Installation and service instructions

for contractors

Vitodens 222-F
Type B2TB, 1.8 to 35.0 kW
Gas condensing storage combi boiler with Vitotronic 200, weather-compensated
Natural gas and LPG version

VITODENS 222-F



5812741 GB 12/2018

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.

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

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

Repair work

Please note
Repairing components that fulfil a safety function can compromise the safe operation of the system.
Replace faulty components only with genuine Viessmann spare parts.

Auxiliary components, spare and wearing parts

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

Safety instructions (cont.)

Safety instructions for operating the system

If you smell gas

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

If you smell flue gas

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

What to do if water escapes from the appliance

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

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

Condensate

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

Flue systems and combustion air

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

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

Extractors

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

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.

System examples

Available system examples: See **www.viessmann-schemes.com**.

Symbols

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

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

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

Intended use

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

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

Commercial or industrial usage for a purpose other than heating the building or DHW shall be deemed inappropriate.

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

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

Product information

Vitodens 222-F, type B2TB

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

- Modulating MatriX cylinder burner for natural gas and LPG
- Integral loading cylinder, capacity
  - 100 l (13 to 26 kW)
  - 130 l (35 kW)
- Hydraulics with 3-way diverter valve and variable speed high efficiency circulation pump
- Vitotronic 200 for weather-compensated operation with touch user interface
- Integral diaphragm expansion vessel (12 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 222-F 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.

(cont.)

Preparing for boiler installation

Use a connection set or connection kit, available as an accessory, to make the connection on the gas and water sides.

Fitting accessories
Fit all accessories that are installed at the back of the boiler (e.g. connection sets).

Preparing connections on site:
Connection set installation instructions
or
Assembly kit installation instructions

Note
Fit safety equipment in accordance with the national regulations.

Please note
Avoid damaging the appliance.
Connect all pipework free of load and torque stress.

The following diagram shows sample connection sets for surface mounting, with connection to the top or side.

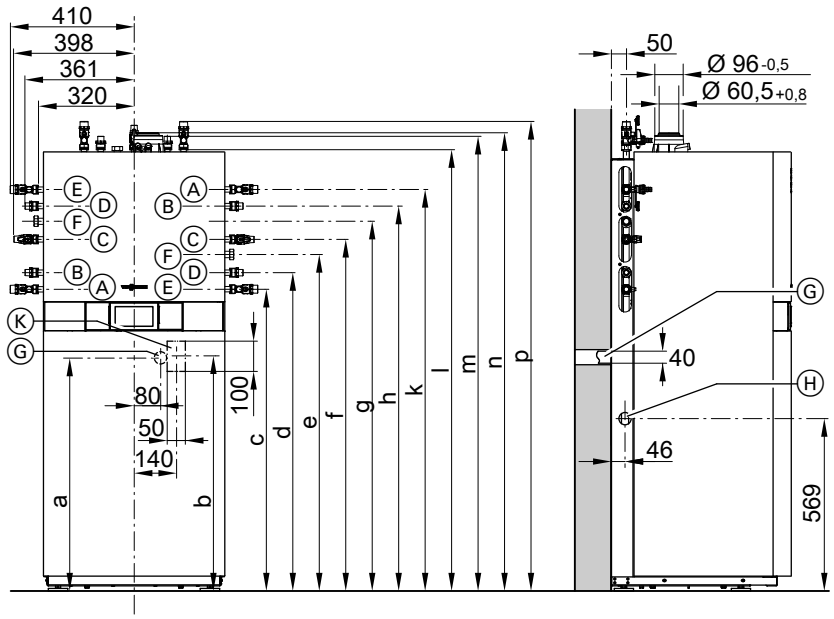


Fig. 1

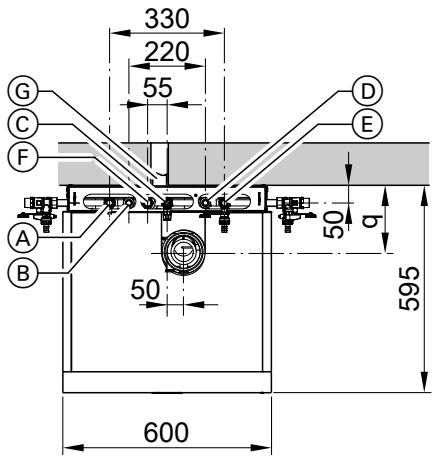


Fig. 2

Ⓐ Heating flow R ¾
Ⓑ DHW R ½
Ⓒ Gas connection R ¾
Ⓓ Cold water R ½
Ⓔ Heating return R ¾
Ⓕ DHW circulation R ½ (separate accessory)
Ⓖ Condensate drain facing backwards into the wall
Ⓗ Condensate drain to the side
Ⓚ Wiring area

Rated heating output	13 - 19 kW	26 kW	35 kW
a (mm)	745	745	945
b (mm)	750	750	950
c (mm)	972	972	1172
d (mm)	1027	1027	1227
e (mm)	1082	1082	1302
f (mm)	1137	1137	1337
g (mm)	1191	1191	1391
h (mm)	1247	1247	1447
k (mm)	1302	1302	1562
l (mm)	1437	1437	1637
m (mm)	1466	1466	1666
n (mm)	1465	1465	1665

(cont.)

Rated heating output	13 - 19 kW	26 kW	35 kW
p (mm)	1526	1526	1726
q (mm)	201	224	224

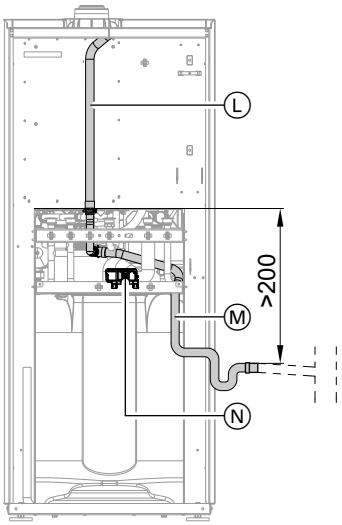


Fig. 3

Ⓛ Trap air vent valve
Ⓜ Condensate drain hose
Ⓝ Cable retainer

Note
All height dimensions have a tolerance of +7 mm on account of the adjustable feet.

1. Prepare the connections on the heating water side. Thoroughly flush the heating system.

Note
If an on-site expansion vessel also has to be installed: Install this expansion vessel in the heating return, as the 3-way diverter valve is located in the heating flow.

2. Prepare the connections on the DHW side. Install the safety assembly (accessories or on-site provision) in the cold water line to DIN 1988 and EN 806. See the following chapter.
Recommendation:
Install the safety valve above the DHW cylinder to protect it against contamination, scaling and high temperatures.
ⒸⒽ: According to W3 "Principles for creating potable water installations", safety valves must be drained directly via a visible unrestricted drain or via a short outlet line to the drain network.

3. Prepare the condensate connection to the on-site waste water pipe or trap:
- Drain towards the back:
  See dimensions for condensate hose Ⓜ and position Ⓖ in the previous diagrams.
- Drain towards the side aperture:
  See position Ⓗ in the previous diagram.

Note
*Do **not** connect the DHW cylinder safety valve to hose Ⓛ. Do **not** change the position of hose Ⓛ (used for ventilation).*

Route the condensate hose with a U-bend. Connect it with a fall to the on-site waste water pipe or trap.

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

5. Prepare the electrical connections.
- The appliance is delivered fitted with an approx. 1.5 m long power cable. Route the cable outwards through the cable holder in area Ⓝ. Max. fuse rating 16 A, 230 V~, 50 Hz (for cable routing, see chapter "Electrical connections").
- Accessory cables: 0.75 mm² flexible cable with required number of cores for external connections

(cont.)

Safety assembly to DIN 1988 and EN 806 on the cold water connection

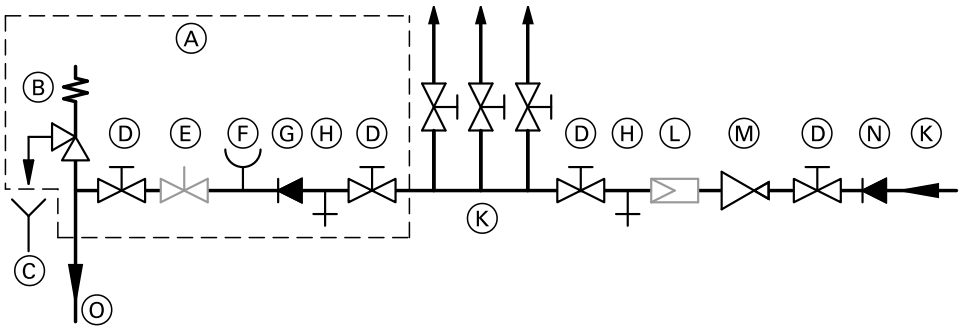


Fig. 4

Ⓐ Safety assembly (accessories for connection sets for unfinished walls)
Ⓑ Safety valve
Ⓒ Visible discharge pipe outlet point
Ⓓ Shut-off valve
Ⓔ Flow regulating valve (installation recommended)
Ⓕ Pressure gauge connection
Ⓖ Non-return valve
Ⓗ Drain outlet
Ⓚ Cold water
Ⓛ Drinking water filter
Ⓜ Pressure reducer to DIN 1988-2, Dec. 1988 issue
Ⓝ Non-return valve/pipe separator
Ⓞ Cold water connection at connection set (accessories)

A safety assembly Ⓐ to DIN 1988 and EN 806 is required if the mains water supply pressure exceeds 10 bar (1 MPa), and no DHW pressure reducing valve is installed (to DIN 4753).
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.

Removing the front panels

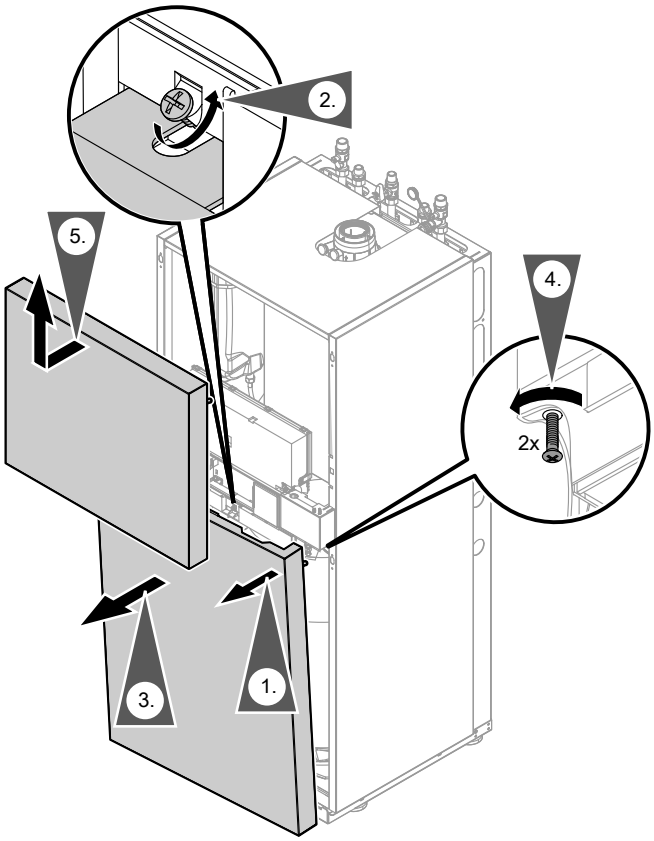


Fig. 5

Siting and levelling the boiler

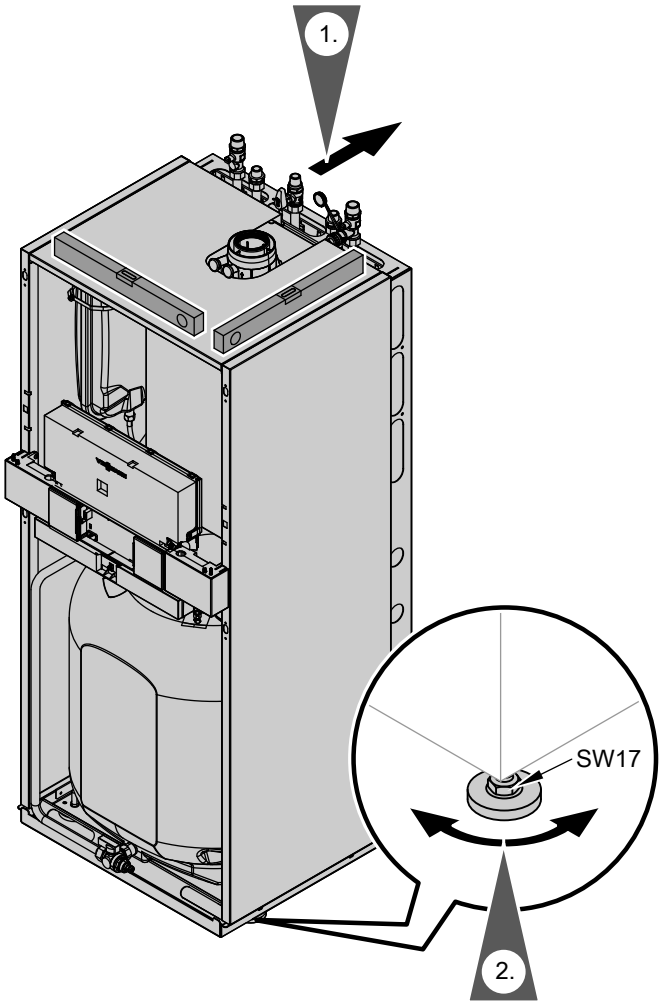


Fig. 6

Note
Position the appliance and accessories so that they are flush with the wall.

Fitting the additional type plate

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

2. In consultation with the system user, attach the additional type plate to the outside of the appliance in a position visible to the flue gas inspector.

Heating water and DHW connections

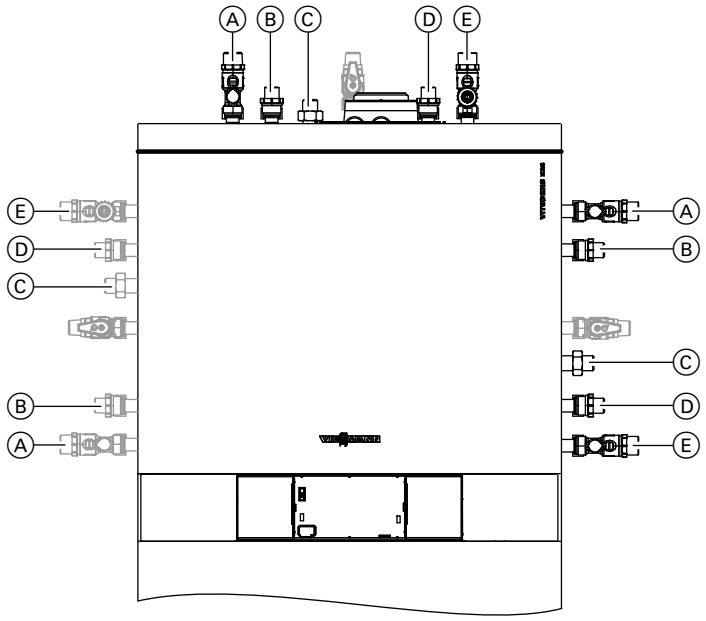


Fig. 7 Shown with connection sets for finished walls (accessories)

Ⓐ Heating flow R ¾
Ⓑ DHW R ½
Ⓒ DHW circulation R ½ (separate accessories)
Ⓓ Cold water R ½
Ⓔ Heating return R ¾

Connection on the DHW side

The DHW expansion vessel, available as an accessory, is installed in the cold water supply inside the boiler.

Separate installation instructions

Condensate connection

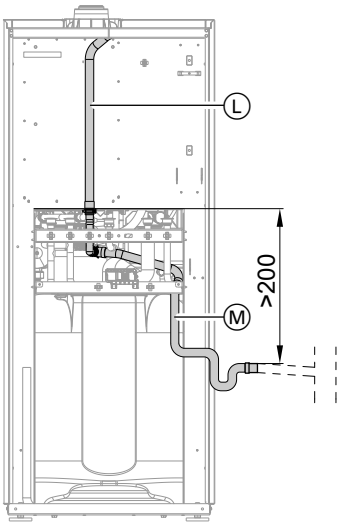


Fig. 8

1. Route condensate hose Ⓜ to the back (drain in wall Ⓖ) or to side aperture Ⓗ (see page 9).

Note
Pull the condensate hose far enough out of the boiler so that no unnecessary bends are created inside the boiler.

2. Route condensate hose Ⓜ as a U-bend and connect with a constant fall and a pipe vent to the public sewage system or to a neutralising system.
If necessary, connect to an on-site trap. Ensure this connection is secure.
Observe local waste water regulations.

Note
*Do **not** connect the DHW cylinder safety valve to hose Ⓛ. Do **not** change the position of hose Ⓛ (used for ventilation).*

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Condensate connection (cont.)

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

  Please note
  A frozen condensate pipe can result in faults and damage to the boiler.
  Always protect condensate pipes against frost.
- Observe local building regulations.

Observe local waste water regulations.

Note
Fill the trap with water before commissioning.

Flue gas connection

Note
- *The "System certification" and "Skoberne GmbH flue system" labels enclosed with the technical documentation may only be used in conjunction with the Viessmann flue system made by Skoberne.*
- *During installation and positioning of the flue system, observe Building Regulations Part L and BS 5440 [GB only].*

Connecting several Vitodens to a shared flue system

If connecting several Vitodens to a shared flue system, install a back draught safety device in each boiler.
- Multiple vertical connections:
  Back draught safety device available as separate accessory
- Flue gas cascade:
  Back draught safety device in standard delivery for the flue gas cascade (accessories)

Install the back draught safety device:

Do not carry out **commissioning** until the following conditions are met:
- Free passage through the flue gas pipes.
- Flue system with positive pressure is gas-tight.
- Inspection port covers checked for secure and tight seating.
- Apertures for ensuring sufficient combustion air supply are open and cannot be closed off.
- Applicable regulations on installing and commissioning flue systems have been followed.

Connecting the balanced flue pipe
Flue system installation instructions.

Back draught safety device installation instructions

Change control unit to operation with a shared flue system:
- In the commissioning assistant, select the **"Multiple connections"** setting under **"Flue system"**.
  or
- Set parameter/code 7E:1 in the "General" group.

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

Gas connection

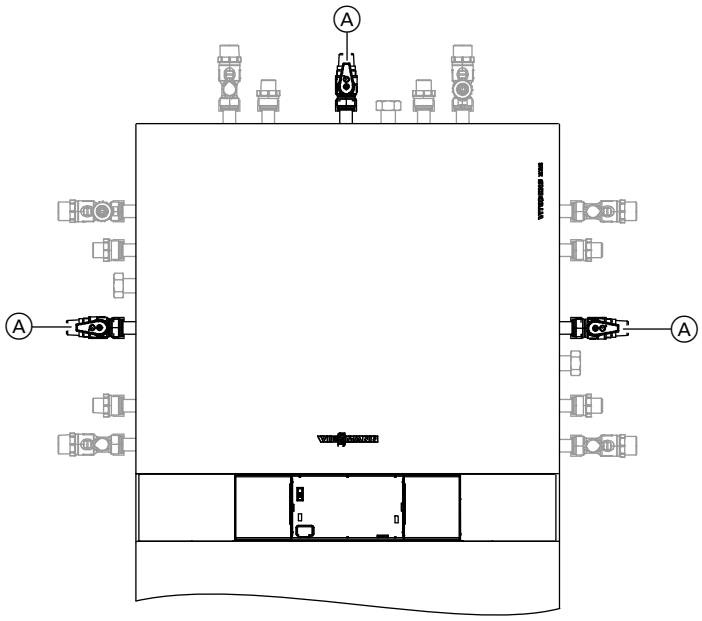


Fig. 9

1. If the gas connection has not been fitted previously, seal gas shut-off valve Ⓐ to the gas connection.

Information on operation with LPG
Install an external safety solenoid valve if the boiler is installed below ground level.

2. **Danger**
Escaping gas leads to a risk of explosion.
Check all gas connections 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 the gas train.
Max. test pressure 150 mbar (15 kPa).
Where higher pressure is required for tightness tests, disconnect the boiler and the gas train from the main supply pipe (undo the fitting).

3. Purge the gas line.

Conversion to alternative gas types:
See "Commissioning, inspection and maintenance".

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Opening the control unit enclosure

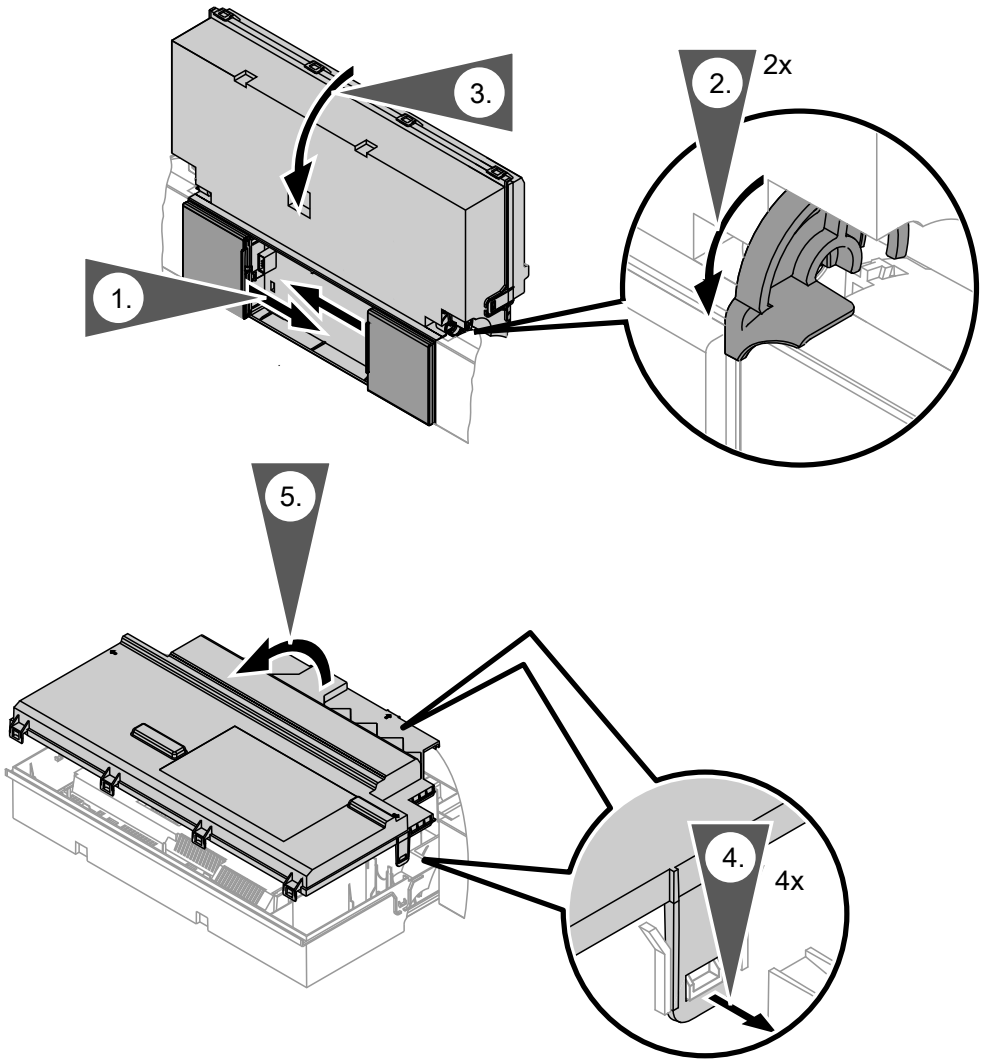


Fig. 10

Electrical connections

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

Electrical connections (cont.)

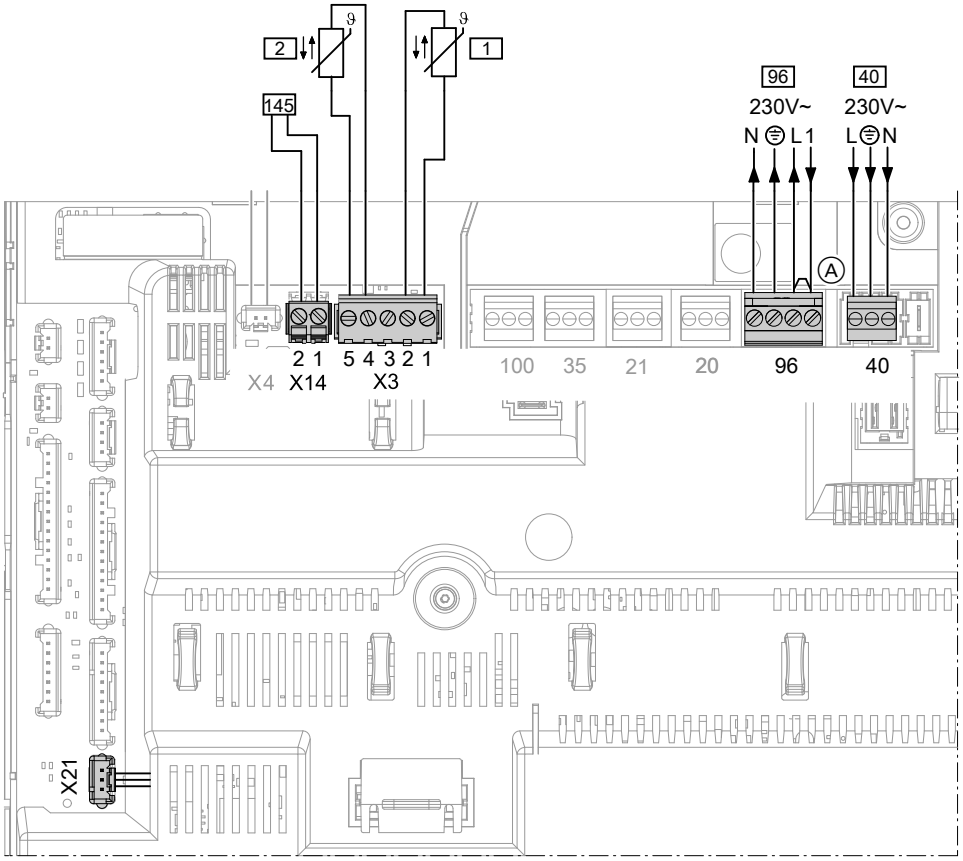


Fig. 11

Ⓐ Jumper

Connections to 230 V~ plugs

40 Power supply
The power cable is connected in the delivered condition.

96
- Power supply for accessories
- External demand/blocking

Connections to LV plugs

X3 Remove for easier installation.
- 1 Outside temperature sensor
- 2 Flow temperature sensor for low loss header (accessories)

X14 145 KM-BUS subscriber (accessories)
- Vitotrol 200-A or Vitotrol 300-A remote control
- Mixer extension kit
- AM1 extension
- EA1 extension
- Wireless base station
- KM-BUS distributor

X21 CO limiter (accessories)

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

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Electrical connections (cont.)

Routing the power cable

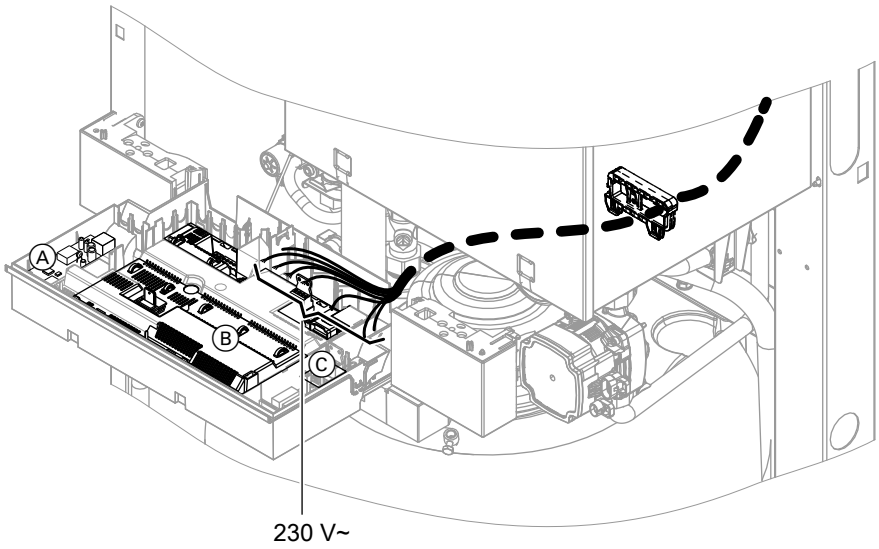


Fig. 12

Note
The power cable (already connected to the control unit) is packed in the appliance behind the control unit.

Ⓐ LON communication module (accessories)
Ⓑ Main PCB
Ⓒ Internal extension (accessories)

Outside temperature sensor 1

Fitting location for outside temperature sensor

- North or north-westerly wall, 2 to 2.5 m above ground level; in multi storey buildings, in the upper half of the second floor
- Not above windows, doors or vents
- Not immediately below balconies or gutters
- Never render over.

Outside temperature sensor connection

2-core lead, length max. 35 m with a cross-section of 1.5 mm^2

Electrical connections (cont.)

Connecting the Vitoconnect 100 connecting cable (accessories)

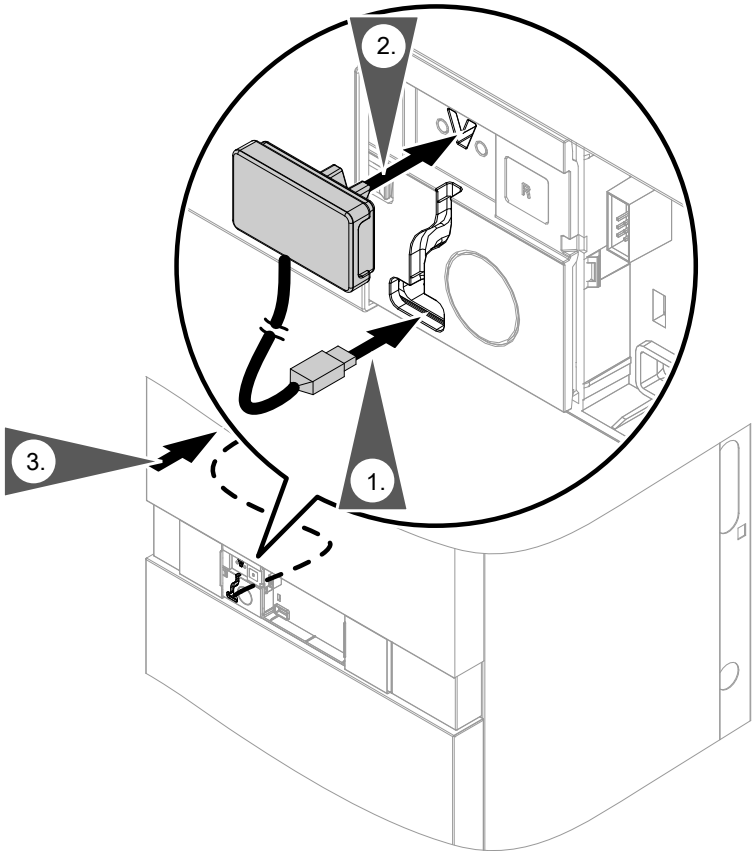


Fig. 13

Installing the Vitoconnect 100

Vitoconnect 100 installation and commissioning instructions

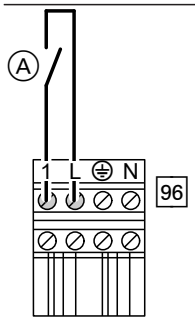
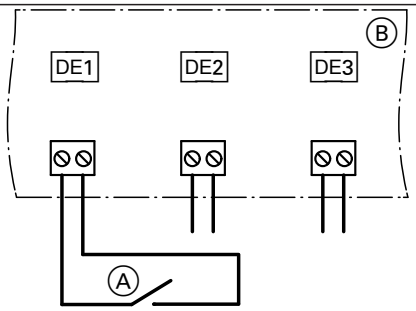
External demand via switching contact

Connection options:
- EA1 extension (accessory, see separate installation instructions)
- Plug 96

When the contact is closed, burner operation is load-dependent. The boiler water is heated to the value set in parameter "9b" in the **"General"** group. The boiler water temperature is limited by this set value and the electronic maximum limit (parameter "06" in the **"Boiler"** group).

Please note
Live contacts lead to short circuits or phase failure.
The external connection **must be potential-free** and meet the requirements of protection class II.

Electrical connections (cont.)

Plug 96	EA1 extension
	
Ⓐ Floating contact (when connecting, remove jumper – if installed – between L and 1)	Ⓐ Floating contact Ⓑ EA1 extension
Parameter settings ▪ "4b:1" in the **"General"** group ▪ Effect of the function on the relevant heating circuit pump: Parameter "d7" in the **"Heating circuit"** group ▪ Effect of the function on the circulation pump for cylinder heating (if installed): Parameter "5F" in the **"DHW"** group	**Parameter settings** ▪ Set "3A" (DE1), "3b" (DE2) or "3C" (DE3) in the **"General"** group to 2 ▪ Effect of the function on the relevant heating circuit pump: Parameter "d7" in the **"Heating circuit"** group ▪ Effect of the function on the circulation pump for cylinder heating (if installed): Parameter "5F" in the **"DHW"** group

External demand via 0 – 10 V input

Connection at 0 – 10 V input at **EA1 extension**.
Ensure DC separation between the earth conductor and the negative pole of the on-site power source.

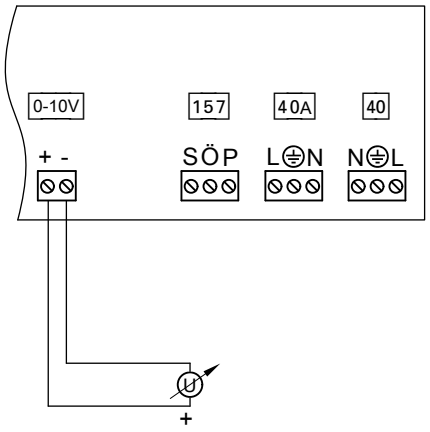


Fig. 14

0 to 1 V	No specification for set boiler water temperature
1 V	Set value 10 °C
10 V	Set value 100 °C

External blocking via switching contact

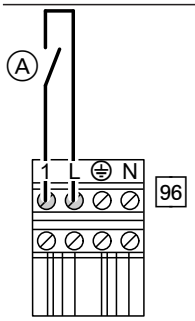
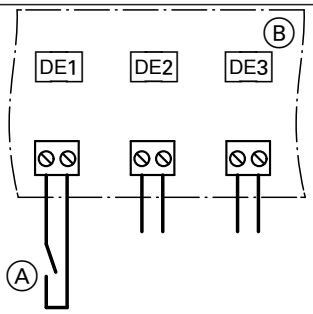
Connection options:
- Plug 96
- EA1 extension (accessory, see separate installation instructions)

When the contact is closed, the burner is switched off. The heating circuit pump and (if installed) circulation pump for cylinder heating are switched according to the following parameter settings.

Please note
Live contacts lead to short circuits or phase failure.
The external connection **must be potential-free** and meet the requirements of protection class II.

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Electrical connections (cont.)

Plug 96	EA1 extension
 Ⓐ Floating contact (when connecting, remove jumper – if installed – between L and 1)	 Ⓐ Floating contact Ⓑ EA1 extension
Parameter settings ▪ "4b:2" in the **"General"** group ▪ Effect of the function on the heating circuit pump: Parameter "d6" in the **"Heating circuit"** group ▪ Effect of the function on the circulation pump for cylinder heating (if installed): Parameter "5E" in the **"DHW"** group	**Parameter settings** ▪ Set "3A" (DE1), "3b" (DE2) or "3C" (DE3) in the **"General"** group to 3 or 4 ▪ Effect of the function on the heating circuit pump: Parameter "d6" in the **"Heating circuit"** group ▪ Effect of the function on the circulation pump for cylinder heating (if installed): Parameter "5E" in the **"DHW"** group

Power supply for accessories at plug 96 (230 V ~)

Where the boiler is sited in a wet room, accessories outside the wet area must not be connected to the power supply at the control unit. If the boiler is not sited in a wet room, the power supply for accessories can be connected at the control unit. This connection is switched directly with the ON/OFF switch of the control unit.

If the total system current exceeds 6 A, connect one or more extensions directly to the mains supply via an ON/OFF switch (see next chapter).

Note
Connect all accessories to the power supply with flexible cables.

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Electrical connections (cont.)

Power supply to all accessories via heat source control unit

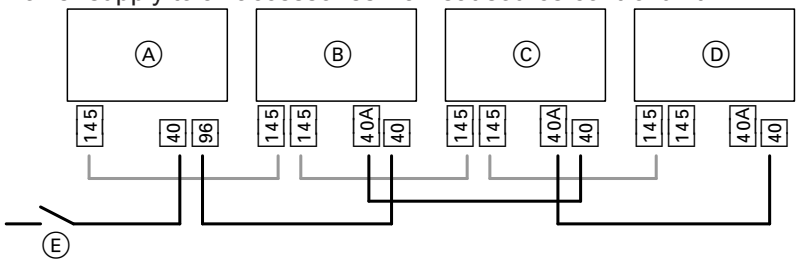


Fig. 15

Some accessories with direct power supply

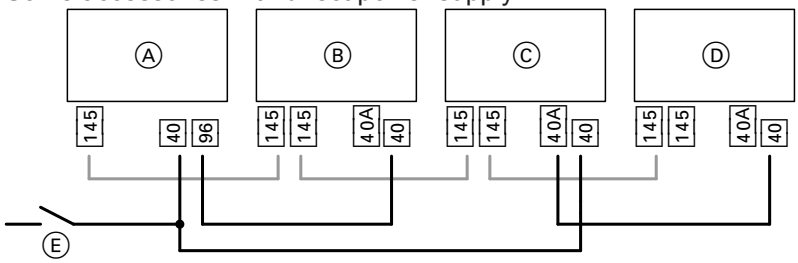


Fig. 16

Ⓐ Heat source control unit
Ⓑ Extension kit for heating circuit with mixer M2 (control unit for weather-compensated operation only)
Ⓒ Extension kit for heating circuit with mixer M3 (control unit for weather-compensated operation only)
Ⓓ AM1 extension or EA1 extension
Ⓔ On-site ON/OFF switch
40 Mains input
40A Power outlet
96 Power outlet at the control unit
145 KM BUS connection

If the current flowing to the connected working parts (e.g. circulation pumps) is higher than the fuse rating of the relevant accessory, only use the output concerned to control an on-site relay.

