---|---|
| 82 °C | | Maximum flow temperature limit for the heating circuit |
| | **82** | Maximum limit in the delivered condition 82 °C |
| | 20 to 82 | Setting range limited by heat generator-specific parameters |

### 12 Operating mode heating circuit 2

Parameter 934.6

| Setting | | Explanations |
|---|---|---|
| | | Heating mode: |
| Weather-compensated without room temperature hook-up | **4** | Weather-compensated **without** room temperature influence |
| Weather-compensated with room temperature hook-up | 7 | Weather-compensated **with** room temperature influence<br>See parameter 934.7; parameter 2427.2 is then automatically activated. |

### 13 Room influence factor, heating circuit 2

Parameter 934.7

| Setting | | Explanations |
|---|---|---|
| | | The higher the value, the greater the influence of the room temperature on the flow temperature of the heating circuit (heating curve). Operation "with room temperature hook-up" must be set for the heating circuit. Only change the value for the heating circuit with mixer. For a sample calculation, see chapter "Heating curve" in the "Function description" |
| | **8** | Maximum limit in the delivered condition |
| | 0 to 64 | Setting range |

### 14 OpenTherm configuration

Parameter 2483.0

| Setting | | Explanations |
|---|---|---|
| | | ***Note***<br>*This setting depends on the OpenTherm device in order to correctly control DHW heating.* |
| | 0 | The heat generator ignores DHW demands via the OpenTherm interface (terminal 3) |
| | **1** | The heat generator follows DHW demands via the OpenTherm interface (terminal 3) |

## Further settings

Only possible via **"ViGuide"**. Parameters are marked with .

## Parameter value (cont.)

### 424.3 Set flow temperature increase, heating circuit 1

Set flow temperature increased when changing from operation at reduced room temperature to operation at standard room temperature or comfort room temperature, heating circuit 1.
See chapter "Function description"

| Value | Meaning |
|---|---|
| **0** | Delivered condition increase 0 K |
| 0 to 20 | Temperature increase adjustable from 0 to 20 K |

### 424.4 Duration for set flow temperature increase of heating circuit 1

Duration for set flow temperature increase, heating circuit 1
See chapter "Function description"

| Value | Meaning |
|---|---|
| **60** | Delivered condition 60 min |
| 0 to 120 | Temperature increase adjustable from 0 to 120 min |

### 426.3 Set flow temperature increase, heating circuit 2

Set flow temperature increased when changing from operation at reduced room temperature to operation at standard room temperature or comfort room temperature, heating circuit 2.
See chapter "Function description"

| Value | Meaning |
|---|---|
| **0** | Delivered condition increase 0 K |
| 0 to 20 | Temperature increase adjustable from 0 to 20 K |

### 426.4 Duration for set flow temperature increase of heating circuit 2

Duration for set flow temperature increase, heating circuit 2
See chapter "Function description"

| Value | Meaning |
|---|---|
| **60** | Delivered condition 60 min |
| 0 to 120 | Temperature increase adjustable from 0 to 120 min |

### 497.0 Operating mode of DHW circulation pump

DHW circulation pump

| Value | Meaning |
|---|---|
| **0** | The DHW circulation pump runs continuously within the time program during the set time phases. |
| 4 | The DHW circulation pump operates with the cycles set in **497.3**. |

### 497.1 DHW circulation pump for hygiene function

Operation of the DHW circulation pump while the function for increased DHW hygiene is active.

## Parameter value (cont.)

| Value | Meaning |
|---|---|
| **0** | The DHW circulation pump runs in accordance with the set time program, irrespective of the increased DHW hygiene function. |
| 1 | The DHW circulation pump is switched on every time the increased DHW hygiene function is activated, **irrespective** of the time program for the DHW circulation pump.<br>With this setting, the pipework can also be integrated into the increased DHW hygiene function. |

***Note***
*The respective operating status of the DHW circulation pump depends on the setting of parameters **497.0** to **497.3** and on the respective operating status of the system.*

⚠ **Danger**
There is a risk of scalding at DHW temperatures **above 60 °C**.
- Limit the temperature in the DHW flow to 60 °C by means of a mixer assembly, e.g. an automatic thermostatic mixing valve (DHW cylinder accessory).
- Switch on scald protection: Via the HMI programming unit or parameter **503.0**

### 497.2 DHW circulation pump for DHW heating

The DHW circulation pump is operated during cylinder heating.

| Value | Meaning |
|---|---|
| **0** | The DHW circulation pump is switched off during cylinder heating. |
| **1** | The DHW circulation pump runs in accordance with the setting in **497.0**, including during cylinder heating. |

***Note***
*The respective operating status of the DHW circulation pump depends on the setting of parameters **497.0** to **497.3** and on the respective operating status of the system.*

**Example:**
- Parameter **497.0** set to **0**.
- Parameter **497.2** set to **0**.
- A time phase is active in the time program for the DHW circulation pump.
- Cylinder heating is active.

The DHW circulation pump is operating in accordance with setting **497.0**.

### 497.3 Number of cycles DHW circulation pump

Within the time phase, the DHW circulation pump is switched on cyclically for 5 min at a time.

| Value | Meaning |
|---|---|
| 0 | 1 cycle per h |
| 1 | 2 cycles per h |
| 2 | 3 cycles per h |
| 3 | 4 cycles per h |
| 4 | 5 cycles per h |
| **5** | 6 cycles per h |

### 508.0 UTC time zone

Setting of the UTC time zone in which the appliance is located.

## Parameter value (cont.)

***Note***
*Only active if 1504.0 has been set to 2.*

| Value | Meaning |
|---|---|
| **2** | The factory setting is UTC +1 h |
| –24 to +24 | Time difference adjustable from –12 h to +12 h in 0.5 h increments |

### 522.3 Interval until next maintenance

Interval until the next maintenance

| Value | Meaning |
|---|---|
| **0** | No interval selected |
| 1 | 3 months |
| 2 | 6 months |
| 3 | 12 months |
| 4 | 18 months |
| 5 | 24 months |

### 534.0 Circulation pump run-on

Circulation pump run-on after cylinder heating

| Value | Meaning |
|---|---|
| **120** | Delivered condition 120 s run-on |
| 0 to 900 | Run-on time adjustable from 0 to 900 s in 60 s increments (the run-on time is rounded down to full minutes)<br><br>***Note***<br>*To avoid damaging the appliance, do not set the run-on time to < 120 s.* |

### 597.0 Limit, max. heating output for DHW heating

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

***Note***
*The setting range and minimum value depend on the boiler.*

| Value | Meaning |
|---|---|
| **100** | Heating output in the delivered condition 100 % |
| -- up to 100 | Adjustable from -- to 100 % |

### 896.0 Display correction for outside temperature

To compensate for systematic measuring faults, a correction value (offset) can be set for the outside temperature sensor.
The correction value can be positive or negative. The correction value is added to the current outside temperature measurement.

## Parameter value (cont.)

| Value | Meaning |
|---|---|
| **0** | No correction |
| –10 to +10 | Correction adjustable from –10 to +10 K |

### 912.0 Automatic summer/wintertime changeover

| Value | Meaning |
|---|---|
| 0 | No automatic summer/wintertime changeover |
| **1** | Automatic summer/wintertime changeover active |

### 912.1 Earliest day of changeover from winter to summertime

| Value | Meaning |
|---|---|
| **25** | Changeover from 02:00 to 03:00 occurs on the Sunday after or on this set date. |
| 1 to 31 | Day of changeover adjustable from 1st to 31st of the month |

### 912.2 Month of changeover from winter to summertime

| Value | Meaning |
|---|---|
| **3** | Month of changeover: March |
| 1 to 12 | Month of changeover adjustable from January to December |

### 912.3 Earliest day of changeover from summer to wintertime

| Value | Meaning |
|---|---|
| **25** | Changeover from 03:00 to 02:00 occurs on the Sunday after or on this set date. |
| 1 to 31 | Day of changeover adjustable from 1st to 31st of the month |

### 912.4 Month of changeover from summer to wintertime

| Value | Meaning |
|---|---|
| **10** | Month of changeover: October |
| 1 to 12 | Month of changeover adjustable from January to December |

### 933.3 DHW heating priority, heating circuit 1

Priority of DHW heating over the heating circuit.
To reduce the heat-up time, room heating can be interrupted during DHW heating. For this purpose, the heating circuit pump for heating circuit 1 is switched off.

| Value | Meaning |
|---|---|
| 0 | Without priority:<br>Simultaneous room heating and DHW heating possible (only if the DHW cylinder is installed downstream of the low loss header). |
| **1** | With priority:<br>▪ No room heating during DHW heating<br>▪ Heating circuit pump for heating circuit 1 is switched off for the duration of DHW heating. |

## Parameter value (cont.)

### 934.3 DHW heating priority, heating circuit 2

Priority of DHW heating over the heating circuit.
To reduce the heat-up time, room heating can be interrupted during DHW heating. For this purpose, the heating circuit pump for heating circuit 2 is switched off.

| Value | Meaning |
|---|---|
| 0 | Without priority:<br>Simultaneous room heating and DHW heating possible (only if the DHW cylinder is installed downstream of the low loss header). |
| **1** | With priority:<br>▪ No room heating during DHW heating<br>▪ Heating circuit pump for heating circuit 2 is switched off for the duration of DHW heating. |

### 934.5 Differential temperature, heating circuit 2

The flow temperature of the heat generator is higher than the flow temperature of the heating circuit with mixer by an adjustable differential temperature.
See chapter "Function description".

| Value | Meaning |
|---|---|
| **8** | Differential temperature in delivered condition 8 K. |
| 0 to 20 | Differential temperature adjustable from 0 to 20 K |

### 950.0 Flow rate, solar circuit at max. pump speed

Flow rate required for calculating the solar yield.

| Value | Meaning |
|---|---|
| **7** | Flow rate 7 l/min |
| 0.1 to 25.5 | Flow rate adjustable from 0.1 to 25.5 l/min<br>1 step ≙ 0.1 l/min |

### 1085.0 Cylinder heating: Set start point

The set value specifies at what temperature below the current set cylinder temperature DHW heating will start.

| Value | Meaning |
|---|---|
| **25** | Start point 2.5 K below the set cylinder temperature |
| 10 to 100 | Adjustable start points:<br>10: 1.0 K ...<br>100: 10.0 K<br><br>***Note***<br>*Stop point 2.5 K **above** the set cylinder temperature* |

### 1087.0 Max. duration, DHW heating

DHW heating stops after expiry of the set duration, irrespective of whether the set cylinder temperature has been reached.

## Parameter value (cont.)

***Note***
*Not adjustable on gas condensing combi boilers!*

***Note***
*The next DHW heating period starts after expiry of duration **1087.1** at the earliest.*

| Value | Meaning |
|---|---|
| **240** | Factory setting 240 min |
| 0 | No time limit for DHW heating |
| 1 to 240 | Duration of DHW heating adjustable from 1 to 240 min in 1 min increments |

### 1087.1 Min. delay until next time DHW is heated

The next DHW heating period starts at the earliest after expiry of the delay set here. In each case this delay starts after DHW heating has ended.

***Note***
*Function becomes effective when the set "Max. duration, DHW heating" (1087.0) is exceeded.*
*Cannot be set on gas condensing combi boilers*

| Value | Meaning |
|---|---|
| **60** | Delivered condition, delay of 60 min |
| 1 to 90 | Delay adjustable from 1 to 90 min in 1 min increments |

### 1098.4 Gas volume correction factor

Value is provided on the gas supplier's bill.
Used for energy consumption data.

| Value | Meaning |
|---|---|
| **1.0000** | |
| 0.7000 to 1.0000 | Gas volume correction factor adjustable from 0.7000 to 1.0000 in increments of 0.0001. |

### 1098.5 Calorific value

Value is provided on the gas supplier's bill.
Used for energy consumption data.

| Value | Meaning |
|---|---|
| **10** | Standard for natural gas. Data in kWh/$m^3$<br>If gas type is switched to LPG, the standard value switches to 10.45 |
| 5 to 40 | Calorific value adjustable from 5 to 40 kWh/$m^3$ in increments of 0.0001 |

### 1100.2 Set speed of the primary circuit pump in heating mode

Set speed of primary circuit pump
- In heating mode
- With external demand
- With demand in conjunction with a low loss header

## Parameter value (cont.)

| Value | Meaning |
|---|---|
| ... | Delivered condition specified by settings specific to the appliance |
| | Setting range depends on the appliance |

### 1101.2 Set speed of the primary circuit pump for DHW heating

Set speed of the internal circulation pump when operated as a circulation pump for cylinder heating

| Value | Meaning |
|---|---|
| ... | Delivered condition specified by settings specific to the appliance<br>Setting range depends on the appliance. |

### 1102.0 Min. speed of the variable speed primary circuit/heating circuit pump in standard mode, heating circuit 1

Minimum 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<br>Setting range depends on the appliance. |

### 1125.0 Maximum cylinder temperature for solar DHW heating

Maximum set cylinder temperature for solar DHW heating

**Danger**
High DHW temperatures can cause scalding.
- Use on-site measures if required. For example, install automatic thermostatic mixing valves in the DHW pipe.
- Inform the system operator.
- Mix with cold water at the draw-off points.

| Value | Explanations |
|---|---|
| **60** | Max. set cylinder temperature 60 °C |
| 10 to 90 | Max. set cylinder temperature adjustable from 10 to 90 °C |

### 1126.0 Minimum collector temperature

Minimum collector temperature for starting the solar circuit pump

| Value | Meaning |
|---|---|
| **10** | Minimum start temperature 10 °C |
| 0 | Minimum temperature limit disabled |
| 1 to 90 | Minimum start temperature adjustable from 1 to 90 °C |

### 1126.1 Maximum collector temperature

If the maximum collector temperature is exceeded, the solar circuit pump is shut down to protect the system components (emergency collector shutdown).

## Parameter value (cont.)

| Value | Meaning |
|---|---|
| **130** | Stop temperature 130 °C |
| 20 to 200 | Stop temperature adjustable from 20 to 200 °C |

### 1127.0 Frost protection function for solar circuit

Frost protection function for the solar circuit

| Value | Meaning |
|---|---|
| **0** | Off - not active |
| 1 | On - active<br>Not required for Viessmann heat transfer medium |

### 1136.2 Heat transfer medium solar circuit

Setting the heat transfer medium for calculating the solar yield

| Value | Meaning |
|---|---|
| 0 | Water as a heat transfer medium |
| **1** | Viessmann heat transfer medium |



### 1139.0 Outside temperature limit for cancelling reduced set room temperature

Temperature limit for cancelling set reduced room temperature

| Value | Meaning |
|---|---|
| **–5** | Temperature limit in the delivered condition –5 °C |
| –61 to +10 | Temperature limit adjustable from –61 to +10 °C in 1 °C increments |

### 1139.1 Outside temperature limit for raising the reduced set room temperature to the standard set room temperature

Temperature limit for raising the set reduced room temperature to the standard set room temperature (see "Function description")

| Value | Meaning |
|---|---|
| **–14** | Temperature limit in the delivered condition –14 °C |
| –60 to +10 | Temperature limit adjustable from –60 to +10 °C in 1 °C increments |

### 1192.0 Minimum flow temperature limit, heating circuit 1

Limiting of set flow temperature for heating operation via heating circuit 1

| Value | Meaning |
|---|---|
| **20** | Min flow temperature 20 °C |
| 5 to 82 | Setting range limited by parameters, depending on appliance version |

### 1193.0 Minimum flow temperature limit, heating circuit 2

Limiting of set flow temperature for heating operation via heating circuit 2

## Parameter value (cont.)

| Value | Meaning |
|---|---|
| **20** | Min flow temperature 20 °C |
| 5 to 82 | Setting range limited by parameters, depending on appliance version |

### 1394.0 Set DHW temperature for reheating suppression

Set cylinder temperature for reheating suppression
Above the selected set cylinder temperature, reheating suppression is active.

| Value | Meaning |
|---|---|
| **40** | Reheating suppression from set cylinder temperature of 40 °C |
| 0 to 95 | Set cylinder temperature adjustable from 0 to 95 °C |

### 1395.1 Heating limit: Economy function, outside temperature, heating circuit 1

The heating limit influences the start and stop behaviour of the heating circuit pump (economy control)
- If the outside temperature is 1 K greater than the selected value, the heating circuit pump switches off.
- If the outside temperature is 1 K smaller than the selected value, the heating circuit pump switches on.

| Value | Meaning |
|---|---|
| **25** | Heating limit at outside temperature 25 °C |
| 10 to 35 | Heating limit adjustable from 10 to 35 °C |

