

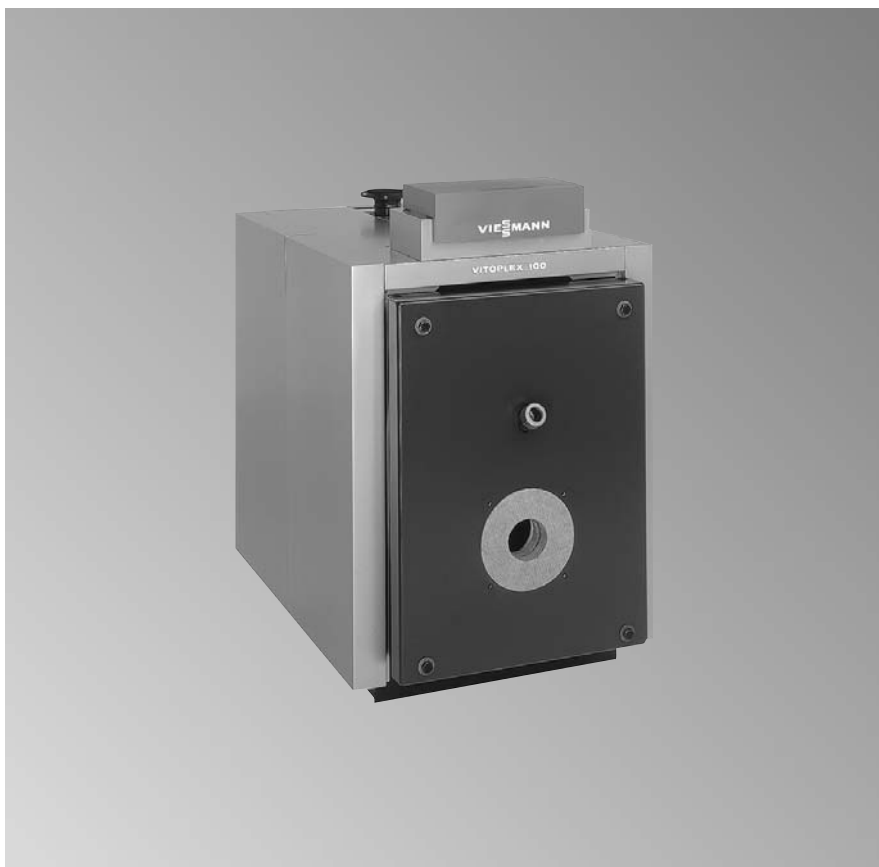
Service instructions for heating engineers

VIESSMANN

Vitoplex 100
Type PV1
Oil/gas fired boilers



VITOPLEX 100



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 registered gas fitter.
- Electrical work 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.

If you notice a smell of gas



Danger

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

- Do not smoke! Prevent naked flames and sparks. Never switch electrical lights or equipment.
- Open windows and doors.
- Close the gas shut-off valve.
- Shut down the heating system.
- Remove all people from the danger zone.
- Observe the safety regulations of your local gas supplier found on the gas meter.

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 heating system

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

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 infringe our warranty conditions. For replacements, use only original spare parts from Viessmann or those which are approved by Viessmann.

Operating and service documents

1. Complete and detach the customer registration card:
 - Give the system user this part for safe-keeping.
 - Retain the heating engineer part.
2. Keep all parts lists, operating and service instructions in the folder and hand this over to the system user. The installation instructions will not be required after the installation is completed, and may therefore be discarded.

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Steps – Initial start-up, inspection and maintenance

For further instructions on individual steps, see pages indicated.

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Further details regarding the individual steps

System start-up



Operating instructions, service instructions – control unit and burner

1. Check that the turbulators are fully pushed into the hot gas flues (see page 10). Open the boiler door for this.
2. Check that the boiler room ventilation aperture is open.
3. Fill the heating system with water and ventilate the system.
Permiss. operating pressure 5 bar



Please note

If you **do not** fill your heating system **with soft heating water**, but instead with water which meets the requirements stated under "Heating water requirements" on page 20, you **must** observe the following during commissioning to prevent a build-up of scale:

Scaling of your boiler can be influenced when commissioning your heating system, by the way it is started up.

