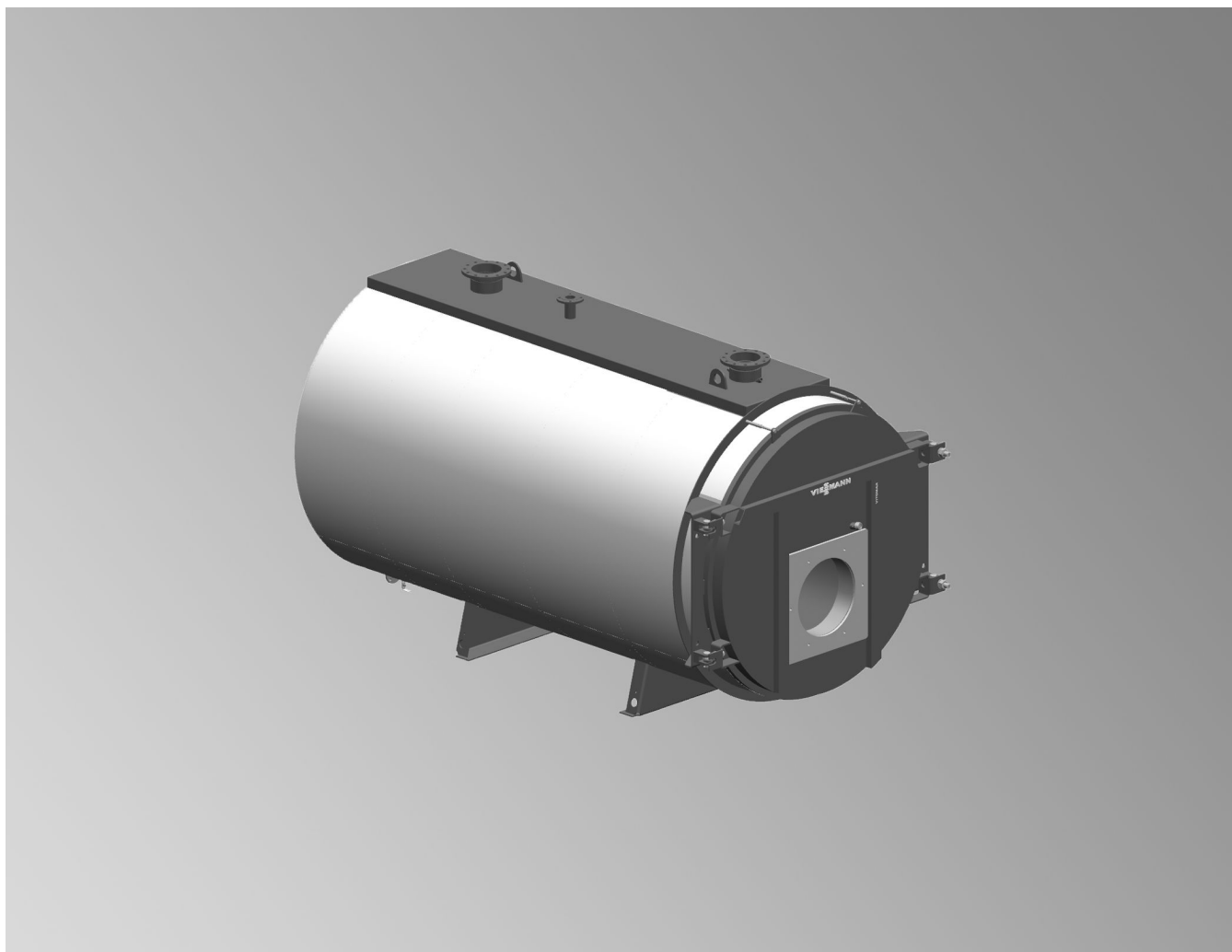


## Datasheet

**VITOMAX LW** Type M22

Low pressure hot water boiler  
Permissible for flow temperatures up to 110 °C  
Suitable for the combustion of gas and EL fuel oil  
Permissible operating pressure PS 6 and 10 bar

## Specification

### Note

All diagrams in this document are schematic, illustrative examples.

All dimensions are nominal.

### Reference values

#### Reference values

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

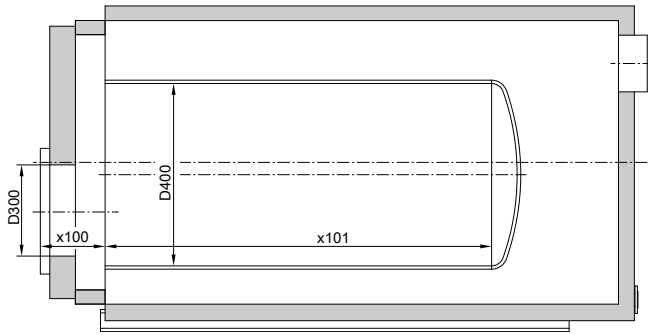
- O<sub>2</sub> content in dry flue gas
  - For natural gas: 3.0 % by vol.
  - For EL fuel oil: 3.0 % by vol.
  - Data for other fuels can only be determined on the basis of a fuel analysis.
- Boiler flow/return temperature:
  - 80/60 °C without economiser, with condensing ECO
  - 90/70 °C with non-condensing ECO
- Economiser water inlet temperature:
  - Condensing ECO: 30 °C
  - Non-condensing ECO: 70 °C
- Water flow rate:
  - Condensing ECO: Continuous partial flow with a flow rate that equates to 30 % of the max. boiler water flow rate at a spread of 20 K
  - Non-condensing ECO: Continuous full flow with a load-dependent boiler water flow rate
- 100 % load
- Installation altitude: < 500 m above sea level
- Combustion air temperature: 25 °C

### Engineering information for burner selection

Boiler size			1	2	3	4	5	6	7	8	9	A	B
<b>Rated heating output</b>													
– For natural gas	MW		0.70	1.00	1.40	1.80	2.30	2.80	3.50	4.20	5.00	6.00	7.00
– For EL fuel oil	MW		0.70	1.00	1.40	1.80	2.30	2.80	3.50	4.20	5.00	6.00	7.00
<b>Combustion heating output (boilers with condensing ECO and without ECO)</b>													
– With natural gas for smooth pipe	MW		0.77	1.10	1.54	1.98	2.53 <sup>*1</sup>	3.08 <sup>*1</sup>	3.85 <sup>*1</sup>	4.62 <sup>*1</sup>	5.50 <sup>*1</sup>	6.59 <sup>*1</sup>	7.69 <sup>*1</sup>
– With EL fuel oil for smooth pipe	MW		0.76	1.09	1.53	1.96	2.51 <sup>*1</sup>	3.05 <sup>*1</sup>	3.82 <sup>*1</sup>	4.58 <sup>*1</sup>	5.45 <sup>*1</sup>	6.54 <sup>*1</sup>	7.63 <sup>*1</sup>
<b>Combustion heating output (boilers with non-condensing ECO)</b>													
– With natural gas for smooth pipe	MW		–	–	–	–	2.41	2.94	3.66	4.41	5.24	6.30	7.36
– With EL fuel oil for smooth pipe	MW		–	–	–	–	2.40	2.93	3.65	4.40	5.22	6.28	7.35
<b>Flame tube dimensions</b>													
Diameter													
– Smooth pipe internal Ø	D400	mm	678	776	872	970	1068	1139	1239	1312	1408	1506	1581
Flame tube length	x101	mm	1330	1560	1815	2035	2275	2485	2750	2990	3230	3505	3760
<b>Burner connections</b>													
– Max. flame head Ø	D300	mm	380	380	380	380	420	420	530	530	530	600	600
– Minimum flame head length	x100	mm	335	335	335	335	335	360	400	400	430	480	480
<b>Combustion chamber volume (min. value)</b>													
Relative to flame tube length x101		m <sup>3</sup>	0.48	0.74	1.08	1.50	2.04	2.53	3.32	4.04	5.03	6.24	7.38
<b>Pressure drop on flue gas side with condensing ECO</b>													
– For natural gas		mbar	–	–	–	–	10.2	11.3	12.5	13.6	14.3	16.7	17.3
<b>Pressure drop on flue gas side with non-condensing ECO</b>													
– For natural gas		mbar	–	–	–	–	10.1	11.7	12.5	14.1	15.5	19.1	20.2
<b>Pressure drop on flue gas side</b>													
– For natural gas		mbar	5.5	6.8	8.4	9.4	9.2	10.1	11.9	12.9	13.6	16.1	16.4
– For EL fuel oil		mbar	4.9	5.9	7.4	8.2	8.0	8.7	10.2	11.0	11.6	13.7	13.9

\*1 with condensing ECO

## Engineering information for burner selection (cont.)



Flame tube dimensions

### Burner selection

#### Criteria for burner selection:

- The choice of burner depends on the combustion heating output and the pressure drop on the flue gas side.
- The boiler/burner combination must comply with country-specific regulations (statutes, standards, guidelines, ordinances, etc.).
- The flame head must be suitable for operating temperatures of at least 500 °C.
- The flame head length must be guaranteed.

#### Recommendation

Certain types of burner can hinder the opening of the boiler doors. Check with the factory prior to delivery.

Burner type	Requirements
Pressure-jet gas burner	Test and identification to EN 676
Pressure-jet oil burner	Test and identification to EN 267



#### Burner specification

Manufacturer's datasheets

### Fuels

#### Gas

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

#### Oil

- EL fuel oil to DIN 51603 Part 1

#### Note

##### Condensing and non-condensing ECO versions

Use EL fuel oil only as a substitute fuel in emergency mode for condensing and non-condensing ECOs.