Accessories	Internal fuse protection
Extension kit for heating circuit with mixer	2 A
AM1 extension	4 A
EA1 extension	2 A

Power supply 40

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

Connect the power supply and implement all safety measures (e.g. RCD circuit) in accordance with the following regulations:
- IEC 60364-4-41
- VDE regulations
- TAR medium voltage VDE-AR-N-4110

- 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 full isolation. This isolator must be fitted in the permanent electrical installation, in line with the installation requirements.
  In addition we recommend the installation of an AC/DC-sensitive RCD (FI Class B ⏦ ⎓) for DC (fault) currents that can arise from energy efficient equipment.
- Connect the power cable to the electricity supply using a fixed connection.
- If the power supply to the appliance is connected with a flexible 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.

Electrical connections (cont.)

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

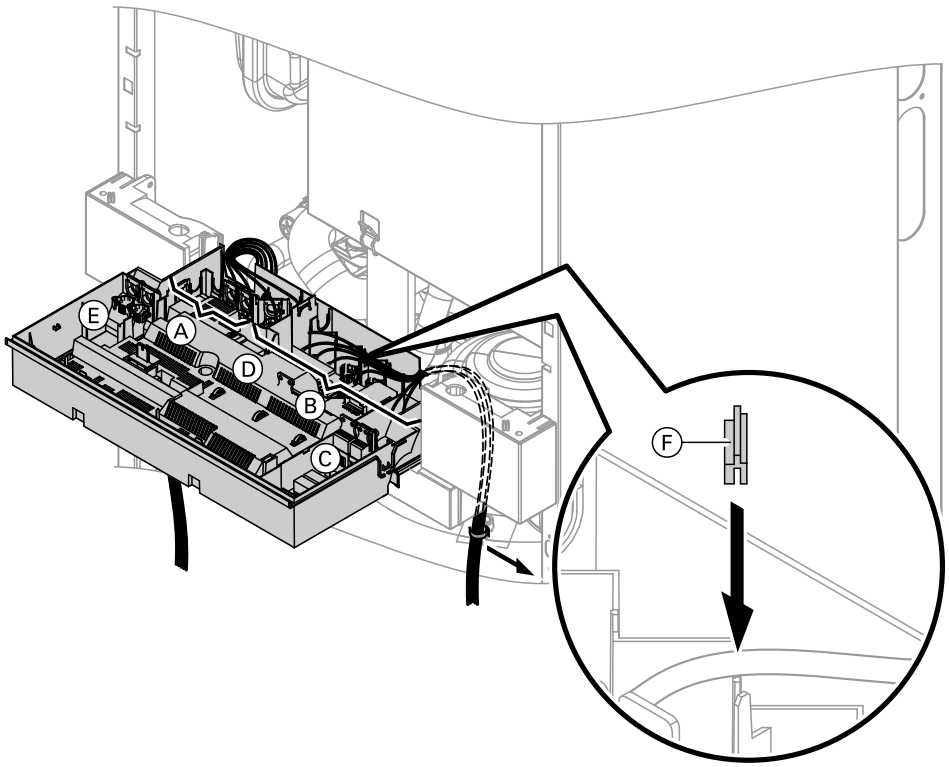


Fig. 17

Ⓐ LV terminals
Ⓑ 230 V terminals
Ⓒ Internal extension
Ⓓ Main PCB
Ⓔ Communication module (accessories)
Ⓕ Cable grommet for power cable

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Closing the control unit enclosure and inserting the programming unit

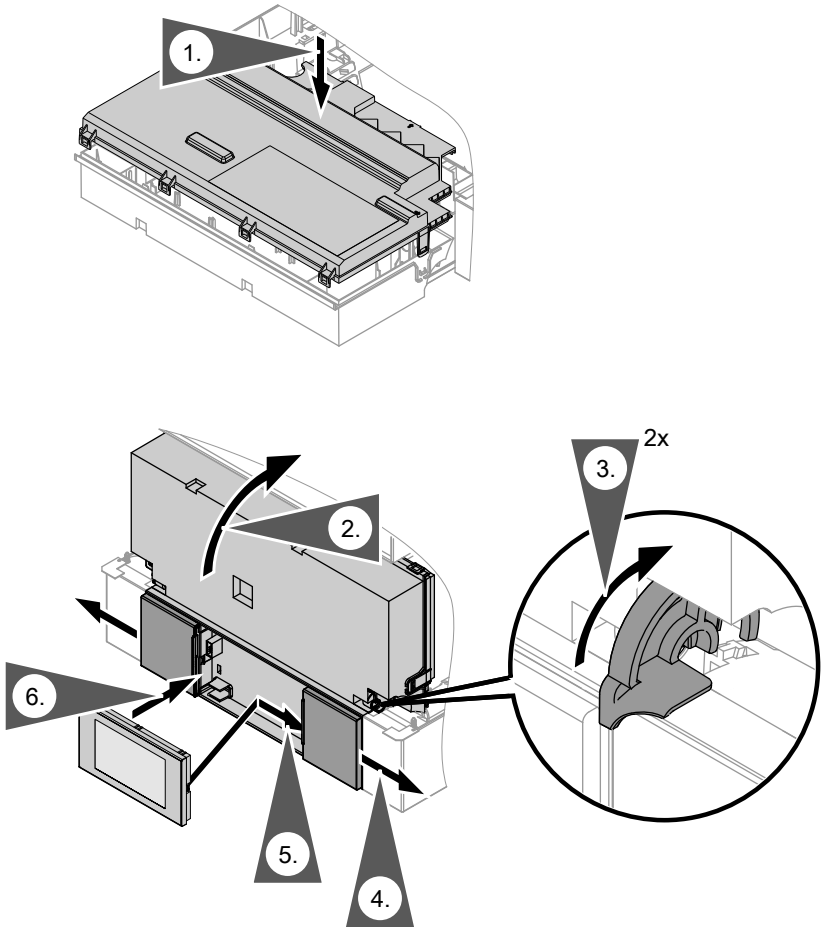


Fig. 18

Insert the programming unit (packed separately) into the control unit support.

Note
The programming unit can also be inserted into a wall mounting base (accessories) near the boiler.

Wall mounting base installation instructions

Fitting the front panels

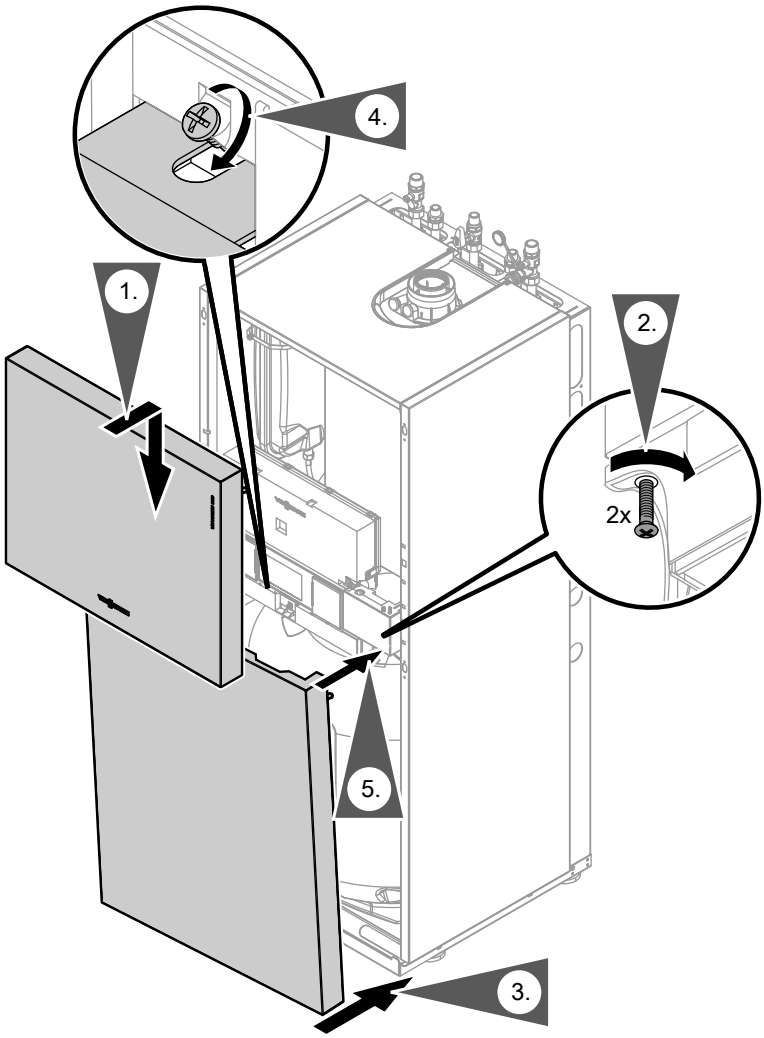
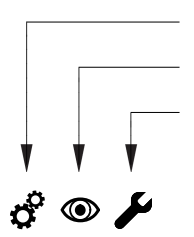


Fig. 19

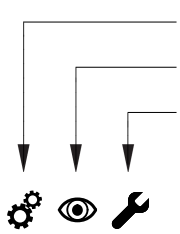
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Steps - commissioning, inspection and… (cont.)



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Removing the front panels

See page 12.

Filling the heating system

Fill water

According to EN 1717 with DIN 1988-100, as a heat transfer medium for DHW heating, the heating water must meet fluid category ≤ 3. This requirement is met if water of potable quality is used as heating water. For example, if additives are used, the additive manufacturer must specify which category the treated heating water comes under.

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

Total permissible hardness of the fill and top-up water

Total heating output	Specific system volume		
kW	< 20 l/kW	≥ 20 l/kW to < 50 l/kW	≥ 50 l/kW
≤ 50	≤ 3.0 mol/m³ (16.8 °dH)	≤ 2.0 mol/m³ (11.2 °dH)	< 0.02 mol/m³ (0.11 °dH)
> 50 to ≤ 200	≤ 2.0 mol/m³ (11.2 °dH)	≤ 1.5 mol/m³ (8.4 °dH)	< 0.02 mol/m³ (0.11 °dH)
> 200 to ≤ 600	≤ 1.5 mol/m³ (8.4 °dH)	≤ 0.02 mol/m³ (0.11 °dH)	< 0.02 mol/m³ (0.11 °dH)
> 600	< 0.02 mol/m³ (0.11 °dH)	< 0.02 mol/m³ (0.11 °dH)	< 0.02 mol/m³ (0.11 °dH)

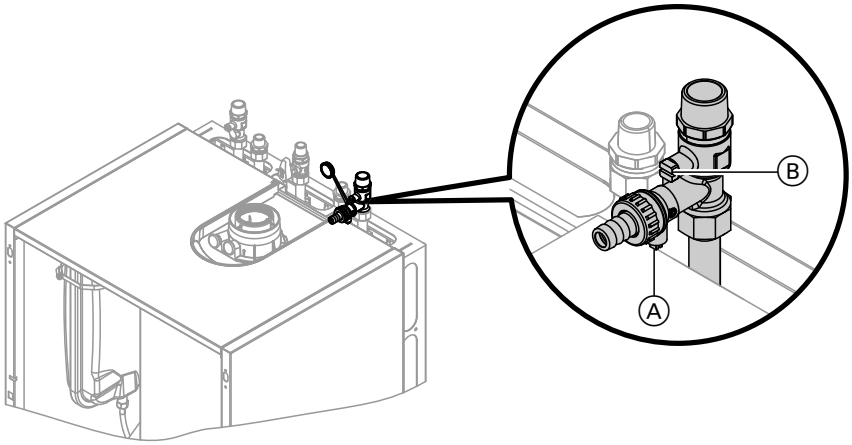


Fig. 20 Shown with connection set for finished walls (accessories)

1. Check the pre-charge pressure of the diaphragm expansion vessel (see page 52).
2. Close the gas shut-off valve.
3. Open shut-off valves Ⓑ on the heating water side.

Filling the heating system (cont.)

4. Fill the heating system via boiler drain & fill valve Ⓐ in the heating return (depending on the connection set either on the side or above the boiler). Minimum system pressure > 1.0 bar (0.1 MPa)

   Note
   If the control unit was not switched on prior to filling the system, then the servomotor of the diverter valve will still be in its central position and the system will be completely filled.

   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. If the control unit was already on before filling: switch the control unit ON and activate the filling function (see next chapter). Then switch the control unit OFF again.

6. Close boiler drain & fill valve Ⓐ.

Activating the filling function

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Service functions"**
5. **"Filling"**
6. Activate the filling function with **"Yes"** or ✔.
   The filling function ends automatically after 20 min or if you tap OK or "✔".

Filling the DHW cylinder on the DHW side

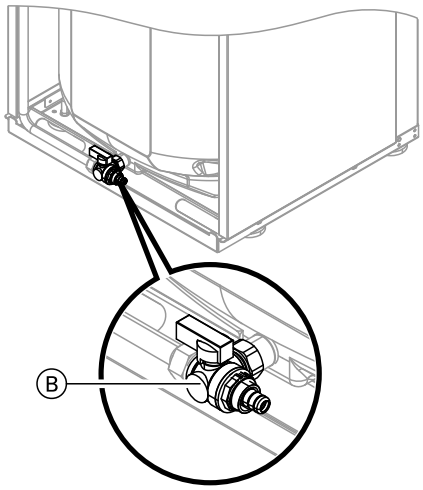


Fig. 21

1. The lever on valve Ⓑ must be in the "left" position.
2. Open the on-site DHW supply and a DHW draw-off point.
3. Once air stops coming out of the DHW draw-off point, the DHW cylinder is completely filled.

Venting the boiler

Venting the boiler

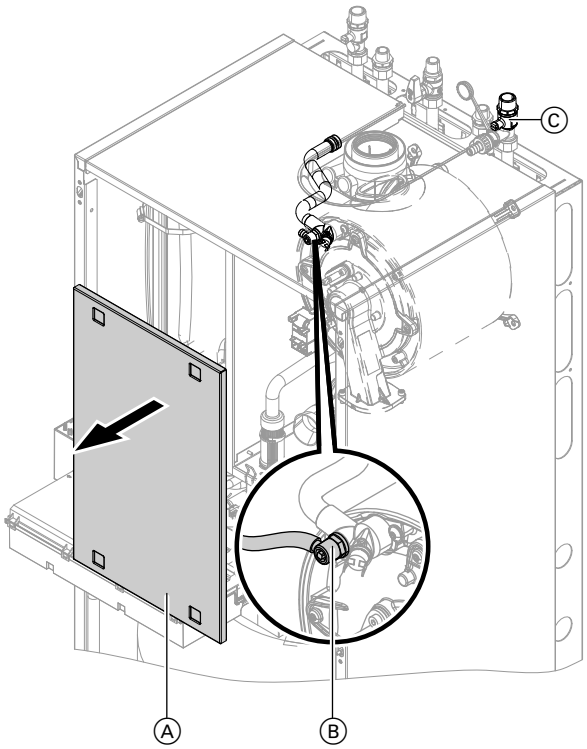


Fig. 22

1. Close the shut-off valves on the heating water side.

   Note
   Only carry out the following tasks with the control unit switched off.

2. Pivot the control unit forwards. Remove cover panel Ⓐ.

3. Connect drain hose to air vent valve Ⓑ. Connect the drain hose to a drain outlet.

4. Open air vent valve Ⓑ and fill valve Ⓒ in the heating return and vent (flush) using mains pressure until no more air noise can be heard.

5. First close air vent valve Ⓑ.

6. When the required operating pressure has built up, close fill valve Ⓒ. Open the shut-off valves on the heating water side.

7. Remove the drain hose again from air vent valve Ⓑ and retain outside the boiler.

Filling the trap with water

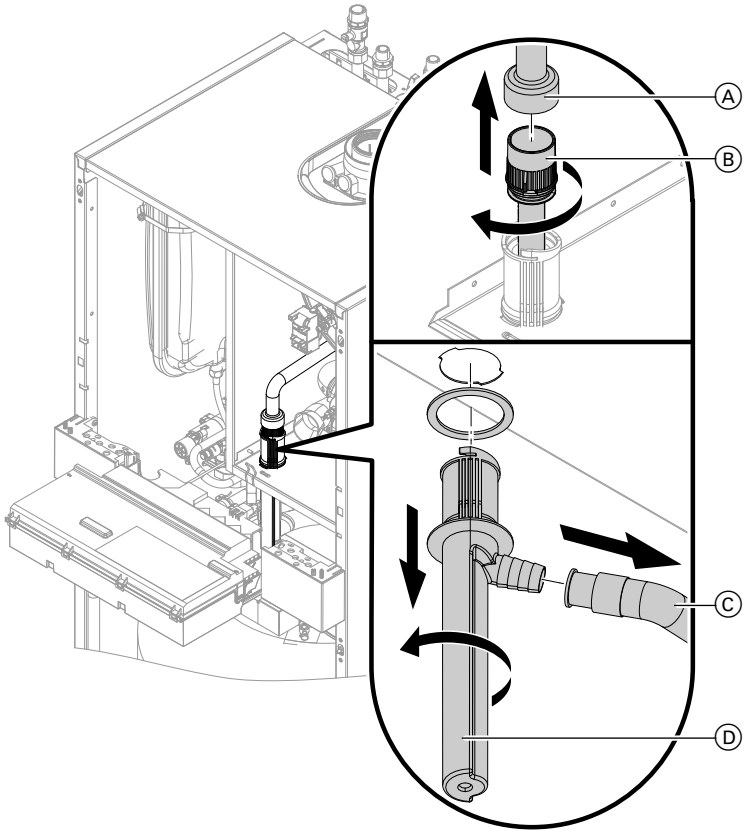


Fig. 23

1. Disconnect condensate hose Ⓐ from the trap.
2. Turn internal pipe Ⓑ and pull upwards.
3. Disconnect corrugated hose Ⓒ from lute Ⓓ.
4. Turn the lute, tilt slightly and pull downwards.
5. Fill the lute with water.
6. Refit lute Ⓓ. Connect corrugated hose Ⓒ.

! **Please note**
Prevent water escaping.
Seal off the drain opening when installing the lute.

7. Reassemble the trap in reverse order.
8. Check that the condensate hose is connected correctly to the trap and heat exchanger.

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

9. Fit the cover panel. Secure the control unit back in the operating position.

Venting the heating system

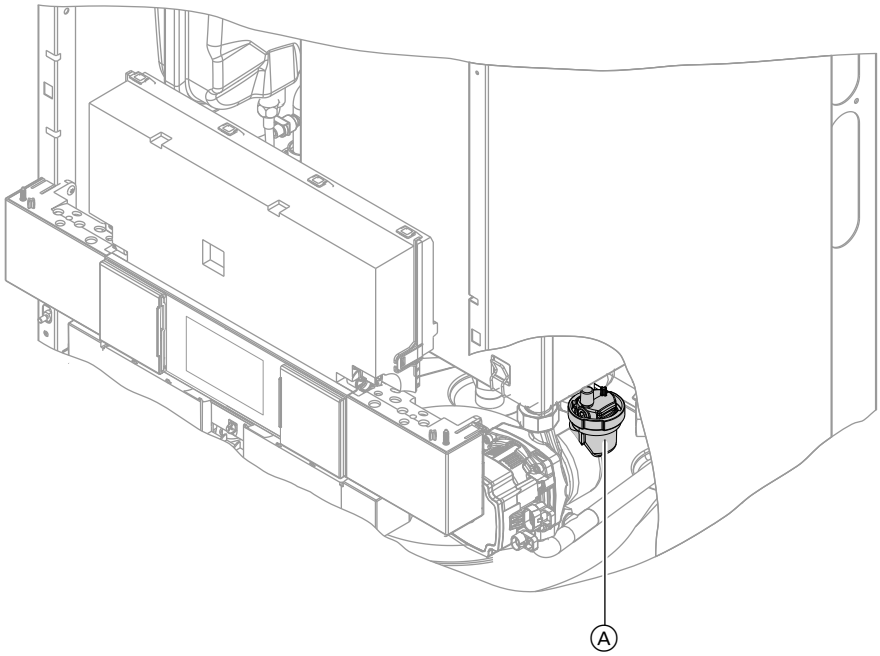


Fig. 24

1. Close the gas shut-off valve and switch the control unit ON.
2. Check whether the air vent screw in quick-action air vent valve Ⓐ of the heating circuit pump is open.
3. Activate venting function (see following steps).

   Note
   For function and sequence of the venting function, see page 141.
4. Check the system pressure.
5. Open the gas shut-off valve.

Activating the venting function

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Service functions"**
5. **"Air vent valve"**
6. Activate the venting function with **"Yes"** or "✔". The venting function ends automatically after 20 min or if you tap OK or "✔".

Commissioning the system with the commissioning assistant

Commissioning assistant

Note
The operating instructions are relevant for various "display versions" and "symbols", which is why 2 images are shown.

Commissioning the system with the commissioning… (cont.)



Fig. 25 HO2B

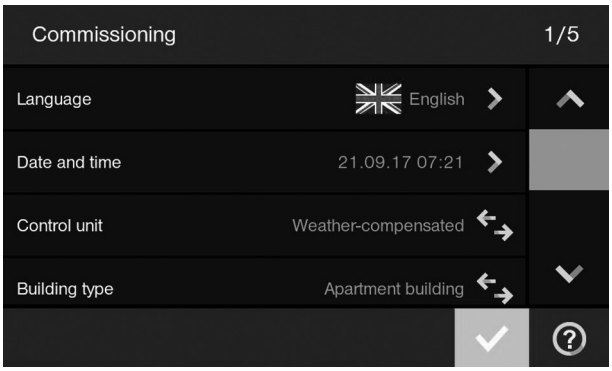


Fig. 26 HO2C

1. Turn on the ON/OFF switch on the control unit.
   The commissioning assistant starts automatically.

2. Optional settings and functions for commissioning are listed in the following table.

   Note
   The adjustable settings and functions depend on the type of appliance and control unit.

3. When all the required commissioning steps have been performed, tap **"Next"** or "✔".
   A safety instruction is shown on the display.

4. After successfully reviewing the safety information, tap **"Yes"** or "✔" to confirm.
   This initiates an automatic flue gas temperature sensor test.
   The display shows: **"Testing, flue gas temperature sensor"** and **"Enabled"**.
   If the flue gas temperature sensor is not positioned correctly, fault message A3 appears on the display.
   For further details regarding the flue gas temperature sensor test, see Maintenance.

5. If fault message A3 appears, reposition the flue gas temperature sensor in the flue gas connection.

   Note
   The burner remains blocked until the test has been passed.

6. When the fault has been remedied, turn the ON/OFF switch off and then back on again.
   Confirm the commissioning assistant with **"Next"** or "✔".

Menu point	Settings and explanations
"Language"	
"Date and time"	
"Control unit"	▪ **"Weather-compensated"** Delivered condition ▪ **"Constant"** The control unit can be switched to constant operation (not Vitodens 3xx) if the system configuration makes this necessary. Not all the described settings are available in this operating mode. ***Note*** *With each change, all the settings revert to the factory settings.*
"Building type"	▪ **"Detached house"** One shared holiday program and time program for DHW heating ▪ **"Apartment building"** Holiday program and time program for DHW heating can be set separately
"Filling and venting"	See chapters "Filling the heating system" and "Venting the heating system".
"Gas type"	Only for operation with LPG: See chapter "Gas type conversion". To convert the gas type, enter password "9".

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Commissioning the system with the commissioning… (cont.)

Menu point	Settings and explanations
"Energy cockpit"	▪ **"ON"** The Energy cockpit with various scanning options is displayed. ▪ **"OFF"** The Energy cockpit is not displayed.
"Flue system" (not Vitodens 3xx)	▪ **"Single connection"** Only one boiler is connected to the flue system. ▪ **"Multiple connections"** Several boilers are connected to the flue system.

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. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Commissioning"**

Extended commissioning assistant

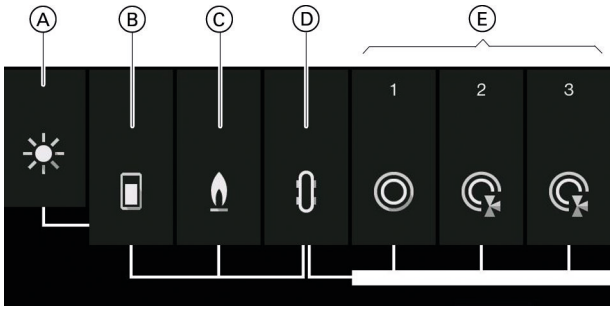


Fig. 27 HO2C

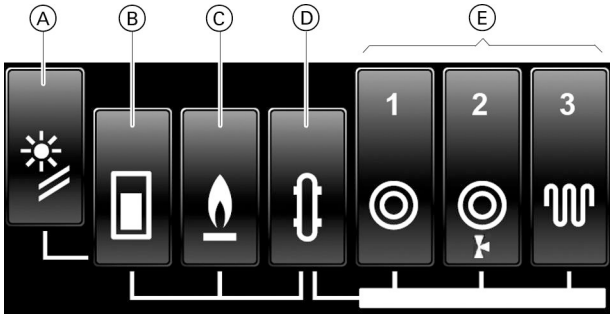


Fig. 28 HO2B

Ⓐ Solar thermal system
Ⓑ DHW cylinder
Ⓒ Heat generator (segments Ⓑ and Ⓒ are summarised for compact appliances)
Ⓓ Low loss header
Ⓔ Heating circuits

1. Call up the extended commissioning assistant with **"Yes"** or "✓".
   A safety instruction is shown on the display.

   Note
   *The extended commissioning assistant can be skipped with **"No"** or "✕".*

2. After successfully reviewing the safety instructions, tap **"Yes"** or "✓" to confirm. Detection of the connected sensors and system components connected via KM-BUS begins.
   This process may take some time.

3. After detecting the devices, tap **"Next"** or "✓".
   A list of detected system components (device list) appears on the display.

4. Compare the device list with the system components actually connected.
   If any components were not detected, these can be added later via the relevant parameters.

5. **Illustration of system components (if available)**
   Accept the device list with **"Next"** or "✓".
   A system scheme according to the detected components appears on the display.

6. Confirm the system scheme with **"Next"** or "✓".
   Add or remove system components with **"Change"** or "✎".
   - If there is no heating circuit without mixer in the system, it must be removed manually.
   - A second DHW cylinder must be added manually.

Commissioning the system with the commissioning… (cont.)

7. Confirm the system scheme with **"Next"** or "✓".

Further settings for the system components

Further settings can be made in relation to individual system components (fine tuning).

1. Tap the required system component.
   The setting options for that system component appear on the display.

   Note
   In relation to the heating circuits for example, the heating circuit type can be set (e.g. underfloor heating circuit or swimming pool).
   For the low loss header, there are no setting options.

2. When all the settings have been entered, tap **"Next"** or "✓".
   The display shows **"Commissioning terminated"** and the selection **"Results"**, **"Components"** and **"Settings"** appears.

   Note
   If no settings have been made, another note appears regarding fine-tuning.

   Commissioning is terminated with **"No"** or "✕".

3. To view a summary of the system configuration, tap the relevant area:
   - **"Results"**:
     - Commissioning steps that have been completed successfully are marked with a tick.
       White tick: Commissioning steps without changes.
       Green tick: Commissioning steps with changes.
     - Commissioning steps that have not been completed successfully are marked with an X.
       Adjustments can be made later via the relevant parameters.
   - **"Components"**:
     All detected sensors and KM-BUS subscribers are displayed.
   - **"Settings"**:
     All settings for the individual components are displayed.

   Return to the selection with ⮌.

4. Confirm **"Commissioning terminated"** with **"Finish"** or "✓".
   The default display appears on the screen.

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

Designating heating circuits – only for weather-compensated control units

In the delivered condition, the heating circuits are designated **"Heating circuit 1"**, **"Heating circuit 2"**, **"Heating circuit ..."** (if installed).
If the system user prefers, the heating circuits can be renamed to suit the specific system.

To enter names for heating circuits:
Operating instructions

Entering contractor contact details

The system operator can call up contact details when required and notify the contractor.

1. Tap **"Menu"** or "☰".
2. Select **"Settings"** or **"Information"**.
3. Select **"Input, service contact details"** or **"Contractor contact details"**.
4. Complete the fields and confirm each one with "**OK**" or "✓".

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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 burner must be converted (see "Gas type conversion" on page 37).

1. Determine the gas type and Wobbe index by asking your local gas supply utility or LPG supplier.
2. For operation with LPG, convert the burner (see page 37).
3. Record the gas type in the report on page 150.

Gas type conversion (only for operation with LPG)

1. To convert the gas type at the control unit, see "Commissioning the system with the commissioning assistant" on page 33

   Note
   Mechanical conversion on the gas train is not possible.

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

Checking the static pressure and supply pressure

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

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

Checking the static pressure and supply pressure (cont.)

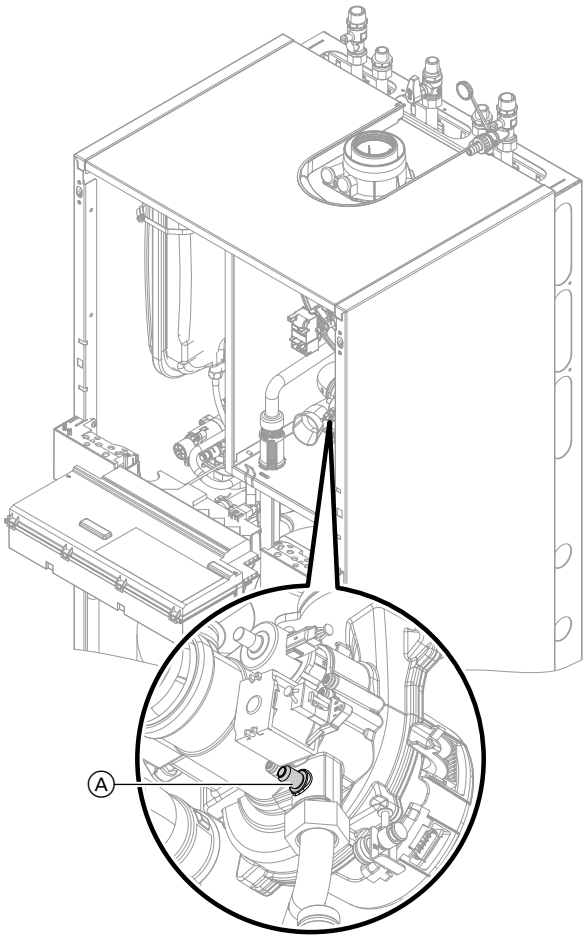


Fig. 29

1. Close the gas shut-off valve.
2. Remove the cover panel; see page 31.
3. Loosen screw Ⓐ inside test connector "PE" on the gas train, but do not remove it, and connect the pressure gauge.
4. Open the gas shut-off valve.
5. Check the static pressure and record the actual value in the report on page 150.
   Set value: max. 57.5 mbar (5.75 kPa).
6. Start the boiler.

   Note
   *During commissioning, the boiler can enter a fault state (fault EE is displayed) because of air in the gas line. After approx. 5 s, press reset button **R** to reset the burner.*
7. Check the supply (flow) pressure. For set values, see the following table.

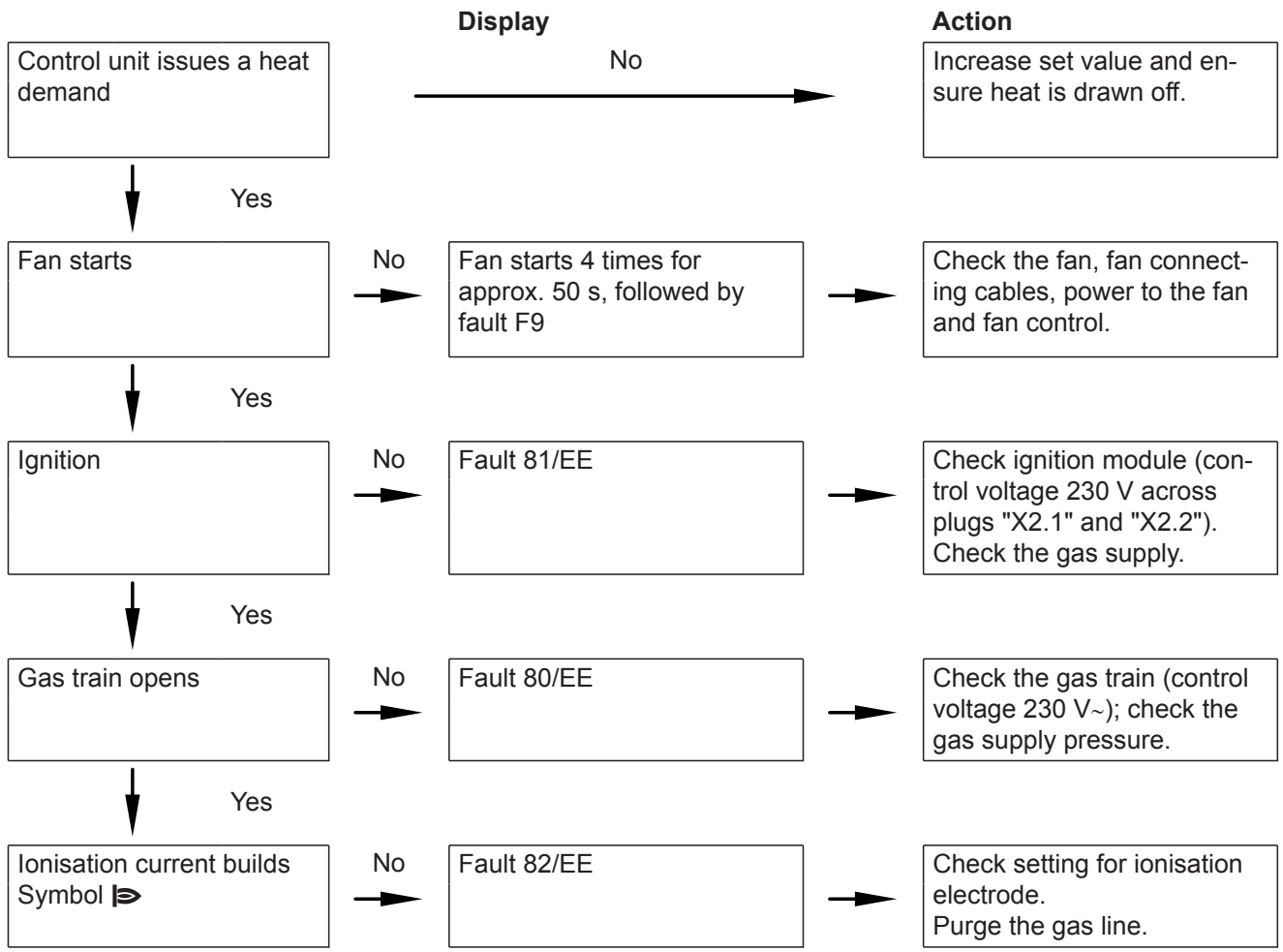
   Note
   Use a suitable measuring device with a resolution of at least 0.1 mbar (0.01 kPa) to check the supply pressure.
8. Record the actual value in the report on page 150.
   Implement measures as indicated in the table below.
9. Shut down the boiler, close the gas shut-off valve, remove the pressure gauge and close test connector Ⓐ with the screw.
10. Open the gas shut-off valve and start the appliance.

    ⚠ **Danger**
    Gas escaping from the test connector leads to a risk of explosion.
    Check gas tightness at test connector Ⓐ.
11. Fit cover panel.

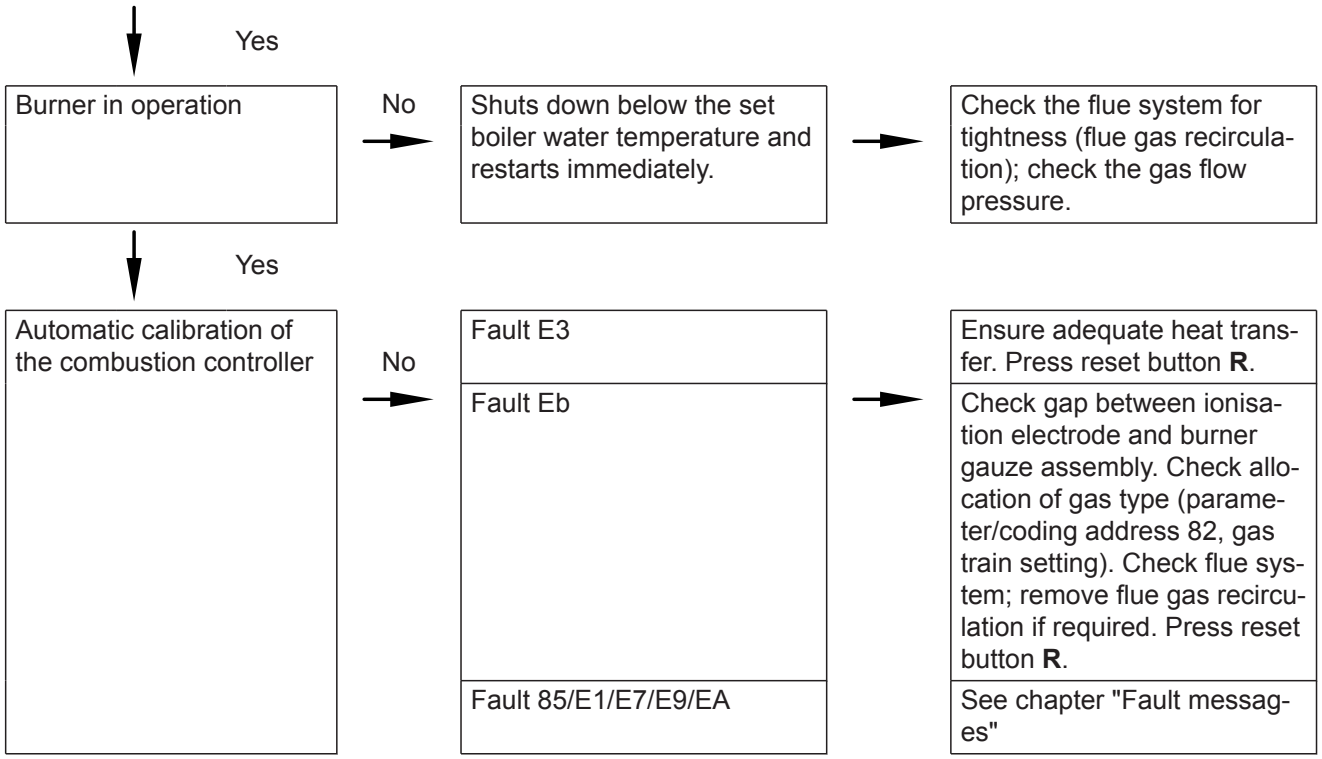
Checking the static pressure and supply pressure (cont.)

