VIESMANN

VITOMAX 100-LW

Heating output 0.65 to 6.0 MW

Datasheet

VITOMAX 100-LW Type M148/System

Low pressure hot water boiler
Certified in accordance with Gas Appliances Directive 2009/142/EC
Permissible for flow temperatures up to 110 °C
Suitable for the combustion of gas and fuel oil EL
Permissible operating pressure 6 and 10 bar

5679 699 GB 5/2015

Specification for burner selection

Note

All diagrams in this document are schematic, illustrative examples.

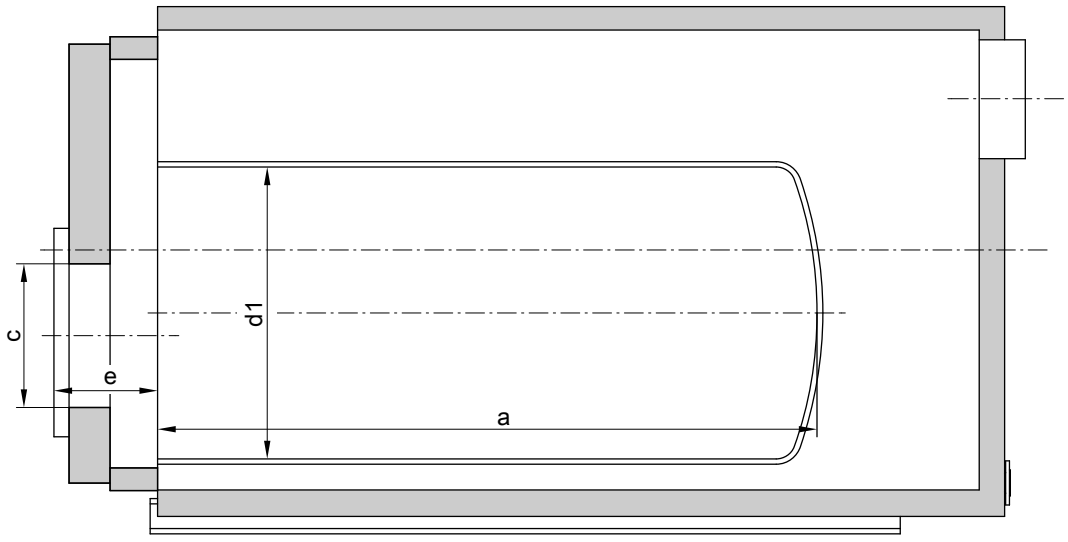
Tolerances related to production factors are not taken into consideration for all dimensions and weights (+ 10 %).

Test conditions

The information and values in the tables relate to the following test conditions:

- O_2 content in the flue gas
  - For natural gas: 3.0 %
  - For fuel oil EL: 3.0 %
- Flow/return temperature:
  - 80/60 °C
  - 90/70 °C with Vitotrans 100-LW/200-LW flue gas/water heat exchanger
- 100 % load
- Installation altitude: < 500 m above sea level
- Combustion air temperature: 25 °C
- Operating pressure: 6 bar

Boiler size			1	2	3	4	5	6	7	8	9	A	B
Rated heating output 110 °C													
– For natural gas		MW	0.65	0.85	1.10	1.40	1.80	2.30	2.90	3.50	4.20	5.00	6.00
– For fuel oil EL		MW	0.65	0.85	1.10	1.40	1.80	2.30	2.90	3.50	4.20	5.00	6.00
Permiss. combustion heating output 110 °C													
– For natural gas		MW	710	930	1210	1540	1980	2530	3190	3850	4620	5490	6590
– For fuel oil EL		MW	710	930	1200	1530	1970	2510	3170	3830	4590	5460	6560
Flame tube dimensions													
Diameter													
– Flame tube, min. internal ∅	d1	mm	678	726	799	847	895	966	1064	1139	1212	1310	1383
– Flame tube length	a	mm	1500	1680	1860	2090	2250	2450	2650	2900	3300	3470	3700
Burner connections													
– Max. flame head ∅	c	mm	380	380	380	380	380	420	420	530	530	530	600
– Min. flame head length	e	mm	335	335	335	335	335	335	360	400	400	430	480
Combustion chamber volume													
Relative to flame tube length a		m^3	0.55	0.70	0.94	1.19	1.43	1.85	2.42	3.02	3.88	4.76	5.66
Max. pressure drop on the flue gas side, 110 °C													
– For natural gas		mbar	2.9	4.4	7.0	8.2	5.5	8.2	10.0	11.0	9.4	10.5	11.2
– For fuel oil EL		mbar	2.5	3.9	6.2	7.1	4.8	7.2	8.9	9.6	8.1	9.0	10.1



