VIESMANN

VITOMAX 200-HS

High pressure steam boiler
Three-pass boiler
Steam output 0.5 to 4.0 t/h

Datasheet

Part no.: see pricelist, prices on request

VITOMAX 200-HS Type M73A

Oil/gas high pressure steam boiler
Compliant with the requirements of the
EC Pressure Equipment Directive and the TRD regulations
Three-pass boiler
with and without integral economiser
Permissible operating pressure 6 to 25 bar

Specification

Specification (without economiser)

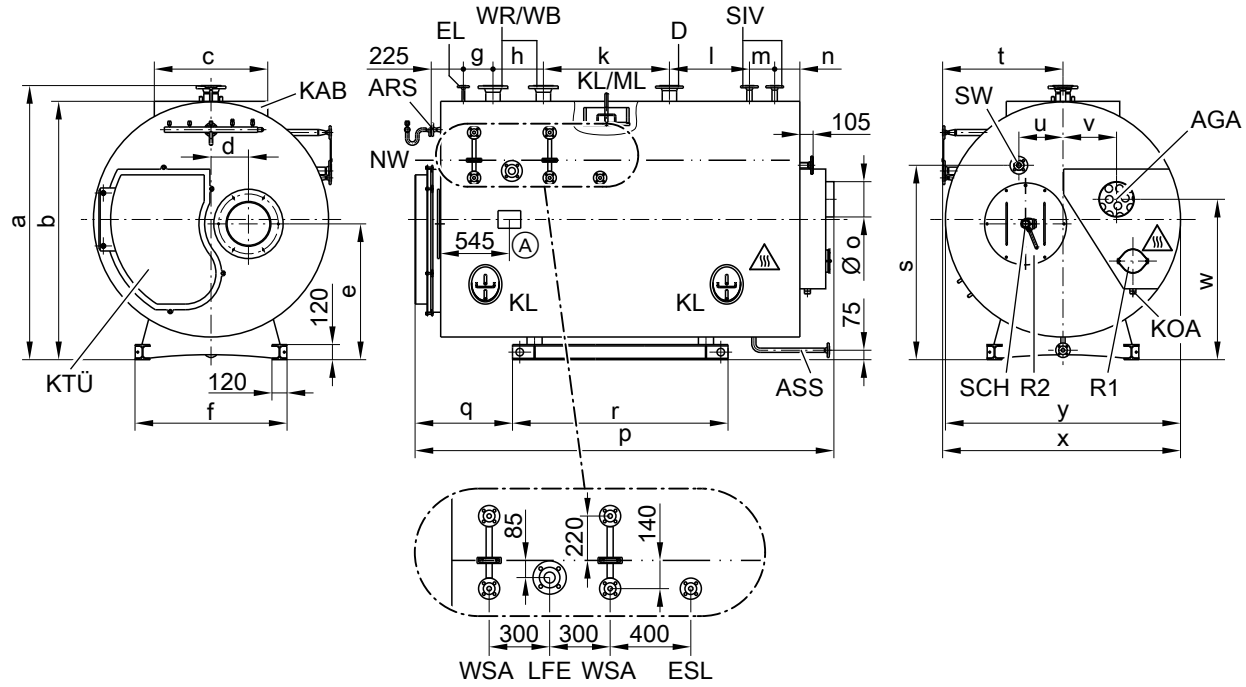
Size			1	2	3	4	5	6	7	8	9
Steam output[*1] (at 102 °C feedwater temperature)		t/h	0.50	0.70	1.0	1.30	1.65	2.0	2.5	3.2	4.0
Combustion heating output			See diagram on page 8								
CE designation			In accordance with Pressure Equipment Directive 97/23/EC								
Overall dimensions with packaging											
Total length		m	2.75	2.90	3.11	3.31	3.53	3.75	3.96	4.31	4.65
Total width		m	1.63	1.71	1.78	1.85	1.94	2.03	2.11	2.24	2.35
Total height		m	1.86	1.95	2.04	2.12	2.20	2.29	2.40	2.53	2.64
Total weight[*2] (boiler with thermal insulation)											
for permiss. operating pressure	6 bar	t	1.9	2.2	2.5	2.8	3.2	3.6	4.3	5.0	5.6
	8 bar	t	2.1	2.4	2.6	3.0	3.4	3.9	4.6	5.5	6.3
	10 bar	t	2.3	2.6	2.9	3.3	3.8	4.4	5.2	6.2	7.0
	13 bar	t	2.5	2.9	3.3	3.7	4.4	4.9	5.9	6.8	7.8
	16 bar	t	2.8	3.2	3.7	4.1	4.9	5.5	6.5	7.7	9.1
	18 bar	t	3.1	3.4	3.9	4.6	5.3	5.9	7.1	8.5	9.8
	20 bar	t	3.3	3.8	4.4	4.9	5.7	6.5	7.7	9.2	10.5
	22 bar	t	3.5	4.0	4.7	5.4	6.0	7.0	8.4	9.8	10.6
	25 bar	t	3.9	4.6	5.1	5.9	6.7	7.6	9.0	10.2	11.6
Boiler water content											
