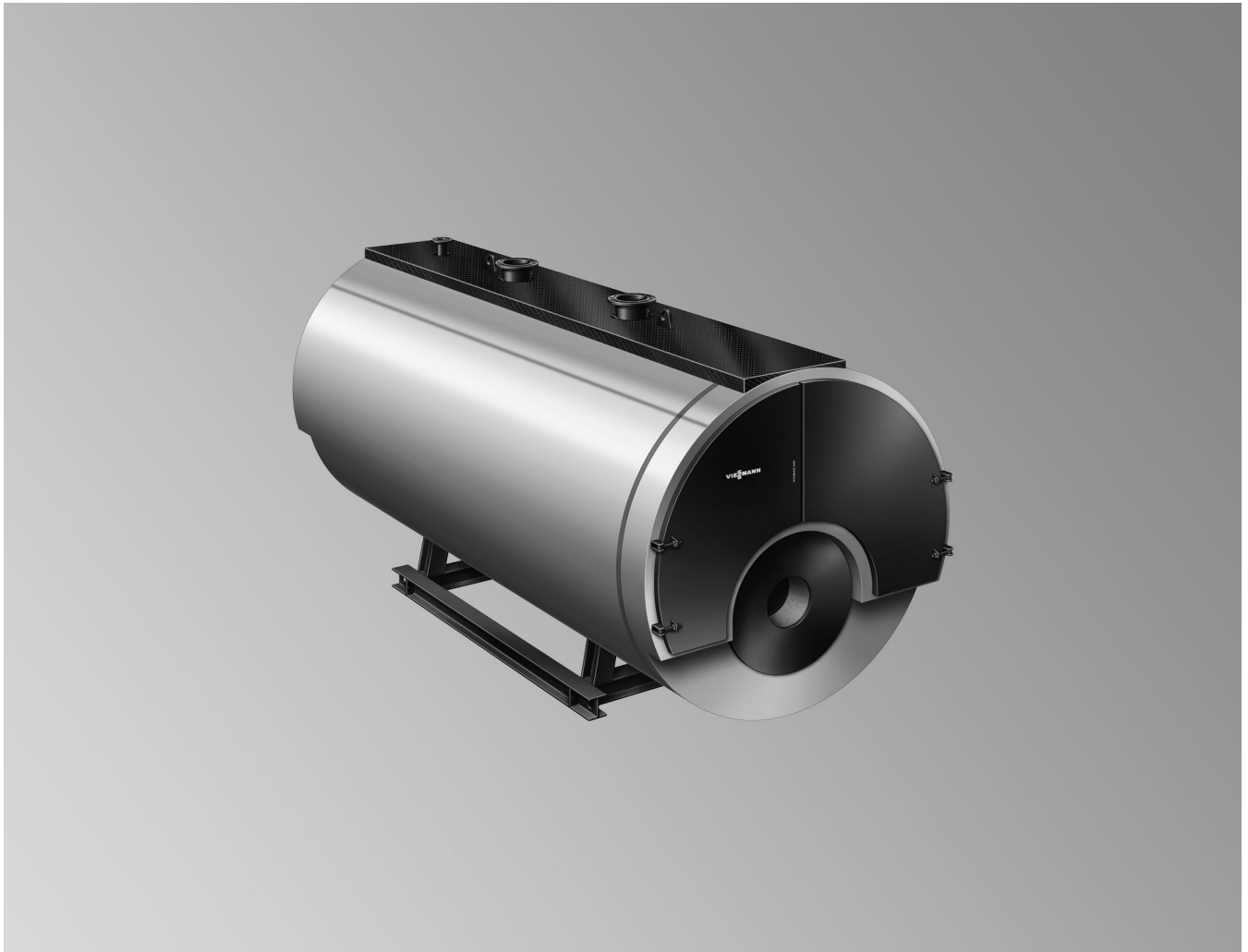


## Datasheet

**VITOMAX 300-LW** Type M84A

Low pressure hot water boiler

Low NO<sub>x</sub> version

Certified in accordance with Gas Appliances Directive 2009/142/EC

Permissible for flow temperatures up to 110 °C

Certified in accordance with Pressure Equipment Directive 97/23/EC

Permissible for flow temperatures up to 120 °C

For the combustion of gas, fuel oil EL

and fuel oil S

Three-pass boiler

Permissible operating pressure 6,10 and 16 bar

## 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<sub>2</sub> content in the flue gas
  - For natural gas: 3.0 %
  - For fuel oil EL: 3.0 %
- Flow/return temperature: 80/60 °C

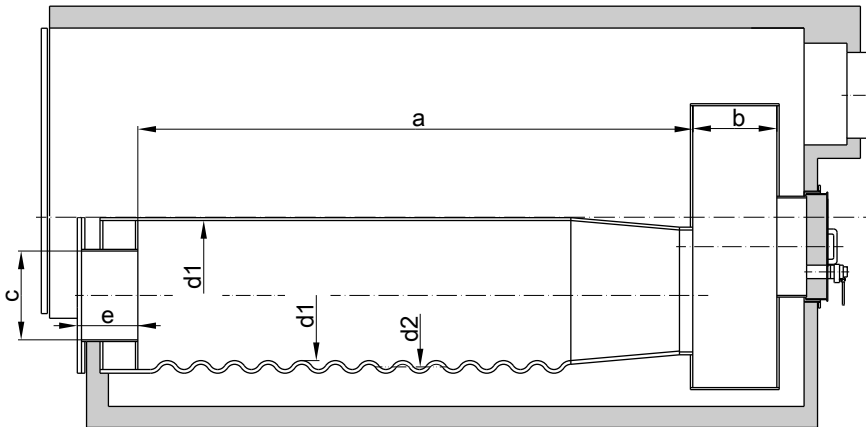
- 100 % load
- Installation altitude: < 500 m above sea level
- Combustion air temperature: 25 °C
- Operating pressure: 6 bar

Boiler size				1	2	3	4	5	6	7
<b>Rated heating output 110 °C</b>										
– For natural gas	MW			8.00	10.00	12.00	14.00	16.00	18.00	20.00
– For fuel oil EL	MW			8.00	10.00	12.00	13.39	14.63	15.29	16.20
<b>Rated heating output 120 °C</b>										
– For natural gas	MW			8.00	10.00	12.00	14.00	16.00	16.87	17.00
– For fuel oil EL	MW			8.00	10.00	12.00	13.06	13.12	13.22	13.29
<b>Permiss. combustion heating output 110 °C<sup>*1*2</sup></b>										
– For natural gas	MW			8.70	10.87	13.04	15.22	17.39	19.57	21.74
– For fuel oil EL	MW			8.70	10.87	13.04	14.37	15.68	16.28	17.18
<b>Permiss. combustion heating output 120 °C<sup>*1*2</sup></b>										
