

Installation instructions

for contractors

VIESMANN

Vitomax 200-HS

Type M73A

Oil/gas high pressure steam boiler

With or without economiser

Rated steam output 0.5 to 4.0 t/h



VITOMAX 200-HS



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.

Note

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

Target group

These instructions are exclusively designed for qualified contractors.

- Work on gas installations must only be carried out by a registered gas fitter.
- Work on electrical equipment must only be carried out by a qualified electrician.

Regulations

Observe the following when working on this system

- All legal instructions regarding the prevention of accidents
- All legal instructions regarding environmental protection,
- Health and Safety at Work Act (BetrSichV) [Germany]

- The Code of Practice of relevant trade associations
- Directive 97/23/EC, as well as the relevant safety regulations of the following countries
 - Ⓓ DVGW, TRGI, TRF and VDE, TRD
 - Ⓐ KG, ABV, LRG-K, LRV-K, DKBG
 - ⒸⒽ SEV, SUVA, SVGW, SVTI, SWKI, VKF and EKAS guideline 1942: LPG, part 2

Working on the system

- Isolate the system from the power supply and check that it is no longer 'live', e.g. by removing the separate fuse or by means of a main 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.

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Storage of Vitomax boilers prior to installation as part of the system

Please note:

This information applies to the storage **prior** to the system installation.

1. Vitomax boilers must be stored in enclosed rooms, free from weather influences under dry conditions.
 2. The room temperature must not fall below 0 °C nor exceed +50 °C.
 3. In its delivered condition the boiler is protected as standard on the water side with dummy flanges or caps against the ingress of foreign matter.
 4. Remove the shipping packaging to prevent the formation of condensate.
- Check the effectiveness of the desiccant regularly. See the details provided by the desiccant manufacturer.
 - Ensure that the desiccant does not come into contact with the boiler material (e.g. through suspended fixing).
 - Preserve the dry flue gas side with a thin film of graphite or boiled oil.
 - Instead of the moisture extraction on the flue gas side by means of a desiccant; a dryer with air circulation can also be connected.

To prevent corrosion in the non-pressurised state, observe the following if the boiler is stored for longer than 4 weeks:

- Protect the interior of the boiler against moisture on the flue gas side and on the DHW side with a desiccant, e.g. silica gel.
- The amount of desiccant depends on the boiler volume.

Handling the boiler

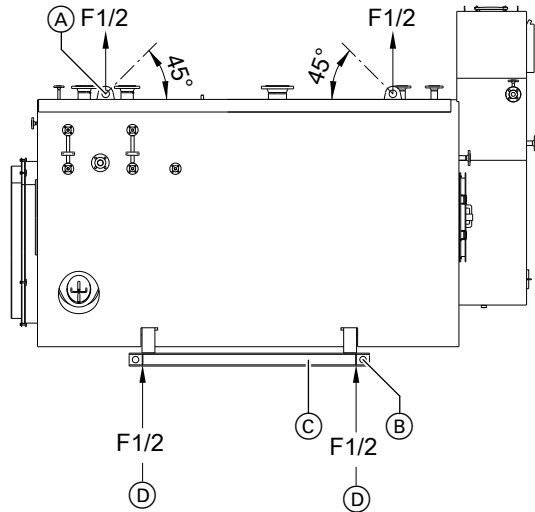
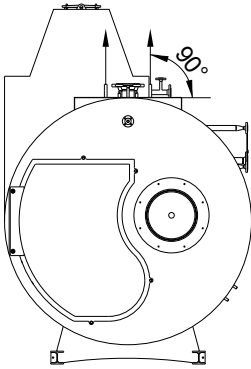
Note

Observe all relevant accident prevention regulations.

Only use the marked fixing points.

1. Lifting the boiler

Use lifting eyes (A) or lifting area (D) on the boiler support.



2. Moving the boiler

For this, fit steel rollers underneath base rail (C).