Flame tube dimensions

Design/engineering information

Burner selection

Criteria for burner selection:
- The burner must be selected in accordance with the combustion heating output and the pressure drop on the flue gas side.
- The boiler and burner combination must be in line with country-specific regulations (statutes, standards, guidelines, ordinances, etc.).
- Burner head must be suitable for operating temperatures of at least 500 °C.
- The minimum flame head length must be guaranteed.

Recommendation
Certain types of burner, such as rotary atomisers, can hinder the opening of the cleaning doors. Check with the factory prior to delivery.

Burner type	Requirements
Pressure-jet oil burner	Test and identification in accordance with DIN EN 267
Pressure-jet gas burner	Test in accordance with DIN EN 676, CE designation in accordance with Directive 2009/142/EC

Burner specification
Manufacturer's datasheets

Burner connection

If the burner plate is to be prepared at the factory, specify burner make and boiler type when ordering.

Otherwise, make the flame tube aperture and fixing holes on site in the blank plate supplied. Then fit the burner to the boiler.

Burner adjustment

Adjust the oil or gas throughput of the burner to the stated combustion heating output of the boiler.

Fuels

Oil
- Fuel oil EL to DIN 51603 Part 1

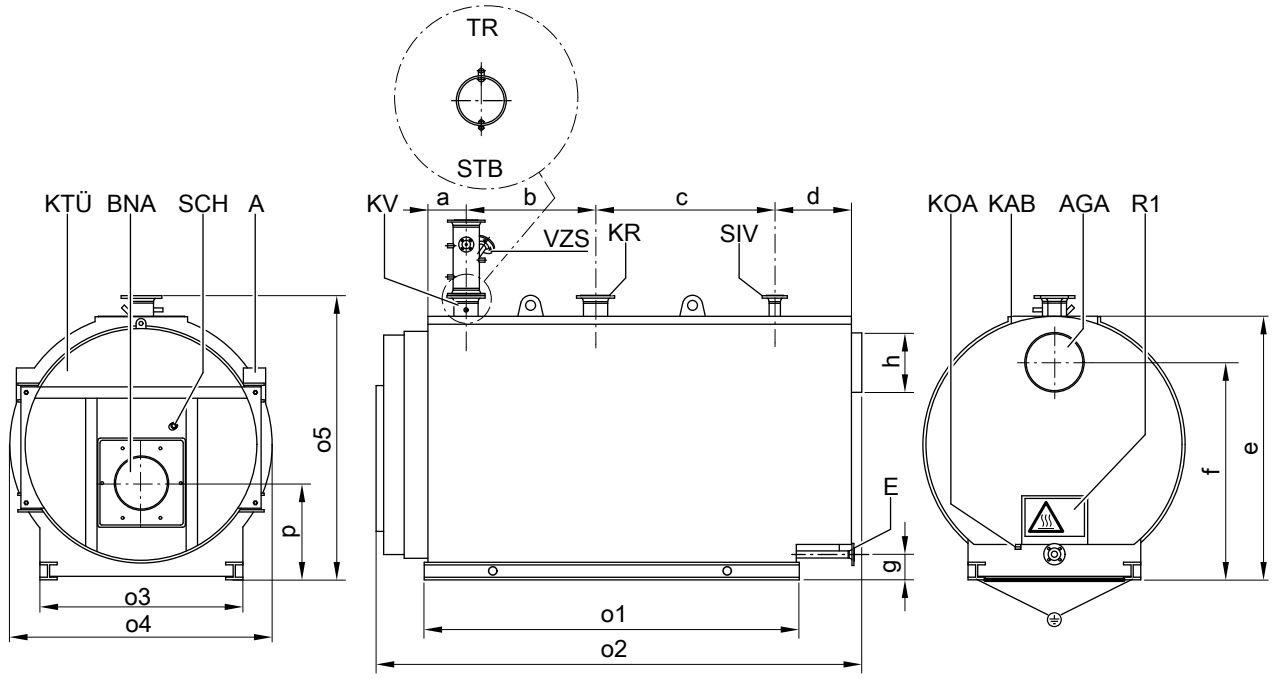
Caution
Vitomax 100-LW, type M148, is not approved for operation with fuel oil S (heavy fuel oil).