Supply pressure (flow pressure)					Measures
For natural gas				For LPG	
H	E, E+, M	L, LL, S, K	Lw		
Below 13 mbar (1.3 kPa)	Below 17 mbar (1.7 kPa)	Below 18 mbar (1.8 kPa)	Below 16 mbar (1.6 kPa)	Below 25 mbar (2.5 kPa)	Do not commission the boiler. Notify your gas supply utility or LPG supplier.
13 to 33 mbar (1.3 to 3.3 kPa)	17 to 33 mbar (1.7 to 3.3 kPa)	18 to 33 mbar (1.8 to 3.3 kPa)	16 to 33 mbar (1.6 to 3.3 kPa)	25 to 57.5 mbar (2.5 to 5.75 kPa)	Start the boiler.
Above 33 mbar (3.3 kPa)	Above 33 mbar (3.3 kPa)	Above 33 mbar (3.3 kPa)	Above 33 mbar (3.3 kPa)	Above 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 your gas supply utility or LPG supplier.

Function sequence and possible faults



Function sequence and possible faults (cont.)



For further details regarding faults, see page 93.

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. The upper limit of the max. adjustable heating output is set by the boiler coding card.

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

1. Tap **"Menu"** or "☰".
2. Select **"Service"**.
3. Enter the password **"viservice"**.
4. Select **"Service functions"**.
5. **"Max. heating output"**
6. Check that a sufficient flow rate is ensured. If necessary, increase the heat transfer.
   Confirm the note with **"Yes"** or "✔".
7. If the flow rate is sufficient, the following is shown:
   "Testing, flow rate"
   "Flow rate sufficient"
   Confirm with "**OK**" or "✔".
8. A value is shown on the display (e.g. "85"). In the delivered condition, this value represents 100 % of rated heating output.
9. Select the required value and then confirm with "**OK**" or "✔".
10. End service functions.

Adjusting the pump rate of the integral circulation pump

The pump speed and consequently the pump rate are regulated subject to the outside temperature and the switching times for heating mode or reduced mode.
The minimum and maximum speeds and the speed for reduced mode can be matched to the existing heating system at the control unit.
In the delivered condition, the minimum pump rate (parameter/code "E7") and the maximum pump rate (parameter/code "E6") are set to the following values:

Rated heating output range in kW	Speed settings in the delivered condition in %	
	Min. pump rate	Max. pump rate
13	45	60
19	45	65
26	45	80
35	45	90

Note
In conjunction with a low loss header, heating water buffer cylinder and heating circuits with mixer, the internal circulation pump runs at a constant speed. The speed can be adjusted subject to demand by changing the parameters at the control unit.

Adjusting the pump rate of the integral… (cont.)

Residual head of the integral circulation pump

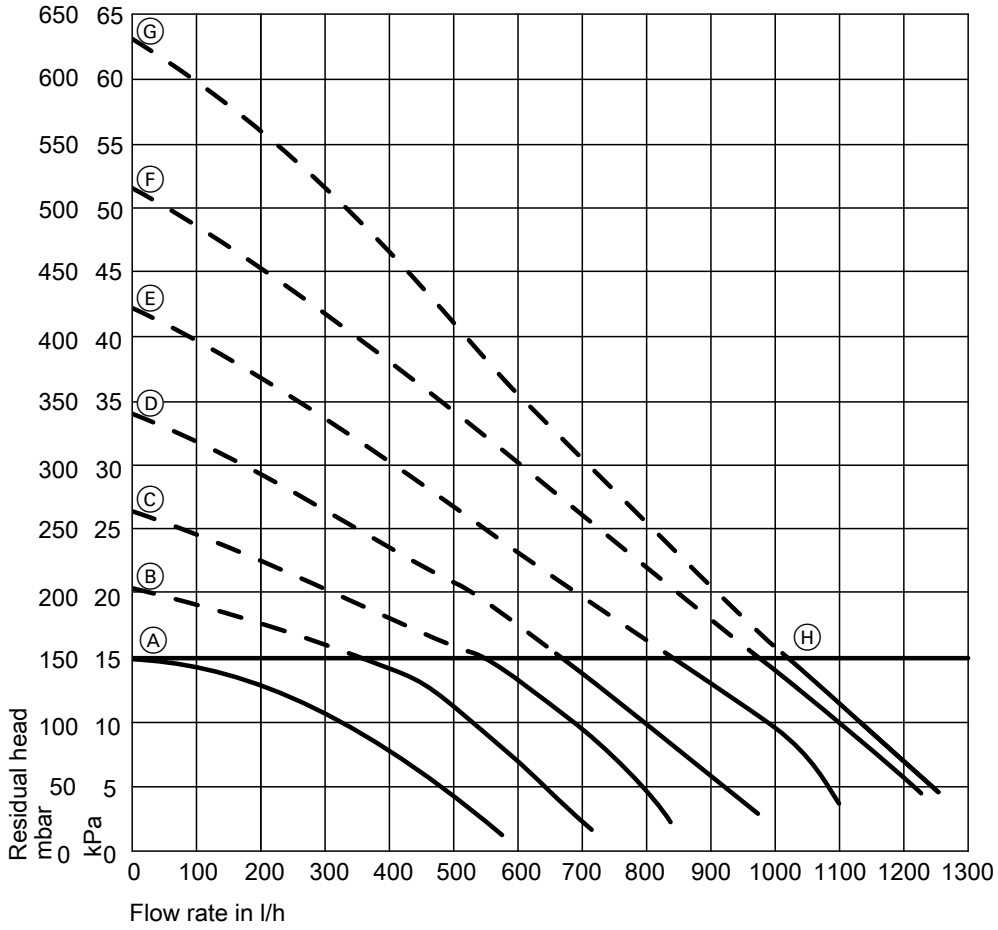


Fig. 30

Ⓗ Upper operational limit

Curve	Pump rate, circulation pump	Setting of parameter/ code "E6"
Ⓐ	40 %	E6:040
Ⓑ	50 %	E6:050
Ⓒ	60 %	E6:060
Ⓓ	70 %	E6:070
Ⓔ	80 %	E6:080
Ⓕ	90 %	E6:090
Ⓖ	100 %	E6:100

Activating screed drying

Screed drying

Various temperature profiles can be set for screed drying:

- 7 preset temperature profiles can be set via parameter F1, see parameter level 2
- Individual temperature profile, see next chapter

Setting an individual temperature profile for screed drying

Setting range for set temperature: 5 to 60 °C
Duration of screed drying program: 30 days

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Activating screed drying (cont.)

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Service functions"**
5. **"Individual prog. Screed drying"**
6. Select the day for which a set temperature is to be specified.
7. Set the required set temperature.

   Note
   *If screed drying is to be inactive on one of the days, select a set temperature of **255**.*

8. **OK** or "✓" to confirm
   The set value is automatically adopted for the following days. The daily overview reappears.
9. **OK** or "✓" to confirm
   A chart with the set program appears.
10. **OK** or "✓" to confirm
11. **Yes** or "✓" if screed drying is to be started immediately.
12. Select a heating circuit.

    Note
    While the screed program is active, the set temperature profile is displayed.

Tightness test on balanced flue system (annular gap check)

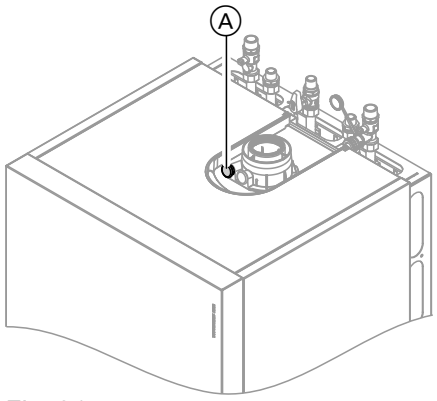


Fig. 31

Ⓐ Combustion air aperture (ventilation air)

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 your heating contractor carries out a simple tightness test during the commissioning of your system. For this it would be sufficient to 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.
After the tightness test, re-seal the test port with the plug.

Removing the burner

Please note
Escaping flue gas poses a risk to health.
Only for multiple connections to a flue system or multi boiler systems with a flue gas cascade:
Shut down all connected boilers.

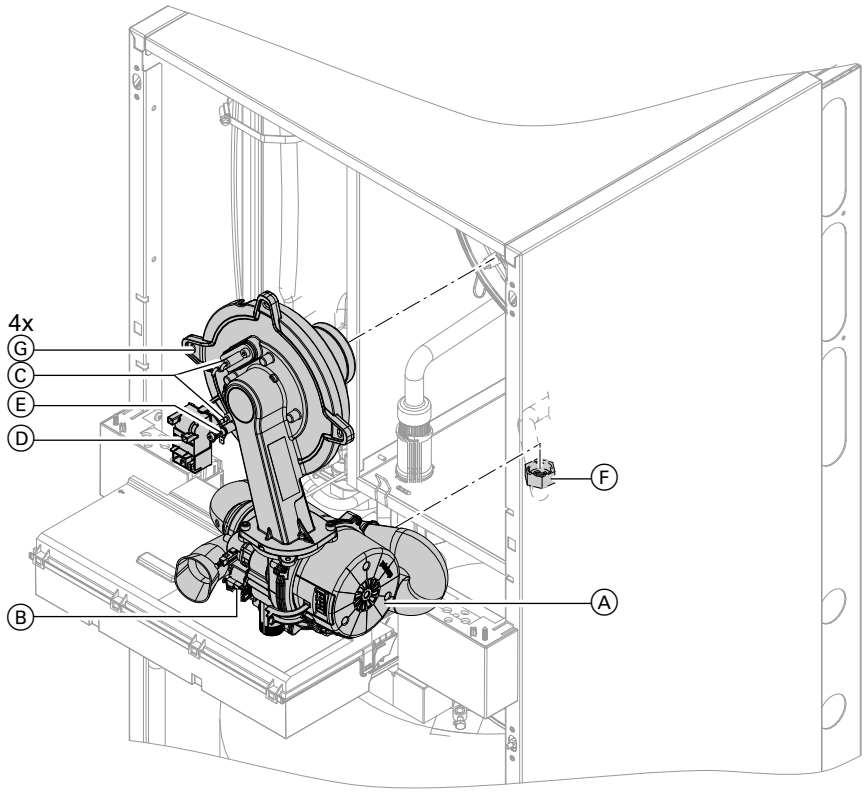


Fig. 32

1. Switch OFF the power supply and the ON/OFF switch at the control unit.
2. Close the gas shut-off valve and safeguard against reopening.
3. Remove cables from fan motor Ⓐ, gas train Ⓑ, ignition and ionisation electrode Ⓒ, ignition unit Ⓓ and earth tab Ⓔ.
4. Undo gas supply pipe fitting Ⓕ.
5. Undo four screws Ⓖ and remove the burner.

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

Checking the burner gasket and burner gauze assembly

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

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

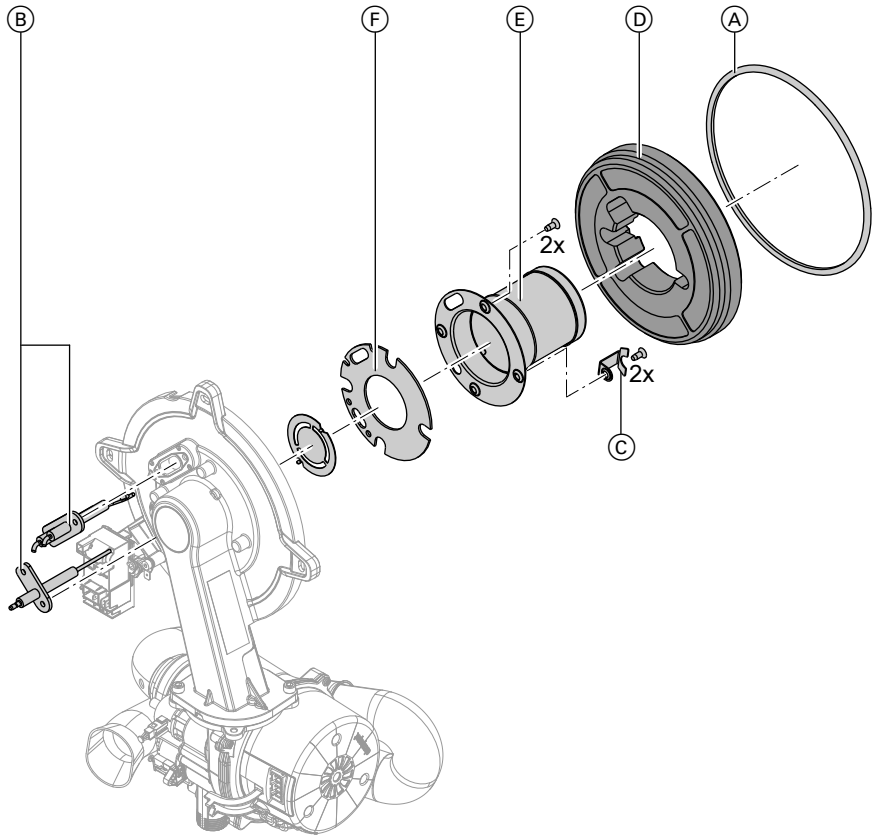


Fig. 33

1. Remove electrodes Ⓑ.
2. Undo 2 retaining clips Ⓒ on thermal insulation ring Ⓓ and then remove thermal insulation ring Ⓓ.
3. Undo 2 Torx screws and remove burner gauze assembly Ⓔ with gasket Ⓕ.
4. Insert new burner gauze assembly Ⓔ with new gasket Ⓕ and secure.
   Torque: 5.0 Nm.
5. Fit thermal insulation ring Ⓓ.
6. Fit electrodes Ⓑ.
   Torque: 4.5 Nm.

Checking and adjusting the ignition and ionisation electrodes

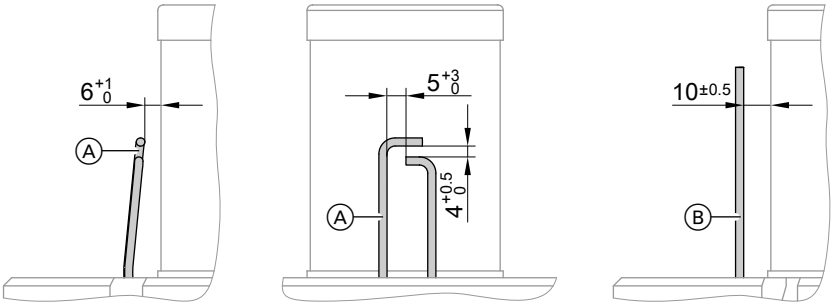


Fig. 34

Ⓐ Ignition electrodes
Ⓑ Ionisation electrode

1. Check the electrodes for wear and contamination.
2. Clean the electrodes with a small brush (not with a wire brush) or sandpaper.
3. Check the electrode gaps. If the gaps are not as specified or the electrodes are damaged, replace the electrodes together with new gaskets and adjust them as required. Tighten the electrode fixing screws with 4.5 Nm.

Checking the back draught safety device

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

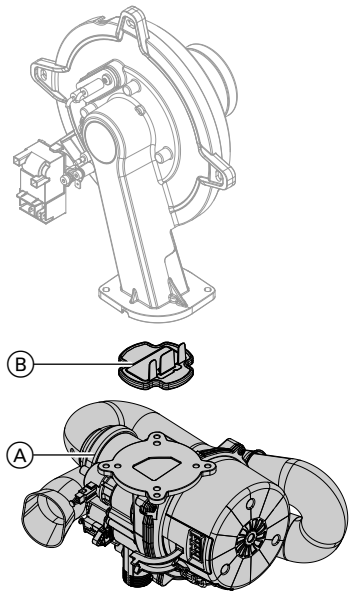


Fig. 35

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 Ⓑ.
5. Refit fan Ⓐ and secure with 2 screws.
   Torque: 4.0 Nm

Cleaning the heating surfaces

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

! **Please note**
Prevent damage due to cleaning water.
Cover the control unit with suitable watertight material.

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Cleaning the heating surfaces (cont.)

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.

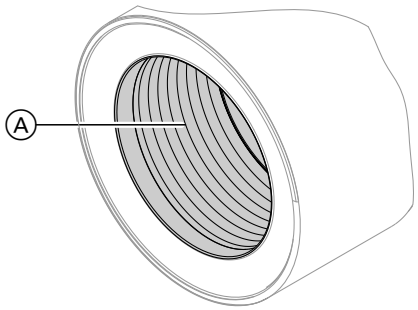


Fig. 36

1. Use a vacuum cleaner to remove combustion residues from heating surface Ⓐ of the heat exchanger.
2. Flush heating surface Ⓐ with water.
3. Check condensate drain. Clean the trap: See the following chapter.
4. Flush the heating surface again with water. This will also fill the trap with water.

Checking the condensate drain and cleaning the trap

Flue gas cascade:
Clean the trap in the flue gas header as well.

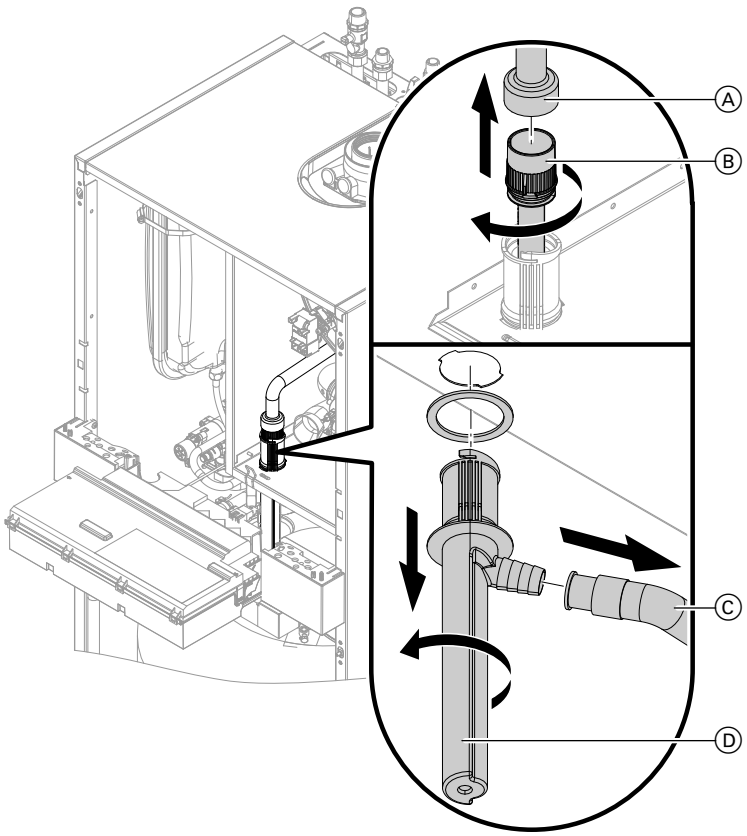


Fig. 37

1. Pivot the control unit forwards. Remove the insulating cover from the DHW cylinder.
2. Disconnect condensate hose Ⓐ from the trap.
3. Turn internal pipe Ⓑ and pull upwards.
4. Disconnect corrugated hose Ⓒ from lute Ⓓ.

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

5. Turn lute, tilt slightly and pull downwards.

   Please note
   Prevent water escaping.
   Seal off the drain opening when removing the lute.

6. Clean internal pipe Ⓑ and lute Ⓓ.

7. Fill lute Ⓓ with water.

8. Refit lute Ⓓ. Connect corrugated hose Ⓒ.

9. Reassemble the trap in reverse order.

10. Check that the condensate hose is connected correctly to the trap and heat exchanger.

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

11. Fit the cover panel and insulating cover. Secure the control unit back in the operating position.

Installing the burner

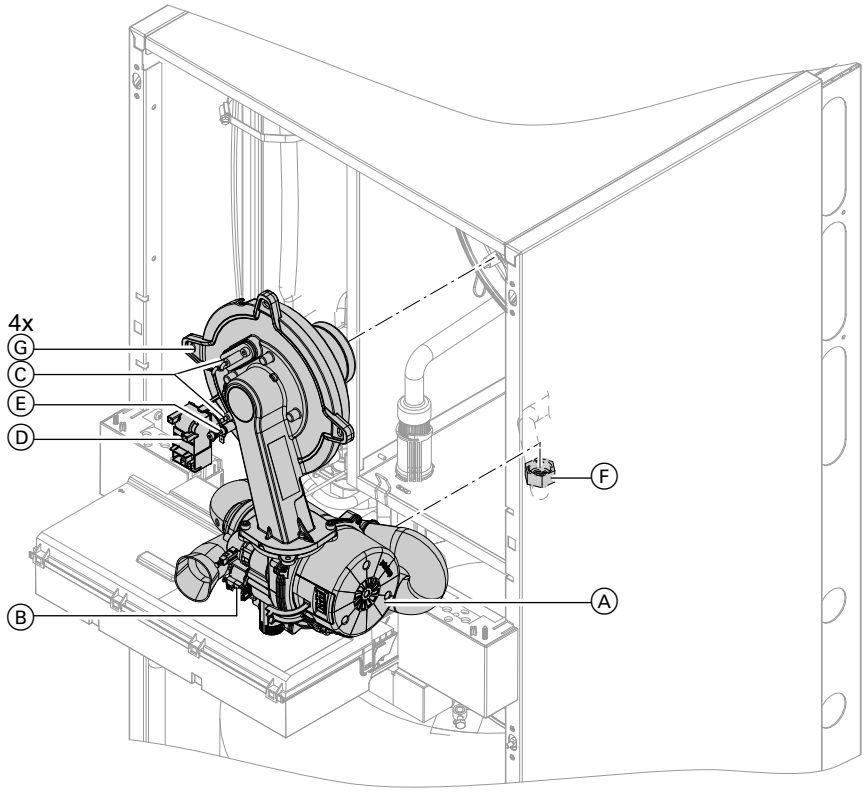


Fig. 38

1. Insert the burner and tighten screws Ⓖ crosswise.
   Torque: 8.5 Nm

2. Fit gas supply pipe Ⓕ with a new gasket.
   Torque: 30 Nm

3. Check gas connections for tightness.

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

4. Connect the electrical cables/leads:
   - Fan motor Ⓐ
   - Ionisation electrode Ⓒ
   - Gas train Ⓑ
   - Ignition unit Ⓓ
   - Earth Ⓔ

Checking the neutralising system (if installed)

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Checking the anode connection and anode earth current with an anode tester

Check that the earth cable is connected to the protective magnesium anode.

Note
We recommend checking the function of the protective magnesium anode annually. This function test can be carried out without interrupting operation, by measuring the earth current with an anode tester.

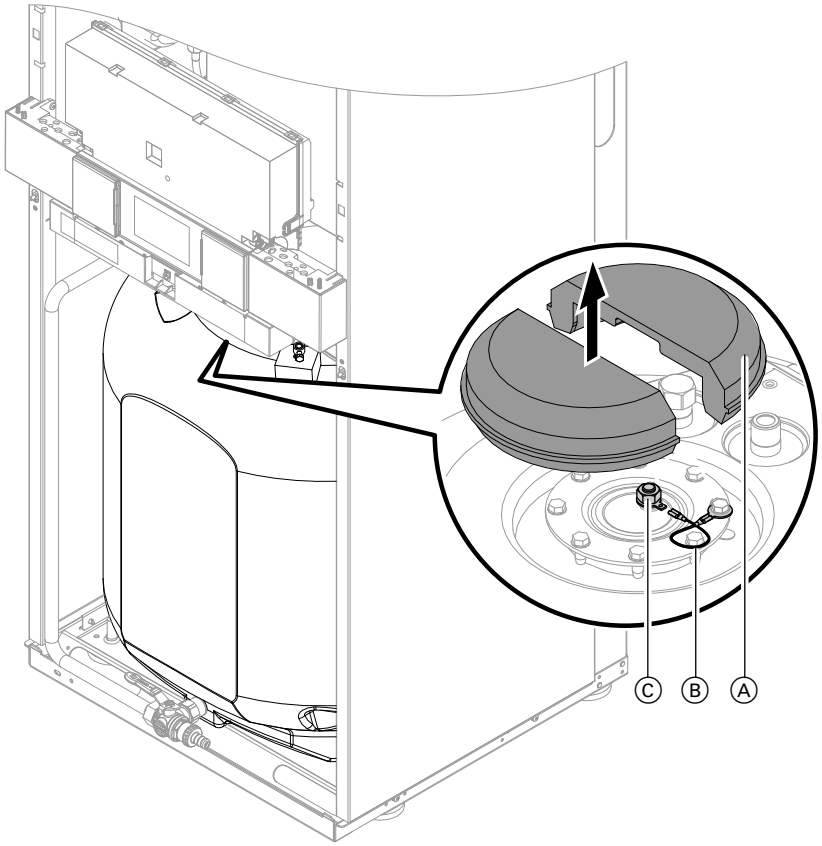


Fig. 39

1. Remove cover Ⓐ (two-part design up to 26 kW).

2. Remove earth cable Ⓑ from tab Ⓒ.

3. Connect tester (up to 5 mA) in series between tab Ⓒ and earth cable Ⓑ.
- If the current measures > 0.3 mA the protective magnesium anode is OK.
- If the current measures < 0.3 mA or if there is no current at all, inspect the protective magnesium anode visually (see page 51).

Draining the boiler on the DHW side

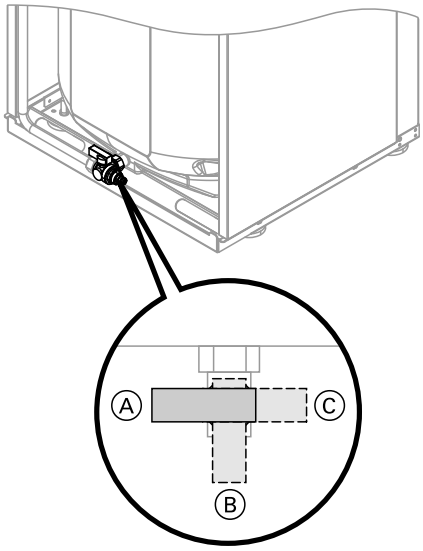


Fig. 40

1. Connect the hose to the drain valve and route it into a suitable container or drain outlet.

   Note
   Ensure adequate ventilation in the DHW pipework.

2. Turn drain valve from lever position Ⓐ (operational) to lever position Ⓑ or Ⓒ as required.
   - Lever position Ⓑ: the DHW circuit in the appliance **excluding** the DHW cylinder is drained via the cold water connection.
   - Lever position Ⓒ: the DHW circuit in the appliance **and** DHW cylinder are drained via the hot water connection. The cold water connection remains filled.

Cleaning the loading cylinder

Note
According to EN 806, a visual inspection and (if necessary) cleaning must be carried out no later than 2 years after commissioning, and as required thereafter.

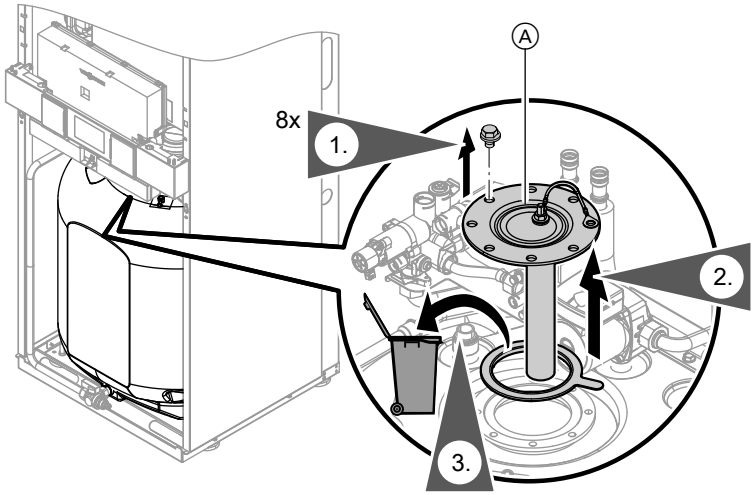


Fig. 41

1. Drain the loading cylinder.
2. Remove flange cover Ⓐ.
3. Disconnect the loading cylinder from the pipework to prevent contamination from entering the pipework.
4. Remove loose deposits with a pressure cleaner. Use a chemical cleaning agent to remove hard deposits that cannot be removed with a pressure cleaner.

   Please note
   Do not damage the cylinder:
   - Only use plastic tools to clean the inside.
   - Never use cleaning agents containing hydrochloric acid.

5. Thoroughly flush the loading cylinder after cleaning.

Checking and replacing the protective magnesium anode (if required)

Check the protective magnesium anode. If it is discovered that the anode has degraded to 10 to 15 mm Ø, we recommend replacing the protective magnesium anode.

Re-assembling and filling the loading cylinder

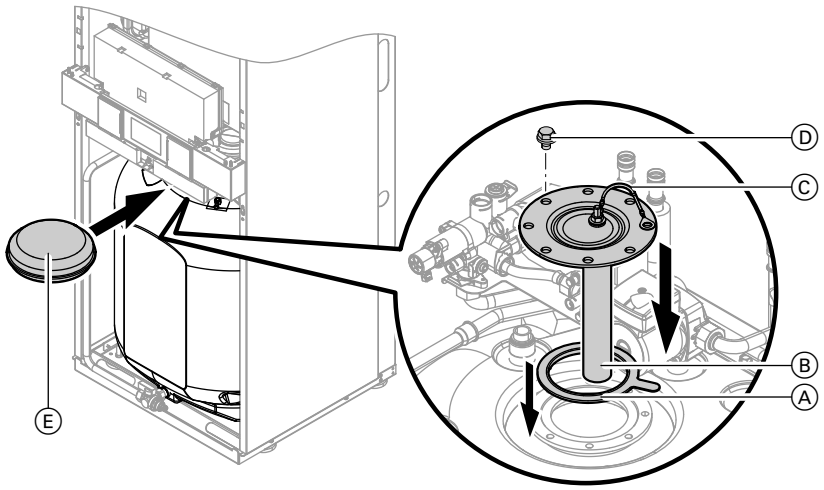


Fig. 42

1. Reconnect the loading cylinder to the pipework.
2. Insert new gasket Ⓐ underneath flange cover Ⓑ.
3. Fit flange cover Ⓑ and tighten 8 screws Ⓓ with a maximum torque of 25 Nm.
4. Push earth cable Ⓒ onto the tab.
5. Fit cover Ⓔ (two-part design up to 26 kW).
6. Fill the loading cylinder with potable water.

Checking the expansion vessel and system pressure

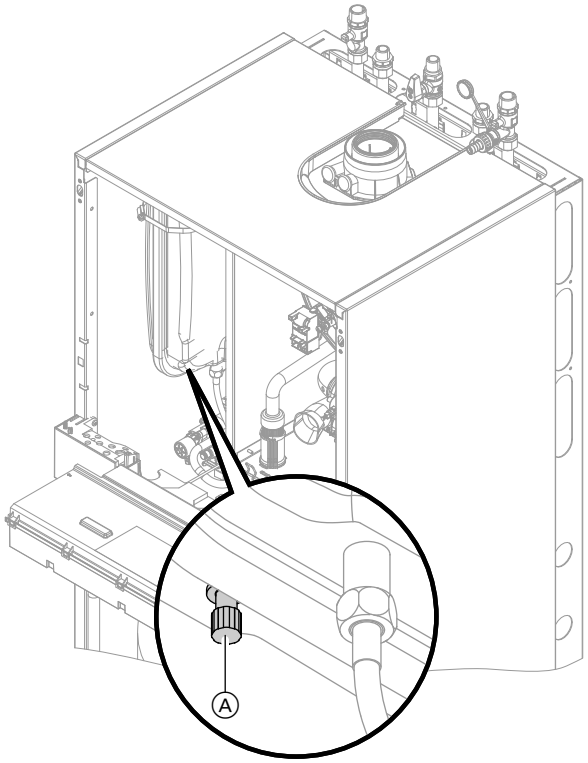


Fig. 43

Note
The diaphragm expansion vessel can lose some charge pressure over time. When the boiler heats up, the pressure gauge indicator may rise to 2 or 3 bar (0.2 or 0.3 MPa). The safety valve may also respond and discharge the excess pressure.

Note
Carry out this test on a cold system.

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

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

Check whether the installed diaphragm expansion vessel is adequate for the system water volume.

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

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

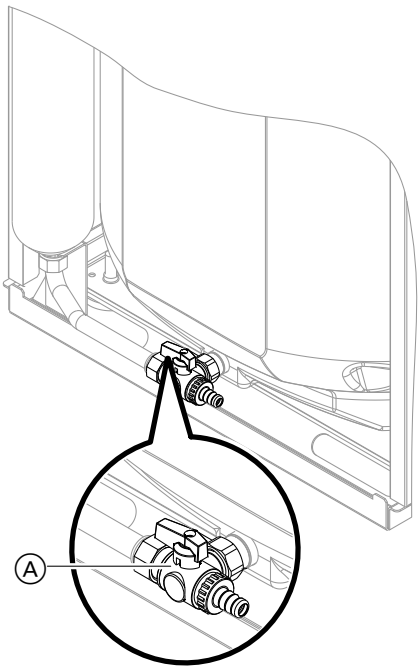


Fig. 44

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 operating lever of valve Ⓐ to the "front" position.
4. Check the pre-charge pressure of the DHW expansion vessel and adjust if required. Set value: Static pressure minus 0.2 bar (0.02 MPa).
5. Turn operating lever of valve Ⓐ back to the "left" position and open the on-site shut-off valve in the cold water line.

Checking the safety valve function

Checking the firm seating of electrical connections

Checking all gas equipment for tightness 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.

Checking the combustion quality

The electronic combustion controller automatically ensures optimum combustion quality. During commissioning/maintenance, only the combustion values need to be checked. For this, measure the CO content and the CO_2 or O_2 content. For a description of the electronic combustion controller functions, see page 146.

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

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

CO_2 or O_2 content
- The CO_2 content must be within the following limits for the lower and upper heating output respectively:
  - 7.5 to 9.5 % for natural gas E and LL
  - 8.8 to 11.1 % for LPG P
- The O_2 content must be between 4.0 and 7.6 % for all gas types.

Checking the combustion quality (cont.)

If the actual CO_2 or O_2 values lie outside their respective ranges, proceed as follows:
- Check the balanced flue system for tightness; see page 43.
- Check the ionisation electrode and connecting cable; see page 46.

Note
During commissioning, the combustion controller carries out an automatic calibration. Allow approx. 30 s after the burner has started before testing the emissions.

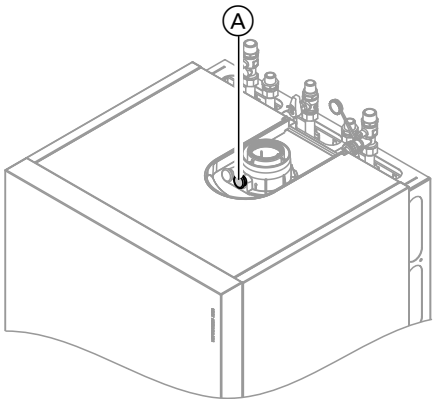


Fig. 45

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 and create a heat demand.
3. Select the lower heating output (see page 54).
4. Check the CO_2 or O_2 content. If the value varies by more than 1 % (CO_2) or 1.5 % (O_2) from the ranges given above, carry out the steps on page 53.
5. Enter the actual value into the report.
6. Select the upper heating output (see page 54).
7. Check the CO_2 or O_2 content. If the value varies by more than 1 % (CO_2) or 1.5 % (O_2) from the ranges given above, carry out the steps on page 53.
8. Enter the actual value into the report.

Selecting the upper/lower heating output

Note
Ensure adequate heat transfer.

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Actuator test"**
5. Set the lower heating output:
   "Base load" "ON". The burner now operates at the lower heating output.
6. Set the upper heating output:
   "Full load" "ON". The burner now operates at the upper heating output.
7. End output selection:
   ⮌
8. End service functions.

Checking the flue system for unrestricted flow and tightness

Adjusting the control unit to the heating system

The control unit must be matched to the system equipment level. Various system components are recognised automatically by the control unit and the relevant parameters are set automatically.

- For selecting the appropriate scheme, see the system examples.
- For the individual steps for setting parameters, see page 60.

Adjusting heating curves

The heating curves illustrate the relationship between the outside temperature and the boiler water or flow temperature.
More simply: The lower the outside temperature, the higher the boiler water or flow temperature.
The boiler water or flow temperature in turn affects the room temperature.

Factory settings:
- Slope = 1.4
- Level = 0

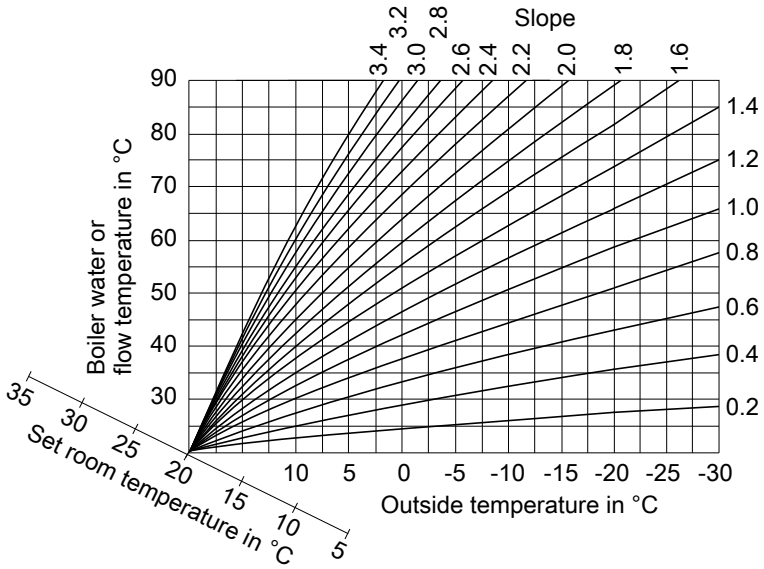


Fig. 46

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

Adjusting the set room temperature

Individually adjustable for each heating circuit.
The heating curve is offset along the set room temperature axis. With the heating circuit pump logic function active, the curve modifies the start and stop characteristics of the heating circuit pump.

