

Operating and service instructions

for contractors

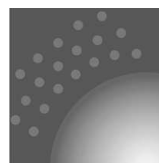
VIESSMANN

Vitomax 200-HW

Type M238

Oil/gas fired high pressure hot water boiler

Combustion output 4.0 to 18.2 MW



VITOMAX 200-HW



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.

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).

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.

Safety instructions (cont.)

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.

Index

Index

Operating information

Operating tips	5
Operational checks	5
Shutdown	6
Maintenance information.....	8

Commissioning, inspection, maintenance

Steps - commissioning, inspection and maintenance	9
Further details regarding the individual steps	11

Additional information

Standard values for water quality	20
---	----

Commissioning/service reports	22
--	----

Keyword index	27
----------------------------	----

Operating tips

According to the Pressure Equipment Directive 97/23/EC, a steam boiler category IV may only be taken into use when the relevant authority has granted permission for the installation of the system, and an authorised expert has tested the system.

The system must be commissioned by the system installer or a qualified person authorised by the installer as well as the relevant expert.

Record all actual values in a commissioning/service report. These values must be confirmed by the expert and the system user.

According to the Pressure Equipment Directive 97/23/EC, hot water boilers category IV may only be operated, supervised and maintained by a trained boilerman.

The relevant authority may grant, upon application, permission to operate the boiler without permanent supervision, subject to it being equipped in accordance with EN 12953 part 6.

In systems comprising several boilers, of which one is constantly used as standby boiler, only change the operation over in longer intervals, e.g. during the annual inspection of the total system.

We would recommend that you operate the boiler constantly at the required operating pressure and temperature.

The continued boiler operation is still advantageous, even if no heat is drawn off for a longer period of time.

Operational checks



Danger

Boiler components that are not thermally insulated can be subject to high temperatures that can result in burns.

Take care with hot surfaces.

Subject to the safety equipment fitted and the details in the permit certificate, either monitor the correct boiler operation constantly, every 24 hours or every 72 hours.

Determine the extent of checks required in accordance with TRD 601, sh. 1, section 7 [or local regulations]. Test the chemical composition of the boiler water and feedwater constantly in accordance with EN 12953 part 10 and VdTÜV datasheet 1466 [or local regulations].

Carry out the following checks **daily** or every 72 hours, subject to boiler version and the manufacturer's specification (see also TRD 601, sh. 1):

- Blow down the boiler (only for boilers without automatic facility; briefly open the valve two or three times at operating pressure).
- Check the water level limiter.
- Check the feed and boiler water.

Operational checks (cont.)

Carry out the following checks

monthly:

- Check the function of the safety valve.
- Check the function of all control and safety equipment.
- Check all connections and closures for leaks.
- Check the installation room ventilation.

Have someone carry out the following checks **every six months** (in accordance with TRD 602 and 604):

- Check the safety equipment.
 - Check the burner.
 - Check the thermal insulation on the hot gas side, i.e. on lids and doors.
- Record the results of the daily, monthly and biannual checks in a log.

Shutdown

To prevent corrosion setting in during idle periods, when the boiler is not pressurised, conserve the boiler surfaces on the flue gas and water sides, subject to the length of the period during which the boiler is taken out of use. There is a differentiation between wet conservation (during which exposure to oxygen is to be avoided) and dry conservation (during which moisture levels are to be minimised).

Brief interruption of operation (1 to 2 days)

Water side

Recommendation: Maintain the boiler pressure and temperature. Where that is not possible and the boiler should be depressurised for several days, we would recommend the following:

To prevent oxygen corrosion, add an oxygen binder with twice to three times the standard dose to the feed-water from approx. one hour before the boiler is shut down.

Flue gas side

Keep the heating surfaces dry.
Remove severe contamination as it binds moisture.

Shutdown (cont.)