– For natural gas	MW			8.70	10.87	13.04	15.22	17.39	18.20	18.20
– For fuel oil EL	MW			8.70	10.87	13.04	14.00	14.00	14.00	14.00
<b>Flame tube dimensions</b>										
Diameter										
– Smooth pipe, min. internal ∅	d1	mm		1306	1431	1531	1631	—	—	—
– Corrugated pipe, min. internal ∅										
	6 bar	d1	mm	—	—	—	—	1700	1750	1825
	10 bar	d1	mm	—	1425	1525	1625	1700	1750	1800
	16 bar	d1	mm	1300	1400	1500	1580	1655	1725	1780
– Corrugated pipe, average ∅										
	6 bar	d2	mm	—	—	—	—	1750	1800	1875
	16 bar	d2	mm	—	1475	1575	1675	1750	1800	1875
	10 bar	d2	mm	1350	1475	1575	1665	1740	1800	1865
– Flame tube length	a	mm		4830	5330	5820	6220	6600	7000	7400
Reversing chamber depth	b	mm		500						
<b>Burner connections</b>										
– Max. flame head ∅	c	mm		915	915	1015	1115	1215	1215	1215
– Min. flame head length	e	mm		360						
<b>Combustion chamber volume (average value)</b>										
– Flame tube		m <sup>3</sup>		6.47	8.57	10.71	13.00	15.87	17.81	20.43
– Relative to flame tube length a and reversing chamber depth b		m <sup>3</sup>		7.14	9.38	11.63	14.04	17.08	19.09	21.81
<b>Max. pressure drop on the flue gas side at 110 °C</b>										
– For natural gas		mbar		10.8	11.9	15.1	14.2	14.7	16.8	19.0
– For fuel oil EL		mbar		9.7	10.6	13.5	11.1	10.4	10.0	10.0
<b>Max. pressure drop on the flue gas side at 120 °C</b>										
– For natural gas		mbar		10.8	11.9	15.1	14.2	14.7	14.4	12.9
– For fuel oil EL		mbar		9.7	10.6	13.5	10.5	8.1	7.2	6.4

