

# Installation and service instructions

for contractors

# VIESMANN

## Vitodens 222-F

### Type FS2B

Gas condensing storage combi boiler  
4.8 to 35 kW natural gas and LPG version

G.C. no: 47-819-15 (19 kW)

G.C. no: 47-819-16 (26 kW)

G.C. no: 47-819-17 (35 kW)

*For applicability, see the last page*

## VITODENS 222-F



## Safety instructions



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

### Safety instructions explained



#### **Danger**

This symbol warns against the risk of injury.



#### **Please note**

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

### **Note**

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

### **Target group**

These instructions are exclusively designed for qualified personnel.

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

### **Regulations**

Observe the following when working on this system

- all legal instructions regarding the prevention of accidents,
- all legal instructions regarding environmental protection,
- the Code of Practice of relevant trade associations,

- all current safety regulations as defined by DIN, EN, DVGW, TRGI, TRF, VDE and all locally applicable standards,
- Gas Safety (Installation & Use) Regulations
  - the appropriate Building Regulation either the Building regulations, the Building Regulation (Scotland), Building Regulations (Northern Ireland),
  - the Water Fittings Regulation or Water Bylaws in Scotland,
  - the current I.E.E. Wiring Regulations.

### **If you smell gas**



#### **Danger**

Escaping gas can lead to explosions which may result in serious injury.

- Never smoke. Prevent naked flames and sparks. Never switch lights or electrical appliances ON or OFF.
- Close the gas shut-off valve.
- Open windows and doors.
- Remove all people from the danger zone.
- Notify your gas or electricity supplier from outside the building.
- Shut off the electricity supply to the building from a safe place (outside the building).

## Safety instructions (cont.)

### If you smell flue gas



#### **Danger**

Flue gas can lead to life-threatening poisoning.

- Shut down the heating system.
- Ventilate the boiler room.
- Close all doors leading to the living space.

### Working on the system

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



#### **Please note**

Electronic modules can be damaged by electro-static discharges.

Touch earthed objects, such as heating or water pipes, to discharge static loads.

### Repair work



#### **Please note**

Repairing components which fulfil a safety function can compromise the safe operation of your heating system.

Replace faulty components only with original Viessmann spare parts.

### Ancillary components, spare and wearing parts



#### **Please note**

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

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## Product information

### Vitodens 222-F, FS2B

Set up for operation with natural gas H.

For conversion to LPG P (without conversion kit), see page 30.

The Vitodens 222-F should generally only be delivered to those countries specified on the type plate. For deliveries to alternative countries, an approved contractor, on his own initiative, must arrange individual approval in accordance with the law of the land.

## Preparing for installation

### Preparing the boiler installation

Use a connection set, available as an accessory, to make the connection on the gas and water sides. The following overview shows sample connection sets for installation on finished walls to the top or side.



**Please note**

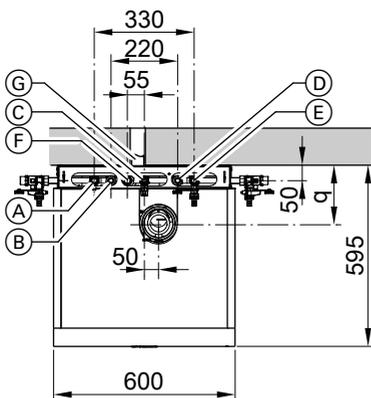
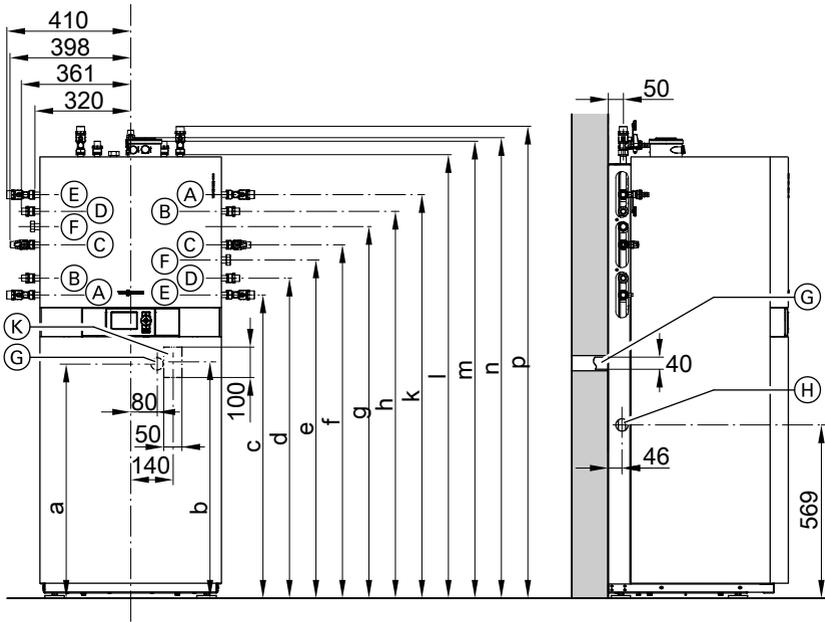
To prevent equipment damage,  
install all pipework free of load and torque stresses.

Preparing the connections on site:



Connection set installation instructions

Preparing for installation (cont.)



- (A) Heating flow R  $\frac{3}{4}$
- (B) DHW R  $\frac{1}{2}$
- (C) Gas connection R  $\frac{3}{4}$
- (D) Cold water R  $\frac{1}{2}$
- (E) Heating return R  $\frac{3}{4}$
- (F) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (G) Condensate drain to the back into the wall
- (H) Side condensate drain
- (K) Cable entry area

Rated output range	4.8 to 19 kW	6.5 to 26 kW	8.8 to 35 kW
a (mm)	745	745	945
b (mm)	750	750	950
c (mm)	972	972	1172



## Preparing for installation (cont.)

Rated output range	4.8 to 19 kW	6.5 to 26 kW	8.8 to 35 kW
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
p (mm)	1526	1526	1726
q (mm)	201	224	224

### Note

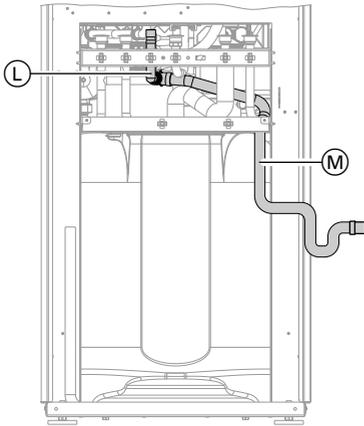
*The adjustable feet give all height measurements a tolerance of +15 mm.*

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

### Note

*Should an additional diaphragm expansion vessel be required on site, connect that vessel into the heating return.*

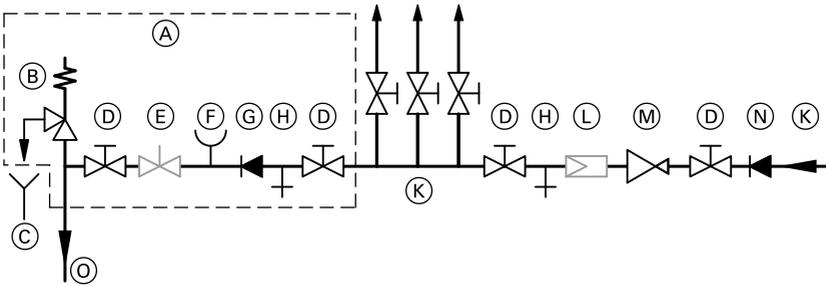
## Preparing for installation (cont.)



2. Prepare the connections on the DHW side. Install the safety assembly (accessory or on-site provision) in accordance with the Water Fittings Regulations 1999 in the cold water line (see page 10).  
Recommendation:  
Install the safety valve above the DHW cylinder to protect it against contamination, scaling and high temperatures.  
Connect the drain hose to condensate collector (L). Remove plug from condensate collector.
  
3. Route condensate hose (M) to the back (drain in wall (G)) or to the side aperture (H) (see page 6).  
Route condensate hose with a U-bend and connect to on-site drain line or siphon. Discharge pipes from expansion valves (safety valve) should not be connected directly to a drain and should pass through a visible tundish, with a AUK3 air gap, and be located adjacent to the device.
  
4. Prepare the gas connection according to TRGI or TRF or all local regulations.
  
5. Prepare the electrical connections.
  - The boiler is delivered with a fitted power cable; fuse protection max. 16 A, 230 V/50 Hz.
  - Accessory cables: NYM with the required number of conductors for the external connections.
  - Allow all cables in area "(K)" (see page 7) to protrude 2000 mm from the wall.

## Preparing for installation (cont.)

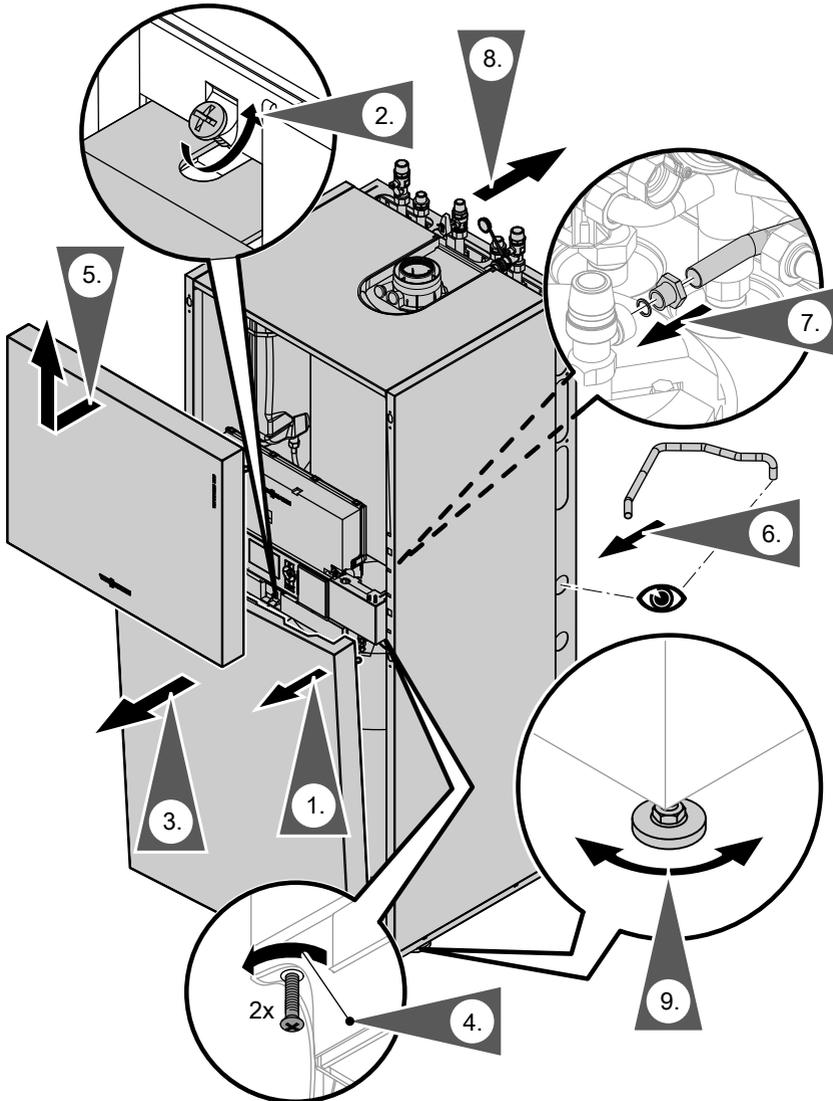
### Safety assembly to Water Fittings Regulations 1999



- |  |   |
|--|---|
| (A) Safety assembly to Water Fittings Regulations 1999 (accessory to connection sets for unfinished walls) | (G) Non-return valve                                    |
| (B) Safety valve   | (H) Drain   |
| (C) Visible blow-off line outlet   | (K) Cold water  |
| (D) Shut-off valve   | (L) Drinking water filter                               |
| (E) Flow regulating valve (installation recommended)   | (M) Pressure reducer to Water Fittings Regulations 1999 |
| (F) Pressure gauge connector   | (N) Non-return valve/pipe separator                     |
|  | (O) Cold water connection at connection set (accessory) |

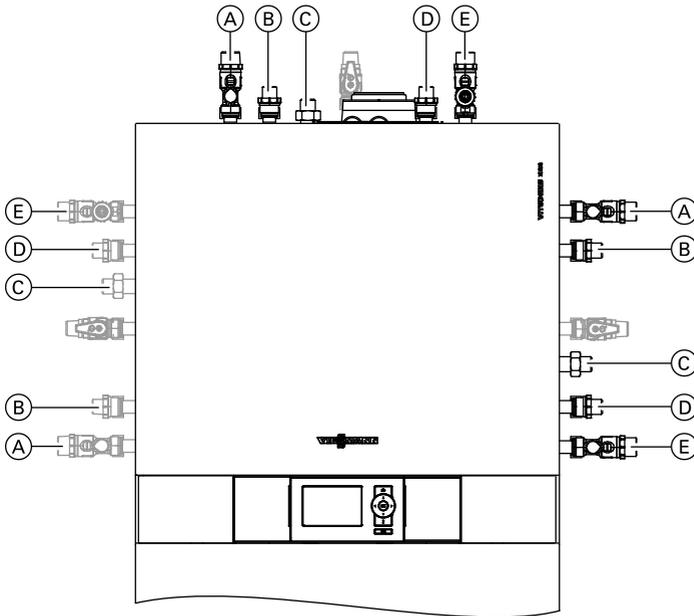
## Installing the boiler

### Assembling the boiler



## Installing the boiler (cont.)

### Connections on the heating water and the DHW side



Shown with connection sets for finished walls (accessories)

- (A) Heating flow R  $\frac{3}{4}$
- (B) DHW R  $\frac{1}{2}$
- (C) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (D) Cold water R  $\frac{1}{2}$
- (E) Heating return R  $\frac{3}{4}$

#### DHW connection

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

 Separate installation instructions

#### Fitting the drain outlet and drain line for the T&P valve

 Separate installation instructions

## Installing the boiler (cont.)

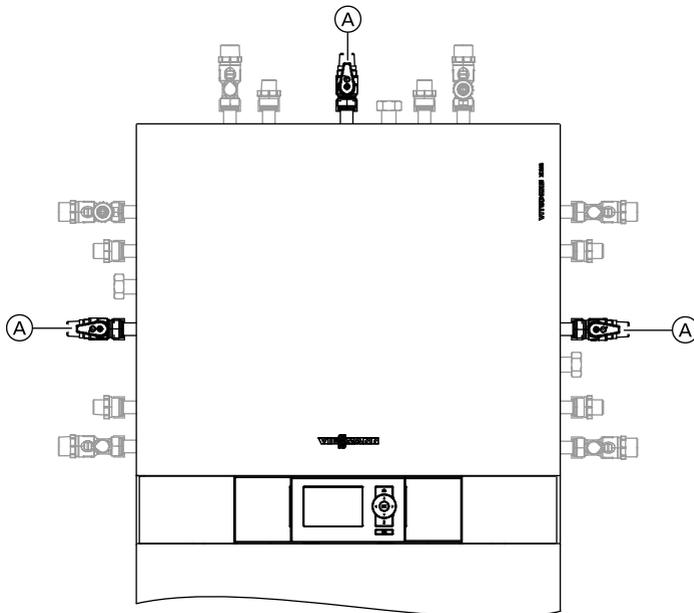
### DHW circulation connection

### DHW circulation connection with DHW circulation pump connection set (accessory)



Separate installation instructions

### Gas connection



- Notes regarding operation with LPG.** We recommend the installation of an external safety solenoid valve when installing the boiler in rooms below ground level.
1. Secure gas shut-off valve (A) at the gas connection.
  2. Carry out a tightness test.

## Installing the boiler (cont.)

### Note

*For the tightness test, use only suitable and approved leak detecting agents (EN 14291) and devices.*

*Leak detecting agents with unsuitable constituents (e.g. nitrites, sulphides) can lead to material damage.*

*Remove residues of the leak detecting agent after testing.*



### Please note

Excessive test pressure may damage the boiler and the gas valve.

Max. test pressure 150 mbar.

Where higher pressure is required for tightness tests, separate the boiler and the gas valves from the gas supply pipe (undo the fitting).

### 3. Vent the gas line.

For conversion to a different gas type see page 30

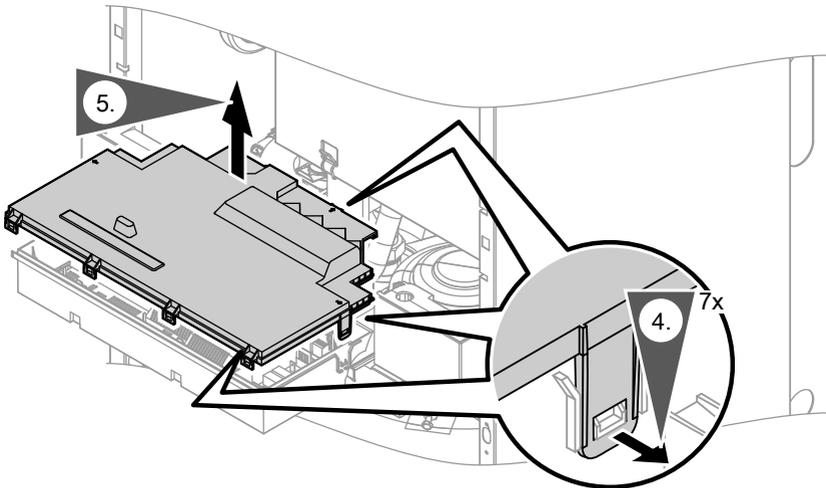
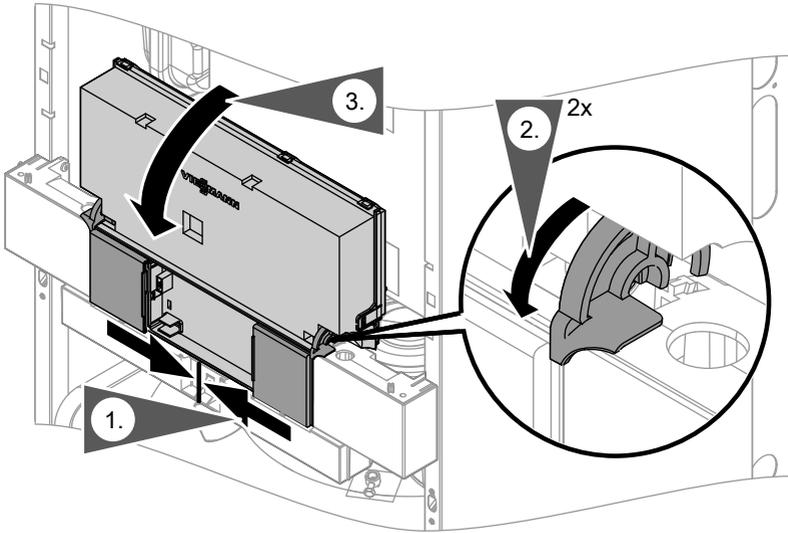
## Flue gas connection

Connect the balanced flue. The flue terminals have to be installed as described in accordance with the Building Regulations Part J and BS 5440.



Flue gas system installation instructions.

## Opening the control unit casing



## Electrical connections



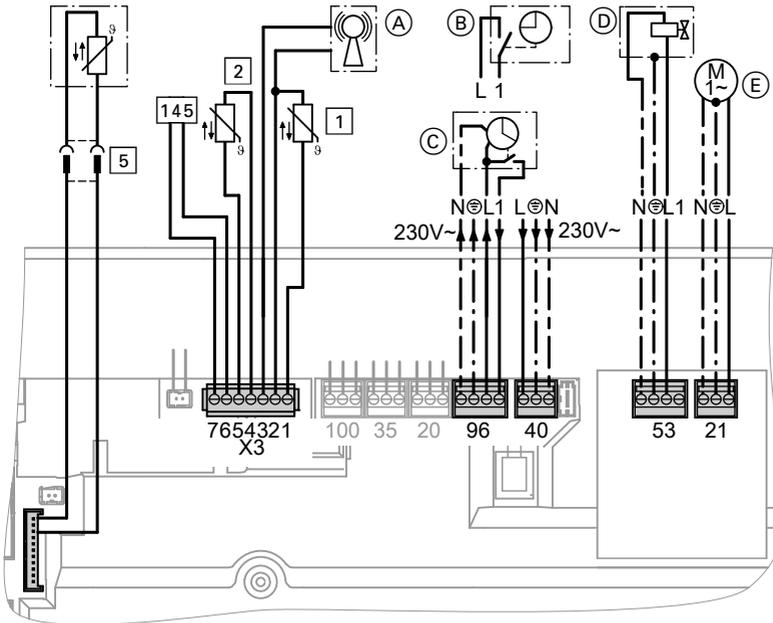
### Information regarding the connection of accessories

For the connection, observe the separate installation instructions provided with the accessory components.



### Please note

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



- (A) Radio clock connection
- (B) Vitotrol 100 UTDB (only for constant temperature control units)
- (C) Vitotrol 100 UTA (only for constant temperature control units)  
or  
Vitotrol 100 UTDB-RF wireless receiver (only for constant temperature control units)

## Electrical connections (cont.)

### Plug 230 V~

- 21 Cylinder primary pump (E) (fitted and connected)
- 40 Power supply [terminals]



#### Danger

Incorrect core termination can cause severe injuries and damage to the equipment.

**Never** interchange cores "L1" and "N".

- Install an isolator in the power supply line that simultaneously isolates all non-earthed conductors from the mains with at least 3 mm contact separation. We additionally recommend installing an AC/DC-sensitive RCD (RCD class B  for DC (fault) currents that can occur with energy-efficient equipment. Remove the existing cable grommet when using larger cross-sections (up to  $\varnothing 14$  mm). Secure the cable with cable grommet (F) (see page 19) integrated into the casing base.
- Max. fuse rating 16 A.

- 53 External safety solenoid valve (LPG) (D)

Do **not** remove jumper between "1" and "L" when making this connection.

- 96 Power supply of accessories  
Where the boiler is installed in a wet area, the connection of accessories to the power supply must not be carried out at the control unit. If the boiler is installed outside wet areas, the power supply for accessories can be connected directly to the control unit (230 V/50 Hz). The connection is switched by the system ON/OFF switch.

#### Note

*If the total system current exceeds 6 A, connect one or more extensions via a mains isolator directly to the mains supply; see page 18.*

- Vitotrol 100 UTA
- Vitotrol 100 UTDB
- Vitotrol 100 UTDB-RF

## Electrical connections (cont.)

### Low voltage plug X3

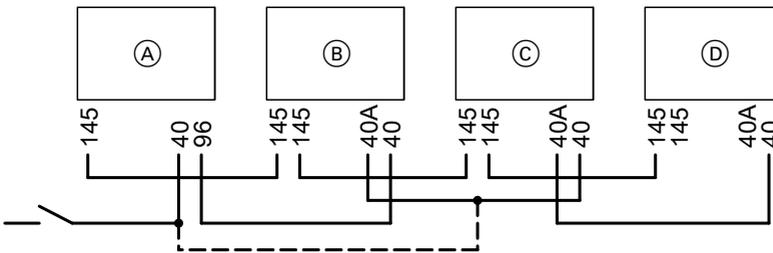
- 1 Outside temperature sensor (only for weather-compensated control units)

Installation:

- North or north-western wall, 2 to 2.5 m above ground level; in multi-storey buildings, in the upper half of the second floor
- Not above windows, doors or ventilation outlets
- Not immediately below balconies or gutters
- Never render over
- Cable length max. 35 m with a cross-section of 1.5 mm<sup>2</sup>

- 2 Flow temperature sensor for low loss header (accessories)
- 5 Cylinder temperature sensor (fitted and connected)
- 145 KM BUS subscriber (accessory)
- Vitotrol 200A or 300A remote control (only for weather-compensated control units)
  - Vitocom 100
  - Extension kit for one heating circuit with mixer (only for weather-compensated control units)
  - Extension AM1 or EA1
  - Open Therm extension

### Connection of accessories



- (A) Boiler control unit
- (B) Extension kit for a heating circuit with mixer M2
- (C) Extension kit for heating circuit with mixer M3
- (D) Extension AM1 or EA1

If a current flows to the actuators connected (e.g. circulation pumps) that is higher than the safety level of the accessory, only use the output concerned to control an on-site relay.

## Electrical connections (cont.)

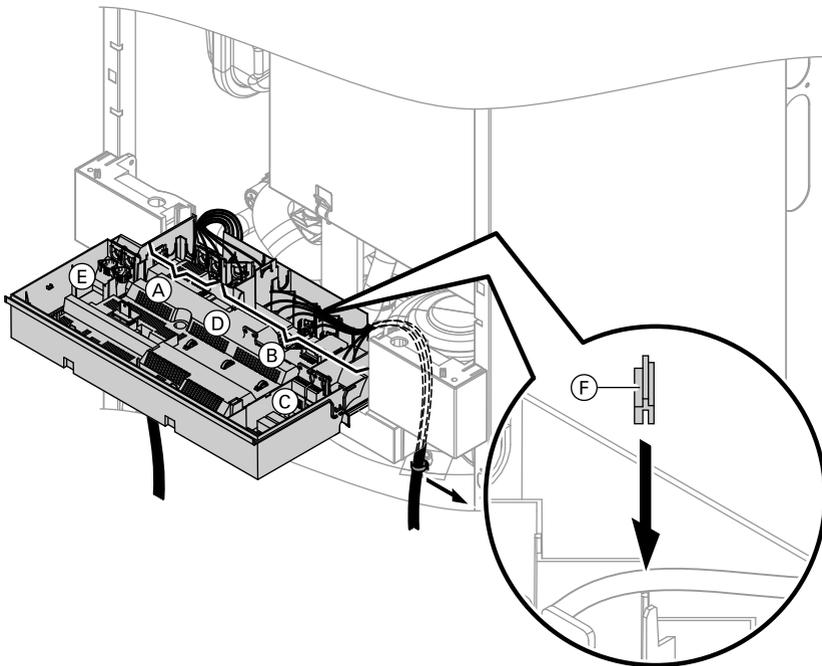
Accessories	Internal fuse protection
Extension kit for one heating circuit with mixer	2 A
Extension AM1	4 A
Extension EA1	2 A

### Routing the connecting cables



#### Please note

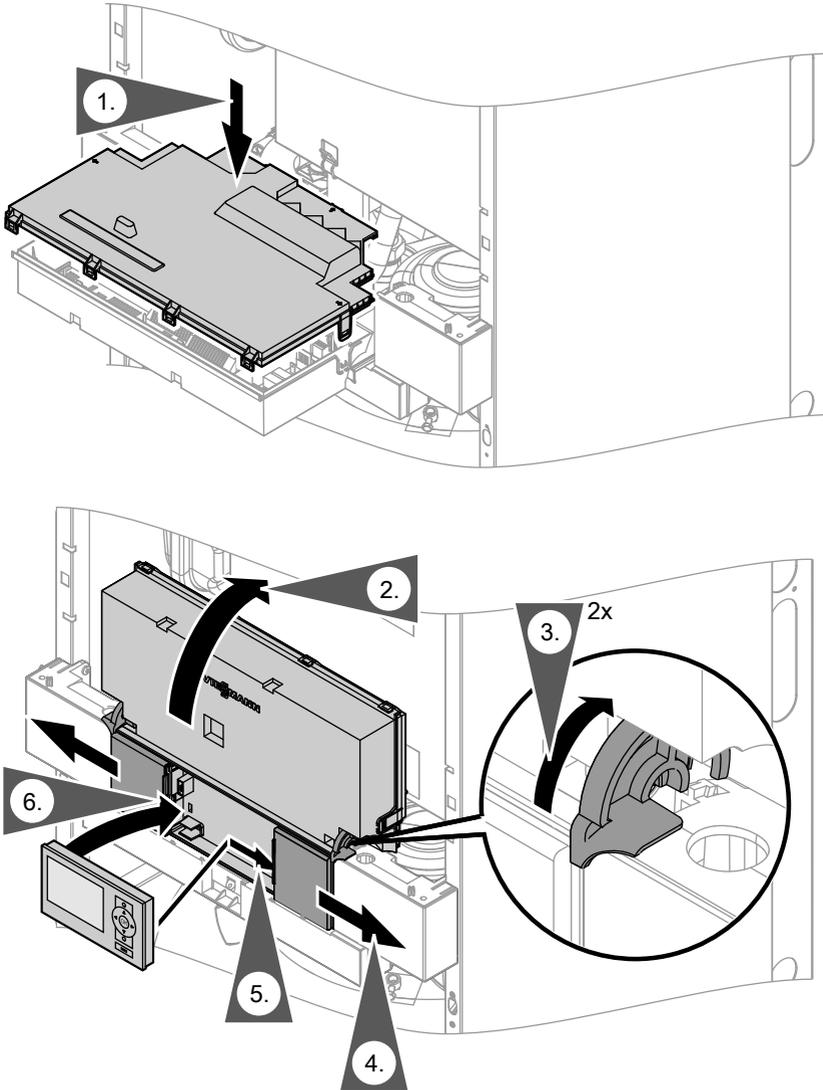
Connecting cables will be damaged if they touch hot parts. When routing and securing power cables on site, ensure that the maximum permissible temperatures for these cables are not exceeded.