Longer interruptions of operation

Water side

Wet conservation, as long as there is no risk of frost

1. Fill the boiler up to the highest possible level with treated feedwater. To prevent oxygen corrosion, add an oxygen binder to the boiler water (e.g. sodium sulphite) in accordance with the manufacturer's instructions. For this, ensure good admixing with the boiler water (thermal or mechanical agitation).
2. If, in multi-boiler systems, only some boilers must be conserved, these can be filled with desalinated boiler water from the boilers that remain in use, which will also maintain the temperature.
3. Maintaining pressure in a fully filled boiler using nitrogen (preferably nitrogen 5.0) of 0.1 to 0.2 bar can prevent corrosion.

Dry conservation in case there is a risk of frost or in case of longer idle periods

Drain the boiler at a temperature between 120 and 140 °C, then open the fittings on the water side. Dry the boiler thoroughly and fill with desiccant (e.g. silica gel) in accordance with the manufacturer's details.

Ensure that the desiccant does not come into contact with the boiler material. Then close the boiler again. Check in regular intervals whether the desiccant is still able to absorb moisture.

Flue gas side

Thoroughly clean and dry the surfaces on the flue gas side. Maintain the alkaline balance of the wash water (pH 8-9, in case of ammonia pH 10).

After the surfaces have been dried completely, conserve them with a thin film of graphite or boiled oil.

Operating information

Shutdown (cont.)

Keep the surfaces dry during the idle periods (by inserting desiccant (e.g. silica gel) or by air changes from a connected dryer).

Further details

For further details, see the operating instructions for conservation on the water and hot gas side or the VdTÜV datasheets (no. 1465, Oct. 1978) and the VGB (no. R116H, 1981) [or local regulations].

Maintenance information

The maintenance of a high pressure hot water boiler is specified by the TRD [or local] regulations.



Danger

Boiler components that are not thermally insulated can be subject to high temperatures that can cause burns.

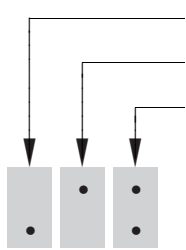
Take care with hot surfaces.

Steps - commissioning, inspection and maintenance

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

			Page
		Commissioning steps	
		Inspection steps	
		Maintenance steps	
•	•	•	1. Starting the heating system 11
	•	•	2. Shutting down the system 12
		•	3. Removing the burner (if required) 13
	•	•	4. Opening the cleaning door(s) 13
	•	•	5. Opening the clean-out cover and combustion chamber door 14
		•	6. Extracting (if installed) and cleaning the turbulators 14
		•	7. Cleaning the heating surface, the flue outlet and flue pipe 15
	•	•	8. Checking all seals/gaskets and packing cords on the flue gas side
	•	•	9. Checking the thermal insulation parts 15
	•	•	10. Inserting turbulators (if appropriate) and closing the cleaning doors 16
	•	•	11. Securing the clean-out cover and the combustion chamber door 16
		•	12. Installing the burner 17
		•	13. Checking all connections on the water and steam side for leaks
		•	14. Checking the inspection ports for leaks 17
		•	15. Check the function of all safety equipment in accordance with the log for steam boiler systems category IV. 18
		•	16. Cleaning the sight glass in the combustion chamber doors 19
	•	•	17. Checking the water quality 19
	•	•	18. Checking the installation room ventilation

Steps - commissioning, inspection and . . . (cont.)