### 1396.1 Heating limit: Economy function, outside temperature, heating circuit 2

The heating limit influences the start and stop behaviour of the heating circuit pump (economy control)
- If the outside temperature is 1 K greater than the selected value, the heating circuit pump switches off.
- If the outside temperature is 1 K smaller than the selected value, the heating circuit pump switches on.

| Value | Meaning |
|---|---|
| **25** | Heating limit at outside temperature 25 °C |
| 10 to 35 | Heating limit adjustable from 10 to 35 °C |

### 1411.0 Clear maintenance messages

Clear maintenance messages if maintenance has been performed.

| Value | Meaning |
|---|---|
| **0** | Maintenance messages are active (if present). |
| 1 | Clear maintenance messages once. |

### 1492.0 Start temperature differential, solar circuit pump

Start temperature differential between actual cylinder temperature and actual collector temperature

| Value | Meaning |
|---|---|
| **8** | Start temperature differential 8 K |
| 2 to 30 | Start temperature differential adjustable from 2 to 30 K |

## Parameter value (cont.)

### 1492.1 Stop temperature differential, solar circuit pump

Stop temperature differential between actual cylinder temperature and actual collector temperature

| Value | Meaning |
|---|---|
| **4** | Stop temperature differential 4 K |
| 1 to 29 | Stop temperature differential adjustable from 1 to 29 K |

### 1504.0 Source for date and time

Selection of source for date and time
The setting depends on the heat generator and accessories.
Setting: Local

| Value | Meaning |
|---|---|
| **0** | Factory setting: The date and time are adopted from the control unit. |
| 2 | Internet protocol (see parameter "508.0") |

### 1505.0 Stagnation time reduction

Hysteresis for set cylinder temperature

***Note***
*To protect system components and heat transfer medium, the solar circuit pump speed is reduced at the same time.*

| Value | Explanations |
|---|---|
| **5** | Temperature differential 5 K |
| 0 | Stagnation time reduction not active |
| 1 to 40 | Temperature differential adjustable from 1 to 40 K |

### 1606.0 Minimum burner pause time

The minimum burner pause time can be set subject to boiler load.

| Value | Meaning |
|---|---|
| 0 | Fixed setting for minimum burner pause time |
| **1** | Delivered condition, integral method (see parameter 1606.4) |

### 1606.4 Burner integral threshold

Only effective if parameter 1606.0 is set to 1.

| Value | Meaning |
|---|---|
| **50** | Factory setting 50 K x min |
| 5 to 255 | Adjustable from 5 to 255 K x min<br>The higher the value, the later the burner switches off. |

## Parameter value (cont.)

### 1667.0 Pump switch-on, heating circuit pump 1 in standby mode

| Setting | | Explanations |
|---|---|---|
| | | Operating mode, heating circuit pump 1 |
| | **0** | In "Standby mode" = permanently switched off |
| | 1 to 24 | In "Standby mode" = switched on 1–24 times a day (in constant mode for 10 min each time; in weather-compensated mode for 50 min each time) |

### 1668.0 Pump switch-on, heating circuit pump 2 in standby mode

| Setting | | Explanations |
|---|---|---|
| | | Operating mode, heating circuit pump 2 |
| | **0** | In "Standby mode" = permanently switched off |
| | 1 to 24 | In "Standby mode" = switched on 1–24 times a day (in constant mode for 10 min each time; in weather-compensated mode for 50 min each time) |

### 1719.0 Interval function solar circuit pump

For capturing the collector temperature, the collector circuit pump is cyclically switched on briefly.

| Value | Meaning |
|---|---|
| **0** | Not active |
| 1 | Active |

### 2426.1 Weather-compensated heating circuit pump logic for heating circuit 1 (only for weather-compensated control units).

| Setting | | Explanations |
|---|---|---|
| | | If the outside temperature is above the threshold value (selected set room temperature plus hysteresis in K), the heating circuit pump is switched off.<br>If the outside temperature is below the threshold value (selected set room temperature plus hysteresis in K), the heating circuit pump is switched on. |

### 2426.2 Room temperature-dependent heating circuit pump logic on/off for heating circuit 1

Only for weather-compensated control unit with room temperature hook-up!
Only activate this function for the heating circuit with mixer or if there is only one direct heating circuit in the system.

| Value | Meaning |
|---|---|
| **0** | Off |
| **1** | On |

## Parameter value (cont.)

### 2426.3 Room temperature-dependent heating circuit pump logic for heating circuit 1 (only for weather-compensated control units with room temperature hook-up).

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

### 2427.1 Weather-compensated heating circuit pump logic for heating circuit 2 (only for weather-compensated control units).

| Setting | | Explanations |
|---|---|---|
| | | If the outside temperature is above the threshold value (the selected set room temperature plus the hysteresis in K), the heating circuit pump is switched off.<br>If the outside temperature is below the threshold value (selected set room temperature plus hysteresis in K), the heating circuit pump is switched on. |

### 2427.2 Room temperature-dependent heating circuit pump logic on/off for heating circuit 2

Only for weather-compensated control unit with room temperature hook-up!
Only activate this function for the heating circuit with mixer or if there is only one direct heating circuit in the system.

| Value | Meaning |
|---|---|
| **0** | Off |
| **1** | On |

### 2427.3 Room temperature-dependent heating circuit pump logic for heating circuit 2 (only for weather-compensated control units with room temperature hook-up).

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

## Subscriber numbers of connected extensions

All extensions connected to the heat generator (except the SDIO/SM1A electronics module) must have a subscriber number. The subscriber number is set on rotary switch S1 at each extension.
Observe maximum number of PlusBus subscribers, see note in chapter "Connection".

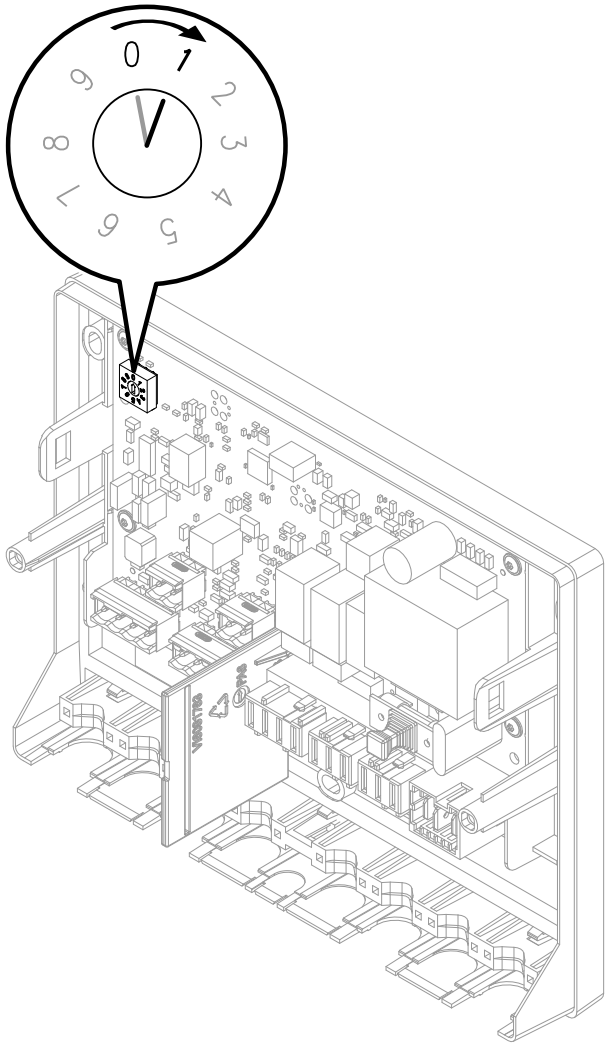


*Fig. 41*

Rotary switch S1 settings:
- EM-S1 extension (system with solar collectors): **0**
- EM-EA1 extension (max. 1 extensions in one system)
  ***Note***
  *On the EM-EA1 extension, select 1 if the "External heating circuit hook-up" function is being set for more than one heating circuit.*
- EM-P1 extension
  - If no heating circuits with mixer are available in the system: **1**
  - If heating circuits with mixer (EM-M1 or EM-MX extensions) are present in the system: Always set subscriber number for EM-P1 extension to the consecutive number after EM-M1 or EM-MX extensions.
- EM-M1 or EM-MX extensions
  - Heating circuit 2 with mixer: Rotary switch on extension kit to 1

***Note***
*EM-EA1 extensions may have the same subscriber number as the EM-P1, EM-M1 or EM-MX extensions. The following table shows an **example** of how a system may be equipped.*

| Function | Electronics module | Extension | Setting Rotary switch S1 |
|---|---|---|---|
| System with solar collectors | ADIO | EM-S1 | **0** |
| Heating circuit 2 with mixer | ADIO | EM-M1/EM-MX | **1** |
| Heating circuit 1 without mixer or DHW circulation pump (circulation pump downstream of low loss header) | ADIO | EM-P1 | **2** |
| Function extensions (e.g.):<br>▪ Fault message input<br>▪ Fault message output<br>▪ Operating mode changeover<br>▪ External heating circuit hook-up (for more than one heating circuit) | DIO | EM-EA1 | **1** |

## Subscriber numbers of connected extensions (cont.)

***Note***
*A maximum of one Vitotrol 200-E can be connected*
*Solar module not compatible with all appliance versions.*

## Service menu

### Calling up the service menu

**Tap the following buttons:**

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

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

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

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

**Service menu overview**

| Service | | | |
|---|---|---|---|
| Er Active messages | | | |
| b.1 Connect with software tool | | | |
| b.2 System configuration | | | |
| b.3 Diagnostics | | | |
| | d.1 Outside temperature | | |
| | d.2 Heat generator flow temperature | | |
| | d.3 Primary circuit pump speed % | | |
| | d.4 Flue gas temperature | | |
| | d.5 Burner hours run | | |
| | d.6 Burner output | | |
| | d.7 3-way valve position | | |
| | | 0 = Heating | |
| | | 1 = Middle position (if installed) | |
| | | 2 = DHW | |
| | d.8 Serial number of heat generator | | |
| | d.9 Heating circuit 1 flow temperature | | |
| | d.10 Heating circuit 2 flow temperature | | |
| | d.11 DHW temperature | | |
| b.4 Message history | | | |
| b.5 Commissioning assistant | | | |
| b.6 Start upper/lower heating output for trade fair mode | | | |
| b.7 Configure the maintenance interval | | | |
| b.8 Reset the maintenance interval | | | |

### Exiting the service menu

**Tap the following buttons:**

"☰" and **"OK"** simultaneously for 4 s.

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

## Diagnosis

### Checking operating data

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

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

### Calling up operating data

**Tap the following buttons:**

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

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

### b.7

**Configuring the maintenance interval**

**Tap the following buttons:**

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.7"** for configuring the maintenance interval.
3. **OK**
4. Use ∧/∨ to set the required value:
   0 = OFF
   1 = 3 months
   2 = 6 months
   3 = 12 months
   4 = 18 months
   5 = 24 months
5. **OK**

### b.8

**Reset service interval**

**Tap the following buttons:**

1. ☰ and **OK** simultaneously for approx. 4 s, then release.
2. Use ∧/∨ to select **"b.8"** for resetting the maintenance interval.
3. **OK**
4. Use ∧/∨ to set the required value:
   **"NO"**
   **"YES"**
5. **OK**





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## Fault display on the programming unit

The display shows **"⚠"** in the event of a fault.

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

**Calling up fault messages**

**Tap the following buttons:**

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

**Acknowledging the fault display**

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

**Calling up acknowledged fault messages**

**Tap the following buttons:**

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

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

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

**Tap the following buttons:**

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

## Overview of electronics modules

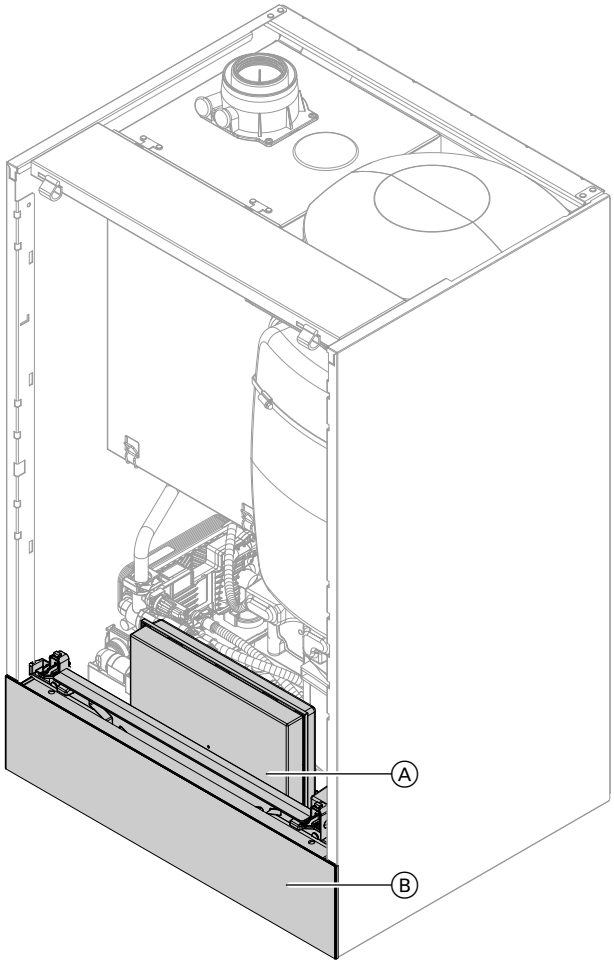


*Fig. 42*

Ⓐ HBMU heat management unit
Ⓑ Programming unit



## Resetting the burner

The display shows and flashes.
The burner is locked 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 simultaneously.*
*A reset is only possible after the burner has cooled down.*

**Tap the following buttons:**

1. to display the fault number.
2. 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.

## Fault messages

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

### 7

**System characteristics**

No DHW heating

**Cause**

Lead break, cylinder temperature sensor

**Measures**

- Check the settings for DHW in the commissioning assistant. Correct if necessary.
- Check the cylinder temperature sensor (terminal 2).
- Measure the voltage at the sensor input on the HBMU heat management unit. Set value: 3.3 V⎓ with sensor disconnected.

Replace faulty component if necessary.

### 8

**System characteristics**

No DHW heating

**Cause**

Short circuit, cylinder temperature sensor

**Measures**

Check the cylinder temperature sensor (terminal 2).
Replace faulty component if required.

### 11

**System characteristics**

No solar DHW heating or central heating backup

**Cause**

Lead break, collector temperature sensor

**Measures**

- Check collector temperature sensor.
- Measure voltage at sensor input on electronics module (ADIO). Set value: 3.3 V⎓ with sensor disconnected.

### 12

**System characteristics**

No solar DHW heating

**Cause**

Short circuit, collector temperature sensor

**Measures**

- Check collector temperature sensor.
- Measure voltage at sensor input on electronics module (ADIO). Set value: 3.3 V⎓ with sensor disconnected.

### 13

**System characteristics**

Controls as if the outside temperature were 0 °C

**Cause**

Lead break, outside temperature sensor

## Fault messages (cont.)

**Measures**

- Check operating mode setting in commissioning assistant and remedy if necessary.
- Check outside temperature sensor and connection to sensor (terminal 4).
- Measure the voltage at the sensor input on the HBMU heat management unit. Set value: 3.3 V⎓ with sensor disconnected.

Replace faulty component if required.

**14**

**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 (terminal 4). Replace faulty components if necessary.

**15**

**System characteristics**

No solar DHW heating

**Cause**

Lead break, solar cylinder temperature sensor (bottom)

**Measures**

Check cylinder temperature sensor.
Measure voltage at sensor input on ADIO electronics module. Set value: 3.3 V⎓ with sensor disconnected.

**16**

**System characteristics**

No solar DHW heating

**Cause**

Short circuit, solar cylinder temperature sensor (bottom)

**Measures**

Check cylinder temperature sensor.
Measure voltage at sensor input on ADIO electronics module. Set value: 3.3 V⎓ with sensor disconnected.

**29**

**System characteristics**

Regulates without flow temperature sensor for low loss header.

**Cause**

Lead break, low loss header sensor

**Measures**

- Check commissioning assistant setting, low loss header.
- Check flow temperature sensor, low loss header.
- Measure voltage at sensor input on electronics module. Set value: 3.3 V⎓ with sensor disconnected.

## Fault messages (cont.)

### 30

**System characteristics**

Regulates without flow temperature sensor for low loss header.

**Cause**

Short circuit, low loss header sensor

**Measures**

Check flow temperature sensor, low loss header.
Measure voltage at sensor input on electronics module. Set value: 3.3 V⎓ with sensor disconnected

### 49

**System characteristics**

Burner in a fault state

**Cause**

Lead break, flue gas temperature sensor

**Measures**

Check flue gas temperature sensor.
Reset the appliance.