#### Caution

**The boiler is not approved for operation with S fuel oil (heavy fuel oil).**

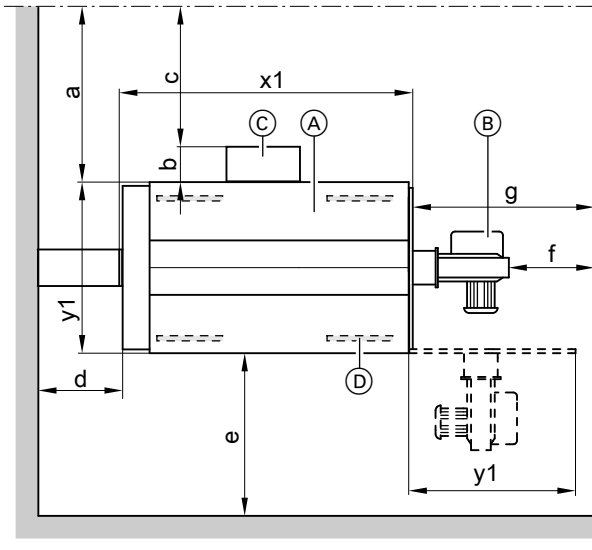
#### Biodiesel

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

Alternative fuels on request

## Engineering information for installation

### Recommended minimum clearances



- (A) Boiler
- (B) Burner
- (C) Control system and switchgear
- (D) Anti-vibration boiler supports
- a Switchgear not fitted
- b Switchgear depth
- c Switchgear fitted
- d, e, f, g Other clearances
- x1, y1 See tables of dimensions: Max. length, max. width

#### Note

The schematic diagram only shows the boiler and the switchgear. Space required for additional equipment or further cables/pipework must be added to the minimum clearances.

a	mm	≥1000
b	mm	Subject to the selected switchgear
c	mm	≥800
d	mm	≥500
e	mm	≥300
Also observe the burner installation dimensions.		
Boiler door hinges can be moved to the other side.		
f	mm	≥500
g	mm	See recommendation: Approx. x1

#### Recommendation for dimension g

Leave one boiler length (x1) of space in front of the boiler door to extract the turbulators (if fitted) and for cleaning.

Observe the stated dimensions to ensure straightforward installation and maintenance.

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

The installation surface must be level. Level the boiler horizontally.

### Siting conditions

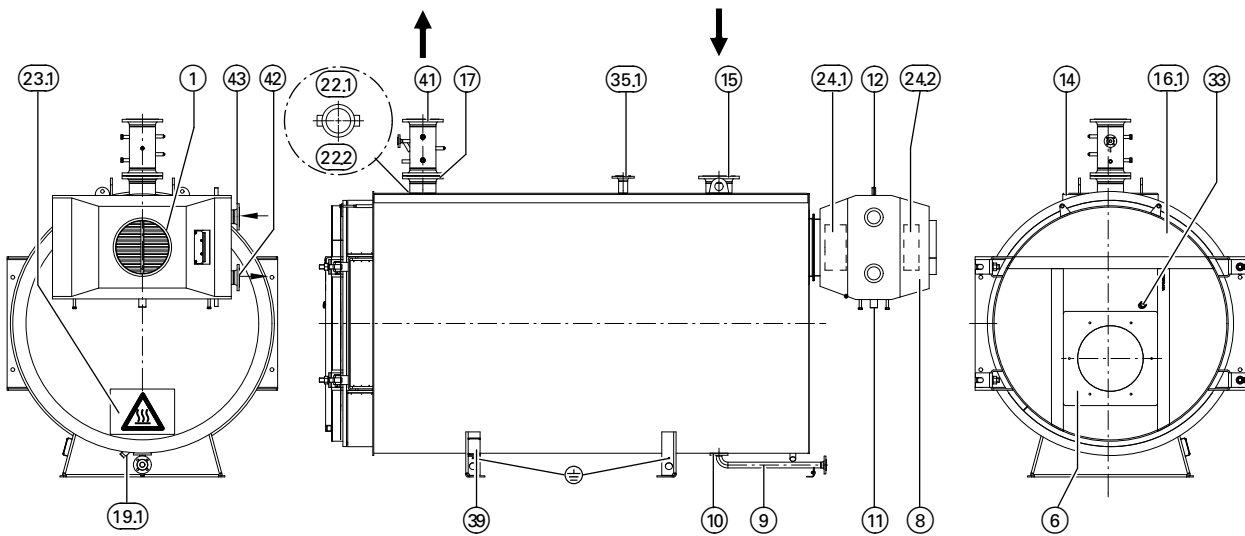
- Contamination of the combustion air from halogenated hydrocarbons is not permissible. Halogenated hydrocarbons can be found in sprays, paints, solvents and cleaning agents, for example.
- Provide an adequate supply of uncontaminated combustion air if there is a risk of air contamination from halogenated hydrocarbons where the boiler is sited.
- Avoid high incidence of dust exposure.

- Avoid high levels of humidity.
  - Prevent frost and ensure good ventilation.
  - Site on a level surface.
  - Align the boiler horizontally.
- Failure to observe these instructions can cause system faults and damage.

### Reducing noise

We recommend positioning anti-vibration supports (accessories) underneath the boiler support.

## Boiler geometry for boiler with condensing ECO



Rear view – side view – front view



Caution – hot surface.  
No thermal insulation fitted!

⊕ Equipotential bonding connection

1 Flue outlet

6 Burner connection

8 Condensing economiser

9 Drain pipe DN 40 PN 40, optional (90° swivelling)  
(using threaded flange)

10 Drain nipple R 1½

11 Drain nipple, ECO

12 Venting nipple, ECO

14 Boiler cover, optional

15 Boiler return connector

16.1 Boiler door

17 Boiler flow connector

19.1 Condensate drain nipple R 1½

22.1 Measurement/control equipment – R ½ female connection

22.2 Measurement/control equipment – R ½ female connection

23.1 Flue gas collector inspection port

24.1 Economiser inspection port

24.2 Economiser inspection port

33 Sight tube

35.1 Safety valve connector

39 Type plate

41 Intermediate flow piece, optional

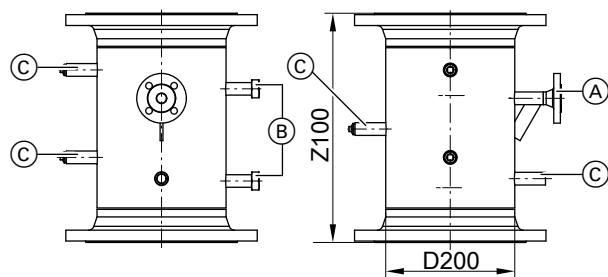
42 Water outlet connector

43 Water inlet connector

### On-site support of the condensing ECO

The condensing ECO must be provided with support on site.

### Intermediate flow piece (option)



Intermediate flow piece for boilers with permissible flow temperatures up to 110 °C

(A) Fitting assembly connector DN 20 PN 40

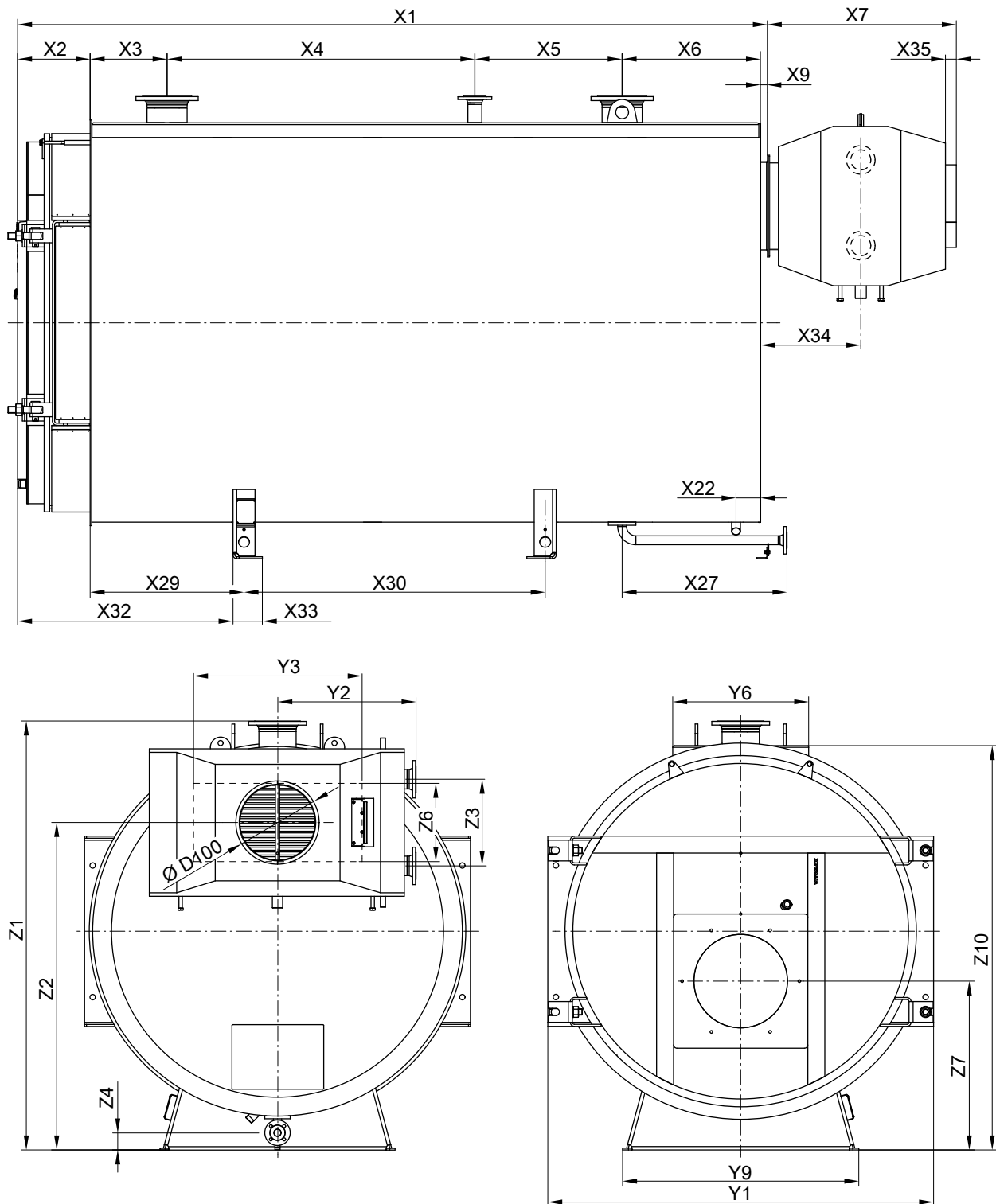
(B) Water level limiter float – sleeves 2 x G 1