Note
If the heating system includes heating circuits with mixer, then the flow temperature of the heating circuit without mixer is higher by a selected differential (8 K in the delivered condition) than the flow temperature of the heating circuits with mixer.
The differential temperature can be set at parameter "9F" in the ***"General"*** *group.*

Standard set room temperature

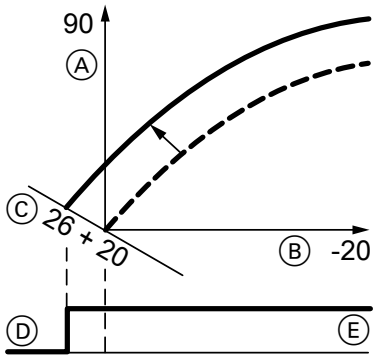


Fig. 47 Example 1: Adjusting the standard set room temperature from 20 to 26 °C

Ⓐ Boiler water temperature or flow temperature in °C
Ⓑ Outside temperature in °C
Ⓒ Set room temperature in °C
Ⓓ Heating circuit pump "OFF"
Ⓔ Heating circuit pump "ON"

Changing the standard set room temperature

Operating instructions

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Adjusting heating curves (cont.)

Reduced set room temperature

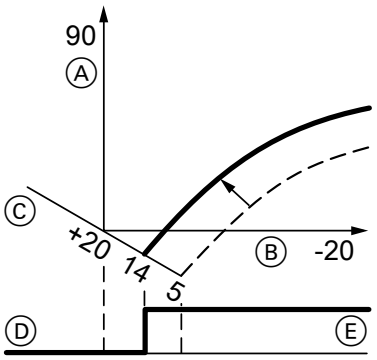


Fig. 48 Example 2: Adjusting the reduced set room temperature from 5 °C to 14 °C

Ⓐ Boiler water temperature or 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.

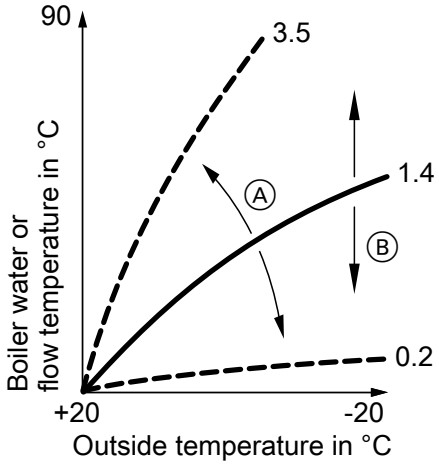


Fig. 49

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

Tap the following buttons:

1. **"Menu"** or ☰
2. **"Heating"**
3. Select **"Heating circuit 1 2 3"** for the required heating circuit.
4. **"Heating curve"**
5. **"Slope"** or **"Level"**
6. Use **+/–** to select the heating curve according to the system requirements.
7. **OK**/✔ to confirm

Connecting the control unit to the WLAN

Note
Vitoconnect 100, OPTO1 available as accessory.
For installation and commissioning: see the separate installation and commissioning instructions.

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Connecting the control unit to the LON

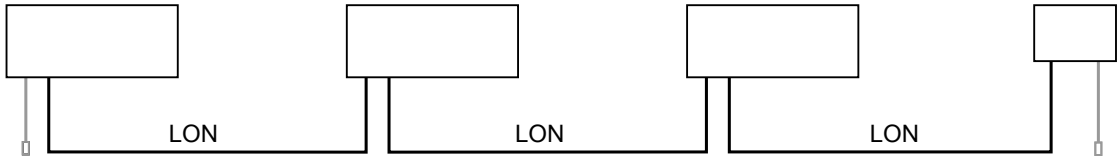
Note
LON communication module available as accessory.
For installation, see separate installation instructions.
Only for weather-compensated control units

Example: single boiler system with Vitotronic 200-H and Vitocom 200

Set the LON subscriber numbers and further functions via parameter level 2 (see the following table).

Note
*The same subscriber number must **not** be allocated twice within the LON.*
***Only one Vitotronic** may be enabled as fault manager.*
Data transfer via LON can take several minutes.

All parameters in the table are listed in the "General" group.

Boiler control unit	Vitotronic 200-H	Vitotronic 200-H	Vitocom
			
Subscriber no. 1 Parameter "77:1"	Subscriber no. 10 Parameter "77:10"	Subscriber no. 11 **Set** parameter "77:11".	Subscriber no. 99
Control unit is fault manager. Parameter "79:1"	Control unit is not fault manager. Parameter "79:0"	Control unit is not fault manager. Parameter "79:0"	Device is fault manager.
Control unit transmits the time. Parameter "7b:1"	Control unit receives the time. **Set** parameter "81:3".	Control unit receives the time. **Set** parameter "81:3".	Device receives the time.
Control unit transmits outside temperature. **Set** parameter "97:2".	Control unit receives outside temperature. **Set** parameter "97:1".	Control unit receives outside temperature. **Set** parameter "97:1".	—
Viessmann system number. Parameter "98:1"	Viessmann system number. Parameter "98:1"	Viessmann system number. Parameter "98:1"	—
LON subscriber fault monitoring. Parameter "9C:20"	LON subscriber fault monitoring. Parameter "9C:20"	LON subscriber fault monitoring. Parameter "9C:20"	—

Carrying out a LON subscriber check

The subscriber check is used to test communication with the system devices connected to the fault manager.

Requirements:
- The control unit must be activated as **fault manager** (parameter "79:1" in the **"General"** group).
- The LON subscriber number must be set in all control units.
- The LON subscriber list in the fault manager must be up to date.

Tap the following buttons:

1. **"Menu"** or ☰
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Service functions"**
5. **"LON subscriber check"**
   The list of all connected LON subscribers appears.
6. Select subscriber and confirm with **"OK"**/✓.
   The subscriber check for the selected subscriber is initiated.

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Connecting the control unit to the LON (cont.)

- If the subscriber check was successful, **"Check OK"** is displayed.
- If the subscriber check was unsuccessful, **"Check not OK"** is displayed.
  Note
  To perform another subscriber check:
  *Create a new list of subscribers with **"New list"**/↻.*
  The subscriber list is updated.

Note
*During the subscriber check, the display of the relevant subscriber shows the subscriber no. and **"Wink"** for approx. 1 min.*

Checking and resetting service messages

Service indicator

Service limits can be set in conjunction with the commissioning assistant or via parameters "21" and "23" in the **"Boiler"** group.
Once these values have been reached, a service message appears on the display.

Tap the following buttons:

1. **"Confirm"**/✓
   ⚠ flashes in the footer.
2. ⚠

   Note
   If your heating system has several fault messages simultaneously, the following will be displayed after you tap ⚠:
3. **"Service, messages"**
   The service messages appear yellow in a list.

After maintenance has been carried out

Tap the following buttons:

1. **"Menu"** or "≡"
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Service functions"**
5. **"Reset service"**
   The selected service parameters for hours run and time intervals restart at 0.
6. Confirm **"Do you really want to delete the service list?"** with **OK**/✓

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Fitting the front panels

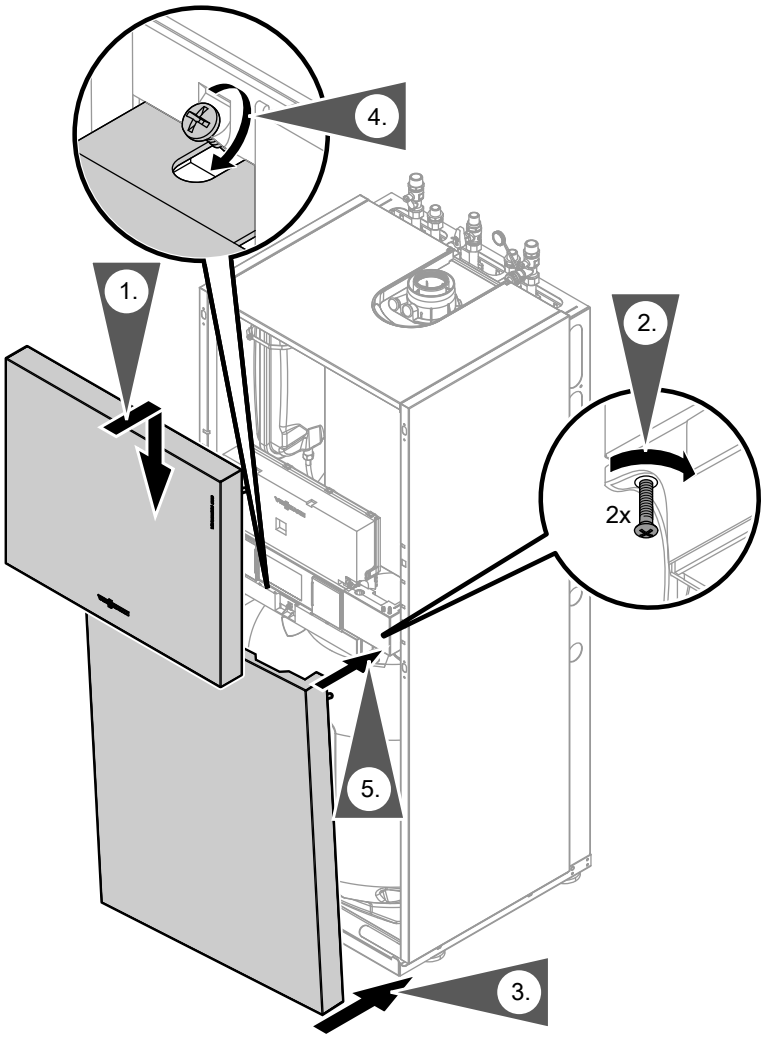


Fig. 50

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.

Calling up parameter level 1

- Parameters are split into the following groups:
  - **"General"**
  - **"Boiler"**
  - **"DHW"**
  - **"Solar"**
  - **"Heating circuit 1/2/3"**
  - **"All parameters"**
    In this group, all parameters are shown in ascending order (the parameters for the **"Solar"** group are only shown if a solar control module, type SM1 is connected).
- Heating systems with one heating circuit without mixer and one or two heating circuits with mixer:
  In the following, the heating circuit without mixer is designated **"Heating circuit 1"** and the heating circuits with mixer as **"Heating circuit 2"** or **"Heating circuit 3"**.
  If the heating circuits have been designated individually, the chosen designation appears.

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter password **"viservice"**.
4. **"System configuration"**
5. **"Parameter level 1"**
6. Select group.
7. Select parameter.
8. **"Change"** or ✎
9. ▼/▲ or ⌃/⌄ for the required value in line with the tables below.
10. **OK** or ✓ to accept the selected value.



Fig. 51 Display of parameter HO2B

Ⓐ Parameter
Ⓑ Description of parameter setting
Ⓒ Number of parameter
Ⓓ Value of parameter

General

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

"System scheme"

Setting		Explanations
One heating circuit without mixer A1 (heating circuit 1) with DHW heating	**00:2**	Value is set automatically
One heating circuit with mixer M2 (heating circuit 2) with DHW heating	00:4	Set the value manually if the system is not equipped with a heating circuit without mixer.
One heating circuit without mixer A1 (heating circuit 1) and one heating circuit with mixer M2 (heating circuit 2), with DHW heating	00:6	Value is set automatically
One heating circuit with mixer M2 (heating circuit 2) and one heating circuit with mixer M3 (heating circuit 3), with DHW heating	00:8	Set the value manually if the system is not equipped with a heating circuit without mixer.
One heating circuit without mixer A1 (heating circuit 1), one heating circuit with mixer M2 (heating circuit 2) and one heating circuit with mixer M3 (heating circuit 3), with DHW heating	00:10	Value is set automatically

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General (cont.)

"Function of internal circulation pump for operation with low loss header or heating water buffer cylinder"

Setting		Explanations
Low loss header: Circulation pump always runs on demand	**51:0**	
Low loss header: Circulation pump only runs on demand if the burner is running with run-on time	51:1	
Heating water buffer cylinder: Circulation pump only runs on demand if the burner is running with pump run-on time	51:2	

"LON subscriber number"

Setting		Explanations
LON subscriber number	**77:1**	
	77:2 to 77:99	Adjustable from 1 to 99: 1 = Boiler 10 to 90 = Vitotronic 200-H 97 = Vitogate 300 BN/MB 98 = Vitogate 99 = Vitocom ***Note*** *Allocate each number only once.*

"Building type"

Setting		Explanations
Apartment building. Holiday program and time program for DHW heating can be set separately.	7F:0	
Detached house. One holiday program and one time program for DHW heating	**7F:1**	

"Operation enabled/disabled"

Setting		Explanations
Everything operable	**8F:0**	Controls on the display
Everything disabled apart from emissions test function	8F:1	
Default display and emissions test function operable	8F:2	

"Set flow temperature for external demand"

Setting		Explanations
70 °C	**9B:70**	
... °C	9B:0 to 9B:127	Adjustable from 0 to 127 °C Limited by boiler-specific parameters

Boiler

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

Boiler (cont.)

"Interval in burner hours until the next service"

Setting		Explanations
None	**21:0**	No service interval set
... 00 h	21:1 to 21:100	The number of hours run before the burner should be serviced is adjustable from 100 to 10,000 h 1 step ≙ 100 h

"Interval until the next service"

Setting		Explanations
No time interval	**23:0**	No time interval selected for service
... Months	23:1 to 23:24	The number of months until the next service is adjustable from 1 to 24

"Service display"

Setting		Explanations
No service display	**24:0**	
Service is shown on the display (address is automatically set and must be manually reset after a service)	24:1	Displayed only if parameter setting 21 or 23 > 0

"Filling function / venting function"

Setting		Explanations
Function disabled	**2F:0**	
Venting function enabled	2F:1	
Filling function enabled	2F:2	

DHW

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

"Set DHW temperature for reheating suppression"

Setting		Explanations
40 °C	**67:40**	For solar DHW heating: Set DHW temperature 40 °C. Above the selected set temperature reheating is suppressed.
... °C	67:0 to 67:95	Set DHW temperature adjustable from 0 to 95 °C (limited by boiler-specific parameters)

"Enable DHW circulation pump"

Setting		Explanations
ON/OFF according to time program	**73:0**	
... x 5 min per hour	73:1 to 73:6	"ON" from once per hour for 5 min up to 6 times per hour for "5 min" during the time program
Permanently ON	73:7	

Heating circuit 1, heating circuit 2, heating circuit 3

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

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Heating circuit 1, heating circuit 2, heating… (cont.)

"Heating limit: Economy function outside temperature"

Setting		Explanations
5 see service instructions	**A5:5**	Economy function outside temperature: Heating circuit pump "OFF" when the outside temperature (OT) is 1 K higher than the set room temperature (RT_{set}) $OT > RT_{set} + 1\ K$
Without	A5:0	No economy function outside temperature
... see service instructions	A5:1 to A5:15	With economy function outside temperature: Heating circuit pump "OFF"; see the following table:

Parameter A5:...	**With economy function outside temperature: Heating circuit pump "OFF"**
1	$OT > RT_{set} + 5\ K$
2	$OT > RT_{set} + 4\ K$
3	$OT > RT_{set} + 3\ K$
4	$OT > RT_{set} + 2\ K$
5	$OT > RT_{set} + 1\ K$
6	$OT > RT_{set}$
7 to 15	$OT > RT_{set} - 1\ K$ to $OT > RT_{set} - 9\ K$

"Heating limit: Complete summer economy control"

Setting		Explanations
None	**A6:36**	Extended economy function **disabled**
... °C	A6:5 to A6:35	Extended economy function enabled: The burner and heating circuit pump will stop at a variable value, adjustable between 5 and 35 °C plus 1 °C. The mixer closes. The basis for this is the adjusted outside temperature. This is based on the actual outside temperature and a time constant, which takes into account the cooling down of an average building.

"Mixer economy function"

Setting		Explanations
Without	**A7:0**	
With	A7:1	Heating circuit pump also "OFF": ▪ If the mixer has been trying to close for some time. Heating circuit pump "ON": ▪ If the mixer changes to control function ▪ If there is a risk of frost

Heating circuit 1, heating circuit 2, heating… (cont.)

"Pump idle time"

Setting		Explanations
With calculated pump idle time	**A9:7**	Heating circuit pump "OFF" if set value is modified by changing the operating mode or changing the set room temperature. Only if room hook-up is not set in parameter b0.
Without	A9:0	No economy function outside temperature
With calculated pump idle time	A9:1 to A9:15	Adjustable from 1 to 15. The higher the value, the longer the pump idle time.

"Room temperature hook-up"

Setting		Explanations
Without	**B0:0**	With remote control: heating mode/reduced mode: weather-compensated Change value only for the heating circuit with mixer.
For reduced mode	B0:1	Heating mode: weather-compensated Reduced mode: with room temperature hook-up
For standard mode	B0:2	Heating mode: with room temperature hook-up Reduced mode: weather-compensated
For standard mode and reduced mode	B0:3	Heating mode/reduced mode: with room temperature hook-up

"Economy function room temperature"

Setting		Explanations
Without	**B5:0**	With remote control: no room temperature-dependent economy function. Change value only for the heating circuit with mixer.
... see service instructions	B5:1 to B5:8	For economy function, see the following table:

Parameter b5:...	**With economy function:**	
	Heating circuit pump "OFF"	**Heating circuit pump "ON"**
1	$RT_{actual} > RT_{set} + 5$ K	$RT_{actual} < RT_{set} + 4$ K
2	$RT_{actual} > RT_{set} + 4$ K	$RT_{actual} < RT_{set} + 3$ K
3	$RT_{actual} > RT_{set} + 3$ K	$RT_{actual} < RT_{set} + 2$ K
4	$RT_{actual} > RT_{set} + 2$ K	$RT_{actual} < RT_{set} + 1$ K
5	$RT_{actual} > RT_{set} + 1$ K	$RT_{actual} < RT_{set}$
6	$RT_{actual} > RT_{set}$	$RT_{actual} < RT_{set} - 1$ K
7	$RT_{actual} > RT_{set} - 1$ K	$RT_{actual} < RT_{set} - 2$ K
8	$RT_{actual} > RT_{set} - 2$ K	$RT_{actual} < RT_{set} - 3$ K

"Minimum flow temperature limit, heating circuit"

Setting		Explanations
20 °C	**C5:20**	Electronic minimum flow temperature limit set to 20 °C
... °C	C5:1 to C5:127	Minimum limit adjustable from 1 to 127 °C (limited by boiler-specific parameters)

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Heating circuit 1, heating circuit 2, heating… (cont.)

"Maximum flow temperature limit, heating circuit"

Setting		Explanations
74 °C	**C6:74**	Electronic maximum flow temperature limit 74 °C
... °C	C6:10 to C6:127	Maximum limit adjustable from 10 to 127 °C (limited by boiler-specific parameters)

"External operating program changeover"

Setting		Explanations
The operating program changes to "Constant central heating with reduced room temperature" or "Standby mode" (subject to the settings of the set reduced room temperature)	**D5:0**	
The operating program changes to "Constant operation with standard room temperature"	D5:1	Subject to parameters 3A, 3B and 3C

"EA1 extension: Operating program changeover"

Setting		Explanations
No operating program changeover	**D8:0**	
Operating program changeover via input DE1	D8:1	
Operating program changeover via input DE2	D8:2	
Operating program changeover via input DE3	D8:3	

"Max. speed of speed-controlled heating circuit pump in standard mode"

Setting		Explanations
... %	**E6: ...**	This value is determined by boiler-specific parameters
... %	E6:0 to E6:100	Maximum speed adjustable from 0 to 100 %

"Min. speed of speed-controlled heating circuit pump in standard mode"

Setting		Explanations
30 %	**E7:30**	
... %	E7:0 to E7:100	Minimum speed adjustable from 0 to 100 % of the maximum speed

"Screed drying"

Setting		Explanations
Screed drying disabled	**F1:0**	Screed drying adjustable, with choice of 6 temperature/time profiles (see chapter "Function description")
Diagram 1	F1:1	
Diagram 2	F1:2	
Diagram 3	F1:3	
Diagram 4	F1:4	
Diagram 5	F1:5	
Diagram 6	F1:6	
Constant flow temperature 20 °C	F1:7 to F1:14	
Individual program for screed drying	F1:15	See chapter "Function description"

Heating circuit 1, heating circuit 2, heating… (cont.)

"Time limit for comfort mode"

Setting		Explanations
8 h	**F2:8**	
No time limit	F2:0	
... h	F2:1 to F2:12	Time limit adjustable from 1 to 12 h

"Outside temperature limit for cancelling reduced set room temperature"

Setting		Explanations
-5 °C	**F8:-5**	See chapter "Function description" Observe parameter "A3".
... °C	F8:+10 to F8:-60	Temperature limit adjustable from +10 to -60°C
Function disabled	F8:-61	

"Outside temperature limit for raising the reduced set room temperature to the standard set room temperature"

Setting		Explanations
-14 °C	**F9:-14**	See chapter "Function description"
... °C	F9:+10 to F9:-60	Temperature limit adjustable from +10 to -60°C

"Raising the set boiler water or flow temperature when switching from operation with reduced room temperature to operation with standard room temperature"

Setting		Explanations
20 %	**FA:20**	See chapter "Function description"
... %	FA:0 to FA:50	Temperature rise adjustable from 0 to 50 %

"Duration for raising the set boiler water or flow temperature"

Setting		Explanations
60 min	**FB:60**	See parameter "FA" See chapter "Function description"
... min	FB:0 to FB:240	Temperature rise adjustable from 0 to 240 min

Calling up parameter level 2

- Parameters are split into the following groups:
  - **"General"**
  - **"Boiler"**
  - **"DHW"**
  - **"Solar"**
  - **"Heating circuit 1/2/3"**
  - **"All parameters"**
    In this group, all parameters are shown in ascending order (the parameters for the **"Solar"** group are only shown if a solar control module, type SM1 is connected).
- Heating systems with one heating circuit without mixer and one or two heating circuits with mixer:
  In the following, the heating circuit without mixer is designated **"Heating circuit 1"** and the heating circuits with mixer as **"Heating circuit 2"** or **"Heating circuit 3"**.
  If the heating circuits have been designated individually, the chosen designation appears.

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter password **"viservice"**.
4. **"System configuration"**
5. **"Parameter level 2"**
6. Enter password **"viexpert"**.
7. Select group.
8. Select parameter.
9. **"Change"** or ✎
10. ▼/▲ or ⌃/⌄ for the required value in line with the tables below.
11. **OK** or "✓" to accept the selected value.

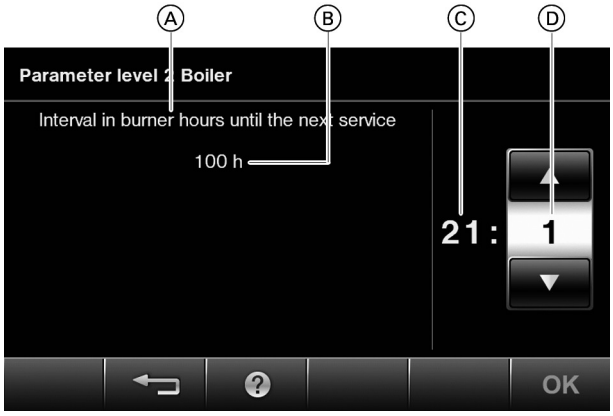


Fig. 52 Display of parameter HO2B

Ⓐ Parameter
Ⓑ Description of parameter setting
Ⓒ Number of parameter
Ⓓ Value of parameter

General

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

"System scheme"

Setting		Explanations
One heating circuit without mixer A1 (heating circuit 1) with DHW heating	**00:2**	Value is set automatically
One heating circuit with mixer M2 (heating circuit 2) with DHW heating	00:4	Set the value manually if the system is not equipped with a heating circuit without mixer.
One heating circuit without mixer A1 (heating circuit 1) and one heating circuit with mixer M2 (heating circuit 2), with DHW heating	00:6	Value is set automatically
One heating circuit with mixer M2 (heating circuit 2) and one heating circuit with mixer M3 (heating circuit 3), with DHW heating	00:8	Set the value manually if the system is not equipped with a heating circuit without mixer.
One heating circuit without mixer A1 (heating circuit 1), one heating circuit with mixer M2 (heating circuit 2) and one heating circuit with mixer M3 (heating circuit 3), with DHW heating	00:10	Value is set automatically

General (cont.)

"Burner control unit parameter access rights"

Setting		Explanations
No	**11:0**	Access to combustion control parameters is blocked
Yes	11:9	Access to combustion control parameters is open

"Outside temperature sensor for constant temp. control"

Setting		Explanations
		Only if control unit has been changed to constant temperature mode.
No outside temperature sensor	**25:0**	
Outside temperature sensor available	25:1	If an outside temperature sensor is connected to the control unit.

"Wireless outside temperature sensor"

Setting		Explanations
Without wireless outside temperature sensor	**2A:0**	Never adjust.
With wireless outside temperature sensor	2A:1	
Wireless outside temperature sensor is not used	2A:2	
	2A:3	

"Show energy consumption"

Setting		Explanations
No	2B:0	
Yes	**2B:1**	

"Extension AM1"

Setting		Explanations
Without	**32:0**	
With	32:1	Value is set automatically upon detection

"Function, output A1 at extension AM1"

Setting		Explanations
DHW circulation pump	33:0	
Heating circuit pump, heating circuit without mixer A1 (heating circuit 1)	**33:1**	
Circulation pump for cylinder heating	33:2	

"Function output, A2 at extension AM1"

Setting		Explanations
DHW circulation pump	**34:0**	
Heating circuit pump, heating circuit without mixer A1 (heating circuit 1)	34:1	
Circulation pump for cylinder heating	34:2	

"Extension EA1"

Setting		Explanations
Without	**35:0**	
With	35:1	Value is set automatically upon detection

General (cont.)

"Function, output 157 at extension EA1"

Setting		Explanations
Central fault message	**36:0**	
Feed pump	36:1	
DHW circulation pump	36:2	

"Function, input DE1 at extension EA1"

Setting		Explanations
None	**3A:0**	
Operating program changeover	3A:1	
External demand with set flow temperature	3A:2	Set flow temperature setting: Parameter 9b Internal circulation pump function: Parameter 3F
External blocking	3A:3	Internal circulation pump function: Parameter 3E
External blocking with fault message	3A:4	Internal circulation pump function: Parameter 3E
External fault message	3A:5	Fault message hook-up from external appliances
Brief operation, DHW circulation pump (pushbutton function)	3A:6	Adjusting DHW circulation pump runtime: Parameter 3d

"Function, input DE2 at EA1 extension"

Setting		Explanations
None	**3B:0**	
Operating program changeover	3B:1	
External demand with set flow temperature	3B:2	Set flow temperature setting: parameter 9B Internal circulation pump function: parameter 3F
External blocking	3B:3	Internal circulation pump function: parameter 3E
External blocking with fault message	3B:4	Internal circulation pump function: parameter 3E
External fault message	3B:5	Fault message hook-up from external devices
Brief operation, DHW circulation pump (pushbutton function)	3B:6	DHW circulation pump runtime setting: parameter 3D

"Function, input DE3 at EA1 extension"

Setting		Explanations
None	**3C:0**	
Operating program changeover	3C:1	
External demand with set flow temperature	3C:2	Set flow temperature setting: parameter 9B Internal circulation pump function: parameter 3F
External blocking	3C:3	Internal circulation pump function: parameter 3E
External blocking with fault message	3C:4	Internal circulation pump function: parameter 3E
External fault message	3C:5	Fault message hook-up from external devices
Brief operation, DHW circulation pump (pushbutton function)	3C:6	DHW circulation pump runtime setting: parameter 3D

"DHW circulation pump runtime for brief operation"

Setting		Explanations
5 min	**3D:5**	
... min	3D:0 to 3D:60	Adjustable from 1 to 60 min

General (cont.)

"Function internal circulation pump with signal "External blocking""

Setting		Explanations
Remains in control mode	**3E:0**	
Is switched off	3E:1	
Is switched on	3E:2	

"Function internal circulation pump with signal "External demand""

Setting		Explanations
Remains in control mode	**3F:0**	
Switch off internal pump or switch on internal pump at VIUPM pump	3F:1	
Is switched on	3F:2	

"Function, input 96"

Setting		Explanations
Without	**4B:0**	Function of external hook-up at plug 96
External demand	4B:1	
External blocking	4B:2	

"Function of internal circulation pump for operation with low loss header or heating water buffer cylinder"

Setting		Explanations
Low loss header: Circulation pump always runs on demand	**51:0**	
Low loss header: Circulation pump only runs on demand if the burner is running with run-on time	51:1	
Heating water buffer cylinder: Circulation pump only runs on demand if the burner is running with pump run-on time	51:2	

"Flow temperature sensor for low loss header"

Setting		Explanations
Without	**52:0**	
With	52:1	Automatic recognition

"Function, output, internal connection extension"

Setting		Explanations
		Actuator at terminal 28
Central fault	53:0	
DHW circulation pump	**53:1**	
Heating circuit pump A1	53:2	Circulation pump for heating circuit without mixer
Circulation pump for cylinder heating	53:3	Circulation pump/diverter valve for DHW heating

General (cont.)

"Solar thermal system"

Setting		Explanations
Without	**54:0**	Do not adjust in the case of storage combi boilers without solar DHW heating.
With Vitosolic 100	54:1	
With Vitosolic 200	54:2	
With solar control module, type SM1, without auxiliary function; automatic recognition	54:3	
With solar control module, type SM1, with auxiliary function, e.g. central heating back-up; automatic recognition	54:4	2nd differential temperature control with temperature sensor [7] and [10]

"Display correction for outside temperature"

Setting		Explanations
... K	6E:0 to 6E:49	Display correction -5 K to -0.1 K
None	**6E:50**	
... K	6E:51 to 6E:100	Display correction +0.1 K to +5 K

"Communication module"

Setting		Explanations
Without	**76:0**	
With LON communication module	76:1	Automatic recognition
With cascade communication module	76:2	Do not adjust

"LON subscriber number"

Setting		Explanations
LON subscriber number	**77:1**	
	77:2 to 77:99	Adjustable from 1 to 99: 1 = Boiler 10 to 90 = Vitotronic 200-H 97 = Vitogate 300 BN/MB 98 = Vitogate 99 = Vitocom ***Note*** *Allocate each number only once.*

"LON communication module: Fault manager"

Setting		Explanations
Control unit is not fault manager	79:0	
Control unit is fault manager	**79:1**	

"LON communication module: time"

Setting		Explanations
Control unit does not transmit the time	7B:0	
Control unit transmits the time	**7B:1**	

General (cont.)

"Chimney connection"

Setting		Explanations
Single connection	**7E:0**	One boiler connected to the flue system
Multiple connections	7E:1	Several boilers connected to one shared flue system

"Building type"

Setting		Explanations
Apartment building. Holiday program and time program for DHW heating can be set separately.	7F:0	
Detached house. One holiday program and one time program for DHW heating	**7F:1**	

"Fault messaging delay"

Setting		Explanations
	80:6	If a fault occurs for at least 30 s, a fault message is displayed
None	80:0	Immediate fault message
... x 5 s	80:2 to 80:199	Delay adjustable from 10 s to 995 s 1 step ≙ 5 s

"Automatic summer/wintertime changeover"

Setting		Explanations
Without automatic summer/wintertime changeover	81:0	Time must be changed over manually
With automatic summer/wintertime changeover	**81:1**	
Use of the radio clock receiver (automatic recognition)	81:2	
With LON communication module: Control unit receives the time	81:3	

"Gas type (note "General" group, parameter 11)"

Setting		Explanations
Natural gas	**82:0**	
LPG	82:1	Only adjustable if parameter 11:9 has been set

"Temperature display"

Setting		Explanations
° Celsius	**88:0**	Temperature indicator in the display
° Fahrenheit	88:1	

"Display conditions, parameter"

Setting		Explanations
For technical services department	**8A:175**	
For technical services department	8A:176	

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General (cont.)

"Operation enabled/disabled"

Setting		Explanations
Everything operable	**8F:0**	Controls on the display
Everything disabled apart from emissions test function	8F:1	
Default display and emissions test function operable	8F:2	

"Time constant for calculating the adjusted outside temperature"

Setting		Explanations
128 x 10 minutes	**90:128**	Time constant for calculating the adjusted outside temperature 21.3 h
... x 10 minutes	90:1 to 90:199	Subject to the set value, the flow temperature is adjusted quickly (low values) or slowly (high values) when the outside temperature changes 1 step ≙ 10 min

"SCOT correction factor, flue length"

Setting		Explanations
...	**93:...**	Never adjust

"Extension OpenTherm"

Setting		Explanations
Without	**94:0**	
With	94:1	Automatic recognition

"Vitocom 100 GSM"

Setting		Explanations
Without	**95:0**	Never adjust.
With	95:1	

"Minimum burner output"

Setting		Explanations
	96:...	Factory setting according to boiler-specific parameters
...	96:... to 96:100	Minimum burner output adjustable from ... to 100 %

"LON communication module: outside temperature"

Setting		Explanations
Control unit uses outside temperature sensor	**97:0**	Temperature value of the outside temperature sensor connected to the control unit is utilised
Control unit receives outside temperature	97:1	
Control unit transmits outside temperature	97:2	

"Viessmann system number"

Setting		Explanations
1	**98:1**	Viessmann system number In conjunction with monitoring several systems via Vitocom 300
...	98:1 to 98:5	System number adjustable from 1 to 5

General (cont.)

"Recognition, extension DAP1"

Setting		Explanations
Without	**99:0**	Never adjust
With	99:1	

"Recognition, extension DAP2"

Setting		Explanations
Without	**9A:0**	Never adjust
With	9A:1	

"Set flow temperature for external demand"

Setting		Explanations
70 °C	**9B:70**	
... °C	9B:0 to 9B:127	Adjustable from 0 to 127 °C Limited by boiler-specific parameters

"LON subscriber monitoring"

Setting		**Explanations**
20 min.	**9C:20**	If there is no response from a subscriber for 20 min, the values specified in the control unit are used. Only then will a fault message be issued.
... Min.	9C:2 to 9C:60	Adjustable from 2 to 60 min

"Differential temperature"

Setting		Explanations
8 K	**9F:8**	The differential temperature is the value by which the common flow temperature should be higher than the highest currently required flow temperature of the heating circuits with mixer. Only in connection with heating circuit with mixer M2 (heating circuit 2) and M3 (heating circuit 3)
... K	9F:0 to 9F:40	Adjustable from 0 to 40 K

Boiler

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

"Single and multi boiler system"

Setting		Explanations
		Only if control unit has been changed to constant temperature mode.
Single boiler system	**01:1**	
Multi boiler system	01:2	If the boiler is operated in a multi boiler system.

Boiler (cont.)

"Minimum burner pause time"

Setting		Explanations
Standard	04:0	Fixed setting for minimum burner pause time
Differential method	04:1	Minimum burner pause time subject to the boiler load
Integral method	**04:2**	Minimum burner pause time subject to the boiler load and taking into account a threshold value (specified by boiler coding card)

"Maximum boiler water temperature limit"

Setting		Explanations
	06:...	Maximum limit of the boiler water temperature, defaulted by the boiler coding card
... °C	06:20 to 06:...	Maximum limit of the boiler water temperature within the ranges specified by the boiler coding card Setting range 20 to ... °C

"Integral threshold for burner switch-off"

Setting		Explanations
20	**10:20**	Only effective if parameter 04:2 has been set.
...	10:5 to 10:255	Adjustable from 5 to 255 The higher the value, the later the burner switches off

"Enable start temperature for cyclical calibration in heating mode"

Setting		Explanations
Do not enable	13:0	
Enable	**13:1**	Never adjust

"Enable increase start hysteresis DHW heating for cyclical calibration requirement"

Setting		Explanations
Do not enable	14:0	
Enable	**14:1**	Never adjust

"Enable increase start hysteresis DHW heating for urgent calibration requirement"

Setting		Explanations
Do not enable	15:0	
Enable	**15:1**	Never adjust

"Interval in burner hours until the next service"

Setting		Explanations
None	**21:0**	No service interval set
... 00 h	21:1 to 21:100	The number of hours run before the burner should be serviced is adjustable from 100 to 10,000 h 1 step ≙ 100 h

"Interval until the next service"

Setting		Explanations
No time interval	**23:0**	No time interval selected for service
... Months	23:1 to 23:24	The number of months until the next service is adjustable from 1 to 24

Boiler (cont.)

"Service display"

Setting		Explanations
No service display	**24:0**	
Service is shown on the display (address is automatically set and must be manually reset after a service)	24:1	Displayed only if parameter setting 21 or 23 > 0

"Burner interval ignition"

Setting		Explanations
No burner interval ignition	**28:0**	
... h	28:1 to 28:24	Time interval adjustable from 1 h to 24 h. The burner is force-started for 30 s each time.

"Recognition, external connection extension"

Setting		Explanations
Without	**2E:0**	
With	2E:1	Automatic recognition

"Filling function / venting function"

Setting		Explanations
Function disabled	**2F:0**	
Venting function enabled	2F:1	
Filling function enabled	2F:2	

"Operating mode, internal circulation pump"

Setting		Explanations
Not speed-controlled	30:0	E.g. temporarily for service
Speed-controlled without flow rate capturing	**30:1**	
Speed-controlled with flow rate capturing	30:2	Automatic recognition

"Set speed of internal circulation pump as boiler circuit pump"

Setting		Explanations
... %	**31:...**	Set speed of the internal circulation pump when operated as boiler circuit pump in %, specified by the boiler coding card
... %	31:0 to 31:100	Set speed adjustable from 0 to 100 %

"Current fault status of burner control unit"

Setting		Explanations
No fault	**38:0**	Status of burner control unit: Operational (no fault)
	38: ...	Status of burner control unit: fault (38:≠0)

Boiler (cont.)