Gas
- Natural gas, town gas and LPG to DVGW Code of Practice G 260/I and II or local regulations

Bio diesel
- To DIN EN 51603-6, EN 14213, EN 14214 (or equivalent)

Alternative fuels on request

Boiler geometry



⚠ Caution - hot surface

A Type plate
AGA Flue outlet
BNA Burner connection
E Drain
- ■ Size 1-5: DN32 PN40
- ■ Size 6-B: DN40 PN40

KAB Boiler cover
KOA Condensate drain connector R 1¼
KR Boiler return
KTÜ Boiler door
KV Boiler flow
R1 Cleaning aperture, flue gas collector
SCH Inspection port
SIV Safety valve connector
STB High limit safety cut-out - female connection R ½
TR Temperature controller - female connection R ½
VZS Intermediate flow piece as accessory
⏚ Equipotential bonding

Boiler size		1	2	3	4	5	6	7	8	9	A	B
a	mm	210	210	210	210	210	265	265	290	290	290	315
b	mm	595	685	775	890	970	1015	1115	1215	1415	1485	1575
c	mm	655	745	835	950	1030	1130	1230	1305	1505	1580	1645
d	mm	430	430	430	430	430	435	485	535	585	585	685
e	mm	1460	1515	1585	1650	1765	1830	1955	2075	2225	2345	2445
f	mm	1250	1280	1350	1400	1475	1510	1610	1705	1830	1925	2000
g	mm	190	190	190	190	190	180	180	200	200	220	220
h (internal ∅)*1	mm	192	242	242	272	346	400	450	500	550	600	650
o1	mm	1650	1830	2010	2240	2400	2600	2800	3050	3450	3595	3825
o2	mm	2310	2490	2670	2900	3060	3310	3580	3870	4320	4500	4825
o3	mm	1000	1050	1075	1100	1150	1200	1275	1375	1465	1600	1625
o4	mm	1450	1505	1575	1640	1755	1880	2030	2092	2235	2320	2420
o5	mm	1610	1665	1735	1800	1915	1975	2100	2220	2370	2490	2590
p	mm	560	580	612	632	652	670	720	778	820	875	908

Transport information

Boiler size			1	2	3	4	5	6	7	8	9	A	B
Shipping dimensions excl. packaging													
– Total length		m	2.30	2.50	2.70	2.90	3.10	3.40	3.60	3.90	4.40	4.50	4.90
– Total width		m	1.48	1.54	1.61	1.67	1.79	1.91	2.06	2.12	2.27	2.35	2.45
– Total height		m	1.65	1.70	1.75	1.80	1.95	2.10	2.20	2.30	2.40	2.50	2.60
Dry weight Boiler incl. thermal insulation													
For permiss. operating pressure	6 bar	t	1.5	1.8	2.1	2.6	3.2	3.7	4.3	5.3	6.4	7.3	8.6
	10 bar	t	1.7	2.0	2.4	3.0	3.8	4.4	5.3	6.2	7.8	8.9	10.4

*1 *External ∅ = internal ∅ + 8 mm (for sizes 1-5). External ∅ = internal ∅ + 10 mm (from size 6 upwards).*

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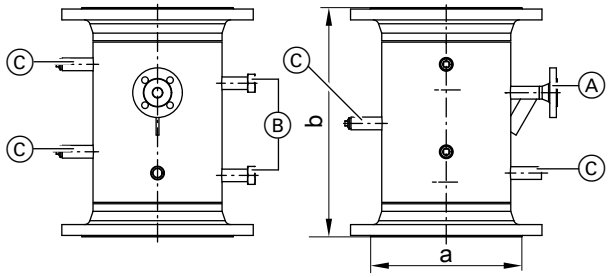
Boiler geometry (cont.)