By starting with low output or slow heating up in stages, scaling generally takes place evenly over the entire heating surface, i.e. not predominantly on the walls with the greatest thermal density.

For multi-boiler systems, we recommend taking **all boilers** into use **simultaneously**. Where only one boiler in a multi-boiler system is taken into use, the entire scaling (calcium content) is concentrated on the heating surface of that one boiler.

If commissioning with only one boiler cannot be avoided, the maximum fill and top-up water volume is determined **only** on the output **of the one boiler**, and not on the output of the entire heating system.

No particular steps are required during commissioning, if you fill the heating system with softened water.

Note

Enter the fill volume and concentration of calcium hydrogen carbonate on page 14.

4. Check the system pressure.
5. Check the fuel oil level or the gas supply pressure.

Further details regarding the individual steps (cont.)

6. Open the flue gas damper (where appropriate).
7. Check whether the cleaning aperture on the flue outlet is closed.
8. Open the shut-off valves in the oil or gas supply pipe.
9. Switch ON the mains electrical isolator, the switch for the heating circuit pump and the burner ON/OFF switch in the order listed here (observe the burner manufacturer's instructions).
10. When heating the system from cold (also when restarting after maintenance and cleaning work), prevent all heat transfer to consumers, in order to clear the dew point range as quickly as possible.
11. After the flow temperature has been reached, sequentially switch on the heat consumers and change over to automatic mode.
12. Check all gaskets/seals and plugs for leaks and retighten if necessary.
13. Check the boiler door and clean-out cover after approx. 50 hours and retighten all screws.

Further details regarding the individual steps (cont.)

System shutdown



Danger

Only open the heating water connections after the boiler has been de-pressurised.

Drain the boiler with a vacuum pump only when the air vent valve has been cracked open.

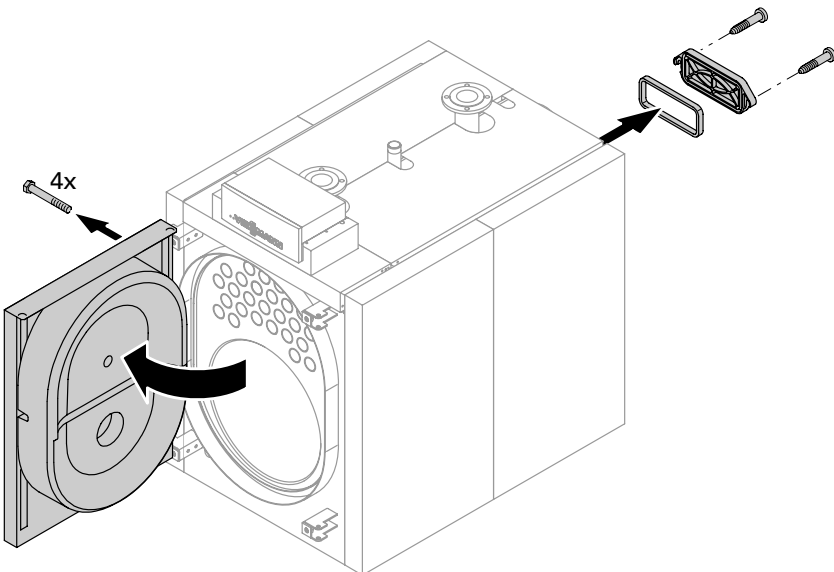
Closing Vitoair draught stabiliser (if installed)