– overall		m^3	1.77	2.16	2.64	3.18	3.84	4.53	5.41	6.71	8.07
– average operating range[*3]		m^3	1.58	1.90	2.32	2.80	3.30	3.85	4.62	5.78	7.01
Steam chamber volume with an average operating range[*3]		m^3	0.19	0.25	0.32	0.39	0.54	0.67	0.79	0.92	1.06
Steam level surface area with an average operating range[*3]		m^2	1.61	1.91	2.25	2.59	3.09	3.55	4.02	4.64	5.29
Boiler connections						**Steam connector**					
for permiss. operating pressure	6 bar	PN 16 DN	65	65	80	100	100	125	125	150	150
	8 bar	PN 16 DN	50	65	65	80	100	100	100	125	150
	10 bar	PN 16 DN	—	50	65	65	80	80	100	125	125
	10 bar	PN 40 DN	40	—	—	—	—	—	—	—	—
	13 bar	PN 40 DN	32	40	50	65	65	80	80	100	100
	16 bar	PN 40 DN	32	40	50	50	65	65	80	80	100
	18 bar	PN 40 DN	32	32	50	50	65	65	65	80	100
	20 bar	PN 40 DN	32	32	40	50	50	65	65	80	80
	22 bar	PN 40 DN	32	32	40	50	50	65	65	65	80
	25 bar	PN 40 DN	32	32	32	40	50	50	65	65	80
						Safety valve connector					
for permiss. operating pressure	6 bar	PN 40 DN	20	20	25	32	32	40	40	50	50
	8 bar	PN 40 DN	20	20	25	25	32	32	40	40	50
	10 bar	PN 40 DN	20	20	20	25	25	32	32	40	40
	13 bar	PN 40 DN	20	20	20	20	25	25	32	32	40
	16 bar	PN 40 DN	20	20	20	20	20	25	25	32	32
	18 bar	PN 40 DN	20	20	20	20	20	20	25	32	32
	20 bar	PN 40 DN	20	20	20	20	20	20	25	25	32
	22 bar	PN 40 DN	20	20	20	20	20	20	25	25	32
	25 bar	PN 40 DN	20	20	20	20	20	20	20	25	32
Connector for feedwater pumps		PN 40 DN	25	25	25	32	32	32	32	32	32
Flue gas parameters			See diagrams on page 10								
Flue gas volume		m^3	0.49	0.63	0.85	1.05	1.29	1.57	1.99	2.67	3.40