Boiler connections

Boiler size			1	2	3	4	5	6	7	8	9	A	B
Boiler flow and return													
For permiss. operating pressure		PN16 DN	80	100	100	125	125	150	150	200	200	200	250
Safety valve connector													
For permiss. operating pressure	6 bar	PN16 DN	—	—	—	50	50	65*2	65*2	80	80	100	100
	6 bar	PN40 DN	32	40	40	—	—	—	—	—	—	—	—
	10 bar	PN16 DN	—	—	—	—	—	50	50	65	65	65	80
	10 bar	PN40 DN	25	32	32	40	40	—	—	—	—	—	—
Flue gas connection - flue outlet (DIN 24154-T2)		DN	200	250	250	280	354	410	460	510	560	610	660

Intermediate flow piece (option)

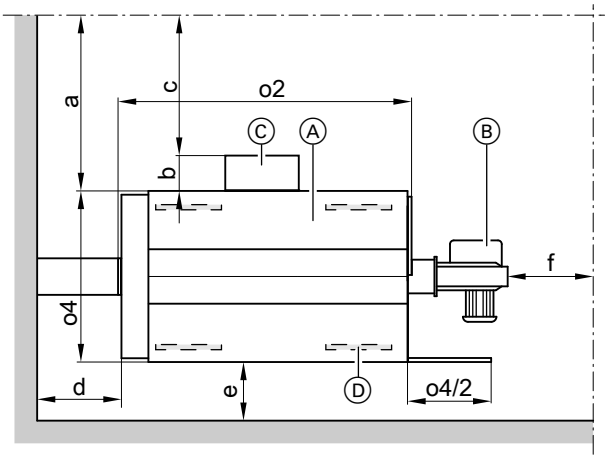


Intermediate flow piece (VZS) for boilers with permissible flow temperature 110 °C

Ⓐ Connector for fitting assembly DN20 PN40
Ⓑ Connector for water level limiter with float (VZS standard delivery)
Ⓒ Female connections for thermometer, sampling valve and other control equipment 4 x R ½

a	DN	80	100	125	150	200	250	300	350	400
b	mm	470	470	470	470	475	485	490	515	515

Recommended minimum clearances



Ⓐ Boiler
Ⓑ Burner
Ⓒ Regulating and control system
Ⓓ Optional: Anti-vibration boiler supports
a Control system not fitted
b Control system depth
c Control system fitted
d,e,f Miscellaneous clearances
o2, o4 See dimension tables: Max. length, max. width

a/b/c	mm	≥1000/≥500/≥800
d/e/f	mm	≥500/≥300/≥500

Recommendation for dimension f
Leave one boiler length (o2) of space in front of the boiler door to extract the turbulators (if fitted) and for cleaning.

Observe the specified clearances to ensure easy installation and maintenance.
Observe the clearances with regard to the regulations applicable at the installation site. Allow for equipment and accessories.

*2 *4-hole version*

Boiler geometry (cont.)

Siting conditions

- Prevent air contamination from halogenated hydrocarbons. Halogenated hydrocarbons can be found in sprays, paints, solvents and cleaning agents.
- Provide an adequate supply of uncontaminated combustion air if there is a risk of air contamination from halogenated hydrocarbons where the boiler is sited.
- Avoid very dusty conditions.
- Avoid high levels of humidity.
- Prevent frost and ensure good ventilation.
- Site on a level surface.

Failure to observe these instructions can cause system faults and damage.