### 50

**System characteristics**

Burner in a fault state

**Cause**

Short circuit, flue gas temperature sensor

**Measures**

Check flue gas temperature sensor.
Reset the appliance.

### 57

**System characteristics**

Normal operation without room influence

**Cause**

Lead break, room temperature sensor

**Measures**

- Check commissioning setting of remote control.
- Check plug and cable of external room temperature sensor, heating circuit.
- If no external room temperature sensor installed, replace Vitotrol programming unit.

### 58

**System characteristics**

Normal operation without room influence

**Cause**

Short circuit, room temperature sensor

**Measures**

Check plug and cable of external room temperature sensor, heating circuit.
If no external room temperature sensor installed, replace Vitotrol programming unit.

### 59

**System characteristics**

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

**Cause**

Undervoltage, HBMU heat management unit

## Fault messages (cont.)

**Measures**

Check mains voltage.

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

**62**

**System characteristics**

Burner in a fault state

**Cause**

High limit safety cut-out 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.

**63**

**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.

**64**

**System characteristics**

Normal operation; burner restarts.

**Cause**

Flame loss during stabilisation or operating phase

**Measures**

- Check gas supply (gas pressure and gas flow switch).
- Check balanced flue system for flue gas recirculation.
- Check the ionisation electrode or ignition/monitoring electrode (replace if necessary).
- Check the distance of the electrode to the burner gauze assembly and its contamination level.

**65**

**System characteristics**

Burner in a fault state

**Cause**

Flame signal not present or insufficient at burner start

## Fault messages (cont.)

**Measures**

- Check gas supply (gas pressure and gas flow switch).
- Check gas solenoid valve.
- Check the system for condensate backup; check the condensate drain.
  ***Note***
  *Prevent water damage.*

Detach fan unit before removing the burner.
Check the ionisation electrode or ignition/monitoring electrode and the connecting cable. Check the ignition. Connecting cables to ignition module and ignition electrode. Ignition electrode for distance and contamination: See also chapter "Checking and adjusting the ignition and ionisation electrodes". Check whether the ceramic of the ignition electrode is broken.
Reset the appliance.

---

**67**

**System characteristics**

Burner in a fault state

**Cause**

Ionisation current lies outside the permissible range

**Measures**

Check gas supply (gas pressure and gas flow switch), check gas solenoid valve and inlet strainer.

Check the ionisation electrode or ignition/monitoring electrode:

- Distance to burner gauze assembly.
- Check electrode/burner gauze assembly for contamination.

If specified measures don't help, replace fan unit.
Reset the appliance.

---

**68**

**System characteristics**

Burner in a fault state

**Cause**

Flame signal is already present at burner start.

**Measures**

Close the gas shut-off valve. Remove connecting cable of the ionisation electrode. Reset the appliance. If the fault persists, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

---

**69**

**System characteristics**

Burner in a fault state

**Cause**

Ionisation current lies outside the permissible range

**Measures**

Check the ionisation electrode or ignition/monitoring electrode:

- Check whether the thermal insulation ring is touching the electrode ceramic.
- Check gas solenoid valve: In the service menu under "b.6", set the burner output to the lower heating output for approx. 4 min. If the fault occurs, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
- In the service menu under "b.6", switch the burner output from the lower to the upper heating output. If this fault occurs during modulation, check the intake screen for contamination. Replace the fan unit if necessary.

## Fault messages (cont.)

**70**

**System characteristics**

Burner in a fault state

**Cause**

HBMU heat management unit internal fault

**Measures**

Replacing the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

**71**

**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.

**72**

**System characteristics**

Burner in a fault state

**Cause**

Fan idle state not reached

**Measures**

- Reset the appliance.
- If the fault occurs repeatedly, replace the fan unit.

**73**

**System characteristics**

Burner in a fault state

**Cause**

Internal communication error

**Measures**

Reset the appliance.
If the fault re-occurs, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

**74**

**System characteristics**

Burner locked out.
Internal circulation pump off. No central heating and no DHW heating.

**Cause**

System pressure too low

**Measures**

Top up with water.

Vent the system.

If the fault occurs repeatedly:
- Check system pressure sensor with external pressure gauge.
- Check diaphragm expansion vessel pre-charge pressure.
- Check settings for set system pressure and range.

## Fault messages (cont.)

### 75

**System characteristics**

System in a fault state

**Cause**

No flow rate

**Measures**

Top up with water.

Vent the system.

If the fault occurs repeatedly:
- Check/open the BDF valves.
- Check/replace the flow sensor (if installed).
- Check/replace the circulation pump.

### 77

**System characteristics**

Burner in a fault state

**Cause**

HBMU heat management unit data memory

**Measures**

Reset the appliance. Reset the parameters of the heat management unit.
If the fault re-occurs, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

### 78

**System characteristics**

Normal operation

**Cause**

No communication between heat management unit and programming unit

**Measures**

Check cables and plug-in connections between central control unit and programming unit.
Check that the cables are correctly routed and positioned.

### 87

**System characteristics**

Burner locked out. Internal pump off. No central heating and no DHW heating.

**Cause**

System pressure too high

**Measures**

Check the system pressure and correct if necessary.
Check pre-charge pressure of diaphragm expansion vessel. Check whether BDF valves are open.
Check the system pressure sensor with an external pressure gauge.

### 89

**System characteristics**

No central heating and no DHW heating

**Cause**

Internal circulation pump blocked.

**Measures**

Check circulation pump. Replace if necessary.

## Fault messages (cont.)

### 91

**System characteristics**

Function of affected extension in emergency mode

**Cause**

DIO electronics module communication error

**Measures**

Check connections to DIO electronics module and connection to HBMU heat management unit.

### 92

**System characteristics**

Function of the relevant electronics module in emergency mode

**Cause**

ADIO electronics module communication error

**Measures**

- Check setting in the commissioning assistant and correct if required.
- Check connections and leads to the ADIO electronics module.
- Check PlusBus voltage level (24 to 28 V).
- Check subscriber number on rotary switch S1 and correct if required.

### 95

**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 C.7 in the commissioning assistant to a value not equal to 14.

### 100

**System characteristics**

Electronics modules connected to PlusBus not functioning

**Cause**

PlusBus voltage error

**Measures**

Check whether the PlusBus power supply on the HBMU heat management unit is OK: Remove all connected PlusBus components and reconnect one by one.
Check that no more than 1 Vitotrol 200-E is connected to the HBMU.
Check whether there is a short circuit at the PlusBus cable.

### 102

**System characteristics**

No internet connection

**Cause**

Error with communication module

**Measures**

Check cables and plug-in connections between heat management unit and communication module.

## Fault messages (cont.)

### 103

**System characteristics**

Normal operation

**Cause**

Internal communication error, programming unit

**Measures**

Check cables and plug-in connections between heat management unit and HMI programming unit.

### 104

**System characteristics**

Depending on configuration of EM-EA1 extension (DIO electronics module)

**Cause**

External fault message input active

**Measures**

Check connected external device.

### 142

**System characteristics**

Burner in a fault state

**Cause**

Communication restriction on CAN bus.

**Measures**

Check the fan unit for correct function. For this, check the stepper motor of the fan unit (reference run with mains ON).
If the fault persists, check the plug-in connections and cables of the CAN bus.
Check further CAN bus subscribers. If fault occurs repeatedly, replace fan unit.

### 161

**System characteristics**

Burner in a fault state

**Cause**

HBMU heat management unit data memory access fault

**Measures**

Reset the appliance.
If the fault re-occurs, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

### 162

**System characteristics**

Burner in a fault state

**Cause**

Undervoltage, HBMU heat management unit

**Measures**

Reset the appliance.
If the fault re-occurs, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

## Fault messages (cont.)

### 163

**System characteristics**

Burner in a fault state

**Cause**

Checksum error, data memory access, HBMU heat management unit

**Measures**

Reset the appliance.
If the fault re-occurs, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

### 176

**System characteristics**

Burner in a fault state

**Cause**

Condensate backup in the heat cell

**Measures**

Remove condensate backup.

Replace the thermal insulation ring, thermal insulation block, electrodes and burner gauze assembly.

***Note***
*Remove the fan unit before opening the burner. Protect the PCB from water damage.*

### 182

**System characteristics**

No DHW heating

**Cause**

Short circuit, outlet temperature sensor (if installed)

**Measures**

Check outlet temperature sensor (plug X7, cores 3 and 4). Measure sensor input on HBMU heat management unit. Set value: 3.3 V⎓ with sensor disconnected.

### 183

**System characteristics**

No DHW heating

**Cause**

Lead break, outlet temperature sensor (if installed)

**Measures**

Check outlet temperature sensor (plug X7, cores 3 and 4).

### 184

**System characteristics**

Burner in a fault state

**Cause**

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

**Measures**

Check the flow temperature sensor/high limit safety cut-out.
Check sensor lead. Replace faulty component if required.
Reset the appliance.

## Fault messages (cont.)

### 185

**System characteristics**

Burner in a fault state

**Cause**

Lead break, flow temperature sensor/high limit safety cut-out

**Measures**

Check the flow temperature sensor/high limit safety cut-out. Replace faulty component if required.
Reset the appliance.

### 299

**System characteristics**

Date/time wrong

**Cause**

Real-time clock fault

**Measures**

Check the date and time; amend if necessary.

### 345

**System characteristics**

Burner locked out, automatic enabling after appliance cooldown. Independent restart

**Cause**

Temperature limiter has responded.

**Measures**

- Ensure adequate heat transfer.
- Check heating system fill level.
- Check pre-charge pressure in diaphragm expansion vessel. Adjust to required system pressure.
- Check whether flow rate is sufficient (circulation pump).
- Check function of 3-way diverter valve. Vent the system.

If the fault occurs during DHW heating: Check DHW cylinder or plate heat exchanger for contamination and scaling.

### 346

**System characteristics**

Burner in a fault state

**Cause**

Ionisation current calibration error

**Measures**

- Check the gas supply pressure.
- Check gas solenoid valve strainer on the inlet side for contamination.
- Check the ionisation electrode or ignition/monitoring electrode for dirt.
- Check flue system. Remove flue gas recirculation if required.
- Check the condensate drain (condensate blockage).

Reset the appliance.

## Fault messages (cont.)

### 347

**System characteristics**

Burner in a fault state

**Cause**

Flue gas recirculation

**Measures**

- Check the flue system for leaks; remedy if necessary.
- Check the flue system for flue gas back pressure, e.g. caused by an insufficient fall in the flue system, constrictions or blockages. Rectify if necessary.

Reset the appliance.

### 348

**System characteristics**

Burner in a fault state

**Cause**

Gas modulation valve

**Measures**

If several heat generators are connected to a common flue system: Check whether **"Multiple connections"** is set in the commissioning assistant.
Check the flue system for unrestricted flow.
If fault remains, replace gas fan unit.

### 349

**System characteristics**

Burner in a fault state

**Cause**

Air mass flow rate in fan unit is not detected correctly.

**Measures**

- Check for dust contamination in the supply air.
- Check burner gauze assembly for contamination.

Reset the appliance. If the fault occurs repeatedly, replace the gas fan unit.

### 350, 351

**System characteristics**

Burner in a fault state

**Cause**

Ionisation current lies outside the permissible range

**Measures**

Replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

### 352

**System characteristics**

Burner in a fault state

**Cause**

Combustion CO limit exceeded

**Measures**

Check entire flue gas path for the following:
- Leaks
- Flue gas back pressure caused by water pocket (if flue system fall is insufficient).
- Constrictions
- Blockages

Repair flue system if necessary.
Reset the appliance.

## Fault messages (cont.)

### 353

**System characteristics**

Shutdown with restart if demand exists

**Cause**

Insufficient gas supply, burner output reduced

**Measures**

Check the gas supply.
Optically check input-side screen in the gas solenoid valve for contamination.
Reset the appliance.

### 354

**System characteristics**

Burner in a fault state

**Cause**

Gas modulation valve tolerance outside permissible range

**Measures**

Replace gas fan unit.

### 355

**System characteristics**

Burner in a fault state.

**Cause**

Condensate backed up or analogue signal reference check: Flame signal is already present at burner start. Function of ignition transformer.

**Measures**

If condensate is backed up: Replace the thermal insulation ring, thermal insulation block, electrodes and burner gauze assembly.

***Note***
*Remove the fan unit before opening the burner. Protect the PCB from water damage.*

Replace the HBMU heat management unit.
Check ignition transformer and ignition cable. Replace if necessary.

### 357

**System characteristics**

Burner in a fault state

**Cause**

Insufficient gas supply

**Measures**

- Check that the main gas valve and the gas shut-off valve are open.
- Test static gas pressure and gas flow pressure.
- Check that on-site gas line and gas flow switch are correctly sized.
  ***Note***
  *If the building pressure regulator has a leak, you may notice rising pressure when the burner is idle. When the system is restarted, the gas flow switch may trip.*
- If the static pressure does not drop, check the cable to the fan unit. Check that the coil resistance at the fuel valve is approx. 4 kΩ.
- Check the ignition electrode for damaged insulation.

Reset the appliance.

## Fault messages (cont.)

### 359

**System characteristics**

Burner in a fault state

**Cause**

No ignition spark

**Measures**

- Check whether the ignition electrode insulation is damaged.
- Check for a voltage of 230 V~ at the ignition module during the ignition phase. If not, replace the HBMU heat management unit.
- If 230 V~ is present at the ignition module but there is still a fault, replace the ignition module.
- Check connection cables and leads from ignition module and ignition electrode.

Reset the appliance.

### 361

**System characteristics**

Burner in a fault state

**Cause**

Flame signal is not present or insufficient at burner start.

**Measures**

Check the ionisation electrode or ignition/monitoring electrode and the connecting cable. Check plug-in connections for loose contacts.

***Note***
*Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits, e.g. laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).*

Reset the appliance.

### 364

**System characteristics**

Burner in a fault state

**Cause**

System fault

**Measures**

Fault 364 always occurs in conjunction with one of the following faults:

- 67
- 348
- 349

If fault 364 persists, replace the HBMU.

### 365

**System characteristics**

Burner in a fault state

**Cause**

Feedback from gas valve relay contact implausible (relay contact is "welded up").

**Measures**

Replace the HBMU heat management unit.

## Fault messages (cont.)

### 366, 367

**System characteristics**

Burner in a fault state

**Cause**

Gas valve electricity supply does not turn off.

**Measures**

Replacing the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

### 368

**System characteristics**

Burner locked out

**Cause**

Gas pressure switch fault. Forced ventilation time expired.

**Measures**

- Check gas supply (gas pressure).
- If installed: Check gas pressure switch for correct function. If necessary, disconnect the gas pressure switch and check whether the burner starts.

### 369

**System characteristics**

Burner in a fault state

**Cause**

Flame is lost immediately after flame formation (during safety time)

**Measures**

Check gas supply (gas pressure and gas flow switch).

Check balanced flue system for flue gas recirculation.

Check the ionisation electrode or ignition/monitoring electrode:
- Clearance to burner gauze assembly.
- Contamination on electrode.

Reset the appliance.

### 370

**System characteristics**

Burner in a fault state.

**Cause**

Fuel valve or modulation valve will not close.

**Measures**

Reset the appliance.
If the fault recurs, replace the HBMU heat management unit.

### 371

**System characteristics**

Burner in a fault state

**Cause**

Fan speed too low

**Measures**

Check the fan.
Check the fan connecting cables.
Check the fan power supply.
Reset the appliance.

## Fault messages (cont.)

### 372

**System characteristics**

Burner in a fault state

**Cause**

Repeated flame loss during calibration

**Measures**

- Check the ionisation electrode or ignition/monitoring electrode and the connecting cable.
- Check plug-in connections for loose contacts.
- Check flue system. Remove flue gas recirculation if required.
- Check system for condensate backup.
- Visually inspect gas solenoid valve inlet and strainer on the inlet side for contamination.

***Note***
*To prevent water damage, detach fan unit before removing the burner. Deposits on the electrodes indicate foreign bodies in the combustion air.*

Check the installation room and flue system for causes of the deposits, e.g. laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney). If the burner gauze assembly and ionisation electrode or ignition/monitoring electrode have been replaced, also clean the fan unit, gas/air channel and Venturi extension.
Reset the appliance.

### 373

**System characteristics**

Burner in a fault state

**Cause**

Heat transfer too low during calibration
Temperature limiter has shut down.