3. Secure the pulling equipment to the tie-down points (B).

Lifting eyes (A):

Tie-down points (B) for IPB 120:

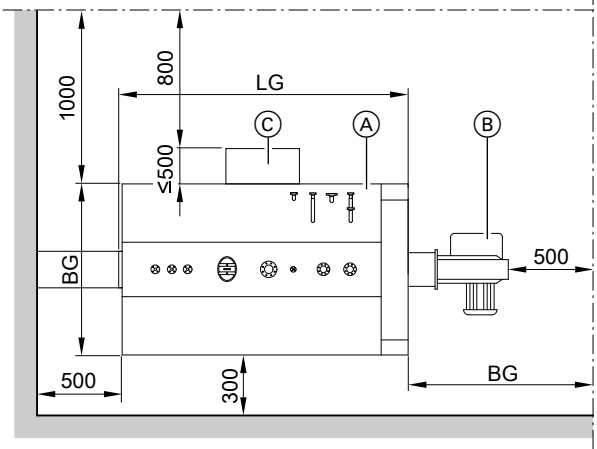
∅ 80

∅ ≤60

Note

Boiler shown with an optional integral economiser.

Clearance dimensions



Illustrative example

- (A) Boiler
- (B) Burner

- (C) Regulating and control system

Note

Observe the given dimensions to ensure easy installation and maintenance.

Subject to equipment level (accessories), check the minimum clearances to TRD 403.

Minimum clearances relate to the boiler.

Boiler size		1	2	3	4	5	6	7	8	9
		Without economiser								
LG	mm	2550	2700	2910	3110	3330	3545	3755	4110	4445
BG	mm	1575	1655	1730	1800	1890	1975	2060	2190	2300
		With economiser								
LG	mm	3010	3160	3370	3595	3815	4175	4385	4740	5075
BG	mm	1575	1655	1730	1800	1890	1975	2060	2190	2300

Boiler positioning and levelling

Level the boiler horizontally.

Note

We recommend installing the boiler on anti-vibration supports. The boiler supports should be distributed evenly across the length and centre under the base rails. Observe the information provided.

Connecting the boiler on the steam side



Danger

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

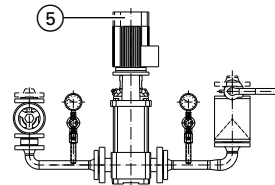
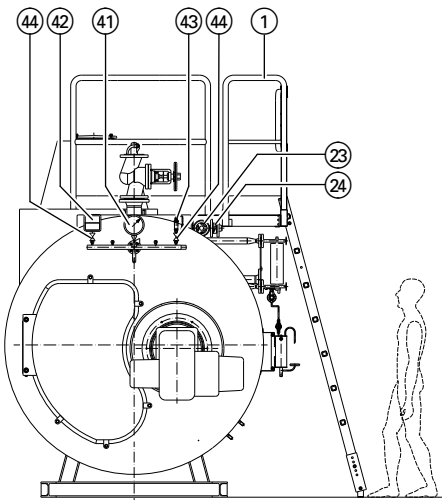
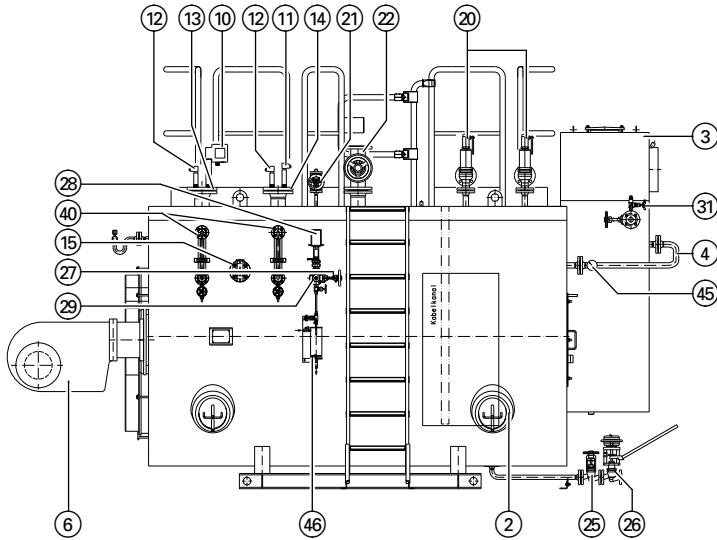
Note

Install all pipe connections free of load and torque stresses.