- (A) Low voltage connections
- (B) 230 V connections
- (C) Internal extension
- (D) Main PCB

- (E) Communication module (accessories)
- (F) Cable grommet for power supply cable

## Closing the control unit casing



Close control unit casing and insert programming unit, packed separately.

**Note**

*The programming unit can also be used in a wall mounting base (accessory) near the boiler.*

## Closing the control unit casing (cont.)



Wall mounting base installation  
instructions

## Steps - commissioning, inspection and maintenance

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

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			Maintenance steps	
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## Further details regarding the individual steps

### Removing the front panels

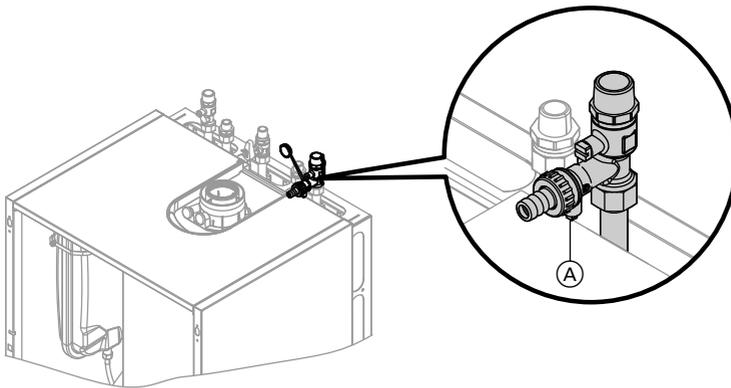
See page 11, steps 1 to 5.

### Filling the heating system



#### Please note

- Unsuitable fill water increases the level of deposits and corrosion and may lead to boiler damage.
  - Thoroughly flush the entire heating system prior to filling it with water.
  - Only use fill water of potable quality.
  - Soften fill water with hardness exceeding 3.0 mmol/l, e.g. use a small softening system for heating water (see Vitoset price list).
  - An antifreeze additive suitable for heating systems can be added to the fill water.



Shown with connection set for finished walls (accessory)

1. Check the pre-charge pressure of the diaphragm expansion vessel.
2. Close the gas shut-off valve.
3. Fill heating system via boiler drain & fill valve (A) in the heating return (at the connection set on the side or above the boiler). (Minimum system pressure > 1.0 bar).

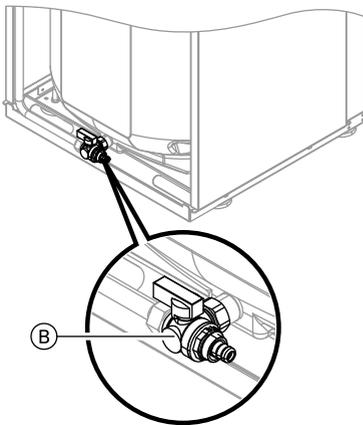
## Further details regarding the individual steps (cont.)

### Note

If the control unit has not been 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

Lever on valve (B) must be in the "l.h." position.



- If the control unit had already been switched ON before filling began: Switch control unit ON and activate filling program (see next steps).

### Note

For function and details of the fill program, see page 137.

- Close boiler drain & fill valve (A).

### Activating filling function with weather-compensated control units:

- Press **OK** and **≡** simultaneously for approx. 4 s.
- "Service functions"
- "Filling"
- Ending filling function:  
Press **OK** or **↶**.

### Activating filling function with constant temperature control units:

- Press **OK** and **≡** simultaneously for approx. 4 s.
- Select **▶ "④"** and confirm with **OK**.  
The display shows **"bF on"** when the filling function is activated.
- Ending filling function:  
Press **↶**.

## Further details regarding the individual steps (cont.)

### Selecting the language (if required) – only for weather-compensated control units

#### Note

At the commissioning stage, the display is in German (default setting)

#### Extended menu:

1. 

2. "Settings"

3. "Language"

Sprache	
Deutsch	DE <input checked="" type="checkbox"/>
Cesky	CZ <input type="checkbox"/>
Dansk	DK <input type="checkbox"/>
English	GB <input type="checkbox"/>
Wählen mit 	

4. Set the required language with ▲/▼.

### Setting the time and date (if required) – only for weather-compensated control units

During commissioning, or after prolonged time out of use, the time and date need to be reset.

#### Extended menu:

1. 

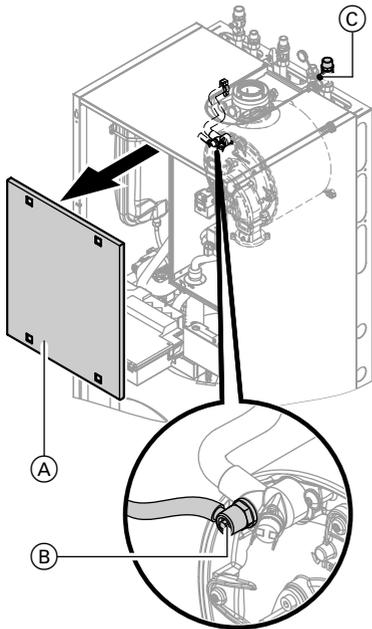
2. "Settings"

3. "Time / Date"

4. Set current time and date.

## Further details regarding the individual steps (cont.)

### Venting the boiler



1. Close the shut-off valves on the heating water side.
2. Remove cover panel (A).
3. Connect the drain hose on valve (B) with a drain.
4. Open air vent valve (B) and fill valve (C) in the heating return and vent using mains pressure (flush) until no more air noise can be heard.
5. Close valve (B) and fill valve (C) in the heating return, and open the shut-off valves on the heating water side.

### Venting the heating system

1. Close the gas shut-off valve and switch the control unit ON.
2. Activate venting program (see next steps).

#### Note

For function and sequence of the venting program, see page 137.

3. Check the system pressure.

#### Activating venting function with weather-compensated control unit:

1. Press **OK** and **≡** simultaneously for approx. 4 s.
2. "Service functions"
3. "Venting"
4. Ending venting function:  
Press **OK** or **↩**.

## Further details regarding the individual steps (cont.)

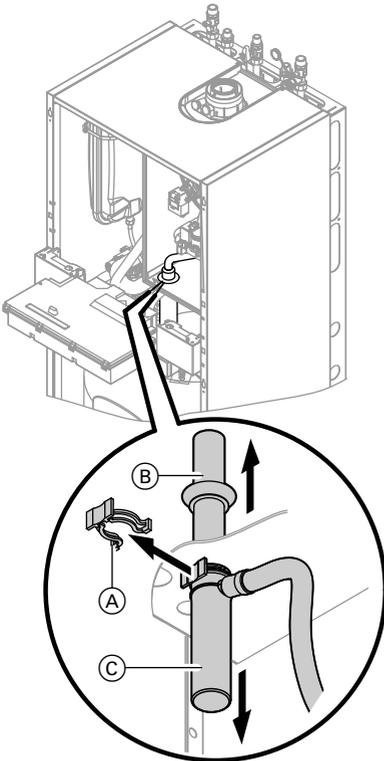
### Activating venting function with constant temperature control unit:

1. Press **OK** and  simultaneously for approx. 4 s.

2. Select ► "**⑤**" and confirm with **OK**.  
When the venting function is activated, "**EL on**" is shown on the display.

3. Ending venting function:  
Press .

### Filling siphon with water



1. Pivot control unit forward.

2. Pull retaining clip **(A)** off.

3. Pull filler pipe **(B)** upwards.

4. Pull off trap **(C)** downwards.

5. Fill siphon with water and reassemble.

6. Check that the condensate pipe is connected correctly to the siphon and heat exchanger.

7. Refit cover panel.

8. Secure control unit back in operating position.

## Further details regarding the individual steps (cont.)

### Designating heating circuits – only for weather-compensated control units

In the delivered condition, the heating circuits are designated **"Heating circuit 1"**, **"Heating circuit 2"** and **"Heating circuit 3"** (if installed).

If the system user prefers, the heating circuits can be designated differently to suit the specific system.



**Enter names for heating circuits:**

Operating instructions

### 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.

- Consequently, for natural gas there is no adjustment required across the entire Wobbe index range.

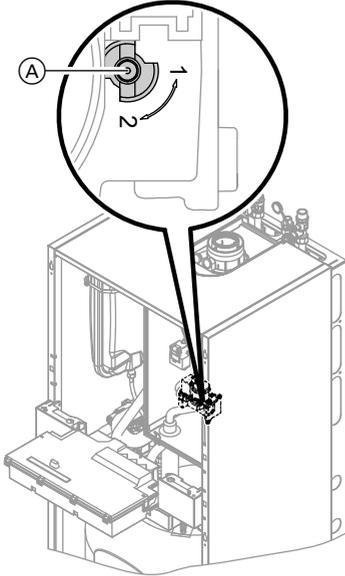
The boiler can be operated in the Wobbe index range 9.5 to 15.2 kWh/m<sup>3</sup> (34.2 to 54.7 MJ/m<sup>3</sup>).

- Convert the burner for operation with LPG (see "Gas type conversion" on page 30).

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 gas type (see page 30).
3. Record the gas type in the service report on page 156.

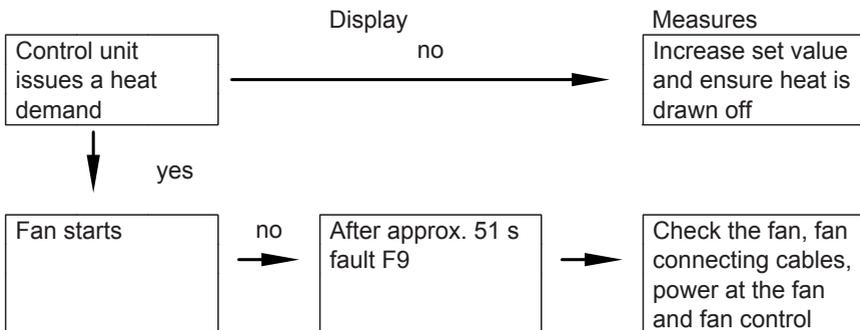
**Further details regarding the individual steps (cont.)**

**Gas type conversion (only for operation with LPG)**

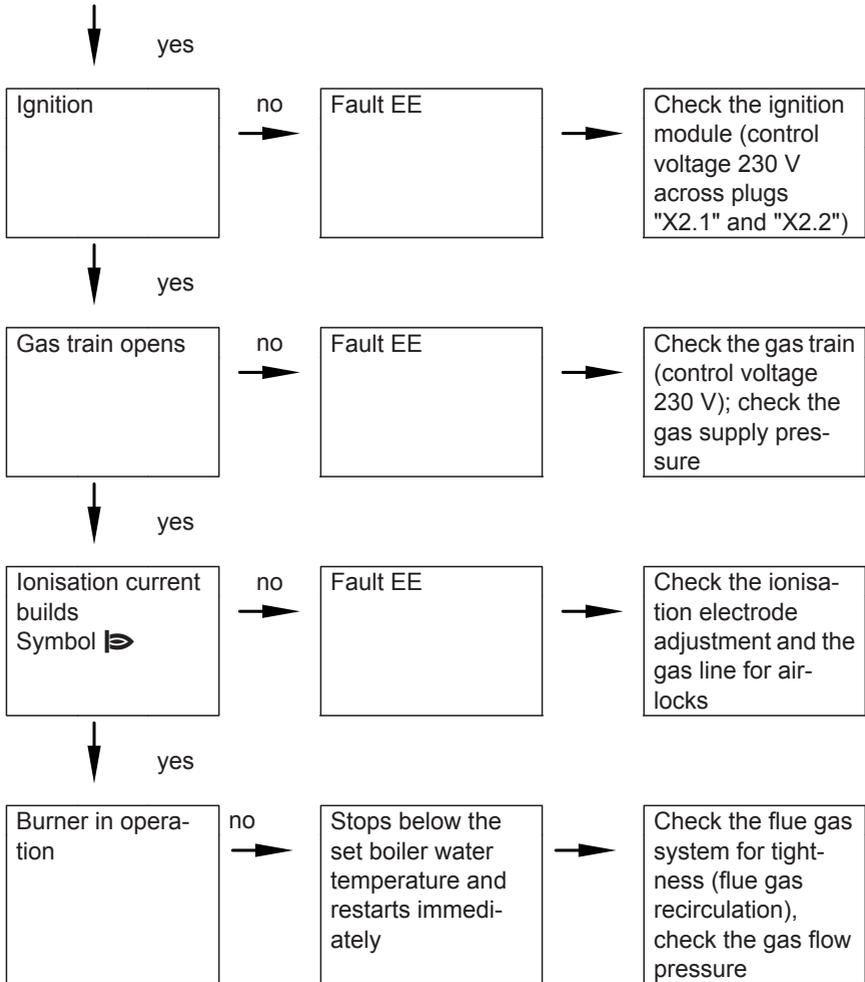


1. Set adjusting screw (A) at the gas train to "2".
2. Switch ON/OFF switch (D) ON.
3. Select the gas type in coding address "82".
  - Call up code 2.
  - Call up **"General"** (weather-compensated control units) or Group **"1"** (constant temperature control units)
  - In coding address "11", select value "9".
  - In coding address "82", select value "1" (LPG operation).
  - In code "11" select value ≠ "9".
  - End service functions.
4. Open the gas shut-off valve.
5. Affix label "G31" (supplied with the technical documentation) adjacent to the type plate on the cover panel.

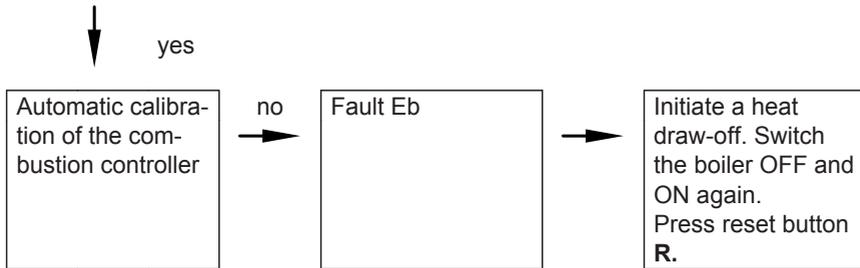
**Function sequence and possible faults**



**Further details regarding the individual steps (cont.)**



## Further details regarding the individual steps (cont.)



For further fault details, see page 102.

## Checking the static and supply pressure



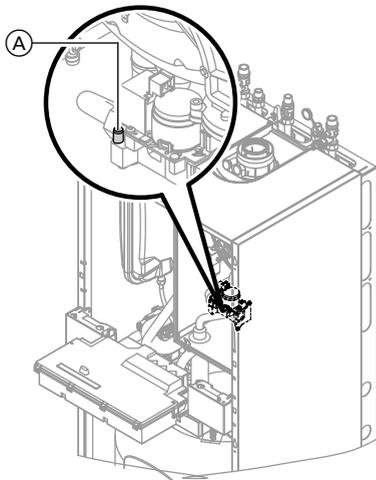
### Danger

CO build-up as a result of an incorrect burner setup can have serious health implications.

Carry out a CO test prior to and after work on gas equipment.

### Operation with LPG

*Flush the LPG tank twice during commissioning/replacement. Vent the tank and gas supply lines thoroughly after flushing.*



1. Close the gas shut-off valve.
2. Release the screw inside test nipple "PE" **A** at the gas train but do not remove it; then connect the pressure gauge.
3. Open the gas shut-off valve.
4. Measure the static pressure and record it in the service report on page 156.  
Set value: max. 37 mbar

## Further details regarding the individual steps (cont.)

### 5. Start the boiler.

#### Note

During commissioning, the boiler can enter a fault state because of airlocks in the gas line. After approx. 5 s, press the reset button **R** (see operating instructions) to reset the burner.

### 6. Check the supply (flow) pressure.

Set value:

- Natural gas: 20 mbar
- LPG: 37 mbar

#### Note

Use suitable test equipment with a resolution of at least 0.1 mbar to measure the supply pressure.

### 7. Record the actual value in the service report on page 156.

Take the action shown in the following table.

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

### 9. Open the gas shut-off valve and start the boiler.



#### Danger

Gas escaping from the test nipple leads to a risk of explosion.

Check test nipple (A) for tightness.

Supply (flow) pressure for natural gas	Supply (flow) pressure for LPG	Measures
below 15 mbar	below 25 mbar	Do not start the boiler. Notify your gas supply utility or LPG supplier.
15 to 25 mbar	25 to 45 mbar	Start the boiler.
above 25 mbar	above 45 mbar	Install a separate gas pressure governor upstream of the system and regulate the pre-charge pressure to 20 mbar for natural gas or 37 mbar for LPG. Notify your gas supply utility or LPG supplier.

## Setting the maximum output

You can limit the maximum output for **heating operation**. The limit is set via the modulation range. The max. adjustable heating output is limited upwards by the boiler coding card.

**Weather-compensated control unit:**

1. Press **OK** and  simultaneously for approx. 4 s.

2. **"Service functions"**

3. **"Max. output"**



## Further details regarding the individual steps (cont.)

**4. "Change?"** Select **"Yes"**.

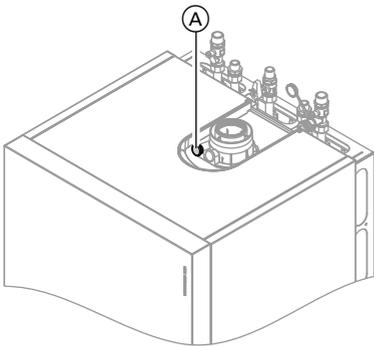
A value flashes on the display (e.g. "85"). In the delivered condition, this value represents 100 % of rated output.

**5.** Select required value.

### Constant temperature control unit:

1. Press **OK** and **≡** simultaneously for approx. 4 s.

## Checking the balanced flue system tightness (annular gap check)



- Ⓐ Combustion air port (ventilation air)

For balanced flue systems tested together with the wall mounted gas fired boiler, the requirement for a tightness test during commissioning by the flue gas inspector is not applicable.

**2.** Select **▶ "③"** and confirm with **OK**.

A value flashes on the display (e.g. "85") and **"▶"** appears. In the delivered condition, this value represents 100 % of rated output.

**3.** Select required value and confirm with **OK**.

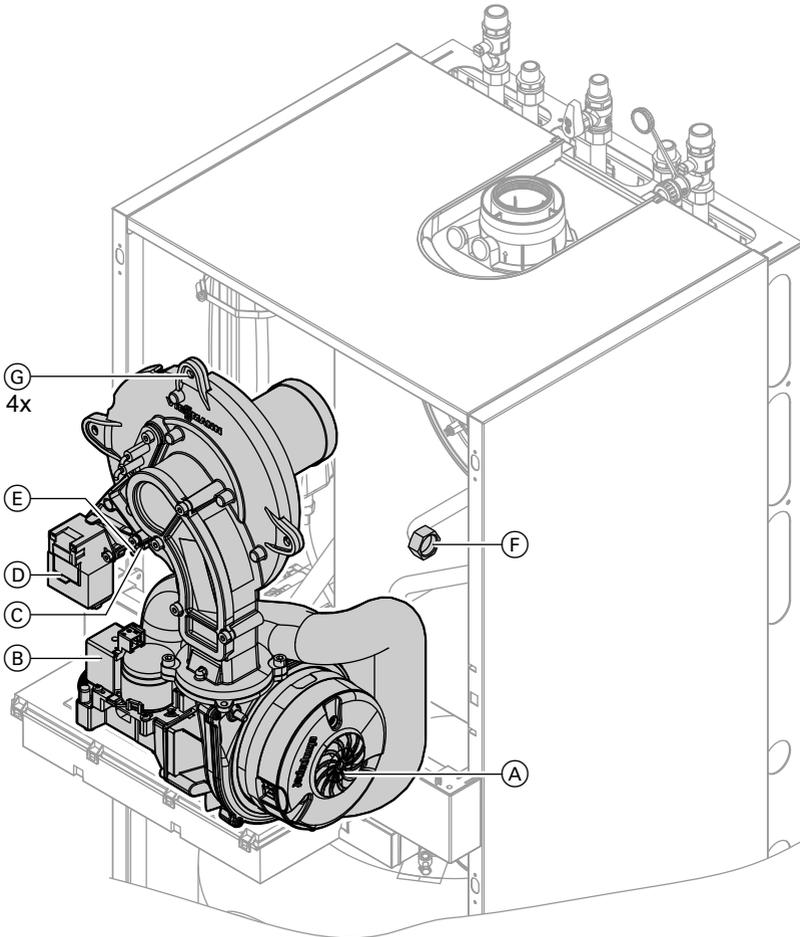
We recommend that your heating engineer carries out a simple leak/tightness test during the commissioning of your system. For this, it would be sufficient to check the  $\text{CO}_2$  or  $\text{O}_2$  concentration in the combustion air at the annular gap of the balanced flue pipe.

The flue pipe is deemed to be gas-tight if the  $\text{CO}_2$  concentration in the combustion air is no higher than 0.2 % or the  $\text{O}_2$  concentration is at least 20.6 %.

If actual  $\text{CO}_2$  values are higher or  $\text{O}_2$  values are lower, then pressure test the flue pipe with a static pressure of 200 Pa.

**Further details regarding the individual steps (cont.)**

**Burner removal**



1. Switch ON/OFF switch ① at the control unit and the main power supply OFF.
2. Close the gas shut-off valve and safeguard against reopening.
3. Pull electrical cables from fan motor (A), gas valve (B), ionisation electrode (C), ignition unit (D) and earth tab (E).
4. Release gas supply pipe fitting (F).

## Further details regarding the individual steps (cont.)

5. Undo four screws (G) and remove the burner.

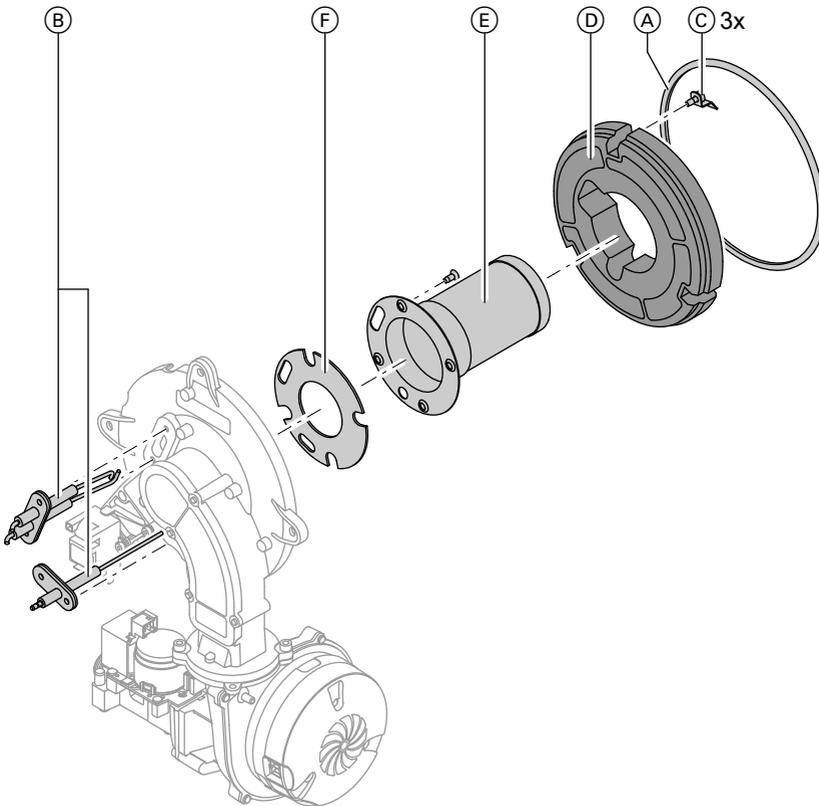


### Please note

Prevent damage to the wire gauze.  
Never rest the burner on the gauze assembly.

## Checking the burner gasket and the burner gauze assembly

Check burner gasket (A) and burner gauze assembly (E) for damage and replace, if required.



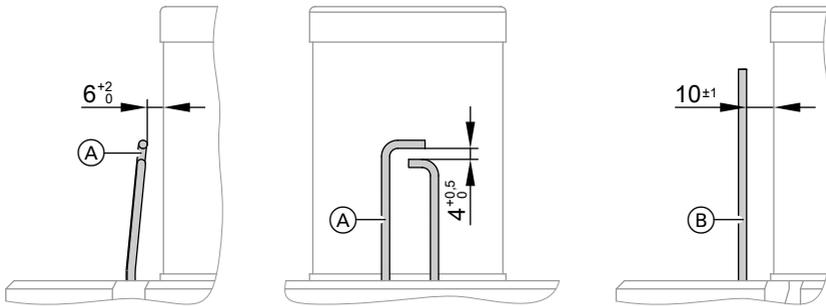
1. Remove electrodes (B).

2. Undo three retaining clips (C) at thermal insulation ring (D) and remove thermal insulation ring (D).

## Further details regarding the individual steps (cont.)

3. Undo four Torx screws and remove burner gauze assembly (E) with its gasket (F).
4. Insert and secure a new burner gauze assembly (E) with a new gasket (F).  
Torque: 3.5 Nm.
5. Refit thermal insulation ring (D).
6. Refit electrodes (B).  
Torque: 4.5 Nm.

## Checking and adjusting the ignition and ionisation electrodes



(A) Ignition electrodes

(B) Ionisation electrode

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

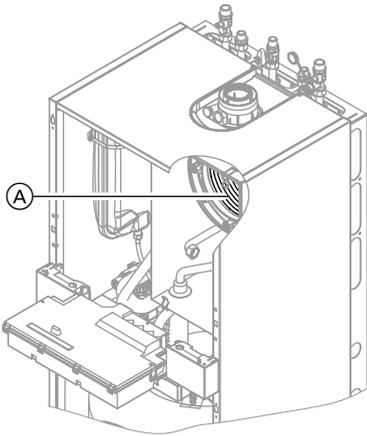
## Cleaning the heat exchanger and fitting the burner



### Please note

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

## Further details regarding the individual steps (cont.)



1. Use a vacuum cleaner to remove residues from heat exchanger (A) inside the combustion chamber.
2. If required, spray slightly acidic, chloride-free cleaning agents based on phosphoric acid onto heat exchanger (A) and let the solution soak in for approx. 20 min.
3. Thoroughly flush heat exchanger (A) with water.
4. Install the burner. Fit the screw with a serrated washer as well as the remaining screws, then apply torque diagonally with 8.5 Nm.
5. Fit the gas supply pipe with a new gasket.
6. Check the gas connections for tightness.



### **Danger**

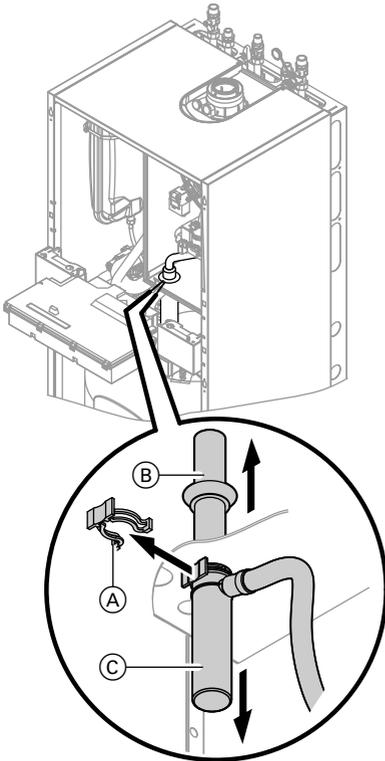
Escaping gas leads to a risk of explosion.

Check all fittings for gas tightness.