1. Switch ON the burner.
2. Switch OFF the system, when pre-purge is running. This closes the control disc.

Opening boiler door and clean-out cover

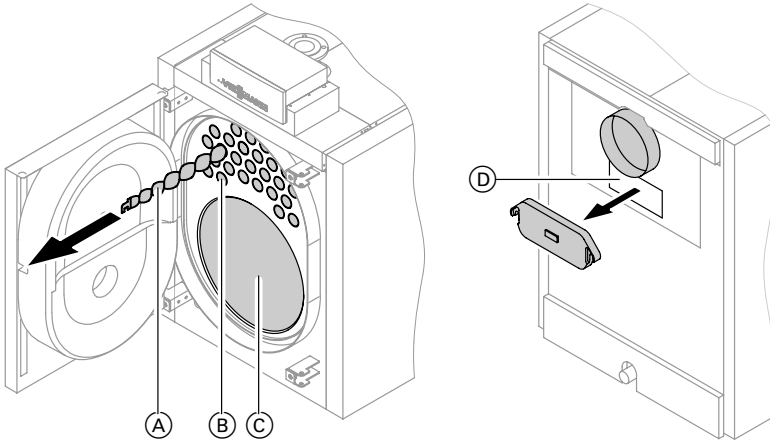
Note

Remove the gas supply pipe on gas burners.



Further details regarding the individual steps (cont.)

Cleaning turbulators, heating surface, flue outlet and flue pipe



1. Remove turbulators (A) without force. For this, use the turbulator extractor supplied.

2. Clean flues (B) and combustion chamber (C) with the brush supplied. Remove combustion residues with a vacuum cleaner.

3. Remove combustion residues from the flue pipe and the flue outlet through the clean-out aperture in flue outlet (D) using a vacuum cleaner.

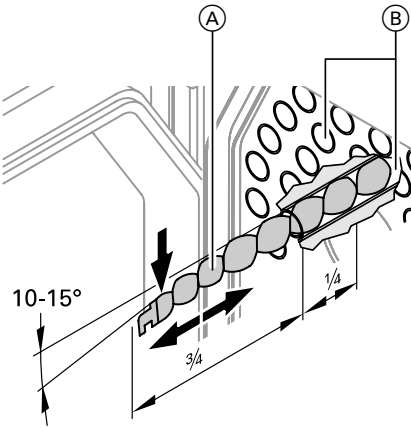
Further details regarding the individual steps (cont.)

Inserting turbulators



Please note

Burner adjustments and specific system conditions can lead the turbulators to move forward, which may result in them being burnt. The thermal insulation on the boiler door can also be damaged by this.



1. Pull approx $\frac{3}{4}$ of the length of turbulators (A) out of flue gas pipes (B).
2. Bend turbulators approx. 10-15°.
3. Insert the turbulators into the flue gas pipes until they meet the end stop. When doing this, check the preliminary tension.

Note

Turbulators must not be able to be pulled from the flue gas pipes easily.

Further details regarding the individual steps (cont.)