	Page
	
19. Checking the flue pipe for soundness	
20. Adjusting the burner	19

Further details regarding the individual steps

Starting the heating system



Details provided by the burner manufacturer and regarding accessories

1. Check that the turbulators (if installed) are fully pushed into the hot gas flues (open the cleaning door(s)).
 2. Check that the installation room ventilation is open.
 3. Check the function of the water treatment system.
 4. Fill the boiler with water and ventilate it.
- Note**
The water in hot water boilers must comply with EN 12953 part 10; see also "Standard values for water quality" on page 20.
5. Check all fitted components, such as pipework, valves, regulators, pumps etc. for function and leaks.
 6. Check the system pressure.
 7. Check the fuel oil level or the gas supply pressure.
 8. Open the flue gas damper (if installed).
 9. Check that the cleaning aperture (s) on the flue outlet is/are closed.
 10. Open the gas or oil supply line shut-off valves.
 11. Switch ON the main isolator, the switch for the boiler drives and the burner control switch in this order (observe the burner manufacturer's operating instructions).
 12. Start the boiler at a low output (max. 30%) and gradually heat up to a temperature of approx. 30 K below operating temperature.
 13. After the required flow temperature has been reached, gradually open the boiler return valve and possibly the feedwater valve as well as the boiler flow valve.
 14. Only then enable the full burner load.
 15. When heating the system from cold (also when restarting after maintenance and cleaning work), prevent all heat transfer to consumers, to clear the dew point range as quickly as possible.
 16. After the operating temperature has been reached, sequentially switch on the heat consumers and change over to automatic mode.



Further details regarding the individual steps (cont.)

17. Check the fittings for leaks prior to and during the heat-up phase and retighten, where required.
Retighten all fittings at max. permissible operating pressure. Torque values under cold and hot conditions:

Closure	Dimensions	Torque
Hand hole	100 x 150, M16	100 Nm
Head hole	220 x 320, M20	200 Nm
Manhole	320 x 420, M24	350 Nm

18. Check the boiler door(s) and clean-out cover after approx. 50 hours for leaks and retighten all screws.

Shutting down the system



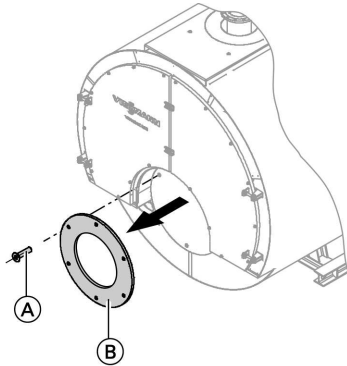
Danger

Opening the boiler connections and openings whilst the boiler is under pressure can lead to a high risk of severe injury.
Only open the connections on the water and steam side and inspection apertures after the boiler has been completely depressurised.

1. Close the shut-off valves in the oil lines (at the oil tank and filter) or the gas shut-off valve.
2. Switch OFF the burner.
3. Isolate the system from the power supply.
4. Close all valves.

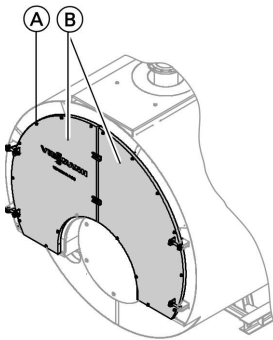
Further details regarding the individual steps (cont.)

Removing the burner (if required)



1. Remove the fuel supply line.
2. Undo screws (A) and remove burner with burner plate (B).

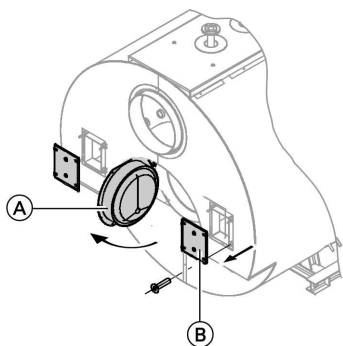
Opening the cleaning door(s)



- Undo screws (A) at cleaning door(s) (B) and open the cleaning door(s).

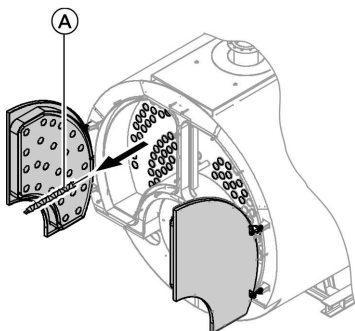
Further details regarding the individual steps (cont.)