(C) High limit safety cut-out, thermometer, sampling valve and other control equipment – sleeves 4 x R ½

D200	PN16	DN	80	100	125	150	200	250	300	350	400	450
Z100		mm	470	470	470	470	475	485	490	515	515	515

## Boiler geometry for boiler with condensing ECO (cont.)

### Dimensions



Boiler size		5	6	7	8	9	A	B
x1	mm	4248	4544	4874	5122	5613	5932	6245
x2	mm	337	356	396	396	426	476	526
x3	mm	320	350	385	420	450	485	515
x4	mm	1280	1400	1540	1680	1800	1940	2060
x5	mm	639	686	766	804	885	944	1027
x6	mm	680	760	795	830	860	895	925
x7	mm	1022	1022	1022	1022	1222	1222	1222
x9	mm	45	45	45	45	45	45	45
x22	mm	135	135	135	135	135	135	135
x27 (option)	mm	750	900	900	900	900	900	900

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## Boiler geometry for boiler with condensing ECO (cont.)

Boiler size		5	6	7	8	9	A	B
x29	mm	640	700	770	840	900	970	1030
x30	mm	1279	1386	1536	1644	1785	1914	2057
x32	mm	917	996	1106	1176	1226	1346	1456
x33	mm	160	160	160	160	240	240	240
x34	mm	542	542	542	542	642	642	642
x35	mm	60	60	60	60	60	60	60
y1	mm	1965	2065	2205	2270	2380	2465	2565
y2	mm	690	690	815	815	865	990	990
y3 <sup>*2</sup>	mm	785	785	950	950	1000	1030	1030
y6	mm	700	700	800	800	800	1000	1000
y9	mm	1196	1252	1316	1383	1440	1493	1547
z1	mm	2175	2280	2400	2525	2630	2730	2830
z2	mm	1623	1705	1805	1928	2000	2070	2130
z3	mm	360	360	510	510	560	620	620
z4 (option)	mm	100	100	100	100	100	100	100
z6 <sup>*2</sup>	mm	400	400	475	475	500	525	525
z7	mm	864	904	955	994	1040	1080	1114
z10	mm	2030	2135	2255	2380	2485	2585	2685
<b>Ø D100</b>								
– Internal	mm	390	440	490	490	550	620	700
– External	mm	400	450	500	500	560	630	710

## Transport information

Boiler size		5	6	7	8	9	A	B
<b>Shipping dimensions<sup>*3*4</sup> incl. packaging</b>								
– Total length	m	4.35	4.64	4.97	5.22	5.71	6.03	6.35
– Total width	m	1.99	2.09	2.23	2.30	2.41	2.49	2.59
– Total height	m	2.20	2.31	2.43	2.55	2.66	2.76	2.86
<b>Shipping dimensions of condensing ECO<sup>*4</sup> if delivered separately</b>								
– Total length	m	1.10	1.10	1.11	1.11	1.35	1.35	1.35
– Total width	m	1.40	1.40	1.65	1.65	1.75	2.00	2.00
– Total height	m	1.05	1.05	1.25	1.25	1.35	1.45	1.45
<b>Dry weight<sup>*4</sup> Boiler with condensing ECO and thermal insulation</b>								
For perm. operating pressure	6 bar	t	3.8	4.5	5.4	6.5	7.5	8.7
	10 bar	t	4.5	5.4	6.4	7.6	9.0	11.9
<b>Dry weight<sup>*4</sup> Condensing ECO incl. thermal insulation</b>		kg	235	235	325	325	400	475
Size of condensing ECO			1	1	3	3	4	5

## Boiler connections

Boiler size		5	6	7	8	9	A	B
<b>Boiler flow and return connectors</b>								
For permissible operating pressure 6 bar, 10 bar								
Temperature spread	20 K	PN 16 DN	150	150	200	200	200	250
By means of an on-site reducer with	30 K	PN 16 DN	125	125	150	150	200	200
	40 K	PN 16 DN	100	100	125	125	150	200
<b>Safety valve connector</b>								
For perm. operating pressure	6 bar	PN 16 DN	50	65	65	65	80	80
		PN 40 DN	—	—	—	—	—	—
	10 bar	PN 16 DN	—	50	50	65	65	80
		PN 40 DN	40	—	—	—	—	—

DN 65 PN 16 in 4-hole design

\*2 Clear dimension, boiler/ECO connection

\*3 To facilitate transport, the boiler and heat exchanger can be delivered separately.

\*4 Order related deviations of ±10 % are possible.

## Boiler geometry for boiler with condensing ECO (cont.)

### Condensing ECO connections

Boiler size			5	6	7	8	9	A	B
Water inlet/outlet connectors	6/10 bar	PN 16 DN	100	100	100	100	150	150	150

## Performance data for boiler with condensing ECO

Boiler size		5	6	7	8	9	A	B
Boiler water capacity	m <sup>3</sup>	2.42	2.94	3.63	4.36	5.04	5.69	6.50

Boiler size		5	6	7	8	9	A	B	
Flue gas mass flow rate* <sup>5</sup> wet	– For natural gas	1.5225 x combustion heating output in MW							
	– For EL fuel oil	1.5 x combustion heating output in MW							
Heating surface area	– Flue gas side	m <sup>2</sup>	52.0	63.2	82.3	91.0	106	125	145
	– Water side	m <sup>2</sup>	46.5	58.7	71.7	80.3	93.0	107	129
Flue gas volume	m <sup>3</sup>	3.61	4.52	5.94	7.19	8.89	10.87	12.7	

### Condensing ECO

Boiler size		5	6	7	8	9	A	B
Pressure drop on the heating water side	bar	0.1	0.1	0.1	0.1	0.1	0.2	0.2

### Condensing ECO

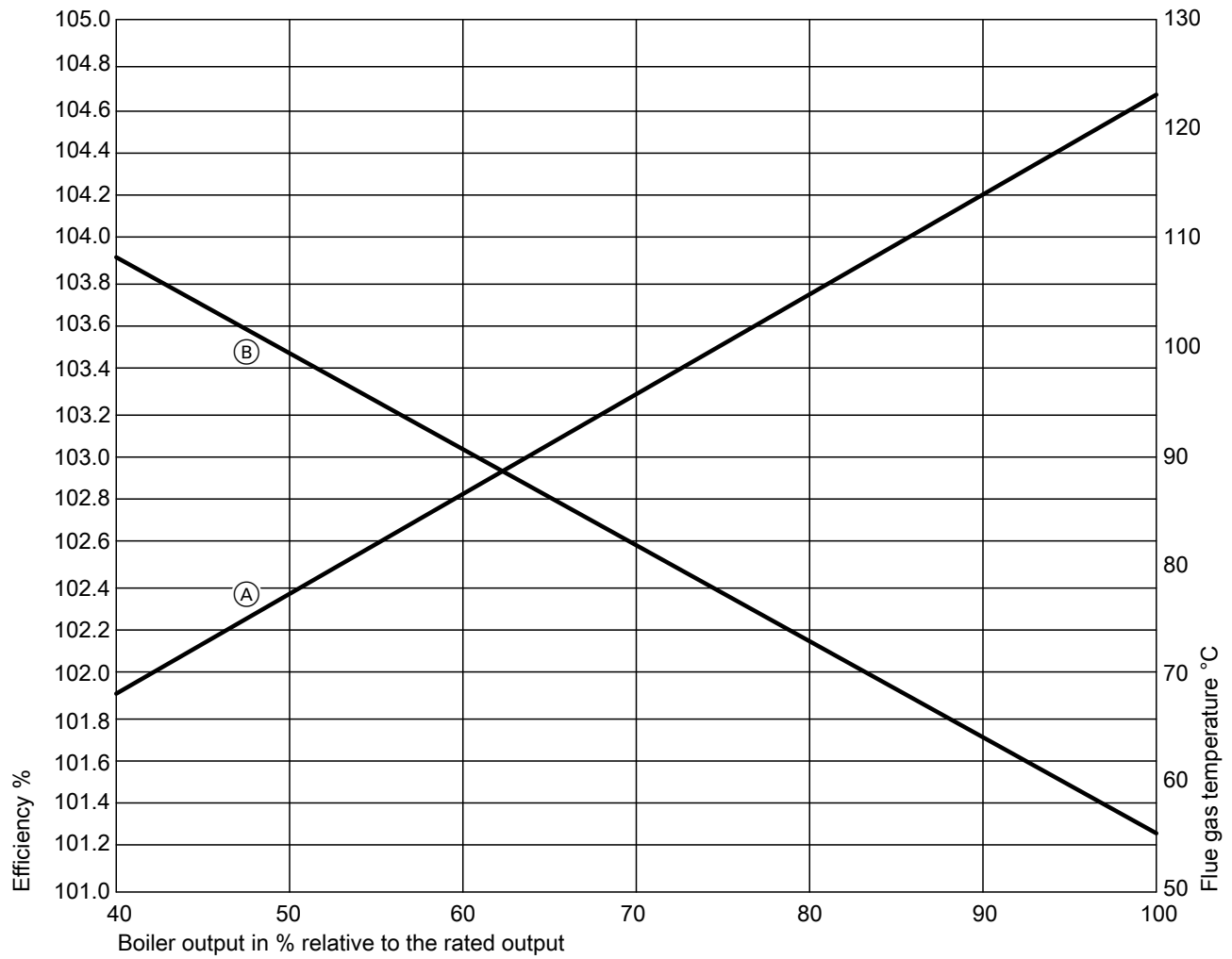
Boiler size		5	6	7	8	9	A	B
Size of condensing ECO		1	1	3	3	4	5	5
Total output	kW	231	270	375	428	511	628	705
Condensate volume	kg/h	178	208	286	327	392	478	538

\*<sup>5</sup> Calculation of values for sizing the flue system to EN 13384.