\*1 In accordance with EN 12953, the internal diameter of the flame tube limits the maximum combustion heating output for oil operation.

\*2 According to EN 12953, a flame tube temperature monitor is required for a combustion heating output > 14 MW when using fuel oil EL and > 18.2 MW when using natural gas.

## Specification for burner selection (cont.)



Flame tube dimensions

## Engineering information for burner selection

### 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
- Fuel oil S to DIN 51603 Part 3  
If using fuel oil S, different output data for the rated heating output, flue gas temperature and efficiency may result.  
Never use heat exchangers if using fuel oil S.

#### Bio diesel

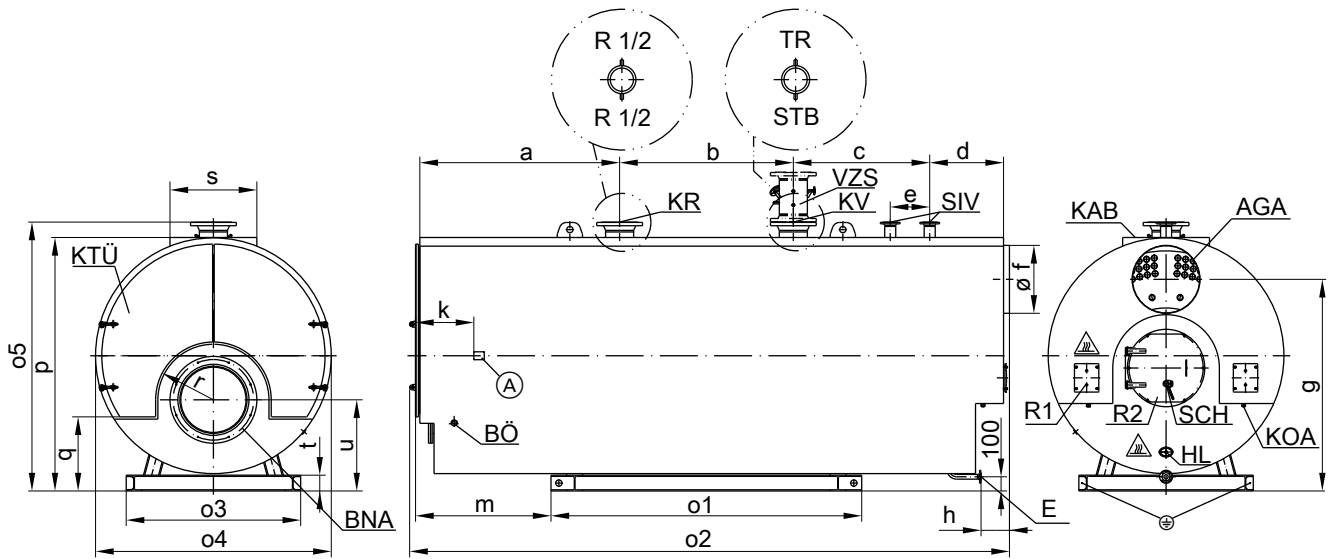
- To DIN EN 51603-6, EN 14213, EN 14214 (or equivalent)