"CO limiter"

Setting		Explanations
Learning mode	**49:0**	No CO limiter installed. Must be set if the CO limiter is to be connected and automatically activated.
Sensor monitoring and fault messaging enabled	49:1	CO limiter with sensor monitoring and fault message active. Is set automatically during commissioning if the CO limiter is connected.
Deactivated	49:2	Connection between Vitotronic and CO limiter deactivated If the CO limit is exceeded and the CO limiter is active: ▪ CO limiter sounds an alarm ▪ Alarm signal is not transmitted to the control unit ▪ The burner is not switched off ▪ No fault message to the control unit

DHW

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

"Selection of set DHW temperature"

Setting		Explanations
Between 10 ... 60 °C	**56:0**	Set DHW temperature adjustable from 10 to ≤ 60 °C
10 °C .. programmed maximum value	56:1	Set DHW temperature adjustable from 10 to > 60 °C ***Note*** *Max. value subject to boiler coding card.* *Observe the maximum permissible DHW temperature.*

"Selection of DHW temperature setting range"

Setting		Explanations
Use of parameter GWG5A	**57:0**	Never adjust
Use of parameter GWG5E	57:1	Never adjust

"Additional function for DHW heating"

Setting		Explanations
0 .. 9: Without auxiliary function for DHW heating	**58:0**	
... Set value °C	58:10 to 58:60	Entry of a 2nd set DHW temperature Adjustable from 10 to 60 °C (observe parameter "56") Activate 4th time phase in DHW time program

"Cylinder heating: Set start point"

Setting		Explanations
2.5 K below set value	**59:0**	
... K below set value	59:1 to 59:10	Start point adjustable from 1 to 10 K below set value

DHW (cont.)

"Loading pump connection"

Setting		Explanations
Output 28, main PCB	5A:0	Never adjust
Internal H1 extension	**5A:1**	Never adjust

"DHW cylinder hydraulic connection"

Setting		Explanations
Directly at boiler or upstream of low loss header	**5B:0**	
Downstream of low loss header	5B:1	

"Function of circulation pump for cylinder heating at "External blocking" signal"

Setting		Explanations
Remains in control mode	**5E:0**	
Is switched off	5E:1	
Is switched on	5E:2	

"Function of circulation pump for cylinder heating at "External demand" signal"

Setting		Explanations
Remains in control mode	**5F:0**	
Is switched off	5F:1	
Is switched on	5F:2	

"Additional function for DHW heating"

Setting		Explanations
		Only if control unit has been changed to constant temperature mode.
Without	**63:0**	Circulation pump with 2 min run-on time after cylinder heating
1x daily	63:1	
All ... Days	63:2 to 63:14	Additional function adjustable from every 2 days to every 15 days
2x daily	63:15	

"Diverter valve"

Setting		Explanations
Without	65:0	
With	**65:...**	Information on the type of diverter valve (never adjust; specified by the boiler coding card)

"Set speed, internal circulation pump for DHW heating"

Setting		Explanations
... %	**6C:...**	Set speed of internal circulation pump for DHW heating specified by boiler coding card
... %	6C:0 to 6C:100	Set speed adjustable from 0 to 100 %

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DHW (cont.)

"Limit, max. heating output for DHW heating"

Setting		Explanations
... %	**6F:...**	Max. heating output for DHW heating in %; defaulted by the boiler coding card
... %	6F:0 to 6F:100	Max. heating output for DHW heating adjustable from min. heating output to 100 %

"DHW circulation pump for DHW heating"

Setting		Explanations
ON according to time program	**71:0**	
OFF	71:1	"OFF" during DHW heating to set value 1
ON	71:2	"ON" during DHW heating to set value 1

"DHW circulation pump for auxiliary function DHW heating"

Setting		Explanations
ON according to time program	**72:0**	
OFF	72:1	"OFF" during DHW heating to set value 2
ON	72:2	"ON" during DHW heating to set value 2

"Enable DHW circulation pump"

Setting		Explanations
ON/OFF according to time program	**73:0**	
... x 5 min per hour	73:1 to 73:6	"ON" from once per hour for 5 min up to 6 times per hour for "5 min" during the time program
Permanently ON	73:7	

Heating circuit 1, heating circuit 2, heating circuit 3

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

"Remote control recognition"

Setting		Explanations
Without	**A0:0**	No remote control connected
With Vitotrol 200-A or Vitotrol 200-RF	A0:1	Automatic recognition
With Vitotrol 300-A, Vitotrol 300-RF or Vitocomfort 200	A0:2	Automatic recognition

"Remote control blocking"

Setting		Explanations
All possible settings at the remote control can be accessed	**A1:0**	
Only comfort mode can be set at the remote control	A1:1	Only for Vitotrol 200

Heating circuit 1, heating circuit 2, heating… (cont.)

"Temperature limits, frost protection function"

Setting		Explanations
2 see service instructions	**A3:2**	Outside temperature below 1 °C: Heating circuit pump "ON" Outside temperature above 3 °C: Heating circuit pump "OFF"
... see service instructions	A3:-9 to A3:15	Heating circuit pump ON/OFF, see following table:

! **Please note**
With settings below 1 °C, pipes outside the thermal envelope of the building could freeze up. Use settings below 1 °C only if pipes are appropriately thermally insulated.

Parameter	**Heating circuit pump**	
A3: ...	**"ON"**	**"OFF"**
-9	-10 °C	-8 °C
-8	-9 °C	-7 °C
-7	-8 °C	-6 °C
-6	-7 °C	-5 °C
-5	-6 °C	-4 °C
-4	-5 °C	-3 °C
-3	-4 °C	-2 °C
-2	-3 °C	-1 °C
-1	-2 °C	0 °C
0	-1 °C	1 °C
1	0 °C	2 °C
2 to 15	1 °C to 14 °C	3 °C to 16 °C

"Frost protection"

Setting		Explanations
With	**A4:0**	Frost protection active
Without	A4:1	No frost protection. Adjustment only possible if parameter "A3:-9" has been set. ***Note*** *Observe "Please note" for parameter "A3"*

"Heating limit: Economy function outside temperature"

Setting		Explanations
5 see service instructions	**A5:5**	Economy function outside temperature: Heating circuit pump "OFF" when the outside temperature (OT) is 1 K higher than the set room temperature (RT_{set}) $OT > RT_{set} + 1\ K$
Without	A5:0	No economy function outside temperature
... see service instructions	A5:1 to A5:15	With economy function outside temperature: Heating circuit pump "OFF"; see the following table:

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Heating circuit 1, heating circuit 2, heating… (cont.)

Parameter A5:...	With economy function outside temperature: Heating circuit pump "OFF"
1	OT > RT_{set} + 5 K
2	OT > RT_{set} + 4 K
3	OT > RT_{set} + 3 K
4	OT > RT_{set} + 2 K
5	OT > RT_{set} + 1 K
6	OT > RT_{set}
7 to 15	OT > RT_{set} - 1 K to OT > RT_{set} - 9 K

"Heating limit: Complete summer economy control"

Setting		Explanations
None	**A6:36**	Extended economy function **disabled**
... °C	A6:5 to A6:35	Extended economy function enabled: The burner and heating circuit pump will stop at a variable value, adjustable between 5 and 35 °C plus 1 °C. The mixer closes. The basis for this is the adjusted outside temperature. This is based on the actual outside temperature and a time constant, which takes into account the cooling down of an average building.

"Mixer economy function"

Setting		Explanations
Without	**A7:0**	
With	A7:1	Heating circuit pump also "OFF": ▪ If the mixer has been trying to close for some time. Heating circuit pump "ON": ▪ If the mixer changes to control function ▪ If there is a risk of frost

"Influence of heating circuit with mixer on internal circulation pump"

Setting		Explanations
Without	A8:0	Heating circuit with mixer creates no demand for internal circulation pump
With	**A8:1**	Heating circuit with mixer creates a demand for internal circulation pump

"Pump idle time"

Setting		Explanations
With calculated pump idle time	**A9:7**	Heating circuit pump "OFF" if set value is modified by changing the operating mode or changing the set room temperature. Only if room hook-up is not set in parameter b0.
Without	A9:0	No economy function outside temperature
With calculated pump idle time	A9:1 to A9:15	Adjustable from 1 to 15. The higher the value, the longer the pump idle time.

Heating circuit 1, heating circuit 2, heating… (cont.)

"Room temperature hook-up"

Setting		Explanations
Without	**B0:0**	With remote control: heating mode/reduced mode: weather-compensated Change value only for the heating circuit with mixer.
For reduced mode	B0:1	Heating mode: weather-compensated Reduced mode: with room temperature hook-up
For standard mode	B0:2	Heating mode: with room temperature hook-up Reduced mode: weather-compensated
For standard mode and reduced mode	B0:3	Heating mode/reduced mode: with room temperature hook-up

"Room influence factor"

Setting		Explanations
The higher the value the greater the room influence	**B2:8**	Room influence factor 8 With remote control, and for the heating circuit, operation with room temperature hook-up must be set Change value only for the heating circuit with mixer
Without	B2:0	
The higher the value the greater the room influence	B2:1 to B2:64	Room influence factor adjustable from 1 to 64.

"Economy function room temperature"

Setting		Explanations
Without	**B5:0**	With remote control: no room temperature-dependent economy function. Change value only for the heating circuit with mixer.
... see service instructions	B5:1 to B5:8	For economy function, see the following table:

Parameter b5:...	**With economy function:**	
	Heating circuit pump "OFF"	**Heating circuit pump "ON"**
1	$RT_{actual} > RT_{set} + 5$ K	$RT_{actual} < RT_{set} + 4$ K
2	$RT_{actual} > RT_{set} + 4$ K	$RT_{actual} < RT_{set} + 3$ K
3	$RT_{actual} > RT_{set} + 3$ K	$RT_{actual} < RT_{set} + 2$ K
4	$RT_{actual} > RT_{set} + 2$ K	$RT_{actual} < RT_{set} + 1$ K
5	$RT_{actual} > RT_{set} + 1$ K	$RT_{actual} < RT_{set}$
6	$RT_{actual} > RT_{set}$	$RT_{actual} < RT_{set} - 1$ K
7	$RT_{actual} > RT_{set} - 1$ K	$RT_{actual} < RT_{set} - 2$ K
8	$RT_{actual} > RT_{set} - 2$ K	$RT_{actual} < RT_{set} - 3$ K

"Minimum flow temperature limit, heating circuit"

Setting		Explanations
20 °C	**C5:20**	Electronic minimum flow temperature limit set to 20 °C
... °C	C5:1 to C5:127	Minimum limit adjustable from 1 to 127 °C (limited by boiler-specific parameters)

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Heating circuit 1, heating circuit 2, heating… (cont.)

"Maximum flow temperature limit, heating circuit"

Setting		Explanations
74 °C	**C6:74**	Electronic maximum flow temperature limit 74 °C
... °C	C6:10 to C6:127	Maximum limit adjustable from 10 to 127 °C (limited by boiler-specific parameters)

"Slope"

Setting		Explanations
1.4	**D3:14**	Heating curve slope = 1.4
...	D3:2 to D3:35	Heating curve slope adjustable from 0.2 to 3.5

"Heating curve level"

Setting		Explanations
0	**D4:0**	
...	D4:-13 to D4:40	Heating curve level adjustable from –13 K to 40 K

"External operating program changeover"

Setting		Explanations
The operating program changes to "Constant central heating with reduced room temperature" or "Standby mode" (subject to the settings of the set reduced room temperature)	**D5:0**	
The operating program changes to "Constant operation with standard room temperature"	D5:1	Subject to parameters 3A, 3B and 3C

"Function of heating circuit pump at "External blocking" signal"

Setting		Explanations
Remains in control mode	**D6:0**	
Is switched off	D6:1	Subject to parameters 3A, 3B and 3C
Is switched on	D6:2	Subject to parameters 3A, 3B and 3C

"Function of heating circuit pump at "External demand" signal"

Setting		Explanations
Remains in control mode	**D7:0**	
Is switched off	D7:1	Subject to parameters 3A, 3B and 3C
Is switched on	D7:2	Subject to parameters 3A, 3B and 3C

"EA1 extension: Operating program changeover"

Setting		Explanations
No operating program changeover	**D8:0**	
Operating program changeover via input DE1	D8:1	
Operating program changeover via input DE2	D8:2	
Operating program changeover via input DE3	D8:3	

Heating circuit 1, heating circuit 2, heating… (cont.)

"Setting range, set day temperature"

Setting		Explanations
3 .. 23 °C	E1:0	
10 .. 30 °C	**E1:1**	Never adjust
17 .. 37 °C	E1:2	

"Display correction of the actual room temperature"

Setting		Explanations
None	**E2:50**	With remote control: No display correction of the actual room temperature
... K	E2:0 to E2:49	Display correction –5 K to Display correction –0.1 K
... K	E2:51 to E2:100	Display correction +0.1 K to Display correction +4.9 K

"Recognition, speed-controlled circulation pump"

Setting		Explanations
Without	**E5:0**	
With	E5:1	Automatic recognition

"Max. speed of speed-controlled heating circuit pump in standard mode"

Setting		Explanations
... %	**E6: ...**	This value is determined by boiler-specific parameters
... %	E6:0 to E6:100	Maximum speed adjustable from 0 to 100 %

"Min. speed of speed-controlled heating circuit pump in standard mode"

Setting		Explanations
30 %	**E7:30**	
... %	E7:0 to E7:100	Minimum speed adjustable from 0 to 100 % of the maximum speed

"Speed setting in reduced mode"

Setting		Explanations
Minimum speed according to parameter E7	E8:0	
Reduced speed according to parameter E9	**E8:1**	

"Speed of speed-controlled heating circuit pump in reduced mode"

Setting		Explanations
45 %	**E9:45**	
... %	E9:0 to E9:100	Speed adjustable from 0 to 100 % of max. speed

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Heating circuit 1, heating circuit 2, heating… (cont.)

"Screed drying"

Setting		Explanations
Screed drying disabled	**F1:0**	Screed drying adjustable, with choice of 6 temperature/time profiles (see chapter "Function description")
Diagram 1	F1:1	
Diagram 2	F1:2	
Diagram 3	F1:3	
Diagram 4	F1:4	
Diagram 5	F1:5	
Diagram 6	F1:6	
Constant flow temperature 20 °C	F1:7 to F1:14	
Individual program for screed drying	F1:15	See chapter "Function description"

"Time limit for comfort mode"

Setting		Explanations
8 h	**F2:8**	
No time limit	F2:0	
... h	F2:1 to F2:12	Time limit adjustable from 1 to 12 h

"Run-on time, heating circuit pump"

Setting		Explanations
		Only if control unit has been changed to constant temperature mode.
None	F5:0	No run-on time of the internal circulation pump in heating mode
... Min.	F5:1 to F5:20	Run-on time of the internal circulation pump in heating mode adjustable from 1 to 20 min

"Pump start heating circuit pump A1, DHW only"

Setting		Explanations
		Only if control unit has been changed to constant temperature mode.
OFF	F6:0	In "Only DHW" mode, the internal circulation pump is permanently off
... ON	F6:1 to F6:24	Activation of the internal circulation pump in "Only DHW" mode is adjustable from 1 to 24 times per day for 10 min. each time.
Constantly ON	**F6:25**	In "Only DHW" mode, the internal circulation pump is permanently on

Heating circuit 1, heating circuit 2, heating… (cont.)

"Pump start heating circuit pump A1, standby mode"

Setting		Explanations
		Only if control unit has been changed to constant temperature mode.
OFF	F7:0	In "Standby mode", the internal circulation pump is permanently off
... ON	F7:1 to F7:24	Activation of the internal circulation pump in "Standby mode" is adjustable from 1 to 24 times per day for 10 min. each time.
Constantly ON	**F7:25**	In "Standby mode", the internal circulation pump is permanently on

"Outside temperature limit for cancelling reduced set room temperature"

Setting		Explanations
-5 °C	**F8:-5**	See chapter "Function description" Observe parameter "A3".
... °C	F8:+10 to F8:-60	Temperature limit adjustable from +10 to -60°C
Function disabled	F8:-61	

"Outside temperature limit for raising the reduced set room temperature to the standard set room temperature"

Setting		Explanations
-14 °C	**F9:-14**	See chapter "Function description"
... °C	F9:+10 to F9:-60	Temperature limit adjustable from +10 to -60°C

"Raising the set boiler water or flow temperature when switching from operation with reduced room temperature to operation with standard room temperature"

Setting		Explanations
20 %	**FA:20**	See chapter "Function description"
... %	FA:0 to FA:50	Temperature rise adjustable from 0 to 50 %

"Duration for raising the set boiler water or flow temperature"

Setting		Explanations
60 min	**FB:60**	See parameter "FA" See chapter "Function description"
... min	FB:0 to FB:240	Temperature rise adjustable from 0 to 240 min

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Calling up the service menu

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.
4. Select the required menu section.

Note

- ***"Parameter level 2"*** *is only displayed if this level has been enabled:*
  Enter the password ***"viexpert"****.*
- *Tap* 🔧 *to return to* ***"Service, main menu"***

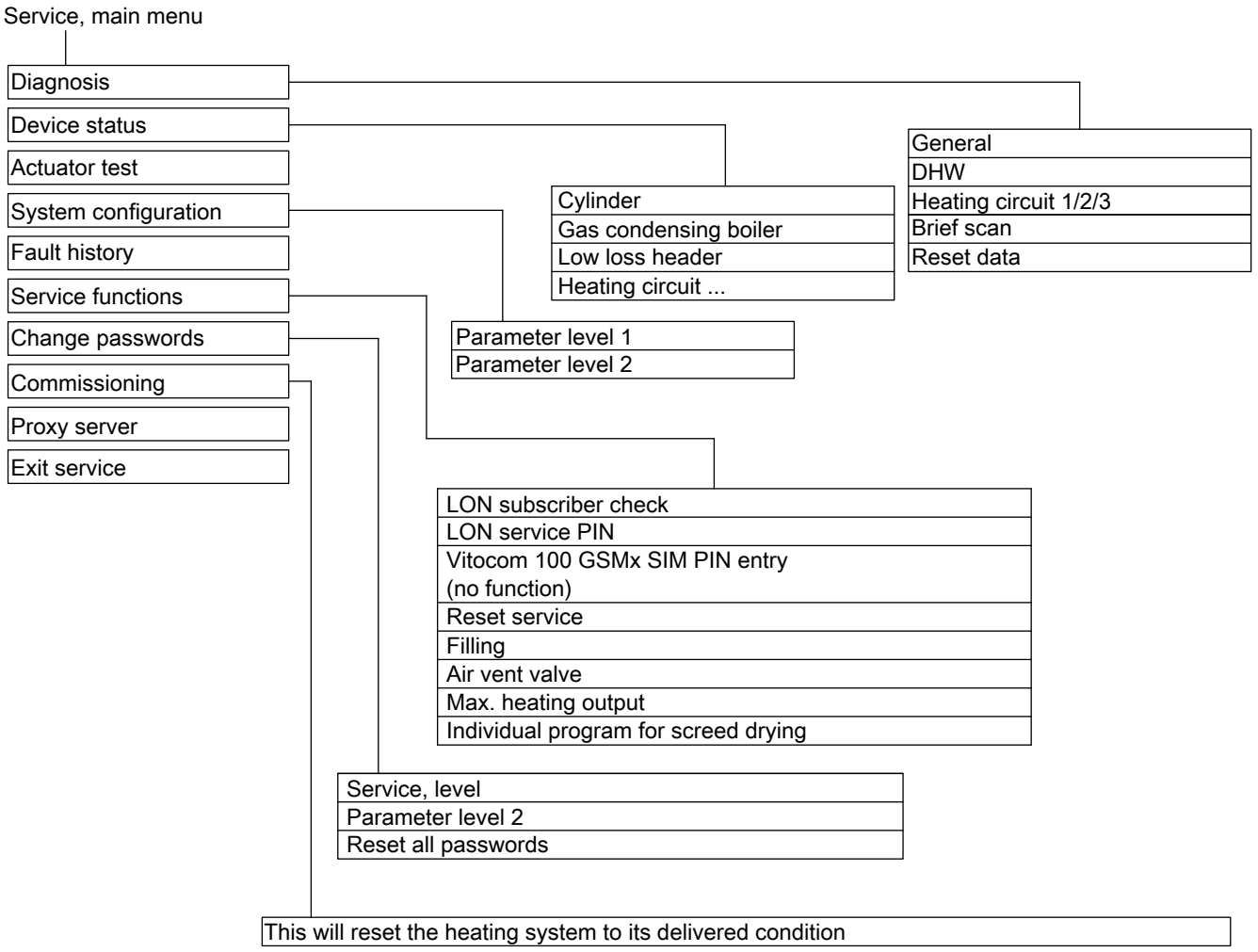


Fig. 53

Exiting the service menu

Tap the following buttons:

"Exit service" or **"Exit service menu"**.

Note

The system exits the service menu automatically after 30 min.

Changing the passwords

In the delivered condition, the following passwords have been assigned:

- **"viservice"** for access to **"Service, main menu"**
- **"viexpert"** for access to **"Parameter level 2"**

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**

Changing the passwords (cont.)

3. Enter the password **"viservice"**.
4. **"Change passwords"**.
5. **"Service, level"**, **"Service menu"** or **"Parameter level 2"**
6. Enter current password.
7. Confirm with **OK** or ✓.
8. Enter new password.
9. Confirm by tapping **OK** or ✓ twice.

Resetting all passwords to the factory setting

Tap the following buttons:

1. Request the master password from the Technical Service at the Viessmann Group.
2. **"Menu"** or "☰"
3. **"Service"**
4. Enter the password **"viservice"**.
5. **"Change passwords"**
6. **"Reset all passwords"**
7. Enter master password.
8. Confirm by tapping **OK** or ✓ twice.

Diagnosis

Calling up operating data

Operating data can be called up in various areas. See **"Diagnosis"** in the service menu overview.
Operating data on heating circuits with mixer or solar thermal systems can only be called up if such components exist in the system.
For further information on operating data, see chapter "Brief scan".

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

Calling up operating data

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Diagnosis"**
5. Select required group, e.g. **"General"**.

Resetting operating data

Saved operating data (for example, hours run) can be reset to 0.
The value "Adjusted outside temperature" is reset to the actual value.

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Diagnosis"**
5. **"Reset data"**
6. Select required value or **"All data"**.

Calling up the device status

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.

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Diagnosis (cont.)

4. **"Device status"**
   The display shows the system scheme.
5. Tap the required system component. A list of current settings and switching states is displayed.

Brief scan

In the brief scan, you can call up temperatures, software versions and connected components, for example.

Tap the following buttons:



Fig. 54 HO2B

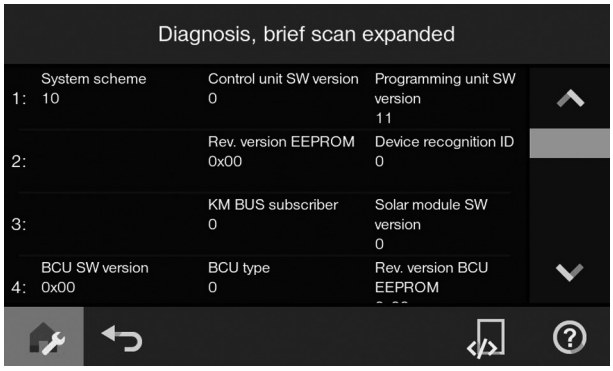


Fig. 55 HO2C

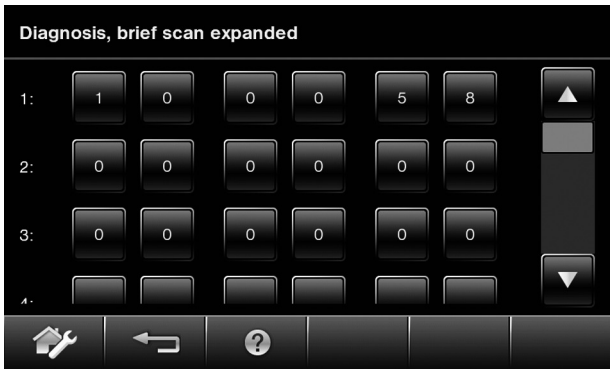


Fig. 56 HO2B

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Diagnosis"**
5. **"Brief scan"**
6. Tap **"Code"** or "</>".
   An overview of the brief scan appears, with 14 rows and 6 fields.
7. ▼/▲ or ⋀/⋁ for the required brief scan in line with the following table

Diagnosis (cont.)

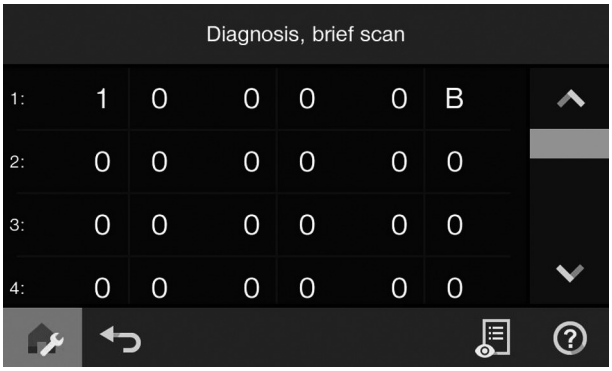


Fig. 57 HO2C

8. Tap ↩ or 📋 to return to "Diagnosis, brief scan expanded" or "Diagnosis, brief scan".

Meaning of the relevant values in the individual rows and fields:

Row (brief scan)	Field					
	1	2	3	4	5	6
1:	System scheme 01 to 10		Software version Control unit		Software version Programming unit	
2:	0	0	Appliance version		Appliance ID CU-ID	
3:	0	0	Number of KM-BUS subscribers		Software version, solar control module SM1	
4:	Software version Burner control unit		Type Burner control unit		Version, burner control unit	
5:	Burner starts until next calibration			Escalation stage, calibration	Software version, AM1 extension	Software version, EA1 extension
6:	0	0	0	Switching state of flow switch (only for combi boiler) 0: OFF 1: Active	0	0
7:	LON Subnet address/system number		LON Node address		0	0
8:	LON SNVT or SVNT configuration	LON Software version, communication coprocessor	LON Neuron chip software version		Number of LON subscribers	
9:	**Heating circuit A1/HC1**		**Heating circuit M2/HC2**		**Heating circuit M3/HC3**	
	Remote control 0: None 1: Vitotrol 200-A/ 200-RF 2: Vitotrol 300-A/	Software version, remote control	Remote control 0: None 1: Vitotrol 200-A/ 200-RF 2: Vitotrol 300-A/	Software version, remote control	Remote control 0: None 1: Vitotrol 200-A/ 200-RF 2: Vitotrol 300-A/	Software version, remote control

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Diagnosis (cont.)

Row (brief scan)	Field					
	1	2	3	4	5	6
10:	0	0	0	0	0	0
11:	0	0	Software version Mixer extension, heating circuit M2 0: No mixer extension	0	Software version Mixer extension, heating circuit M3 0: No mixer extension	0
12:	**Vitovent gateway**		**CU-ID**		**Connection error, Vitovent**	
	0: None 1: Available		xx		xx	
13:	0	0	0	0	0	0
14:	0	0	0	0	0	0

Checking outputs (actuator test)

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter the password **"viservice"**.
4. **"Actuator test"**
5. Select (tap) the actuator.
6. Use ⮌ to deactivate the actuator or choose another actuator.
   The actuator is also deactivated automatically after 30 min.

The following actuators (relay outputs) can be controlled subject to the system equipment level:

Display		Explanation
"All actuators"	**"OFF"**	All actuators are off
"Base load"	**"ON"**	Burner operates at min. output. Internal pump is switched on
"Full load"	**"ON"**	Burner operates at max. output. Internal pump is switched on
"Output 20"	**"ON"**	Internal output [20] (int. pump) active
"Valve"	**"Heating"**	Diverter valve set to heating mode
"Valve"	**"Middle"**	Diverter valve in central position (filling/draining)
"Valve"	**"DHW"**	Diverter valve set to DHW heating
"Heating circuit pump HC2"	**"ON"**	Output for heating circuit pump active (extension heating circuit with mixer)
"Mixer HC2"	**"Open"**	Output for "Mixer open" active (extension heating circuit with mixer)
"Mixer HC2"	**"Close"**	Output for "Mixer close" active (extension heating circuit with mixer)
"Heating circuit pump HC3"	**"ON"**	Output for heating circuit pump active (extension heating circuit with mixer)
"Mixer HC3"	**"Open"**	Output for "Mixer open" active (extension heating circuit with mixer)
"Mixer HC3"	**"Close"**	Output for "Mixer close" active (extension heating circuit with mixer)
"Output, internal H1 extension"	**"ON"**	Output at internal extension active
"Solar circuit pump"	**"ON"**	Solar circuit pump output [24] on solar control module SM1 active
"Solar circuit pump min."	**"ON"**	Solar circuit pump output on solar control module SM1 switched to minimum speed

Checking outputs (actuator test) (cont.)

Display		Explanation
"Solar circuit pump max."	**"ON"**	Solar circuit pump output on solar control module SM1 switched to maximum speed
"SM1 output 22"	**"ON"**	Output 22 on solar control module SM1 active
"EA1 output 1"	**"ON"**	Contact P - S at plug 157 of EA1 extension closed
"AM1 output 1"	**"ON"**	Output A1 at AM1 extension active
"AM1 output 2"	**"ON"**	Output A2 at AM1 extension active
"Output 28"	**"ON"**	If available: Internal output 28 (DHW circulation pump) active

Fault display

In the event of a fault, the red fault indicator on the control unit flashes. ⚠ appears on the display and **"Fault"** is shown.

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

For an explanation of fault codes, see chapter "Fault messages".

Acknowledging a fault display

Tap **"Confirm"**.
The footer shows ⚠.

Note
Any connected central fault message facility is switched off.
If an acknowledged fault is not remedied, the fault message will be redisplayed the following day at 07:00 h, and the fault message facility restarts.

Calling up acknowledged fault messages

Tap the following buttons:

1. ⚠

   Note
   If service messages are present at the same time in the heating system, ***"Faults"*** *and* ***"Service, messages"*** *appear.*

2. **"Faults"**
   The fault messages appear in red and in chronological order in a list.
   Service messages appear in yellow.

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

The 10 most recent faults (including those remedied) and service messages are saved and can be called up.
Faults are sorted by date.

Tap the following buttons:

1. **"Menu"** or "☰"
2. **"Service"**
3. Enter password **"viservice"**.
4. **"Fault history"**
5. Use ? or ⓘ to call up further information on the relevant fault.
6. If you wish to delete the list, tap **"Delete"** or 🗑.

Fault codes

Fault code displayed	System characteristics	Cause	Measures
10	Regulates as if the outside temperature were 0 °C.	Short circuit, outside temperature sensor	Check outside temperature sensor (see page 107)
18	Regulates as if the outside temperature were 0 °C.	Lead break, outside temperature sensor	Check outside temperature sensor (see page 107).
19	Regulates as if the outside temperature were 0 °C.	Configuration fault	Set parameter 2A:0.

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
0F	Control mode	Maintenance "0F" is only displayed in the fault history.	Perform a service. ***Note*** *Set parameter/code "24:0" following a service.*
20	Regulates without flow temperature sensor (low loss header).	Short circuit, system flow temperature sensor	Check low loss header sensor (see page 108).
21	Control mode Display fault in energy cockpit	Sensor outside tolerance range	Check sensor on DHW cylinder and collectors.
22	Control mode Display fault in energy cockpit	Sensor outside tolerance range	Check sensor on DHW cylinder and collectors.
23	Control mode Display fault in energy cockpit	Incorrect commissioning	Determine solar circuit flow rate (if installed) and enter value established.
24	Control mode Display fault in energy cockpit	DHW circulation pump not working	Check setting of parameter 39 ("**General**" group). If required, carry out an actuator test.
25	Control mode Display fault in energy cockpit	Transfer pump not working	Check setting of parameter 20 ("**Solar**" group). If required, carry out an actuator test.
26	Control mode Display fault in energy cockpit	DHW circulation pump and transfer pump not working	Check setting of parameter 20 ("**Solar**" group) and of parameter 39 ("**General**" group). If required, carry out an actuator test.
27	Control mode Display fault in energy cockpit	Incorrect commissioning	Determine solar circuit flow rate (if installed) and enter value established.
28	Regulates without flow temperature sensor (low loss header)	Lead break, system flow temperature sensor	Check low loss header sensor (see page 108). If no low loss header sensor is connected, set parameter 52:0.
30	Burner blocked	Short circuit, boiler water temperature sensor	Check the boiler water temperature sensor (see page 108).
38	Burner blocked	Lead break, boiler water temperature sensor	Check the boiler water temperature sensor (see page 108).
40	Mixer is being closed.	Short circuit, flow temperature sensor, heating circuit 2 (with mixer)	Check flow temperature sensor (see page 113).
44	Mixer is being closed.	Short circuit, flow temperature sensor, heating circuit 3 (with mixer)	Check flow temperature sensor (see page 113).
48	Mixer is being closed.	Lead break, flow temperature sensor, heating circuit 2 (with mixer)	Check flow temperature sensor (see page 113).
49	Mixer is being closed.	Incorrect assignment of extension for mixer, heating circuit 2	Check and adjust rotary switch S1 (see page 113).

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
4C	Mixer is being closed.	Lead break, flow temperature sensor, heating circuit 3 (with mixer)	Check flow temperature sensor (see page 113).
4D	Mixer is being closed.	Incorrect assignment of extension for mixer, heating circuit 3	Check and adjust rotary switch S1 (see page 113).
50	No DHW heating	Short circuit, cylinder temperature sensor	Check sensors (see page 108).
51	No DHW heating	Short circuit, outlet temperature sensor	Check the sensor (see page 108).
58	No DHW heating	Lead break, cylinder temperature sensor	Check sensors (see page 108).
59	No DHW heating	Lead break, outlet temperature sensor	Check the sensor (see page 108).
70	Burner blocked	Gas pressure switch prevents burner start.	▪ Check gas supply (gas pressure). ▪ If installed: check gas pressure switch for correct function. If necessary, disconnect plug 111 from the control unit and check whether the burner starts.
71	Burner blocked	Mains voltage too low	Check the power supply.
73	Burner blocked	Feedback input from internal H1 extension prevents burner start.	Check that internal H1 extension and any devices connected to it are correctly connected and working properly (internal: plug 53/96 power interruption)
74	Burner blocked or in a fault state	Temperature limiter earth fault	Check temperature limiter, connecting cables and plug-in connection for contact to earthed components; remove contact if necessary. Press reset button **R**.
75	Burner blocked or in a fault state	Internal H1/H2 extension earth fault	Check internal H1/H2 extension, connecting cables and plug-in connection for connection (contact) to earthed components. Remove contact if necessary. Press reset button **R**.
76	Burner blocked or in a fault state	Gas pressure switch earth connection	Check gas pressure switch, connecting cables and plug-in connection for connection (contact) to earthed components. Remove contact if necessary. Press reset button **R**.

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
80	Burner in a fault state	Insufficient gas supply	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. The gas flow switch may respond if the system is restarted.*
81	Burner in a fault state	No ignition spark	Check connecting cables and leads from ignition module and ignition electrode (see page 46). Check for a voltage of 230 V~ at plug 54 on the ignition module during the ignition phase. Check whether the ignition electrode insulation is damaged.
82	Burner in a fault state	Flame signal at burner start not present or insufficient.	Check the ionisation electrode and connecting lead (see page 46). Check plug-in connections for loose contacts. ***Note*** *Deposits on the electrodes indicate foreign bodies in the ventilation air. Check the installation room and flue system for causes of the deposits. For example: laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).*
83	Burner in a fault state	Flame signal is already present at burner start.	Check system for condensate backup. ***Note*** *To prevent water damage, detach fan unit before removing the burner.* Check ionisation and ignition electrode for damage and earth faults (e.g. contact with the thermal insulation ring). Check connecting leads from ionisation and ignition electrode. Replace control unit if fault is permanent. Press reset button **R**.

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
84	Burner in a fault state	CO limit within appliance exceeded	Check entire flue gas path for the following: ▪ Flue gas recirculation ▪ Leaks ▪ Flue gas back pressure caused by water pocket (if flue system fall is insufficient) ▪ Constrictions ▪ Blockages Repair flue system if necessary. Press reset button **R**.
85	Burner in a fault state	Gas supply insufficient during calibration	Test static gas pressure and gas flow pressure. Check that on-site gas line and gas flow switch are correctly sized. Visually inspect gas train inlet and strainer on the inlet side for contamination. ***Note*** *Contamination from a brazed gas line, for example, can block up the gas train strainer on the inlet side.* Press reset button **R**.
95	Burner blocked The burner starts again once the CO level is below the CO limit.	CO limit exceeded.	⚠ **Danger** An increased concentration of carbon monoxide can cause potentially fatal carbon monoxide poisoning. Observe the safety instructions at the beginning of this manual. Determine the cause of the increased CO level. Remedy the fault. Press **Test** on the CO limiter. The alarm is switched off.
96	Burner blocked	CO limiter sensor fault	Replace the CO limiter. If the system is to be temporarily operated without a CO limiter: ▪ Disconnect plug X21 from the control unit. ▪ Set parameter 49:0.
A3	Burner blocked	Flue gas temperature sensor incorrectly positioned	Fit flue gas temperature sensor correctly (see page 110).
A7	Control mode as per delivered condition	Programming unit faulty	Replace the programming unit.
A8	Burner blocked. The venting program is started automatically (see page 141).	Air in the internal circulation pump or minimum flow rate not achieved	Vent the system if the fault message continues to be displayed.