**Measures**

- Ensure adequate heat transfer.
- Check circulation pump for faults, scale or blockages.
- Check function of 3-way diverter valve. Vent the system.
- Check function of flow sensor.

Reset the appliance.

### 374

**System characteristics**

Burner restarts.

**Cause**

Preparation for calibration of ionisation current:
Stabilisation conditions for pre-calibration not met.

**Measures**

- Check the ionisation electrode or ignition/monitoring electrode and the connecting cable.
- Check plug-in connections for loose contacts.
- Check flue system; remove flue gas recirculation if necessary.
- Check system for condensate backup.
- Visually inspect gas solenoid valve inlet and inlet strainer for contamination.

***Note***
*To prevent water damage, detach fan unit before removing the burner.*
*Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits, e.g. laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney). If the burner gauze assembly and ionisation electrode or ignition/monitoring electrode have been replaced, also clean the fan unit, gas/air channel and Venturi extension.*

Reset the appliance.

### 375

**System characteristics**

Burner restarts.

## Fault messages (cont.)

**Cause**

Performing ionisation current calibration: Calibration not performed.
Minimum value or termination criterion not reached.

**Measures**

- Check the ionisation electrode or ignition/monitoring electrode and the connecting cable.
- Check plug-in connections for loose contacts.
- Check flue system; remove flue gas recirculation if necessary.
- Check system for condensate backup.
- Visually inspect gas solenoid valve inlet and inlet strainer for contamination.

***Note***
*To prevent water damage, detach fan unit before removing the burner.*
*Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits, e.g. laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney). If the burner gauze assembly and ionisation electrode or ignition/monitoring electrode have been replaced, also clean the fan unit, gas/air channel and Venturi extension.*

Reset the appliance.

### 376

**System characteristics**

Burner restarts.

**Cause**

Ionisation current differential compared to previous value not plausible

**Measures**

- Check the ionisation electrode or ignition/monitoring electrode and the connecting cable.
- Check plug-in connections for loose contacts.
- Check flue system; remove flue gas recirculation if necessary.
- Check system for condensate backup.
- Visually inspect gas solenoid valve inlet and inlet strainer for contamination.

***Note***
*To prevent water damage, detach fan unit before removing the burner.*
*Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits, e.g. laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney). If the burner gauze assembly and ionisation electrode or ignition/monitoring electrode have been replaced, also clean the fan unit, gas/air channel and Venturi extension.*

Reset the appliance.

### 377

**System characteristics**

Burner in a fault state

**Cause**

Post-processing of ionisation current calibration: Stabilisation conditions for post-calibration not met.

**Measures**

Check gas type setting. If the fault occurs repeatedly, replace the HBMU heat management unit. See chapter "Replacing the HBMU heat management unit".
Reset the appliance.

### 378

**System characteristics**

Burner in a fault state

**Cause**

Flame loss during stabilisation or operating phase

**Measures**

- Check gas supply (gas pressure and gas flow switch).
- Check flue gas recirculation.
- Check for dirt on the ionisation electrode or ignition/monitoring electrode and the burner gauze assembly.

## Fault messages (cont.)

Reset the appliance.

### 379

**System characteristics**

Burner in a fault state

**Cause**

Flame signal not present or insufficient

**Measures**

- Check the connecting cable of the ionisation electrode or ignition/monitoring electrode for damage and firm seating.
- Check the ionisation electrode or ignition/monitoring electrode; replace if necessary.

Reset the appliance.

### 380

**System characteristics**

Burner in a fault state

**Cause**

Flame is lost immediately after flame formation (during safety time)

**Measures**

Check gas supply (gas pressure and gas flow switch).

Check balanced flue system for flue gas recirculation.

Check the ionisation electrode or ignition/monitoring electrode and the burner gauze assembly:
- Distance to burner gauze assembly.
- Contamination on electrode.

Reset the appliance.

### 381

**System characteristics**

Burner in a fault state

**Cause**

Flame loss during operating phase

**Measures**

Check gas supply (gas pressure and gas flow switch).

Check balanced flue system for flue gas recirculation.

Check the ionisation electrode or ignition/monitoring electrode and the burner gauze assembly:
- Clearance to burner gauze assembly.
- Contamination on electrode.

Reset the appliance.

### 382

**System characteristics**

Burner in a fault state

**Cause**

Fault counter has exceeded limit.

**Measures**

Reset the appliance. Work through fault analysis using fault history.

### 383, 384

**System characteristics**

Burner in a fault state

**Cause**

Possible contamination of gas line

## Fault messages (cont.)

**Measures**

Reset the appliance.

- Check gas line for contamination.
- Check the gas supply pressure.
- Replace gas fan if required.

### 385

**System characteristics**

Burner in a fault state

**Cause**

Short circuit, signal 1, ionisation current
HBMU heat management unit faulty.

**Measures**

Check the ionisation electrode or ignition/monitoring electrode for an earth fault. If the fault persists, replace the HBMU heat management unit.
Reset the appliance.

### 386

**System characteristics**

Burner in a fault state

**Cause**

HBMU heat management unit faulty.

**Measures**

Replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".
Reset the appliance.

### 387

**System characteristics**

Burner in a fault state

**Cause**

Earth fault, ionisation current. HBMU heat management unit faulty.

**Measures**

Check the ionisation electrode or ignition/monitoring electrode and the connecting cable. If the fault persists, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".
Reset the appliance.

### 388

**System characteristics**

Burner in a fault state

**Cause**

HBMU heat management unit faulty.

**Measures**

Replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".
Reset the appliance.

### 395

**System characteristics**

Burner in a fault state

**Cause**

Earth fault at ignition electrode, HBMU heat management unit faulty.

## Fault messages (cont.)

**Measures**

Reset the appliance.

Check ignition electrode for earth fault. If the fault persists, replace the HBMU heat management unit.

**396**

**System characteristics**

Burner in a fault state

**Cause**

HBMU heat management unit faulty.

**Measures**

Replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".
Reset the appliance.

**399**

**System characteristics**

Burner in a fault state

**Cause**

Earth fault at ionisation electrode or ignition/monitoring electrode, HBMU heat management unit faulty.

**Measures**

Check the ionisation electrode or ignition/monitoring electrode for an earth fault. If the fault persists, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".
Reset the appliance.

**400**

**System characteristics**

Burner in a fault state

**Cause**

HBMU heat management unit faulty.

**Measures**

Replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".
Reset the appliance.

**401**

**System characteristics**

Burner in a fault state

**Cause**

Earth fault at ionisation electrode or ignition/monitoring electrode, HBMU heat management unit faulty

**Measures**

Check the ionisation electrode or ignition/monitoring electrode for an earth fault. If the fault persists, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".
Reset the appliance.

**402**

**System characteristics**

Burner in a fault state

**Cause**

HBMU heat management unit faulty

**Measures**

Replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".
Reset the appliance.

## Fault messages (cont.)

### 403

| System characteristics | Measures |
|---|---|
| Burner in a fault state | Check the ionisation electrode or ignition/monitoring electrode for an earth fault. If the fault persists, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit". Reset the appliance. |
| **Cause** | |
| Earth fault at ionisation electrode or ignition/monitoring electrode, HBMU heat management unit faulty | |

### 404

| System characteristics | Measures |
|---|---|
| Burner in a fault state | Replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit". Reset the appliance. |
| **Cause** | |
| HBMU heat management unit faulty | |

### 405

| System characteristics | Measures |
|---|---|
| Burner in a fault state | Check the ionisation electrode or ignition/monitoring electrode for an earth fault. If the fault persists, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit". Reset the appliance. |
| **Cause** | |
| Earth fault at ionisation electrode or ignition/monitoring electrode, HBMU heat management unit faulty | |

### 406, 408, 410

| System characteristics | Measures |
|---|---|
| Burner in a fault state | Replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit". Reset the appliance. |
| **Cause** | |
| HBMU heat management unit faulty | |

### 416

| System characteristics | Measures |
|---|---|
| Burner locked out | Fit flue gas temperature sensor correctly. See "Repairs". |
| **Cause** | Carry out mains reset after fault has been remedied. |
| Flue gas temperature sensor incorrectly positioned | |

### 417, 418

| System characteristics | Cause |
|---|---|
| Burner in a fault state | HBMU heat management unit faulty |

## Fault messages (cont.)

**Measures**

Reset the appliance.

Replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

### 425

**System characteristics**

System in control mode, calculation out of operation. Calculation values can be viewed via software tool.

**Cause**

Time synchronisation failed.

**Measures**

Set the time.

### 446

**System characteristics**

Burner in a fault state

**Cause**

Deviation, heat generator flow temperature sensor/ high limit safety cut-out

**Measures**

Check the flow temperature sensor/high limit safety cut-out.
Check plug-in connection and lead to sensor.
Reset the appliance.

### 447, 448

**System characteristics**

Burner in a fault state

**Cause**

Deviation, ionisation voltage/ionisation current signal.

**Measures**

Replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".
Reset the appliance.

### 449, 451, 452

**System characteristics**

Burner in a fault state

**Cause**

Error in scheduled program run monitoring

**Measures**

Reset the appliance. If this occurs repeatedly, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

### 453

**System characteristics**

Burner in a fault state

**Cause**

Synchronisation error, sequence

**Measures**

Reset the appliance. If this occurs repeatedly, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

## Fault messages (cont.)

### 454

**System characteristics**

Burner in a fault state

**Cause**

Incorrect parameter set of HBMU heat management unit.

**Measures**

Flash correct HBMU heat management unit parameter set.

### 455, 456

**System characteristics**

Burner in a fault state

**Cause**

Error in program run monitoring

**Measures**

Reset the appliance. If this occurs repeatedly, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

### 457

**System characteristics**

Burner in a fault state

**Cause**

Fan sluggish or blocked.

**Measures**

Reset the appliance.
Check fan for sluggishness. In the case of severe contamination or grinding noises, replace fan unit.

### 458

**System characteristics**

Burner in a fault state

**Cause**

Faulty reset sequence

**Measures**

Check connecting cable between HBMU heat management unit and HMI programming unit.
Reset the appliance.

### 461

**System characteristics**

Burner in a fault state

**Cause**

Flue gas damper fault

**Measures**

Check flue gas damper.

### 462

**System characteristics**

Burner in a fault state

**Cause**

Feedback input of the external gas safety valve causes the burner start to be aborted.

## Fault messages (cont.)

**Measures**

Check the external gas safety valve and connection

### 463

**System characteristics**

Burner in a fault state

**Cause**

Contaminated combustion air, flue gas recirculation

**Measures**

Check flue system for contamination and flue gas recirculation. Clean flue system if required.
Reset the burner.

***Note***
*Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits, e.g. laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).*
*If the burner gauze assembly and ionisation electrode or ignition/monitoring electrode have been replaced, also clean the fan unit, gas/air channel and Venturi extension.*
*Reset the appliance.*

### 464

**System characteristics**

Burner in a fault state

**Cause**

Ionisation current too low during calibration. Differential compared to previous value not plausible.

**Measures**

- Check the ionisation electrode or ignition/monitoring electrode and the connecting cable. Check plug-in connections for loose contacts.
- Check whether there is a lot of dust in the ventilation air (e.g. from construction work).
- Check flue system. Remove flue gas recirculation if required.
- Check system for condensate backup.

Reset the appliance.

***Note***
*To prevent water damage, detach fan unit before removing the burner.*

If the fault is constant, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

***Note***
*Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits, e.g. laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).*
*If the burner gauze assembly and ionisation electrode or ignition/monitoring electrode have been replaced, also clean the fan unit, gas/air channel and Venturi extension.*

### 467

**System characteristics**

Burner in a fault state

**Cause**

Gas supply insufficient during calibration. Contaminated or insufficiently sized gas line.

**Measures**

- Test static gas pressure and gas flow pressure.
- Check that on-site gas line and gas flow switch are correctly sized.
- Visually inspect gas solenoid valve inlet and strainer on the inlet side for contamination.

Reset the appliance.

***Note***
*Contamination, for example from a brazed gas line, can block up the gas solenoid valve strainer on the inlet side.*





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## Fault messages (cont.)

### 468

**System characteristics**

Burner in a fault state

**Cause**

Ionisation current too high during calibration

**Measures**

Check the gap between the ionisation electrode or ignition/monitoring electrode and the burner gauze assembly.
Check whether there is a lot of dust in the ventilation air (e.g. from construction work).

Reset the appliance.

***Note***
*Deposits on the electrodes indicate foreign bodies in the ventilation air. Check the installation room and flue system for causes of the deposits, e.g. laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).*
*If the burner gauze assembly and ionisation electrode or ignition/monitoring electrode have been replaced, also clean the fan unit, gas/air channel and Venturi extension.*

### 471

**System characteristics**

No heat demand.

**Cause**

System pressure sensor not available, lead break or short circuit.

**Measures**

- Check system pressure sensor (plug 163).
- Check lead and plug-in connection.
- Check whether the supply voltage to the sensor is 5 V⎓.

### 474

**System characteristics**

Burner in a fault state

**Cause**

Error in scheduled program run monitoring

**Measures**

Reset the appliance.
If the fault re-occurs, replace the HBMU heat management unit: See chapter "Replacing the HBMU heat management unit".

### 477

**System characteristics**

Limited solar thermal system functionality.
No solar yield.

**Cause**

Fault, differential temperature monitoring, solar, collector/cylinder, difference outside tolerance.
Air in the solar circuit. Sensor not positioned correctly.
Pump faulty.

## Fault messages (cont.)

**Measures**

- Check the following:
  - No flow or low flow rate in the solar circuit.
  - There may be air in the solar circuit.
  - Dirt in the system.
  - Check whether the flow rates are set correctly.
  - Check the system pressure.
  - Check the function of any check valves installed.
  - Check the function and nominal speed of the circulation pump and check it for dirt. Check any high limit safety cut-out limiter (STB) that may be installed.
  - Check the connections and plug-in connection of the TS1 cylinder temperature sensor [5] and TS2 collector temperature sensor [6] on the ADIO (EM-S1) for correct seating, contact corrosion and mechanical damage.
  - Check resistance R of both sensors (TS1 NTC 10 kΩ / TS2 NTC 20 kΩ) on the disconnected plug. If necessary, replace the temperature sensors.

***Note***
*To measure the collector temperature more accurately, the solar circuit pump can be periodically started for a short duration. If necessary, activate the interval function of the solar circuit pump.*

### 517

**System characteristics**

Normal operation, remote control not functioning

**Cause**

Lead break, PlusBus cable, incorrect appliance address set, remote control faulty

**Measures**

- Check setting in the commissioning assistant and correct as necessary.
- Check remote control cable.
- Check remote control subscriber number. Replace faulty remote control if applicable.

### 527, 528

**System characteristics**

Burner in a fault state

**Cause**

Incorrect HBMU heat management unit parameter set

**Measures**

Overwrite (flash) the HBMU heat management unit with the correct parameter set.

### 540

**System characteristics**

Burner in a fault state

**Cause**

Condensate backup in the heat cell

**Measures**

- Check system for condensate backup.
- Check the condensate drain and trap.
- If necessary, replace the thermal insulation ring, thermal insulation block, electrodes and burner gauze assembly.

***Note***
*To prevent water damage, detach fan unit before removing the burner.*

## Fault messages (cont.)

Reset the appliance.

### 544

**System characteristics**

Emergency function operating mode is activated for heating circuit 2:
Mixer closes. Heating circuit pump is operational.

**Cause**

Lead break, flow temperature sensor, heating circuit 2 with mixer.

Incorrect setting during commissioning.

**Measures**

Check flow temperature sensor, mixer 2.
Measure voltage at sensor input on electronics module. Set value: 3.3 V⎓ with sensor disconnected.
Check setting in the commissioning assistant and correct if required.
Checking setting of ADIO rotary switch.

### 545

**System characteristics**

Emergency function operating mode is activated for heating circuit 2:
Mixer closes. Heating circuit pump is operational.

**Cause**

Short circuit, flow temperature sensor, heating circuit 2 with mixer.

**Measures**

Check flow temperature sensor, mixer 2.
Measure voltage at sensor input on electronics module. Set value: 3.3 V⎓ with sensor disconnected

### 574

**System characteristics**

Normal operation without room influence.

**Cause**

Room temperature sensor, heating circuit 1 not available.

**Measures**

Check external room temperature sensor for heating circuit or room temperature sensor on remote control unit.

### 575

**System characteristics**

Normal operation without room influence

**Cause**

Lead break, room temperature sensor, heating circuit 1.

**Measures**

Check external room temperature sensor for heating circuit or room temperature sensor on remote control unit.

### 576

**System characteristics**

Normal operation without room influence

**Cause**

Short circuit, room temperature sensor, heating circuit 1.