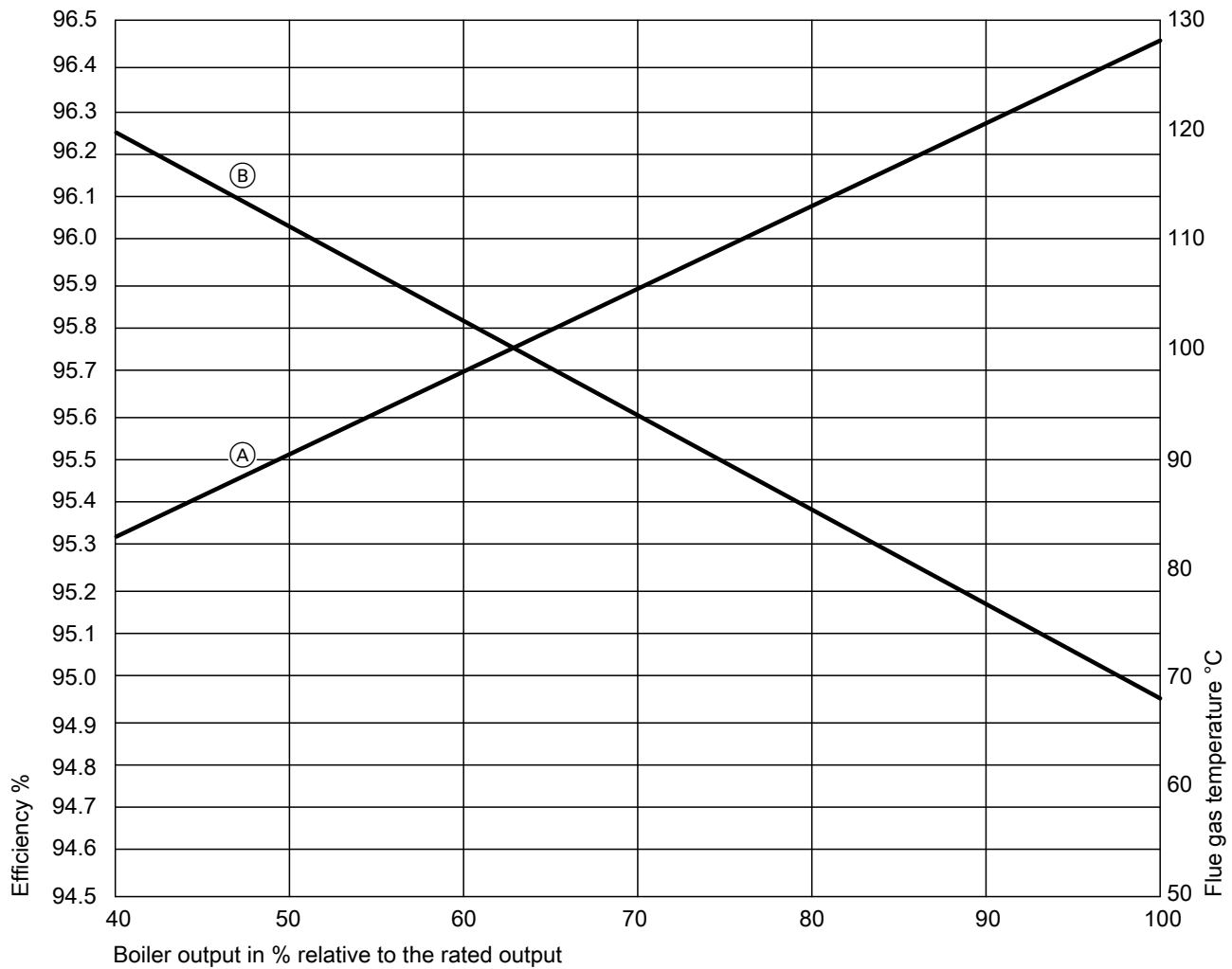
## Performance data for boiler with condensing ECO (cont.)

Flue gas temperature and efficiency with condensing ECO for gas operation



- Ⓐ Flue gas temperature in °C
- Ⓑ Efficiency in %

## Performance data for boiler with condensing ECO (cont.)



- (A) Flue gas temperature in °C at 60 °C water inlet temperature in condensing ECO
- (B) Efficiency in % at 60 °C water inlet temperature in condensing ECO

### Calculation of efficiency

The efficiency levels given are calculated as follows:  $\text{Efficiency} = 100\% \text{ load} - \text{flue gas loss (\%)} - \text{radiation loss (\%)} + \text{ECO output (\%)}$   
 The radiation losses are calculated according to EN 12953-11.

### Efficiency increase

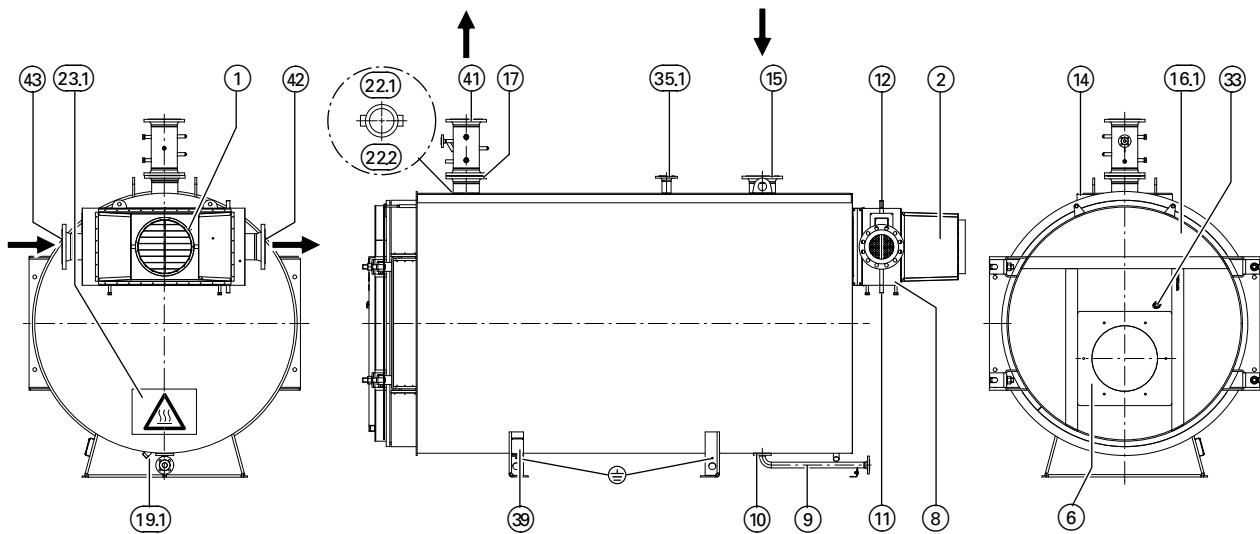
Relative to the O<sub>2</sub> content

- Gas: With a residual O<sub>2</sub> content of 2.1 %, the efficiency increases by 0.05 %.
- EL fuel oil: With a residual O<sub>2</sub> content of 2.7 %, the efficiency increases by 0.01 %.
- Data for other fuels can only be determined on the basis of a fuel analysis.

Relative to the temperature spread

- With 30 K spread while maintaining the flow temperature and 100 % load: + 0.2 %

## Boiler geometry for boiler with non-condensing ECO



Rear view – side view – front view



Caution – hot surface.  
No thermal insulation fitted!

⊕ Equipotential bonding connection

1 Flue outlet

2 Flue gas hood/adaptor

6 Burner connection

8 Non-condensing economiser

9 Drain pipe DN 40 PN 40, optional (90° swivelling)  
(using threaded flange)

10 Drain nipple R 1½

11 Drain nipple, ECO

12 Venting nipple, ECO

14 Boiler cover, optional

15 Boiler return connector

16.1 Boiler door

17 Boiler flow connector

19.1 Condensate drain nipple R 1½

22.1 Measurement/control equipment – R ½ female connection

22.2 Measurement/control equipment – R ½ female connection

23.1 Flue gas collector inspection port

33 Sight tube

35.1 Safety valve connector

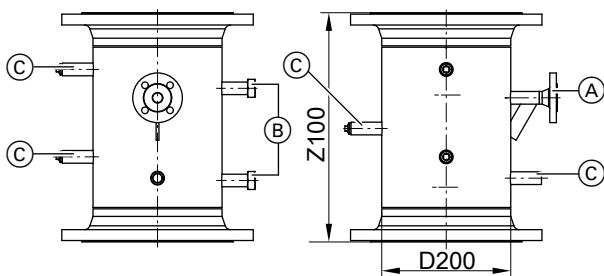
39 Type plate

41 Intermediate flow piece, optional

42 Water outlet connector

43 Water inlet connector

### Intermediate flow piece (option)



Intermediate flow piece for boilers with permissible flow temperatures up to 110 °C