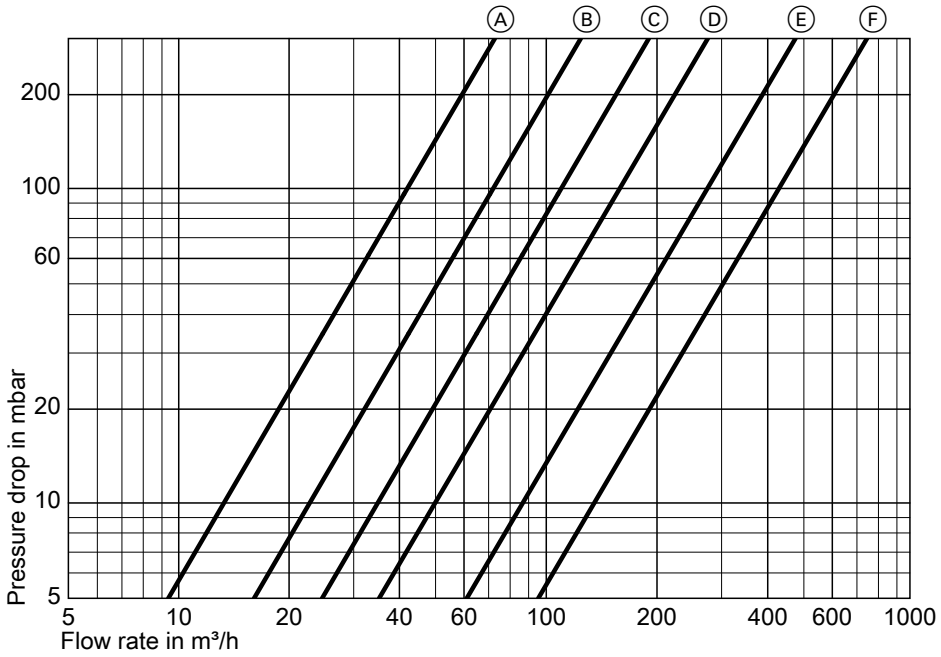
Reducing noise

Place anti-vibration supports (not included in standard delivery) under the boiler shell. Position supports centrally under the base rails, distributed evenly along the length.

Boiler performance data

Boiler size		1	2	3	4	5	6	7	8	9	A	B
Boiler water content	m^3	1.1	1.3	1.5	1.8	2.2	2.3	2.9	3.4	4.5	4.9	5.6

Pressure drop on the heating water side



Connectors for boiler flow and return

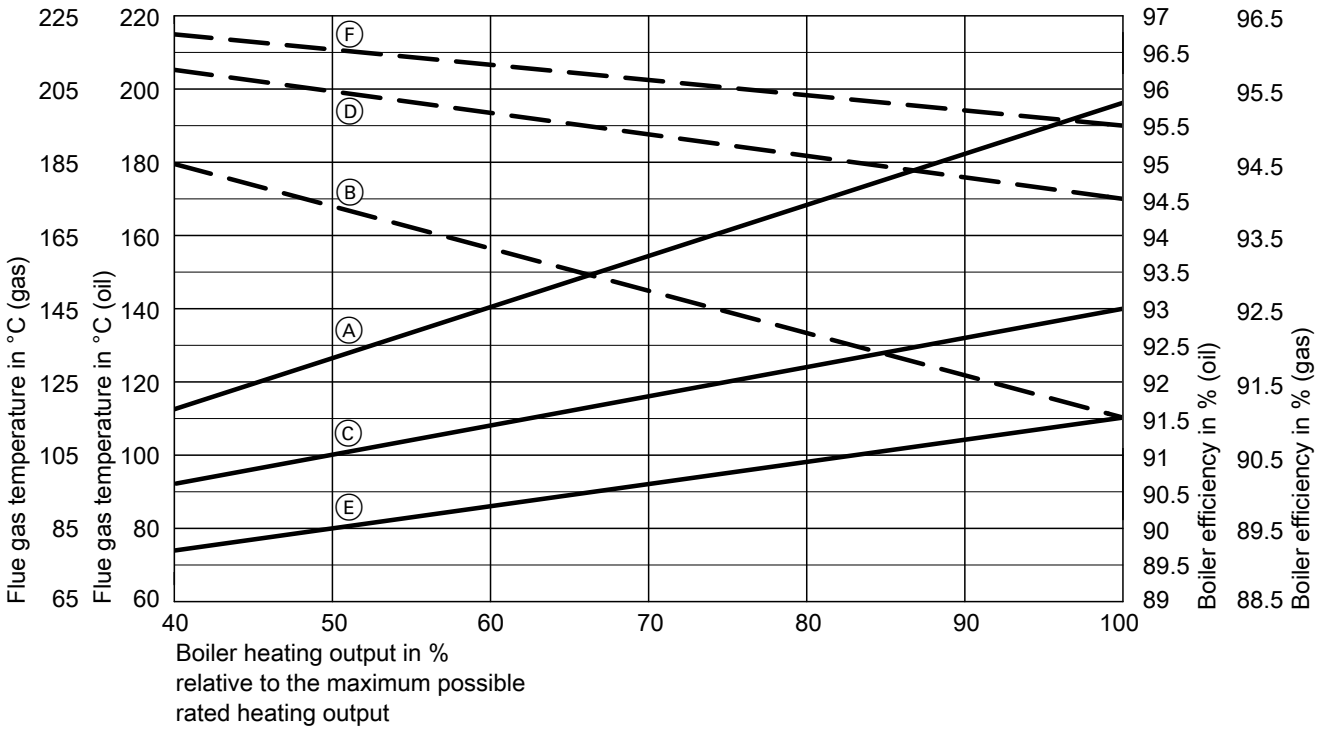
Ⓐ DN80
Ⓑ DN100
Ⓒ DN125
Ⓓ DN150
Ⓔ DN200
Ⓕ DN250