1. Thoroughly flush the system (especially when connecting the boiler to an existing system).
2. Make all necessary connections.
3. Install a feedwater line between the outlet connector on the economiser and the feedwater connector on the boiler*¹.
4. Thermally insulate the feedwater line with the insulation material supplied*¹.
5. Fit the thermometer to the female connection and the drain valve to the connector*¹.

*¹ If the boiler is equipped with an optional integral economiser.

Connecting the boiler on the steam side (cont.)



Illustrative example. Order-specific deviations from the standard delivery are possible.

Connecting the boiler on the steam side (cont.)

Note

Illustration of the fitting assembly refers to modulating operation. Provide two further pressure regulators for stepped operation; the pressure transducer for the burner control will then not be required.

- | | |
|---|--|
| ① Platform | ⑳ Air vent shut-off valve |
| ② Control panel
See separate documentation | ㉑ Steam shut-off valve |
| ③ Integral economiser | ㉒ Feedwater shut-off valve |
| ④ Connection line between economiser and boiler | ㉓ Feedwater non-return valve |
| ⑤ Feedwater pump (module) | ㉔ Blow-down shut-off valve |
| ⑥ Burner | ㉕ Blow-down valve |
| ⑩ Level electrode
(WR – water level control) | ㉖ T.D.S. shut-off valve |
| ⑪ Level electrode
(HW – maximum water level) | ㉗ T.D.S. valve |
| ⑫ Level electrode
(NW – minimum water level) | ㉘ Mating flange DN 20 |
| ⑬ Accessory, flanged connection
DN 100 | ㉙ Air vent valve for Economiser |
| ⑭ Accessory, flanged connection
DN 100 | ㉚ Water level indicator |
| ⑮ Conductivity electrode | ㉛ Pressure gauge |
| ⑳ Safety valve | ㉜ Maximum pressure limiter |
| | ㉝ Pressure transducer |
| | ㉞ Straight-through shut-off valve with
cap (option) |
| | ㉟ Dial thermometer |
| | ㊱ Sampling cooler |

Connecting the boiler on the steam side (cont.)

Boiler connections

Boiler size		1	2	3	4	5
Steam connector						
for permiss. operating pressure						
6 bar	PN 16 DN	65	65	80	100	100
8 bar	PN 16 DN	50	65	65	80	100
10 bar	PN 16 DN	—	50	65	65	80
	PN 40 DN	40	—	—	—	—
13 bar	PN 40 DN	32	40	50	65	65
16 bar	PN 40 DN	32	40	50	50	65
18 bar	PN 40 DN	32	32	50	50	65
20 bar	PN 40 DN	32	32	40	50	50
22 bar	PN 40 DN	32	32	40	50	50
25 bar	PN 40 DN	32	32	32	40	50
Safety valve connector						
for permiss. operating pressure						
6 bar	PN 40 DN	20	20	25	32	32
8 bar	PN 40 DN	20	20	25	25	32
10 bar	PN 40 DN	20	20	20	25	25
13 bar	PN 40 DN	20	20	20	20	25
16 bar	PN 40 DN	20	20	20	20	20
18 bar	PN 40 DN	20	20	20	20	20
20 bar	PN 40 DN	20	20	20	20	20
22 bar	PN 40 DN	20	20	20	20	20
25 bar	PN 40 DN	20	20	20	20	20
Feedwater connector						
for permiss. operating pressure						
6-25 bar	PN 40 DN	25	25	25	32	32

Connecting the boiler on the steam side (cont.)

Boiler connections (cont.)