(A) Fitting assembly connector DN 20 PN 40

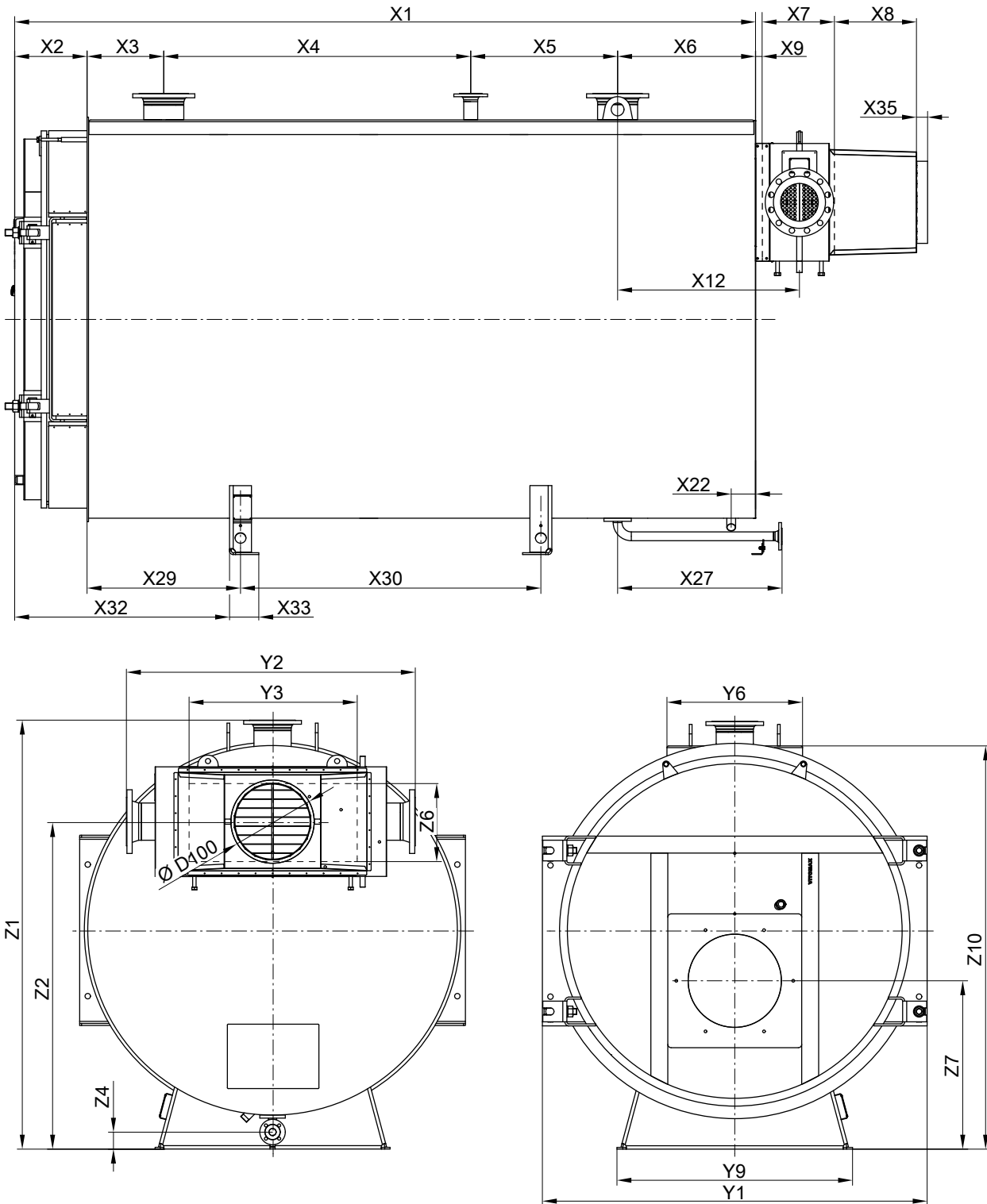
(B) Water level limiter float – sleeves 2 x G 1

(C) High limit safety cut-out, thermometer, sampling valve and other  
control equipment – sleeves 4 x R ½

D200	PN16	DN	80	100	125	150	200	250	300	350	400	450
Z100		mm	470	470	470	470	475	485	490	515	515	515

# Boiler geometry for boiler with non-condensing ECO (cont.)

## Dimensions



Boiler size		5	6	7	8	9	A	B
x1	mm	4190	4486	4816	5064	5355	5674	5987
x2	mm	337	356	396	396	426	476	526
x3	mm	320	350	385	420	450	485	515
x4	mm	1280	1400	1540	1680	1800	1940	2060
x5	mm	639	686	766	804	885	944	1027
x6	mm	680	760	795	830	860	895	925
x7	mm	402	402	402	402	402	402	402
x8 (option)	mm	502	502	502	502	502	502	502
x9	mm	45	45	45	45	45	45	45
x12	mm	926	1006	1041	1076	1106	1141	1171

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## Boiler geometry for boiler with non-condensing ECO (cont.)

Boiler size		5	6	7	8	9	A	B
x22	mm	135	135	135	135	135	135	135
x27 (option)	mm	750	900	900	900	900	900	900
x29	mm	640	700	770	840	900	970	1030
x30	mm	1279	1386	1536	1644	1785	1914	2057
x32	mm	917	996	1106	1176	1226	1346	1456
x33	mm	160	160	160	160	240	240	240
x35	mm	60	60	60	60	60	60	60
y1	mm	1965	2065	2205	2270	2380	2465	2565
y2	mm	1535	1535	1700	1700	1750	1780	1780
y3	mm	785	785	950	950	1000	1030	1030
y6	mm	700	700	800	800	800	1000	1000
y9	mm	1196	1252	1316	1383	1440	1493	1547
z1	mm	2175	2280	2400	2525	2630	2730	2830
z2	mm	1623	1705	1805	1928	2000	2070	2130
z4 (option)	mm	100	100	100	100	100	100	100
z6	mm	400	400	475	475	500	525	525
z7	mm	864	904	955	994	1040	1080	1114
z10	mm	2030	2135	2255	2380	2485	2585	2685
<b>Ø D100</b>								
– Internal	mm	390	440	490	490	550	620	700
– External	mm	400	450	500	500	560	630	710

### Transport information

Boiler size		5	6	7	8	9	A	B
<b>Shipping dimensions</b> <sup>*4</sup> incl. packaging								
– Total length	m	4.29	4.59	4.92	5.16	5.46	5.77	6.09
– Total width	m	1.99	2.09	2.23	2.30	2.41	2.49	2.59
– Total height	m	2.20	2.31	2.43	2.55	2.66	2.76	2.86
<b>Dry weight</b> <sup>*4</sup> Boiler with non-condensing ECO and thermal insulation								
For perm. operating pressure	6 bar	t	3.9	4.6	5.4	6.5	7.5	8.6
	10 bar	t	4.6	5.5	6.4	7.6	9.0	10.1
Size of non-condensing ECO			1	1	3	3	4	5

### Boiler connections

Boiler size		5	6	7	8	9	A	B
<b>Boiler flow and return connectors</b>								
For permissible operating pressure 6 bar, 10 bar								
Temperature spread	20 K	PN 16 DN	150	150	200	200	200	250
By means of an on-site reducer with	30 K	PN 16 DN	125	125	150	150	200	200
	40 K	PN 16 DN	100	100	125	125	150	200
<b>Safety valve connector</b>								
For perm. operating pressure	6 bar	PN 16 DN	50	65	65	65	80	100
		PN 40 DN	—	—	—	—	—	—
	10 bar	PN 16 DN	—	50	50	65	65	80
		PN 40 DN	40	—	—	—	—	—

DN 65 PN 16 in 4-hole design

### Non-condensing ECO connections

Boiler size		5	6	7	8	9	A	B
Water inlet/outlet connectors	6/10 bar	PN 40 DN	150	150				
		PN 25 DN			200	200	200	250

## Performance data for boiler with non-condensing ECO

Boiler size		5	6	7	8	9	A	B
Boiler water capacity	m <sup>3</sup>	2.44	2.96	3.66	4.39	5.07	5.72	6.53
<b>Boiler size</b>		<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>A</b>	<b>B</b>
Flue gas mass flow rate <sup>*5</sup> wet	t/h	1.5225 x combustion heating output in MW						
– For natural gas	t/h	1.5 x combustion heating output in MW						
– For EL fuel oil	t/h							
<b>Heating surface area</b>								
– Flue gas side	m <sup>2</sup>	83.3	94.5	121.3	130.0	151.1	160.8	181
– Water side	m <sup>2</sup>	46.5	58.7	71.7	80.3	93.0	107	129
Flue gas volume without flue gas hood	m <sup>3</sup>	3.47	4.38	5.66	6.91	8.41	10.24	12.1
Flue gas volume with flue gas hood	m <sup>3</sup>	3.37	4.28	5.51	6.76	8.24	10.05	11.9