Opening the clean-out cover and combustion chamber door



1. Remove clean-out cover (B).
2. Open combustion chamber door (A).

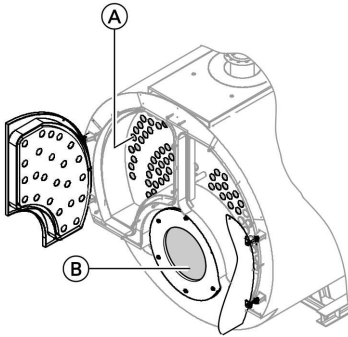
Extracting (if installed) and cleaning the turbulators



Remove turbulators (A) without force.
For this, use the turbulator extractor
that is part of the cleaning equipment.

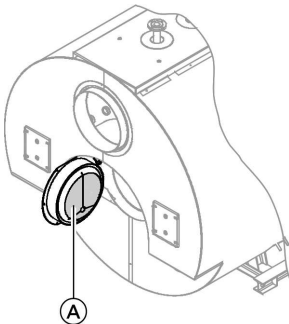
Further details regarding the individual steps (cont.)

Cleaning the heating surface, the flue outlet and flue pipe



1. Clean flues (A), combustion chamber (B) and reversing chamber with the brush and remove combustion residues.
2. Remove combustion residues from the flue pipe and the flue outlet.

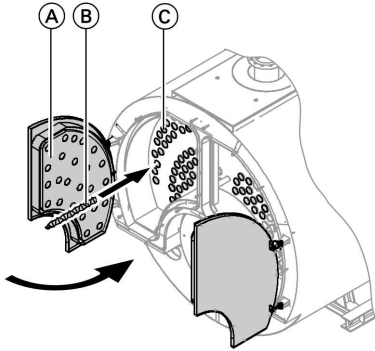
Checking the thermal insulation parts



1. Checking the thermal insulation parts of combustion chamber door (A)
2. Check the thermal insulation parts on the clean-out doors, the combustion chamber entry, the clean-out cover and check inside the reversing chamber.

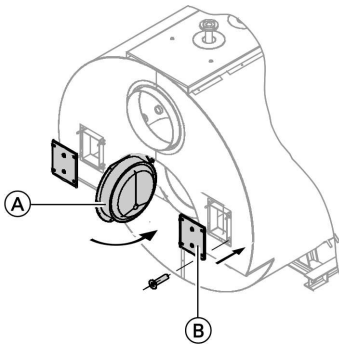
Further details regarding the individual steps (cont.)

Inserting turbulators (if appropriate) and closing the cleaning doors



1. Insert turbulators (B) (only in the 3rd flue (C)) as far as they will go.
2. Close the clean-out doors.
3. Tighten the screws on the clean-out doors (A) evenly and diagonally.

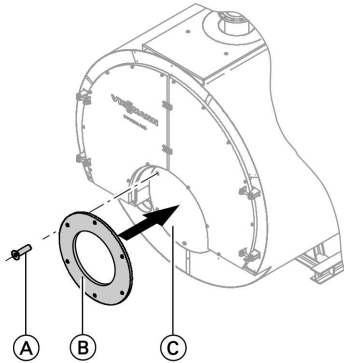
Securing the clean-out cover and the combustion chamber door



1. Tighten down both clean-out covers (B) so they seal.
2. Close combustion chamber door (A) and tighten it down so it seals.

Further details regarding the individual steps (cont.)

Installing the burner



1. Secure burner plate (B) with screws (A) to burner flange (C).
2. For pressure-jet gas burner:
Fit the gas supply pipe.



Danger

Escaping gas leads to a risk of explosion.
Test the soundness of all gas connections.

Checking the inspection ports for leaks



Danger

Boiler components that are not thermally insulated can be subject to high temperatures that can result in burns.
Take care with hot surfaces.