7. Connect the electrical cables/leads to each corresponding component.

**Further details regarding the individual steps (cont.)**

**Checking the condensate drain and cleaning the siphon**

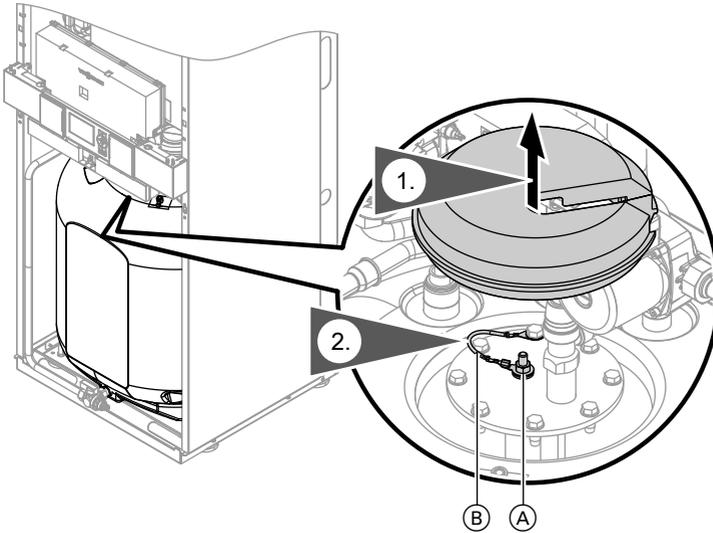


1. Check that the condensate can drain freely at the siphon.
2. Pull retaining clip (A) off.
3. Pull filler pipe (B) upwards.
4. Pull off trap (C) downwards.
5. Pull the condensate hose from trap (C).
6. Clean the siphon.
7. Fill siphon with water and reassemble.
8. Check that the condensate pipe is connected correctly to the siphon and heat exchanger.

**Checking the anode connection**

Check that the earth lead is connected to the magnesium anode.

**Further details regarding the individual steps (cont.)**



Ⓐ Magnesium anode

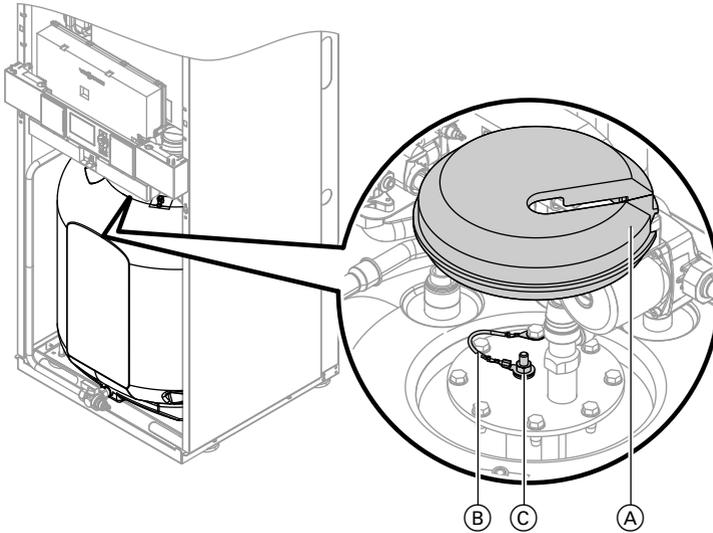
Ⓑ Earth cable

**Testing the anode earth current with an anode tester**

**Note**

*We recommend that the magnesium anode function is checked annually. This function test can be carried out without interrupting operation, by measuring the earth current with an anode tester.*

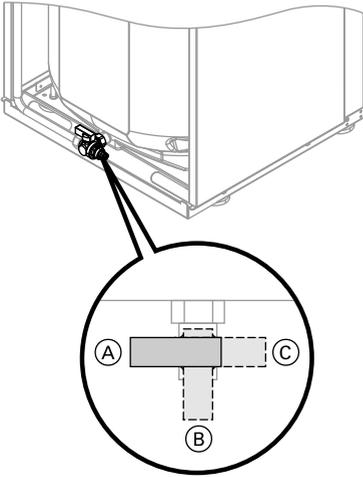
## Further details regarding the individual steps (cont.)



1. Remove cover (A).
2. Pull earth lead (B) from tab (C).
3. Connect the tester (up to 5 mA) in series between tab (C) and earth cable (B).
  - The anode is OK if the indicated current is  $> 0.3$  mA.
  - Visually inspect the anode if the current measures  $< 0.3$  mA, or if there is no current at all (see page 44).

## Further details regarding the individual steps (cont.)

### Draining the boiler on the DHW side



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

#### **Note**

*Ensure adequate ventilation in the DHW pipework.*

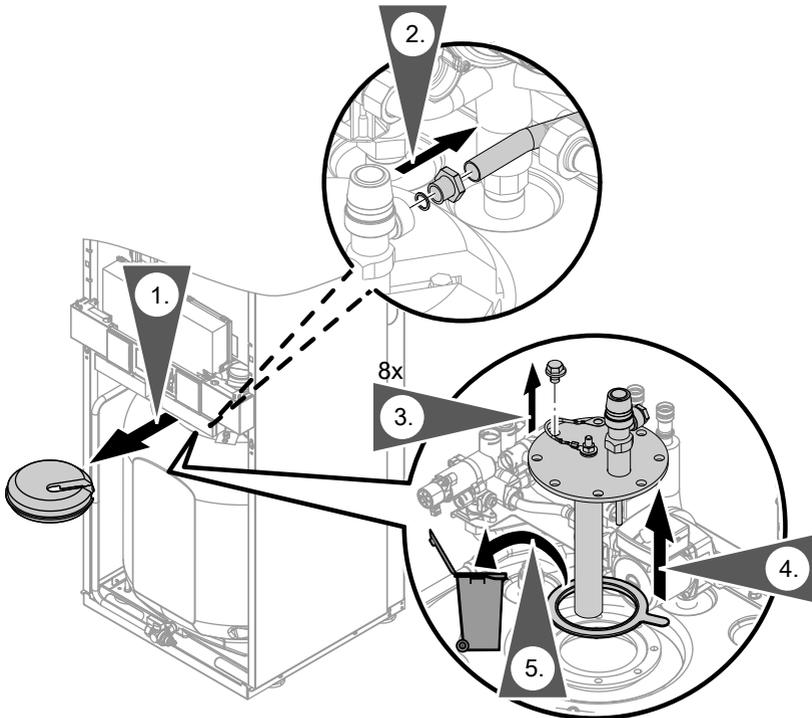
2. Turn drain valve from lever position (A) to lever position (B) or (C) as required.
  - Lever position (B): Drain heating system **excluding** cylinder via the cold water connection.
  - Lever position (C): Drain heating system **and** cylinder via the DHW connection. Cold water connection remains filled.

**Further details regarding the individual steps (cont.)**

**Cleaning the primary store**

**Note**

*EN 806 specifies a visual inspection and (if required) cleaning every two years after the cylinder has been taken into use and thereafter according to requirements.*



1. Drain the primary store.

2. Remove flange lid.

3. Disconnect the primary store from the pipework to prevent contamination from entering the pipe system.

4. Remove loose deposits with a high pressure cleaner.



**Please note**

When cleaning the inside, only use plastic cleaning utensils.

## Further details regarding the individual steps (cont.)

5. Use a chemical cleaning agent to remove hard deposits that cannot be removed by a high pressure cleaner.
6. Thoroughly flush the primary store after cleaning.



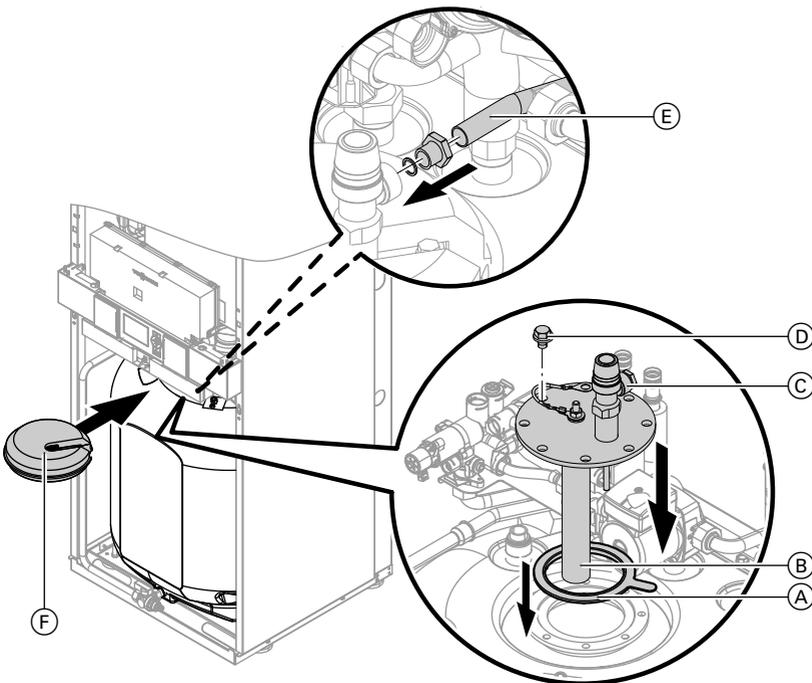
### Please note

Never use hydrochloric acid based cleaning agents.

## Checking and replacing the magnesium anode (if required)

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

## Returning the primary store into use

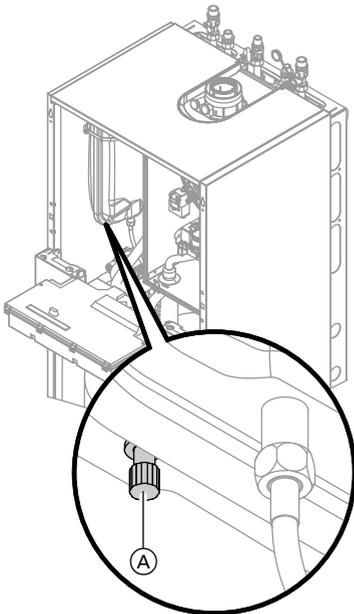


1. Reconnect the primary store to the pipework.
2. Insert new gasket (A) underneath flange lid (B).

### Further details regarding the individual steps (cont.)

3. Fit flange lid (B) and tighten eight screws (D) with up to 25 Nm.
4. Push earth cable (C) onto tab.
5. Install the drain line T&P valve (E).
6. Fit cover (F).
7. Fill the primary store with drinking water.

### Checking the diaphragm expansion vessel and system pressure



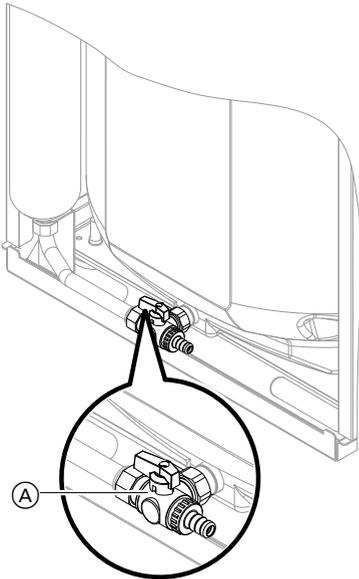
#### Note

Carry out this test on a cold system.

1. Drain the system, until the pressure gauge indicates "0".
2. If the diaphragm expansion vessel inlet pressure is lower than the static system pressure: Top up with nitrogen via connection (A), until the inlet pressure is 0.1 to 0.2 bar.
3. Top up your heating system with water and vent until the filling pressure of a cooled system is 0.1 to 0.2 bar higher than the inlet pressure of the diaphragm expansion vessel. Permiss. operating pressure: 3 bar

## Further details regarding the individual steps (cont.)

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



1. Check the static pressure of the DHW line downstream of the pressure reducer and adjust if required. Set value: max. 3.0 bar
2. Close the on-site shut-off valve in the cold water line.
3. Turn lever on valve (A) 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
5. Turn lever on valve (A) back to the "l.h." position and open the on-site shut-off valve in the cold water line.

### Checking all gas equipment for tightness at operating pressure



#### **Danger**

Escaping gas leads to a risk of explosion.

Check gas equipment for tightness.

#### **Note**

*For the tightness test, use only suitable and approved leak detecting agents (EN 14291) and devices. Leak detecting agents with unsuitable constituents (e.g. nitrites, sulphides) can lead to material damage.*

*Remove residues of the leak detecting agent after testing.*

### Checking the combustion quality

The electronic combustion controller automatically ensures an optimum combustion quality. The combustion values only need to be checked during commissioning and maintenance. For this, check the CO<sub>2</sub> or O<sub>2</sub> content. For a description of the electronic combustion controller functions, see page 143.

## Further details regarding the individual steps (cont.)

### Note

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

### CO<sub>2</sub> or O<sub>2</sub> content

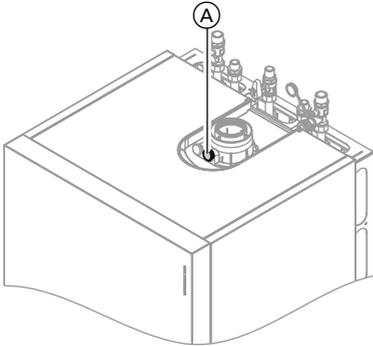
- The CO<sub>2</sub> content must be within the following limits (upper and lower output):
  - 7.7 to 9.2 % for natural gas H
  - 9.3 to 10.9 % for LPG P
- For all gas types, the O<sub>2</sub> content must be between 4.4 and 6.9 %.

If the actual CO<sub>2</sub> or O<sub>2</sub> values lie outside their respective ranges, proceed with the following steps:

- Checking the balanced flue system for tightness, see page 34.
- Checking the ionisation electrode and connecting cable, see page 37.

### Note

During commissioning, the combustion controller carries out an automatic calibration. Only test the emissions approx. 30s after the burner has started.



1. Connect a flue gas analyser at flue gas aperture (A) on the boiler flue connection.
2. Open the gas shut-off valve, start the boiler and create a heat demand.
3. Select the lower output (see page 48).
4. Check the CO<sub>2</sub> content. Should the actual value deviate from the above ranges by more than 1 %, implement steps from page 46.
5. Enter actual values into the service report.
6. Select the upper output (see page 48).
7. Check the CO<sub>2</sub> content. Should the actual value deviate from the above ranges by more than 1 %, implement steps from page 46.
8. After testing, press **OK**.
9. Enter actual values into the service report.

## Further details regarding the individual steps (cont.)

### Selecting the upper/lower output for weather-compensated control units:

1. Press **OK** and  simultaneously for approx. 4 s.
2. **"Actuator test"**
3. Select the lower output:  
Select **"Base load" "ON"** and confirm with **OK**.
4. Select the upper output:  
Select **"Full load" "ON"** and confirm with **OK**.
2. Select  **"☐"** and confirm with **OK**.  
The display shows **"I"** and **"on"** flashes.
3. Select the lower output:  
Press **OK**, **"on"** will be displayed permanently.
4. Select the upper output:  
Press .
5. Select **"2"** with  and confirm with **OK**.
6. Exit output selection with .

### Selecting the upper/lower output for constant temperature control units:

1. Press **OK** and  simultaneously for approx. 4 s.  
**"☐"** flashes on the display.

## Matching the control unit to the heating system

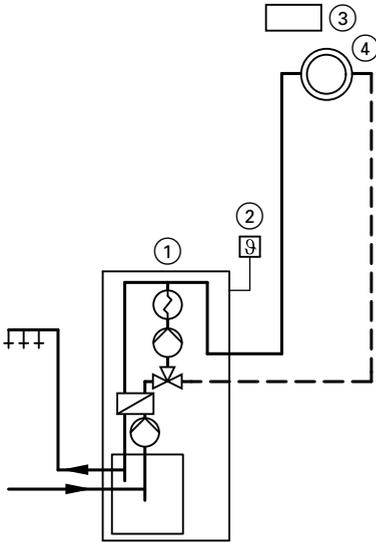
Subject to the equipment level, the control unit must be matched to the system. Various system components are recognised automatically by the control unit and the relevant codes are adjusted automatically.

- For the selection of an appropriate scheme, see the following diagrams.
- For coding steps, see page 64.

**Further details regarding the individual steps (cont.)**

**System version 1**

**One heating circuit without mixer A1**



- ① Vitodens 222-F
- ② Outside temperature sensor (only for weather-compensated control units)

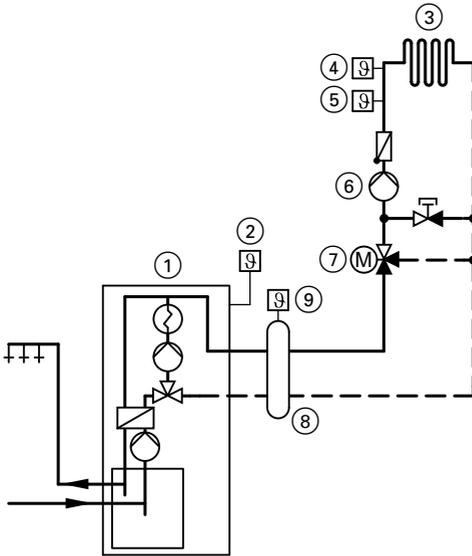
- ③ Vitotrol 100 (only for constant temperature control units)
- ④ Heating circuit without mixer A1 (heating circuit 1)

Function/system components	Code	
	Adjust	Delivered condition
Operation with LPG	82:1	82:0
System <b>with</b> DHW circulation pump: DHW circulation pump connection at extension AM1, terminal A2	—	34:0

**Further details regarding the individual steps (cont.)**

**System version 2**

**One heating circuit with mixer M2 and a low loss header**



- ① Vitodens 222-F
- ② Outside temperature sensor
- ③ Heating circuit with mixer M2 (heating circuit 2)
- ④ Temperature limiter for limiting the maximum temperature of underfloor heating systems
- ⑤ Flow temperature sensor M2
- ⑥ Heating circuit pump M2
- ⑦ Extension kit for one heating circuit with mixer M2
- ⑧ Low loss header
- ⑨ Flow temperature sensor, low loss header

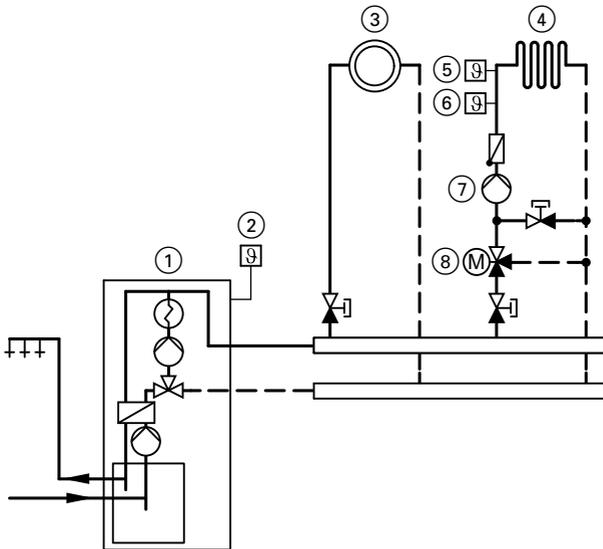
Function/system components	Code	
	Adjust	Delivered condition
Operation with LPG	82:1	82:0
System <b>only</b> with one heating circuit with mixer with extension kit for mixer (without unregulated heating circuit) with DHW heating	00:4	00:6
System <b>with</b> DHW circulation pump:		

**Further details regarding the individual steps (cont.)**

Function/system components	Code	
	Adjust	Delivered condition
DHW circulation pump connection at extension AM1, terminal A2	—	34:0
System <b>with</b> low loss header	04:0	04:1

**System version 3**

**One heating circuit without mixer A1 and one heating circuit with mixer M2**



- ① Vitodens 222-F
- ② Outside temperature sensor
- ③ Heating circuit without mixer A1 (heating circuit 1)
- ④ Heating circuit with mixer M2 (heating circuit 2)
- ⑤ Temperature limiter for limiting the maximum temperature of underfloor heating systems
- ⑥ Flow temperature sensor M2
- ⑦ Heating circuit pump M2
- ⑧ Extension kit for one heating circuit with mixer M2

**Further details regarding the individual steps (cont.)**

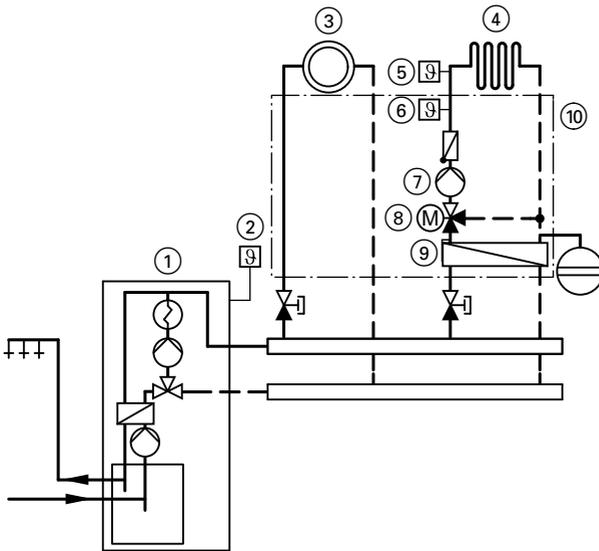
**Note**

The flow rate of the heating circuit without mixer must be at least 30 % greater than the flow rate of the heating circuit with mixer.

Function/system components	Code	
	Adjust	Delivered condition
Operation with LPG	82:1	82:0
System <b>only</b> with one heating circuit with mixer with extension kit for mixer (without unregulated heating circuit) with DHW heating	00:4	00:6
System <b>with</b> DHW circulation pump: DHW circulation pump connection at extension AM1, terminal A2	—	34:0

**System version 4**

**One heating circuit without mixer A1, one heating circuit with mixer M2 and system separation**



① Vitodens 222-F

② Outside temperature sensor

### Further details regarding the individual steps (cont.)

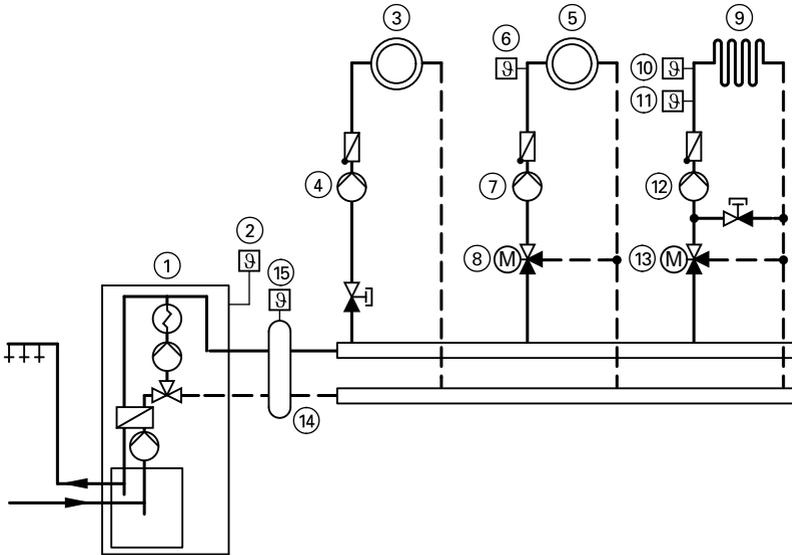
- ③ Heating circuit without mixer A1 (heating circuit 1)
- ④ Heating circuit with mixer M2 (heating circuit 2)
- ⑤ Temperature limiter for limiting the maximum temperature of underfloor heating systems
- ⑥ Flow temperature sensor M2
- ⑦ Heating circuit pump M2
- ⑧ Extension kit for one heating circuit with mixer M2
- ⑨ Heat exchanger for system separation
- ⑩ Assembly kit with mixer (accessory)

Function/system components	Code	
	Adjust	Delivered condition
Operation with LPG	82:1	82:0
System <b>only</b> with one heating circuit with mixer with extension kit for mixer (without unregulated heating circuit) with DHW heating	00:4	00:6
System <b>with</b> DHW circulation pump: DHW circulation pump connection at extension AM1, terminal A2	—	34:0

**Further details regarding the individual steps** (cont.)

**System version 5**

**One heating circuit without mixer, one heating circuit with mixer M2 (with extension kit), one heating circuit with mixer M3 (with extension kit) and low loss header (with/without DHW heating)**



- ① Vitodens 222-F
- ② Outside temperature sensor
- ③ Heating circuit without mixer A1 (heating circuit 1)
- ④ Heating circuit pump A1
- ⑤ Heating circuit with mixer M2 (heating circuit 2)
- ⑥ Flow temperature sensor M2
- ⑦ Heating circuit pump M2
- ⑧ Extension kit for one heating circuit with mixer M2
- ⑨ Heating circuit with mixer M3 (heating circuit 3)
- ⑩ Temperature limiter for limiting the maximum temperature of underfloor heating systems
- ⑪ Flow temperature sensor M3
- ⑫ Heating circuit pump M3
- ⑬ Extension kit for one heating circuit with mixer M3
- ⑭ Low loss header
- ⑮ Flow temperature sensor, low loss header

## Further details regarding the individual steps (cont.)

Function/system components	Code	
	Adjust	Delivered condition
Operation with LPG	82:1	82:0
System <b>only</b> with two heating circuits with mixer with extension kit for mixer (without unregulated heating circuit) with DHW heating	00:8	00:10
Heating circuit pump A1 connection at extension AM1, terminal A1	—	33:1
DHW circulation pump connection at extension AM1, terminal A2	—	34:0
System <b>with</b> low loss header	04:0	04:1

### Adjusting the heating curves (only for weather-compensated control units)

The heating curves illustrate the relationship between the outside temperature and the boiler water or flow temperature.

To put it simply, the lower the outside temperature, the higher the boiler water or flow temperature.

The room temperature, again, depends on the boiler water or the flow temperature.

#### Note

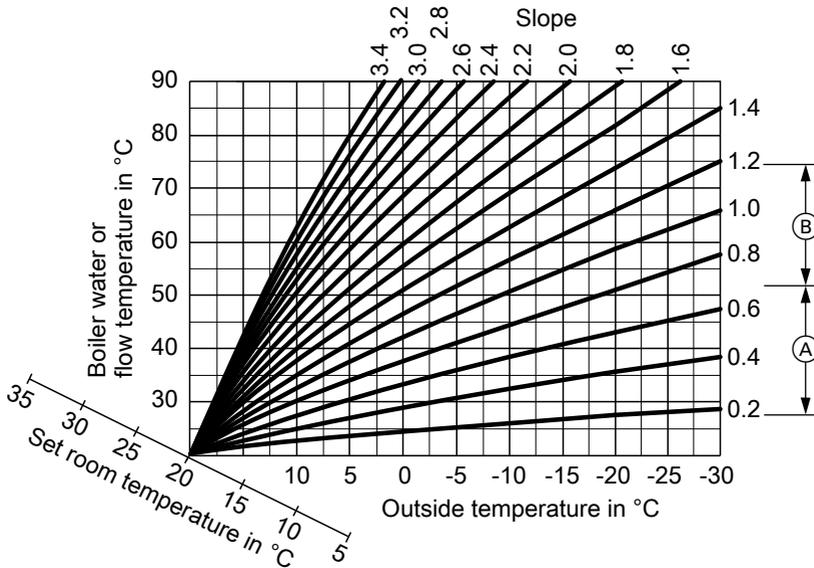
*If the heating system includes heating circuits with mixers, then the flow temperature of the heating circuit without mixer is higher by a selected differential (8 K in the delivered condition) than the flow temperature of the heating circuits with mixers.*

*The differential temperature can be changed at coding address 9F.*

Settings in the delivered condition:

- Slope = 1.4
- Level = 0

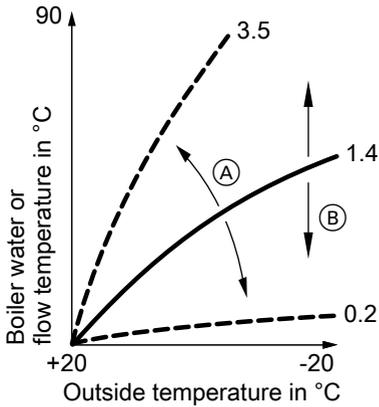
**Further details regarding the individual steps (cont.)**



- (A) Heating curve slope for underfloor heating systems
- (B) Heating curve slope for low temperature heating systems (according to the Energy Savings Order [Germany])

## Further details regarding the individual steps (cont.)

### Changing the slope and level



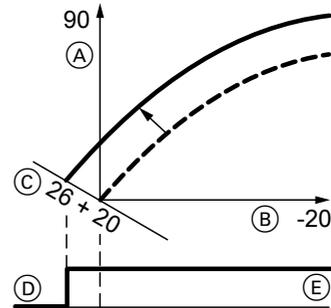
- Ⓐ Changing the slope
- Ⓑ Changing the level (vertical parallel offset of the heating curve)

### Extended menu:

- 1.
2. "Heating"
3. Select heating circuit.
4. "Heating curve"
5. "Slope" or "Level"
6. Select heating curve according to the system requirements.