Boiler size		6	7	8	9
Steam connector					
for permitt. operating pressure					
6 bar	PN 16 DN	125	125	150	150
8 bar	PN 16 DN	100	100	125	150
10 bar	PN 16 DN	80	100	125	125
	PN 40 DN	—	—	—	—
13 bar	PN 40 DN	80	80	100	100
16 bar	PN 40 DN	65	80	80	100
18 bar	PN 40 DN	65	65	80	100
20 bar	PN 40 DN	65	65	80	80
22 bar	PN 40 DN	65	65	65	80
25 bar	PN 40 DN	50	65	65	80
Safety valve connector					
for permitt. operating pressure					
6 bar	PN 40 DN	40	40	50	50
8 bar	PN 40 DN	32	40	40	50
10 bar	PN 40 DN	32	32	40	40
13 bar	PN 40 DN	25	32	32	40
16 bar	PN 40 DN	25	25	32	32
18 bar	PN 40 DN	20	25	32	32
20 bar	PN 40 DN	20	25	25	32
22 bar	PN 40 DN	20	25	25	32
25 bar	PN 40 DN	20	20	25	25
Feedwater connector					
for permitt. operating pressure					
6-25 bar	PN 40 DN	32	32	32	32

Fitting the test and control equipment

Fit test and control equipment that is pressure tested to the same level as the operating pressure of the boiler and that is suitable for the intended operating mode (operation with or without constant supervision). Agree details with the responsible approval body, which should also approve them.

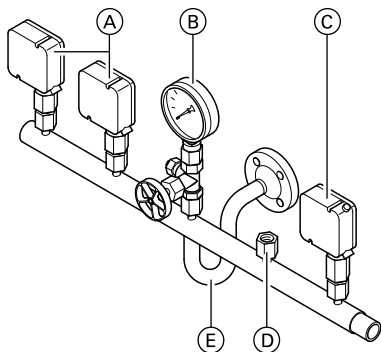
Note

Carry out the installation in accordance with the instructions supplied with the equipment.

For the electrical connection, see the connection and wiring diagrams provided.

Fitting the test and control equipment (cont.)

Installing the fitting assembly



Note

Illustration of the fitting assembly refers to staged operation.

For modulating operation, two pressure regulators are replaced by one pressure transducer.

Fill the U-bend of fitting assembly (E) with water and mount on the boiler front panel.

The fitting assembly offers the following connections:

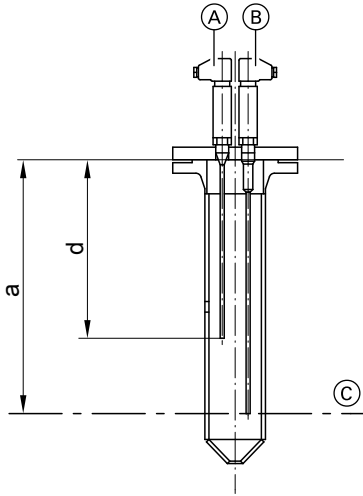
- 1 or 2 pressure regulators (A) (optionally with cap valve)
- 1 maximum pressure limiter (C) (optionally with cap valve)

- 1 pressure gauge (B) with test valve and 1 drain valve
- 1 additional connection (D).

Fitting the test and control equipment (cont.)

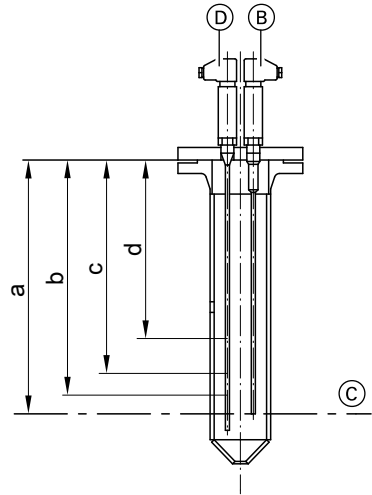
Fitting the water level limiter and the water level controller electrodes

Connector for water level limiter



- (A) Max. water level limiter electrode
- (B) Min. water level limiter electrode
- (C) Minimum water level (NW)

Connector for water level controller and limiter



- (B) Min. water level limiter electrode
- (C) Minimum water level (NW)
- (D) Water level controller electrode

Note

Example showing the electrode heads.