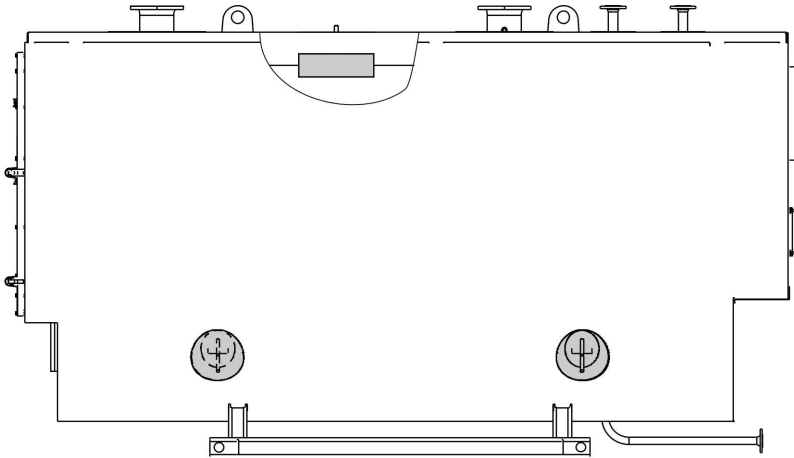
Note

*Replace the gaskets every time a connection has been opened.
Insert only gaskets approved in accordance with TRD 401, appendix 1, VdTÜV [or local regulations].*



Installation instructions of the gasket manufacturer.

Further details regarding the individual steps (cont.)

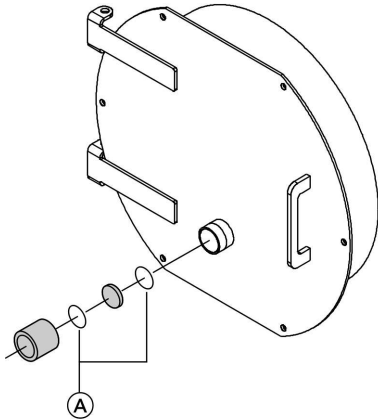


Check the function of all safety equipment in accordance with the log for steam boiler systems category IV.

Check the safety valves plus the temperature and pressure limiters in accordance with manufacturer's details.

Further details regarding the individual steps (cont.)

Cleaning the sight glass in the combustion chamber doors



Check the sight glass with gaskets (A) for leaks and clean.

Checking the water quality

For standard values, see page 20.

Adjusting the burner

By the burner manufacturer or authorised heating contractor.

Standard values for water quality

According to the EN 12953 part 10 and the VdTÜV datasheet 1466 regarding the water quality for hot water boilers in heating systems, the following details apply to heating systems operated with flow temperatures in excess of 100 °C:

Operation with circulating water with low salt content

Only use water with a low salt content as fill or top-up water, such as desalinated water, permeate or condensate.

Systems using mixed condensate generally create water with low salt content if no boiler water is fed into the system for putrefaction by alkalies.

Operation with saline water

Where possible, use water with a low salt content that is at least free from alkaline earths (softened) as fill or top-up water.

	with low salt content		saline
El. conductivity at 25 °C μS/cm	10 to 30	> 30 to 100	> 100 to 1 500
General requirements	Clear, without sediments	Clear, without sediments	Clear, without sediments
pH value at 25 °C	9 - 10	9 - 10.5	9 - 10.5
pH value according to the Drinking Water Order/ Drinking Water Treatment Order [or local regulations]	≤ 9.5	≤ 9.5	≤ 9.5
Oxygen (O ₂) mg/ litre (values for constant operation are generally significantly lower)	< 0.1	< 0.05	< 0.02* ¹

*¹The oxygen concentration in the re-circulated water may be up to 0.1 mg/litre, if suitable inorganic corrosion inhibitors are used.