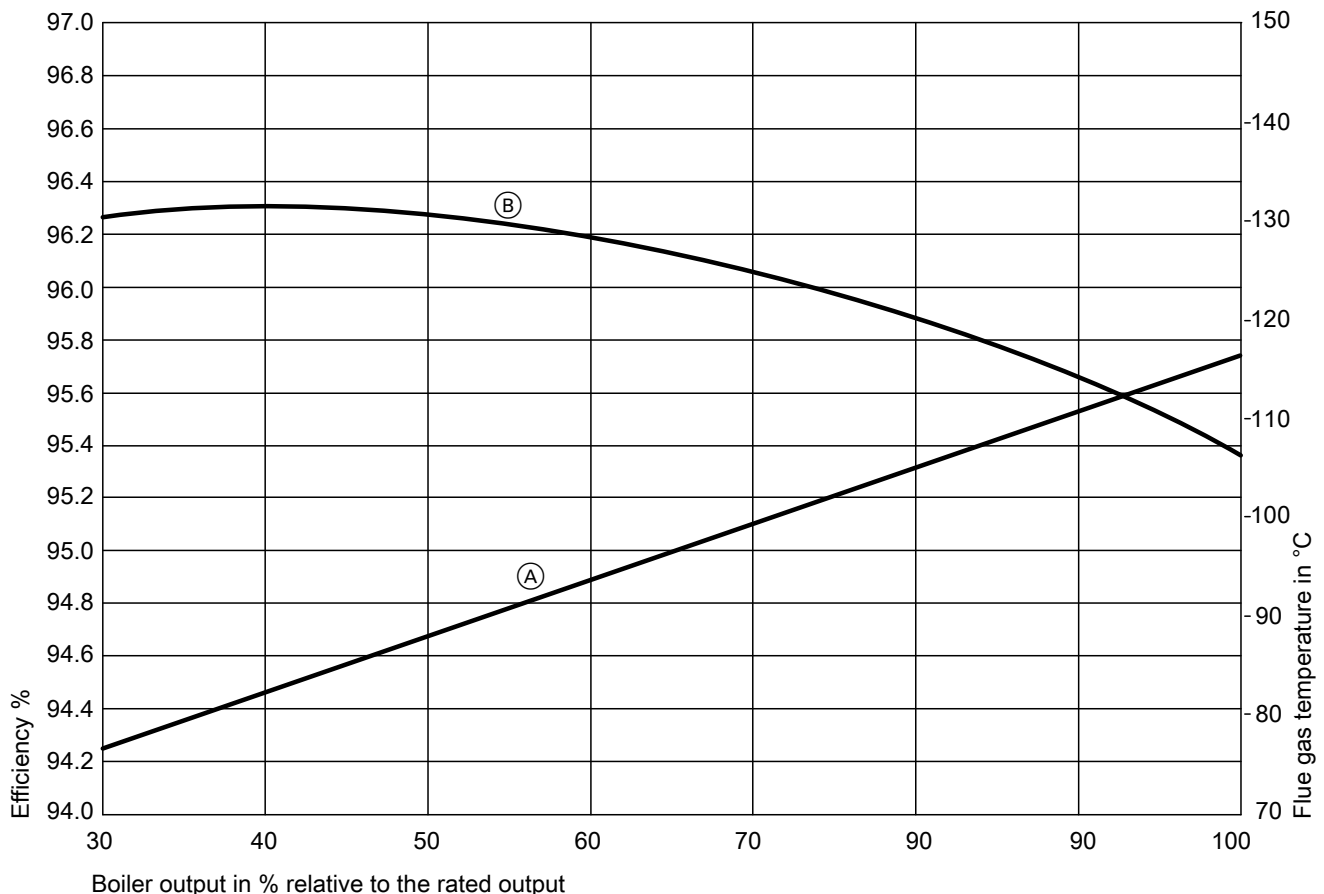
### Non-condensing ECO

Boiler size		5	6	7	8	9	A	B
Pressure drop on the heating water side	bar	0.21	0.21	0.21	0.21	0.21	0.21	0.21

### Non-condensing ECO

Boiler size		5	6	7	8	9	A	B
Size of non-condensing ECO		1	1	3	3	4	5	5
Total output	kW	108	125	166	191	232	268	298

### Flue gas temperature and boiler efficiency with non-condensing ECO for gas operation



- (A) Flue gas temperature in °C  
 (B) Boiler efficiency in %

#### Boiler efficiency calculation

The boiler efficiency levels given are calculated as follows: Boiler efficiency = 100 % - flue gas loss (%) - radiation loss (%)  
 The radiation losses are calculated according to EN 12953-11.

\*5 Calculation of values for sizing the flue system to EN 13384.

## Performance data for boiler with non-condensing ECO (cont.)

### Efficiency increase

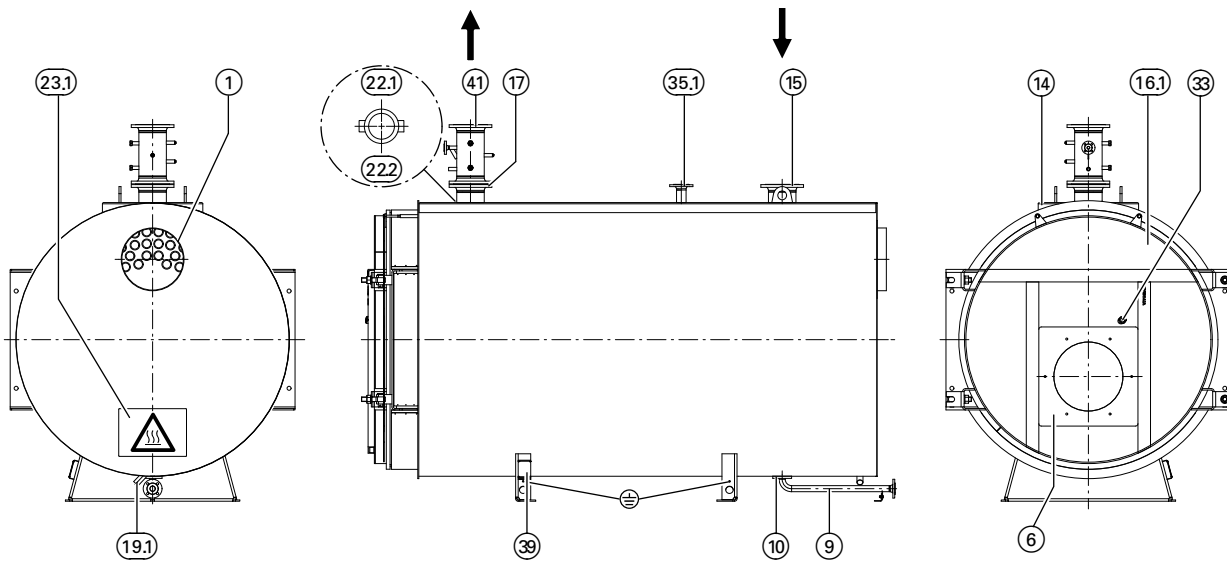
Relative to the O<sub>2</sub> content

- Gas: With a residual O<sub>2</sub> content of 2.1 %, the efficiency increases by 0.15 %.
- EL fuel oil: With a residual O<sub>2</sub> content of 2.7 %, the efficiency increases by 0.05 %.
- Data for other fuels can only be determined on the basis of a fuel analysis.

Relative to the temperature spread

- With 30 K spread while maintaining the flow temperature and 100 % load: + 0.2 %

## Boiler geometry for boiler without economiser

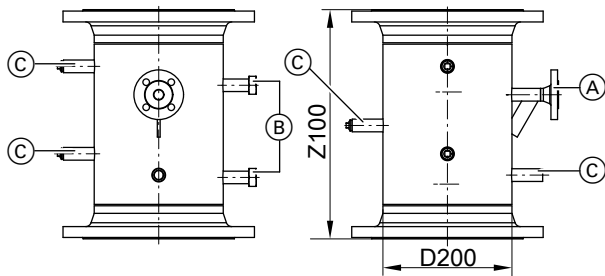


Rear view – side view – front view

- |   |  |
|---|--|
| <p> Caution – hot surface.<br/>No thermal insulation fitted!</p> <p> Equipotential bonding connection</p> <p>1 Flue outlet</p> <p>6 Burner connection</p> <p>9 Drain pipe DN 40 PN 40, optional (90° swivelling) (using threaded flange)</p> <p>10 Drain nipple R 1½</p> <p>14 Boiler cover, optional (for boiler size 5 and above)</p> <p>15 Boiler return connector</p> | <p>16.1 Boiler door</p> <p>17 Boiler flow connector</p> <p>19.1 Condensate drain nipple R 1½</p> <p>22.1 Measurement/control equipment – R ½ female connection</p> <p>22.2 Measurement/control equipment – R ½ female connection</p> <p>23.1 Flue gas collector inspection port</p> <p>33 Sight tube</p> <p>35.1 Safety valve connector</p> <p>39 Type plate</p> <p>41 Intermediate flow piece, optional</p> |
|---|--|