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
A9	If a heating circuit with mixer is connected, the burner operates at its lower heating output. If only one heating circuit without mixer is connected, the burner is blocked.	Internal circulation pump blocked	Check circulation pump.
B0	Burner in a fault state	Short circuit, flue gas temperature sensor	Check flue gas temperature sensor and connecting lead.
B1	Control mode as per delivered condition	Communication error, programming unit	Check connections and replace programming unit if required.
B4	Regulates as if the outside temperature were 0 °C.	Internal fault	Replace control unit.
B5	Control mode as per delivered condition	Internal fault	Replace control unit.
B7	Burner blocked	Boiler coding card fault	Plug in boiler coding card or replace if faulty.
B8	Burner in a fault state	Lead break, flue gas temperature sensor	Check flue gas temperature sensor and connecting lead.
BA	Mixer regulates to 20 °C flow temperature.	Communication error, extension kit for heating circuit 2 (with mixer)	Check extension kit connections and assignment.
BB	Mixer regulates to 20 °C flow temperature.	Communication error, extension kit for heating circuit 3 (with mixer)	Check extension kit connections and assignment.
BC	Control mode without remote control	Communication error, Vitotrol remote control, heating circuit 1 (without mixer)	Check connections, lead, parameter "A0" and remote control settings (see page 145). In case of wireless remote control: Check connection. Place the remote control unit close to the boiler.
BD	Control mode without remote control	Communication error, Vitotrol remote control, heating circuit 2 (with mixer)	Check connections, lead, parameter "A0" and remote control settings (see page 145). In case of wireless remote control: Check connection. Place the remote control unit close to the boiler.
BE	Control mode without remote control	Communication error, Vitotrol remote control, heating circuit 3 (with mixer)	Check connections, lead, parameter "A0" and remote control settings (see page 145). In case of wireless remote control: Check connection. Place the remote control unit close to the boiler.
BF	Control mode	Incorrect LON communication module	Replace LON communication module.
C1	Control mode	Communication error, EA1 extension	Check connections.
C3	Control mode	Communication error, AM1 extension	Check connections.

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
C4	Control mode	Communication error, OpenTherm extension	Check OpenTherm extension.
C5	Control mode, max. pump speed	Communication error, internal variable speed pump	Check setting of parameter "30".
CD	Control mode	Communication error	Set parameter 95:0.
CF	Control mode	Communication error, communication module	Replace communication module
D3	Burner in a fault state or blocked.	Communication error, fan unit.	Check the connecting cable to the fan unit. Press reset button **R**. If the fault recurs, replace the fan unit.
D4	Control mode Burner is operating with a limited modulation range.	No air flow detected in fan unit.	Check the mass flow sensor at the fan unit. Check the flue system for flue gas back pressure.
D5	Burner in a fault state	Fan blocked	Press reset button **R**. Check fan impeller movement. If necessary, replace fan.
D6	Control mode	Input DE1 at EA1 extension reports a fault.	Remedy fault at appliance concerned.
D7	Control mode	Input DE2 at EA1 extension reports a fault.	Remedy fault at appliance concerned.
D8	Control mode	Input DE3 at EA1 extension reports a fault.	Remedy fault at appliance concerned.
DA	Control mode without room influence	Short circuit, room temperature sensor, heating circuit 1 (without mixer)	Check room temperature sensor, heating circuit 1.
DB	Control mode without room influence	Short circuit, room temperature sensor, heating circuit 2 (with mixer)	Check room temperature sensor, heating circuit 2.
DC	Control mode without room influence	Short circuit, room temperature sensor, heating circuit 3 (with mixer)	Check room temperature sensor, heating circuit 3.
DD	Control mode without room influence	Lead break, room temperature sensor, heating circuit 1 (without mixer)	Check room temperature sensor, heating circuit 1 and remote control settings (see page 145).
DE	Control mode without room influence	Lead break, room temperature sensor, heating circuit 2 (with mixer)	Check room temperature sensor, heating circuit 2 and remote control settings (see page 145).
DF	Control mode without room influence	Lead break, room temperature sensor, heating circuit 3 (with mixer)	Check room temperature sensor, heating circuit 3 and remote control settings (see page 145).
E0	Control mode	External LON subscriber error	Check connections and LON subscribers.

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
E1	Burner in a fault state	Ionisation current too high during calibration	Check gap between ionisation electrode and burner gauze assembly (see page 46). Check whether there is a lot of dust in the ventilation air (e.g. from construction work). ***Note*** *Deposits on the electrodes indicate foreign bodies in the ventilation air. Check the installation room and flue system for causes of the deposits. For example: laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).* *If burner gauze assembly and ionisation electrode have been replaced, also clean fan unit, gas/air channel and Venturi extension.*
E2	Burner in a fault state	No calibration as flow rate too low	Ensure adequate heat transfer. Press reset button **R**.
E3	Burner in a fault state	Heat transfer too low during calibration Temperature limiter has shut down.	Ensure adequate heat transfer. Check circulation pump for faults, scale or blockages. Press reset button **R**.
E4	Burner blocked	24 V power supply fault	Replace control unit.
E5	Burner blocked or in a fault state	Flame amplifier fault	Press reset button **R**. Replace control unit if fault is permanent.
E7	Burner in a fault state	Ionisation current too low during calibration	Check the ionisation electrode and connecting lead (see page 46). Check plug-in connections for loose contacts. Check flue system; remove flue gas recirculation if required. Press reset button **R**. ***Note*** *Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits. For example: laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).* *If burner gauze assembly and ionisation electrode have been replaced, also clean fan unit, gas/air channel and Venturi extension.*

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
E8	Burner in a fault state	Ionisation current lies outside the permissible range	Check gas supply (gas pressure and gas flow switch), gas train and connecting cable. Check assignment of gas type (see page 37). Check ionisation electrode: ▪ Distance to burner gauze assembly (see page 46) ▪ Electrode contaminated Press reset button **R**.
E9	Burner in a fault state	Repeated flame loss during calibration	Check the ionisation electrode and connecting lead (see page 46). Check plug-in connections for loose contacts. Check flue system; remove flue gas recirculation if required. Check system for condensate backup. Visually inspect gas train inlet and strainer on the inlet side for contamination. ***Note*** *To prevent water damage, detach fan unit before removing the burner.* ***Note*** *Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits. For example: laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).* *If burner gauze assembly and ionisation electrode have been replaced, also clean fan unit, gas/air channel and Venturi extension.* Press reset button **R**.

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
EA	Burner in a fault state	Ionisation current too low during calibration. Difference compared to previous value not plausible.	Check ionisation electrode and connecting cable. Check plug-in connections for loose contacts. Check whether there is a lot of dust in the ventilation air (e.g. from construction work). Check flue system; remove flue gas recirculation if required. Check system for condensate backup. ***Note*** *To prevent water damage, detach fan unit before removing the burner.* Replace coding card if fault is permanent. ***Note*** *Deposits on the electrodes indicate foreign bodies in the combustion air. Check the installation room and flue system for causes of the deposits. For example: laundry detergents, cleaning agents, toiletries, deposits in the ventilation air supply (chimney).* *If burner gauze assembly and ionisation electrode have been replaced, also clean fan unit, gas/air channel and Venturi extension.* Press reset button **R**.

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
EB	Burner in a fault state	Process fault: shutdown during calibration.	▪ Check system for condensate backup. ***Note*** *To prevent water damage, detach fan unit before removing the burner.* Remove the condensate backup. Press reset button **R**. ▪ Check the gas supply pressure. Check gas train strainer on the inlet side for contamination. ▪ Check ionisation electrode for contamination. Check gap between ionisation electrode and burner gauze assembly (see page 46). Press reset button **R**. ▪ Check flue system; remove flue gas recirculation if required. Press reset button **R**. ▪ Check that internal H1 extension and any devices connected to it are correctly connected and working properly (internal: plug 53/96 power interruption) ▪ Check the connecting cable to the fan unit. Check impeller for ease of operation.
EC	Burner in a fault state	Parameter error during calibration	Press reset button **R** or replace boiler coding card and press reset button **R**.
ED	Burner in a fault state	Internal fault at control unit	Press reset button **R**. Replace control unit if fault is permanent.
EE	Burner in a fault state	Flame signal at burner start not present or insufficient.	▪ Check gas supply (gas pressure and gas flow switch). ▪ Check gas train. ▪ Check system for condensate backup. ***Note*** *To prevent water damage, detach fan unit before removing the burner.* ▪ Check ionisation electrode and connecting cable. Check ignition: ▪ Connecting cables to ignition module and ignition electrode ▪ Ignition electrode gap and contamination (see page 46). ▪ Check ignition electrode for broken insulation. Press reset button **R**.

Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
EF	Burner in a fault state	Flame is lost immediately after it has built (during safety time).	Check gas supply (gas pressure and gas flow switch). Check balanced flue system for flue gas recirculation. Check ionisation electrode: ▪ Distance to burner gauze assembly (see page 46) ▪ Electrode contaminated Press reset button **R**.
F0	Burner blocked or in a fault state	Internal fault	Press reset button **R**. Replace control unit if fault is permanent.
F1	Burner in a fault state	Flue gas temperature limiter has responded.	Check heating system fill level. Vent the system. Press reset button **R** after flue system has cooled down.
F2	Burner in a fault state	Temperature limiter has responded.	Check heating system fill level. Check circulation pump. Vent the system. Check temperature limiter and connecting cables. Press reset button **R**.
F3	Burner in a fault state	Flame signal is already present at burner start.	Check ionisation electrode and connecting cable. Check system for condensate backup. ***Note*** *To prevent water damage, detach fan unit before removing the burner.* Press reset button **R**.
F8	Burner in a fault state	Fuel valve or modulation valve will not close.	Check the gas train and replace if required. Press reset button **R**.
F9	Burner in a fault state	Fan speed too low	Check the fan. Check the fan connecting cables. Check the fan power supply. Press reset button **R**.
FA	Burner in a fault state	Fan idle state or set speed not reached	Check the fan. Check the fan connecting cables. Press reset button **R**.
FB	Burner in a fault state	Flame loss in the stabilisation or operating phase	Check gas supply (gas pressure and gas flow switch). Check balanced flue system for flue gas recirculation. Check ionisation electrode: ▪ Distance to burner gauze assembly (see page 46) ▪ Electrode contaminated Press reset button **R**.

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Fault codes (cont.)

Fault code displayed	System characteristics	Cause	Measures
FC	Burner in a fault state	Gas train faulty, modulation valve control faulty or flue gas path blocked	Check connecting cables to the gas train for damage. Check gas train. Check flue system for blockages or constrictions. Press reset button **R**.
Fd	Burner in a fault state	Burner control unit fault	Check ignition electrode, ionisation electrode and connecting cables. Check whether a strong interference (EMC) field exists near the appliance. Press reset button **R**. If the fault occurs sporadically, replace the coding card. Replace control unit if fault is permanent.
FE	Burner blocked or in a fault state	EEPROM error, PCB	Press reset button **R**. Replace control unit if fault persists.
FE	Burner in a fault state and additional fault B7 is displayed.	Boiler coding card missing.	Insert the boiler coding card. Press reset button **R**. Replace control unit if fault persists.
FF	Burner blocked or in a fault state	Internal fault or reset button **R** blocked.	Restart the appliance. Replace the control unit if the appliance will not restart.

Repairs

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

Water ingress can result in damage to other components.

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

Putting the control unit into the service position

If required for commissioning and servicing, the control unit can be put into a different position.

Repairs (cont.)

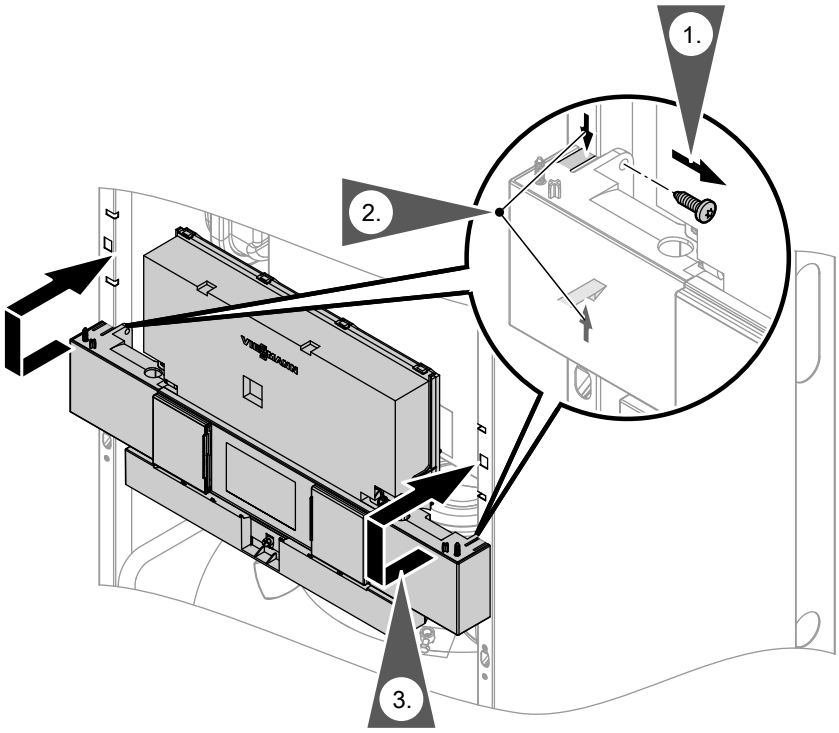


Fig. 58

Draining the boiler on the heating water side

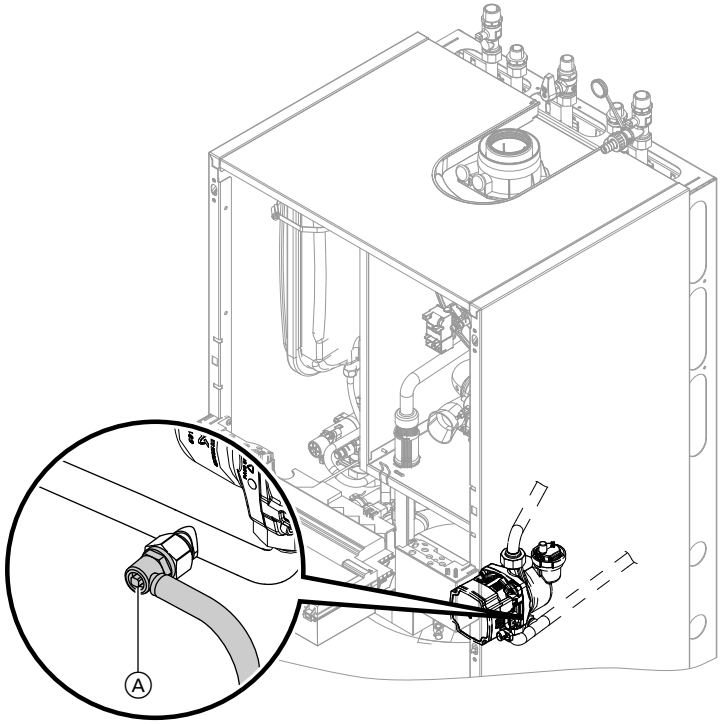


Fig. 59

1. Close the shut-off valves on the heating water side.
2. Route hose at drain valve Ⓐ into a suitable container or drain outlet.
3. Open drain valve Ⓐ and drain the boiler as much as required.

Repairs (cont.)

Checking the outside temperature sensor

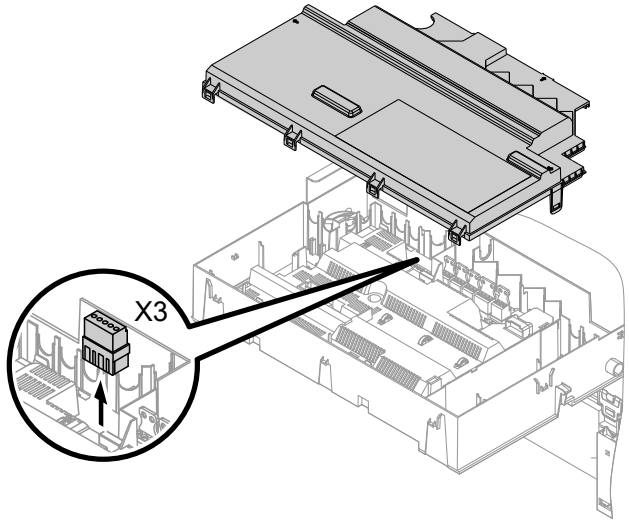


Fig. 60

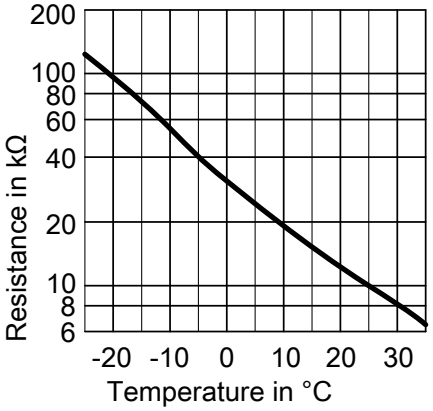


Fig. 61 Sensor type: NTC 10 kΩ

1. Pull plug "X3" from the control unit.
2. Test the resistance of the outside temperature sensor across terminals "X3.1" and "X3.2" on the disconnected plug and compare it with the curve.
3. Where actual values deviate severely from the curve values, disconnect the wires at the sensor and repeat the test on the sensor itself.
4. Depending on the result, replace the lead or the outside temperature sensor.

Repairs (cont.)

Checking the boiler water temperature sensor, cylinder temperature sensor or flow temperature sensor of low loss header

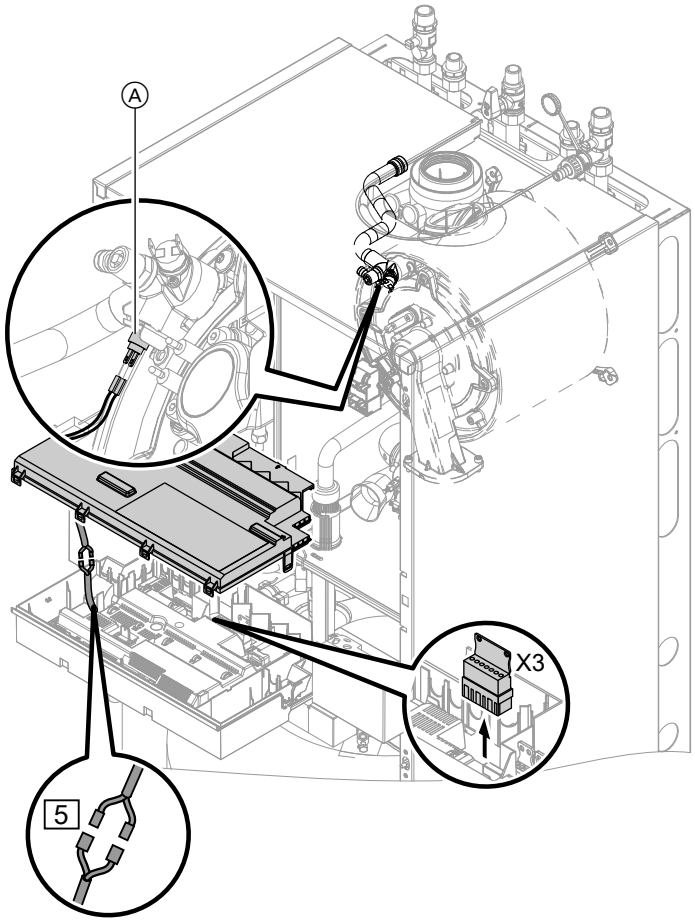


Fig. 62

1. ▪ **Boiler water temperature sensor**
   Disconnect leads from boiler water temperature sensor Ⓐ and check resistance.
   ▪ **Cylinder temperature sensor**
   Pull plug 5 from the cable harness at the control unit and check resistance.
   ▪ **Flow temperature sensor**
   Disconnect plug "X3" at the control unit and check the resistance across terminals "X3.4" and "X3.5".

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

3. In the event of severe deviation replace the sensor.

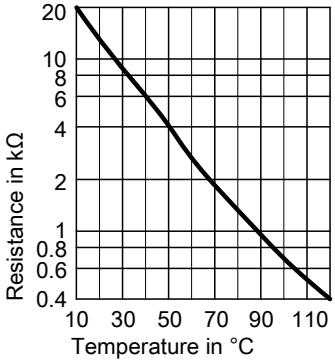


Fig. 63 Sensor type: NTC 10 kΩ

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

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Repairs (cont.)

Checking the outlet temperature sensor

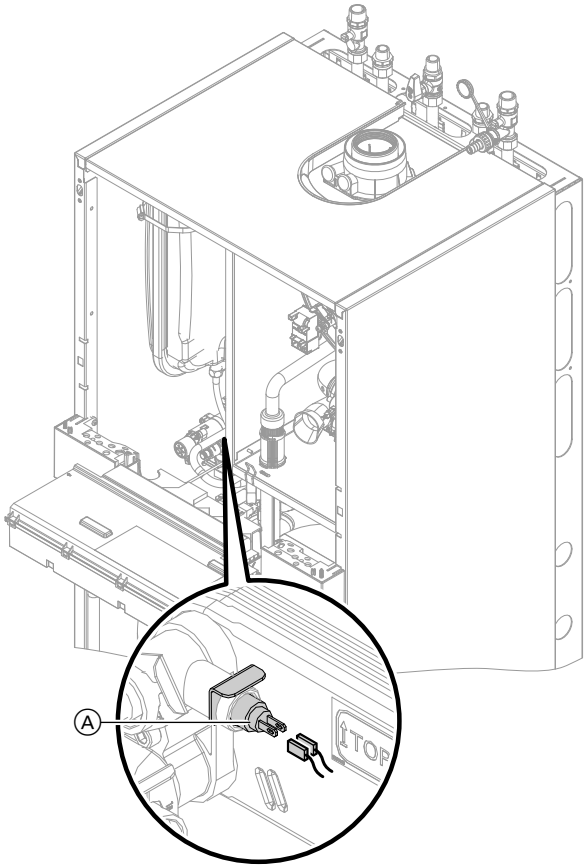


Fig. 64

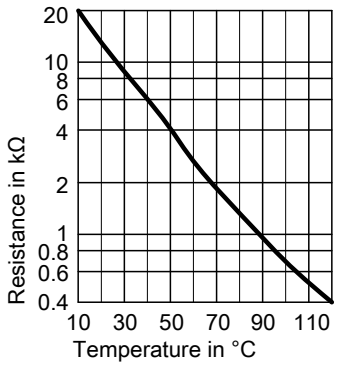


Fig. 65 Sensor type: NTC 10 kΩ

1. Pull leads from outlet temperature sensor Ⓐ.
2. Check sensor resistance and compare it to the curve.
3. In the event of severe deviation replace the sensor.

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

Repairs (cont.)

Checking the plate heat exchanger

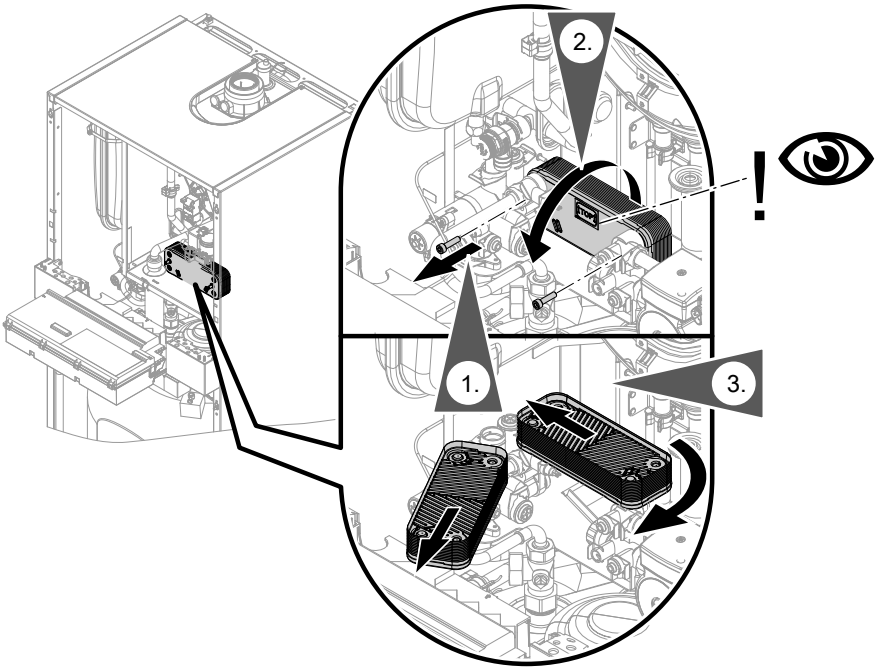


Fig. 66

1. Shut off and drain the boiler on the heating water and DHW sides.
2. Release side fasteners and pivot control unit forward.
3. Remove the trap (see page 47).
4. Undo two fixing screws; pull the plate heat exchanger towards the back, turn and remove towards the front.
5. Check the connections on the heating water and DHW side for contamination and scaling; if required, replace the plate heat exchanger.
6. Install in reverse order using new gaskets.

Checking the flue gas temperature sensor

The flue gas temperature sensor locks out the boiler if the permissible flue gas temperature is exceeded. After the flue system has cooled down, press reset button **R** to cancel the lock.

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Repairs (cont.)

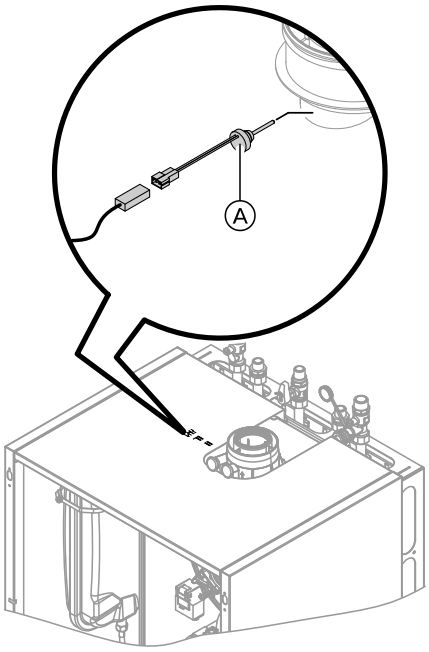


Fig. 67

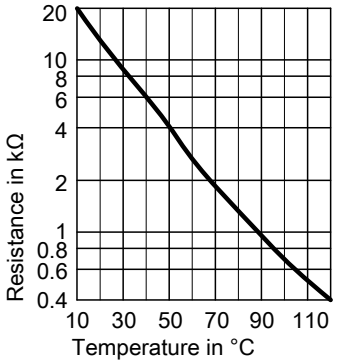


Fig. 68 Sensor type: NTC 10 kΩ

Fault during commissioning (fault A3)

During commissioning, the control unit checks correct placement of the flue gas temperature sensor. If fault message A3 is displayed:

1. Check whether the flue gas temperature sensor is correctly inserted. See previous diagram.
2. Correct the position of the flue gas temperature sensor if required.
3. Switch the ON/OFF switch OFF.
4. Switch the ON/OFF switch ON again. Re-start the commissioning assistant.

1. Disconnect leads from flue gas temperature sensor Ⓐ.
2. Check sensor resistance and compare it to the curve.
3. In the event of severe deviation replace the sensor.

Checking the temperature limiter

If the burner control unit cannot be reset after a fault shutdown although the boiler water temperature is below approx. 75 °C, check the following:

Repairs (cont.)

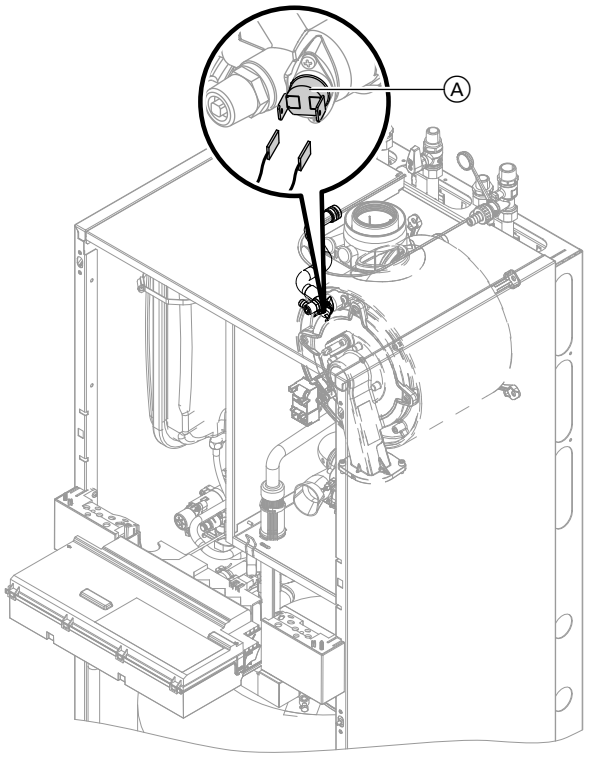


Fig. 69

1. Disconnect the leads from temperature limiter Ⓐ.
2. Check continuity of the temperature limiter with a multimeter.
3. Remove faulty temperature limiter.
4. Coat the new temperature limiter with heat conducting paste and install it.
5. After commissioning, press reset button **R** on the control unit.

Checking the fuse

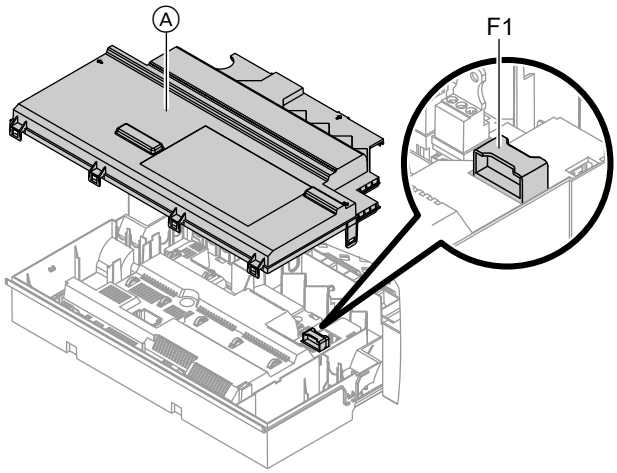


Fig. 70

1. Switch OFF the power supply.
2. Release the side closures and pivot the control unit down.
3. Remove cover Ⓐ.
4. Check fuse F1 (see connection and wiring diagram).

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

Repairs (cont.)

Mixer extension kit

Checking the setting of rotary selector S1

The rotary selector on the PCB of the extension kit defines the assignment to the relevant heating circuit.

Heating circuit	Rotary selector S1 setting
Heating circuit with mixer M2 (heating circuit 2)	2 
Heating circuit with mixer M3 (heating circuit 3)	4 

Checking the rotational direction of the mixer motor

After being switched on, the boiler implements a self-test. During this, the mixer is opened and closed again.

Note
The mixer motor can also be started via the actuator test (see chapter "Checking outputs").

Observe the rotational direction of the mixer motor during its self-test.
Then manually set the mixer back to "Open".
The flow temperature sensor must now capture a higher temperature. If the temperature drops, either the motor is turning in the wrong direction or the mixer insert is incorrectly fitted.

Mixer installation instructions

Changing the rotational direction of the mixer motor (if required)

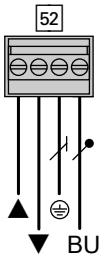


Fig. 71

1. Remove the upper casing cover of the extension kit.

   Danger
   An electric shock can be life-threatening. Before opening the boiler, disconnect it from the mains voltage, e.g. at the fuse or mains isolator.

2. At plug 52, swap the cores at terminals "▲" and "▼".

3. Refit the casing cover.

Check flow temperature sensor

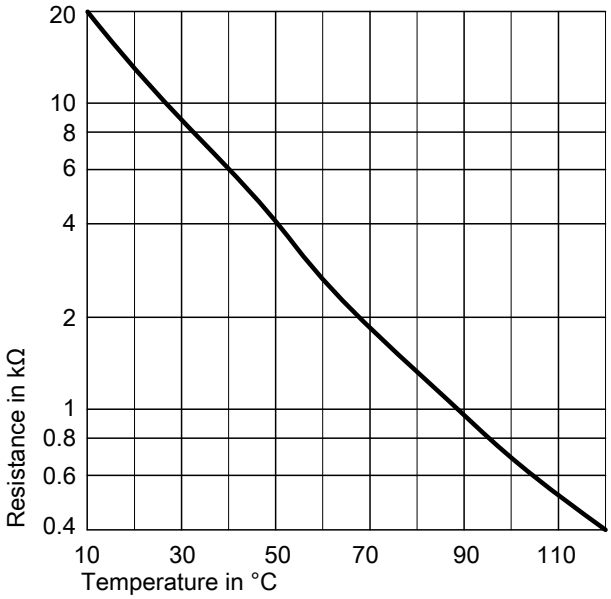


Fig. 72 Sensor type: NTC 10 kΩ

1. Disconnect plug 2 (flow temperature sensor).

2. Check the sensor resistance and compare it to the curve.
   In the event of severe deviation replace the sensor.

Repairs (cont.)

Checking the Vitotronic 200-H (accessories)

The Vitotronic 200-H is connected to the control unit via the LON cable. To test the connection, carry out a subscriber check at the boiler control unit (see page 57).

Overview of assemblies

The following details are required when ordering parts:

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

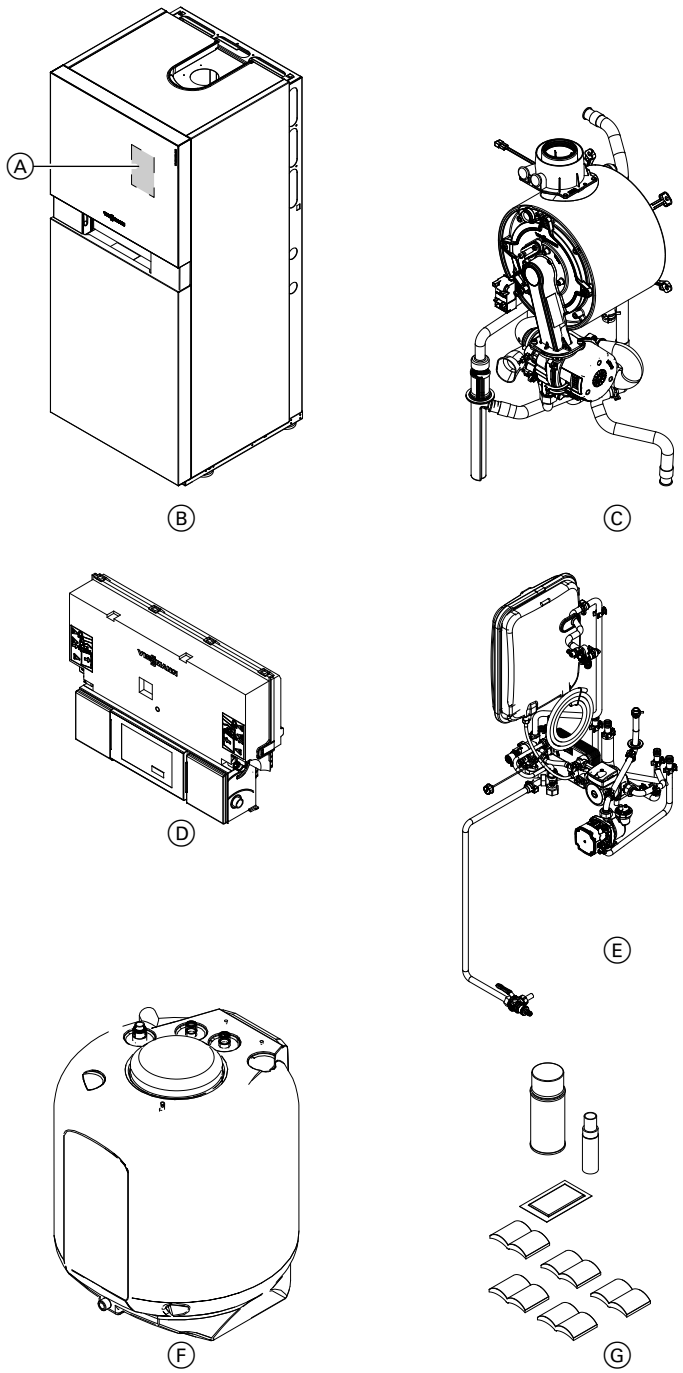


Fig. 73

Ⓐ Type plate
Ⓑ Casing assembly
Ⓒ Heat cell assembly with MatriX cylinder burner
Ⓓ Control unit assembly
Ⓔ Hydraulic assembly with hydraulic block
Ⓕ Loading cylinder assembly
Ⓖ Miscellaneous assembly

Casing

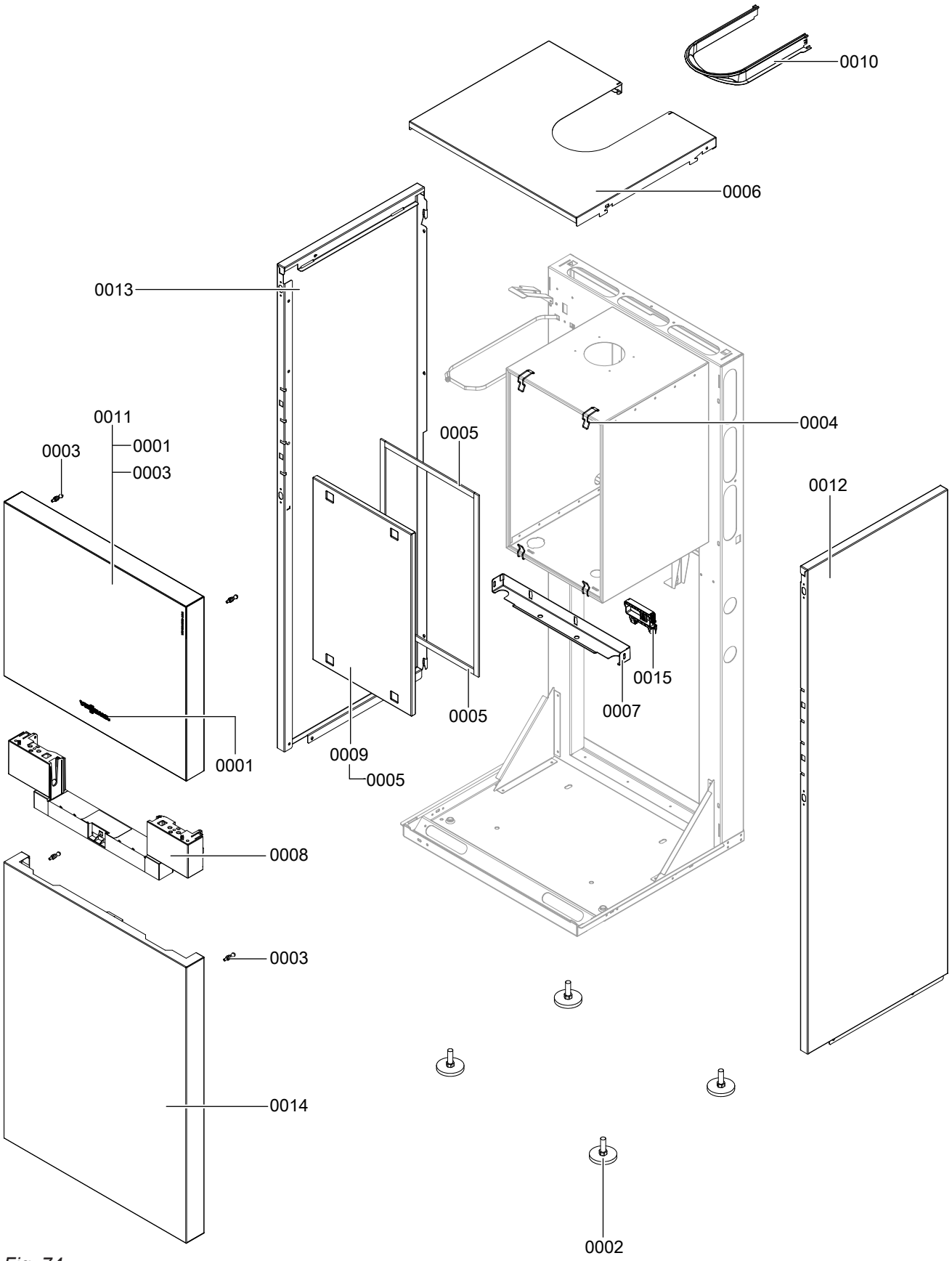


Fig. 74

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Casing (cont.)