Standard values for water quality (cont.)

		with low salt content		saline
Alkaline earths (Ca + Mg)	mmol/ litre	< 0.02	< 0.02	< 0.02
Phosphate (PO ₄)	mg/ litre	< 5	< 10	< 15
Phosphate (PO ₄) according to the Drinking Water Order/Drinking Water Treatment Order [or local regulations]	mg/ litre	≤ 7	≤ 7	≤ 7
Phosphate (PO ₄) for Viessmann hot water boilers	mg/ litre	< 2.5	< 5	< 15
When using oxygen binders: Sodium sulphite (Na ₂ SO ₃) (When using other suitable products, observe the respective guidelines issued by the relevant supplier.)	mg/ litre	–	–	< 10

The VdTÜV datasheet 1466 advises that further oxygen binders are offered as chemicals that may have the following active ingredients:

- Ascorbic acid
- Carbohydrazide
- Diethyl-hydroxylamine (DEHA)
- Hydroquinone

- Methyl ethyl ketoxime (Meko)
- Tannic acid

These must be used with care, however, as they can give rise to oxidation, cleavage and transformation products under boiler operating conditions. Please refer to the above guidelines for further information.

Commissioning/service reports

Commissioning/service reports

	Commissioning	Service	Service
date:			
by:			

	Service	Service	Service
date:			
by:			

	Service	Service	Service
date:			
by:			

	Service	Service	Service
date:			
by:			

	Service	Service	Service
date:			
by:			

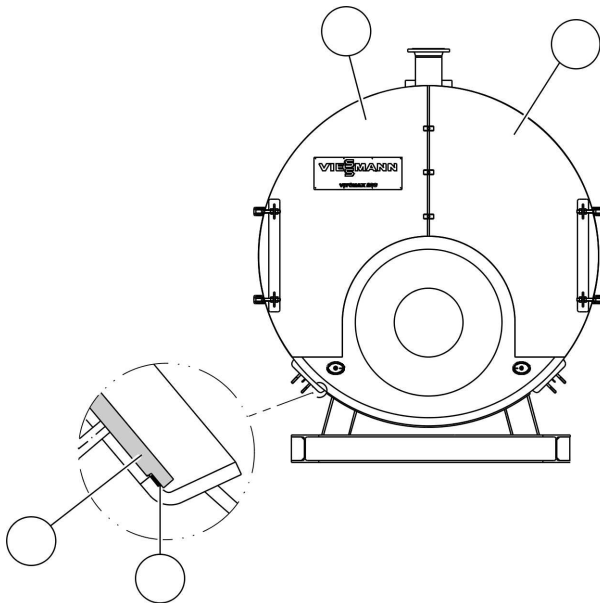
Vitomax 200-HW spare parts

Note

When ordering spare parts, please quote the serial number and the boiler type (see type plate).

Tick the required spare parts and state the number required.

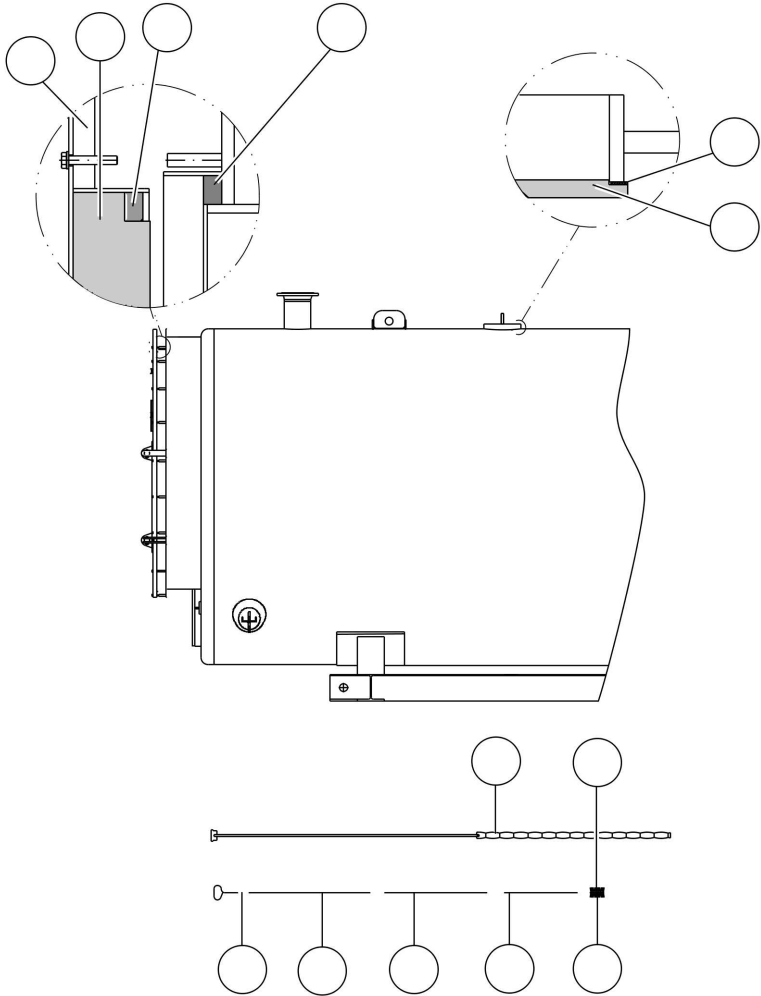
Obtain standard parts from your local supplier.