## Boiler geometry for boiler without economiser (cont.)

### Intermediate flow piece (option)

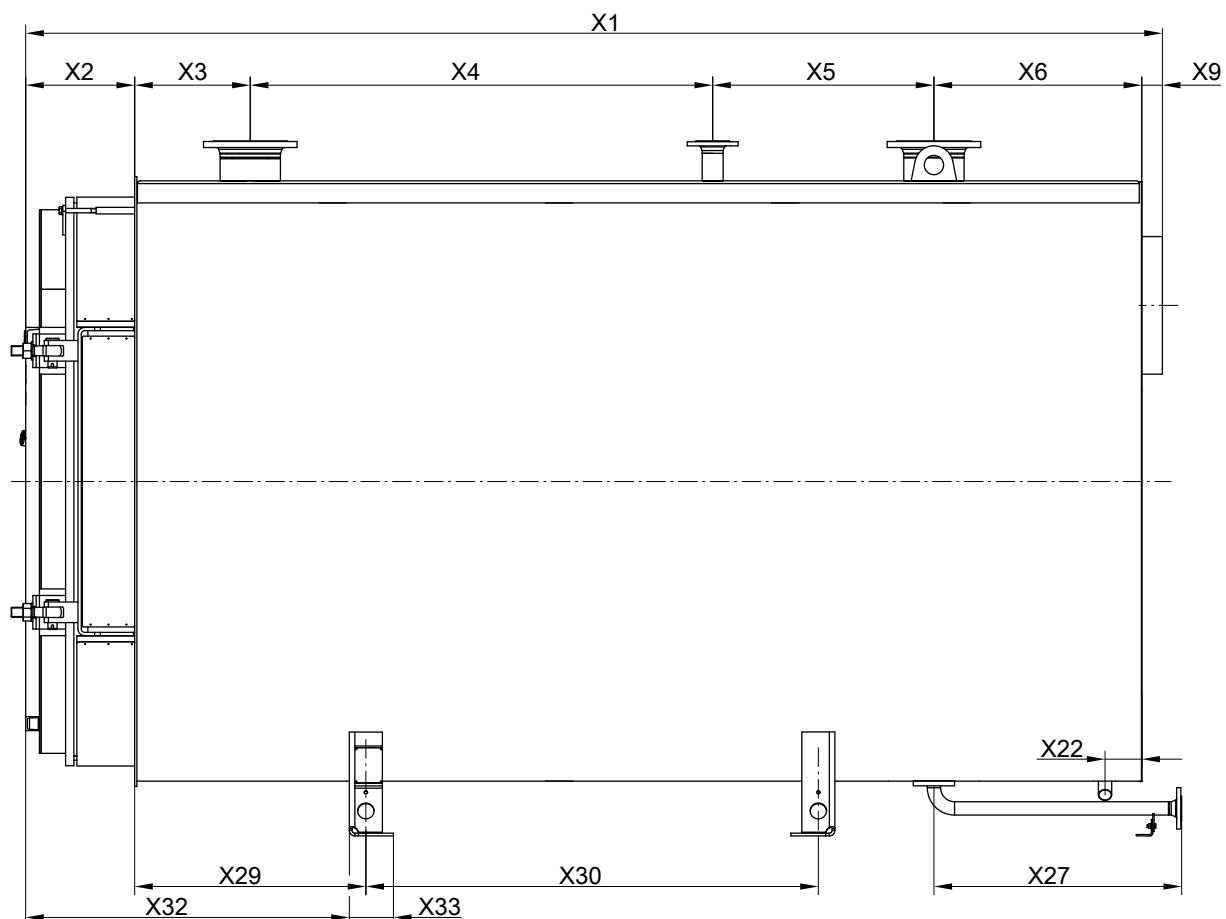


Intermediate flow piece for boilers with permissible flow temperatures up to 110 °C

- (A) Fitting assembly connector DN 20 PN 40
- (B) Water level limiter float – sleeves 2 x G 1
- (C) High limit safety cut-out, thermometer, sampling valve and other control equipment – sleeves 4 x R ½

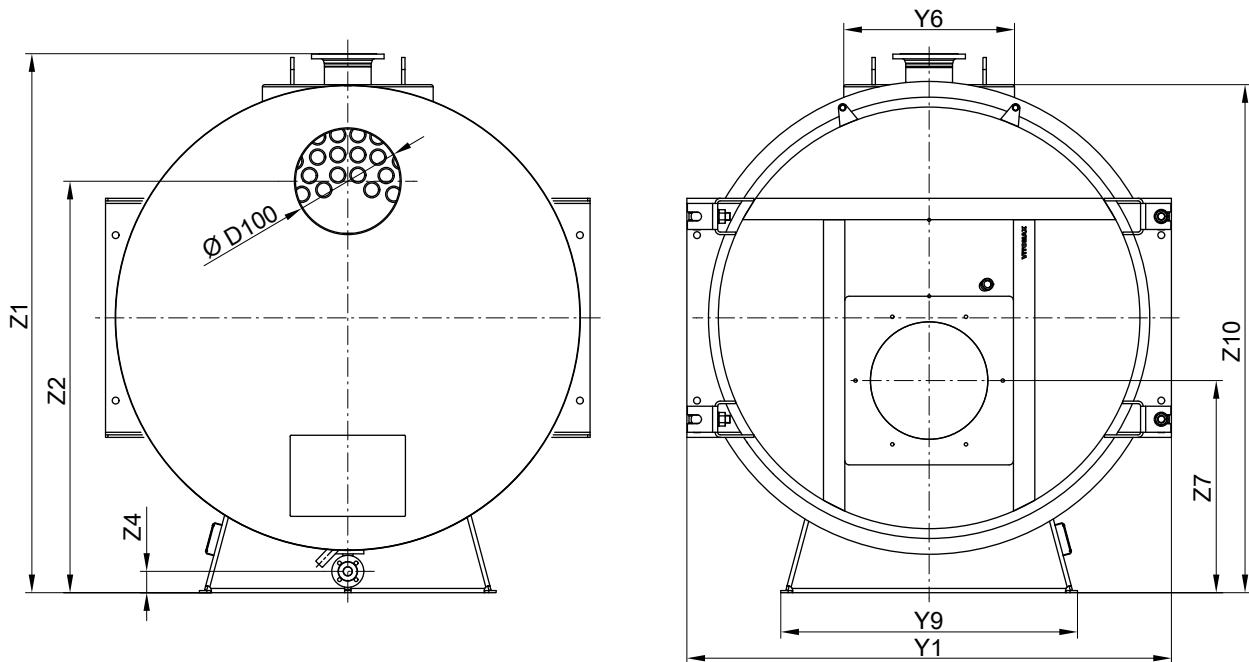
D200	PN16	DN	80	100	125	150	200	250	300	350	400	450
Z100		mm	470	470	470	470	475	485	490	515	515	515

### Dimensions





## Boiler geometry for boiler without economiser (cont.)



Boiler size		1	2	3	4	5	6	7	8	9	A	B
x1	mm	2259	2507	2775	3010	3256	3552	3882	4130	4421	4740	5053
x2	mm	337	337	337	337	337	356	396	396	426	476	526
x3	mm	200	230	260	290	320	350	385	420	450	485	515
x4	mm	800	920	1040	1160	1280	1400	1540	1680	1800	1940	2060
x5	mm	362	430	518	573	639	686	766	804	885	944	1027
x6	mm	560	590	620	650	680	760	795	830	860	895	925
x9	mm	75	75	75	75	75	75	75	75	75	75	75
x22	mm	135	135	135	135	135	135	135	135	135	135	135
x27 (option)	mm	750	750	750	750	750	900	900	900	900	900	900
x29	mm	400	460	520	580	640	700	770	840	900	970	1030
x30	mm	762	890	1038	1153	1279	1386	1536	1644	1785	1914	2057
x32	mm	677	737	797	857	917	996	1106	1176	1226	1346	1456
x33	mm	160	160	160	160	160	160	160	160	240	240	240
y1	mm	1400	1555	1670	1810	1965	2065	2205	2270	2380	2465	2565
y6	mm	—	—	—	—	700	700	800	800	800	1000	1000
y9	mm	920	992	1054	1121	1196	1252	1316	1383	1440	1493	1547
z1	mm	1660	1795	1910	2035	2175	2280	2400	2525	2630	2730	2830
z2	mm	1215	1323	1420	1513	1623	1705	1805	1928	2000	2070	2130
z4	mm	100	100	100	100	100	100	100	100	100	100	100
z7	mm	664	715	766	817	864	904	955	994	1040	1080	1114
z10	mm	—	—	—	—	2030	2135	2255	2380	2485	2585	2685
<b>Ø D100</b>												
– Internal	mm	204	230	305	305	390	440	490	490	550	620	700
– External	mm	214	240	315	315	400	450	500	500	560	630	710

### Transport information

Boiler size		1	2	3	4	5	6	7	8	9	A	B
<b>Shipping dimensions incl. packaging<sup>*4</sup></b>												
– Total length	m	2.36	2.61	2.88	3.11	3.36	3.65	3.98	4.23	4.52	4.84	5.15
– Total width	m	1.43	1.58	1.70	1.84	1.99	2.09	2.23	2.30	2.41	2.49	2.59
– Total height	m	1.69	1.82	1.94	2.06	2.20	2.31	2.43	2.55	2.66	2.76	2.86
<b>Dry weight<sup>*4</sup> Boiler incl. thermal insulation</b>												
For perm. operating pressure	6 bar	t	1.7	2.1	2.5	2.8	3.6	4.3	5.1	6.2	7.1	8.2
	10 bar	t	1.8	2.3	2.8	3.3	4.3	5.2	6.1	7.3	8.6	9.9

## Boiler geometry for boiler without economiser (cont.)

### Boiler connections

Boiler size			1	2	3	4	5	6	7	8	9	A	B
<b>Boiler flow and return connectors</b>													
For permissible operating pressure 6 bar, 10 bar													
Temperature spread	20 K	PN16 DN	80	100	125	125	150	150	200	200	200	250	250
By means of an on-site reducer with													
	30 K	PN 16 DN	65	80	100	100	125	125	150	150	200	200	200
	40 K	PN 16 DN	65	65	80	80	100	100	125	125	150	150	200
<b>Safety valve connector</b>													
For permiss. operating pressure													
	6 bar	PN16 DN	—	—	—	50	50	65	65	65	80	80	100
		PN40 DN	32	32	40	—	—	—	—	—	—	—	—
	10 bar	PN16 DN	—	—	—	—	—	50	50	65	65	65	80
		PN40 DN	25	25	32	40	40	—	—	—	—	—	—