Securing boiler door and clean-out cover

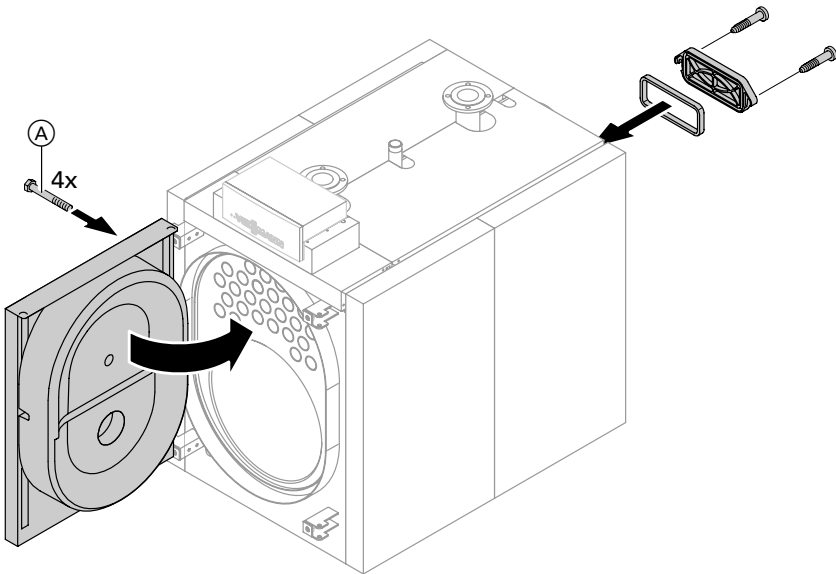
Note

Refit the gas supply pipe on gas burners.



Danger

Carry out a leak test on all gas supply connections.



Ⓐ Tighten the screws diagonally.

Further details regarding the individual steps (cont.)

Checking function of all safety equipment

Check the safety valves and the water level and pressure limiters in accordance with manufacturer's instructions.

Checking diaphragm expansion vessel and system pressure

Observe the diaphragm expansion vessel manufacturer's instructions. Carry out this test on a cold system.

Pump controlled pressure maintaining systems



Please note

In heating systems with automatic pressure maintaining equipment and/or de-gassing systems (operating according to the pressure reduction method for de-gassing), we recommend the installation of a diaphragm expansion vessel (DEV) as individual boiler protection. The diaphragm expansion vessel must be able to hold the heating water expansion volume inside the boiler, and provide a capacity of at least 35 litres.

This diaphragm expansion vessel reduces the frequency and severity of pressure fluctuations; the service life of the pressure pump is improved and consequently the operational reliability and service life of system components also improve.

Damage on boiler or other system components may result if these recommendations are not followed.

Carry out all checks in accordance with manufacturer's instructions. Limit pressure fluctuations to the lowest possible differential. Cyclical pressure fluctuations and more significant pressure differentials point towards a system fault. Immediately remedy such faults, otherwise other heating system components may become faulty.

Further details regarding the individual steps (cont.)

Diaphragm expansion vessels

1. Drain the system or close the cap valve on the diaphragm expansion vessel and reduce the pressure, until the pressure gauge indicates "0".
2. If the inlet pressure of the diaphragm expansion vessel is lower than the static system pressure, top up with enough nitrogen to raise the inlet pressure 0.1 to 0.2 bar higher than the static system pressure.
The static pressure corresponds to the static height.
3. Top up the heating system with water, until the filling pressure of a cool system is 0.1 to 0.2 bar higher than the inlet pressure of the diaphragm expansion vessel.
Permiss. operating pressure 5 bar

Note

The inlet pressure of the diaphragm expansion vessel (p_0) comprises the static system pressure (p_{St}) (= static head) and a supplement ($p_0 = p_{St} + \text{supplement}$). The supplement is subject to the settings of the high limit safety cut-out. It corresponds to the high limit safety cut-out setting as follows:

- 100 °C 0.2 bar
- 110 °C 0.7 bar.

Further details regarding the individual steps (cont.)

Checking water quality

For requirements, see page 20.

Enter the quantity of top-up water and the respective calcium hydrogen carbonate concentration $[Ca(HCO_3)_2]$ into the table.

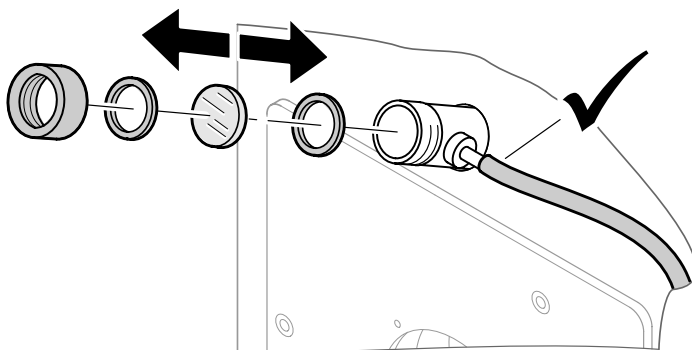
Fill water m ³	Top-up water m ³	Meter reading m ³	Total water volume m ³	Concentration $[Ca(HCO_3)_2]$ mol/m ³	Water treatment		Date
					Agent	Metering volume	
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____	_____	_____	_____

Max. fill volume: m³

5692 576 GB

Further details regarding the individual steps (cont.)