Alternative fuels on request

#### Gas

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

## Boiler geometry



Caution - hot surface

- (A) Type plate
- AGA Flue outlet
- BNA Burner connection
- BÖ Inspection port
- E Drain - DN40 PN40
- HL Handhole - 100 x 150 mm
- KAB Boiler cover
- KOA Condensate drain connector R 1½
- KR Boiler return
- KTÜ Boiler door
- KV Boiler flow
- R1 Cleaning aperture, flue gas collector
- R2 Cleaning aperture, flame tube
- 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
a	mm	2145	2350	2530	2690	2730	2950	2990
b	mm	1900	2050	2200	2400	2650	2750	3150
c	mm	1382	1667	1727	1807	1937	2037	2037
d	mm	885	785	935	985	1035	1035	1035
e*3	mm	400	500	500	500	500	500	500
f (internal Ø) *4	mm	700	790	790	890	990	990	1110
g	mm	2520	2725	2915	3085	3210	3280	3350
h	mm	310	310	360	410	460	460	460
k	mm	698	738	738	778	818	838	878
m	mm	1430	1595	1655	1790	1785	1985	2130
o1	mm	3435	3685	4055	4265	4735	4775	4965
o2	mm	6441	6981	7521	8011	8481	8901	9341
o3	mm	2120	2250	2450	2560	2750	2790	2850
o4	mm	2815	3035	3150	3360	3500	3580	3675
o5	mm	3235	3455	3650	3860	4000	4080	4175
p	mm	3035	3255	3450	3660	3800	3880	3975
q	mm	980	1030	1127	1172	1182	1182	1195
r	mm	675	750	800	850	888	912	950
s	mm	1000	1100	1100	1200	1200	1200	1200
t	mm	200	200	240	240	280	280	280
u	mm	1145	1220	1350	1455	1493	1518	1555

\*3 2nd SIV optional on request

\*4 External Ø = internal Ø + 10 mm

## Boiler geometry (cont.)

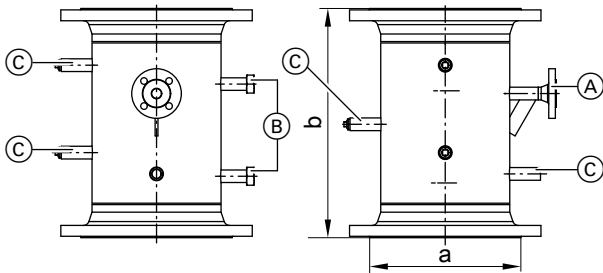
### Transport information

Boiler size			1	2	3	4	5	6	7
<b>Shipping dimensions incl. packaging</b>									
	– Total length	m	6.64	7.18	7.72	8.21	8.68	9.10	9.54
	– Total width	m	2.87	3.09	3.20	3.41	3.55	3.63	3.73
	– Total height	m	3.26	3.48	3.68	3.89	4.03	4.11	4.20
<b>Dry weight Boiler incl. thermal insulation</b>									
	For perm. operating pressure								
	6 bar	t	16.9	21.8	25.2	30.1	32.8	35.9	40.0
	10 bar	t	19.9	23.9	28.3	33.4	41.0	44.8	47.3
	16 bar	t	23.3	29.6	34.7	40.5	44.5	48.0	54.4

### Boiler connections

Boiler size			1	2	3	4	5	6	7
<b>Boiler flow and return</b>									
	For perm. operating pressure								
	6 bar	PN16 DN	250	300	350	350	400	400	400
	10 bar	PN16 DN	250	300	350	350	400	400	400
	16 bar	PN25 DN	250	300	350	350	400	400	400
<b>Safety valve connector</b>									
	For perm. operating pressure								
	6 bar	PN16 DN	100	100	125	125	150	150	2x100
	10 bar	PN16 DN	80	80	100	100	100	125	125
	16 bar	PN40 DN	65	65	80	80	100	100	100
Flue gas connection - flue outlet (DIN 24154-T2)		DN	710	800	800	900	1000	1000	1120