Boiler size		1	2	3	4	5	6	7	8	9	A	B
Flue gas mass flow rate[*3]												
– For natural gas	t/h	1.5225 x combustion heating output in MW										
– For fuel oil EL	t/h	1.5 x combustion heating output in MW										
Heating surface, flue gas side	m^2	16	19	22	28	38	42	51	61	77	87	104
Flue gas volume	m^3	1.0	1.2	1.5	1.9	2.4	2.8	3.8	4.7	6.3	7.5	9.1

*[*3] Calculation of values for sizing the flue system to EN 13384 with the following CO_2 contents: 13 % for fuel oil EL, 10 % for natural gas. The significant factor for sizing the flue system is the flue gas temperature at a boiler water temperature of 80 °C. It is used to determine the application range of flue pipes with maximum permissible operating temperatures.*

Boiler performance data (cont.)

Flue gas temperature and boiler efficiency



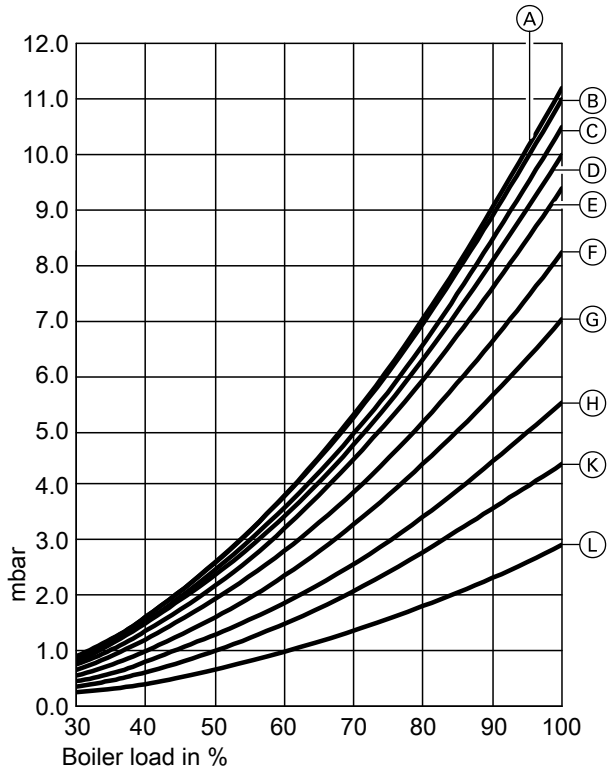
Without Vitotrans 100-LW/200-LW
Lower limits averaged across all boiler sizes
Ⓐ Flue gas temperature in °C
Ⓑ Boiler efficiency in %

With Vitotrans 100-LW
All efficiency figures ± 0.5 %, relative to heat exchanger use
Ⓒ Flue gas temperature in °C
Ⓓ Boiler efficiency in %

With Vitotrans 200-LW
All efficiency figures ± 0.5 %, relative to heat exchanger use
Ⓔ Flue gas temperature in °C
Ⓕ Boiler efficiency in %

Boiler performance data (cont.)

Pressure drop on the flue gas side, natural gas

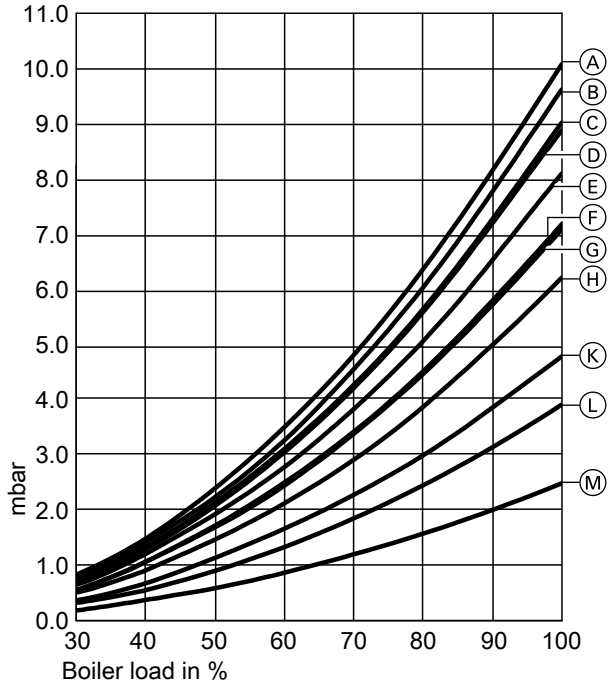


Ⓒ M14800A
Ⓓ M148007
Ⓔ M148009
Ⓕ M148004 and M148006
Ⓖ M148003
Ⓗ M148005
Ⓚ M148002
Ⓛ M148001