### Adjusting the set room temperature

#### Standard room temperature



Example 1: Adjustment of the standard room temperature from 20 to 26°C

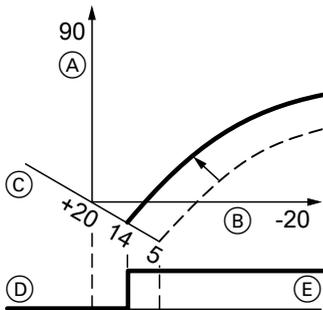
- Ⓐ Boiler water temperature or flow temperature in °C
- Ⓑ Outside temperature in °C
- Ⓒ Set room temperature in °C
- Ⓓ Heating circuit pump "OFF"
- Ⓔ Heating circuit pump "ON"

#### Adjustment of the standard room temperature:

Operating instructions

## Further details regarding the individual steps (cont.)

### Reduced room temperature



- (C) Set room temperature in °C
- (D) Heating circuit pump "OFF"
- (E) Heating circuit pump "ON"

### Adjustment of the reduced room temperature:



Operating instructions

Example 2: Adjustment of reduced room temperature from 5 °C to 14 °C

- (A) Boiler water temperature or flow temperature in °C
- (B) Outside temperature in °C

## Connecting the control unit to the LON system (only for weather-compensated control units)

The LON communication module (accessories) must be plugged in.



Installation instructions  
LON communication module

### Note

*In the same LON system, the same number **cannot** be allocated twice.*

**Only one Vitotronic** may be programmed as fault manager.

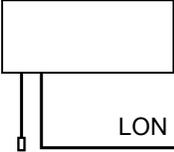
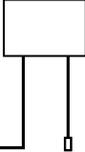
### Note

*The data transfer via LON can take several minutes.*

### Single boiler system with Vitotronic 200-H and Vitocom 300 (example)

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

## Further details regarding the individual steps (cont.)

Boiler control unit	Vitotronic 200-H	Vitotronic 200-H	Vitocom
			
Subscriber no. 1 Code "77:1"	Subscriber no. 10 Code "77:10"	Subscriber no. 11 <b>Set</b> code "77:11"	Subscriber no. 99
Control unit is fault manager Code "79:1"	Control unit is not fault manager Code "79:0"	Control unit is not fault manager Code "79:0"	Device is fault manager
Control unit transmits the time Code "7b:1"	The control unit receives the time <b>Set</b> code "81:3"	The control unit receives the time <b>Set</b> code "81:3"	Device receives the time
Control unit transmits outside temperature <b>Set</b> code "97:2"	The control unit receives the outside temperature <b>Set</b> code "97:1"	The control unit receives the outside temperature <b>Set</b> code "97:1"	—
LON subscriber fault monitoring Code "9C:20"	LON subscriber fault monitoring Code "9C:20"	LON subscriber fault monitoring Code "9C:20"	—

### Carrying out a LON subscriber check

Communication with the system devices connected to the fault manager is tested with a subscriber check.

Preconditions:

- The control unit must be programmed as **fault manager** (code "79:1")
- The LON subscriber number must be programmed in all control units (see page 59)
- The LON subscriber list in the fault manager must be up to date (see page 59)

### 2. "Service functions"

### 3. "Subscriber check"

### Carrying out a subscriber check:

1. Press **OK** and  simultaneously for approx. 4 s.

## Further details regarding the individual steps (cont.)

4. Select subscriber (e.g. subscriber 10).  
The subscriber check for the selected subscriber is introduced.
- Successfully tested subscribers are designated with **"OK"**.
  - Unsuccessfully tested subscribers are designated with **"Not OK"**.

### Note

To carry out a new subscriber check, create a new subscriber list with menu item **"Delete list?"**

### Note

If the subscriber check is carried out by another control unit, the subscriber number and **"Wink"** are shown on the display for approx. 1 min.

## Scanning and resetting the "Service" display

After the limits specified in coding addresses "21" and "23" have been reached, the red fault indicator flashes and the following appears on the programming unit display:

- On a constant temperature control unit:  
The specified hours run or the specified interval with clock symbol "⌚" (subject to setting) and "🔧"
- On a weather-compensated control unit:  
"Service" and "🔧"

### Scanning and resetting service

Press **OK** to acknowledge a service message.

### Note

An acknowledged service message that was not reset reappears:

- On a weather-compensated control unit, on the following Monday.
- On a constant temperature control unit, after seven days.

### After a service has been carried out (reset service)

#### Weather-compensated control unit

1. Press **OK** and  simultaneously for approx. 4 s.
2. **"Service functions"**
3. **"Service reset"**

### Note

The selected service parameters for hours run and time interval restart at 0.

## Further details regarding the individual steps (cont.)

### Constant temperature control unit

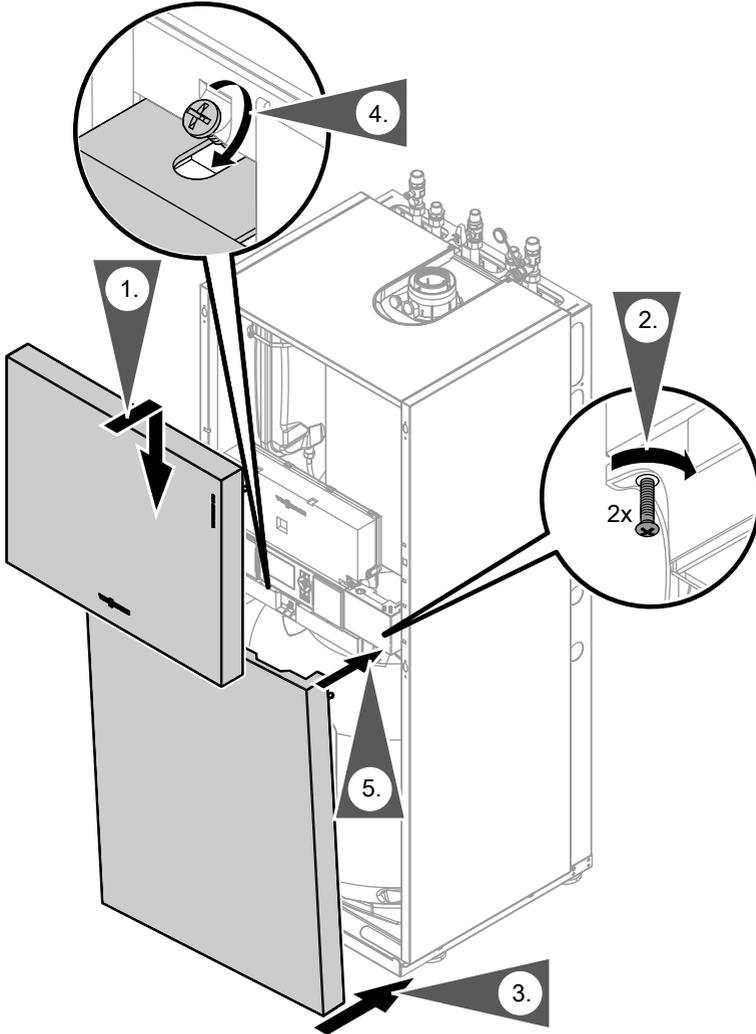
Reset code 24:1 to 24:0.

**Note**

*The selected service parameters for hours run and time interval restart at 0.*

**Further details regarding the individual steps (cont.)**

**Fitting the front panels**



## Further details regarding the individual steps (cont.)

### Instructing the system user

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

## Calling up coding level 1

### Note

- On weather-compensated control units, codes are displayed as plain text.
- Codes that have no function due to the heating system equipment level or the setting of other codes are not displayed.
- Heating systems with one heating circuit without mixer and one or two heating circuits with mixer:  
The heating circuit without a mixer is designated "**Heating circuit 1**" and the heating circuits with mixer as "**Heating circuit 2**" or "**Heating circuit 3**".  
If the heating circuits were given individual designations, the selected designation and "**HC1**", "**HC2**" or "**HC3**" appear instead.

### Weather-compensated control unit:

1. Press **OK** and  simultaneously for approx. 4 s.
2. "**Coding level 1**"
3. Select group of required coding address:
  - "**General**"
  - "**Boiler**"
  - "**DHW**"
  - "**Heating circuit 1/2/3**"
  - "**All cod. or solar**"

In this group, all coding addresses are displayed in ascending order.
4. Select coding address.
5. Select value according to the following tables and confirm with **OK**.

6. If you want to reset all codes to their delivered condition:  
Select "**Standard setting**" in "**Coding level 1**".

### Note

This also resets codes from coding level 2.

### Constant temperature control unit:

1. Press **OK** and  simultaneously for approx. 4 s.
2. With , select "**1**" for coding level 1 and confirm with **OK**.  
"1" flashes on the display for the coding addresses in group 1.
3. Select group of the required coding address with /. For example, "1" for group "General" (see following section):  
Confirm selected group with **OK**.
4. Select coding address with /.
5. Select value according to the following tables with / and confirm with **OK**.
6. If you want to reset all codes to their delivered condition:  
Select  "**7**" and confirm with **OK**.  
When "**\***" flashes, confirm with **OK**.

### Note

This also resets codes from coding level 2.

## General/Group "1"

Select **"General"** for weather-compensated control units (see page 64).  
Select **"1"** for constant temperature control units (see page 64).

### Coding

Coding in the delivered condition		Possible change	
<b>System design</b>			
00:2	System version 1: One heating circuit without mixer (A1), with DHW heating	00:2 to 00:10	For system schemes, see the following table:

Value address 00: ...	System version	Description
2	1	One heating circuit without mixer (heating circuit 1), with DHW heating (code is adjusted automatically)
4	2	One heating circuit with mixer (heating circuit 2), with DHW heating
6	3, 4	One heating circuit without mixer (heating circuit 1) and one heating circuit with mixer (heating circuit 2), with DHW heating (code is adjusted automatically)
8	5	One heating circuit with mixer (heating circuit 2) and one heating circuit with mixer (heating circuit 3), with DHW heating
10	5	One heating circuit without mixer (heating circuit 1), one heating circuit with mixer (heating circuit 2) and one heating circuit with mixer (heating circuit 3), with DHW heating (code is adjusted automatically)

## General/Group "1" (cont.)

Coding in the delivered condition		Possible change	
<b>Internal circulation pump function</b>			
51:0	Internal circulation pump always starts when there is a heat demand	51:1	System with low loss header: When there is a heat demand, the internal circulation pump only starts when the burner is operational (with pump run-on).
		51:2	System with heating water buffer cylinder: When there is a heat demand, the internal circulation pump only starts when the burner is operational (with pump run-on).
<b>Subscriber no.</b>			
77:1	LON subscriber number (only for weather-compensated control units)	77:2 to 77:99	LON subscriber number, adjustable from 1 to 99: 1 - 4 = Boiler 5 = Cascade 10 - 98 = Vitotronic 200-H 99 = Vitocom  <b>Note</b> <i>Allocate each number <b>only once</b>.</i>
<b>Detached house/apartment building</b>			
7F:1	Detached house (only for weather-compensated control units)	7F:0	Apartment building Separate adjustment of holiday program and time program for DHW heating, as option
<b>Lock out controls</b>			
8F:0	All control elements active	8F:1	All control elements locked out
		8F:2	Only standard settings can be controlled

## General/Group "1" (cont.)

Coding in the delivered condition		Possible change	
<b>Set flow temperature for ext. demand</b>			
9b:70	Set flow temperature for external demand 70 °C	9b:0 to 9b:127	Set flow temperature for external demand adjustable from 0 to 127 °C (limited by boiler-specific parameters)

## Boiler/Group "2"

Select **"Boiler"** for weather-compensated control units (see page 64).  
Select **"2"** for constant temperature control units (see page 64).

## Coding

Coding in the delivered condition		Possible change	
<b>Single/multi-boiler system</b>			
01:1	Do not adjust (only for constant temperature control units)		
<b>Burner service in 100 hours</b>			
21:0	No service interval (hours run) selected	21:1 to 21:100	The number of hours run before the burner should be serviced is adjustable from 100 to 10,000 h One adjusting step $\hat{=}$ 100 h
<b>Service interval in months</b>			
23:0	No time interval for burner service	23:1 to 23:24	Interval adjustable from 1 to 24 months
<b>Service status</b>			
24:0	No <b>"Service"</b> display	24:1	<b>"Service"</b> display (the address is automatically set and must be manually reset after a service has been carried out)
<b>Filling/Venting</b>			
2F:0	Venting program/ fill program disabled	2F:1	Venting program enabled
		2F:2	Fill program enabled

## DHW/Group "3"

Select **"DHW"** for weather-compensated control units (see page 64).  
Select **"3"** for constant temperature control units (see page 64).

### Coding

Coding in the delivered condition		Possible change	
<b>Enable DHW circulation pump</b>			
73:0	DHW circulation pump: "ON" in accordance with the time program (only for weather-compensated control units)	73:1 to	"ON" from once per hour for 5 min up to 6 times per hour for 5 min during the time program
		73:6	
		73:7	Constantly "ON"

## Heating circuit 1, heating circuit 2, heating circuit 3/Group "5"

Select **"Heating circuit ..."** for weather-compensated control units (see page 64).  
Select **"5"** for constant temperature control units (see page 64).

### Coding

Coding in the delivered condition		Possible change	
<b>Summer eco function outside temperature</b>			
A5:5	With heating circuit pump logic function (economy circuit): Heating circuit pump "OFF" when the outside temperature (AT) is 1 K higher than the set room temperature ( $RT_{set}$ ) $AT > RT_{set} + 1$ K (only for weather-compensated control units)	A5:0	Without heating circuit pump logic function
		A5:1 to A5:15	With heating circuit pump logic function: Heating cir- cuit pump "OFF" (see the following table)

Parameter address	With heating circuit pump logic function: Heating circuit pump "OFF"
<b>A5:...</b>	
1	$AT > RT_{set} + 5$ K
2	$AT > RT_{set} + 4$ K
3	$AT > RT_{set} + 3$ K
4	$AT > RT_{set} + 2$ K

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

Parameter address A5:...	With heating circuit pump logic function: Heating circuit pump "OFF"
5	$AT > RT_{\text{set}} + 1 \text{ K}$
6	$AT > RT_{\text{set}}$
7	$AT > RT_{\text{set}} - 1 \text{ K}$
to	
15	$AT > RT_{\text{set}} - 9 \text{ K}$

Coding in the delivered condition	Possible change
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### Summer eco function absolute

A6:36	Extended economy function <b>disabled</b> (only for weather-compensated control units)	A6:5 to A6:35	Extended economy control enabled, i.e. the burner and heating circuit pump will stop and the mixer close at a variable value, adjustable between 5 and 35 °C plus 1 °C. Base value is the adjusted outside temperature. This value is based on the actual outside temperature and a time constant that takes the cooling down of an average building into consideration.
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### Mixer eco function

A7:0	Without mixer economy function (only for a weather-compensated control unit and heating circuit with mixer)	A7:1	With mixer economy function (extended heating circuit pump logic): Heating circuit pump also "OFF": <ul style="list-style-type: none"> <li>■ If a mixer has been closed for longer than 20 min.</li> </ul> Heating pump "ON": <ul style="list-style-type: none"> <li>■ If the mixer changes to control function</li> <li>■ If there is a risk of frost</li> </ul>
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## Heating circuit 1, heating circuit 2, heating... (cont.)

Coding in the delivered condition		Possible change	
<b>Pump idle time, transition red. mode</b>			
A9:7	With pump idle time: Heating circuit pump "OFF" if the set value changes through a change in operating mode or through a change in the set room temperature (only for weather-compensated control units)	A9:0 A9:1 to A9:15	Without pump idle time  With pump idle time; adjustable from 1 to 15

### Weather-compensated/room temperature hook-up

b0:0	With remote control: Heating mode/reduced mode: Weather-compensated (only for weather-compensated control units; change the code only for the heating circuit with mixer)	b0:1	Heating mode: Weather-compensated Reduced mode: With room temperature hook-up
		b0:2	Heating mode: With room temperature hook-up Reduced mode: Weather-compensated
		b0:3	Heating mode/reduced mode: With room temperature hook-up

### Summer eco function room temperature

b5:0	With remote control: No room temperature-dependent heating circuit pump logic function (only for weather-compensated control units; change the code only for the heating circuit with mixer)	b5:1 to b5:8	Heating circuit pump logic function, see the following table:
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Parameter address b5:...	With heating circuit pump logic function:	
	Heating circuit pump "OFF"	Heating circuit pump "ON"
1	$RT_{\text{actual}} > RT_{\text{set}} + 5 \text{ K}$	$RT_{\text{actual}} < RT_{\text{set}} + 4 \text{ K}$
2	$RT_{\text{actual}} > RT_{\text{set}} + 4 \text{ K}$	$RT_{\text{actual}} < RT_{\text{set}} + 3 \text{ K}$
3	$RT_{\text{actual}} > RT_{\text{set}} + 3 \text{ K}$	$RT_{\text{actual}} < RT_{\text{set}} + 2 \text{ K}$
4	$RT_{\text{actual}} > RT_{\text{set}} + 2 \text{ K}$	$RT_{\text{actual}} < RT_{\text{set}} + 1 \text{ K}$
5	$RT_{\text{actual}} > RT_{\text{set}} + 1 \text{ K}$	$RT_{\text{actual}} < RT_{\text{set}}$

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

Parameter address b5:...	With heating circuit pump logic function:	
	Heating circuit pump "OFF"	Heating circuit pump "ON"
6	$RT_{\text{actual}} > RT_{\text{set}}$	$RT_{\text{actual}} < RT_{\text{set}} - 1 \text{ K}$
7	$RT_{\text{actual}} > RT_{\text{set}} - 1 \text{ K}$	$RT_{\text{actual}} < RT_{\text{set}} - 2 \text{ K}$
8	$RT_{\text{actual}} > RT_{\text{set}} - 2 \text{ K}$	$RT_{\text{actual}} < RT_{\text{set}} - 3 \text{ K}$

Coding in the delivered condition		Possible change	
<b>Flow temperature minimum limit</b>			
C5:20	Electronic minimum flow temperature limit 20 °C (only for weather-compensated control units)	C5:1 to C5:127	Minimum limit adjustable from 1 to 127 °C (limited by boiler-specific parameters)
<b>Flow temperature maximum limit</b>			
C6:74	Electronic maximum flow temperature limit 74 °C (only for weather-compensated control units)	C6:10 to C6:127	Maximum limit adjustable from 10 to 127 °C (limited by boiler-specific parameters)
<b>Heating program - changeover</b>			
d5:0	The external heating program changeover changes the heating program to "Constant operation with reduced room temperature" or "Standby mode" (only for weather-compensated control units)	d5:1	The external heating program changeover changes to "Constant operation with standard room temperature" (independent of coding address 3A, 3b and 3C)
<b>Ext. heating program changeover to heating circuit</b>			
d8:0	No heating program changeover via extension EA1	d8:1	Heating program changeover via input DE1 at extension EA1
		d8:2	Heating program changeover via input DE2 at extension EA1
		d8:3	Heating program changeover via input DE3 at extension EA1

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

Coding in the delivered condition		Possible change	
<b>Screed function</b>			
F1:0	Screed drying function disabled (only for weather-compensated control units)	F1:1 to F1:6	Screed drying function adjustable in accordance with 6 optional temperature/time profiles (see page 137)
		F1:15	Constant flow temperature 20 °C
<b>Party mode time limit</b>			
F2:8	Time limit for party mode or external heating program changeover via key: 8 h (only for weather-compensated control units)* <sup>1</sup>	F2:0	No time limit for party mode* <sup>1</sup>
		F2:1 to F2:12	Time limit adjustable from 1 to 12h* <sup>1</sup>
<b>Pump control in "Only DHW"</b>			
F6:25	In the "Only DHW" operating mode, the internal circulation pump is permanently ON (only for constant temperature control units)	F6:0	In the "Only DHW" operating mode, the internal circulation pump is permanently OFF
		F6:1 to F6:24	In the "DHW only" operating mode, the internal circulation pump will be started for 10 min respectively 1 to 24 times per day.
<b>Pump control in "Standby mode"</b>			
F7:25	In "Standby mode", the internal circulation pump is permanently ON (only for constant temperature control units)	F7:0	In "Standby mode", the internal circulation pump is permanently OFF
		F7:1 to F7:24	In "Standby mode", the internal circulation pump in operating mode will be started for 10 min respectively 1 to 24 times per day.

\*<sup>1</sup> Party mode ends **automatically** in the "Heating and DHW" program, when the system changes over to operation with standard room temperature.

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

Coding in the delivered condition		Possible change	
<b>Start temperature raising</b>			
F8:-5	Temperature limit for terminating the reduced mode -5 °C, see example on page 140. Observe the setting of coding address "A3" (only for weather-compensated control units)	F8:+10 to F8:-60	Temperature limit adjustable from +10 to -60 °C
		F8:-61	Function disabled
<b>End temperature raising</b>			
F9:-14	Temperature limit for raising the reduced set room temp. -14 °C, see example on page 140 (only for weather-compensated control units)	F9:+10 to F9:-60	Temperature limit for raising the set room temperature to the value selected for standard mode adjustable from +10 to -60 °C
<b>Increase set flow temperature</b>			
FA:20	Raising the set boiler water temperature or the set flow temperature when changing from operation with reduced room temperature to operation with standard room temperature, by 20 %. See example on page 141 (only for weather-compensated control units)	FA:0 to FA:50	Temperature rise adjustable from 0 to 50 %
<b>Duration set flow temperature increase</b>			
Fb:30	Duration for raising the set boiler water temperature or the set flow temperature (see coding address "FA") 60 min. See example on page 141 (only for weather-compensated control units)	Fb:0 to Fb:150	Duration adjustable from 0 to 300 min; one step $\triangleq$ 2 min

## Calling up coding level 2

### Note

- In coding level 2, all codes are accessible, including the codes from coding level 1.
- Codes that have no function due to the heating system equipment level or the setting of other codes are not displayed.
- Heating systems with one heating circuit without mixer and one or two heating circuits with mixer:  
The heating circuit without a mixer is designated "**Heating circuit 1**" and the heating circuits with mixer as "**Heating circuit 2**" or "**Heating circuit 3**".  
If the heating circuits were given individual designations, the selected designation and "**HC1**", "**HC2**" or "**HC3**" appear instead.

### Weather-compensated control unit:

1. Press **OK** and  simultaneously for approx. 4 s.
2. Press **OK** and  simultaneously for approx. 4 s.
3. "**Coding level 2**"
4. Select group of required coding address:
  - "**General**"
  - "**Boiler**"
  - "**DHW**"
  - "**Heating circuit 1/2/3**"
  - "**All cod. or solar**"

In this group, all coding addresses are displayed in ascending order.
5. Select coding address.
6. Select value according to the following tables and confirm with "**OK**".
7. **If you want to reset all codes to their delivered condition:**  
Select "**Standard setting**" in "**Coding level 2**".

### Note

This also resets codes from coding level 1.

### Constant temperature control unit:

1. Press **OK** and  simultaneously for approx. 4 s.
2. Press **OK** and  simultaneously for approx. 4 s.
3. With , select "**2**" for coding level 2 and confirm with **OK**.  
"1" flashes on the display for the coding addresses in group 1.
4. Select group of the required coding address with /. For example, "1" for group "General" (see following section):  
Confirm selected group with **OK**.
5. Select coding address with /.
6. Select value according to the following tables with / and confirm with **OK**.

## Calling up coding level 2 (cont.)

7. If you want to reset all codes to their delivered condition:  
 Select ▶ "⑦" and confirm with **OK**.  
 When "H" flashes, confirm with **OK**.

### Note

*This also resets codes from coding level 1.*

## General/Group "1"

Select **"General"** for weather-compensated control units (see page 74).  
 Select **"1"** for constant temperature control units (see page 74).

## Coding

Coding in the delivered condition		Possible change	
00:2	System version 1: One heating circuit without mixer (A1), with DHW heating	00:2 to 00:10	For system schemes, see the following table:

Value address 00: ...	System version	Description
2	1	One heating circuit without mixer (heating circuit 1), with DHW heating (code is adjusted automatically)
4	2	One heating circuit with mixer (heating circuit 2), with DHW heating
6	3, 4	One heating circuit without mixer (heating circuit 1) and one heating circuit with mixer (heating circuit 2), with DHW heating (code is adjusted automatically)
8	5	One heating circuit with mixer (heating circuit 2) and one heating circuit with mixer (heating circuit 3), with DHW heating
10	5	One heating circuit without mixer (heating circuit 1), one heating circuit with mixer (heating circuit 2) and one heating circuit with mixer (heating circuit 3), with DHW heating (code is adjusted automatically)

## General/Group "1" (cont.)

Coding in the delivered condition		Possible change	
11:#9	No access to the coding addresses for the combustion controller parameters	11:9	Access open to the coding addresses for the combustion controller parameters
25:0	Without outside temperature sensor (for constant temperature control units)	25:1	With outside temperature sensor (automatic recognition)
32:0	Without extension AM1	32:1	With extension AM1 (automatic recognition)
33:1	Function output A1: Heating circuit pump	33:0	Function output A1 at extension AM1: DHW circulation pump
		33:2	Function output A1: Circulation pump for cylinder heating
34:0	Function output A2 at extension AM1: DHW circulation pump	34:1	Function output A2: Heating circuit pump
		34:2	Function output A2: Circulation pump for cylinder heating
35:0	Without extension EA1	35:1	With extension EA1 (automatic recognition)
36:0	Function output <span style="border: 1px solid black; padding: 0 2px;">157</span> at extension EA1: Fault message	36:1	Function output <span style="border: 1px solid black; padding: 0 2px;">157</span> : Feed pump
		36:2	Function output <span style="border: 1px solid black; padding: 0 2px;">157</span> : DHW circulation pump

## General/Group "1" (cont.)

Coding in the delivered condition		Possible change	
3A:0	Function input DE1 at extension EA1: No function	3A:1	Function input DE1: Heating program changeover
		3A:2	Function input DE1: External demand with set flow temperature. Function internal circulation pump: Coding address 3F
		3A:3	Function input DE1: External blocking. Function internal circulation pump: Coding address 3E
		3A:4	Function input DE1: External blocking with fault message input Function internal circulation pump: Coding address 3E
		3A:5	Function input DE1: Fault message input
		3A:6	Function input DE1: Brief operation, DHW circulation pump (pushbutton function). DHW circulation pump runtime adjustment: Coding address 3d

**General/Group "1"** (cont.)

<b>Coding in the delivered condition</b>		<b>Possible change</b>	
3b:0	Function input DE2 at extension EA1: No function	3b:1	Function input DE2: Heating program changeover
		3b:2	Function input DE2: External demand with set flow temperature. Function internal circulation pump: Coding address 3F
		3b:3	Function input DE2: External blocking. Function internal circulation pump: Coding address 3E
		3b:4	Function input DE2: External blocking with fault message input Function internal circulation pump: Coding address 3E
		3b:5	Function input DE2: Fault message input
		3b:6	Function input DE2: Brief operation, DHW circulation pump (pushbutton function). DHW circulation pump runtime adjustment: Coding address 3d

## General/Group "1" (cont.)

Coding in the delivered condition		Possible change	
3C:0	Function input DE3 at extension EA1: No function	3C:1	Function input DE3: Heating program changeover
		3C:2	Function input DE3: External demand with set flow temperature. Function internal circulation pump: Coding address 3F
		3C:3	Function input DE3: External blocking. Function internal circulation pump: Coding address 3E
		3C:4	Function input DE3: External blocking with fault message input Function internal circulation pump: Coding address 3E
		3C:5	Function input DE3: Fault message input
		3C:6	Function input DE3: Brief operation, DHW circulation pump (pushbutton function). DHW circulation pump runtime adjustment: Coding address 3d
3d:5	DHW circulation pump runtime for brief operation: 5 min	3d:1 to 3d:60	DHW circulation pump runtime adjustable from 1 to 60 min
3E:0	Internal circulation pump stays in control mode at signal "External blocking"	3E:1	Internal circulation pump stops at signal "External blocking"
		3E:2	Internal circulation pump starts at signal "External blocking"

## General/Group "1" (cont.)

Coding in the delivered condition		Possible change	
3F:0	Internal circulation pump stays in control mode at signal "External demand"	3F:1	Internal circulation pump stops at signal "External demand"
		3F:2	Internal circulation pump starts at signal "External demand"
51:0	Internal circulation pump always starts when there is a heat demand	51:1	System with low loss header: When there is a heat demand, the internal circulation pump only starts when the burner is operational (with pump run-on).
		51:2	System with heating water buffer cylinder: When there is a heat demand, the internal circulation pump only starts when the burner is operational (with pump run-on).
52:0	Without flow temperature sensor for low loss header	52:1	With flow temperature sensor for low loss header (automatic recognition)
54:0	Without solar thermal system		
6E:50	Do not adjust		
76:0	Without LON communication module (only for weather-compensated control units)	76:1	With LON communication module (automatic recognition)
77:1	LON subscriber number (only for weather-compensated control units)	77:2 to 77:99	LON subscriber number, adjustable from 1 to 99: 1 - 4 = Boiler 5 = Cascade 10 - 98 = Vitotronic 200-H 99 = Vitocom  <b>Note</b> <i>Allocate each number <b>only once</b>.</i>

## General/Group "1" (cont.)

Coding in the delivered condition		Possible change	
79:1	With LON communication module: Control unit is fault manager (only for weather-compensated control units)	79:0	Control unit is not fault manager
7b:1	With LON communication module: The control unit transmits the time (only for weather-compensated control units)	7b:0	Does not transmit time
7F:1	Detached house (only for weather-compensated control units)	7F:0	Apartment building Separate adjustment of holiday program and time program for DHW heating, as option
80:6	A fault message is displayed, providing a fault is active for at least 30 s	80:0	Immediate fault message
		80:2 to 80:199	The minimum fault duration before a fault message is issued is adjustable from 10 s to 995 s; one step $\triangleq$ 5 s
81:1	Automatic summer/winter time changeover	81:0	Manual summer/winter time changeover
		81:2	Use of the radio clock receiver (automatic recognition)
		81:3	With LON communication module: The control unit receives the time
82:0	Operation with natural gas	82:1	Operation with LPG (only adjustable if coding address 11:9 has been set)
86:0	Do not adjust		
87:0	Do not adjust		
88:0	Temperature displayed in °C (Celsius)	88:1	Temperature displayed in °F (Fahrenheit)
8A:175	Do not adjust		



**General/Group "1" (cont.)**

<b>Coding in the delivered condition</b>		<b>Possible change</b>	
8F:0	All control elements active	8F:1	All control elements locked out
		8F:2	Only standard settings can be controlled
90:128	Time constant for calculating the adjusted outside temperature 21.3 h	90:1 to 90:199	Fast (low values) or slow (high values) matching of the flow temperature, subject to the set value when the outside temperature changes; 1 step $\pm$ 10 min
94:0	Without Open Therm extension	94:1	With Open Therm extension (automatic recognition)
95:0	Without Vitocom 100 communication interface	95:1	With Vitocom 100 communication interface (automatic recognition)
97:0	With LON communication module: The outside temperature of the sensor connected to the control unit is utilised internally (only for weather-compensated control units)	97:1	The control unit receives the outside temperature
		97:2	The control unit transmits the outside temperature to the Vitotronic 200-H
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
99:0	Never adjust		
9A:0	Never adjust		
9b:70	Set flow temperature for external demand 70 °C	9b:0 to 9b:127	Set flow temperature for external demand adjustable from 0 to 127 °C (limited by boiler-specific parameters)

## General/Group "1" (cont.)

Coding in the delivered condition		Possible change	
9C:20	Monitoring LON subscribers. If a subscriber fails to respond, the values specified inside the control unit will be used after 20 min. Only then will a fault message be issued (only for weather-compensated control units)	9C:0 9C:5 to 9C:60	No monitoring The time is adjustable from 5 to 60 min
9F:8	Differential temperature 8 K; only in conjunction with the mixer circuit (only for weather-compensated control units)	9F:0 to 9F:40	Differential temperature adjustable from 0 to 40 K

## Boiler/Group "2"

Select **"Boiler"** for weather-compensated control units (see page 74).