Pos.	Part
0001	VIESSMANN logo
0002	Adjustable foot
0003	Fixings for location stud (2 pce)
0004	Toggle fastener set (4 pce)
0005	Profiled seal 15 l=520
0006	Top panel
0007	Mounting bracket for DHW cylinder
0008	Control unit support
0009	Cover panel with gaskets
0010	Top panel insert
0011	Front panel, top
0012	Side panel, right
0013	Side panel, left
0014	Front panel, bottom
0015	Cable holder

Hydraulics

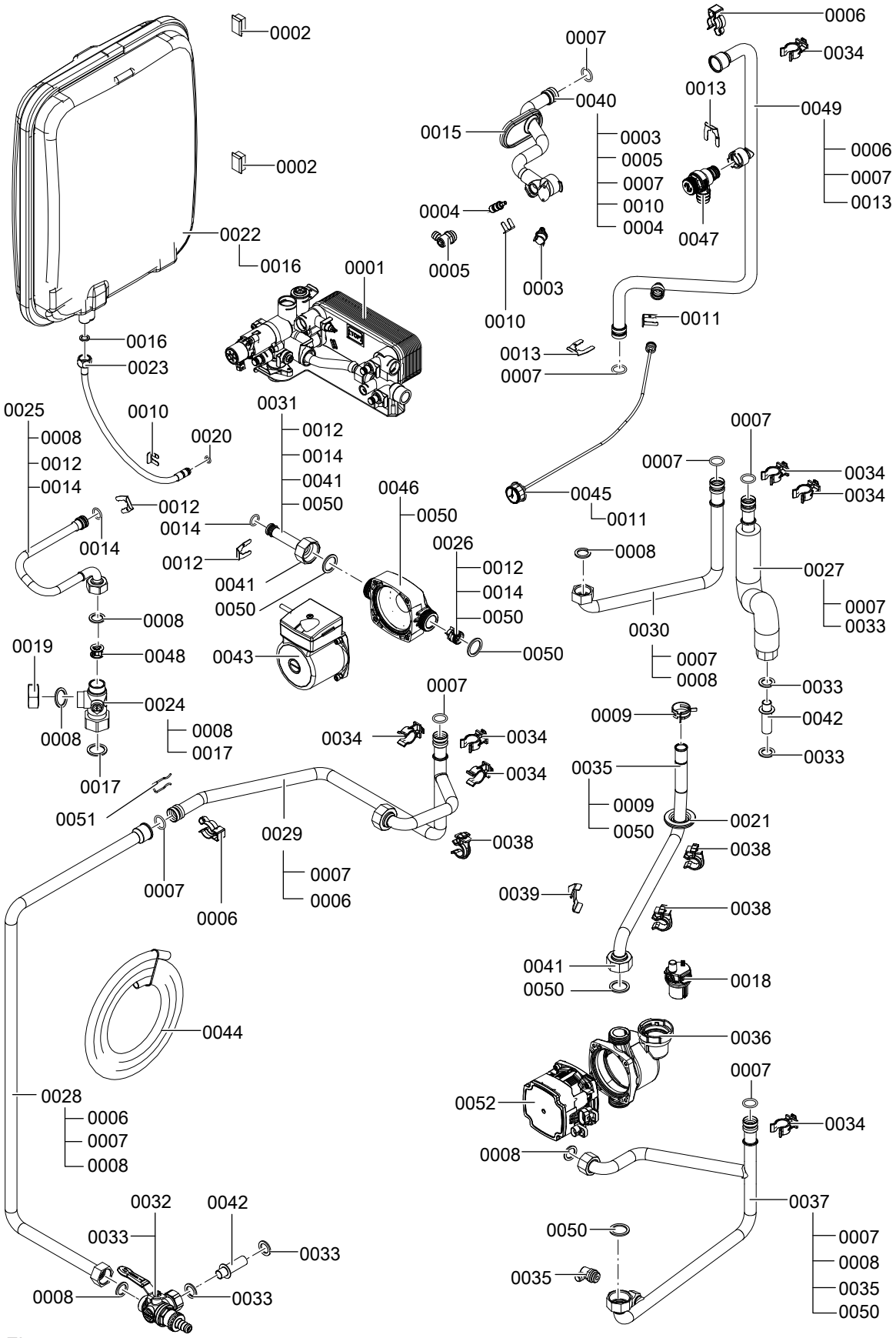


Fig. 75

5812741

Hydraulics (cont.)

Pos.	Part
0001	Hydraulic block
0002	Plug, oil preheater
0003	Thermal circuit breaker
0004	Temperature sensor
0005	Air vent valve G3/8
0006	Set of pipe clips (2 pce)
0007	O-ring set 17.86 x 2.62 (5 pce)
0008	Gasket set A 17 x 24 x 2 (5 pce)
0009	Spring clip DN 25 (5 pce)
0010	Clip ∅ 8 (5 pce)
0011	Clip ∅ 10 (5 pce)
0012	Clip ∅ 15 (5 pce)
0013	Clip ∅ 18 (5 pce)
0014	O-ring 14.3 x 2.4 (5 pce)
0015	Diaphragm grommet (5 pce)
0016	Gasket set A 10 x 15 x 1.5 (5 pce)
0017	Gasket 23 x 30 x 2 (5 pce)
0018	Air vent valve for HC (heating circuit) pump
0019	Cap G 3/4", spanner size 30
0020	Circular seal ring 8 x 2 (5 pce)
0021	Diaphragm grommet (5 pce)
0022	Diaphragm expansion vessel 12 l
0023	Connection line, expansion vessel G3/8
0024	Right-angle shut-off valve, DHW cylinder heating
0025	Connection line, DHW heating
0026	RV cartridge (non-return valve) OV 20/DN 20
0027	Connection pipe, DHW
0028	Connection pipe, cold water, cylinder (100 l)
0029	Connection pipe, cold water
0030	Connection pipe, heating flow
0031	Cold water connection
0032	Right-angle shut-off valve, DHW cylinder, cold water
0033	Gasket set A 16 x 24 x 2 (5 pce)
0034	Pipe clip ∅ 18 x 1.5
0035	Connection pipe, heating return
0036	CIAO2 casing
0037	Connection pipework, heating return
0038	Pipe clip ∅ 18
0039	Spring clip (5 pce)
0040	Flow pipe
0041	Union nut G 1"
0042	Sleeve
0043	Circulation pump motor VIUPM2 50
0044	Hose 10 x 1.5 x 1500
0045	Pressure gauge, 0-4 bar

Hydraulics (cont.)

Pos.	Part
0046	Casing CIL2 PPs
0047	Safety valve 3 bar
0048	Fascia ∅ 5.0
0049	Connection pipe, heating flow WZ (heat generator)
0050	Gasket set A 23 x 30 x 2 (5 pce)
0051	Wire fuse (5 pce)
0052	Circulation pump UPM3 15-75 KM

Hydraulics (cont.)

Hydraulic block

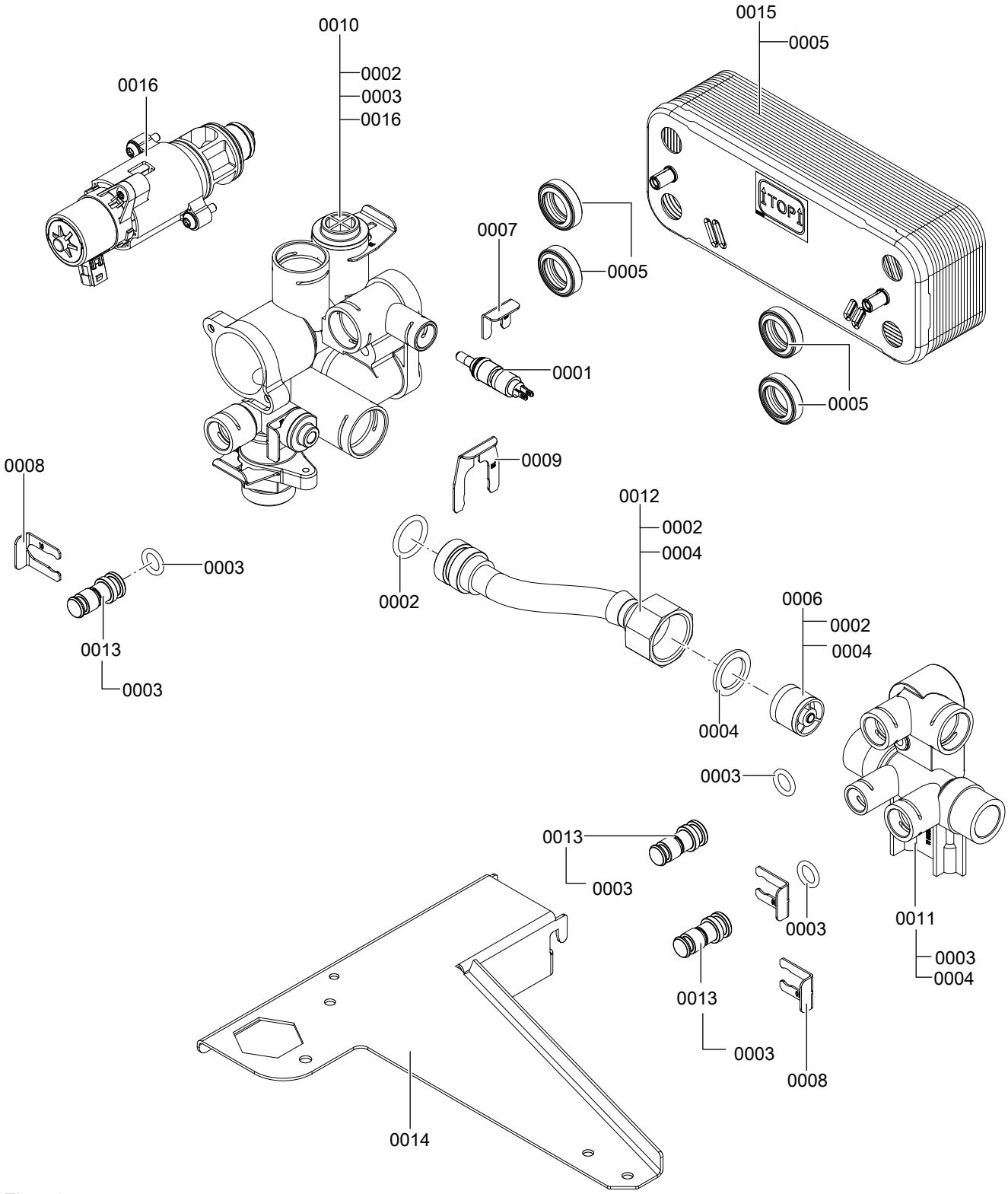


Fig. 76

5812741

Hydraulic block (cont.)

Pos.	Part
0001	Temperature sensor
0002	O-ring set 17.86 x 2.62 (5 pce)
0003	O-ring set 9.6 x 2.4 (5 pce)
0004	Gasket set A 17 x 24 x 2 (5 pce)
0005	Profiled gasket (4 pce)
0006	Overflow valve HDS 20-230
0007	Clip ∅ 8 (5 pce)
0008	Clip ∅ 10 (5 pce)
0009	Clip ∅ 18 (5 pce)
0010	Flow unit
0011	Return unit
0012	Overflow line
0013	Plug ∅ 8/10
0014	Hydraulic retaining bracket
0015	Plate heat exchanger CB10-14A
0016	Valve insert

Loading cylinder

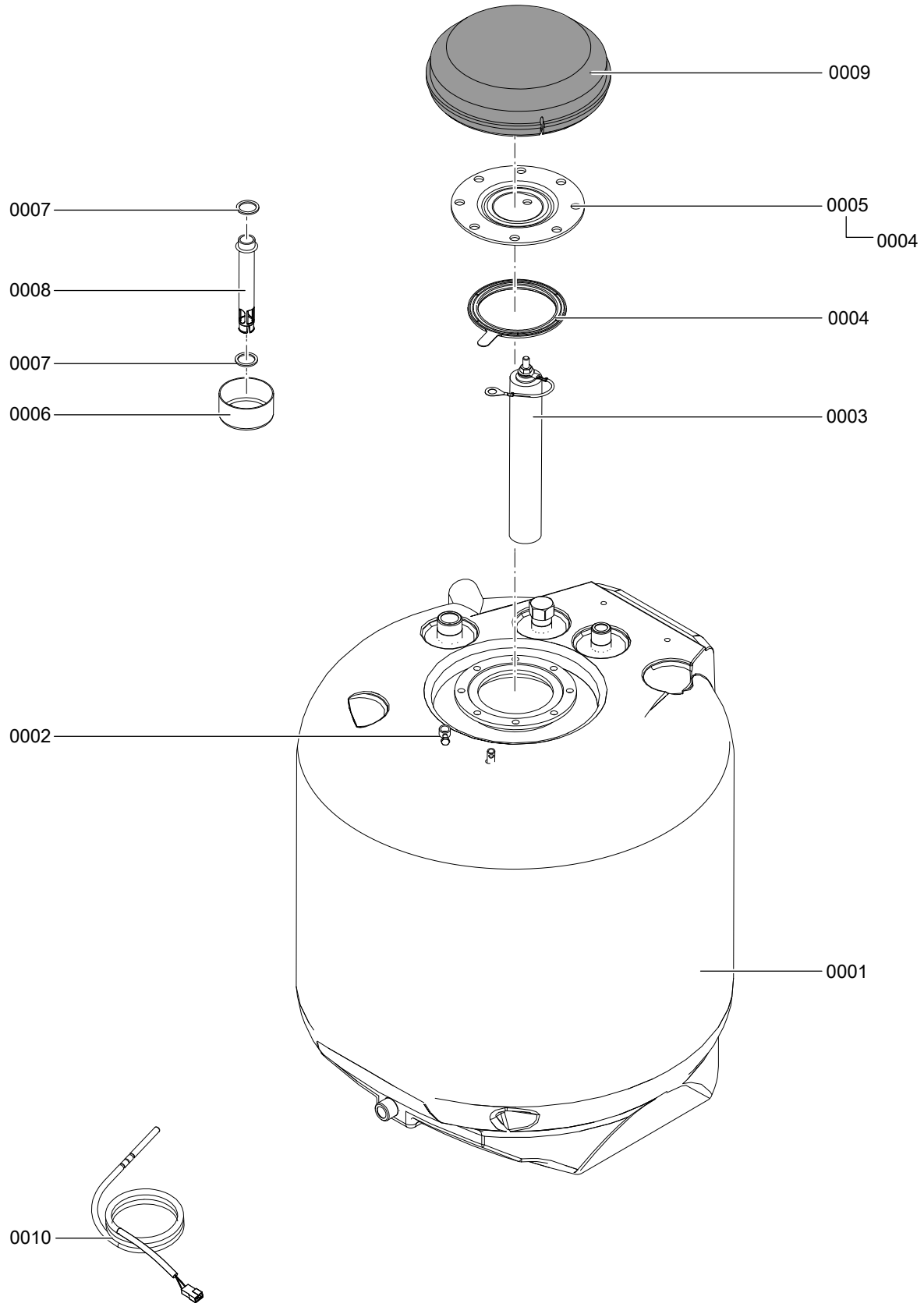


Fig. 77

Loading cylinder (cont.)

0001	Loading cylinder
0002	Strain relief
0003	Protective magnesium anode
0004	Gasket
0005	Flange with gasket
0006	Cover
0007	Gasket 23 x 30 x 2 (5 pce)
0008	Sleeve
0009	Flange insulation
0010	Cylinder temperature sensor NTC 10kΩ

Heat cell

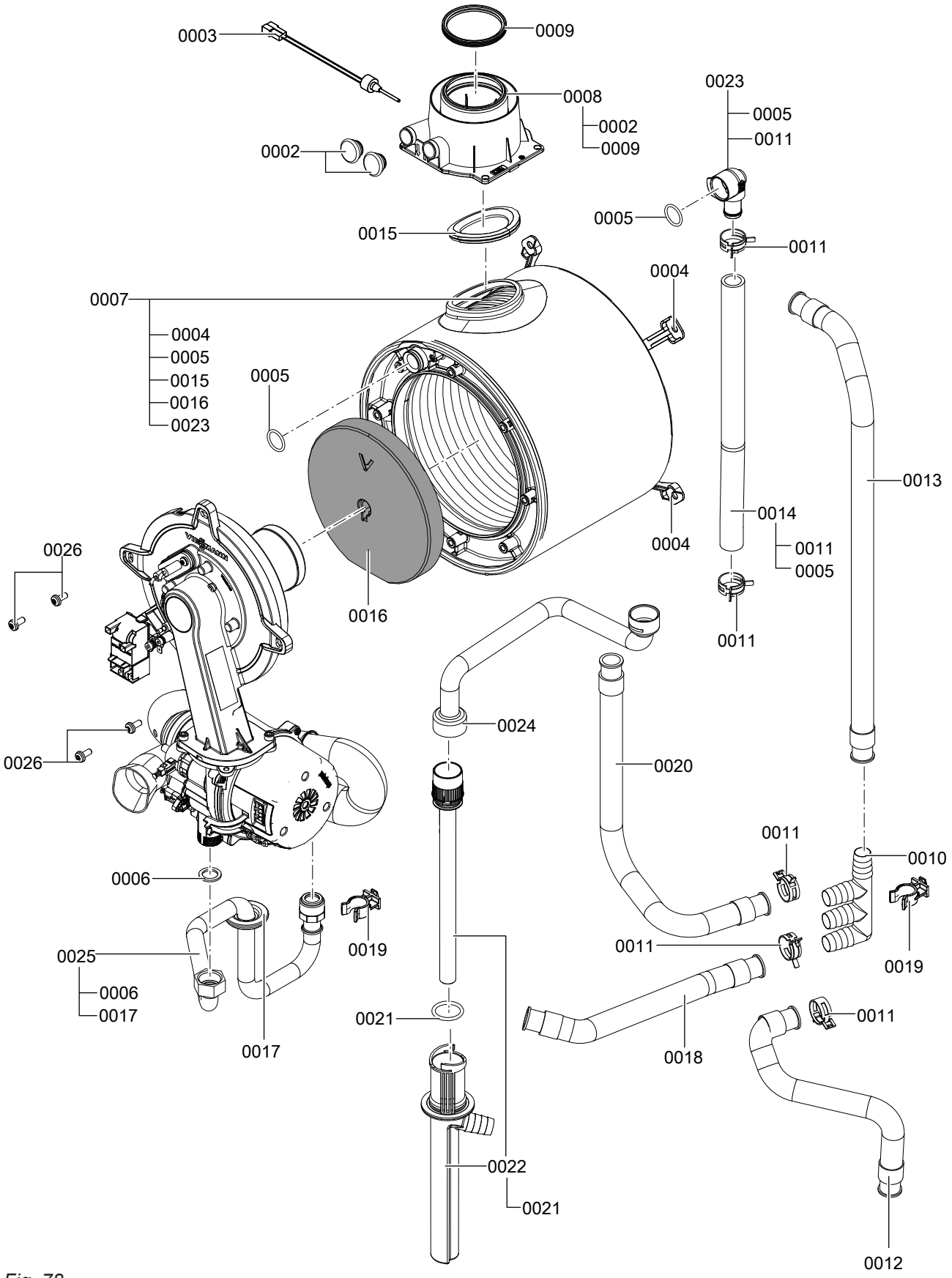


Fig. 78

5812741

Heat cell (cont.)

Pos.	Part
0001	MatriX cylinder burner
0002	Boiler flue connection plug
0003	Flue gas temperature sensor
0004	Bracket set, heat exchanger
0005	O-ring set 20.63 x 2.62 (5 pce)
0006	Gasket set A 17 x 24 x 2 (5 pce)
0007	Heat exchanger
0008	Boiler flue connection
0009	Gasket DN 60
0010	Condensate receiver
0011	Spring clip DN 5 (5 pce)
0012	Condensate hose
0013	Hose 19 x 600, corrugated
0014	Profile hose, heating return
0015	Flue gasket, single
0016	Thermal insulation block
0017	Diaphragm grommet (5 pce)
0018	Corrugated hose 19 x 290
0019	Pipe clip ∅ 18 x 1.5
0020	Hose 19 x 500, corrugated
0021	O-rings (5 pce) 25.7 x 3.5
0022	Trap
0023	Connection elbow, heating return
0024	Condensate hose
0025	Gas pipe
0026	Door screws set

MatriX cylinder burner

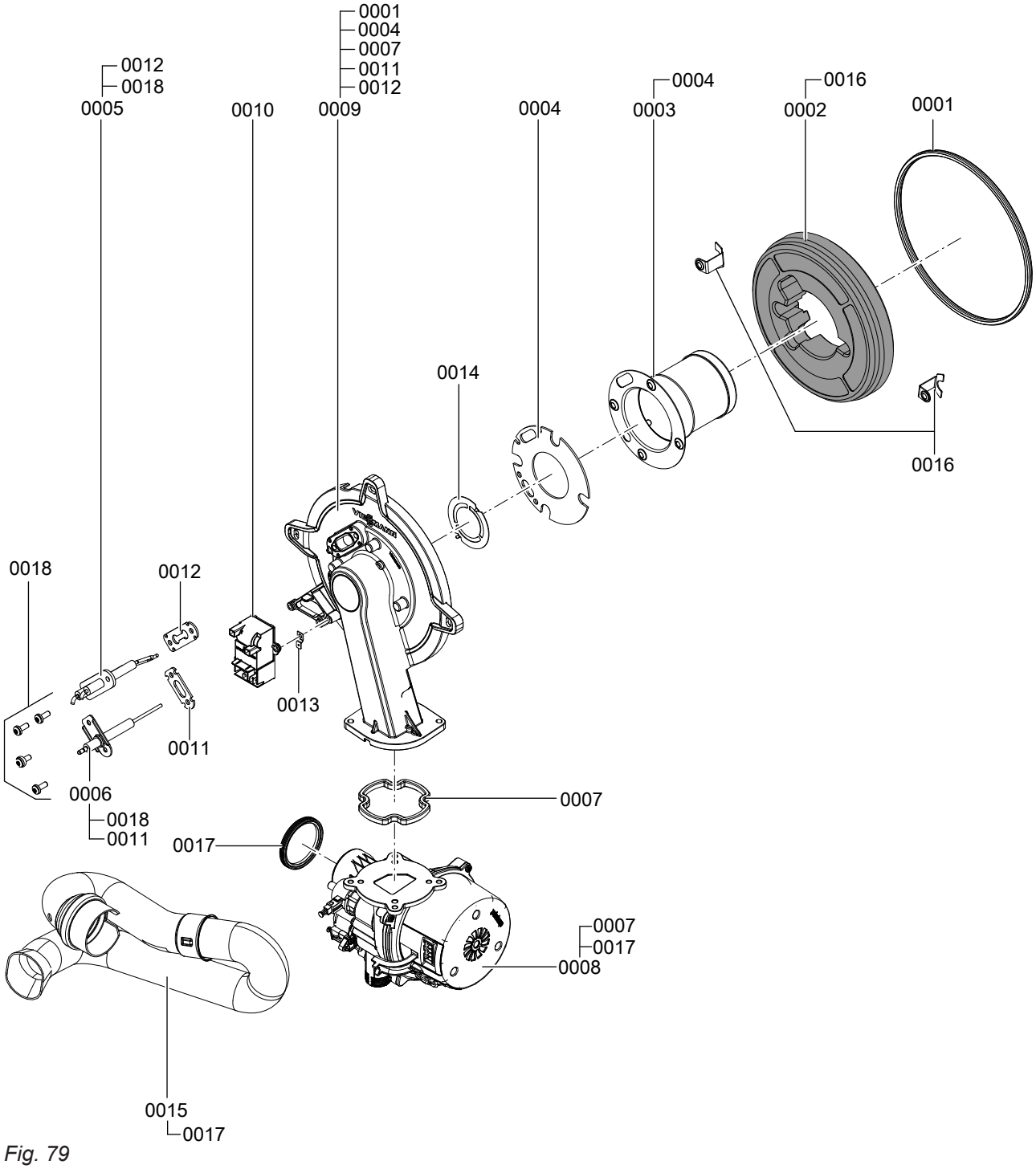


Fig. 79

MatriX cylinder burner (cont.)

Pos.	Part
0001	Burner gasket ∅ 187
0002	Thermal insulation ring
0003	Cylinder burner gauze assembly
0004	Burner gauze assembly gasket
0005	Ignition electrode (wearing part)
0006	Ionisation electrode (wearing part)
0007	Gasket, burner door flange
0008	Radial fan iNR77
0009	Burner door
0010	Ignition unit
0011	Gasket, ionisation electrode (5 pce)
0012	Gasket, ignition electrode (5 pce)
0013	Blade terminal (10 pce)
0014	Mixture restrictor
0015	Venturi extension
0016	Mounting plate, thermal insulation ring (2 pce)
0017	Gasket DN 50
0018	Fixing screws

Control unit

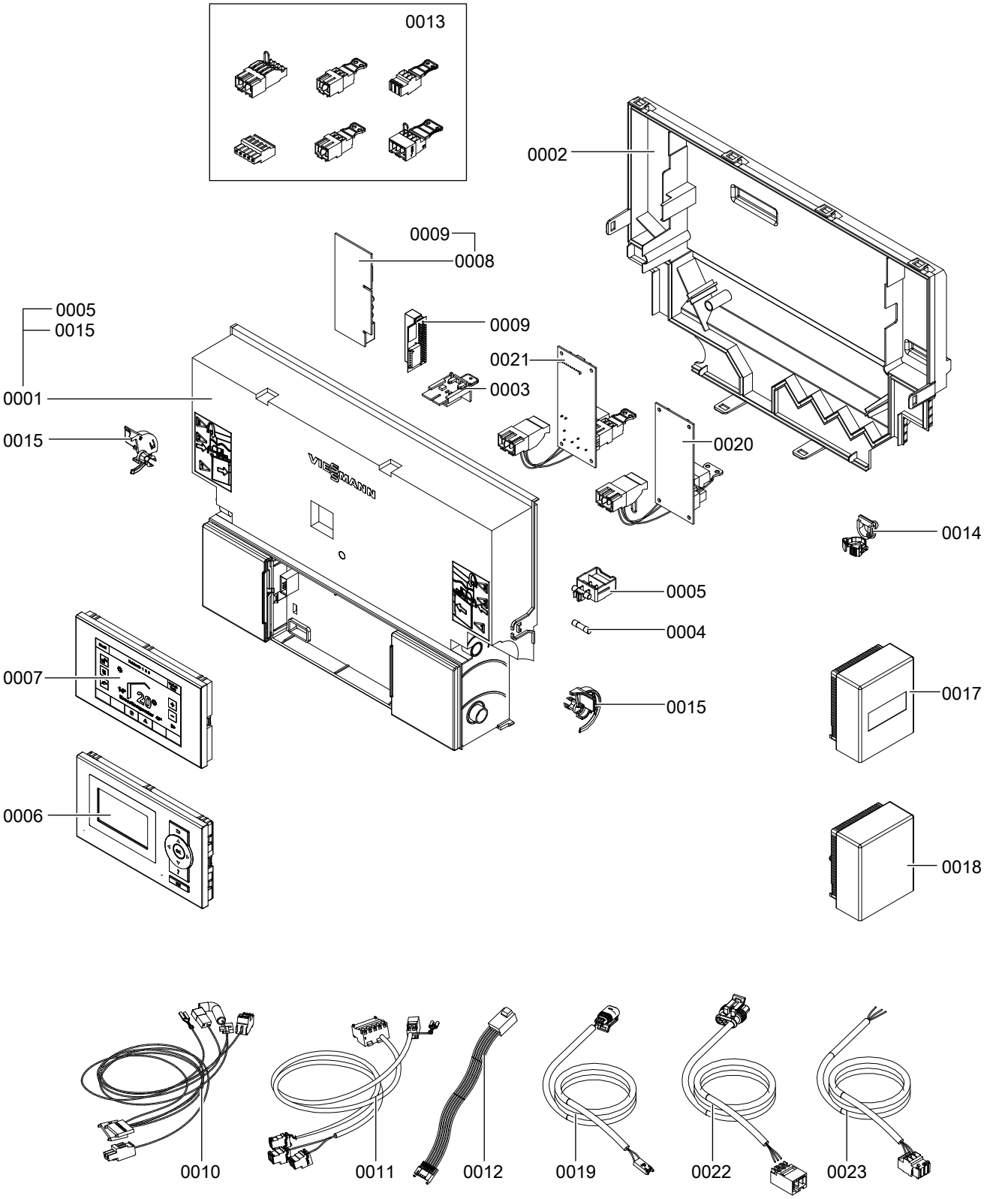


Fig. 80

5812741

Control unit (cont.)

Pos.	Part
0001	Control unit VBC138-A60.0xx
0002	Casing back panel
0004	Fuse, 6.3 A (slow), 250 V (10 pce)
0005	Fuse holder, 6.3 A (slow)
0006	Vitotronic 100 HC1B
0007	Vitotronic 200 HO2B or HO2C
0008	LON HO1 communication module
0009	PCB adaptor
0010	Cable harness X8/X9/ion
0011	Cable harness 100/35/54/earth
0012	Cable harness, Molex stepper motor
0013	Mating plug, Neptun
0014	Cable ties (10 pce)
0015	Locking bolts, left and right
0017	Wireless outside temperature sensor
0018	Outside temperature sensor NTC
0019	KM-BUS connecting cable 145
0020	Internal H1 extension
0021	Internal H2 extension
0022	Heating circuit pump connecting cable 20
0023	Power cable 40

Miscellaneous

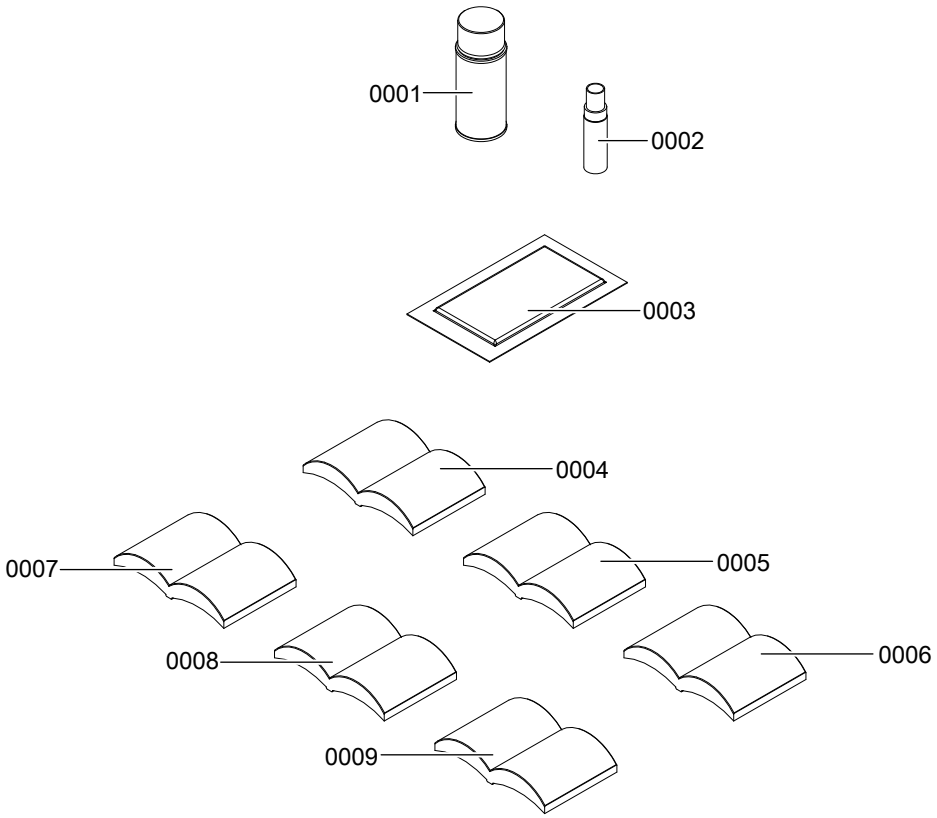


Fig. 81

Miscellaneous (cont.)

0001	Touch-up spray paint, white
0002	Touch-up paint stick, white
0003	Special grease
0004	Operating instructions for constant temperature mode
0005	Operating instructions for weather-compensated mode
0006	Operating instructions for weather-compensated operation with touchscreen
0007	Installation and service instructions with HC1B
0008	Installation and service instructions with HO1B
0009	Installation and service instructions with HO2B or HO2C

Ordering individual parts for accessories

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

Control unit

Heating mode

The control unit determines a set boiler water temperature subject to outside temperature or room temperature (if a room temperature-dependent remote control is connected) and to the slope/level of the heating curve.
The determined set boiler water temperature is transferred to the burner control unit. From the set and actual boiler water temperatures, the burner control unit calculates the modulation level and regulates the burner accordingly.

The electronic temperature limiter inside the burner control unit limits the boiler water temperature.

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.
After loading has stopped, the cylinder loading pump and the 3-way diverter valve remain on for a further 30 s.

Reheating when DHW is drawn off

When DHW is drawn off, cold water enters 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 has been reached at the cylinder temperature sensor.
The cylinder loading pump and the 3-way diverter valve remain ON for a further 30 s.

Boosting DHW heating

This function is activated by specifying a second set DHW temperature via parameter 58 in the **"DHW"** group and activating the fourth DHW phase for DHW heating.

Heating is boosted during the periods selected in this time phase.

Internal extensions (accessories)

Internal H1 extension

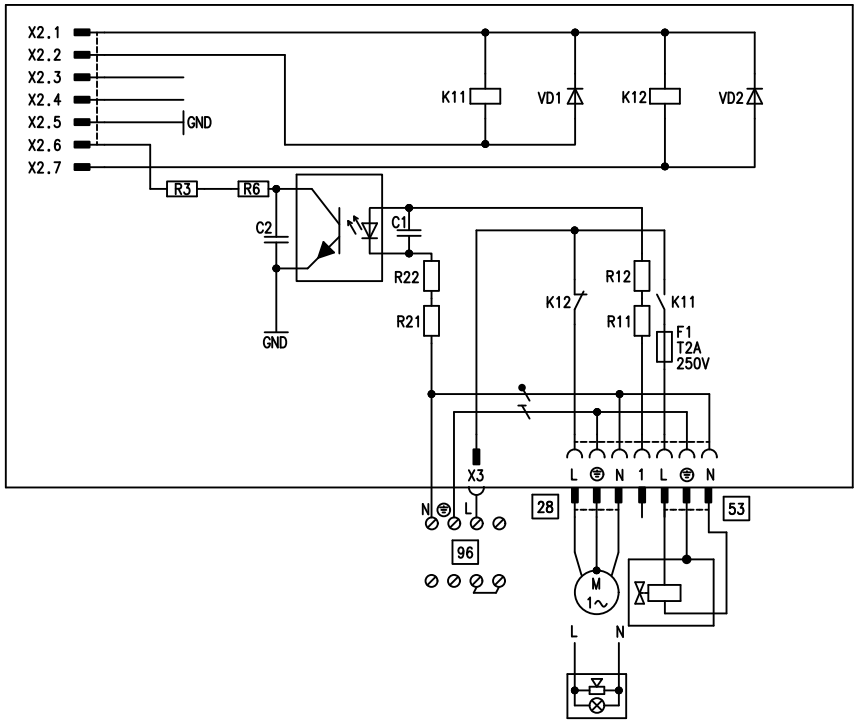


Fig. 82

The internal extension is integrated into the control unit enclosure. The following alternative functions can be connected to relay output 28. The function is assigned via parameter "53" in the **"General"** group:

- Central fault message (parameter "53:0")
- DHW circulation pump (parameter "53:1") (only for weather-compensated operation)
  Connect DHW circulation pumps with standalone functions directly to the 230 V~ supply.
- Heating circuit pump for heating circuit without mixer (parameter "53:2")
- Circulation pump for cylinder heating (parameter "53:3")

An external safety valve can be connected to connection 53.

Internal extensions (accessories) (cont.)