Pressure drop on the flue gas side 30 % to 100 % boiler load

Ⓐ M14800B
Ⓑ M148008

Pressure drop on the flue gas side, fuel oil EL



Ⓒ M14800A
Ⓓ M148007
Ⓔ M148009
Ⓕ M148006
Ⓖ M148004
Ⓗ M148003
Ⓚ M148005
Ⓛ M148002
Ⓜ M148001

Pressure drop on the flue gas side 30 % to 100 % boiler load

Ⓐ M14800B
Ⓑ M148008

Boiler performance data (cont.)

Operating conditions

		Requirements/notes	
		Boiler	**Boiler with Vitotrans 100-/200-LW**
1.	Heating water flow rate	No minimum heating water flow rate required	
2.	**Boiler return temperature** (minimum value) – Oil operation – Gas operation	 50 °C 55 °C	 65 °C 65 °C
3.	Lower boiler water temperature	70 °C	
4.	**Max. spread** – Oil operation – Gas operation	 50 K 50 K	 40 K 40 K
5.	Stepped burner operation	None	
6.	Modulating burner operation	None	
7.	**Reduced mode** Single boiler system	Operation with lower boiler water temperature	
	Multi boiler system – Lead boiler – Lag boiler	Operation with lower boiler water temperature Lag boilers can be shut down	
	Weekend setback	See reduced mode	

For water quality requirements
"Requirements and standard values for water quality"

Permissible flow temperatures

Permissible flow temperatures

Hot water boiler for permissible flow temperatures (= safety temperatures)

- **Up to 110 °C**
  - Designation: In accordance with Gas Appliances Directive 2009/142/EC

For further information on design/engineering
see the technical guide to this boiler

Tested quality

CE designation according to current EC directives.

Boiler scope of delivery

Boiler

- Boiler shell with burner connection flange and burner plate supplied
- Fitted boiler doors
- Bolted down cleaning cover
- Fitted load bearing boiler cover
- Fitted thermal insulation and thermally insulated flue gas collector
- Turbulators (if installed)
- Turbulator extractor (if turbulators are installed)
- Packaging

Boiler accessories (optional)

- Safety equipment
- Burner
- Valves/fittings
- Heat exchanger
- Return temperature raising facilities
- Boiler control platform
- Regulating and control systems
- Flue gas components
- Pressure-maintaining facility
- For further accessories, see pricelist

System scope of delivery

As per the boiler, plus:

- Drilled burner plate
- Burner
- Shut-off damper for boiler flow and return connectors
- Shut-off valve for drain outlet
- Fitting assembly with pressure gauge
- Straight-through shut-off valve
- Mating flanges for boiler flow, boiler return and drain connectors
- Maximum pressure limiter
- Minimum pressure limiter
- Vitocontrol control panel with fitted Vitotronic 100 (type GC1B)
- Control panel with adaptor