Select **"2"** for constant temperature control units (see page 74).

## Coding

Coding in the delivered condition		Possible change	
01:1	Do not adjust		
04:1	Minimum burner pause subject to the boiler load (specified by boiler coding card)	04:0	Minimum burner pause set permanently (specified by boiler coding card)
06:...	Maximum limit of the boiler water temperature, specified in °C by the boiler coding card	06:20 to 06:127	Maximum limit of the boiler water temperature within the ranges specified by the boiler
0d:0	Do not adjust		
0E:0	Do not adjust		
13:1	Do not adjust		
14:1	Do not adjust		
15:1	Do not adjust		

**Boiler/Group "2"** (cont.)

Coding in the delivered condition		Possible change	
21:0	No service interval (hours run) selected	21:1 to 21:100	The number of hours run before the burner should be serviced is adjustable from 100 to 10,000 h One adjusting step $\hat{=}$ 100 h
23:0	No time interval for burner service	23:1 to 23:24	Interval adjustable from 1 to 24 months
24:0	No <b>"Service"</b> display	24:1	<b>"Service"</b> display (the address is automatically set and must be manually reset after a service has been carried out)
28:0	No burner interval ignition	28:1 to 28:24	Time interval adjustable from 1 to 24 h. The burner is force-started once every 30 s (only when operating with LPG)
2E:0	Never adjust		
2F:0	Venting program/fill program disabled	2F:1	Venting program enabled
		2F:2	Fill program enabled
38:0	Status burner control unit: Operational (no fault)	38:≠0	Status burner control unit: Fault

**DHW/Group "3"**

Select **"DHW"** for weather-compensated control units (see page 74).

Select **"3"** for constant temperature control units (see page 74).

## DHW/Group "3" (cont.)

### Coding

Coding in the delivered condition		Possible change	
56:0	Set DHW temperature adjustable from 10 to 60 °C	56:1	Set DHW temperature adjustable from 10 to above 60 °C  <b>Note</b> <i>Maximum value subject to boiler coding card. Observe the max. permissible DHW temperature.</i>
58:0	Without auxiliary function for DHW heating	58:10 to 58:60	Input of a second set DHW temperature, adjustable from 10 to 60 °C (observe coding addresses "56" and "63")
5E:0	Circulation pump for cylinder heating stays in control mode at signal "External blocking"	5E:1	Circulation pump for cylinder heating stops at signal "External blocking"
		5E:2	Circulation pump for cylinder heating starts at signal "External blocking"
5F:0	Circulation pump for cylinder heating stays in control mode at signal "External demand"	5F:1	Circulation pump for cylinder heating stops at signal "External demand"
		5F:2	Circulation pump for cylinder heating starts at signal "External demand"
63:0	Without auxiliary function for DHW heating (only for constant temperature control units)	63:1	Auxiliary function: 1 x daily
		63:2 to 63:14	Every 2 days to every 14 days
		63:15	2 x daily



**DHW/Group "3"** (cont.)

Coding in the delivered condition		Possible change	
65:...	Information regarding the type of diverter valve (not adjustable): 0: no diverter valve 1: Viessmann diverter valve 2: Wilo diverter valve 3: Grundfos diverter valve		
6F:...	Maximum output for DHW heating in %, specified by the boiler coding card	6F:0 to 6F:100	Max. output during DHW heating adjustable from min. output to 100 %
71:0	DHW circulation pump: "ON" in accordance with the time program (only for weather-compensated control units)	71:1	"OFF" during DHW heating to the first set value
		71:2	"ON" during DHW heating to the first set value
72:0	DHW circulation pump: "ON" in accordance with the time program (only for weather-compensated control units)	72:1	"OFF" during DHW heating to the second set value
		72:2	"ON" during DHW heating to the second set value
73:0	DHW circulation pump: "ON" in accordance with the time program (only for weather-compensated control units)	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
		73:7	Constantly "ON"

**Heating circuit 1, heating circuit 2, heating circuit 3/Group "5"**

Select "**Heating circuit ...**" for weather-compensated control units (see page 74).  
Select "**5**" for constant temperature control units (see page 74).

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

### Coding

Coding in the delivered condition		Possible change	
A0:0	Without remote control (only for weather-compensated control units)	A0:1	With Vitotrol 200A (automatic recognition)
		A0:2	With Vitotrol 300A or Vitohome 300 (automatic recognition)
A1:0	All settings that can be made at the remote control can be executed (only for constant temperature control units)	A1:1	Only party mode can be set at the remote control
A3:2	Outside temperature below 1 °C: Heating circuit pump "ON" Outside temperature above 3 °C: Heating circuit pump "OFF"	A3:-9 to A3:15	Heating circuit pump "ON/OFF" (see the following table)



#### Please note

If a value is selected below 1 °C, there is a risk of pipes outside the thermal envelope of the building freezing up.  
The standby mode, in particular, should be taken into consideration, e.g. during holidays.

Parameter Address A3:...	Heating circuit pump	
	"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	1 °C	3 °C
to	to	to
15	14 °C	16 °C

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

Coding in the delivered condition		Possible change	
A4:0	With frost protection (only for weather-compensated control units)	A4:1	No frost protection; this setting is only possible if code "A3: -9" has been selected.  <b>Note</b> <i>Observe the information regarding coding address "A3"</i>
A5:5	With heating circuit pump logic function (economy circuit): Heating circuit pump "OFF" when the outside temperature (AT) is 1 K higher than the set room temperature ( $RT_{set}$ ) $AT > RT_{set} + 1$ K (only for weather-compensated control units)	A5:0	Without heating circuit pump logic function
		A5:1 to A5:15	With heating circuit pump logic function: Heating circuit pump "OFF" (see the following table)

Parameter address A5:...	With heating circuit pump logic function: Heating circuit pump "OFF"
1	$AT > RT_{set} + 5$ K
2	$AT > RT_{set} + 4$ K
3	$AT > RT_{set} + 3$ K
4	$AT > RT_{set} + 2$ K
5	$AT > RT_{set} + 1$ K
6	$AT > RT_{set}$
7	$AT > RT_{set} - 1$ K
to 15	$AT > RT_{set} - 9$ K

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

Coding in the delivered condition		Possible change	
A6:36	Extended economy function <b>disabled</b> (only for weather-compensated control units)	A6:5 to A6:35	Extended economy control enabled, i.e. the burner and heating circuit pump will stop and the mixer close at a variable value, adjustable between 5 and 35 °C plus 1 °C. Base value is the adjusted outside temperature. This value is based on the actual outside temperature and a time constant that takes the cooling down of an average building into consideration.
A7:0	Without mixer economy function (only for a weather-compensated control unit and heating circuit with mixer)	A7:1	With mixer economy function (extended heating circuit pump logic): Heating circuit pump also "OFF": <ul style="list-style-type: none"> <li>■ If a mixer has been closed for longer than 20 min.</li> </ul> Heating pump "ON": <ul style="list-style-type: none"> <li>■ If the mixer changes to control function</li> <li>■ If there is a risk of frost</li> </ul>
A8:1	Heating circuit with mixer creates a demand for the internal circulation pump (only for weather-compensated control units)	A8:0	Heating circuit with mixer creates no demand for the internal circulation pump
A9:7	With pump idle time: Heating circuit pump "OFF" if the set value changes through a change in operating mode or through a change in the set room temperature (only for weather-compensated control units)	A9:0	Without pump idle time
		A9:1 to A9:15	With pump idle time; adjustable from 1 to 15



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

Coding in the delivered condition		Possible change	
b0:0	With remote control: Heating mode/reduced mode: Weather-compensated (only for weather-compensated control units; change the code only for the heating circuit with mixer)	b0:1	Heating mode: Weather-compensated Reduced mode: With room temperature hook-up
		b0:2	Heating mode: With room temperature hook-up Reduced mode: Weather-compensated
		b0:3	Heating mode/reduced mode: With room temperature hook-up
b2:8	With remote control and for the heating circuit, operation with room temperature hook-up must be programmed: Room influence factor 8 (only for weather-compensated control units; change the code only for the heating circuit with mixer)	b2:0	Without room influence
		b2:1 to b2:64	Room influence factor adjustable from 1 to 64
b5:0	With remote control: No room temperature-dependent heating circuit pump logic function (only for weather-compensated control units; change the code only for the heating circuit with mixer)	b5:1 to b5:8	Heating circuit pump logic function, see the following table:

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

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

Coding in the delivered condition		Possible change	
C5:20	Electronic minimum flow temperature limit 20 °C (only for weather-compensated control units)	C5:1 to C5:127	Minimum limit adjustable from 1 to 127 °C (limited by boiler-specific parameters)
C6:74	Electronic maximum flow temperature limit 74 °C (only for weather-compensated control units)	C6:10 to C6:127	Maximum limit adjustable from 10 to 127 °C (limited by boiler-specific parameters)
d3:14	Heating curve slope = 1.4	d3:2 to d3:35	Heating curve slope adjustable from 0.2 to 3.5 (see page 55)
d4:0	Heating curve level = 0	d4:-13 to d4:40	Heating curve level adjustable from -13 to 40 (see page 55)
d5:0	The external heating program changeover changes the heating program to "Constant operation with reduced room temperature" or "Standby mode" (only for weather-compensated control units)	d5:1	The external heating program changeover changes to "Constant operation with standard room temperature" (independent of coding address 3A, 3b and 3C)
d6:0	Heating circuit pump stays in control mode at signal "External blocking"	d6:1	Heating circuit pump stops at signal "External blocking" (subject to coding addresses 3A, 3b and 3C)
		d6:2	Heating circuit pump starts at signal "External blocking" (subject to coding addresses 3A, 3b and 3C)
d7:0	Heating circuit pump stays in control mode at signal "External demand"	d7:1	Heating circuit pump stops at signal "External demand" (subject to coding addresses 3A, 3b and 3C)
		d7:2	Heating circuit pump starts at signal "External blocking" (subject to coding addresses 3A, 3b and 3C)



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

Coding in the delivered condition		Possible change	
d8:0	No heating program changeover via extension EA1	d8:1	Heating program changeover via input DE1 at extension EA1
		d8:2	Heating program changeover via input DE2 at extension EA1
		d8:3	Heating program changeover via input DE3 at extension EA1
E1:1	Never adjust		
E2:50	With remote control: No display correction for the actual room temperature (only for weather-compensated control units)	E2:0 to E2:49	Display correction $-5$ K to Display correction $-0.1$ K
		E2:51 to E2:99	Display correction $+0.1$ K to Display correction $+4.9$ K
E5:0	Do not adjust		
F1:0	Screed drying function disabled (only for weather-compensated control units)	F1:1 to F1:6	Screed drying function adjustable in accordance with 6 optional temperature/time profiles (see page 137)
		F1:15	Constant flow temperature $20$ °C
F2:8	Time limit for party mode or external heating program changeover via key: 8 h (only for weather-compensated control units) <sup>*1</sup>	F2:0	No time limit for party mode <sup>*1</sup>
		F2:1 to F2:12	Time limit adjustable from 1 to 12h <sup>*1</sup>
F5:12	Run-on time of the internal circulation pump in heating mode: 12 min (only for constant temperature control units)	F5:0	No run-on time for the internal circulation pump
		F5:1 to F5:20	Run-on time of the internal circulation pump adjustable from 1 to 20 min

<sup>\*1</sup> Party mode ends **automatically** in the "Heating and DHW" program, when the system changes over to operation with standard room temperature.

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

Coding in the delivered condition		Possible change	
F6:25	In the "Only DHW" operating mode, the internal circulation pump is permanently ON (only for constant temperature control units)	F6:0	In the "Only DHW" operating mode, the internal circulation pump is permanently OFF
		F6:1 to F6:24	In the "DHW only" operating mode, the internal circulation pump will be started for 10 min respectively 1 to 24 times per day.
F7:25	In "Standby mode", the internal circulation pump is permanently ON (only for constant temperature control units)	F7:0	In "Standby mode", the internal circulation pump is permanently OFF
		F7:1 to F7:24	In "Standby mode", the internal circulation pump in operating mode will be started for 10 min respectively 1 to 24 times per day.
F8:-5	Temperature limit for terminating the reduced mode -5 °C, see example on page 140. Observe the setting of coding address "A3" (only for weather-compensated control units)	F8:+10 to F8:-60	Temperature limit adjustable from +10 to -60 °C
		F8:-61	Function disabled
F9:-14	Temperature limit for raising the reduced set room temp. -14 °C, see example on page 140 (only for weather-compensated control units)	F9:+10 to F9:-60	Temperature limit for raising the set room temperature to the value selected for standard mode adjustable from +10 to -60 °C



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

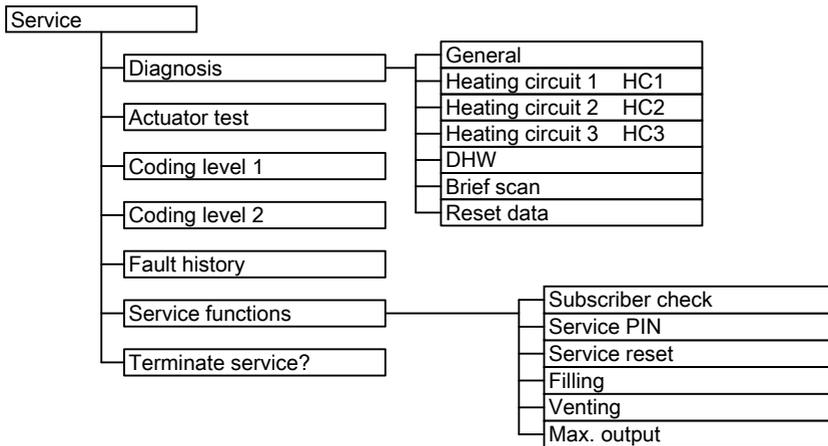
<b>Coding in the delivered condition</b>		<b>Possible change</b>	
FA:20	Raising the set boiler water temperature or the set flow temperature when changing from operation with reduced room temperature to operation with standard room temperature, by 20 %. See example on page 141 (only for weather-compensated control units)	FA:0 to FA:50	Temperature rise adjustable from 0 to 50 %
Fb:30	Duration for raising the set boiler water temperature or the set flow temperature (see coding address "FA") 60 min. See example on page 141 (only for weather-compensated control units)	Fb:0 to Fb:150	Duration adjustable from 0 to 300 min; one step $\hat{=}$ 2 min

## Calling up the service menu

### Only for weather-compensated control units

Press **OK** and  simultaneously for approx. 4 s.

#### Service menu overview



## Diagnosis

### Scanning operating data

- Weather-compensated control unit:  
 Operating data can be scanned in six areas. See **"Diagnosis"** in the service menu overview.  
 Operating data on heating circuits with mixers and solar can only be scanned if the components are installed in the system.  
 For further information on operating data, see chapter "Brief scan".
- Constant temperature control unit:  
 Operating data can be scanned in the "i" menu.



Operating instructions

For further information on operating data, see chapter "Brief scan".

## Diagnosis (cont.)

### Note

"- - -" appears on the display if a sensor that has been scanned is faulty.

### Calling up operating data

#### Weather-compensated control unit

1. Press **OK** and  simultaneously for approx. 4 s.

2. **"Diagnosis"**

### Resetting operating data

Saved operating data (e.g. hours run) can be reset to 0.  
The value "Adjusted outside temp" is reset to the actual value.

#### Weather-compensated control unit

1. Press **OK** and  simultaneously for approx. 4 s.

2. **"Diagnosis"**

3. **"Reset data"**

### Brief scan

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

#### Weather-compensated control unit

1. Press **OK** and  simultaneously for approx. 4 s.

2. **"Diagnosis"**

3. **"Brief scan"**.

4. Press **OK**.  
The display shows 9 lines with 6 fields each.

3. Select required group, e.g. **"General"**.

#### Constant temperature control unit

 Operating instructions, chapter "Scanning information"

4. Select required value (e.g. **"Burner starts"**) or **"All details"**.

#### Constant temperature control unit

 Operating instructions, chapter "Scanning information"

## Diagnosis (cont.)

Diagnose Kurzabfrage						
1:	1	F	0	A	1	2
2:	0	0	0	0	0	0
3:	0	0	0	0	0	0
4:	0	0	0	0	0	0

Wählen mit 

For an explanation of the relevant values in the individual lines and fields, see the following table:

Line (brief scan)	Field					
	1	2	3	4	5	6
1:	Software version Control unit		Equipment version		Burner control unit version	
2:	System schemes 02 to 10		Number of KM BUS sub- scribers	Maximum demand temperature		
3:	0	Software version Program- ming unit	Software version Mixer exten- sion heating circuit M2 0: no mixer exten- sion	0	Software version LON module	0
4:	Software version Burner control unit		Type Burner control unit		Appliance type	
5:	0: no external demand 1: external demand	0: no external blocking 1: external block- ing		External hook-up 0 - 10 V Display in °C 0: no external hook-up		
6:	Number of LON sub- scribers		Check digit	Max. output Details in %.		



**Diagnosis** (cont.)

Line (brief scan)	Field					
	1	2	3	4	5	6
7:	<b>Heating circuit A1 (without mixer)</b> Remote control 0: w/o 1: Vitotrol 200A 2: Vitotrol 300A or Vithome		<b>Heating circuit M2 (with mixer)</b> Remote control 0: w/o 1: Vitotrol 200A 2: Vitotrol 300A or Vithome		<b>Heating circuit M3 (with mixer)</b> Remote control 0: w/o 1: Vitotrol 200A 2: Vitotrol 300A or Vithome	
8:	0	0	0	0	0	0
9:	Internal details for calibration				Software version Extension AM1	Software version Extension EA1

**Constant temperature control unit**

1. Press **OK** and  simultaneously for approx. 4 s.  
"P" flashes on the display.
2. Confirm with **OK**.
3. Select scan with /. For example, "b" for "Max. output" (see following table):
4. Confirm selected scan with **OK**.

For explanations of individual scans, see the following table:

Brief scan	Display				
					
0		System scheme	Software version Control unit		Software version Program- ming unit
1		Software version Burner control unit		0	

**Diagnosis** (cont.)

Brief scan		Display			
0	0	0	0	0	0
E			External hook-up 0 - 10 V Display in °C 0: no external hook-up		
3			Set boiler water temperature		
A			Highest demand temperature		
4		Burner control unit type		Appliance type	
5			Set cylinder temperature		
b	Diverter valve status 0: not installed 1: Heating 2: Central position 3: DHW heating		Max. output in %		
C		Boiler coding card (hexadecimal)			
c		Version Appliance		Version Burner control unit	
d				0	0
F	Code 53 setting	Internal details for calibration			
①		<b>Extension AM1</b>			
F	Software version	Output A1 configuration (value corresponds to code 33 setting)	Output A1 switching state 0: OFF 1: ON	Output A2 configuration (value corresponds to code 34 setting)	Output A2 switching state 0: OFF 1: ON
②					
		<b>Extension EA1</b>			
F	Output 157 configuration (value corresponds to code 36 setting)	Output 157 switching state 0: OFF 1: ON	Input DE1 switching state 0: open 1: closed	Input DE2 switching state 0: open 1: closed	Input DE3 switching state 0: open 1: closed
③					

## Diagnosis (cont.)

Brief scan	Display				
F ④	Software version		External hook-up 0 - 10 V Display in %		
<b>Open Therm extension (if installed)</b>					
F ⑨	Software version	DHW heating status	External hook-up 0 - 10 V Display in %		

## Checking outputs (relay test)

### Weather-compensated control unit

1. Press **OK** and simultaneously for approx. 4 s.
2. **"Actuator test"**

The following relay outputs can be controlled subject to system design:

Display	Explanation
Start base load	Burner operates at minimum output; internal pump starts
Start full load	Burner operates at maximum output; internal pump starts
Start outp. internal	Internal output  (internal pump) enabled
Start valve Heating	Diverter valve set to heating mode
Start valve centre	Diverter valve in central position (filling/draining)
Start valve cylinder	Diverter valve set to DHW mode
Start htg circ pump HC2	Heating circuit pump output enabled (extension to heating circuit with mixer)
Open mixer HC2	"Mixer open" output enabled (extension to heating circuit with mixer)
Close mixer HC2	"Mixer closed" output enabled (extension to heating circuit with mixer)
Start htg circ pump HC3	Heating circuit pump output enabled (extension to heating circuit with mixer)
Open mixer HC3	"Mixer open" output enabled (extension to heating circuit with mixer)
Close mixer HC3	"Mixer closed" output enabled (extension to heating circuit with mixer)
Start outp. int. exten. H1	Output at internal extension enabled
Start AM1 output 1	Output A1 at extension AM1 enabled

## Checking outputs (relay test) (cont.)

Display	Explanation
Start AM1 output 2	Output A2 at extension AM1 enabled
Start EA1 output 1	Contacts P - S at plug <span style="border: 1px solid black; padding: 0 2px;">157</span> for extension EA1 closed

### Constant temperature control unit

1. Press **OK** and  simultaneously for approx. 4 s.  
"P" flashes on the display.
2. Select  "P" and confirm with **OK**.
3. Select required actuator (output) with  /  (see following table):
4. Confirm selected actuator with **OK**.  
The display shows the number for the activated actuator and "ON".

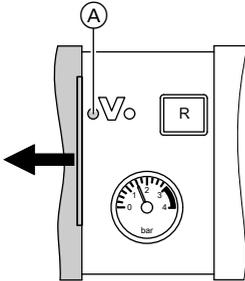
The following actuators (relay outputs) can be controlled subject to system design:

Display	Explanation
1	Burner operates at minimum output; internal pump starts
2	Burner operates at maximum output; internal pump starts
3	Internal output <span style="border: 1px solid black; padding: 0 2px;">20</span> (internal pump) is enabled
4	Diverter valve set to heating mode
5	Diverter valve in central position (filling/draining)
6	Diverter valve set to DHW mode
10	Internal extension output enabled
19	Contacts P - S at plug <span style="border: 1px solid black; padding: 0 2px;">157</span> for extension EA1 closed
20	Output A1 at extension AM1 enabled
21	Output A2 at extension AM1 enabled

## Fault display

### Weather-compensated control unit

If there is a fault, the red fault indicator (A) flashes. "Δ" flashes on the display and "Fault" is shown.



The fault code is displayed with **OK**. For an explanation of the fault code, see the following pages.

For some faults, the type of fault is also displayed in plain text.

#### Acknowledging a fault

Follow the instructions on the display.

#### Note

*The fault message is shown in the standard display of the short menu.*

*A fault messaging facility, if connected, will be switched OFF.*

*If an acknowledged fault is not remedied, the fault message will be re-displayed the following day and the fault message facility restarted.*

#### Calling up acknowledged faults

Select "**Fault**" in the standard menu. The current faults will be displayed in a list.

#### Calling up fault codes from the fault memory (fault history)

The 10 most recent faults (including resolved ones) are saved and can be scanned.

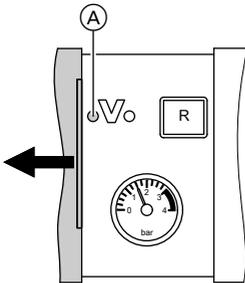
Faults are sorted by date.

1. Press **OK** and  simultaneously for approx. 4 s.
2. "**Fault history**"
3. "**Display?**"

## Fault display (cont.)

### Constant temperature control unit

If there is a fault, the red fault indicator (A) flashes. The two-digit fault code and (subject to the type of fault) "△" or "▽" flash on the programming unit display.



Other current faults can be displayed with ▲/▼. For an explanation of the fault codes, see the following pages.



Example: Fault code "50"

#### Acknowledge fault

Press **OK**; the standard display is shown again.

A fault messaging facility, if connected, will be switched OFF.

If an acknowledged fault is not remedied, the fault message will be re-displayed the following day and the fault message facility restarted.

#### Calling up acknowledged faults

Press **OK** for approx. 4 s.

The 10 most recent faults (including resolved ones) are saved and can be scanned.

#### Calling up fault codes from the fault memory (fault history)

The 10 most recent faults (including those remedied) are saved and can be called up.

Faults are sorted by date.

1. Press **OK** and **≡** simultaneously for approx. 4 s.
2. Select "△" and enable fault history with **OK**.
3. Select fault messages with ▲/▼.