## Fault messages (cont.)

**Measures**

Check external room temperature sensor for heating circuit or room temperature sensor on remote control unit.

**577**

**System characteristics**

Normal operation without room influence

**Cause**

Room temperature sensor, heating circuit 2 not available

**Measures**

Check external room temperature sensor for heating circuit or room temperature sensor on remote control unit.

**578**

**System characteristics**

Normal operation without room influence

**Cause**

Lead break, room temperature sensor, heating circuit 2.

**Measures**

Check external room temperature sensor for heating circuit or room temperature sensor on remote control unit.

**579**

**System characteristics**

Normal operation without room influence

**Cause**

Short circuit, room temperature sensor, heating circuit 1.

**Measures**

Check external room temperature sensor for heating circuit or room temperature sensor on remote control unit.

**682**

**System characteristics**

Burner in a fault state

**Cause**

Air mass flow rate sensor not available

**Measures**

Check air mass flow rate sensor.

**683**

**System characteristics**

Burner in a fault state

**Cause**

Air mass flow rate sensor faulty

## Fault messages (cont.)

**Measures**

Check air mass flow rate sensor.

---

**684**

**System characteristics**

Burner in a fault state

**Cause**

Back draught safety device faulty

**Measures**

Check back draught safety device.

---

**694**

**System characteristics**

Burner in a fault state

**Cause**

Signal comparison, deviation, flue gas high limit safety cut-out

**Measures**

Check the plug-in connection and cable to the sensor.
Check sensor. Replace sensor if necessary.
Reset the appliance.

---

**738**

**System characteristics**

Normal operation

**Cause**

OpenTherm remote control connected but not configured

**Measures**

Set C.7 in the commissioning assistant to a value of 14.

---

**766**

**System characteristics**

Reduced burner output.

**Cause**

Flue gas temperature too high.

**Measures**

Clean the heat cell. Perform maintenance.

---

**767**

**System characteristics**

Burner output reduced to a minimum.

**Cause**

Flue gas temperature too high.

**Measures**

Clean the heat cell. Perform maintenance.

## Fault messages (cont.)

### 799

**System characteristics**

No DHW heating, no central heating

**Cause**

Central heating circuit pump reports an electrical fault.

No flow rate.

**Measures**

Perform a power reset.
If this occurs repeatedly, replace the heating circuit pump.

### 979

**System characteristics**

Constant heat demand. Set room temperature is exceeded.

**Cause**

Both inputs – plug 96 and OpenTherm – are occupied and reporting a heat demand.

**Measures**

***Note***
*Only one input can be used. Either plug 96 or OpenTherm.*

Remove external devices or wire jumper from one of the inputs.

### 980

**System characteristics**

No DHW heating

**Cause**

Minimum flow rate not achieved before the start of DHW heating:
- Shut-off or too much constriction
- Scaling or sludge
- Incorrect hydraulic configuration
- Circulation pump faulty, air in the heating circuit
- System pressure unstable or too low

**Measures**

- Check that all cylinder shut-off devices are fully open.
- Check the set hydraulic scheme and correct if necessary.
- Ensure that the system is fully vented. If necessary, run the entire venting program of the heating circuit again (select via service menu).
- Ensure that all quick-action air vent valves on the appliance side are permanently open.
- Check the quick-action air vent valves for leaks and replace if necessary
- Check the set system pressure (this fault is more likely if the system pressure is too low).
- Check the quick-action air vent valves for leaks and replace if necessary.
- Check the circulation pump and replace if necessary.

***Note***
*If fault 980 occurs, DHW heating is blocked for the period of time specified in parameter 1087.0. Heating operation remains available during this period. Once the period of time set in parameter 1087.0 has elapsed, DHW heating is enabled again. The DHW heating blocking time can be terminated by carrying out a mains reset of the appliance. Switch the appliance off and on again at the appliance switch. For further information, see chapter "Function description".*

### 981

**System characteristics**

No DHW heating

**Cause**

Minimum flow rate not achieved during DHW heating:

- Shut-off or too much constriction
- Scaling, sludge
- Incorrect hydraulic configuration
- Faulty circulation pump, air in the heating circuit
- Unstable or excessively low system pressure

## Fault messages (cont.)

**Measures**

- Check that all cylinder shut-off devices are fully open.
- Check the set hydraulic scheme and correct if necessary.
- Ensure that the system is fully vented. If necessary, run the entire venting program of the heating circuit again (select via service menu).
- Ensure that all quick-action air vent valves on the appliance side are permanently open.
- Check the quick-action air vent valves for leaks and replace if necessary.
- Check the set system pressure (this fault is more likely if the system pressure is too low).
- Check the circulation pump and replace if necessary.

***Note***
*If fault 981 occurs, DHW heating is blocked for the period of time specified in parameter 1087.0. Heating operation remains available during this period. Once the period of time set in parameter 1087.0 has elapsed, DHW heating is enabled again. The DHW heating blocking time can be terminated by carrying out a mains reset of the appliance. Switch the appliance off and on again at the appliance switch. For further information, see chapter "Function description"*

**982**

**System characteristics**

No central heating, no DHW heating

**Cause**

Circulation pump heating circuit 1 running dry.

**Measures**

Check the DEV; check the circulation pump.

## Status messages

The following messages can be displayed using the "ViGuide" software tool:

| Message on the display | Meaning |
|---|---|
| S.9 | Fan pre-purge for heating mode |
| S.29 | Standard mode for heating |
| S.36 | Comfort mode for DHW draw-off |
| S.60 | Summer mode active (outside temperature economy function) |
| S.74 | Heating suppression, heating |
| S.75 | DHW circulation pump active |
| S.94 | No demand, external hook-up, heating circuit 1 |
| S.95 | No demand, external hook-up, heating circuit 2 |
| S.96 | No demand, external hook-up, heating circuit 3 |
| S.154 | Due to insufficient heat transfer in heating system, burner operation not required |

## Repairs

### Draining the boiler on the heating water side

**Please note**
Risk of scalding
Residual water will escape when the boiler or one of the following components is fitted or removed:
- Water-filled pipework
- 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 (especially in the service position)
- Electrical components
- Plug-in connections
- Electrical cables/leads

Only drain the boiler or heating system when the boiler water or cylinder temperature has dropped below 40 °C.

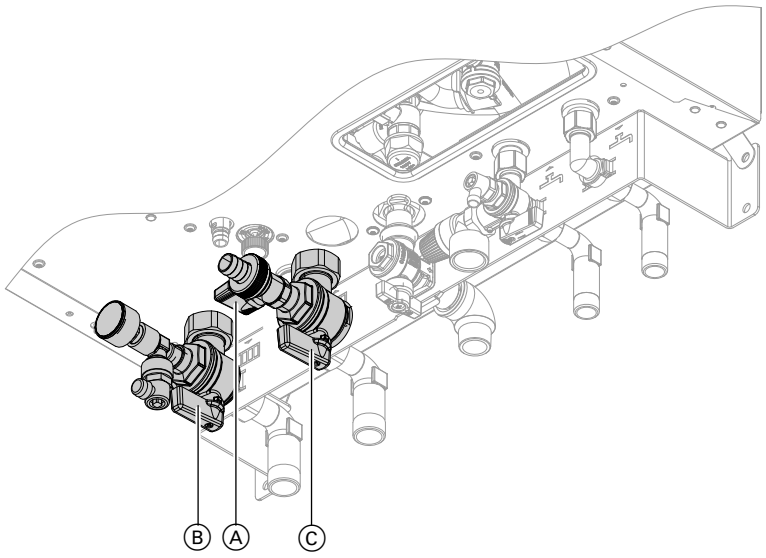



*Fig. 43*

1. Switch on the control unit. Call up the actuator test and put the diverter valve into its central position (see "Actuator and sensor test").
2. Wait until the valve has moved into its central position (approx. 5 s), then turn off the ON/OFF switch "⏻" on the control unit.
3. Route hose at drain valve Ⓐ into a suitable container or drain outlet.
4. Close heating flow shut-off valve Ⓑ and heating return shut-off valve Ⓒ.
5. Open drain valve Ⓐ. Drain the boiler as much as necessary.

   ***Note***
   *Residual water will remain in the boiler.*

## Repairs (cont.)

### Draining the boiler on the DHW side

! **Please note**
Risk of scalding
Only drain the boiler or heating system when the boiler water or cylinder temperature has dropped below 40 °C.

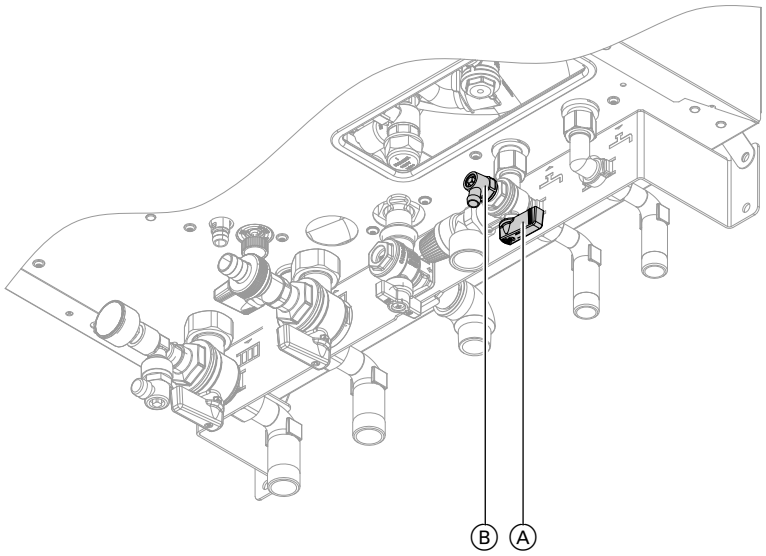



*Fig. 44*

1. Close cold water shut-off valve Ⓐ.
2. Connect hose to drain valve Ⓑ and route it into a suitable container or drain outlet.
3. Open drain valve Ⓑ.

   ***Note***
   *Ensure adequate ventilation in the DHW pipework. Open hot water draw-off point.*

## Repairs (cont.)

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

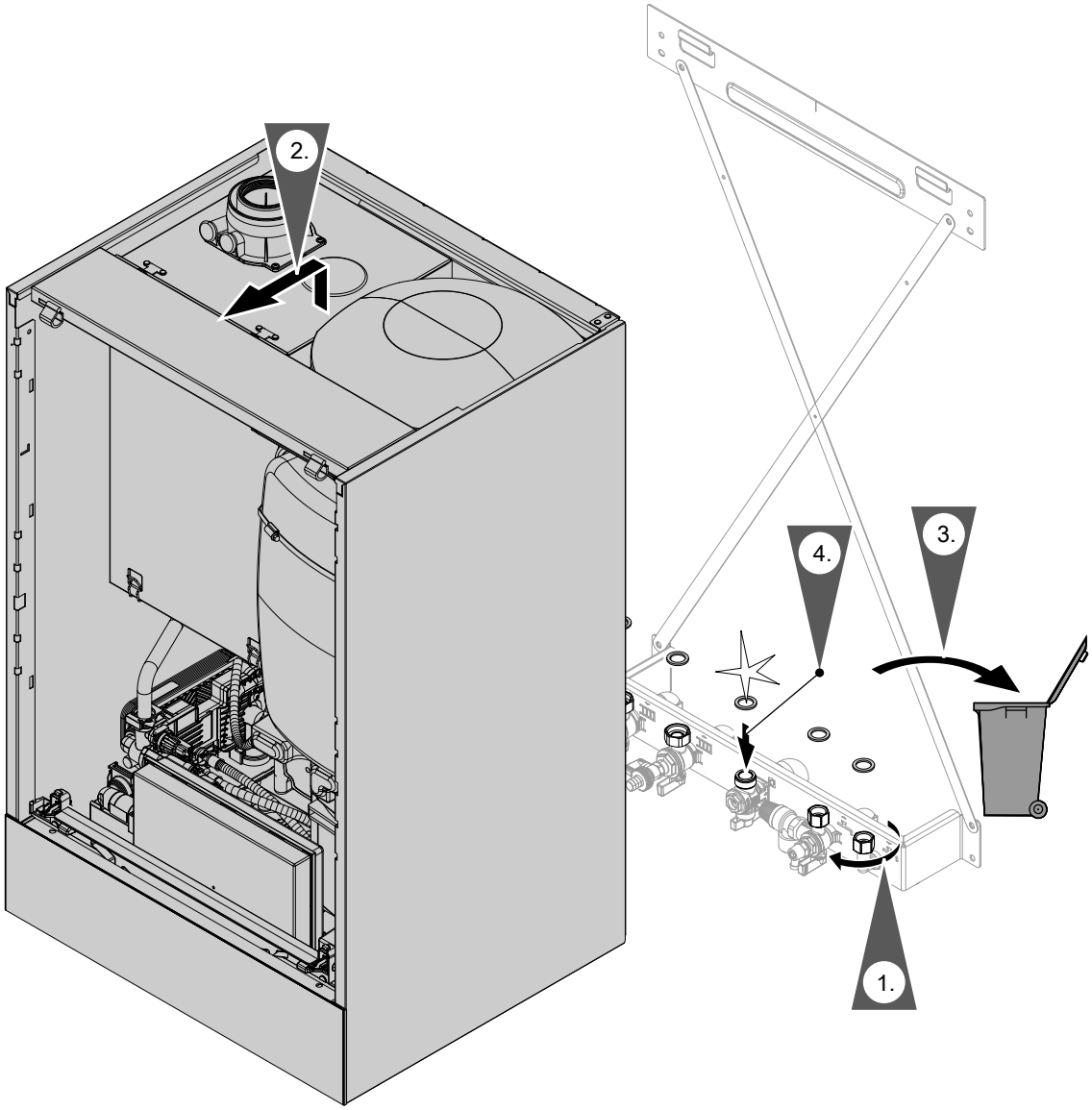



*Fig. 45*

***Note***
*Use new gaskets when assembling.*

*Internal gasket diameter:*
- *Gas connection Ø 18.5 mm*
- *Connections on the heating water side Ø 17 mm*
- *Connections on the DHW side Ø 12 mm*

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

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

### Status/checking/diagnosing the internal circulation pump

The internal circulation pump is fitted with two status LEDs.