Fit the water level controller and water level limiter electrodes:



Installation instructions for the electrodes

Fitting the test and control equipment (cont.)

Note

Match or adjust the electrodes to the switching points listed in the table. The electrodes provided are matched at the factory to the relevant boiler.

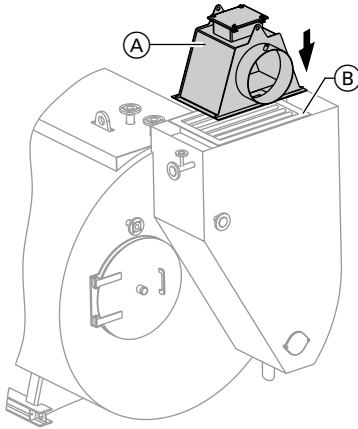
In each connector, only one electrode can be fitted for limiting the water level. However, the water level controller and limiter can be combined. Ensure the electrodes of multi boiler systems are not interchanged.

Boiler size	Permiss. operating pressure up to 13 bar			
	Reference electrode to low water level	Pump on	Pump off	Maximum water level HW
	Dimension a mm	Dimension b mm	Dimension c mm	Dimension d mm
1	502	462	422	357
2	527	487	447	382
3	540	500	460	395
4	551	511	471	406
5	585	545	505	440
6	608	568	528	463
7	618	578	538	473
8	622	582	542	477
9	625	585	545	480

Boiler size	Permiss. operating pressure from 16 bar			
	Reference electrode to low water level	Pump on	Pump off	Maximum water level HW
	Dimension a mm	Dimension b mm	Dimension c mm	Dimension d mm
1	492	452	412	357
2	517	477	437	382
3	530	490	450	395
4	541	501	461	406
5	575	535	495	440
6	598	558	518	463
7	608	568	528	473
8	612	572	532	477
9	615	575	535	480

Connections on the flue gas side

Fitting a flue gas hood to the economiser (when supplied separately)

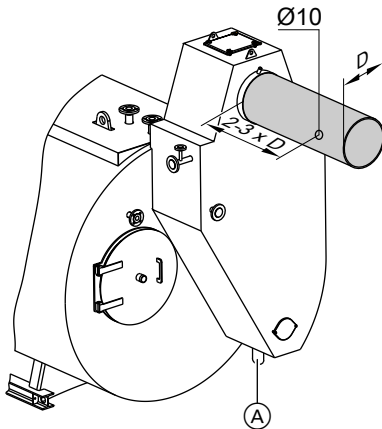


1. Mount flue gas hood (A) on economiser (B) and align centrally.
2. Weld the flue gas hood gas-tight (fillet weld a ≥ 5 mm).
3. Stuff the empty space between the thermal insulation of the hood and the economiser with thermal insulation mats.
4. Fit the thermal insulation panels.

Note

The thermal insulation mats and panels are part of the standard delivery.

Fitting a flue pipe



1. Connect the flue outlet with the shortest possible run to the flue system using slightly inclined flue pipes. Avoid sharp bends.
2. Provide a test port (approx. 10 mm \varnothing) at a distance of two to three times the diameter of the flue pipe downstream of the flue outlet.
3. Insulate the flue pipe.

Note

Option: flue gas flange with mating flange.

Connections on the flue gas side (cont.)

Boiler size		1	2	3	4	5	6	7	8	9
Flue outlet ^{*2}	Internal ∅ mm	152	192	216	242	272	307	346	392	442

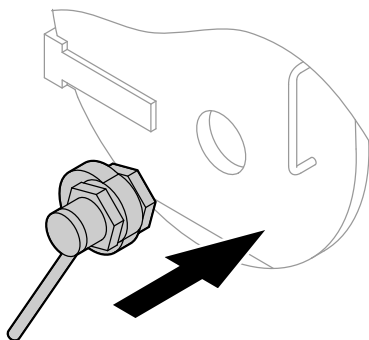


Danger

Risk of poisoning through escaping flue gas.