## Fault codes

Dis-played fault code	Const.	Weath.-comp.	System characteristics	Cause	Measures
10	X	X	Regulates as if the outside temperature were 0 °C	Short circuit, outside temperature sensor	Check the outside temperature sensor (see page 115)
18	X	X	Regulates as if the outside temperature were 0 °C	Lead break, outside temperature sensor	Check the outside temperature sensor (see page 115)
20	X	X	Regulates without flow temperature sensor (low loss header)	Short circuit, system flow temperature sensor	Check the low loss header sensor (see page 117)
28	X	X	Regulates without flow temperature sensor (low loss header)	Lead break, system flow temperature sensor	Check the low loss header sensor (see page 117)
30	X	X	Burner blocked	Short circuit, boiler water temperature sensor	Check the boiler water temperature sensor (see page 117)
38	X	X	Burner blocked	Lead break, boiler water temperature sensor	Check the boiler water temperature sensor (see page 117)
40		X	Mixer closes	Short circuit, flow temperature sensor, heating circuit 2 (with mixer)	Check flow temperature sensor
44		X	Mixer closes	Short circuit, flow temperature sensor, heating circuit 3 (with mixer)	Check flow temperature sensor

**Fault codes** (cont.)

Dis- played fault code	Const.	Weath.- comp.	System char- acteristics	Cause	Measures
48		X	Mixer closes	Lead break, flow tempera- ture sensor, heating circuit 2 (with mixer)	Check flow temper- ature sensor
4C		X	Mixer closes	Lead break, flow tempera- ture sensor, heating circuit 3 (with mixer)	Check flow temper- ature sensor
50	X	X	No DHW heat- ing	Short circuit, cylinder temper- ature sensor	Check sensors (see page 117)
51	X	X	No DHW heat- ing	Short circuit, outlet temper- ature sensor	Check sensor (see page 117)
58	X	X	No DHW heat- ing	Lead break, cylinder temper- ature sensor	Check sensors (see page 117)
59	X	X	No DHW heat- ing	Lead break, outlet temper- ature sensor	Check sensor (see page 117)
A7		X	Control mode as per deliv- ered condition	Programming unit faulty	Replace program- ming unit



**Fault codes** (cont.)

Dis-played fault code	Const.	Weath.-comp.	System characteristics	Cause	Measures
A9		X	The burner operates at its lower output if a heating circuit with mixer is connected. The burner is blocked if only one heating circuit without mixer is connected.	Internal circulation pump blocked	Check the circulation pump
b0	X	X	Burner blocked	Short circuit, flue gas temperature sensor	Check the flue gas temperature sensor
b1	X	X	Control mode as per delivered condition	Communication error, programming unit	Check connections and replace the programming unit if required
b5	X	X	Control mode as per delivered condition	Internal fault	Replace the control unit
b7	X	X	Burner blocked	Boiler coding card faulty	Plug in boiler coding card or replace, if faulty
b8	X	X	Burner blocked	Lead break, flue gas temperature sensor	Check the flue gas temperature sensor
bA		X	Mixer regulates to 20 °C flow temperature	Communication error, extension kit for heating circuit 2 (with mixer)	Check extension kit connections and code

**Fault codes** (cont.)

Dis- played fault code	Const.	Weath.- comp.	System char- acteristics	Cause	Measures
bb		X	Mixer regulates to 20 °C flow temperature	Communica- tion error, extension kit for heating circuit 3 (with mixer)	Check extension kit connections and code
bC		X	Control mode without remote control	Communica- tion error, remote control Vitotrol heating circuit 1 (without mixer)	Check connec- tions, lead, coding address "A0" and remote control set- tings (see page 143)
bd		X	Control mode without remote control	Communica- tion error, remote control Vitotrol heating circuit 2 (with mixer)	Check connec- tions, lead, coding address "A0" and remote control set- tings (see page 143)
bE		X	Control mode without remote control	Communica- tion error, remote control Vitotrol heating circuit 3 (with mixer)	Check connec- tions, lead, coding address "A0" and remote control set- tings (see page 143)
bF		X	Control mode	Incorrect LON commu- nication mod- ule	Replace the LON communication module
C1	X	X	Control mode	Communica- tion error extension EA1	Check electrical connections
C3	X	X	Control mode	Extension AM1 commu- nication error	Check electrical connections



**Fault codes** (cont.)

<b>Dis- played fault code</b>	<b>Const.</b>	<b>Weath.- comp.</b>	<b>System char- acteristics</b>	<b>Cause</b>	<b>Measures</b>
C4	X	X	Control mode	Communica- tion error, Open Therm extension	Check Open Therm extension
Cd	X	X	Control mode	Communica- tion error, Vitocom 100 (KM BUS)	Check connec- tions, Vitocom 100 and coding address "95"
CE	X	X	Control mode	Communica- tion error, ext. extension	Check electrical connections
CF		X	Control mode	Communica- tion error, LON commu- nication mod- ule	Replace the LON communication module
d6	X	X	Control mode	Input DE1 reports a fault at extension EA1	Remove fault at the appliance con- cerned
d7	X	X	Control mode	Input DE2 at extension EA1 reports a fault	Remove fault at the appliance con- cerned
d8	X	X	Control mode	Input DE3 at extension EA1 reports a fault	Remove fault at the appliance con- cerned
dA		X	Control mode without room influence	Short circuit, room temper- ature sensor, heating circuit 1 (without mixer)	Check room tem- perature sensor, heating circuit 1

**Fault codes** (cont.)

Dis- played fault code	Const.	Weath.- comp.	System char- acteristics	Cause	Measures
db		X	Control mode without room influence	Short circuit, room temper- ature sensor, heating circuit 2 (with mixer)	Check room tem- perature sensor, heating circuit 2
dC		X	Control mode without room influence	Short circuit, room temper- ature sensor, heating circuit 3 (with mixer)	Check room tem- perature sensor, heating circuit 3
dd		X	Control mode without room influence	Lead break, room temper- ature sensor, heating circuit 1 (without mixer)	Check room tem- perature sensor for heating circuit 1 and remote control settings (see page 143)
dE		X	Control mode without room influence	Lead break, room temper- ature sensor, heating circuit 2 (with mixer)	Check room tem- perature sensor for heating circuit 2 and remote control settings (see page 143)
dF		X	Control mode without room influence	Lead break, room temper- ature sensor, heating circuit 3 (with mixer)	Check room tem- perature sensor for heating circuit 3 and remote control settings (see page 143)
E0		X	Control mode	Fault external LON sub- scriber	Check connections and LON subscri- bers
E1	X	X	Burner in a fault state	The ionisa- tion current lies outside the permissi- ble range	Check the ionisa- tion electrode and cable. Press reset button <b>R.</b>



**Fault codes** (cont.)

Dis-played fault code	Const.	Weath.-comp.	System char-acteristics	Cause	Measures
E2	X	X	Burner in a fault state	The ionisa-tion current lies outside the permissi-ble range	Check the ionisa-tion electrode and cable. Press reset button <b>R</b> .
E3	X	X	Burner in a fault state	The ionisa-tion current lies outside the permissi-ble range	Check the ionisa-tion electrode and cable. Press reset button <b>R</b> .
E4	X	X	Burner blocked	Fault, supply voltage 24 V	Replace the control unit.
E5	X	X	Burner blocked	Fault, flame amplifier	Replace the control unit.
E8	X	X	Burner in a fault state	The ionisa-tion current lies outside the permissi-ble range	Check the ionisa-tion electrode and cable. Press reset button <b>R</b> .
EA	X	X	Burner in a fault state	The ionisa-tion current lies outside the permissi-ble range dur-ing calibra-tion	Check the ionisa-tion electrode and cable. Press reset button <b>R</b> .
Eb	X	X	Burner in a fault state	Heat draw-off repeatedly too low during calibration	Initiate a heat draw-off. Switch the boiler OFF and ON again. Press reset button <b>R</b> .
EC	X	X	Burner in a fault state	Parameter fault during calibration	Press reset button <b>R</b> or Replace boiler cod-ing card and press reset button <b>R</b> .

**Fault codes** (cont.)

Dis-played fault code	Const.	Weath.-comp.	System char-acteristics	Cause	Measures
Ed	X	X	Burner in a fault state	Internal fault	Replace the control unit.
EE	X	X	Burner in a fault state	Flame signal is not present or too weak at burner start	Check the ionisation electrode and connecting cable, measure the ionisation current, check the gas supply (gas pressure and gas flow limiter), check the gas train, ignition, ignition module, ignition electrodes and the condensate drain. Press reset button <b>R</b> .
EF	X	X	Burner in a fault state	Flame is lost after flame has built.	Check the gas supply (gas pressure and gas flow limiter), check the flue gas/ventilation air system for flue gas recirculation, check the ionisation electrode (replace if required). Press reset button <b>R</b> .
F0	X	X	Burner blocked	Internal fault	Replace the control unit.



**Fault codes** (cont.)

Dis-played fault code	Const.	Weath.-comp.	System characteristics	Cause	Measures
F1	X	X	Burner in a fault state	Flue gas temperature limiter has responded	Check the heating system fill level. Vent the system. Press reset button <b>R</b> after the flue system has cooled down.
F2	X	X	Burner in a fault state	The temperature limiter has responded	Check the heating system fill level. Check the circulation pump. Vent the system. Check the temperature limiter and connecting cables. Press reset button <b>R</b> .
F3	X	X	Burner in a fault state	Flame signal is already present at burner start	Check the ionisation electrode and connecting cable. Press reset button <b>R</b> .
F8	X	X	Burner in a fault state	The fuel valve closes too late	Check the gas train. Check both control paths. Press reset button <b>R</b> .
F9	X	X	Burner in a fault state	Fan speed too low during burner start	Check the fan, the fan connecting cables and power supply; check the fan control. Press reset button <b>R</b> .

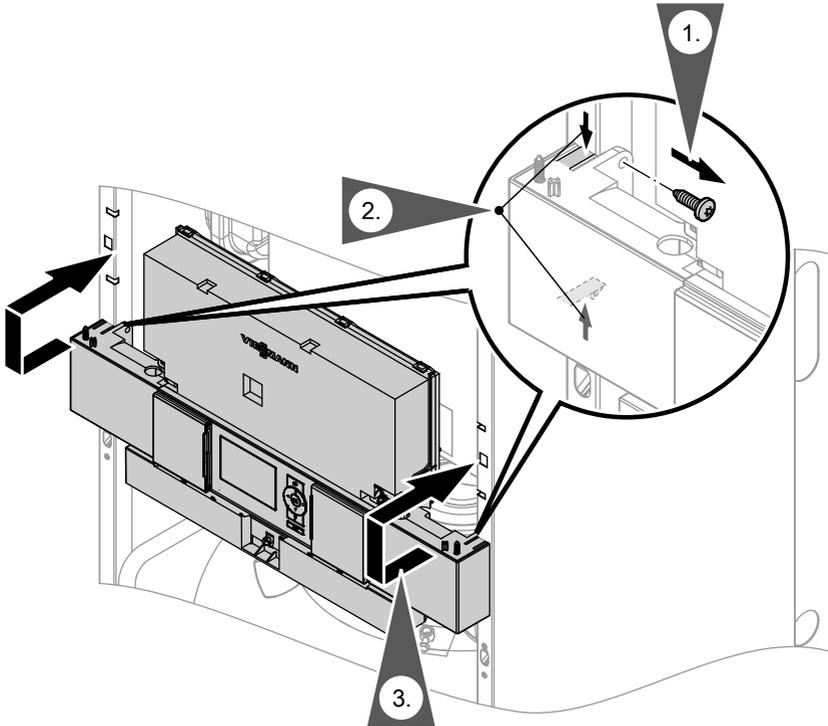
**Fault codes** (cont.)

Dis-played fault code	Const.	Weath.-comp.	System char-acteristics	Cause	Measures
FA	X	X	Burner in a fault state	Fan not at standstill	Check the fan, fan connecting cables and fan control. Press reset button <b>R</b> .
FC	X	X	Burner in a fault state	Gas train faulty or faulty modulation valve control or flue gas path blocked	Check the gas train. Check the flue gas system. Press reset button <b>R</b> .
Fd	X	X	Burner in a fault state	Fault, combustion controller	Check ignition electrodes and connecting cables. Check whether a strong interference (EMC) field exists near the appliance.  Press reset button <b>R</b> . Replace control unit if the fault persists.
FE	X	X	Burner blocked or in a fault state	Boiler coding card or main PCB faulty	Press reset button <b>R</b> . Replace boiler coding card or control unit if the fault persists.
FF	X	X	Burner blocked or in a fault state	Internal fault or reset button <b>R</b> blocked	Start the appliance again. Replace the control unit if the appliance will not restart.

## Repairs

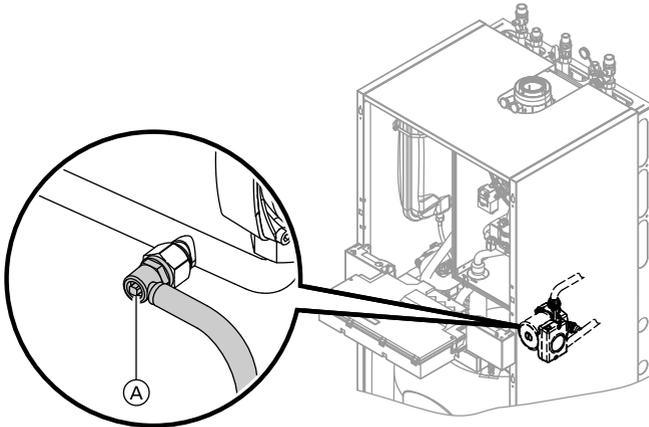
### Putting control unit in maintenance position

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



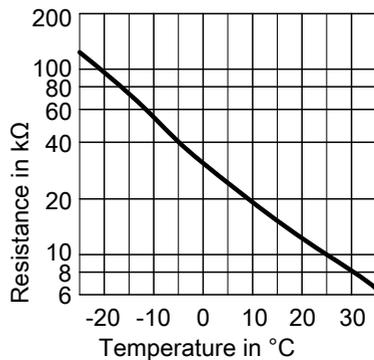
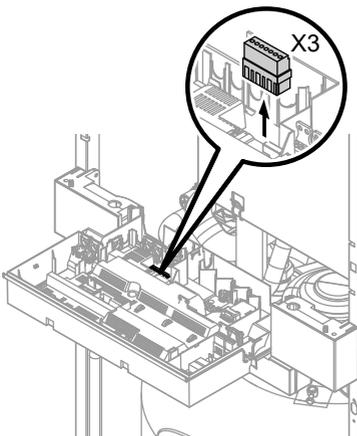
**Repairs** (cont.)

**Draining the boiler on the heating water side**



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

**Checking the outside temperature sensor (weather-compensated control unit)**



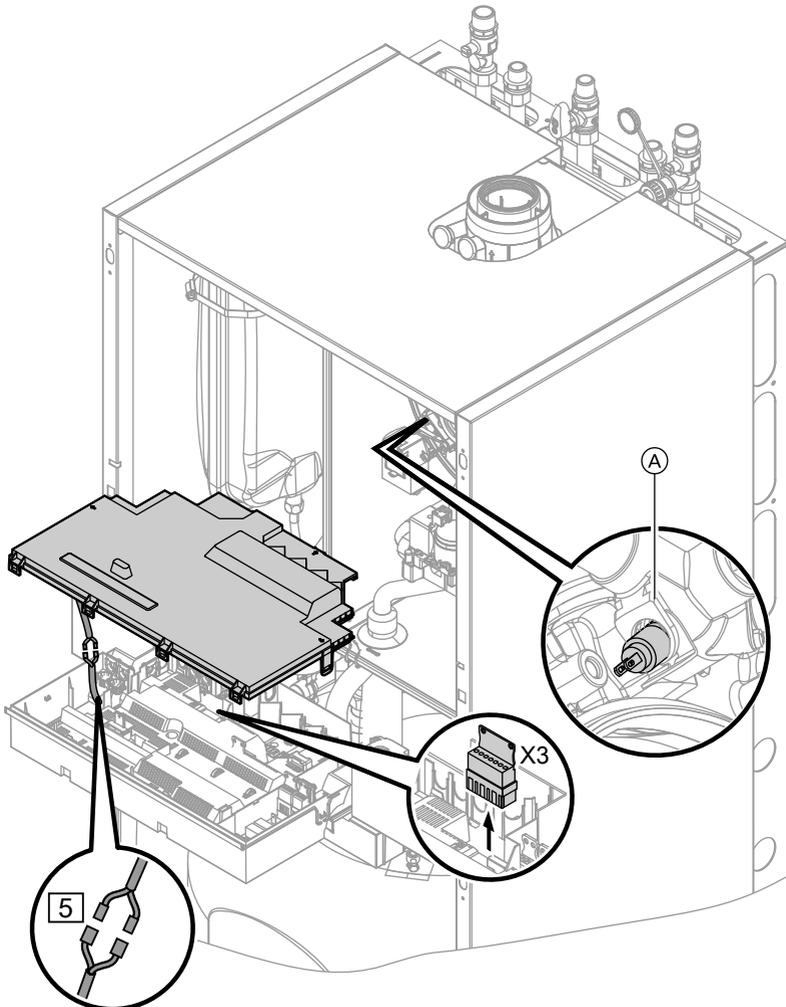
1. Pull plug "X3" from the control unit.

## Repairs (cont.)

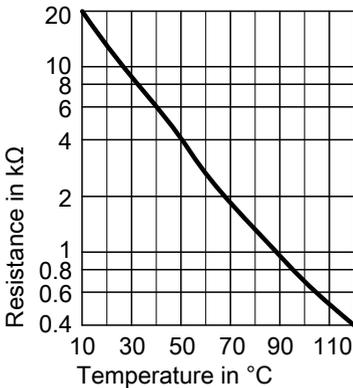
2. Test the resistance of the outside temperature sensor across terminals "X3.1" and "X3.2" on the disconnected plug and compare it with the curve.
3. Where actual values deviate severely from the curve values, disconnect the wires at the sensor and repeat test on the sensor itself.
4. Subject to result,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

**Repairs** (cont.)

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



**Repairs** (cont.)



1. ■ **Boiler water temperature sensor**  
Pull the leads from boiler water temperature sensor (A) and check the resistance.
  - **Cylinder temperature sensor**  
Pull plug [5] from the cable harness at the control unit and check the resistance.
  - **Flow temperature sensor**  
Pull plug "X3" from the control unit and check the resistance across terminals "X3.4" and "X3.5".
2. Check the sensor resistance and compare the actual values with the curve.
  3. Replace the sensor in case of severe deviation.



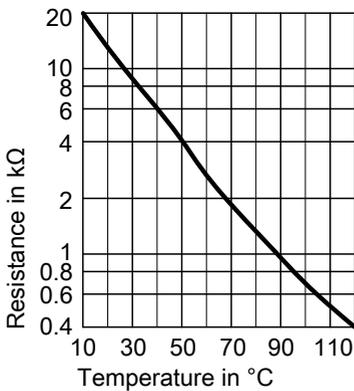
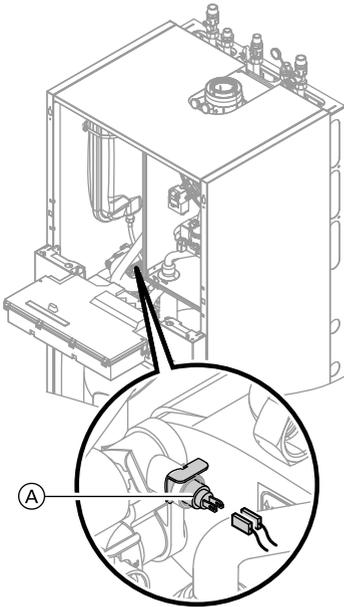
**Danger**

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

**Repairs** (cont.)

**Checking the outlet temperature sensor**

1. Pull the leads from outlet temperature sensor (A).



2. Check the sensor resistance and compare it with the curve.
3. Replace the sensor in case of severe deviation.



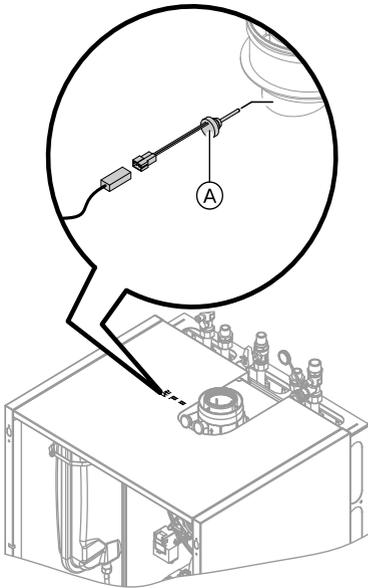
**Danger**

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

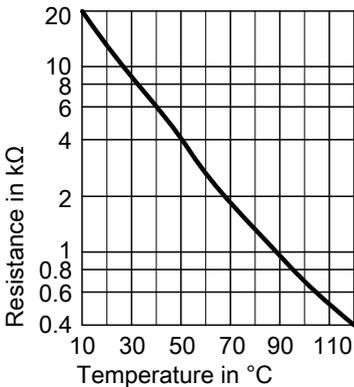
## Repairs (cont.)

### Checking the flue gas temperature sensor

The flue gas temperature sensor locks out the boiler when the permissible flue gas temperature is exceeded. Reset the interlock after the flue system has cooled down by pressing reset button **R**.



1. Pull the leads from flue gas temperature sensor **(A)**.



2. Check the sensor resistance and compare it with the curve.
3. Replace the sensor in case of severe deviation.

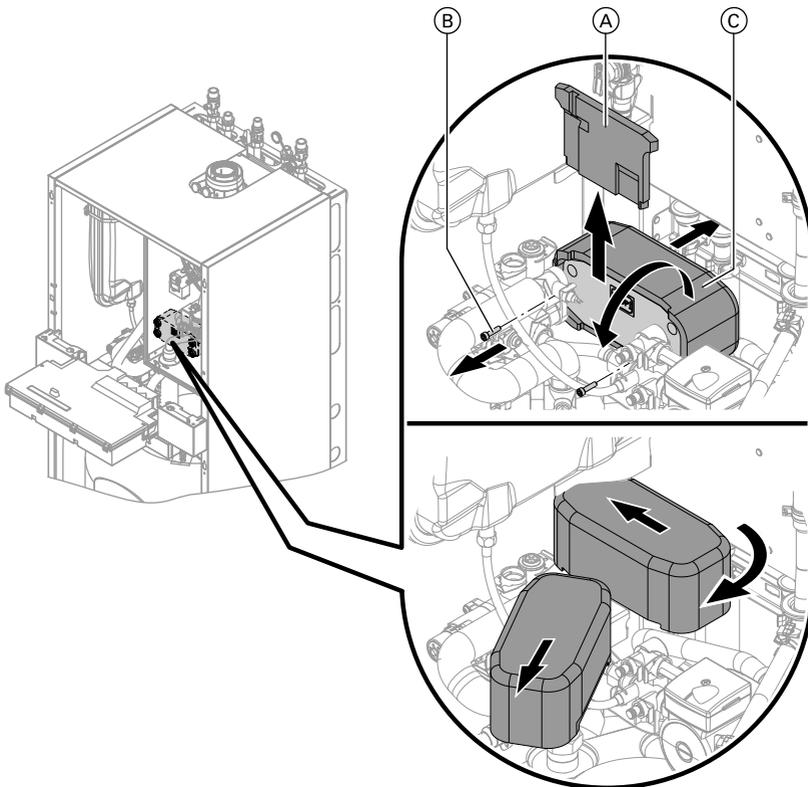
**Repairs** (cont.)

**Checking the plate heat exchanger**

**Note**

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

*During removal, small amounts of water may trickle out and escape from the plate heat exchanger.*



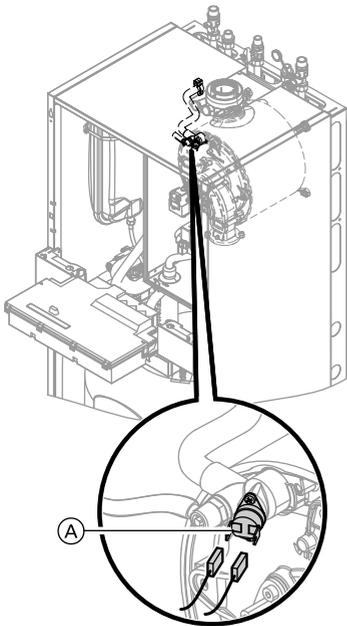
1. Shut off and drain the boiler on its heating water and DHW side.
2. Release the side closures and pivot the control unit forward.
3. Remove the siphon (see page 28).
4. Push insulating mat (A) upwards and remove.
5. Undo two screws (B) and pull out plate heat exchanger (C) to the front.

## Repairs (cont.)

6. Check the connections on the heating water and DHW side for contamination and scaling; if required, replace the plate heat exchanger.
7. Install in reverse order with new gas-kets.

## Checking the temperature limiter

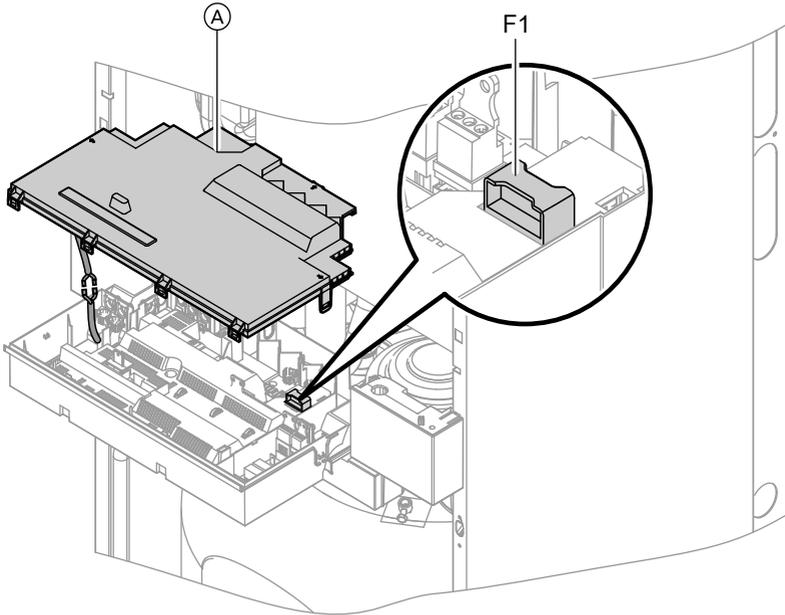
If the burner control unit cannot be reset after a fault shutdown, although the boiler water temperature is below approx. 75 °C, check the following:



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

**Repairs** (cont.)

**Checking the fuse**



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

**Extension kit for heating circuit with mixer**

**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 

## Repairs (cont.)

### 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 rotational direction of the mixer motor during its self-test. Then set the mixer manually to "Open" again.

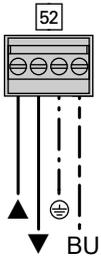
#### Note

*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 set is incorrectly fitted.*



Mixer installation instructions

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



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



#### Danger

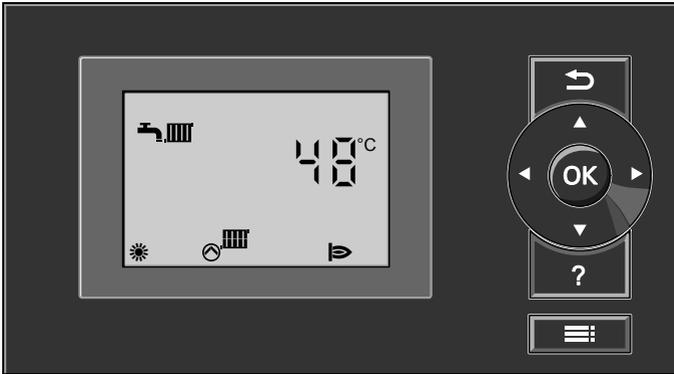
An electric shock can be life-threatening. Before opening the boiler, disconnect from the mains voltage, for example at the fuse or the main isolator.

2. At plug 52, swap the cores at terminals "▲" and "▼".
3. Refit the casing cover.

### 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 59).

## Constant temperature control unit



### Heating mode

The selected set boiler water temperature will be maintained when a demand is being raised by the room thermostat and the heating program is set to DHW and central heating "III→". The boiler water temperature will be maintained at the default frost protection temperature when there is no demand.

The electronic temperature limiter inside the burner control unit limits the boiler water temperature.  
Flow temperature setting range: 20 to 74 °C.

### Heating the DHW primary cylinder from cold

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

- The cylinder primary pump is switched ON if the boiler water temperature  $\geq$  set DHW temperature.
- The burner is switched ON if the boiler water temperature  $\leq$  set DHW temperature, and the cylinder primary pump is switched ON when the required boiler water temperature is reached.