### Intermediate flow piece (option)

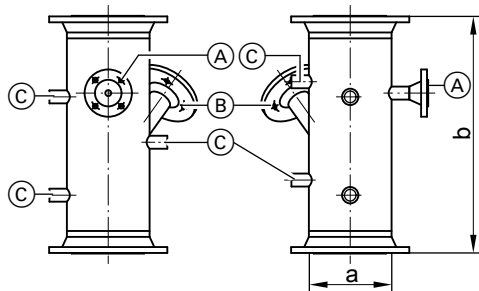


Intermediate flow piece (VZS) for boilers with permissible flow temperature 110 °C

- (A) Connector for fitting assembly DN20 PN40
- (B) Connector for water level limiter with float (VZS standard delivery)
- (C) Female connections for thermometer, sampling valve and other control equipment 4 x R 1/2

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

### Intermediate flow piece (option)



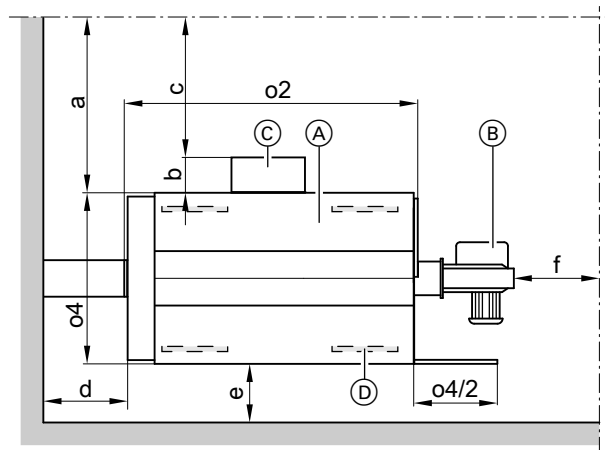
Intermediate flow piece (VZS) for boilers with permissible flow temperature 120 °C

- (A) Connector for fitting assembly DN20 PN40
- (B) Connector for water level limiter with electrodes DN20 PN40
- (C) Female connections for thermometer, sampling valve and other control equipment 5 x R 1/2

## Boiler geometry (cont.)

a	DN	125	150	200	250	300	350	400
b	mm	500	500	500	550	550	600	600

### Recommended minimum clearances



- (A) Boiler
- (B) Burner

- (C) Regulating and control system
- (D) 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.

### 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

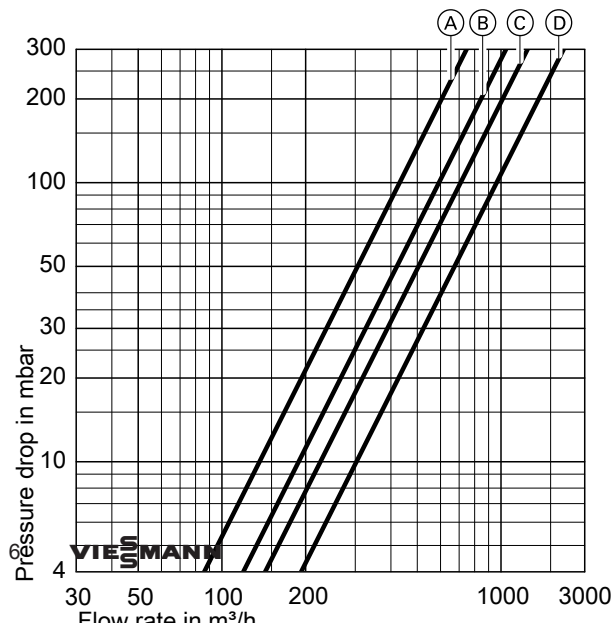
Place anti-vibration supports (not included in standard delivery) under the boiler shell. Position supports centrally under the base rails, distributed evenly along the length.