Ⓐ Serial number:

Ⓑ Boiler type:

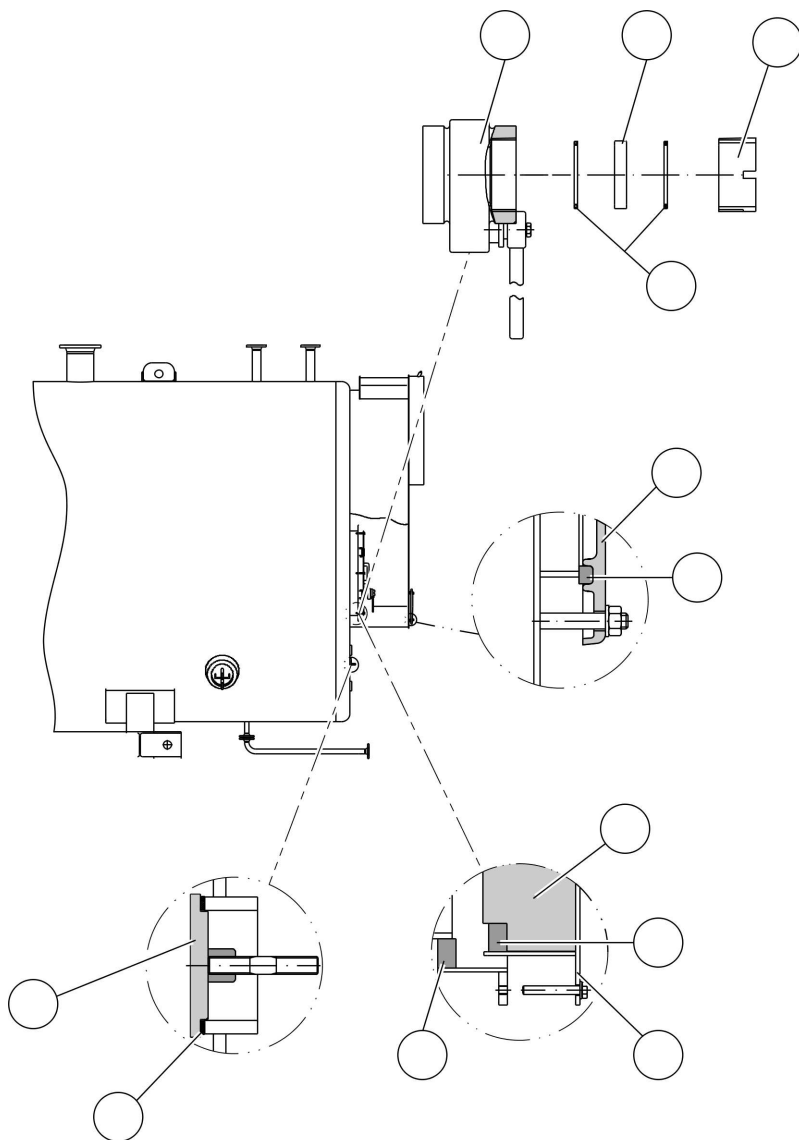
Vitomax 200-HW spare parts (cont.)