The primary cylinder is heated up to the set DHW temperature. Heating stops when the set temperatures have been reached at the cylinder temperature sensor and at the outlet temperature sensor.

After heating, the cylinder primary pump and the three-way diverter valve remain ON for a further 30 s.

## Constant temperature control unit (cont.)

### Boosting when DHW is drawn off

When DHW is drawn off, cold water enters at the bottom of the primary cylinder.

The heating circuit pump is switched ON and the three-way diverter valve is changed over, if the cylinder temperature sensor recognises a temperature lower than the set temperature.

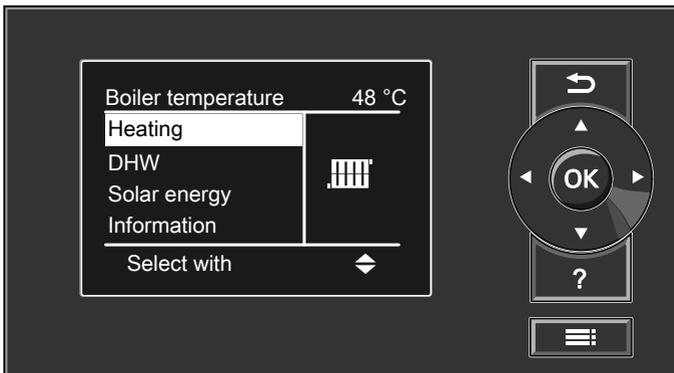
- The cylinder primary pump is switched ON if the boiler water temperature  $\geq$  set DHW temperature.
- The burner is switched ON if the boiler water temperature  $\leq$  set DHW temperature, and the cylinder primary pump is switched ON when the required boiler water temperature is reached.

The DHW is controlled to the specified temperature via the cylinder temperature sensor.

The primary cylinder continues to be heated up after the draw off process has terminated, until the set DHW temperature has been reached at the cylinder temperature sensor.

The cylinder primary pump and the three-way diverter valve remain ON for a further 30 s.

## Weather-compensated control unit



## Weather-compensated control unit (cont.)

### 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 primary cylinder from cold

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

- The cylinder primary pump is switched ON if the boiler water temperature  $\geq$  set DHW temperature.
- The burner is switched ON if the boiler water temperature  $\leq$  set DHW temperature, and the cylinder primary pump is switched ON when the required boiler water temperature is reached.

The primary cylinder is heated up to the set DHW temperature. Heating stops when the set temperatures have been reached at the cylinder temperature sensor and at the outlet temperature sensor.

After heating, the cylinder primary pump and the three-way diverter valve remain ON for a further 30 s.

### Boosting when DHW is drawn off

When DHW is drawn off, cold water enters at the bottom of the primary cylinder.

The heating circuit pump is switched ON and the three-way diverter valve is changed over, if the cylinder temperature sensor recognises a temperature lower than the set temperature.

- The cylinder primary pump is switched ON if the boiler water temperature  $\geq$  set DHW temperature.
- The burner is switched ON if the boiler water temperature  $\leq$  set DHW temperature, and the cylinder primary pump is switched ON when the required boiler water temperature is reached.

## **Weather-compensated control unit** (cont.)

The DHW is controlled to the specified temperature via the cylinder temperature sensor.

The primary cylinder continues to be heated up after the draw off process has terminated, until the set DHW temperature has been reached at the cylinder temperature sensor.

The cylinder primary pump and the three-way diverter valve remain ON for a further 30 s.

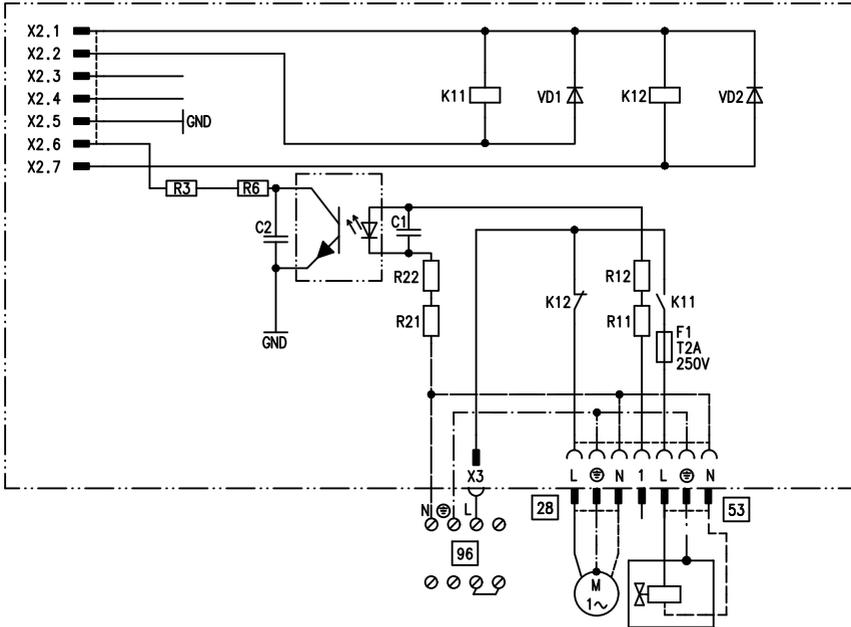
### **Boosting DHW heating**

The booster heating function is activated if a switching period is selected for the fourth time phase.

The set temperature value for the heating boost is adjustable in coding address "58".

## Internal extensions

### Internal extension H1

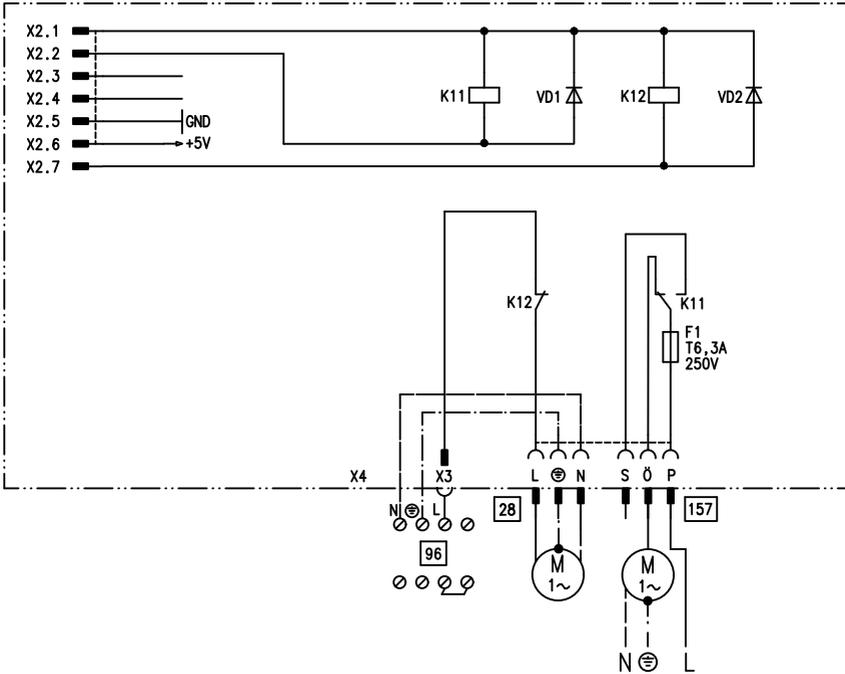


The internal extension H1 is integrated into the control unit casing. The cylinder primary pump is connected to relay output **28**.

An external safety valve can be connected to **53**.

**Internal extensions (cont.)**

**Internal extension H2 (accessories)**



The internal extension H2 is integrated into the control unit casing instead of the internal extension H1. The cylinder primary pump is connected to relay output **28**.

An external extractor interlock can be connected to **157**.



**External extensions (accessories) (cont.)**

**Functions**

One of the following circulation pumps can be connected to each of the terminals A1 and A2:

- Heating circuit pump for the heating circuit without mixer
- Circulation pump for cylinder heating
- DHW circulation pump

**Allocating functions for outputs A1 and A2**

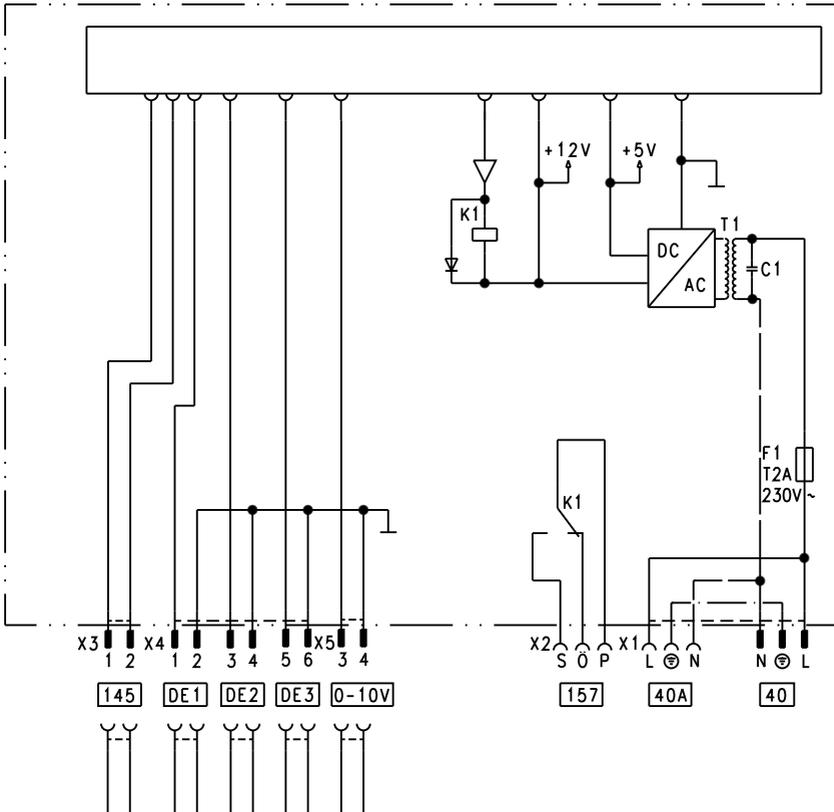
Select the function for these outputs via the codes on the boiler control unit:

- Output A1: Code 33
- Output A2: Code 34

Function	Code	
	Output A1	Output A2
DHW circulation pump <span style="border: 1px solid black; padding: 0 2px;">28</span>	33:0	34:0 (delivered cond.)
Heating circuit pump <span style="border: 1px solid black; padding: 0 2px;">20</span>	33:1 (delivered cond.)	34:1
Circulation pump for cylinder heating <span style="border: 1px solid black; padding: 0 2px;">21</span>	33:2	34:2

**External extensions (accessories) (cont.)**

**Extension EA1**



- DE1 Digital input 1
- DE2 Digital input 2
- DE3 Digital input 3

0 - 10 V 0 - 10 V input

**40** Power supply [terminals]

**40**A Power supply terminal for additional accessories

**157** Central fault message/feed pump/DHW circulation pump (zero volt)

**145** KM BUS

## External extensions (accessories) (cont.)

### Digital data inputs DE1 to DE3

The following functions can be connected alternatively:

- External heating program changeover for each heating circuit
- External blocking
- External blocking with fault message input
- External demand with minimum boiler water temperature
- Fault message input
- Short operation of the DHW circulation pump

The hooked-up contacts must correspond to protection class II.

### Input function assignment

Select the input functions via the codes on the boiler control unit:

- DE1: Code 3A
- DE2: Code 3b
- DE3: Code 3C

### Assigning the heating program changeover function to the heating circuits

Assign the heating program changeover function for the respective heating circuit via code d8 at the boiler control unit:

- Changeover via input DE1: Code d8:1
- Changeover via input DE2: Code d8:2
- Changeover via input DE3: Code d8:3

Select the effect of the heating program changeover via code d5:

Set the duration of the changeover via code F2.

### Effect on the pumps of external blocking function

The effect on the internal circulation pump is selected with code 3E.  
The effect on the relevant heating circuit pump is selected with code d6.  
The effect on a circulation pump for cylinder heating is selected with code 5E.

### Effect on the pumps of the external demand function

The effect on the internal circulation pump is selected with code 3F.  
The effect on the relevant heating circuit pump is selected with code d7.  
The effect on a circulation pump for cylinder heating is selected with code 5F.

### DHW circulation pump runtime for brief operation

The runtime is set in code 3d.

### Analogue input 0 - 10 V

The 0 - 10 V hook-up provides an additional set boiler water temperature: 0 - 1 V taken as "no default set boiler water temperature".

1 V  $\hat{=}$  set value 10 °C

10 V  $\hat{=}$  set value 100 °C

### Output 157

The following functions can be connected to output 157:

- Feed pump to substation  
or
- DHW circulation pump  
or
- Fault message facility

## External extensions (accessories) (cont.)

### Function assignment

Select the function of output 157 via code 36 at the boiler control unit.

## Control functions

### External heating program changeover

The "External heating program changeover" function is connected via extension EA1. There are 3 inputs available at extension EA1 (DE1 to DE3).

The function is selected via the following codes:

Heating program changeover	Code
Input DE1	3A:1
Input DE2	3b:1
Input DE3	3C:1

Assign the heating program changeover function for the respective heating circuit via code d8 at the boiler control unit:

Heating program changeover	Code
Changeover via input DE1	d8:1
Changeover via input DE2	d8:2
Changeover via input DE3	d8:3

You can select which direction the heating program changeover takes in coding address "d5":

Heating program changeover	Code
Changeover towards "Permanently reduced" or "Permanent standby" mode (subject to the selected set value)	d5:0
Changeover towards "Constant heating mode"	d5:1

The duration of the heating program changeover can be adjusted in coding address "F2":

## Control functions (cont.)

Heating program changeover	Code
No heating program changeover	F2:0
Duration of the heating program changeover 1 to 12 hours	F2:1 to F2:12

The heating program changeover stays enabled for as long as the contact remains closed, but at least as long as the duration selected in coding address "F2".

## External blocking

The "External blocking" and "External blocking and fault message input" functions are connected via extension EA1. There are 3 inputs available at extension EA1 (DE1 to DE3).

The function is selected via the following codes:

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

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

The effect on the internal circulation pump is selected with code 3E.

The effect on the relevant heating circuit pump is selected with code d6.

## External demand

The "External demand" function is connected via extension EA1. There are 3 inputs available at extension EA1 (DE1 to DE3).

The function is selected via the following codes:

## Control functions (cont.)

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

The effect on the internal circulation pump is selected with code 3F. The effect on the relevant heating circuit pump is selected with code d7.

The minimum set boiler water temperature in case of external demand is selected in coding address "9b".

## Venting program

During the venting program, the circulation pump will be alternately switched ON and OFF for 30 s respectively over a period of 20 min.

For a certain period, the diverter valve is alternately set towards heating and DHW heating. The burner is switched OFF during the venting program.

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

## Fill program

In the delivered condition, the diverter valve is set to its central position, enabling the system to be filled completely. After switching ON the control unit, the diverter valve no longer goes into its central position.

Afterwards, the diverter valve can be moved via the fill function into the central position (see "Filling the heating system"). In this position, the control unit can be switched OFF, and the system can be filled completely.

### Filling with the control unit switched ON

If the system is to be filled with the control unit switched ON, the diverter valve is moved in the fill program to its central position and the pump starts. When the function is enabled, the burner shuts down. The program is automatically disabled after 20 min.

## Screed drying function

The screed function enables screeds to be dried. For this, always observe the details specified by the screed manufacturer.

## Control functions (cont.)

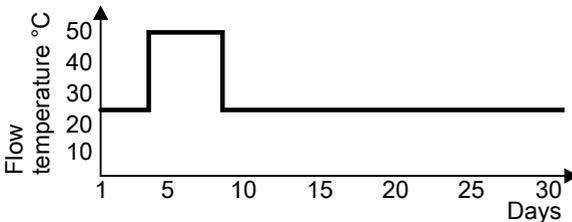
When the screed drying function is activated, the heating circuit pump of the mixer circuit is switched ON and the flow temperature will be held in accordance with the selected profile. After completion (30 days), the mixer circuit will again be regulated automatically via the set parameters.

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

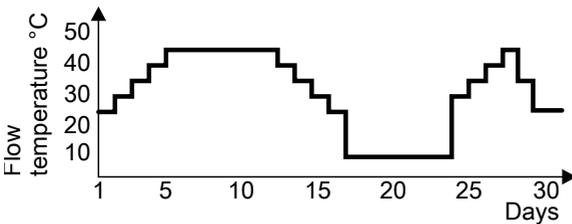
- Heat-up data with respective flow temperatures
- Max. flow temperature achieved
- Operating conditions and outside temperature during handover

The various temperature profiles are adjustable via coding address "F1". The function continues after power failure or after the control unit has been switched OFF. "Heating and DHW" will be started after the screed drying function has been terminated or if code "F1:0" is manually adjusted.

### Temperature profile 1: (EN 1264-4) code "F1:1"

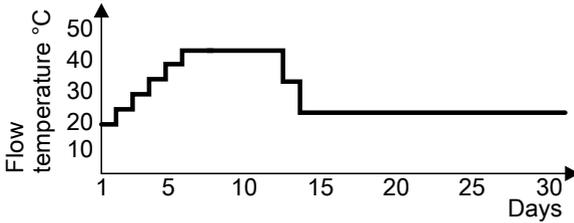


### Temperature profile 2: (ZV parquet and flooring technology) code "F1:2"

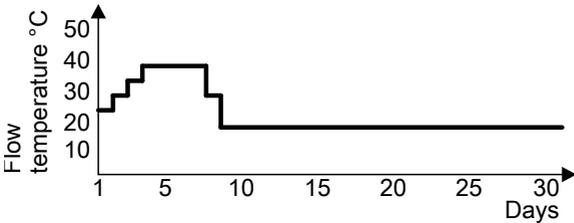


## Control functions (cont.)

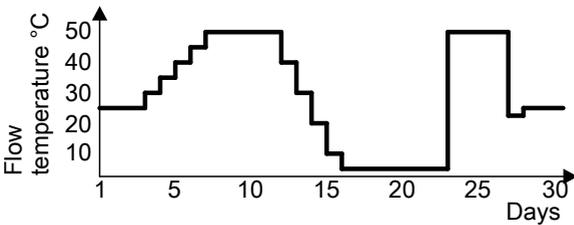
Temperature profile 3: Code "F1:3"



Temperature profile 4: Code "F1:4"

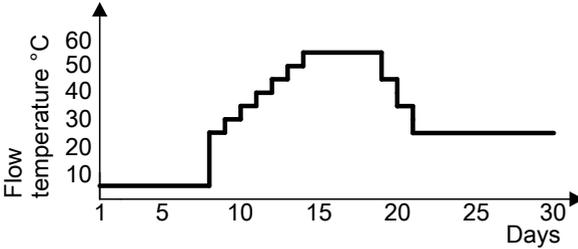


Temperature profile 5: Code "F1:5"

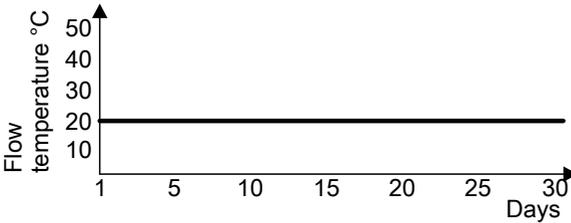


## Control functions (cont.)

### Temperature profile 6: Code "F1:6"



### Temperature profile 7: Code "F1:15"



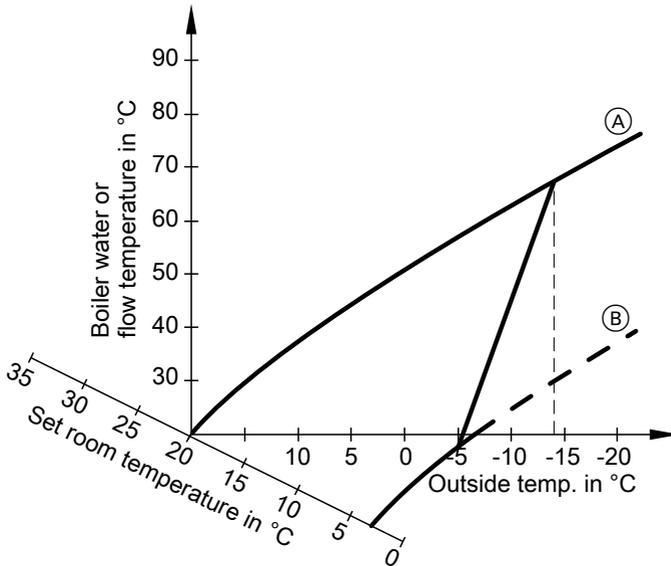
## Raising the reduced room temperature

During operation with 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, but no higher than the set standard room temperature.

The outside temperature limits for the start and end of the temperature raising can be adjusted via coding addresses "F8" and "F9".

## Control functions (cont.)

### Example using the settings in the delivered condition



Ⓐ Heating curve for operation with standard room temperature

Ⓑ Heating curve for operation with reduced room temperature

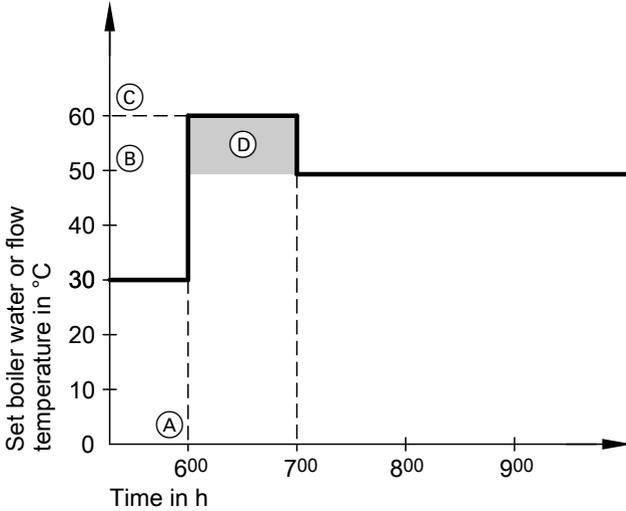
### Reducing the heat-up time

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 of the additional increase of the set boiler water or flow temperature can be adjusted in coding addresses "FA" and "Fb".

## Control functions (cont.)

### Example using the settings in the delivered condition



- (A) Start of operation with standard room temperature
- (B) Set boiler water or flow temperature in accordance with the selected heating curve
- (C) Set boiler water or flow temperature in accordance with coding address "FA":  
 $50\text{ °C} + 20\% = 60\text{ °C}$
- (D) Duration of operation with raised set boiler water or flow temperature in accordance with coding address "Fb":  
60 min

## Allocating heating circuits to the remote control

The heating circuit allocation must be configured when commissioning the Vitotrol 200A or Vitotrol 300A.

Heating circuit	Configuration	
	Vitotrol 200A	Vitotrol 300A
The remote control affects the heating circuit without mixer A1	H 1	HK1
The remote control affects the heating circuit with mixer M2	H 2	HK2
The remote control affects the heating circuit with mixer M3	H 3	HK3

### Note

*One heating circuit can be allocated to the Vitotrol 200A.*

*Up to three heating circuits can be allocated to the Vitotrol 300A.*

*If the heating circuit allocation is later cancelled, reset coding address A0 for this heating circuit to 0 (fault message bC, bd, bE).*

## Electronic combustion controller

The electronic combustion controller utilises the physical correlation between the level of the ionisation current and the air factor  $\lambda$ . For all gas qualities, the maximum ionisation current results with air factor 1.

The ionisation signal is evaluated by the combustion controller, and the air factor is adjusted to between  $\lambda=1.24$  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.

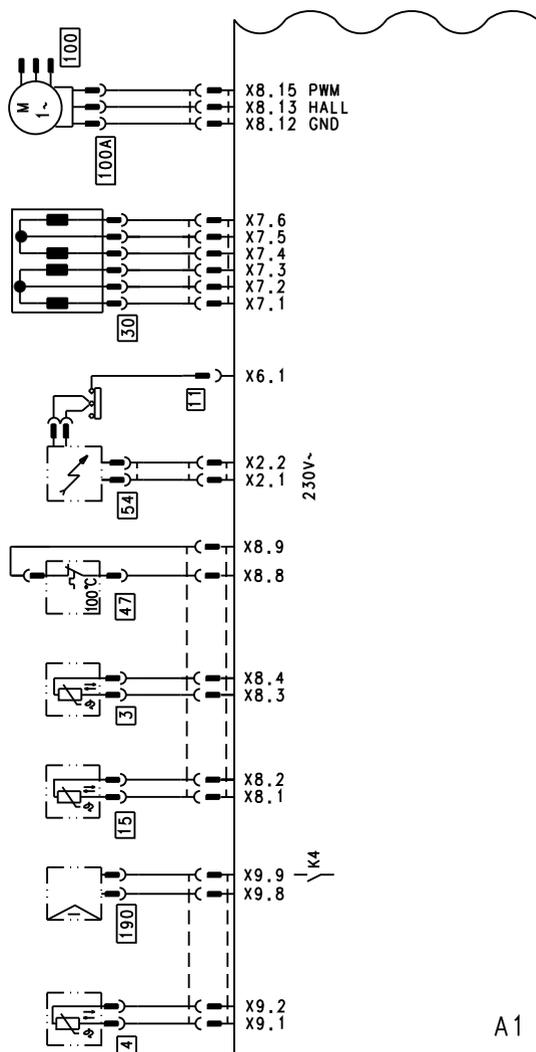
To check the combustion quality, the CO<sub>2</sub> content or the O<sub>2</sub> content of the flue gas is measured. The actual values enable the prevailing air factor to be determined. The relationship between the CO<sub>2</sub> or O<sub>2</sub> content and air factor  $\lambda$  is illustrated in the following table.