*[*1] The permissible steam output varies depending on the required emission values.*

*[*2] Because of production methods, the total weight (weight when empty) can vary by up to 10 %.*

*[*3] Average water level between pump ON and pump OFF.*

Specification (cont.)



Ⓐ Type plate
AGA Flue gas connection
ARS Connector DN 20 PN 40 for instrument base (pressure regulator, pressure limiter and pressure gauge)
ASS Connector DN 25 PN 40 for blow-down valve
D Steam connector
EL Connector DN 15 PN 40 for air vent valve
ESL Connector DN 20 PN 40 for T.D.S. line
KAB Boiler cover
KL Head hole
KOA Condensate drain R 1½
KTÜ Boiler door
LFE Connector DN 50 PN 40 for conductivity electrode
ML Manhole (from size 3)
NW Minimum water level
R Cleaning aperture
SCH Inspection port
SIV Safety valve connector
SW Feedwater connector
WB Connector DN 100 PN 40 for water level limiter
WR Connector DN 100 PN 40 for water level controller
WSA Connector DN 20 PN 40 for water level indicator

Note
Illustration of standard version. The boiler can be designed as a mirror image on request.

Dimensions[*4]

Size		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Steam output	t/h	0.5	0.7	1.0	1.3	1.65	2.0	2.5	3.2	4.0
a	mm	1830	1920	2010	2090	2175	2260	2370	2500	2610
b	mm	1700	1795	1895	1965	2050	2135	2245	2375	2485
c	mm	500	500	500	600	900	900	900	900	1000
d	mm	222	245	256	278	297	320	348	379	405
e	mm	859	940	995	1046	1078	1122	1199	1300	1385
f	mm	1022	1070	1118	1161	1207	1252	1311	1381	1440
g	mm	235	235	235	235	235	235	235	235	235
h	mm	300	300	300	400	400	400	400	400	400
k	mm	765	860	800	850	1000	1100	1200	1300	1400
l	mm	225	280	550	565	610	650	760	925	1160
m	mm	200	200	200	225	250	250	250	300	300
n	mm	165	165	165	200	200	230	230	230	230
o (fem.)	∅ mm	152	192	216	242	272	307	346	392	442
p	mm	2551	2701	2911	3111	3331	3545	3755	4110	4445
q	mm	581	619	671	721	776	844	896	1015	1099
r	mm	1320	1395	1500	1600	1710	1808	1912	2070	2238
s	mm	1280	1345	1422	1491	1543	1605	1704	1830	1938
t	mm	815	850	880	910	955	1000	1025	1075	1115
u	mm	227	230	325	350	350	375	400	425	450
v	mm	350	375	380	380	425	450	450	490	500
w	mm	1070	1115	1175	1230	1273	1315	1395	1500	1580
x	mm	1575	1655	1730	1800	1888	1975	2055	2170	2264
y	mm	1520	1610	1700	1780	1865	1950	2060	2190	2300

[*4] *Nominal dimensions, subject to modification.*

5822 534 GB

Specification (cont.)

Specification (with economiser)