## Boiler performance data

Boiler size		1	2	3	4	5	6	7
Boiler water content	m <sup>3</sup>	16.2	20.2	23.0	28.1	30.1	34.0	37.2

### Pressure drop on the heating water side

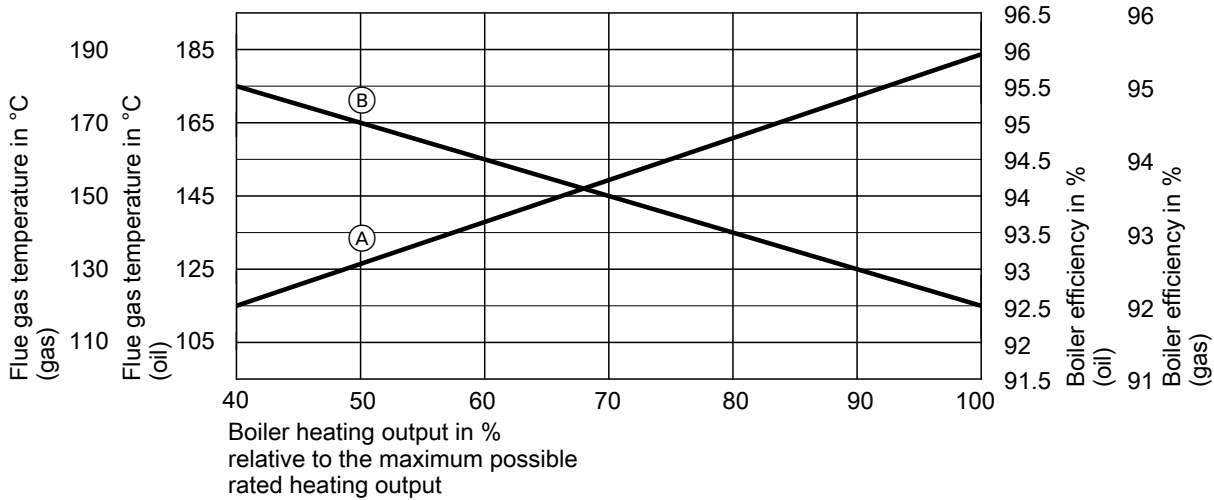
- (C) DN350
- (D) DN400



## Boiler performance data (cont.)

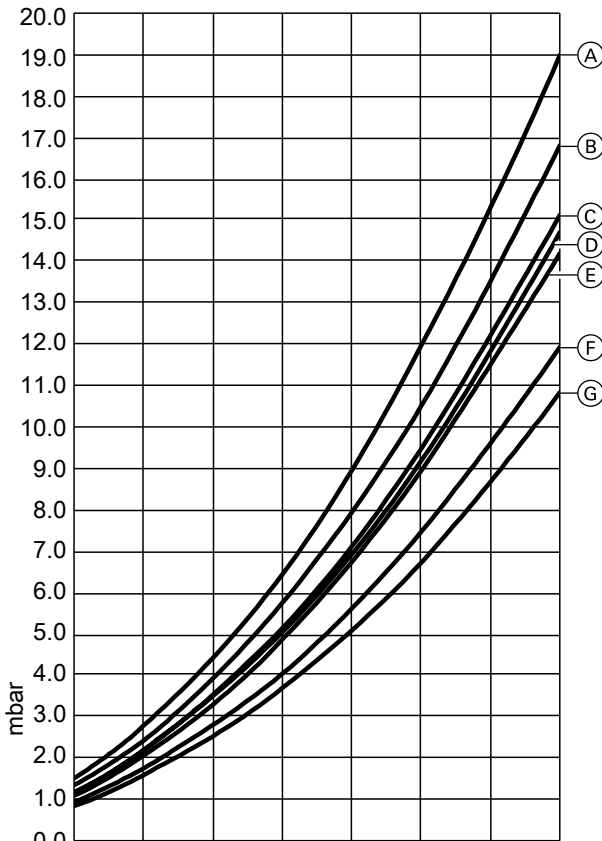
Boiler size		1	2	3	4	5	5	5
Flue gas mass flow rate*5 – For natural gas – For fuel oil EL	t/h	1.5225 x combustion output in MW						
	t/h	1.5 x combustion output in MW						
Heating surface, flue gas side	m <sup>2</sup>	229	284	332	386	443	493	547
Flue gas volume	m <sup>3</sup>	12.7	16.6	20.2	24.9	30.5	33.8	38.1