**Electronic combustion controller (cont.)****Air factor  $\lambda$  – CO<sub>2</sub>/O<sub>2</sub> content**

<b>Air factor <math>\lambda</math></b>	<b>O<sub>2</sub> content (%)</b>	<b>CO<sub>2</sub> content (%) for natural gas H</b>	<b>CO<sub>2</sub> content (%) for LPG P</b>
1.24	4.4	9.2	10.9
1.27	4.9	9.0	10.6
1.30	5.3	8.7	10.3
<b>1.34</b>	<b>5.7</b>	<b>8.5</b>	<b>10.0</b>
1.37	6.1	8.3	9.8
1.40	6.5	8.1	9.6
1.44	6.9	7.8	9.3

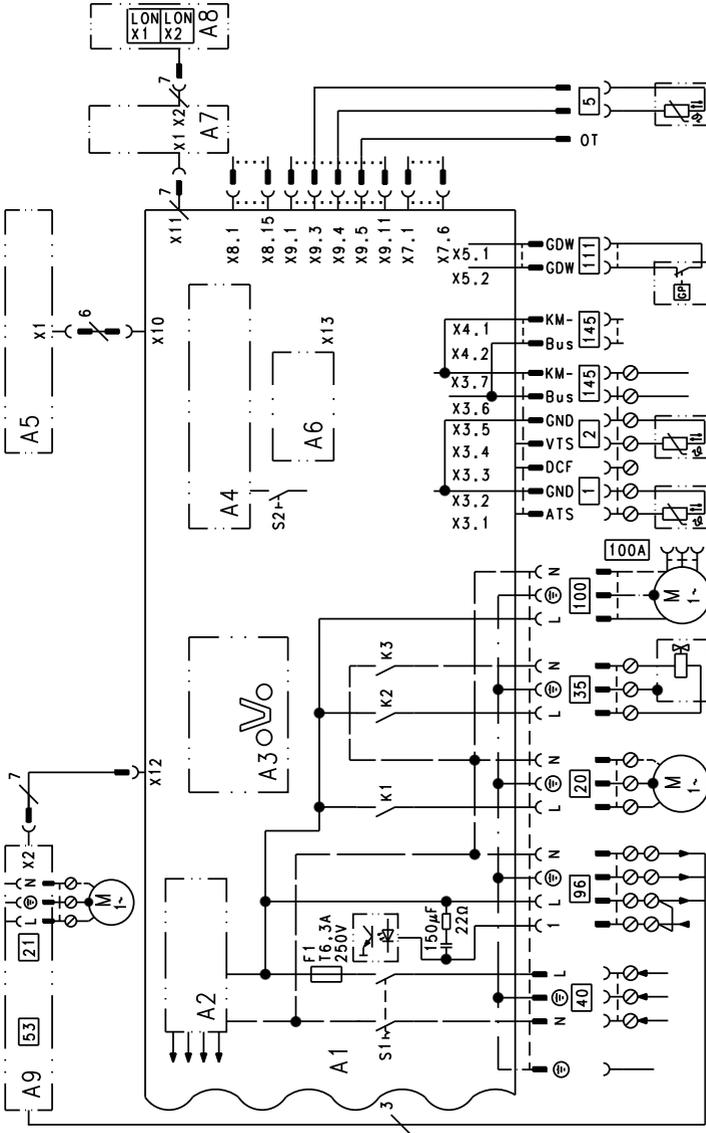
To achieve an optimum combustion control, the system regularly carries out an automatic self-calibration; also after a power failure (shutdown). For this, the combustion is briefly regulated to max. ionisation current (equals air factor  $\lambda=1$ ). The automatic calibration is carried out shortly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

## Internal connection diagram



- |      |                                 |     |                                  |
|------|---------------------------------|-----|----------------------------------|
| A1   | Main PCB                        | 30  | Stepper motor for diverter valve |
| X... | Electrical interfaces           | 47  | Thermal circuit breaker          |
| 3    | Boiler water temperature sensor | 54  | Ignition unit                    |
| 4    | Outlet temperature sensor       | 100 | Fan motor                        |
| 11   | Ionisation electrode            | 100 | Fan motor control                |
| 15   | Flue gas temperature sensor     | 190 | Modulation coil                  |

## External connection diagram



- |    |                   |    |                     |
|----|-------------------|----|---------------------|
| A1 | Main PCB          | A4 | Burner control unit |
| A2 | Power supply unit | A5 | Programming unit    |
| A3 | Optolink          | A6 | Coding card         |

## External connection diagram (cont.)

A7	Connection adaptor	20	Internal circulation pump
A8	LON communication module	35	Gas solenoid valve
A9	Internal extension H1	40	Power supply [terminals]
S1	ON/OFF switch	96	Power supply accessories and Vitotrol 100
S2	Reset button		
X...	Electrical interfaces	100	Fan motor
1	Outside temperature sensor	100A	Fan motor control
2	Flow temperature sensor, low loss header	111	Gas pressure limiter
5	Cylinder temperature sensor (plug on the cable harness)	145	KM BUS

## Parts lists

### Spare parts information

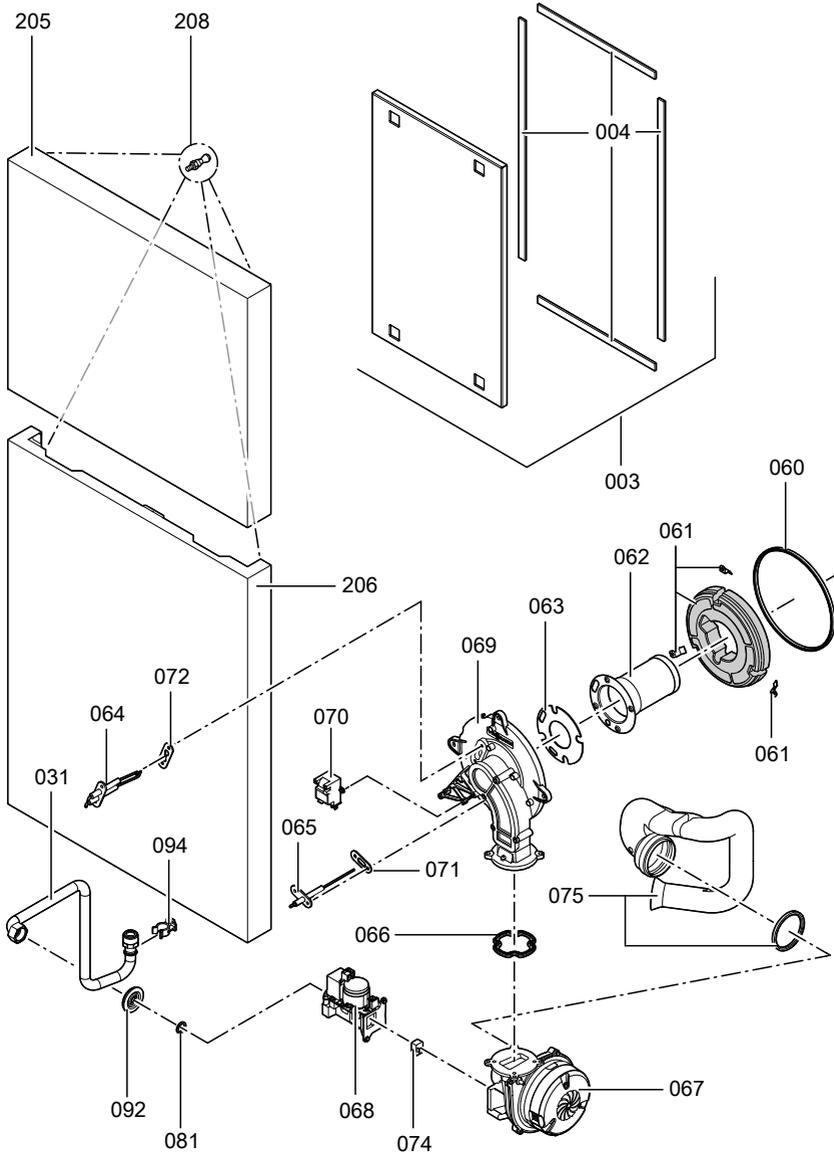
Quote the part and serial no. (see type plate) and the item number of the required part (as per this parts list).

Obtain standard parts from your local supplier.

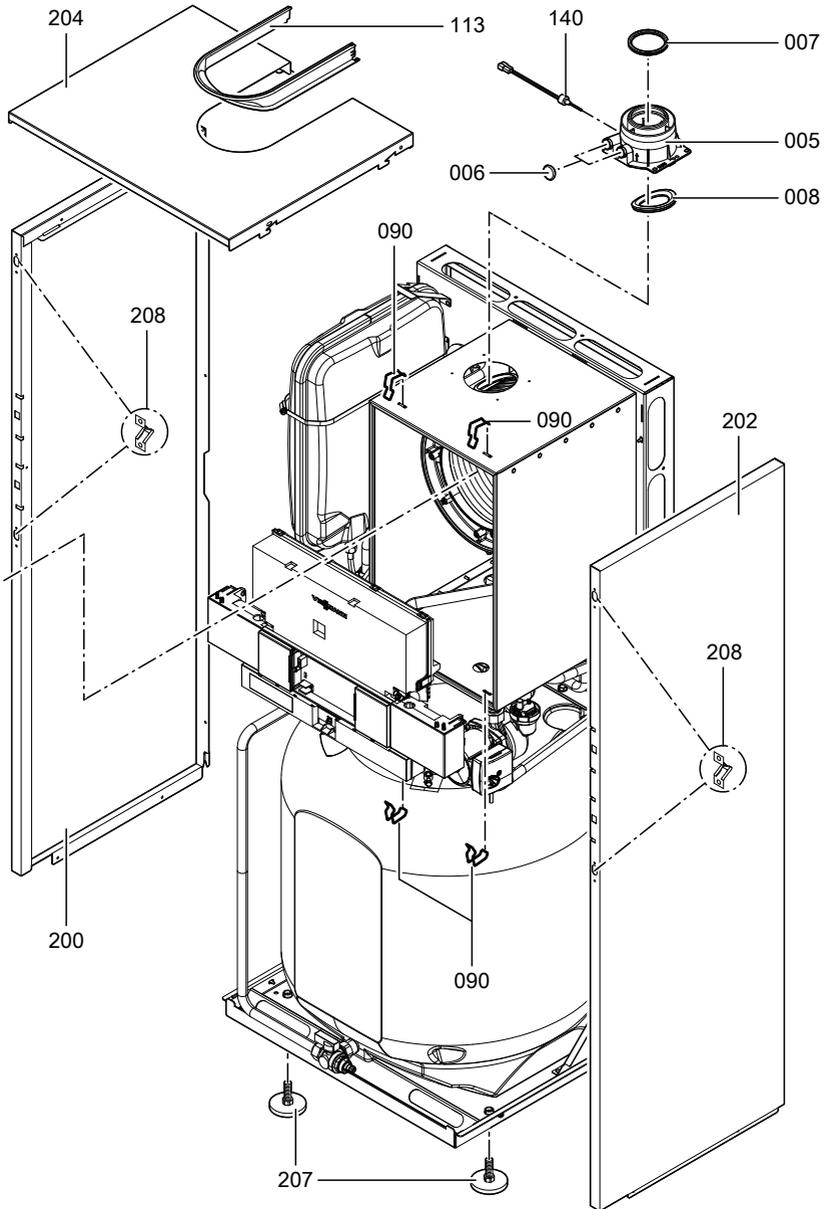
- |     |  |     |  |
|-----|--|-----|--|
| 001 | Diaphragm expansion vessel                       | 037 | DHW connection pipe                            |
| 002 | Connection line; diaphragm expansion vessel      | 038 | Heating water flow connection pipe             |
| 003 | Cap panel with gasket                            | 039 | Cold water connection                          |
| 004 | Profiled seal                                    | 040 | Return connection pipe                         |
| 005 | Boiler flue connection                           | 050 | Flow unit                                      |
| 006 | Plug   | 051 | Return unit                                    |
| 007 | Ventilation air gasket                           | 052 | Overflow valve                                 |
| 008 | Flue gas gasket                                  | 053 | Plug $\varnothing$ 8/10                        |
| 010 | Heat exchanger                                   | 054 | Plate heat exchanger                           |
| 011 | Moulded hose, return                             | 055 | Profiled gasket                                |
| 012 | Condensate hose                                  | 056 | Valve insert                                   |
| 013 | Siphon   | 057 | Overflow pipe                                  |
| 015 | Hose (2300 mm long)                              | 062 | Burner gauze assembly                          |
| 016 | Hose (500 mm long)                               | 063 | Burner gauze assembly gasket                   |
| 017 | Hose (270 mm long)                               | 066 | Fan flange gasket                              |
| 019 | Condensate collector                             | 067 | Fan  |
| 021 | Safety valve                                     | 068 | Gas train                                      |
| 023 | Hose ferrule                                     | 069 | Burner door                                    |
| 024 | Right-angle shut-off valve, DHW cylinder heating | 070 | Ignition unit                                  |
| 025 | Connection line, DHW heating                     | 071 | Ionisation electrode gasket                    |
| 026 | Bezel  | 072 | Ignition electrode gasket                      |
| 027 | Non-return valve                                 | 074 | Gas nozzle                                     |
| 028 | Air vent valve G $\frac{3}{8}$                   | 075 | Venturi extension                              |
| 029 | Pressure gauge                                   | 080 | Gasket set A 16 x 24 x 2.0                     |
| 030 | Right-angle shut-off valve, cylinder cold water  | 081 | Gasket set A 17 x 24 x 2.0                     |
| 031 | Gas pipe   | 082 | Gasket set A 10 x 15 x 1.5                     |
| 032 | Flow pipe  | 084 | Gasket 23 x 30 x 2.0 (5 pce)                   |
| 033 | Connection pipe, cold water, cylinder            | 085 | O-ring gasket set 17.86 x 2.62                 |
| 034 | Heating water flow connection pipe               | 087 | O-ring 14.3 x 2.4 (5 pce)                      |
| 035 | Connection pipework, heating water return        | 088 | O-ring 35.4 x 3.6 (5 pce)                      |
| 036 | Connection pipework, cold water                  | 089 | Set of plug connector retainers                |
|     |  | 090 | Toggle fastener (4 pce)                        |
|     |  | 092 | Grommet  |
|     |  | 093 | Pipe clip $\varnothing$ 18                     |
|     |  | 094 | Pipe clip $\varnothing$ 18/1.5                 |
|     |  | 095 | Hose clip DN 25                                |
|     |  | 096 | Clip $\varnothing$ 8 (5 pce)                   |
|     |  | 097 | Clip $\varnothing$ 10 (5 pce)                  |
|     |  | 098 | Clip $\varnothing$ 15 (5 pce)                  |
|     |  | 099 | Clip $\varnothing$ 18 (5 pce)                  |
|     |  | 100 | Hose clip $\varnothing$ 34.3 - 38.7            |
|     |  | 101 | Worm-drive hose clip $\varnothing$ 34.0 - 37.4 |



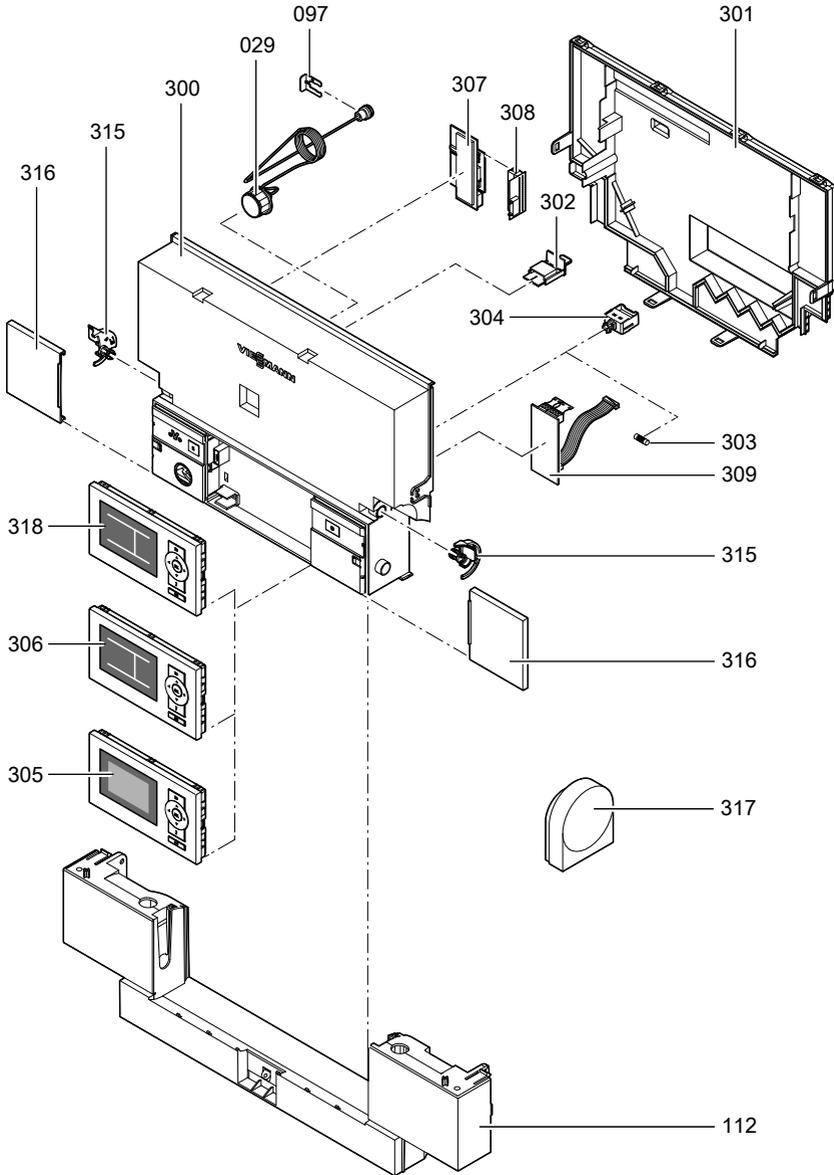
**Parts lists** (cont.)



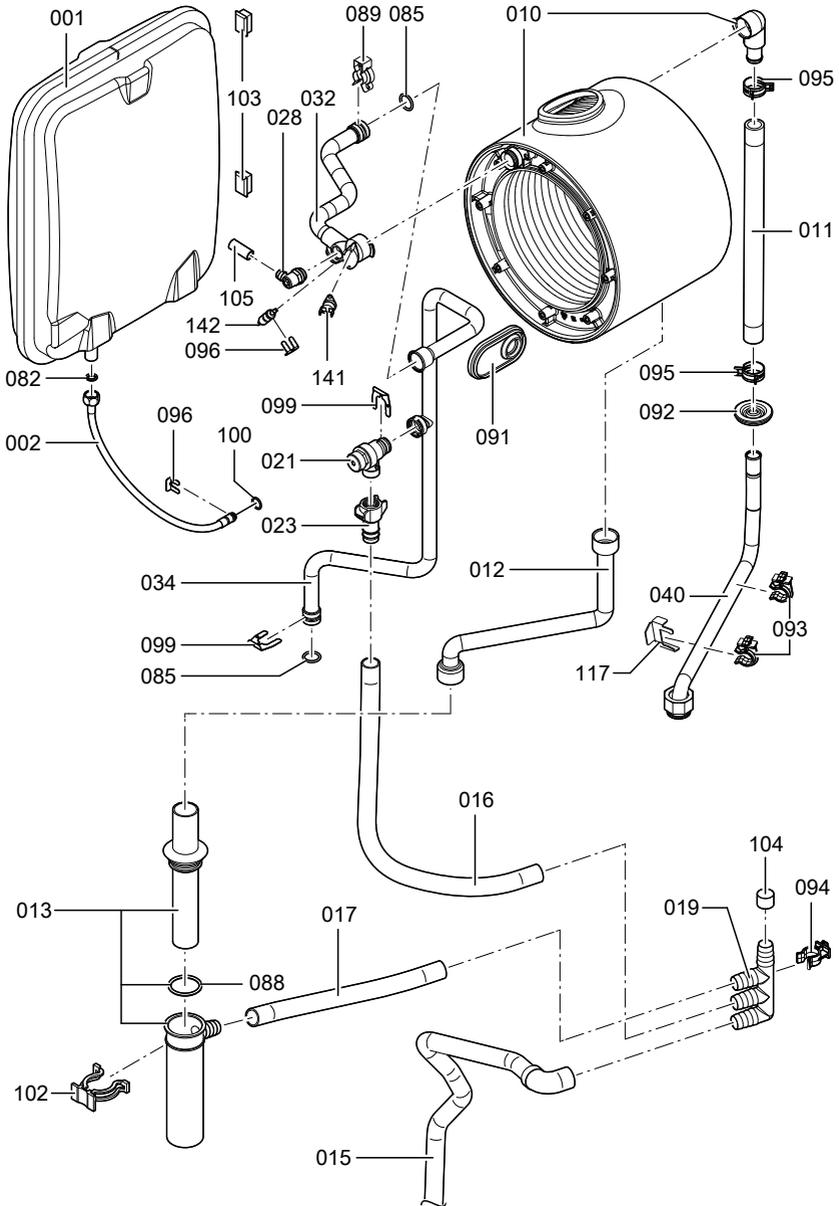
**Parts lists** (cont.)



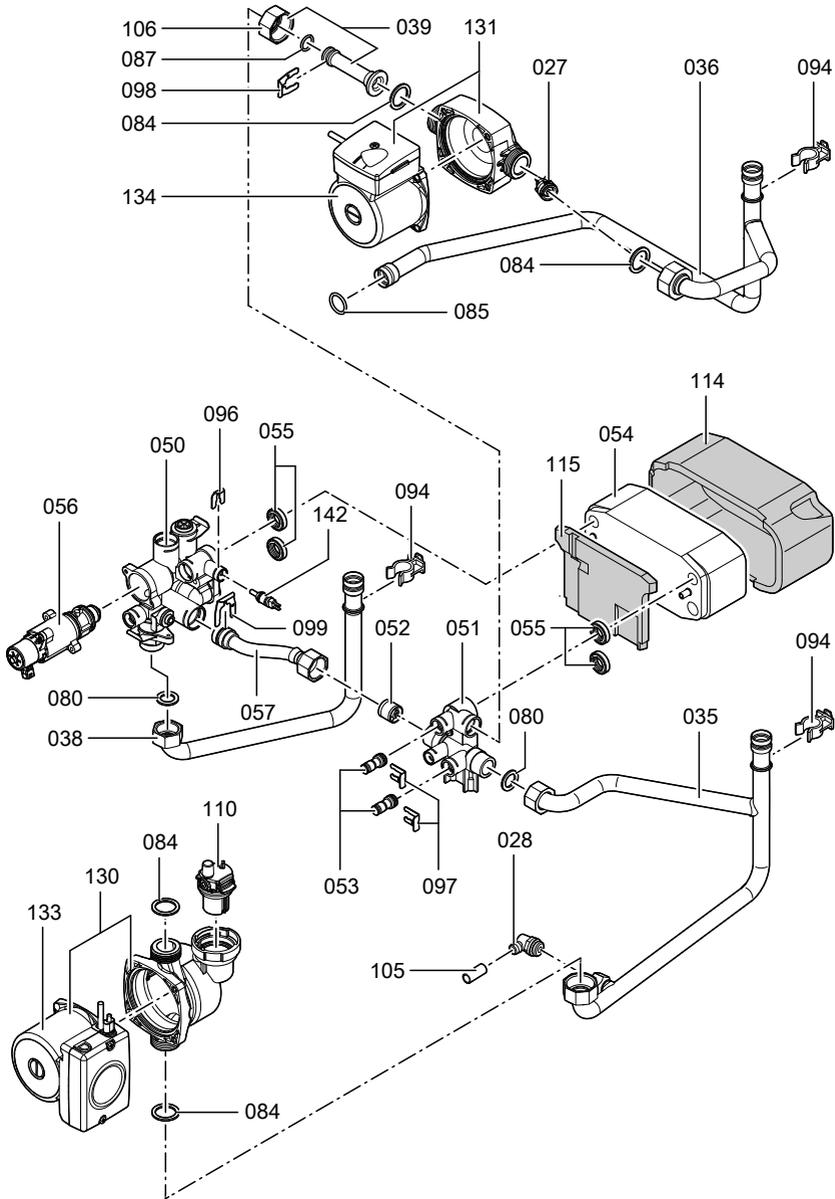
**Parts lists** (cont.)



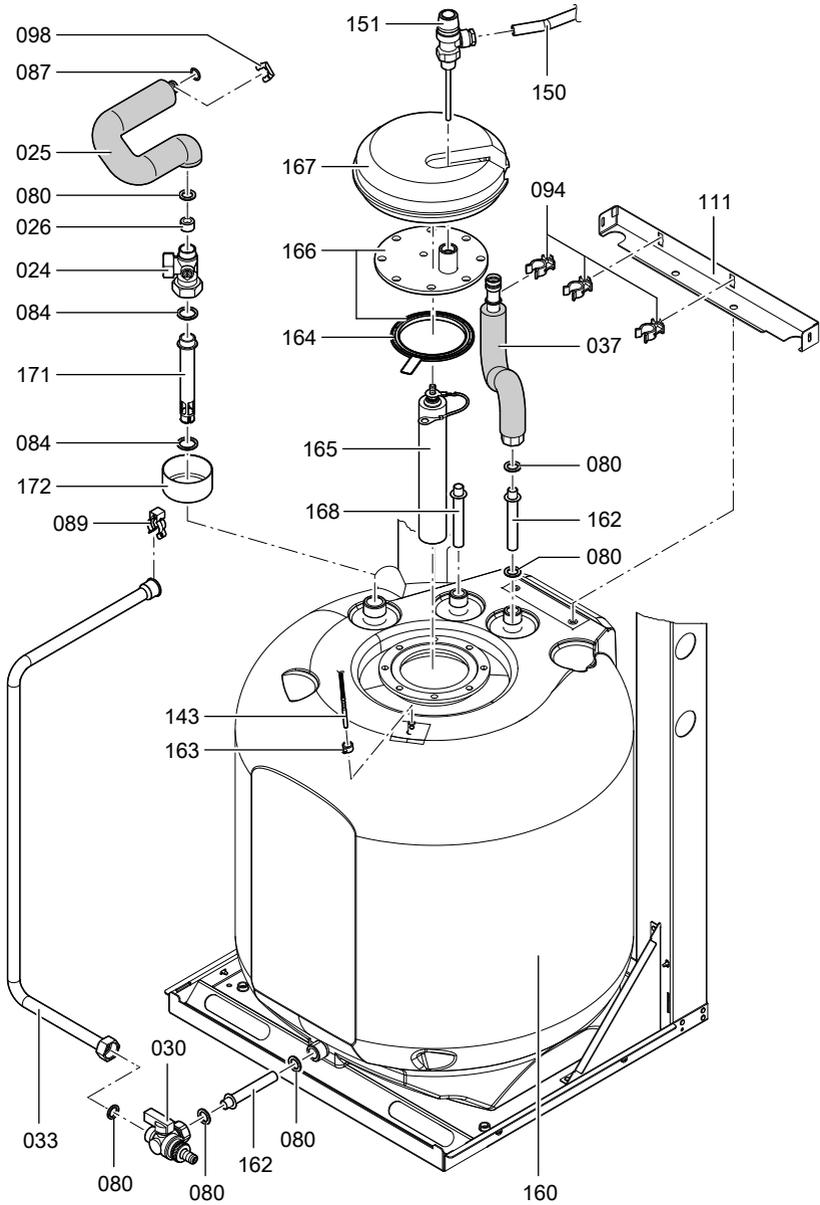
**Parts lists** (cont.)



**Parts lists (cont.)**



**Parts lists** (cont.)



5458 303 GB

Service

## Commissioning/service reports

Setting and test values	Date: By:	Set value	Commissioning	Service
<b>Static pressure</b>	<i>mbar</i>	max. 57.5 mbar		
<b>Supply pressure (flow pressure)</b>				
<input type="checkbox"/> for natural gas H	<i>mbar</i>	17.4-25 mbar		
<input type="checkbox"/> for LPG	<i>mbar</i>	25-47 mbar		
<i>Tick gas type</i>				
<b>Carbon dioxide content CO<sub>2</sub></b>				
■ at lower output	<i>% by vol.</i>			
■ at upper output	<i>% by vol.</i>			
<b>Oxygen content O<sub>2</sub></b>				
■ at lower output	<i>% by vol.</i>			
■ at upper output	<i>% by vol.</i>			
<b>Carbon monoxide content CO</b>				
■ at lower output	<i>ppm</i>			
■ at upper output	<i>ppm</i>			

## Specification

Rated voltage	230 V	Electronic temperature limiter setting	81 °C
Rated frequency	50 Hz	Temperature limiter setting	100 °C (fixed)
Rated current	6 A	Line fuse (mains)	max. 16 A
Protection class	I		
IP rating	IP X 4 D to EN 60529		
Permissible ambient temperature			
■ during operation	0 to +40 °C		
■ during storage and transport	-20 to +65 °C		

### Gas boilers

<b>Rated output range</b>				
at $T_V/T_R$ 50/30 °C	kW	4.8 to 19	6.5 to 26	8.8 to 35
at $T_V/T_R$ 80/60 °C	kW	4.3 to 17.5	5.9 to 24.1	7.9 to 32.2
<b>Rated output</b>				
for DHW heating	kW	4.3 to 17.5	5.9 to 26.4	7.9 to 35.6
<b>Rated thermal load range</b>				
	kW	4.5 to 17.9	6.2 to 30.5	8.3 to 34.9
<b>Power consumption</b>				
	W	90	105	138
<b>Connection values</b>				
in relation to the max. load				
Natural gas H	m <sup>3</sup> /h	1.89	3.23	3.86
LPG P	kg/h	1.40	2.39	2.85
<b>Product ID</b>		CE-0085BU0051		
Cylinder heat-up time, 15 to 60 °C		19 mins		
Cylinder heat-up time, 70% volume		15 mins		

### Note

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

## Declaration of conformity

### Declaration of conformity for the Vitodens 222-F

We, Viessmann Werke GmbH & Co KG, D-35107 Allendorf, confirm as sole responsible body that the product **Vitodens 222-F** complies with the following standards:

DIN 4753	EN 55 014
EN 483	EN 60 335-1
EN 625	EN 60 335-2-102
EN 677	EN 61 000-3-2
EN 806	EN 61 000-3-3
EN 12897	EN 62 233

In accordance with the following Directives, this product is designated **CE-0085**:

97/23/EC	2006/ 95/EC
92/42/EEC	2009/142/EC
2004/108/EC	

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

Allendorf, 1 March 2010

Viessmann Werke GmbH&Co KG



pp. Manfred Sommer

**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** complies with the NO<sub>x</sub> limits specified by the 1st BImSchV paragraph 7 (2) [Germany].

Allendorf, 1 March 2010

Viessmann Werke GmbH&Co KG

A handwritten signature in black ink, appearing to read 'M. Sommer', written in a cursive style.

pp. Manfred Sommer

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## Applicability

### Gas condensing storage combi boiler

Type FS2B	from serial no.
4.8 to 19 kW	7438 012 ...
6.5 to 26 kW	7438 013 ...
8.8 to 35 kW	7438 014 ...

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Subject to technical modifications.

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