Ⓐ Serial number:

Ⓑ Boiler type:

Vitomax 200-HW spare parts (cont.)

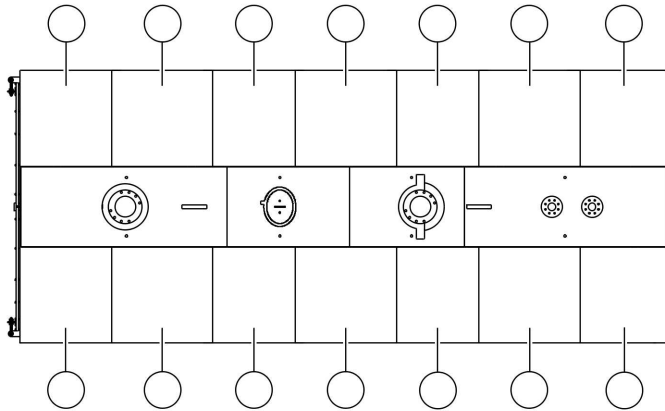
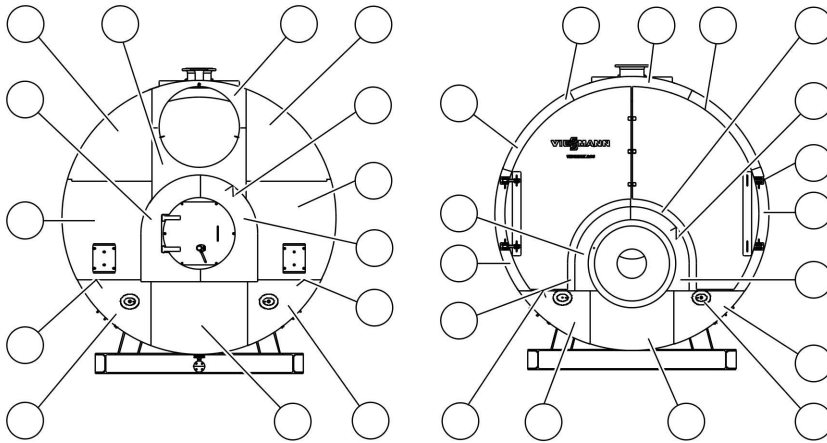


5592 548 GB

Ⓐ Serial number:

Ⓑ Boiler type:

Vitomax 200-HW spare parts (cont.)



Ⓐ Serial number:

Ⓑ Boiler type:

Keyword index

B		O	
Burner installation.....	17	Operational checks	5
Burner, removal.....	13		
C		S	
Cleaning door, opening	13	Safety valve, checking	6
Clean-out cover, opening.....	14	Saline water	20
Clean-out cover, securing	16	Shutdown.....	6, 12
Combustion chamber door, opening ..	14	Sight glass, cleaning	19
.....	14	Starting the heating system	11
F		T	
Fill and top-up water.....	20	Thermal insulation parts, checking	15
Flue outlet and flue pipe, cleaning.	15	Turbulators, extracting	14
Flue supply line	13	Turbulators, inserting	16
M		W	
Maintenance information.....	8	Water quality	20
		Water with a low salt content.....	20

Viessmann Werke GmbH&Co KG
D-35107 Allendorf
Telephone: +49 6452 70-0
Fax: +49 6452 70-2780
www.viessmann.com

Viessmann Limited
Hortonwood 30, Telford
Shropshire, TF1 7YP, GB
Telephone: +44 1952 675000
Fax: +44 1952 675040
E-mail: info-uk@viessmann.com

5592 548 GB Subject to technical modifications.



Printed on environmentally friendly,
chlorine-free bleached paper