Cleaning sight glass in boiler door



Check gaskets and hose connection for leaks.

Checking mixer for easy operation and leaks

1. Remove the motorised lever from the mixer handle, and check the mixer for ease of movement.
2. Check the mixer for leaks. Replace the O-rings if the mixer leaks.
3. Snap the motorised lever into place.

Checking Vitoair draught stabiliser (if installed)

Release the latch on the control disc. The control disc must swing freely during burner operation.

Further details regarding the individual steps (cont.)

Burner adjustment



For burner settings, see separate burner documentation.

Adjust the highest oil or gas throughput of the burner to the rated boiler output.

Rated output kW	Pressure drop on hot gas side	
	Pa	mbar
110-150	70	0.7
151-200	130	1.3
201-250	140	1.4
251-310	220	2.2
311-400	250	2.5
401-500	260	2.6
501-620	360	3.6

To protect the system against dew point corrosion, burner stage 2 (full output) must be set to the rated boiler output and must not be switched OFF even in summer (stage 2 constant standby).

Operation with burner load $\geq 60\%$

The minimum boiler water temperature is 50 °C for oil fired operation and 60 °C for gas fired operation. To protect the boiler, the minimum output at the base load stage is set to 60% of rated output.

Rated output kW	Minimum output to be set (burner stage 1) kW
110-150	90
151-200	120
201-250	150
251-310	186
311-400	240
401-500	300
501-620	372

A minimum flue gas temperature is required for the base load stage, the value of which is subject to the design of the flue gas system.

Operation with burner load $< 60\%$

The minimum boiler water temperature is 60 °C for oil fired operation and 65 °C for gas fired operation. Set the minimum heating output for the base load stage according to the conditions of the flue gas system. Note that the flue gas system must be suitable for the low flue gas temperatures which may arise.

Parts list

When ordering spare parts

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

Obtain common parts from your local supplier.

Parts

- 001 Door
- 002 Stud
- 003 Sight glass pack, comprising:
item 004 to 008
- 004 Hose
- 005 Sight glass closure
- 006 Sight glass with item 007
- 007 Seal ring
- 008 Hose coupling nipple
- 009 Hose pack \varnothing 18 mm
- 010 Insulating block
- 011 Insulating mat I
- 013 Packing 20 × 15 mm
- 014 Turbulator
- 015 Gasket
- 016 Clean-out cover
- 017 Packing 10 × 10 mm
- 018 Sensor well
- 200 Top front panel
- 201 Top rear panel
- 202 Bottom rear panel
- 203 Side panel, r.h. front and
l.h. back
- 204 Side panel, l.h. front and
r.h. back
- 205 R.h. top panel
- 206 L.h. top panel
- 207 Insulating casing
- 208 Rear insulating mat
- 209 Vitoplex logo
- 210 Control unit bracket

Parts not shown

- 300 Installation instructions
- 301 Service instructions
- 303 Insulation pack
- 304 Touch-up spray, Vitosilver
- 305 Touch-up paint stick, Vitosilver