## Repairs (cont.)

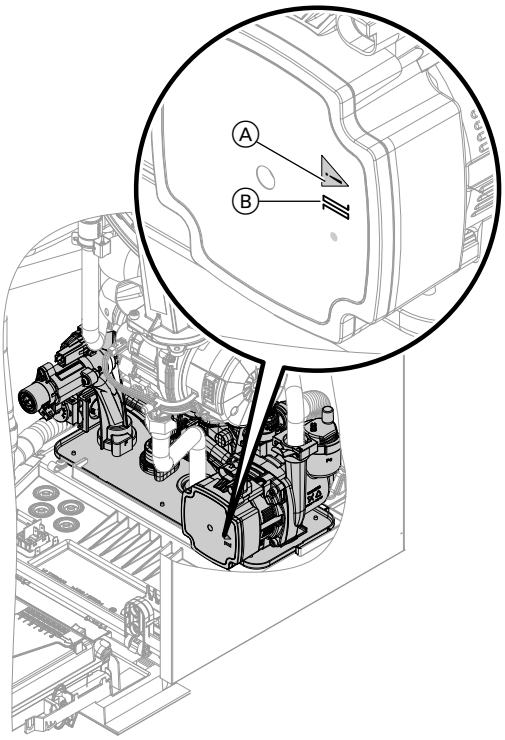



*Fig. 46*

- Ⓑ LED constant green:
  No communication (pump is running without external control from the boiler controller).
- Ⓑ LED flashing green:
  Pump is running with external control (PWM signal) from the boiler controller
- Ⓐ LED constant red:
  Pump failure

***Note***

*The pump is controlled by a PWM signal. A lead break in the data line will not generate a fault message.*
*The pump is operating at 100 % of its maximum output.*

## Repairs (cont.)

### Checking the temperature sensors

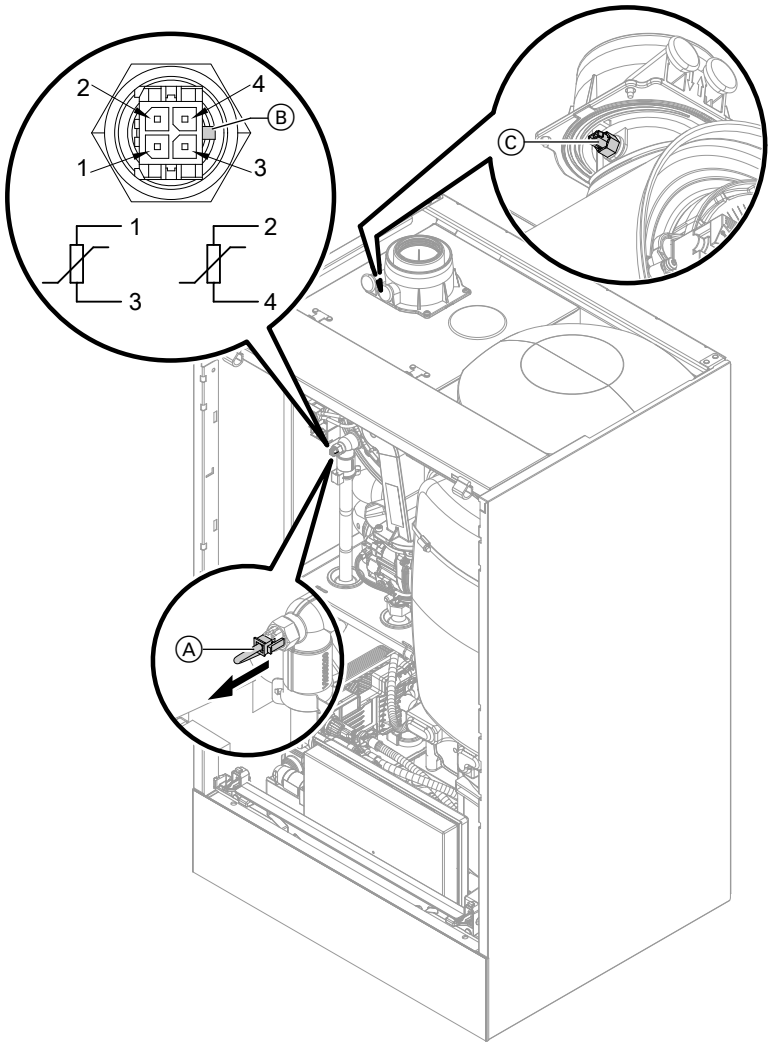



*Fig. 47*

**Heat generator circuit flow temperature sensor (dual sensor)**

1. Check the leads and plugs of flow temperature sensors Ⓐ.
2. Disconnect the leads from flow temperature sensors Ⓐ.
3. Check the sensor resistance. Note position of guide lug Ⓑ.
   - Sensor 1: Connections 1 and 3
   - Sensor 2: Connections 2 and 4

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

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

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

## Repairs (cont.)

### Cylinder temperature sensor/outlet temperature sensor

1. Check lead and plug of cylinder temperature sensor [5] or outlet temperature sensor [4].
2. Disconnect wires of sensor plug.
3. Check the sensor resistance. Compare the resistance with the value for the current temperature from the following diagram.
   In the event of severe deviation (> 10 %), replace the sensor.

### Low loss header sensor

1. Check lead and plug of temperature sensor [9] on the ADIO electronics module (mixer extension kit).
2. Disconnect wires of sensor plug.
3. Check the sensor resistance. Compare the resistance with the value for the current temperature from the following diagram.
   In the event of severe deviation (> 10 %), replace the sensor.

### Outside temperature sensor

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

### Flue gas temperature sensor

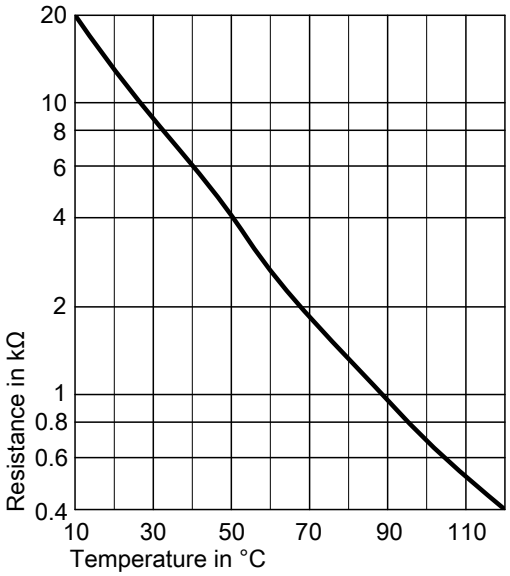
1. Check the lead and plug of flue gas temperature sensor Ⓒ.
2. Disconnect leads, flue gas temperature sensor Ⓒ.
3. Rotate sensor (anti-clockwise) by ¼ turn to remove it (bayonet fitting).
4. Check the sensor resistance. Compare the resistance with the value for the currently recorded temperature from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

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

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

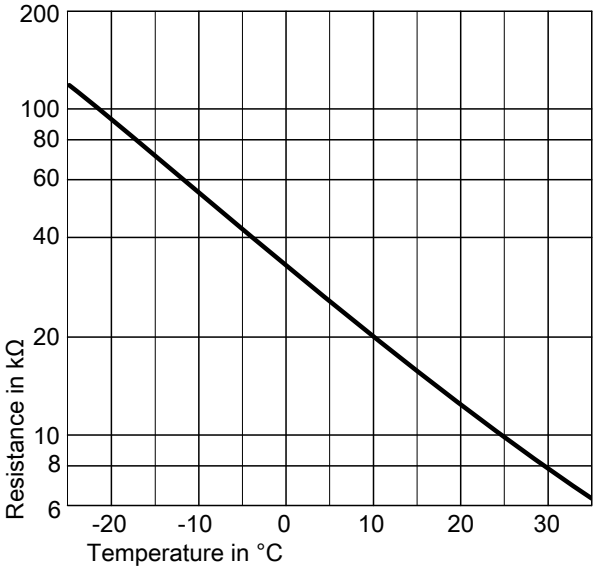
## Repairs (cont.)

- Flue gas temperature sensor
- Flow temperature sensor
- Cylinder temperature sensor
- Outlet temperature sensor
- Temperature sensor, low loss header




*Sensor type: NTC 10 kΩ*

- Outside temperature sensor




*Sensor type: NTC 10 kΩ*

**Fault during commissioning (fault message 416)**

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

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

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

### Replacing the HBMU heat management unit

***Note***
*If replacing the HBMU heat management unit, "ViGuide" must be used.*

See spare part installation instructions and internet address: www.viguide.info

### Replacing the power cable

When replacing the power cable, only use the power cable available as a spare part from Viessmann.

## Repairs (cont.)

### Replacing the HMI connecting cable

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

### Checking the plate heat exchanger

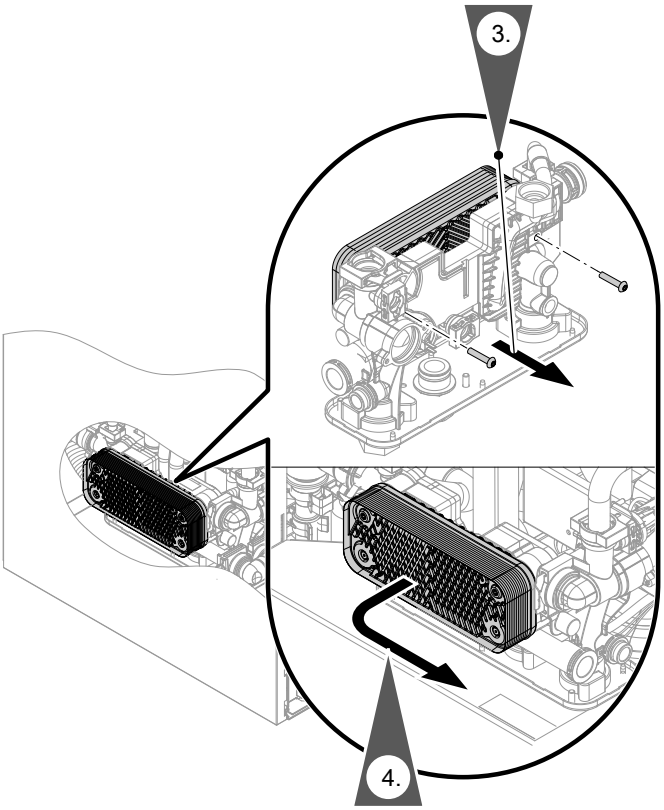



*Fig. 48*

1. Drain the boiler on the heating water and DHW sides.
2. Move the programming unit to the service position.
3. Undo the fixing screws.
4. Detach the plate heat exchanger and remove towards the front.
5. Check connections on the heating water and DHW sides for contamination and scaling. Replace plate heat exchanger if necessary.
6. Install in reverse order using new gaskets.
   Tighten screws as tightly as necessary and ensure that the components are undamaged and are functioning correctly throughout service life.
   Observe torque settings if a torque wrench is available.
   Torque for fixing screws 3.2 Nm

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

## Repairs (cont.)

### 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.

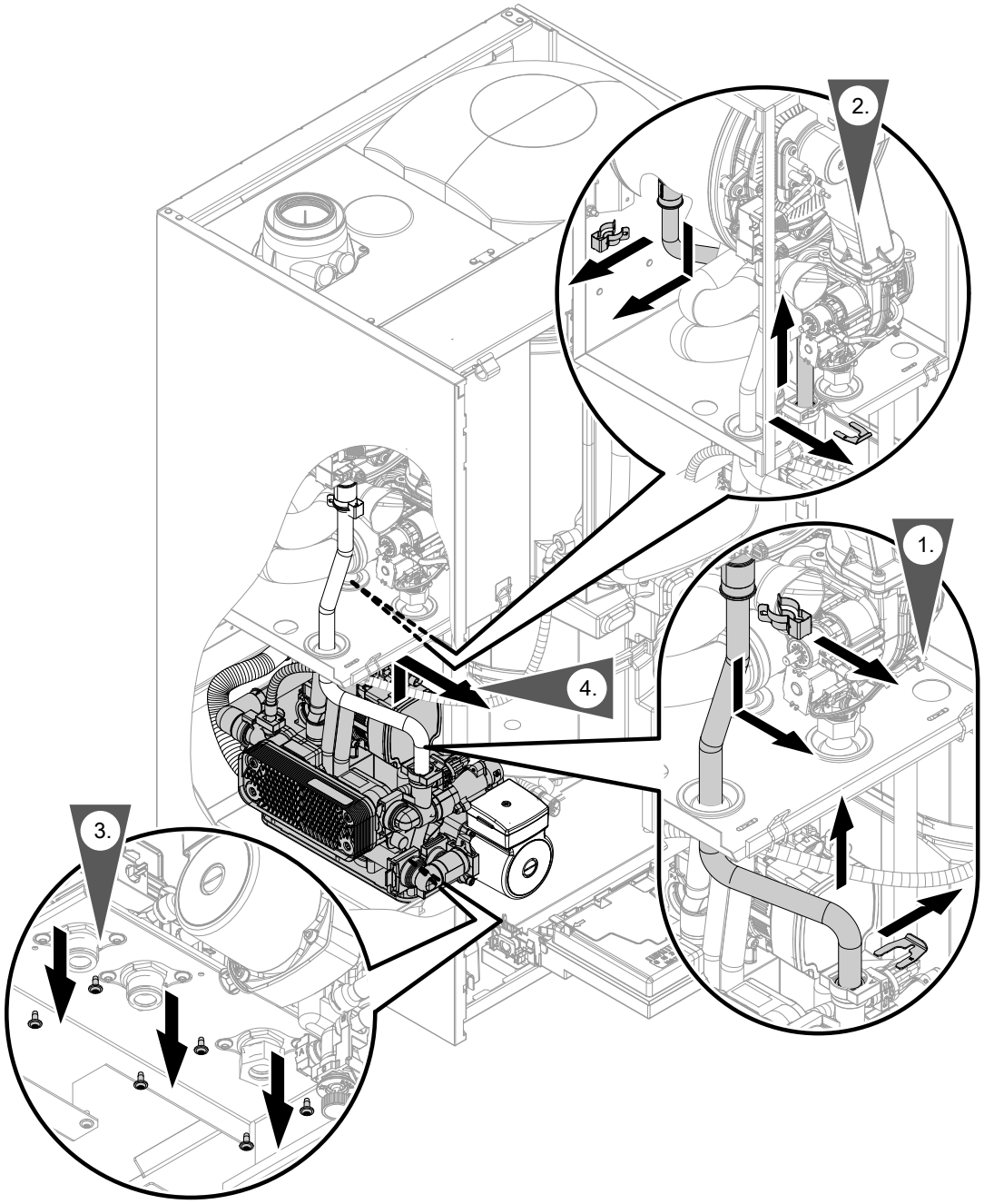



*Fig. 49*





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## Repairs (cont.)

### Checking the fuse

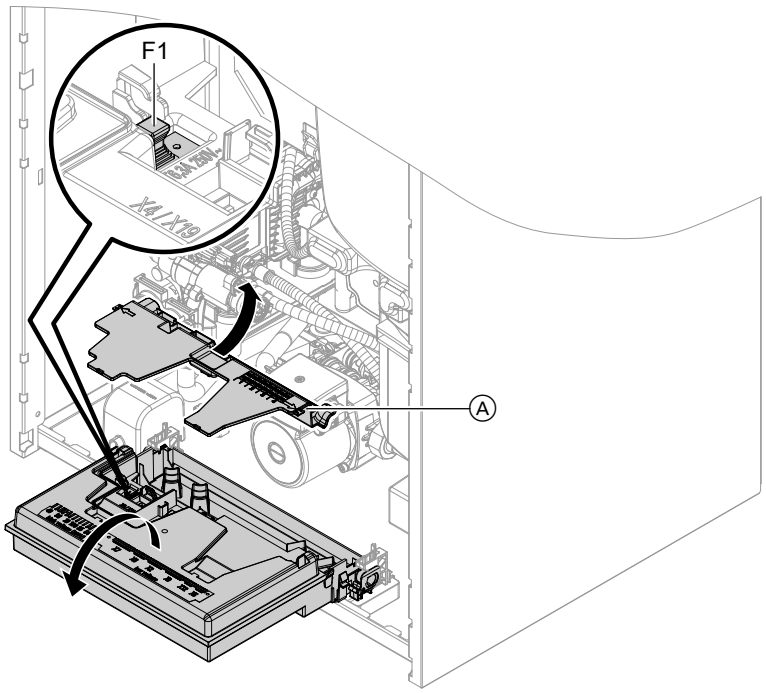


*Fig. 50*

1. Turn off the ON/OFF switch.
2. Depending on the layout: Move programming unit together with bracket to service position.
3. Pivot the HBMU heat management unit down.
4. Remove cover Ⓐ.
5. Check fuse F1 (see connection and wiring diagram).

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

## Appliance functions

### Heating mode

- **Weather-compensated operation:**
  The rooms are heated in accordance with the room temperature and time program settings.
  The control unit determines a set flow temperature for the heat generator, subject to the outside temperature, the room temperature and the slope/level of the heating curve.
- **Room temperature-dependent operation (constant operation with room thermostat):**
  System with one heating circuit without mixer. The rooms are heated in accordance with the settings of the room temperature controller/room thermostat (accessories).
  If the room temperature controller/room thermostat issues a demand, the standard set flow temperature is maintained. If there is no demand present, the reduced set flow temperature is maintained.
- **Constant operation without room thermostat:**
  The rooms are heated according to the time program settings.
  In the time phases at standard room temperature, the standard set flow temperature or the set comfort flow temperature is maintained. Outside the set time phases, the reduced set flow temperature is maintained.
- **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.

### 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.

### Flow rate monitoring for DHW heating

**Additional information on fault 980:**

The internal flow rate of the appliance is monitored before any DHW heating takes place.
If the required threshold value is not exceeded within a specified period of time, the burner is not enabled for DHW heating and DHW heating is interrupted as a result.
Instead, the internal diverter valve returns to the heating position for a period of 5 minutes. Heating operation is enabled for this period. After 5 minutes, a second attempt at DHW heating is made.

If the required threshold value is still not achieved in the second attempt, DHW heating is interrupted and the diverter valve again returns to the heating position for 5 minutes.
A total of 4 DHW heating attempts are made. If the required threshold value is not reached during these 4 attempts (approx. duration 20 minutes), fault 980 is output. If fault 980 occurs, DHW heating is blocked for the period of time set in parameter 1087.0. Heating operation remains available during this period. Once the period of time set in parameter 1087.0 has elapsed, DHW heating is enabled again. The DHW heating blocking time can be terminated by carrying out a mains reset of the appliance. Switch the appliance off and on again at the appliance switch.

## Appliance functions (cont.)

**Additional information on fault 981:**

The internal flow rate of the appliance is monitored during DHW heating.
If the flow rate drops below a defined threshold, DHW heating is interrupted.
The internal diverter valve returns to the heating position for a period of 5 minutes. Heating operation is enabled for this period. After 5 minutes, a second attempt at DHW heating is made.
If the flow rate also drops below the threshold value in the second attempt, DHW heating is interrupted and the diverter valve again returns to the heating position for 5 minutes.