DN 65 PN 16 in 4-hole design

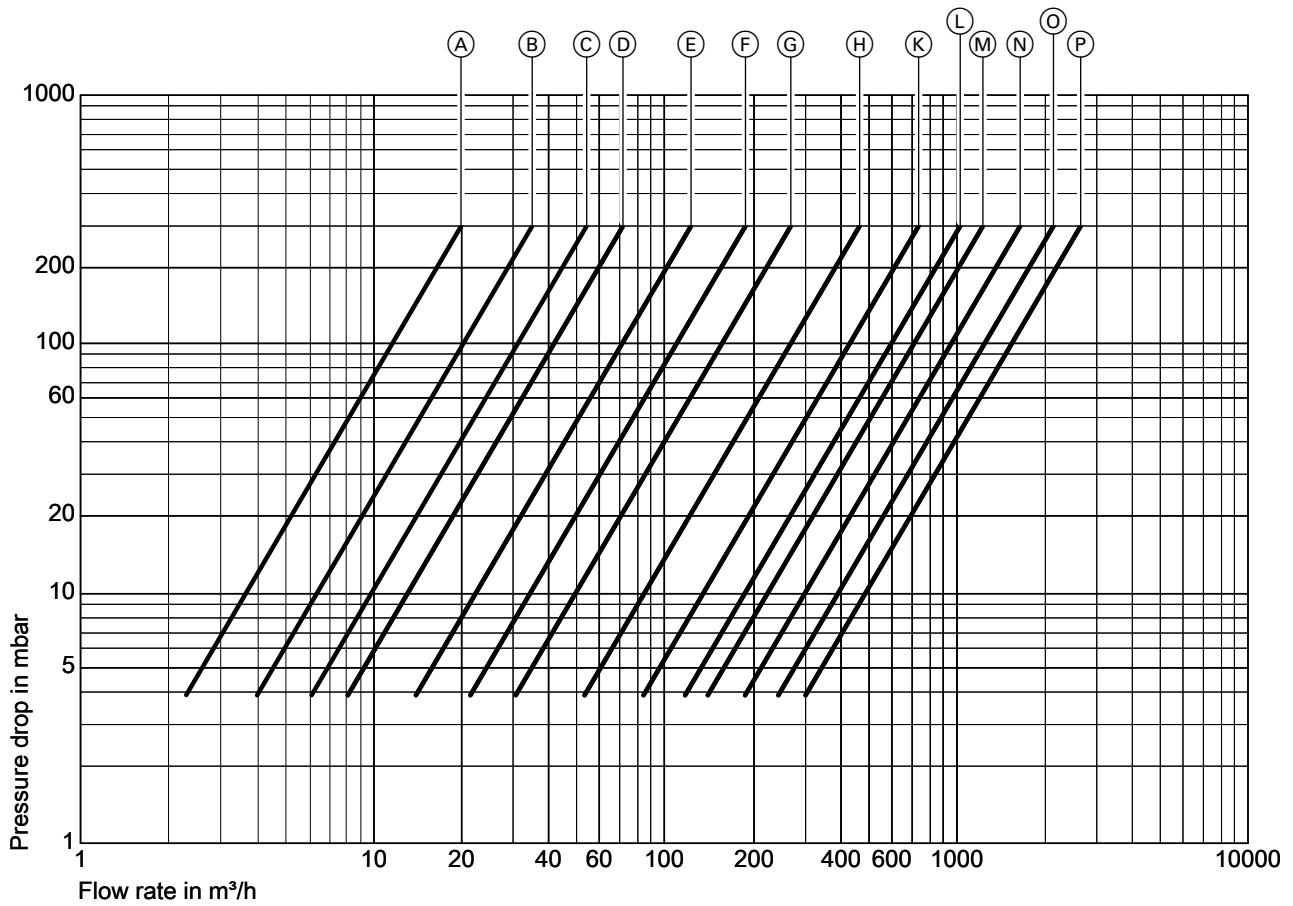
## Performance data for boiler without economiser

Boiler size		1	2	3	4	5	6	7	8	9	A	B
Boiler water capacity	m <sup>3</sup>	0.79	1.12	1.48	1.90	2.42	2.94	3.63	4.36	5.04	5.69	6.50
<b>Boiler size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>A</b>	<b>B</b>
<b>Flue gas mass flow rate</b> <sup>*6</sup> wet												
– For natural gas	t/h	1.5225 x combustion heating output in MW										
– For EL fuel oil	t/h	1.5 x combustion heating output in MW										
<b>Heating surface</b>												
– Flue gas side	m <sup>2</sup>	14.4	20.3	26.4	34.2	42.8	54.0	66.0	74.7	86.4	99.3	120
– Water side	m <sup>2</sup>	15.8	22.3	29.0	37.6	46.5	58.7	71.7	80.3	93.0	107	129
Flue gas volume	m <sup>3</sup>	0.91	1.32	1.82	2.40	3.27	4.18	5.37	6.62	8.08	9.87	11.7

\*6 Calculation of values for sizing the flue system to EN 13384 with the following CO<sub>2</sub> content: 13.4 % for EL fuel oil and 10.5 % for natural gas under the stated general conditions. For O<sub>2</sub> content in the dry flue gas of 3.0 % by vol. natural gas or 3.0 % by vol. EL fuel oil, the CO<sub>2</sub> content is as follows: 13 % for EL fuel oil and 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.

## Performance data for boiler without economiser (cont.)

Pressure drop on the heating water side

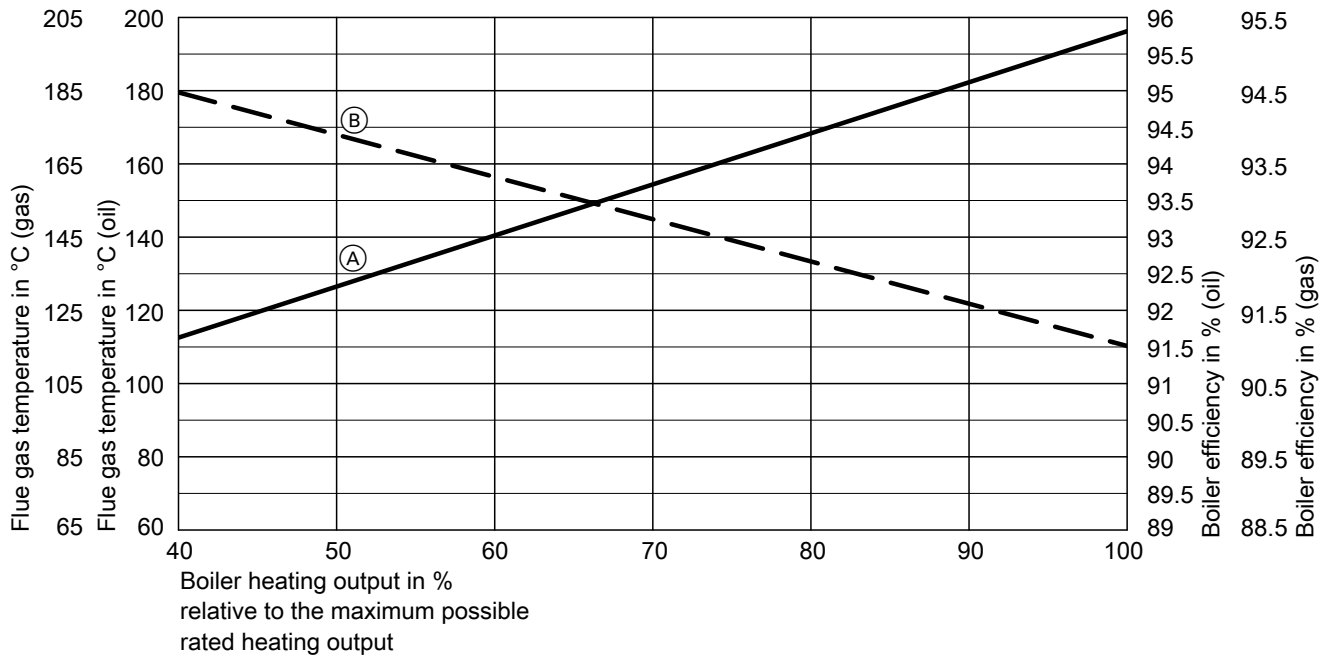


Nominal diameter of boiler flow and return connectors

Ⓐ DN40	Ⓗ DN200
Ⓑ DN50	Ⓚ DN250
Ⓒ DN65	Ⓛ DN300
Ⓓ DN80	Ⓜ DN350
Ⓔ DN100	Ⓝ DN400
Ⓕ DN125	Ⓞ DN450
Ⓖ DN150	Ⓟ DN500

## Performance data for boiler without economiser (cont.)

### Flue gas temperature and boiler efficiency



Lower limits averaged across all boiler sizes

- (A) Flue gas temperature in °C
- (B) Boiler efficiency in %

### Boiler efficiency calculation

The boiler efficiency levels given are calculated as follows:  $\text{Boiler efficiency} = 100\% - \text{flue gas loss (\%)} - \text{radiation loss (\%)}$   
 The radiation losses are calculated according to EN 12953-11.

### Efficiency increase

Relative to the  $O_2$  content

- Gas: With a residual  $O_2$  content of 2.1 %, the efficiency increases by 0.7 %.
- EL fuel oil: With a residual  $O_2$  content of 2.7 %, the efficiency increases by 0.2 %.
- Data for other fuels can only be determined on the basis of a fuel analysis.

Relative to the temperature spread

- With 40 K spread while maintaining the flow temperature and 100 % load: + 0.4 %
- With 30 K spread while maintaining the flow temperature and 100 % load: + 0.2 %

## Operating conditions

	Requirements/notes		
	Boiler with condensing ECO	Boiler with non-condensing ECO	Boiler
1. Heating water flow rate	No minimum heating water flow rate required		
2. <b>Boiler return temperature</b> (minimum value) – Gas operation – Oil operation	55 °C 50 °C	65 °C 65 °C	55 °C 50 °C
3. Minimum flow temperature	70 °C		
4. Minimum water inlet temperature	Recommendation for condensing ECO: 30 °C for high condensation rate	See boiler return temperature	See boiler return temperature
5. <b>Maximum temperature spread</b> For gas and oil operation	50 K	40 K	50 K
6. Multi stage burner operation	None		
7. Modulating burner operation	None		
8. <b>Setback mode</b> Single boiler system	Operation with minimum flow temperature		
Multi boiler system – Lead boiler – Lag boiler	Operation with minimum flow temperature Lag boilers can be shut down		
Weekend setback	See setback mode		

### Note

The water should flow through the condensing ECO via a dedicated water circuit or one that is separate from the boiler circuit.



Chapter "Standard values for water quality" in operating and service instructions

## Permissible flow temperatures

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

- **Up to 110 °C**
  - Designation: According to Gas Appliances Regulation (EU)



### Further information on design/engineering

See the technical guide to this boiler

### Note

The achievable flow temperature is approx. 15 K below the permissible flow temperature (= safety temperature).

## Tested quality

**CE** CE designation according to current EU Directives and EU Regulations.

## Standard delivery

Standard delivery in accordance with order confirmation.

For further information on this product type, speak to your Viessmann contact.

Subject to technical modifications.

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