Accessories

- 020 Brush handle
- 021 Extension
- 022 Brush handle

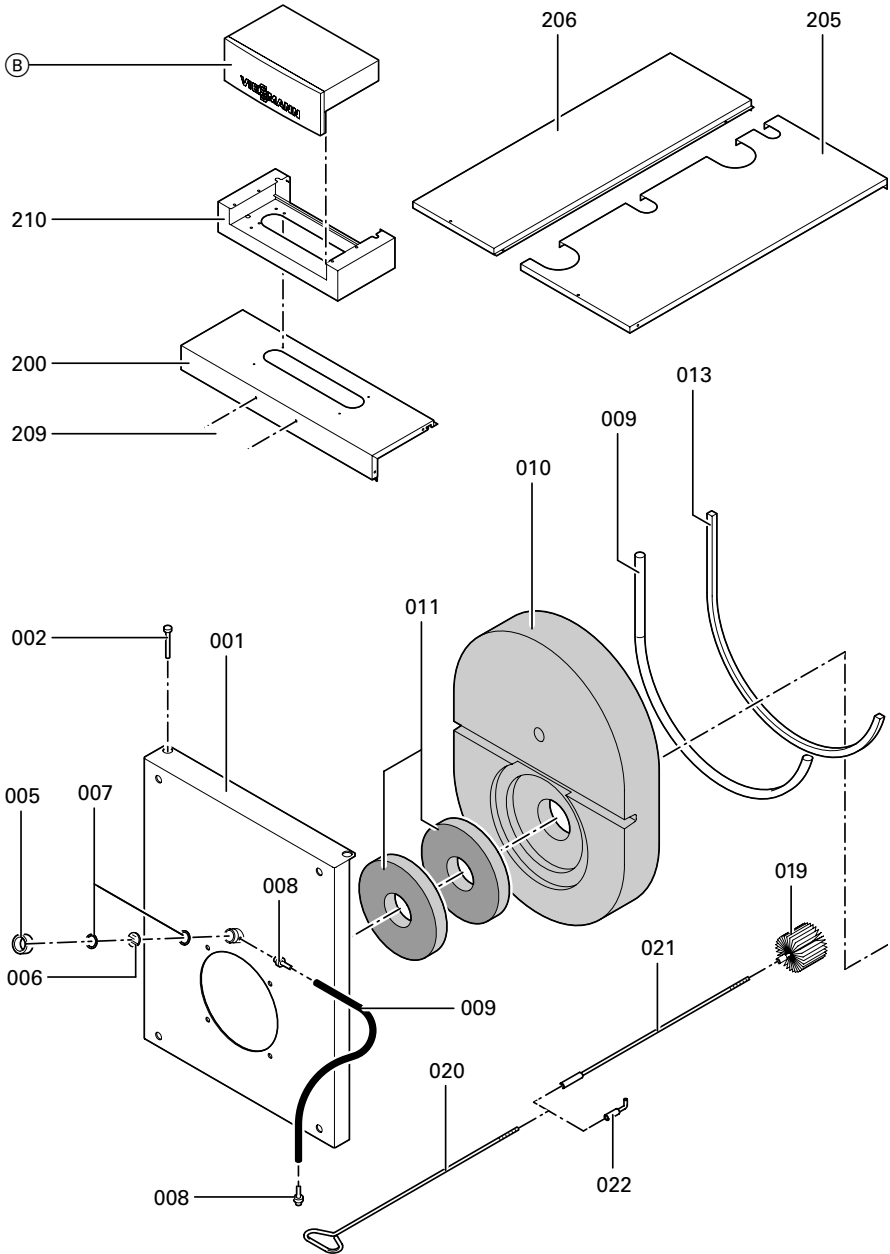
Wear parts

- 019 Cleaning brush

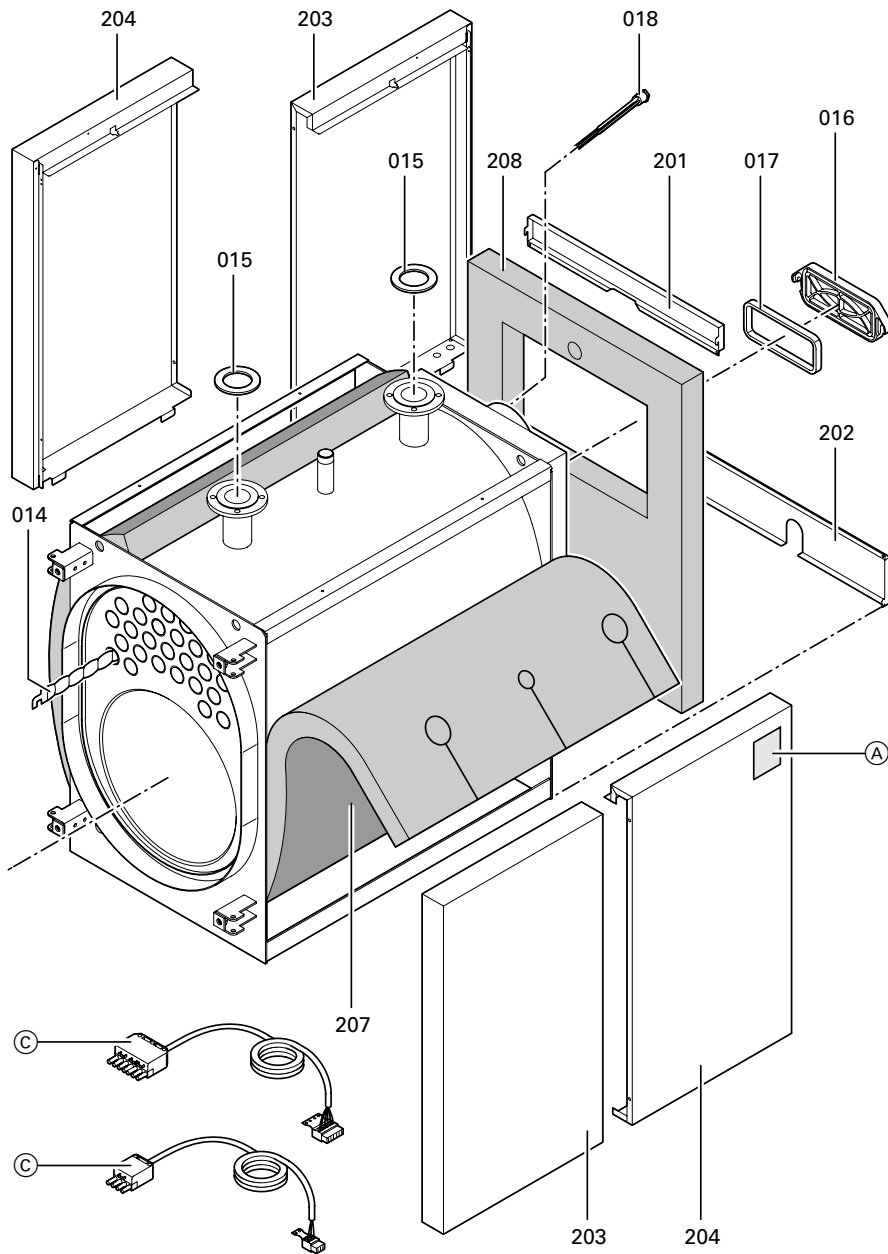
- Ⓐ Type plate, optionally l.h. or r.h. side
- Ⓑ Boiler control unit, see parts list in the boiler control unit service instructions
- Ⓒ Burner cable, see parts list in the boiler control unit service instructions

Parts list

Parts list (cont.)



Parts list (cont.)