Internal H2 extension

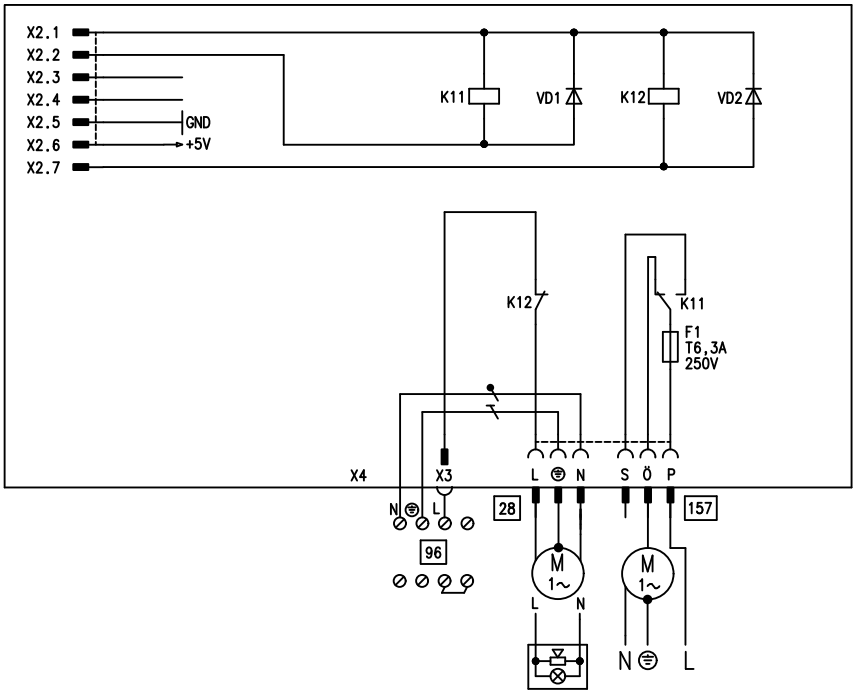


Fig. 83

The internal extension is integrated into the control unit enclosure. The following alternative functions can be connected to relay output 28. The function is assigned via parameter "53" in the **"General"** group:

- Central fault message (parameter "53:0")
- DHW circulation pump (parameter "53:1") (only for weather-compensated operation)
  Connect DHW circulation pumps with standalone functions directly to the 230 V~ supply.
- Heating circuit pump for heating circuit without mixer (parameter "53:2")
- Circulation pump for cylinder heating (parameter "53:3")

An extractor fan can be switched off via connection 157 when the burner starts.

External extensions (accessories)

AM1 extension

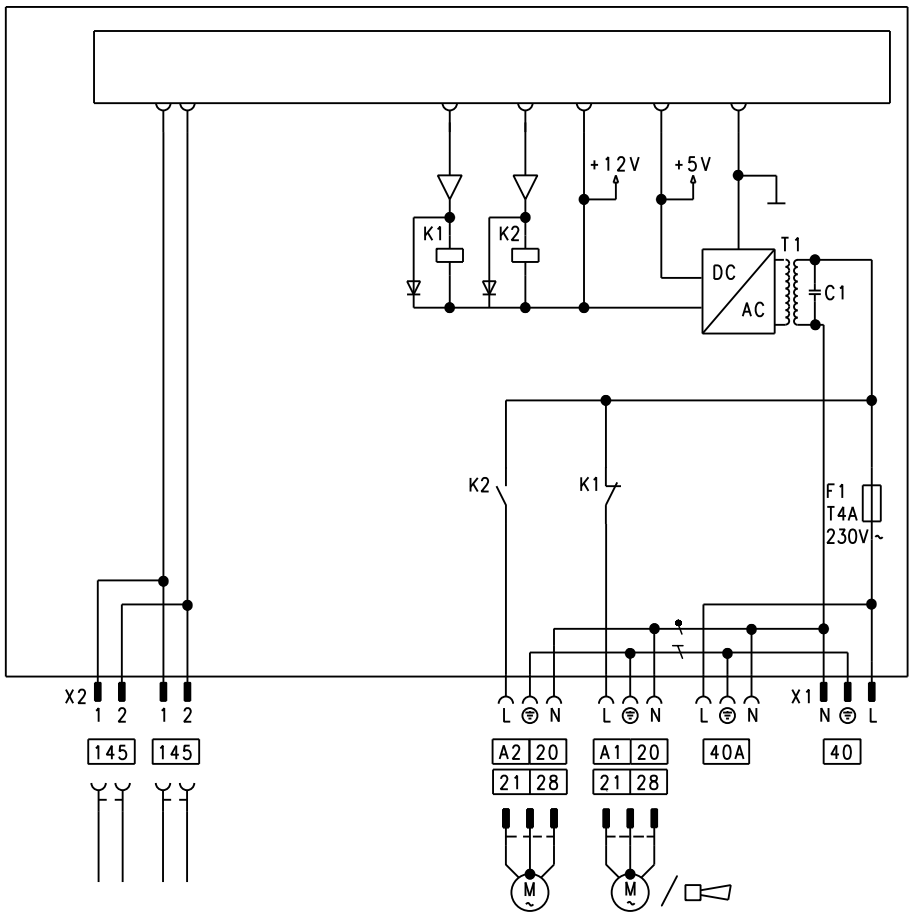


Fig. 84

A1 Circulation pump
A2 Circulation pump
40 Power supply
40 A Power supply for additional accessories
145 KM BUS

Functions

One of the following circulation pumps can be connected to each of the connections A1 and A2:
- Heating circuit pump for heating circuit without mixer
- Circulation pump for cylinder heating
- DHW circulation pump
  Connect DHW circulation pumps with standalone functions directly to the 230 V~ supply.

Select the output functions via parameters at the boiler control unit.

Function assignment

Function	Parameter ("General" group)	
	Output A1	Output A2
DHW circulation pump 28	33:0	34:0 (delivered condition)
Heating circuit pump 20	33:1 (delivered condition)	34:1
Circulation pump for cylinder heating 21	33:2	34:2

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External extensions (accessories) (cont.)

EA1 extension

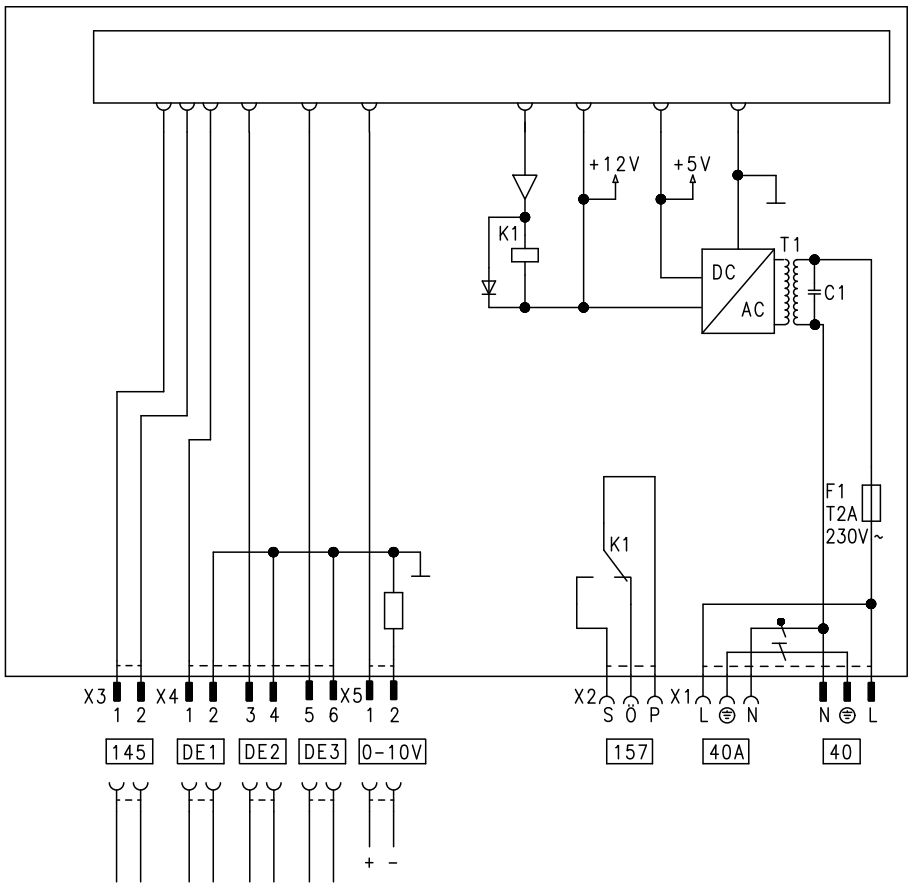


Fig. 85

F1 Fuse
DE1 Digital input 1
DE2 Digital input 2
DE3 Digital input 3
0–10V 0 – 10 V input

40 Power supply
40 A Power supply for additional accessories
157 Central fault message/feed pump/DHW circulation pump (potential-free)
145 KM-BUS

Digital data inputs DE1 to DE3

Alternatively, the following functions can be connected:
- External operating program changeover for each heating circuit
- External blocking
- External blocking with fault message input
- External demand with minimum boiler water temperature
- Fault message input
- Brief operation of the DHW circulation pump

External contacts must be potential-free. When making the connection, adhere to the requirements of protection class II: 8.0 mm air and creep paths and 2.0 mm insulation thickness against live components.

Input function assignment

Select the input functions via the parameters in the **"General"** group at the boiler control unit:
- DE1: Parameter 3A
- DE2: Parameter 3b
- DE3: Parameter 3C

Assigning the operating program changeover function to the heating circuits

Select the operating program changeover function for the relevant heating circuit via parameter d8 in the **"Heating circuit"** group at the boiler control unit:
- Changeover via input DE1: Parameter d8:1
- Changeover via input DE2: Parameter d8:2
- Changeover via input DE3: Parameter d8:3

The effect of the operating program changeover is selected via parameter d5 in the **"Heating circuit"** group.

External extensions (accessories) (cont.)

The duration of the changeover is set via parameter F2 in the **"Heating circuit"** group.

Effect of external blocking function on the pumps

The effect on the internal circulation pump is selected via parameter 3E in the **"General"** group.
The effect on the relevant heating circuit pump is selected via parameter d6 in the **"Heating circuit"** group.
The effect on a circulation pump for cylinder heating is selected via parameter 5E in the **"DHW"** group.

Effect of the external demand function on the pumps

The effect on the internal circulation pump is selected via parameter 3F in the **"General"** group.
The effect on the relevant heating circuit pump is selected via parameter d7 in the **"Heating circuit"** group.
The effect on a circulation pump for cylinder heating is selected via parameter 5F in the **"DHW"** group.

DHW circulation pump runtime for brief operation

The DHW circulation pump is started by closing the contact at DE1, DE2 or DE3 by means of a pushbutton. The runtime is set via parameter "3d" in the **"General"** group.

Analogue input 0 – 10 V

The 0 – 10 V hook-up provides an additional set boiler water temperature:

0 – 1 V is taken as "no specification for set boiler water temperature".
1 V ≙ Set value 10 °C
10 V ≙ Set value 100 °C
Ensure DC separation between the earth conductor and the negative pole of the on-site power source.

Output 157

The following functions can be connected to output 157:
- Feed pump to substation
  or
- DHW circulation pump
  or
- Fault message facility

Information on the feed pump
Function only possible in conjunction with a heating circuit control unit connected via LON.

Information on DHW circulation pumps
Connect DHW circulation pumps with standalone functions directly to the 230 V~ supply.

Function assignment

The function of output 157 is selected via parameter "36" in the **"General"** group at the boiler control unit.

Control functions

External operating program changeover

The "External operating program changeover" function is implemented via the EA1 extension. There are 3 inputs available at the EA1 extension (DE1 to DE3). The function is selected via the following parameters in the **"General"** group:

Operating program changeover	Parameter
Input DE1	3A:1
Input DE2	3b:1
Input DE3	3C:1

Select the operating program changeover function for the respective heating circuit via parameter d8 in the **"Heating circuit"** group at the boiler control unit:

Operating program changeover	Parameter
Changeover via input DE1	d8:1
Changeover via input DE2	d8:2
Changeover via input DE3	d8:3

Control functions (cont.)

You can select the direction of the operating program changeover in parameter d5 in the **"Heating circuit"** group:

Operating program changeover	Parameter
Changeover towards "Continually reduced" or "Continuous standby mode" (subject to the selected set value)	d5:0
Changeover towards "Continuous heating mode"	d5:1

The duration of the operating program changeover is set in parameter F2 in the **"Heating circuit"** group:

Operating program changeover	Parameter
No operating program changeover	F2:0
Duration of the operating program changeover 1 to 12 hours	F2:1 to F2:12

The operating program changeover is enabled for as long as the contact is closed. As a minimum, it is enabled until the time set in parameter F2 has expired.

External blocking

The functions "External blocking" and "External blocking" and "Fault message input" are implemented via the EA1 extension. There are 3 inputs available at the EA1 extension (DE1 to DE3).
The function is selected via the following parameters in the **"General"** group:

External blocking	Parameter
Input DE1	3A:3
Input DE2	3b:3
Input DE3	3C:3

External blocking and fault message input	Parameter
Input DE1	3A:4
Input DE2	3b:4
Input DE3	3C:4

The effect on the internal circulation pump is selected in parameter 3E in the **"General"** group.
The effect on the relevant heating circuit pump is selected in parameter d6 in the **"Heating circuit"** group.

External demand

The "External demand" function is implemented via the EA1 extension. There are 3 inputs available at the EA1 extension (DE1 to DE3).
The function is selected via the following parameters in the **"General"** group:

External demand	Parameter
Input DE1	3A:2
Input DE2	3b:2
Input DE3	3C:2

The effect on the internal circulation pump is selected in parameter 3F in the **"General"** group.
The effect on the relevant heating circuit pump is selected in parameter d7 in the **"Heating circuit"** group.
The set minimum boiler water temperature for external demand is selected in parameter 9b in the **"General"** group.

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 for a certain period between heating and DHW heating. The burner is switched off during the venting program.

Activating the venting program: See "Venting the heating system".

Fill program

In conjunction with the commissioning assistant, the system can be filled completely. The 3-way diverter valve is in its central position.

Control functions (cont.)

If the system is to be filled independently of the commissioning assistant, the diverter valve can be moved to the central position via the filling function (see "Filling the heating system"). 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.

Screed drying

When activating screed drying, observe the information provided by the screed manufacturer.
When screed drying is activated, the heating circuit pump for the heating circuit with mixer starts and the flow temperature is maintained in accordance with the selected profile. On completion (30 days), the heating circuit with mixer is controlled automatically according to the set parameters.

Note
Temperature profile 6 ends after 21 days

Observe EN 1264. The report to be provided by the heating contractor must contain the following details regarding heat-up:

- Heat-up data with respective flow temperatures
- Max. flow temperature achieved
- Operating state and outside temperature during handover

Different temperature profiles can be set via parameter F1 in the **"Heating circuit"** group.
The function continues after a power failure or after the control unit has been switched off. "Heating and DHW" is started when screed drying is finished or if parameter F1:0 is set manually.

Temperature profile 1: (EN 1264-4) parameter F1:1

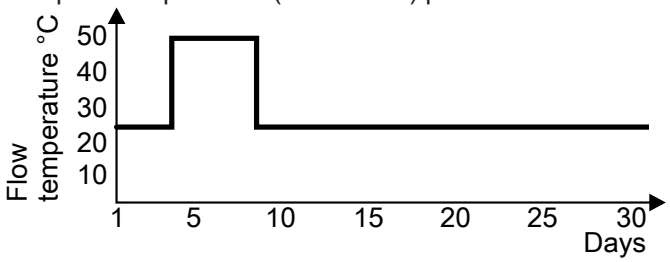


Fig. 86

Temperature profile 2: (ZV parquet and floor technology) parameter F1:2

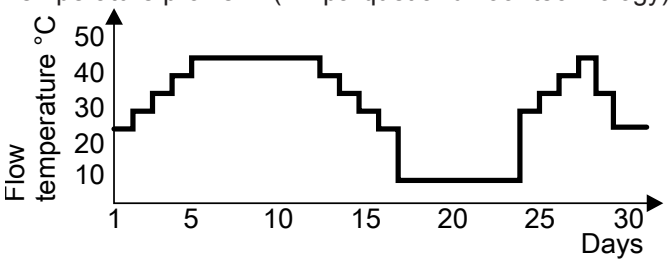


Fig. 87

Temperature profile 3: Parameter F1:3

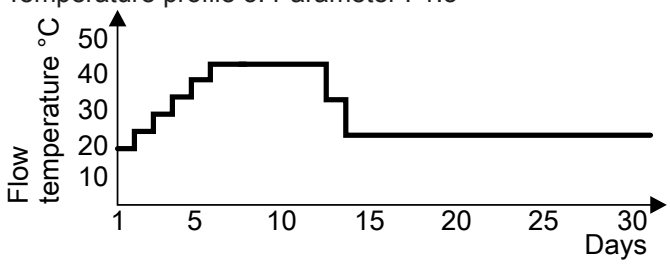


Fig. 88

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Control functions (cont.)

Temperature profile 4: Parameter F1:4

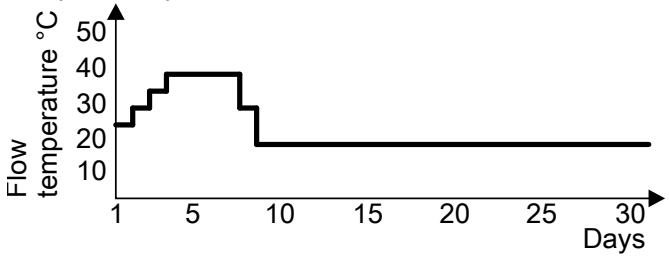


Fig. 89

Temperature profile 5: Parameter F1:5

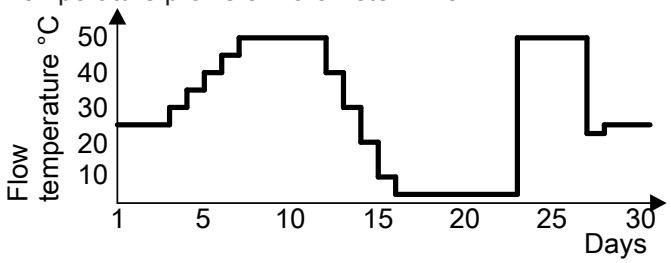


Fig. 90

Temperature profile 6: Parameter F1:6

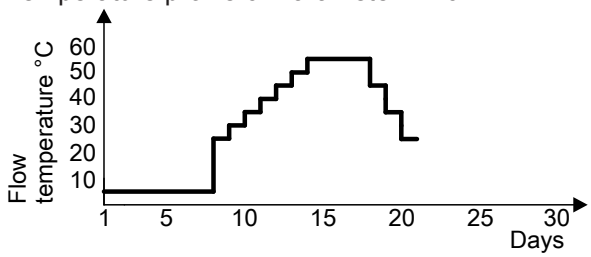


Fig. 91 Ends after 21 days

Individual temperature profile for screed drying

An individual temperature profile can be set for screed drying. See "Commissioning, inspection and maintenance".

Raising the reduced room temperature

During operation at reduced room temperature, the reduced set room temperature can be automatically raised subject to the outside temperature. The temperature is raised in accordance with the selected heating curve, and no higher than the set standard room temperature.

The outside temperature limits for the start and end of temperature raising can be set in parameters F8 and F9 in the **"Heating circuit"** group.

Control functions (cont.)

Example using the settings in the delivered condition

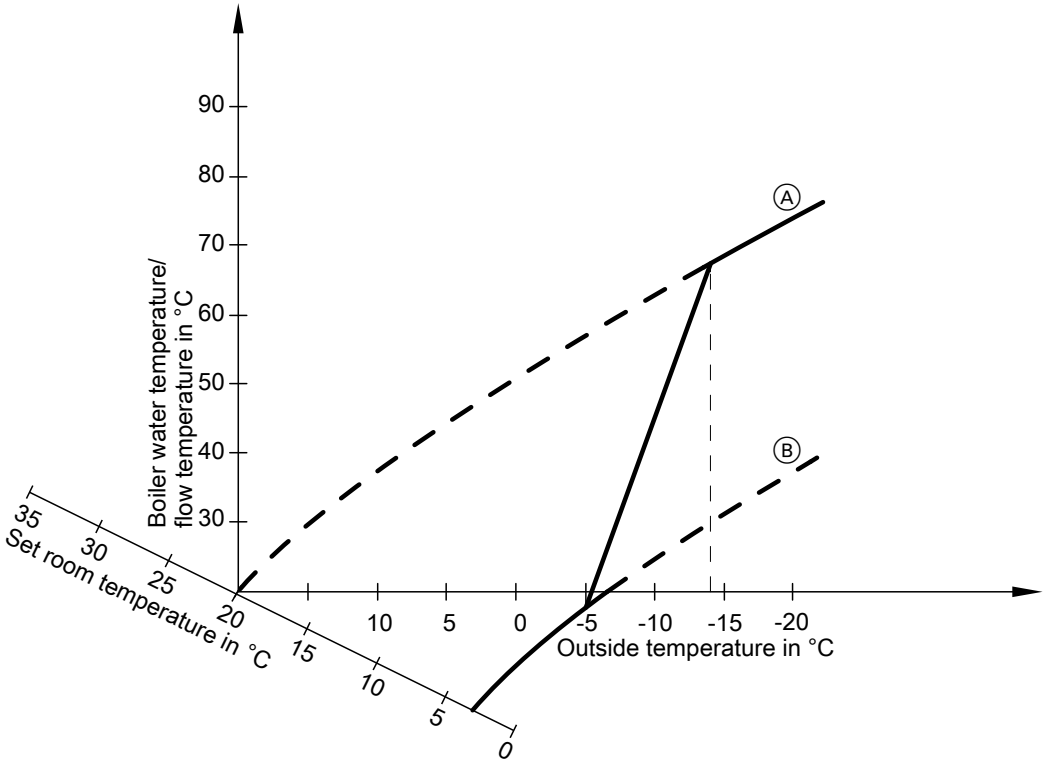


Fig. 92

Ⓐ Heating curve for operation with standard room temperature
Ⓑ Heating curve for operation with reduced room temperature

Reducing the heat-up time

During the transition from operation with reduced room temperature to operation with standard room temperature, the boiler water or flow temperature will be raised in accordance with the selected heating curve. The boiler water or flow temperature can be automatically increased.

The value and duration for the additional raising of the set boiler water temperature or set flow temperature can be set in parameters FA and Fb in the **"Heating circuit"** group.

Control functions (cont.)

Example using the settings in the delivered condition

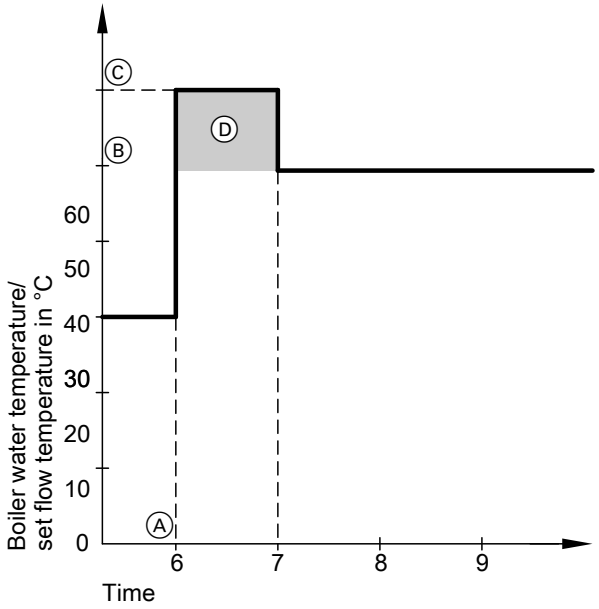


Fig. 93

Ⓐ Start of operation with standard room temperature
Ⓑ Set boiler water or flow temperature in accordance with the selected heating curve
Ⓒ Set boiler water temperature or set flow temperature in accordance with parameter FA:
50 °C + 20 % = 60 °C
Ⓓ Duration of operation with higher set boiler water temperature or set flow temperature in accordance with parameter Fb:
60 min

Assigning heating circuits to the remote control

The assignment of heating circuits must be configured during remote control commissioning.

Remote control affects the following heating circuit:	**Configuration**	
	Vitotrol 200-A **Vitotrol 200-RF**	**Vitotrol 300-A**
Heating circuit without mixer A1	H 1	Heating circuit 1
Heating circuit with mixer M2	H 2	Heating circuit 2
Heating circuit with mixer M3	H 3	Heating circuit 3

Note
The Vitotrol 200-A and 200-RF can have one heating circuit assigned.
The Vitotrol 300-A can have up to 3 heating circuits assigned.
A maximum of 2 hardwired remote control units ***or*** *3 wireless remote controls may be connected to the control unit.*
If the assignment of a heating circuit is later cancelled, reset parameter A0 in the ***"Heating circuit"*** *group for this heating circuit to 0 (fault message bC, bd, bE).*

Hydronic balancing

When carrying out hydronic balancing using the "Hydronic balancing service case with Vitosoft 300", **"Hydraulic balancing ENABLED"** appears on the display.
While the function is enabled, it is not possible to operate the boiler via the Vitotronic control unit.

The boiler is unavailable for heating operation or other functions during hydronic balancing. The burner does not start.

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 and the air ratio is adjusted to a value between λ=1.24 and 1.44. This range provides for an optimum combustion quality. Thereafter, the electronic gas valve 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 with the measured values. The relationship between the CO_2 or O_2 content and air ratio λ is illustrated in the following table.

Air ratio λ– CO_2/O_2 content

Air ratio λ	O_2 content (%)	CO_2 content (%) for natural gas E	CO_2 content (%) for natural gas LL	CO_2 content (%) for LPG P
1.20	3.8	9.6	9.2	11.3
1.24	4.4	9.2	9.1	10.9
1.27	4.9	9.0	8.9	10.6
1.30	5.3	8.7	8.6	10.3
1.34	**5.7**	**8.5**	**8.4**	**10.0**
1.37	6.1	8.3	8.2	9.8
1.40	6.5	8.1	8.0	9.6
1.44	6.9	7.8	7.7	9.3
1.48	7.3	7.6	7.5	9.0

To achieve an optimum combustion control, the system regularly carries out an automatic self-calibration; also after a power failure (shutdown). For this, the combustion is briefly regulated to max. ionisation current (corresponding to air ratio λ=1). Automatic calibration is carried out shortly after the burner start and lasts approx. 5 s. During calibration, higher than normal CO emissions may occur briefly.

Internal connections

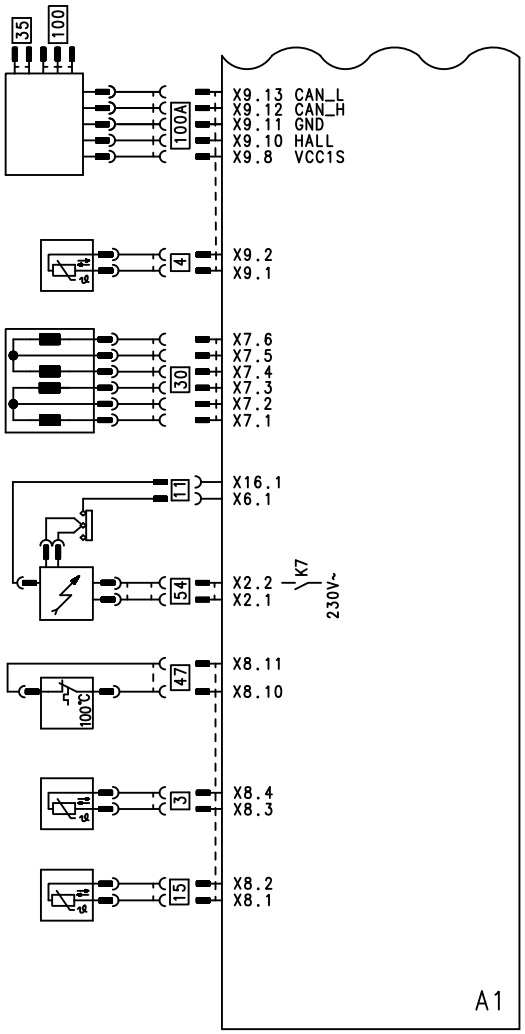


Fig. 94

A1 Main PCB
X... Electrical interfaces
3 Boiler water temperature sensor
4 Outlet temperature sensor
11 Ionisation electrode
15 Flue gas temperature sensor
30 Stepper motor for diverter valve
47 Temperature limiter
54 Ignition unit
100 Fan motor
100A Fan motor control
35 Gas solenoid valve

External connections

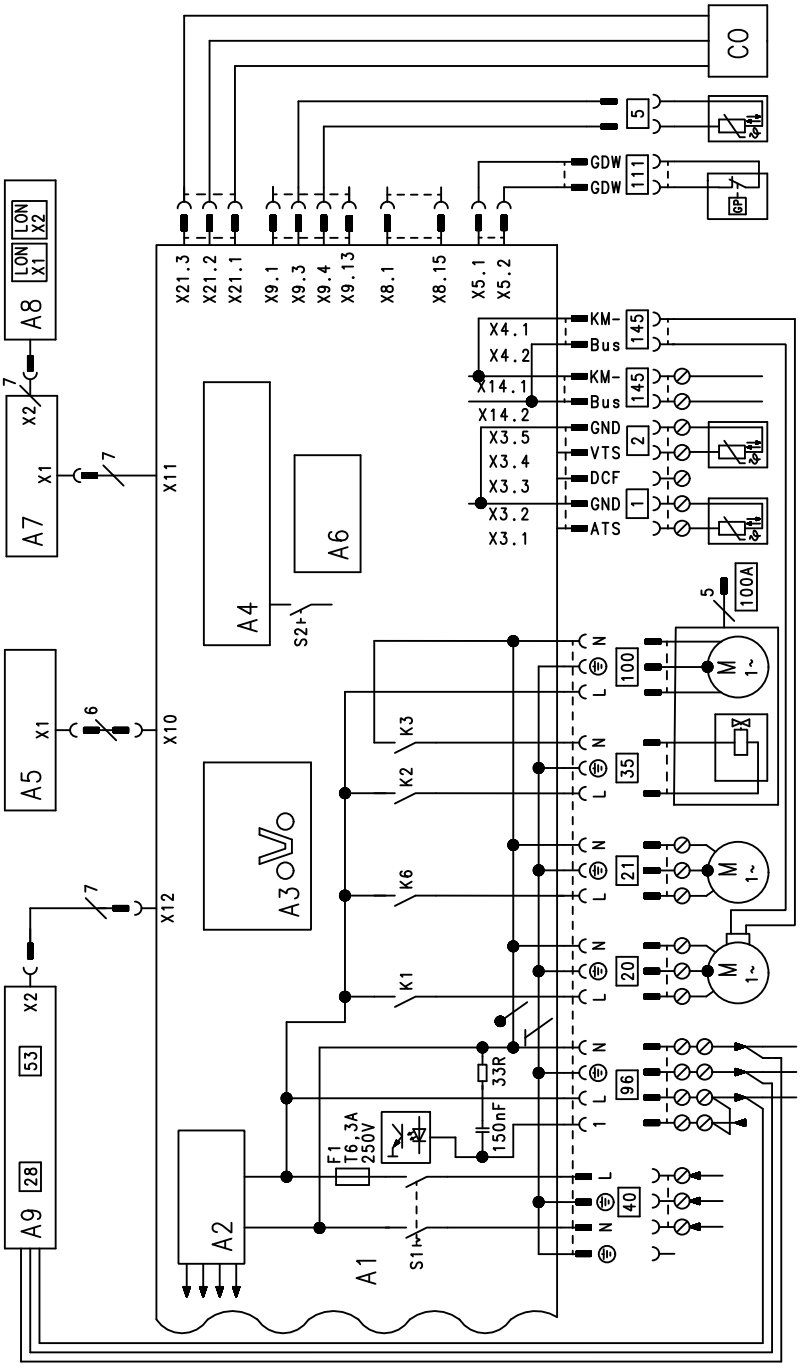


Fig. 95

A1 Main PCB
A2 Switching mode power supply
A3 Optolink
A4 Burner control unit
A5 Programming unit
A6 Coding card
A7 Connection adaptor
A8 LON communication module (accessories)
A9 Internal H1 or H2 extension (accessories)
S1 ON/OFF switch
S2 Reset button
X... Electrical interfaces
[1] Outside temperature sensor
[2] Flow temperature sensor, low loss header
[5] Cylinder temperature sensor (plug on cable harness)
[20] Internal circulation pump
[21] Cylinder loading pump
[28] DHW circulation pump (connect DHW circulation pumps with standalone functions directly to the 230 V ~ supply)
[35] Gas solenoid valve
[40] Power supply
[53] External safety solenoid valve
[96] Power supply for accessories and Vitotrol 100
[100] Fan motor
[100]A Fan motor control
[111] Gas pressure switch

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External connections (cont.)

145 KM-BUS
CO CO limiter

Commissioning/service reports

Settings and test values		Set value	Commissioning	Maintenance/ service	Maintenance/ service
Date					
Signature					
Static pressure	mbar kPa	≤ 57.5 ≤ 5.75			
Supply pressure (flow pressure)					
☐ For natural gas	mbar kPa	See supply pressure table (commissioning …)			
☐ For LPG	mbar kPa				
☐ *Enter gas type*					
Carbon dioxide content CO_2 For natural gas					
▪ At lower heating output	% by vol.	7.5-9.5			
▪ At upper heating output	% by vol.	7.5-9.5			
For LPG					
▪ At lower heating output	% by vol.	8.8-11.1			
▪ At upper heating output	% by vol.	8.8-11.1			
Oxygen content O_2					
▪ At lower heating output	% by vol.	4.0-7.6			
▪ At upper heating output	% by vol.	4.0-7.6			
Carbon monoxide content CO					
▪ At lower heating output	ppm	< 1000			
▪ At upper heating output	ppm	< 1000			

Specification

Rated heating output range					
At T_F/T_R 50/30 °C (P(50/30))	**kW**	**1.9 - 13**	**1.9 - 19**	**2.6 - 26**	**1.8 (3.5)[*1] - 35**
At T_F/T_R 80/60 °C (Pn(80/60))	**kW**	**1.7 - 12.1**	**1.7 - 17.6**	**2.4 - 24.1**	**1.6 (3.2) - 32.5**
Rated heating output for DHW heating	kW	1.7 - 17.6	1.7 - 17.6	2.4 - 30.0	1.6 (3.2) - 34.4
Rated heat input (Qn)	kW	1.8 - 12.3	1.8 - 17.9	2.5 - 24.7	1.7 (3.3) - 33.0
Rated heat input for DHW heating (Qnw)	kW	17.9	17.9	30.5	34.9
Rated voltage	V	230			
Rated frequency	Hz	50			
Rated current	A	6			
Backup fuse (power supply)	A	16			
Power consumption					
In the delivered condition	W	28	42	65	95
Maximum	W	126	126	148	163
Electronic temperature limiter setting (TN)	°C	81			
Temperature limiter setting (fixed)	°C	100			
Weight	kg	105	105	148	163
Permiss. operating pressure (PMS)	bar MPa	3 0.3	3 0.3	3 0.3	3 0.3
NO_X	Class	6	6	6	6
DHW heating					
Cylinder capacity	l	100	100	100	130
Permiss. operating pressure (PMW)	bar	10	10	10	10
	MPa	1.0	1.0	1.0	1.0
Specific flow rate (D)	l/min	18.2	18.2	20.7	27.3
Max. DHW temperature (TS)	°C	60	60	60	60
Comfort factor	Stars	3	3	3	3
Heating water capacity	l	4.0	4.0	4.2	5.0
Flue gas values					
▪ Mass flow rate (for DHW heating)	g/s	9	9	15	17
▪ Temperature (for DHW heating)	°C	66	67	68	77
▪ Max. temperature	°C	120	120	120	120
Supply values relative to the max. load					
Natural gas E	m^3/h	1.89	1.89	3.23	3.69
Natural gas LL	m^3/h	2.20	2.20	3.75	4.30
LPG P	kg/h	1.40	1.40	2.38	2.73
Permissible ambient temperature					
▪ During operation	°C	0 to +40			
▪ During storage and transport	°C	–20 to +65			
IP rating		IP X 4 to EN 60529			
Protection class		I			
Product ID		CE-0085CN0050			

[*1] *Only when operating with LPG P*

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).

Type of flue system

Available in the following countries	Type of flue system
AE, AM, AT, BA, BG, BY, CH, CY, CZ, DK, EE, ES,FI, GB, GR, HR, HU, IE, IS, IT, KG, KZ, LI, LT, LU, LV, MT, NL, NO, PL, PT, RO, RS, RU, SE, SK, TR, UA	B_{23}, B_{33}, C_{13}, C_{33}, C_{43}, C_{53}, C_{63}, C_{83}, C_{93}
BE	B_{23}, B_{23P}, B_{33}, C_{13}, C_{33}, C_{43}, C_{53}, C_{83}, C_{83P}, C_{93}
DE, SI	B_{23}, B_{33}, C_{13X}, C_{33X}, C_{43X}, C_{53X}, C_{63X}, C_{83X}, C_{93X}
FR	B_{23}, B_{23P}, B_{33}, C_{13}, C_{33}, C_{43}, C_{53}, C_{63}, C_{83}, C_{83P} C_{93}

Gas categories

Available in the following countries	Gas categories
AE, AT, AM, BA, BG, BY, CH, CZ, DK, EE, ES, FI, GB, GR, HR, IE, IS, IT, KG, KZ, LI, LT, LU, LV, MT, NO, PT, RO, RS, RU, SE, SI, SK, TR, UA	II_{2N3P}/II_{2H3P}
AM, BY, KG, KZ, RU, UA	I_{2N}/I_{2H}
BE	I_{2N}
DE, FR	II_{2N3P}
CY	I_{3P}
FR, IT	I_{2HM}
HU	II_{2N3P}/II_{2HS3P}
NV	II_{2EK3P}
PL	II_{2N3P}/II_{2ELw3P}

Final decommissioning and disposal

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

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

Declaration of conformity

We, Viessmann Werke GmbH & Co. KG, D-35107 Allendorf, declare as sole responsible body that the named product complies with the European directives and supplementary national requirements in terms of its design and operational characteristics.

Conformity has been verified with the CE designation. Using the serial number, the full Declaration of Conformity can be found on the following website:

www.viessmann.co.uk/eu-conformity

Manufacturer's declaration

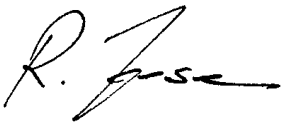
This product meets the requirements of the Efficiency Directive (92/42/EEC) for **condensing boilers**.

Manufacturer's certificate according to the 1st BImSchV [Germany]

We, Viessmann Werke GmbH & Co. KG, D-35107 Allendorf, confirm that the product **Vitodens 222-F**, **type B2TB**, complies with the NO_x limits specified by the 1st BImSchV Paragraph 6 [Germany].

Allendorf, 1 August 2017

Viessmann Werke GmbH & Co. KG



Authorised signatory Reiner Jansen
Head of Strategic Quality Management

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