### Flue gas temperature and boiler efficiency



### Pressure drop on the flue gas side for natural gas at 110 °C

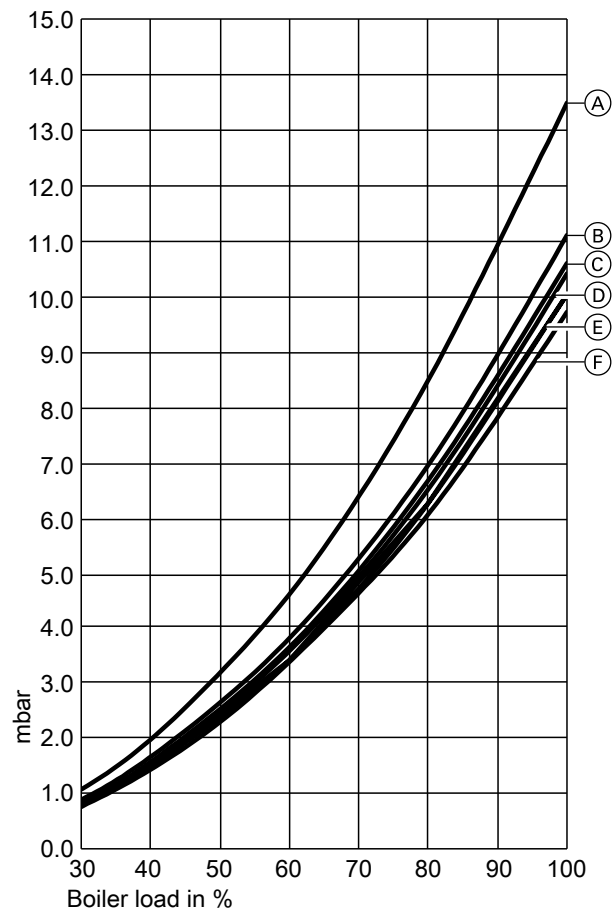
- (C) M84A003
- (D) M84A005
- (E) M84A004
- (F) M84A002
- (G) M84A001



\*5 Calculation of values for sizing the flue system to EN 13054 with the following CO<sub>2</sub> contents: 13 % for fuel oil EL, 10 % for natural gas. The significant factor for sizing the flue system is the flue gas temperature at 80 °C boiler water temperature. It is used to determine the application range of flue pipes with maximum permissible operating temperatures.