A total of 4 DHW heating attempts are made. If the flow rate drops below the threshold value in all 4 attempts, fault 981 is output. If fault 981 occurs, DHW heating is blocked for the period of time set in parameter 1087.0. Heating operation remains available during this period. Once the period of time set in parameter 1087.0 has elapsed, DHW heating is enabled again. The DHW heating blocking time can be terminated by carrying out a mains reset of the appliance. Switch the appliance off and on again at the appliance switch.

## 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 room temperature set point.

Factory settings:
- Slope = 1
- Level = 3

***Note***
*If heating circuits with mixer are present in the heating system: The flow temperature of the heat generator is one differential temperature higher than the flow temperature for the heating circuits with mixer. Differential temperature in delivered condition set to 8 K.*

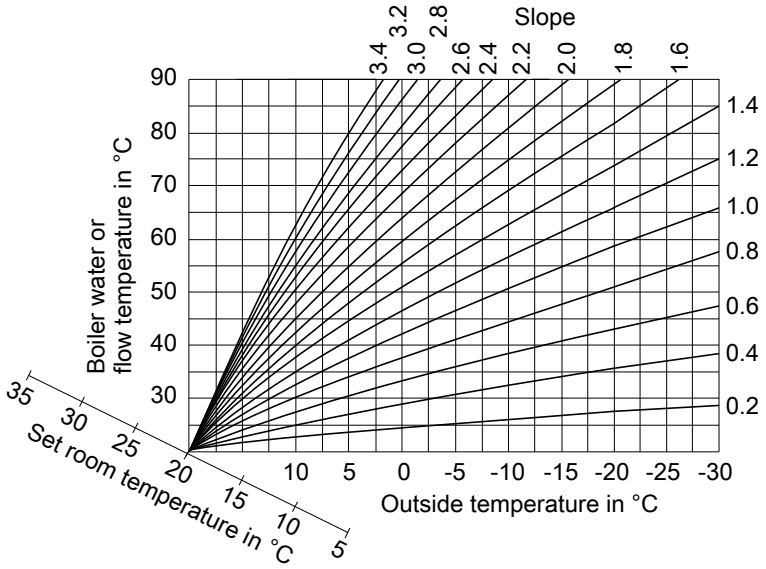


*Fig. 51*

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

**Set room temperature**

**Standard room temperature or comfort room temperature**

Individually adjustable for each heating circuit.

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

## Appliance functions (cont.)

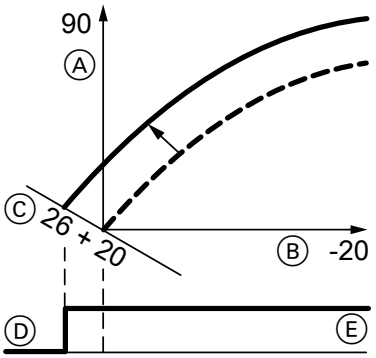


*Fig. 52 Example 1: Changing the set room temperature from 20 to 26 °C*

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

Changing the set room temperature

Operating instructions

**Reduced room temperature**

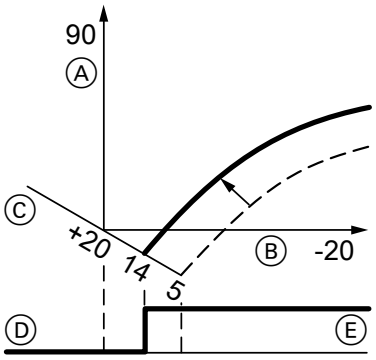


*Fig. 53 Example 2: Changing the reduced set room temperature from 5 °C to 14 °C*

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

Changing the reduced set room temperature

Operating instructions

**Changing the slope and level**

Individually adjustable for each heating circuit.

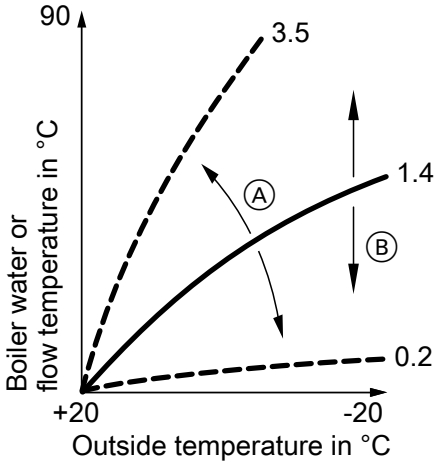


*Fig. 54*

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

## Screed drying

When enabling screed drying, observe the information provided by the screed manufacturer.
When the screed drying function is activated, the heating circuit pumps of **all** heating circuits are switched on and the flow temperature is maintained in accordance with the selected profile. After completion (30 days), the heating circuits with mixer are automatically controlled with the set parameters.
Screed drying is adjusted in the system configuration:
- 0 = OFF
- 2 = Temperature profile A
- 3 = Temperature profile B
- ...
- 7 = Temperature profile F

***Note***
*During screed drying, DHW heating is not available.*

Observe EN 1264. The report to be provided by the heating contractor must contain the following details regarding heat-up:
- Heat-up data with the relevant set flow temperatures
- Max. flow temperature achieved.
- Operating state and outside temperature at handover

***Note***
*Temperature profile F ends after 21 days.*





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## Appliance functions (cont.)

The function continues after a power failure or after the control unit has been switched off. When screed drying has completed or been manually switched off, the system is controlled in accordance with the selected parameters.

**Parameter "Screed drying":**

Temperature profile A (EN 1264-4)

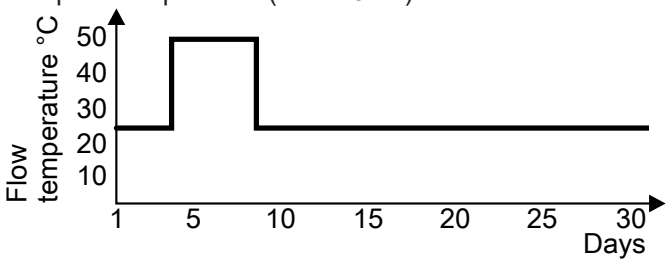


*Fig. 55*

Temperature profile B (ZV parquet and flooring technology)

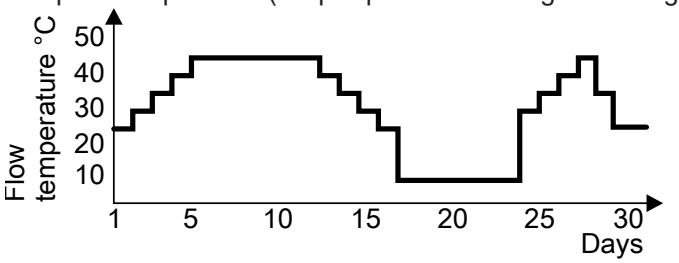


*Fig. 56*

Temperature profile C

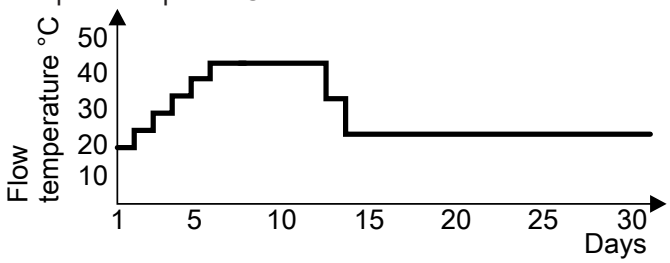


*Fig. 57*

Temperature profile D

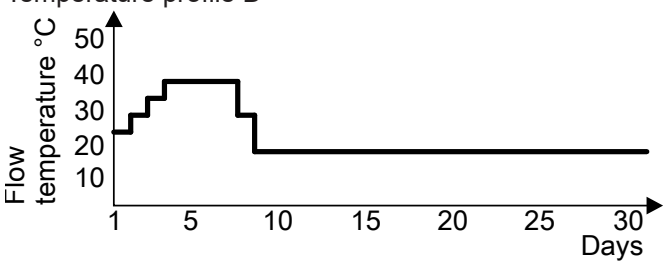


*Fig. 58*

## Appliance functions (cont.)

Temperature profile E

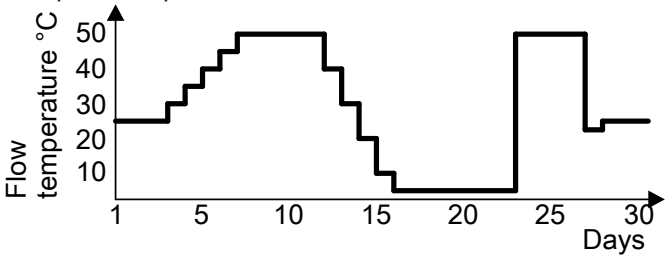


*Fig. 59*

Temperature profile F

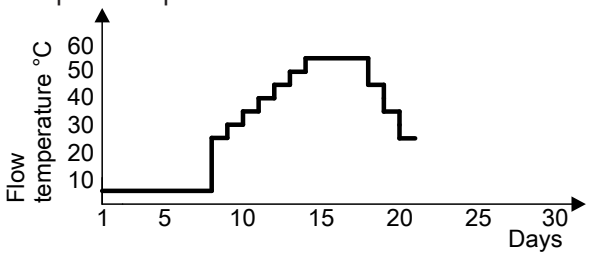


*Fig. 60 Ends after 21 days.*

## DHW heating

### Heating the DHW loading cylinder from cold

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

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

The loading cylinder is heated up to the set cylinder temperature. Heating stops when the specified temperature has been reached at the cylinder temperature sensor.

### Reheating when DHW is drawn off

When DHW is drawn off, cold water enters the lower section of the loading cylinder.
The heating circuit pump is switched ON and the 3-way diverter valve is changed over, if the cylinder temperature sensor captures a temperature lower than the defaulted set value.

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

DHW is regulated to the set temperature via the outlet temperature sensor.
After the draw-off process has ended, the loading cylinder continues to be heated up until the set DHW temperature is reached at the cylinder temperature sensor.

## External heating circuit hook-up (if installed)

***Note***
*Only in conjunction with weather-compensated operation.*

- Function:
  - If the external demand is active (plug 96 or digital input on EM-EA1 (DIO) electronics module closed), the heating circuit is supplied with heat.
  - If the external demand is inactive (contact open), heat supply to the heating circuit ends (regardless of the current set room temperature or the switching time).

    **Please note**

    There is no frost protection for the connected heating circuits.
- Connection:
  - If only one heating circuit is hooked up, use connection at plug 96: See page 28.
  - If multiple heating circuits are hooked up, connect all contacts to EM-EA1 extension (DIO electronics module) with the subscriber number. 1 (rotary switch = 1).

    See EM-EA1 extension installation instructions

    ***Note***
    *Perform the hook-up with subscriber number **"1"**.*

## Valve and pump kick

To prevent circulation pumps and valves from getting stuck or jammed (e.g. inactive heating system in summer), all pumps and valves connected to the control unit are automatically switched on or switched over for 10 seconds after **90 hours** of idle time:

- Mixer pumps
- Internal pumps / boiler circuit pumps
- DHW circulation pumps
- Loading pumps
- Solar circuit pumps
- Mixer valves
- Diverter valves

***Note***
*On appliances with a 3/2-way diverter valve, the valve is automatically moved to the centre position and back to the original position after 25 hours of standstill.*

## HBMU heat management unit

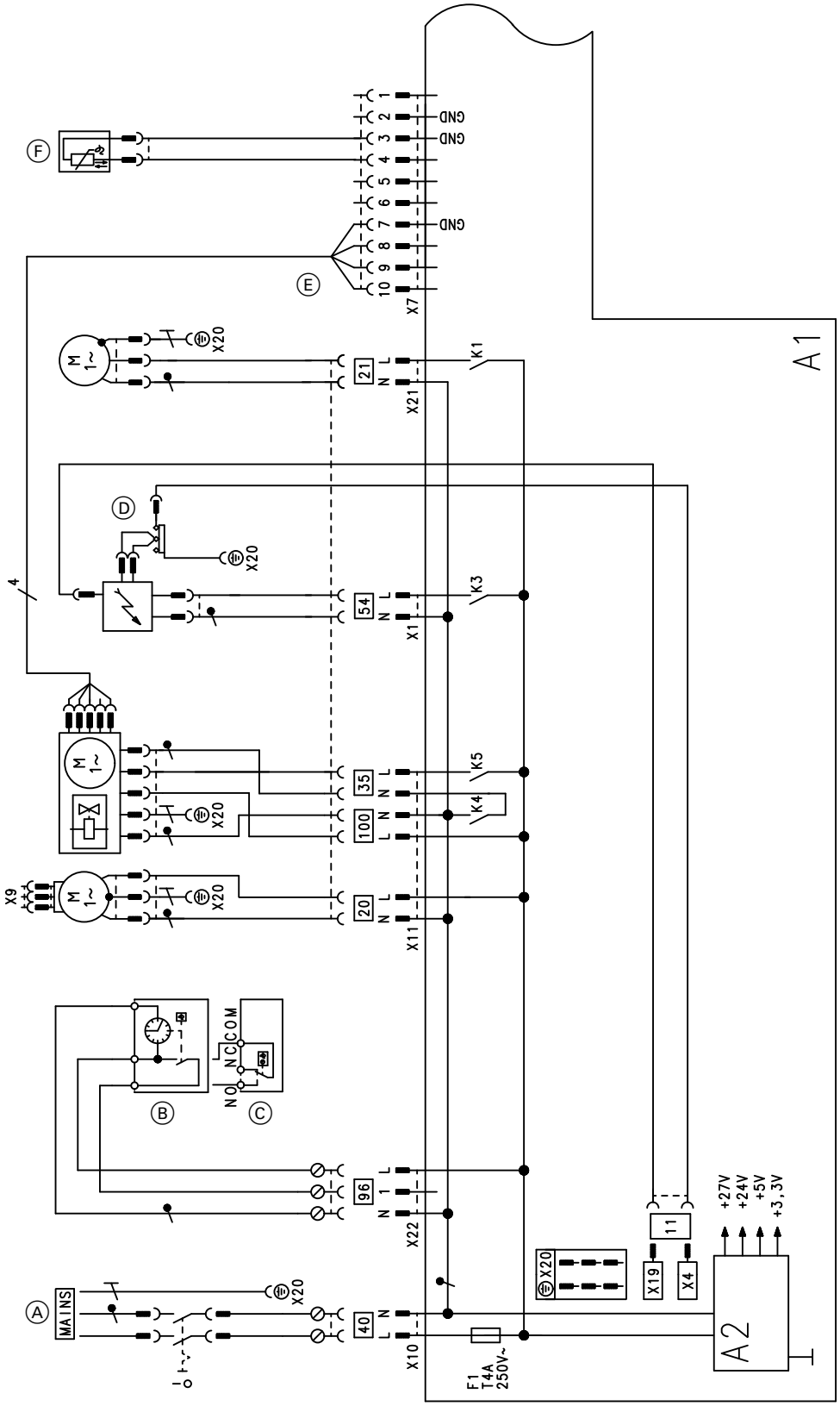


*Fig. 61*

A1 HBMU heat management unit
X... Electrical interfaces
A2 Power supply unit
Ⓐ Power supply 40
Ⓑ Vitotrol 100, type UTA
Ⓒ Vitotrol 100, type UTDB
Ⓓ Ignition unit/ionisation 54
Ⓕ Outlet temperature sensor
35 Gas solenoid valve
100 Fan motor
Ⓔ Fan motor control
96 230 V connection accessories

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## HBMU heat management unit (cont.)