Seal the condensate drain connectors (A) if they are not used. They are designed for draining the water from the flue gas collector that may accumulate when cleaning the economiser or for draining any condensate collected in the start-up condition.

Installing the sight glass



Fit sight glass (inside the flame tube) to the cleaning door on the back of the boiler.

Mounting the burner



Separate burner documentation.

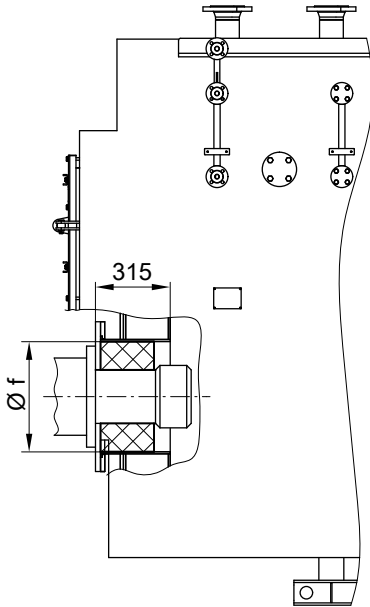
^{*2} Internal diameter, for external diameter +8 mm.

Mounting the burner (cont.)

Note

If the burner plate was not pre-drilled at the factory, drill the burner fixing holes into the burner plate and cut the flame head hole out with an oxy-acetylene torch.

For max. flame head diameter, see table on page 19.



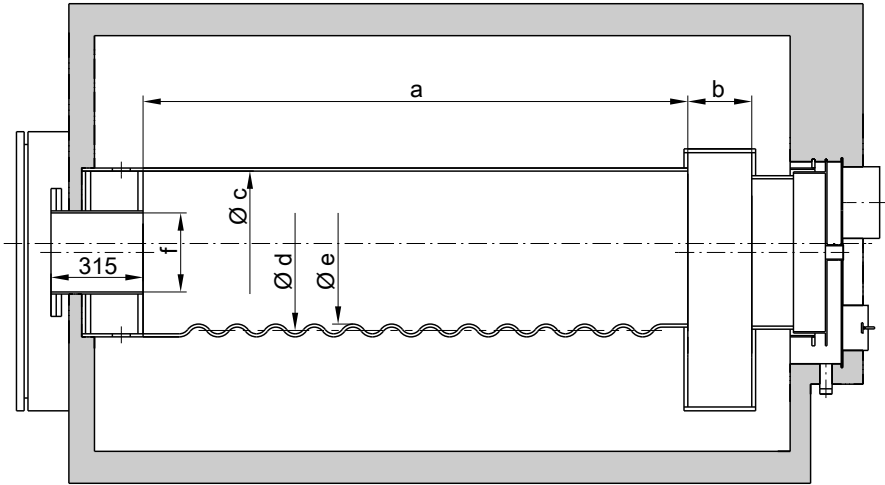
1. For the burner connection, secure the burner plate to the boiler flange.
2. Secure the burner to the burner plate.
3. For different dimensions, adjust the cut-out in the thermal insulation according to the flame head diameter.
4. After fitting the burner, seal the annular gap between the flame head and the thermal insulation block with heat-resistant insulation (supplied in the flame tube pack).
5. Insert the turbulators (if available) as far as they will go.
6. Close the boiler doors and cleaning aperture at the back of the boiler.

Adjusting the burner



For burner adjustment, see the separate burner documentation.

Adjusting the burner (cont.)