## Boiler performance data (cont.)

Pressure drop on the flue gas side for fuel oil EL at 110 °C

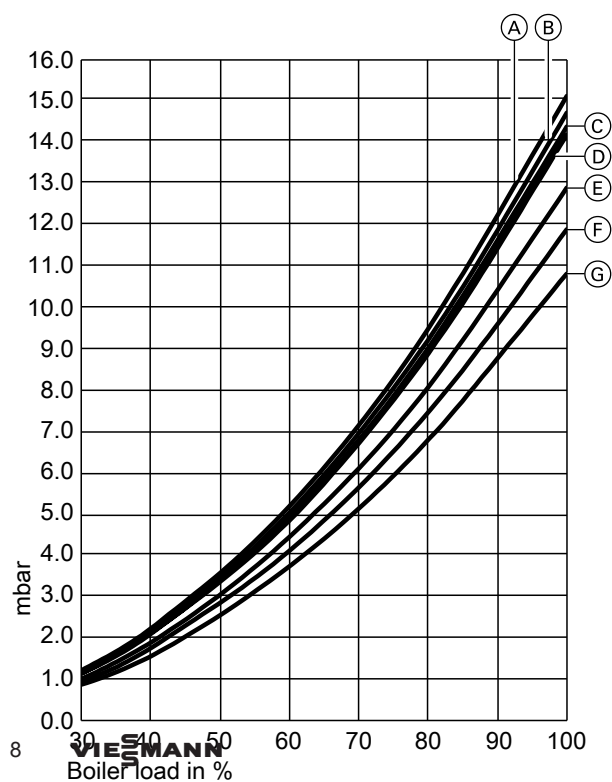


- Ⓒ M84A002
- Ⓓ M84A005
- Ⓔ M84A006 and M84A007
- Ⓕ M84A001

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

- Ⓐ M84A003
- Ⓑ M84A004

Pressure drop on the flue gas side for natural gas at 120 °C

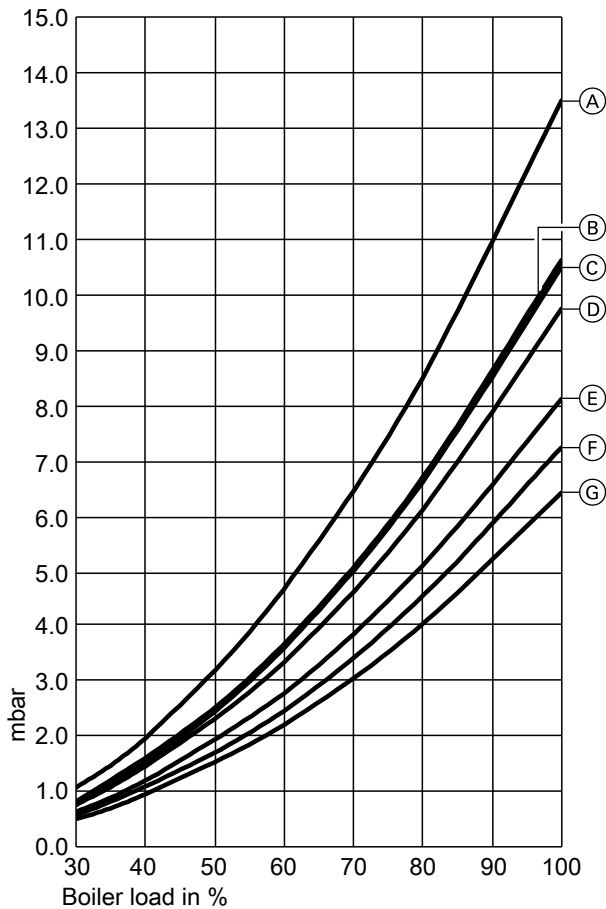


- Ⓒ M84A006
- Ⓓ M84A004
- Ⓔ M84A007
- Ⓕ M84A002
- Ⓖ M84A001



## Boiler performance data (cont.)

Pressure drop on the flue gas side for fuel oil EL at 120 °C



- Ⓒ M84A004
- Ⓓ M84A001
- Ⓔ M84A005
- Ⓕ M84A006
- Ⓖ M84A007

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

- Ⓐ M84A003
- Ⓑ M84A002

## Operating conditions

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



**For water quality requirements**

"Requirements and standard values for water quality"

## Operating conditions (cont.)

### 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
- **Up to 120 °C**
  - Designation: In accordance with Pressure Equipment Directive 97/23/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

### Boiler accessories (option)

- Safety equipment
- Burner
- Valves/fittings
- Heat exchanger
- Return temperature raising facilities

- 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 control platform
- Regulating and control systems
- Flue gas components
- Pressure-maintaining facility
- For further accessories, see pricelist



Subject to technical modifications.

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