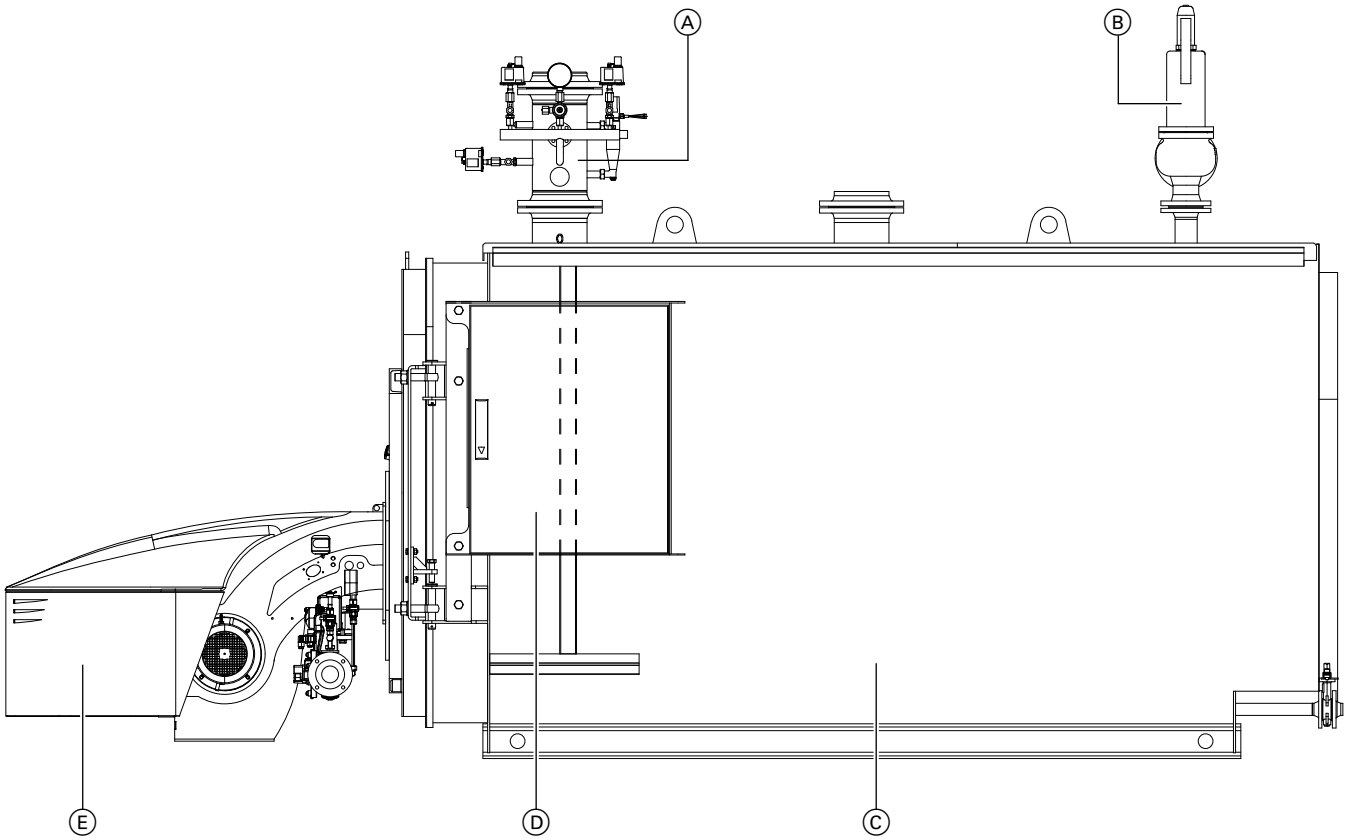
System scope of delivery (cont.)

- Flash trap replacement set
- Safety valve
- Intermediate flow piece with low water indicator
- Dial thermometer with sensor well
- Provisions for control platform installation

System accessories (optional)

- Return temperature raising facility (RTRF) with shunt pump *4
- Return temperature raising facility with 3-way mixing valve and boiler circuit pump *4
- Temperature sensor for flue outlet
- Vitotrans 100-LW/200-LW flue gas/water heat exchanger, max. flow, with mating flanges on the water side for improved efficiency *4
- Flue gas silencer *4
- Steel or stainless steel motorised flue gas damper *4
- Gas train with 100 mbar or 300 mbar supply pressure
- Modular operating platform *4

Example system with accessories



Illustrative example

Ⓐ Intermediate flow piece with safety control and limiting equipment
Ⓑ Safety valve
Ⓒ Low pressure hot water boiler
Ⓓ Regulating and control system (Vitocontrol with Vitotronic)
Ⓔ Combustion system

Specification and dimensions
Component datasheets

*4 *For specification, see the manufacturer's datasheet*

Subject to technical modifications.

Represented by

Viessmann Ltd
Hortonwood 30
TF1 7YP Telford
Telephone: +441952 675000
Telefax: +441952 675040
www.viessmann.co.uk

Manufacturer

Viessmann Industriekessel Mittenwalde GmbH
Berliner Chaussee 3
D-15479 Mittenwalde
Telephone: +49 33764 83-0
Telefax: +49 33764 83-202
www.viessmann.com

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