Boiler size			1	2	3	4	5
Steam output ^{*3}	t/h		0.5	0.7	1.0	1.3	1.65
(for 102 °C feedwater temperature)							
Max. permissible combustion heating output	MW		0.380	0.530	0.760	0.985	1.250
■ Natural gas							
Max. flue gas pressure drop without ECO	mbar		4.2	4.7	6.4	7.9	10.4
Max. flue gas pressure drop with ECO 100	mbar		4.6	5.3	7.2	8.9	11.4
Max. flue gas pressure drop with ECO 200	mbar		4.8	5.5	7.9	9.9	11.9
■ Fuel oil EL							
Max. flue gas pressure drop without ECO	mbar		3.8	4.2	5.8	7.1	9.3
Max. flue gas pressure drop with ECO 100	mbar		4.2	4.8	6.6	8.1	10.3
Max. flue gas pressure drop with ECO 200	mbar		4.4	5.0	7.3	9.1	10.8
Combustion chamber dimensions							
Length							
Flame tube	Dimension a	mm	1350	1500	1710	1910	2130

^{*3} The permissible steam output varies depending on the required emission values.

Adjusting the burner (cont.)

Boiler size			1	2	3	4	5
Reversing chamber	Dimension b	mm	250	250	250	250	250
Diameter							
Internal smooth tube min.	Dimension c	mm	468	508	549	582	620
Internal smooth tube max.	Dimension c	mm	486	524	569	602	642
Corrugated pipe, average	Dimension d	mm	—	—	—	—	—
Corrugated pipe, internal	Dimension e	mm	—	—	—	—	—
Burner connection dimensions							
Min. flame head length		mm	315	315	315	315	315
Max. flame head diameter	Dimension f	mm	240	240	290	290	320
Combustion chamber volume (average)							
Flame tube		m ³	0.24	0.31	0.42	0.53	0.67
Flame tube and reversing chamber depth		m ³	0.29	0.37	0.48	0.59	0.74

Adjusting the burner (cont.)

Boiler size			6	7	8	9
Steam output ³ (for 102 °C feedwater temperature)	t/h		2.0	2.5	3.2	4.0
Max. permissible combustion heating output	MW		1.510	1.890	2.415	3.020
■ Natural gas						
Max. flue gas pressure drop without ECO	mbar		10.5	10.9	10.9	12.5
Max. flue gas pressure drop with ECO 100	mbar		11.5	12.4	12.4	14.0
Max. flue gas pressure drop with ECO 200	mbar		12.0	13.4	13.4	15.5
■ Fuel oil EL						
Max. flue gas pressure drop without ECO	mbar		9.4	9.8	9.9	11.1
Max. flue gas pressure drop with ECO 100	mbar		10.4	11.3	11.4	12.6
Max. flue gas pressure drop with ECO 200	mbar		10.9	12.3	12.4	14.1
Combustion chamber dimensions						
Length						
Flame tube	Dimension a	mm	2325	2535	2850	3185
Reversing chamber	Dimension b	mm	250	250	250	250
Diameter						
Internal smooth tube min.	Dimension c	mm	653	696	746	791
Internal smooth tube max.	Dimension c	mm	675	720	768	813
Corrugated pipe, average	Dimension d	mm	—	—	790	835
Corrugated pipe, internal	Dimension e	mm	—	—	740	785
Burner connection dimensions						
Min. flame head length		mm	315	315	315	315
Max. flame head diameter	Dimension f	mm	320	370	420	420
Combustion chamber volume (average)						
Flame tube		m ³	0.81	1.00	1.28	1.61
Flame tube and reversing chamber depth		m ³	0.89	1.10	1.40	1.74

Note

Details regarding **diameter** refer to the maximum depth of corrugations and the smallest internal diameter. The type of flame tube depends on the pressure stages employed. Product-specific tolerances are possible.

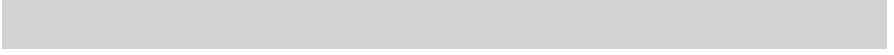
³ The permissible steam output varies depending on the required emission values.

Commissioning and adjustment



Service instructions for boiler and boiler control unit and separate burner documentation.





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