Water quality requirements (VDI 2035)

Heating systems with rated operating temperatures up to 100 °C (VDI 2035)

Heating water requirements

Total boiler output of the system [\dot{Q}]	Calcium hydrogen carbonate concentration [$\text{Ca}(\text{HCO}_3)_2$] of fill and top-up water	Maximum permissible fill and top-up water volume [V_{max}]
$100 \text{ kW} < \dot{Q} \leq 350 \text{ kW}$	$\text{Ca}(\text{HCO}_3)_2 \leq 2.0 \text{ mol/m}^3$	$V_{\text{max}} [\text{m}^3] =$ three times the system volume
$350 \text{ kW} < \dot{Q} \leq 1000 \text{ kW}$	$\text{Ca}(\text{HCO}_3)_2 \leq 1.5 \text{ mol/m}^3$	or $V_{\text{max}} [\text{m}^3] = 0.0313 \times \frac{\dot{Q} [\text{kW}]}{\text{Ca}(\text{HCO}_3)_2 [\text{mol/m}^3]}$

^{*1}The requirements for systems with $\dot{Q} > 100 \text{ kW}$ apply to the replacement of the boiler in systems originally with $\dot{Q} > 100 \text{ kW}$ and a system water volume $\geq 20 \text{ litre/kW}$.

Specification

Rated output	kW	110 to 150	151 to 200	201 to 250	251 to 310	311 to 400	401 to 500	501 to 620
Flue gas values *1								
Temperature (at boiler water temperature 60 °C)								
– at rated output	°C	200	200	200	200	200	200	200
– at partial load	°C	140	140	140	140	140	140	140
Temperature (at boiler water temperature 80 °C)								
– at rated output	°C	215	215	215	215	215	215	215
Product ID	CE-0085 BP 0365							
Product characteristics (to EnEV)								
Efficiency η at								
– 100% of rated output	%	91.2	91.3	91.4	91.5	91.5	91.6	91.7
– 30% of rated output	%	95.7	95.7	95.8	95.8	95.8	96.0	96.1
Standby losses $q_{B,70}$	%							
Power consumption *2								
at								
– 100% of rated output	W	465	529	606	678	744	854	950
– 30% of rated output	W	155	176	202	226	248	285	317

*1 Values for calculating the size of the flue system to EN 13384 based on 13% CO₂ for fuel oil EL and 10% CO₂ for natural gas.

Flue gas temperature measured at 20 °C combustion air temperature.

*2 Standard characteristics

Commissioning/service report

	Initial start-up	Maintenance/service	Maintenance/service
date:			
by:			

	Maintenance/service	Maintenance/service	Maintenance/service
date:			
by:			

	Maintenance/service	Maintenance/service	Maintenance/service
date:			
by:			

	Maintenance/service	Maintenance/service	Maintenance/service
date:			
by:			

	Maintenance/service	Maintenance/service	Maintenance/service
date:			
by:			

Declaration of conformity

We, Viessmann Werke GmbH&Co KG, D-35107 Allendorf, declare as sole responsible body, that the product

Vitoplex 100, type PV1 with Vitotronic boiler control unit

corresponds to the following standards:

EN 226
EN 267
EN 303
EN 676
EN 14 394
EN 50 082-1
EN 50 165
EN 55 014
EN 60 335
EN 61 000-3-2
EN 61 000-3-3
TRD 702

In accordance with the following guidelines

73/ 23/EEC
89/336/EEC
90/396/EEC
98/ 37/EC

this product is designated as follows:

CE-0085

This product meets the requirements of the Efficiency Directive (92/42/EEC) for:

Standard boiler (boiler < 400 kW)

In addition, this boiler meets the requirements of all current TRD regulations.

The **product characteristics** determined as system values for **Vitoplex 100 as part of EC type testing according to the Efficiency Directive** (see specification table) can be utilised for the energy assessment of heating and ventilation equipment to DIN V 4701-10 specified by the EnEV [Germany].

Manufacturer's certification according to the 1st BImSchV

We, Viessmann Werke GmbH&Co KG, D-35107 Allendorf, confirm that the following product meets the standards set by the 1st BImSchV para.7 (2) [Germany]:

- NO_x limits and
- efficiency level of at least 91 % (boiler < 400 kW):

Vitoplex 100, type PV1

Allendorf, 30 September 2004

Viessmann Werke GmbH&Co KG

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

pp. Manfred Sommer

Keyword index**B**

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