20 Heating circuit pump
21 Cylinder loading pump

## HBMU heat management unit (cont.)

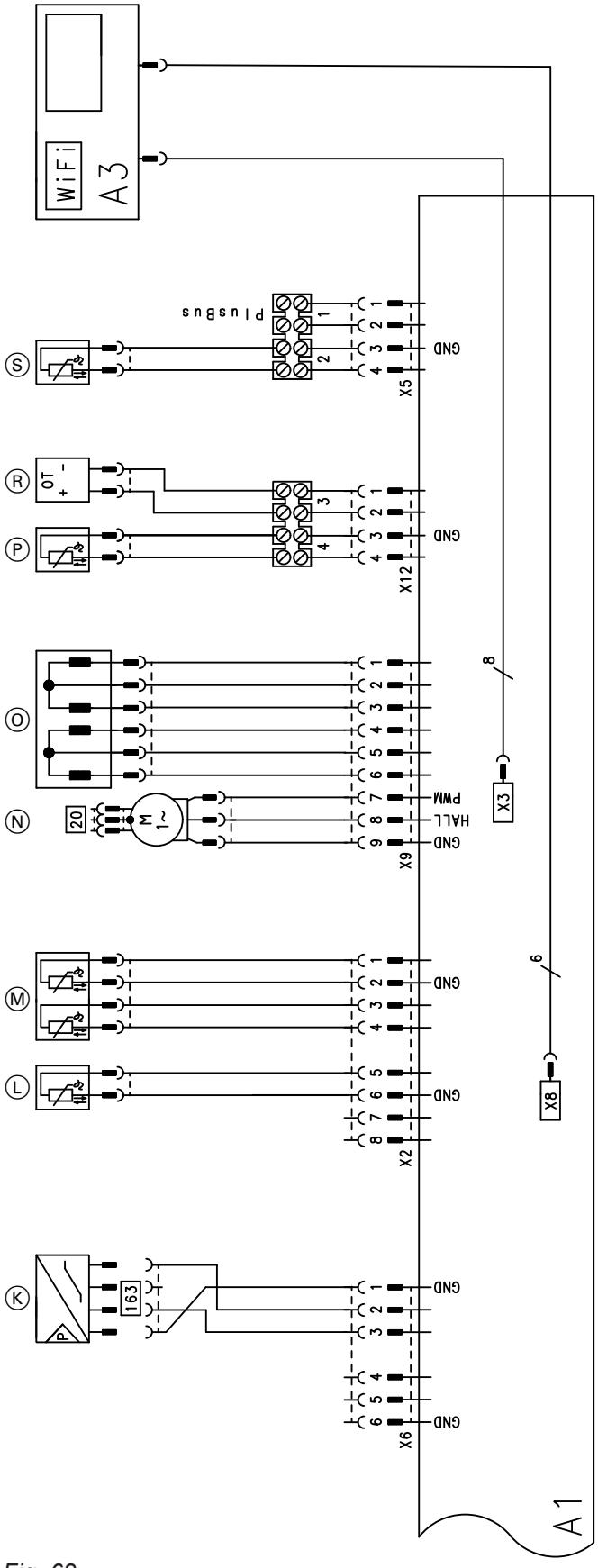


*Fig. 62*

A1 HBMU heat management unit
A3 Programming unit with communication module (TCU 100)
X... Electrical interfaces

Ⓚ Water pressure sensor
Ⓛ Flue gas temperature sensor
Ⓜ Boiler water temperature sensor
Ⓝ Circulation pump (PWM)





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## HBMU heat management unit (cont.)

Ⓞ Diverter valve stepper motor
Ⓟ Outside temperature sensor
Ⓡ Remote control (OpenTherm device)
Ⓢ Cylinder temperature sensor

## Report

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

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# Specification

***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).*

## Specification

**Appliances for single connection**

**Gas boiler, type B and C, category $II_{2N3P}$**

| **Type** | | **B1LG** | |
|---|---|---|---|
| **Rated heating output range (details to EN 15502)** | | | |
| **$T_F/T_R$ = 50/30 °C (P(50/30))** | | | |
| **Natural gas** | **kW** | **3.2 to 25.0** | **3.2 to 32.0** |
| **LPG** | **kW** | **3.2 to 25.0** | **3.2 to 32.0** |
| **$T_F/T_R$ = 80/60 °C (Pn(80/60))** | | | |
| **Natural gas** | **kW** | **2.9 to 23** | **2.9 to 29.3** |
| **LPG** | **kW** | **2.9 to 23** | **2.9 to 29.3** |
| **Rated heating output for DHW heating** | | | |
| Natural gas | kW | 2.9 to 31.1 | 2.9 to 34.6 |
| LPG | kW | 2.9 to 31.1 | 2.9 to 34.6 |
| **Rated heat input (Qn)** | | | |
| Natural gas | kW | 3.0 to 23.4 | 3.0 to 29.9 |
| LPG | kW | 3.0 to 23.4 | 3.0 to 29.9 |
| **Rated heat input for DHW heating (Qnw)** | | 31.7 | 34.9 |
| Natural gas | kW | 3.0 to 31.7 | 3.0 to 34.9 |
| LPG | kW | 3.0 to 31.7 | 3.0 to 34.9 |
| **Product ID** | | CE-0085DL0217 | |
| **IP rating** | | IP X1 to EN 60529 | |
| **$NO_X$** | Class | 6 | 6 |
| **Gas supply pressure** | | | |
| Natural gas | mbar | 20 | 20 |
| | kPa | 2 | 2 |
| LPG | mbar | 50 | 50 |
| | kPa | 5 | 5 |
| **Max. permiss. gas supply pressure**[*3] | | | |
| Natural gas | mbar | 13 to 25.0 | 13 to 25.0 |
| | kPa | 1.3 to 2.5 | 1.3 to 2.5 |
| LPG | mbar | 25 to 57.5 | 25 to 57.5 |
| | kPa | 2.5 to 5.75 | 2.5 to 5.75 |
| **Rated voltage** | V | 230 | |
| Rated frequency | Hz | 50 | |
| Appliance fuse protection | A | 4.0 | |
| Backup fuse (power supply) | A | 16 | |
| **Communication module** (integral) | | | |
| WiFi frequency band | MHz | 2400 to 2483.5 | |

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

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## Specification (cont.)



**Appliances for single connection**

**Gas boiler, type B and C, category $II_{2N3P}$**

| **Type** | | **B1LG** | |
|---|---|---|---|
| **Rated heating output range (details to EN 15502)** | | | |
| **$T_F/T_R$ = 50/30 °C (P(50/30))** | | | |
| **Natural gas** | **kW** | **3.2 to 25.0** | **3.2 to 32.0** |
| **LPG** | **kW** | **3.2 to 25.0** | **3.2 to 32.0** |
| **$T_F/T_R$ = 80/60 °C (Pn(80/60))** | | | |
| **Natural gas** | **kW** | **2.9 to 23** | **2.9 to 29.3** |
| **LPG** | **kW** | **2.9 to 23** | **2.9 to 29.3** |
| Max. transmission power | dBm | 20 | |
| Low power radio frequency band | MHz | 2400 to 2483.5 | |
| Max. transmission power | dBm | 10 | |
| Supply voltage | V ⎓ | 24 | |
| Power consumption | W | 4 | |
| **Sound power level** (according to EN ISO 15036-1) | | | |
| at partial load | dB(A) | 35 | 35 |
| At rated heating output (DHW heating) | dB(A) | 51.1 | 52.9 |
| **Power consumption** (delivered condition) | W | 73 | 113 |
| **Permissible ambient temperature** | | | |
| ▪ During operation | °C | +5 to +35 | |
| ▪ During storage and transport | °C | –5 to +60 | |
| **Electronic temperature limiter setting (TN)** | °C | 91 | |
| **Electronic temperature limiter setting** | °C | 110 | |
| **Weight** | | | |
| – Excl. heating water and DHW | kg | 67.8 | 67.8 |
| – Incl. heating water and DHW | kg | 120.0 | 120.0 |
| **Water capacity** (excl. diaphragm expansion vessel) | l | 3.0 | 3.0 |
| **Max. flow temperature** | °C | 82 | 82 |
| **Max. flow rate** (Limit for the use of hydraulic separation) | l/h | See residual head graphs | |
| **Nominal circulating water volume** At $T_F/T_R$ = 80/60 °C | l/h | 988 | 1259 |
| **Expansion vessel** | | | |
| Capacity | l | 10 | 10 |
| Pre-charge pressure | bar | 0.75 | 0.75 |
| | kPa | 75 | 75 |
| **Permiss. operating pressure** | bar | 3 | 3 |
| | MPa | 0.3 | 0.3 |
| **Connections** (with connection accessories) | | | |
| Boiler flow and return | R | ¾ | ¾ |
| Cold water and DHW | G | ½ | ½ |
| **Dimensions** | | | |
| Length | mm | 500 | 500 |
| Width | mm | 600 | 600 |
| Height | mm | 950 | 950 |
| **Gas connection** (with connection accessories) | R | ¾ | ¾ |

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## Specification (cont.)



**Appliances for single connection**

**Gas boiler, type B and C, category $II_{2N3P}$**

| **Type** | | **B1LG** | |
|---|---|---|---|
| **Rated heating output range (details to EN 15502)** | | | |
| **$T_F/T_R$ = 50/30 °C (P(50/30))** | | | |
| **Natural gas** | **kW** | **3.2 to 25.0** | **3.2 to 32.0** |
| **LPG** | **kW** | **3.2 to 25.0** | **3.2 to 32.0** |
| **$T_F/T_R$ = 80/60 °C (Pn(80/60))** | | | |
| **Natural gas** | **kW** | **2.9 to 23** | **2.9 to 29.3** |
| **LPG** | **kW** | **2.9 to 23** | **2.9 to 29.3** |
| **DHW loading cylinder** | | | |
| Capacity | l | 46 | 46 |
| Permiss. operating pressure (DHW side) | bar | 10 | 10 |
| | MPa | 1 | 1 |
| Continuous DHW output | kW | 30.3 | 33.9 |
| For DHW heating from 10 to 45 °C | l/h | 726.6 | 813.6 |
| Performance factor $N_L$*4 | | 1.5 | 1.7 |
| Initial DHW output<br>For DHW heating from 10 to 45 °C | l/10 min | 170.3 | 180.8 |
| **Supply values**<br>Relative to the max. load and 1013 mbar/15 °C | | | |
| Natural gas E | $m^3/h$ | 3.35 | 3.69 |
| Natural gas LL | $m^3/h$ | 3.90 | 4.29 |
| LPG | kg/h | 2.46 | 2.71 |
| **Flue gas parameters** | | | |
| Temperature (at a return temperature of 30 °C) | | | |
| – At rated heating output | °C | 46 | 59 |
| – At partial load | °C | 38 | 38 |
| Temperature (at a return temperature of 60 °C) | °C | 74 | 77 |
| **Mass flow rate (for DHW heating)** | | | |
| Natural gas | | | |
| – At rated heating output | kg/h | 57.3 | 62.1 |
| – At partial load | kg/h | 5.6 | 5.6 |
| LPG | | | |
| – At rated heating output | kg/h | 57.1 | 61.1 |
| – At partial load | kg/h | 3.9 | 3.9 |
| **Available draught** | Pa | 250 | 250 |
| | mbar | 2.5 | 2.5 |

*4 *At 70 °C average boiler water temperature and cylinder storage temperature Tcyl = 60 °C. DHW performance factor $N_L$ depends on cylinder storage temperature Tcyl. Standard values: Tcyl = 60 °C → 1.0 × $N_L$ Tcyl = 55 °C → 0.75 × $N_L$ Tcyl = 50 °C → 0.55 × $N_L$ Tcyl = 45 °C → 0.3 × $N_L$.*

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## Specification (cont.)



**Appliances for single connection**

| **Gas boiler, type B and C, category $II_{2N3P}$** | | | |
|---|---|---|---|
| **Type** | | **B1LG** | |
| **Rated heating output range (details to EN 15502)** | | | |
| **$T_F/T_R$ = 50/30 °C (P(50/30))** | | | |
| **Natural gas** | **kW** | **3.2 to 25.0** | **3.2 to 32.0** |
| **LPG** | **kW** | **3.2 to 25.0** | **3.2 to 32.0** |
| **$T_F/T_R$ = 80/60 °C (Pn(80/60))** | | | |
| **Natural gas** | **kW** | **2.9 to 23** | **2.9 to 29.3** |
| **LPG** | **kW** | **2.9 to 23** | **2.9 to 29.3** |
| **Max. amount of condensate** to DWA-A 251 | l/h | 4.1 | 4.9 |
| **Condensate connection** (hose nozzle) | Ø mm | 20 to 24 | 20 to 24 |
| **Flue gas connection** | Ø mm | 60 | 60 |
| **Ventilation air connection** | Ø mm | 100 | 100 |
| **Standard seasonal efficiency [to DIN] at** | | | |
| $T_F/T_R$ = 40/30 °C | % | Up to 98 ($H_s$) [gross cv] | |
| **Energy efficiency class** | | | |
| – Heating | | A | A |
| – DHW heating, draw-off profile XL | | A | A |

***Note***
*With appliances for use in multiple connection (vertical) and cascades (horizontal), the specifications in the table* ***above*** *apply, with the exception of the following data; see table "Appliances for multiple connection" on page 142*

**Appliances for multiple connection**

| **Gas boiler, type B and C, category $II_{2N3P}$** | | | |
|---|---|---|---|
| **Type** | | **B1LG-M** | |
| **Rated heating output range (to EN 15502)** | | | |
| **$T_F/T_R$ = 50/30 °C (P(50/30))** | | | |
| **Natural gas** | **kW** | **5.7 to 25.0** | **5.7 to 32.0** |
| **$T_F/T_R$ = 80/60 °C (Pn(80/60))** | | | |
| **Natural gas** | **kW** | **5.2 to 23** | **5.2 to 29.3** |
| **Rated heating output for DHW heating** | | | |
| Natural gas | kW | 5.1 to 31.1 | 5.1 to 34.6 |
| **Rated heat input (Qn)** | | | |
| Natural gas | kW | 5.3 to 23.4 | 5.3 to 29.9 |
| **Rated heat input for DHW heating (Qnw)** | | | |
| Natural gas | kW | 5.3 to 31.7 | 5.3 to 34.9 |
| **Mass flow rate (for DHW heating)** | | | |
| Natural gas | | | |
| – At rated heating output | kg/h | 57.3 | 62.1 |
| – at partial load | kg/h | 9.8 | 9.8 |
| **Available draught** for type $C_{(10)}$ (at header system interface) | Pa | 25 | 25 |
| Maximum permissible pressure differential between flue gas outlet and air inlet with $C_{(10)}$ | Pa | –200 | –200 |

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## Specification (cont.)

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

**Flue system types**

| Available in the following countries | Flue system types |
|---|---|
| AE, AM, AT, AZ, BA, BG, BY, CH, CY, CZ, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, KG, KZ, LT, LV, MD, ME, MT, NL, NO, PL, PT, RO, RS, RU, SE, SK, TR, UA, UZ | $B_{23}$, $B_{23P}$, $B_{33}$, $C_{13}$, $C_{33}$, $C_{53}$, $C_{63}$, $C_{83}$, $C_{83P}$, $C_{93}$ ($C_{43}$, $C_{43P}$, $C_{(10)3}$, $C_{(11)3}$, $C_{(13)3}$, $C_{(14)3}$ *5) |
| AU, BE, NZ | $B_{23}$, $B_{23P}$, $B_{33}$, $C_{13}$, $C_{33}$, $C_{53}$, $C_{83}$, $C_{83P}$, $C_{93}$ ($C_{43}$, $C_{43P}$, $C_{(10)3}$, $C_{(11)3}$, $C_{(13)3}$, $C_{(14)3}$ *5) |
| DE, LU, SI | $B_{23}$, $B_{23P}$, $B_{33}$, $C_{13X}$, $C_{33X}$, $C_{53X}$, $C_{63X}$, $C_{83X}$, $C_{93X}$ ($C_{43}$, $C_{43P}$, $C_{(10)3}$, $C_{(11)3}$, $C_{(13)3}$, $C_{(14)3}$ *5) |
| CN | C13 |

**Gas categories**

| Available in the following countries | Gas categories |
|---|---|
| AE,AM, AT, DK, EE, KG, LV, LU, LT, RO, RU, SE AZ, BA, BG, BY, CH, CZ, ES, FI, GB, GR, HR, IE, IS, KZ, IT, MD, ME, NO, PT, RS, SI, SK, TR, UZ HU, MT, UA | $II_{2N3P}$/$II_{2H3P}$ |
| BE | $I_{2N}$ |
| DE, FR | $II_{2N3P}$ |
| CY | $I_{3P}$ |
| NL | $II_{2EK3P}$ |
| PL | $II_{2N3P}$/$II_{2ELw3P}$ |
| CN | 12T |
| AU, NZ | NG/ULPG/$I_{2H}$ |

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

## Electronic combustion control unit

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

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

*5 *Only for specifically marked appliances.*

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## Final decommissioning and disposal

This product can be recycled. Components and fluids from the system do not belong in ordinary domestic waste.

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

## Ordering individual parts for accessories

Please affix accessory labels with part numbers here.
Please specify the relevant part no. when ordering individual parts.

## Declaration of conformity

We, Viessmann Climate Solutions GmbH & Co. KG, Viessmannstrasse 1, 35108 Allendorf (Eder), Germany, 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 GmbH & Co. KG, Viessmannstrasse 1, 35108 Allendorf (Eder), Germany, 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**

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