Size			1	2	3	4	5	6	7	8	9
Steam output[*5] (at 102 °C feedwater temperature)		t/h	0.5	0.7	1.0	1.3	1.65	2.0	2.5	3.2	4.0
Combustion heating output			See diagram on page 8								
CE designation			In accordance with Pressure Equipment Directive 97/23/EC								
Overall dimensions											
Total length		m	3.21	3.36	3.57	3.79	4.01	4.38	4.59	4.94	5.28
Total width		m	1.63	1.71	1.78	1.85	1.94	2.03	2.11	2.24	2.35
Total height	– with ECO 100	m	2.21	2.30	2.39	2.52	2.61	2.69	2.85	3.03	3.14
	– with ECO 200	m	2.47	2.56	2.65	2.90	2.98	2.94	3.10	3.27	3.38
Total weight[*6] (boiler with thermal insulation) for permiss. operating pressure											
– with ECO 100	6 bar	t	2.1	2.4	2.7	3.0	3.4	3.9	4.6	5.3	5.9
	8 bar	t	2.3	2.6	2.8	3.2	3.6	4.2	4.9	5.8	6.6
	10 bar	t	2.5	2.8	3.1	3.5	4.0	4.7	5.5	6.5	7.3
	13 bar	t	2.7	3.1	3.5	3.9	4.6	5.2	6.2	7.1	8.1
	16 bar	t	3.0	3.4	3.9	4.3	5.1	5.8	6.8	8.0	9.4
	18 bar	t	3.3	3.6	4.1	4.8	5.5	6.2	7.4	8.8	10.1
	20 bar	t	3.5	4.0	4.6	5.1	5.9	6.8	8.0	9.5	10.8
	22 bar	t	3.7	4.2	4.9	5.6	6.2	7.3	8.7	10.1	10.9
	25 bar	t	4.1	4.8	5.3	6.1	6.9	7.9	9.3	10.5	11.9
for permiss. operating pressure											
– with ECO 200	6 bar	t	2.2	2.5	2.9	3.2	3.6	4.1	4.9	5.7	6.3
	8 bar	t	2.4	2.7	3.0	3.4	3.8	4.4	5.2	6.2	7.0
	10 bar	t	2.6	2.9	3.3	3.7	4.2	4.9	5.8	6.9	7.7
	13 bar	t	2.8	3.2	3.7	4.1	4.8	5.4	6.5	7.5	8.5
	16 bar	t	3.1	3.5	4.1	4.5	5.3	6.0	7.1	8.4	9.8
	18 bar	t	3.4	3.7	4.3	5.0	5.7	6.4	7.7	9.2	10.5
	20 bar	t	3.6	4.1	4.8	5.3	6.1	7.0	8.3	9.9	11.2
	22 bar	t	3.8	4.3	5.1	5.8	6.4	7.5	9.0	10.5	11.3
	25 bar	t	4.2	4.9	5.5	6.3	7.1	8.1	9.6	10.9	12.3
Boiler water content											
– total with ECO 100		m^3	1.78	2.17	2.65	3.19	3.85	4.55	5.43	6.73	8.09
– total with ECO 200		m^3	1.79	2.18	2.66	3.20	3.86	4.57	5.45	6.76	8.13
− average operating range[*7] with ECO 100		m^3	1.59	1.91	2.33	2.81	3.31	3.87	4.64	5.80	7.03
− average operating range[*7] with ECO 200		m^3	1.60	1.92	2.34	2.82	3.32	3.89	4.66	5.83	7.07
Steam chamber volume with an average operating range[*7]		m^3	0.19	0.25	0.32	0.39	0.54	0.67	0.79	0.92	1.06
Steam level surface area with an average operating range[*7]		m^2	1.61	1.91	2.25	2.59	3.09	3.55	4.92	4.64	5.29
Boiler connections						**Steam connector**					
for permiss. operating pressure	6 bar	PN 16 DN	65	65	80	100	100	125	125	150	150
	8 bar	PN 16 DN	50	65	65	80	100	100	100	125	150
	10 bar	PN 16 DN	—	50	65	65	80	80	100	125	125
	10 bar	PN 40 DN	40	—	—	—	—	—	—	—	—
	13 bar	PN 40 DN	32	40	50	65	65	80	80	100	100
	16 bar	PN 40 DN	32	40	50	50	65	65	80	80	100
	18 bar	PN 40 DN	32	32	50	50	65	65	65	80	100
	20 bar	PN 40 DN	32	32	40	50	50	65	65	80	80
	22 bar	PN 40 DN	32	32	40	50	50	65	65	65	80
	25 bar	PN 40 DN	32	32	32	40	50	50	65	65	80
						Safety valve connector					
for permiss. operating pressure	6 bar	PN 16 DN	20	20	25	32	32	40	40	50	50
	8 bar	PN 16 DN	20	20	25	25	32	32	40	40	50
	10 bar	PN 16 DN	20	20	20	25	25	32	32	40	40
	13 bar	PN 40 DN	20	20	20	20	25	25	32	32	40
	16 bar	PN 40 DN	20	20	20	20	20	25	25	32	32
	18 bar	PN 40 DN	20	20	20	20	20	20	25	32	32
	20 bar	PN 40 DN	20	20	20	20	20	20	25	25	32
	22 bar	PN 40 DN	20	20	20	20	20	20	25	25	32
	25 bar	PN 40 DN	20	20	20	20	20	20	20	25	25
Connector for feedwater pumps		PN 40 DN	25	25	25	32	32	32	32	32	32

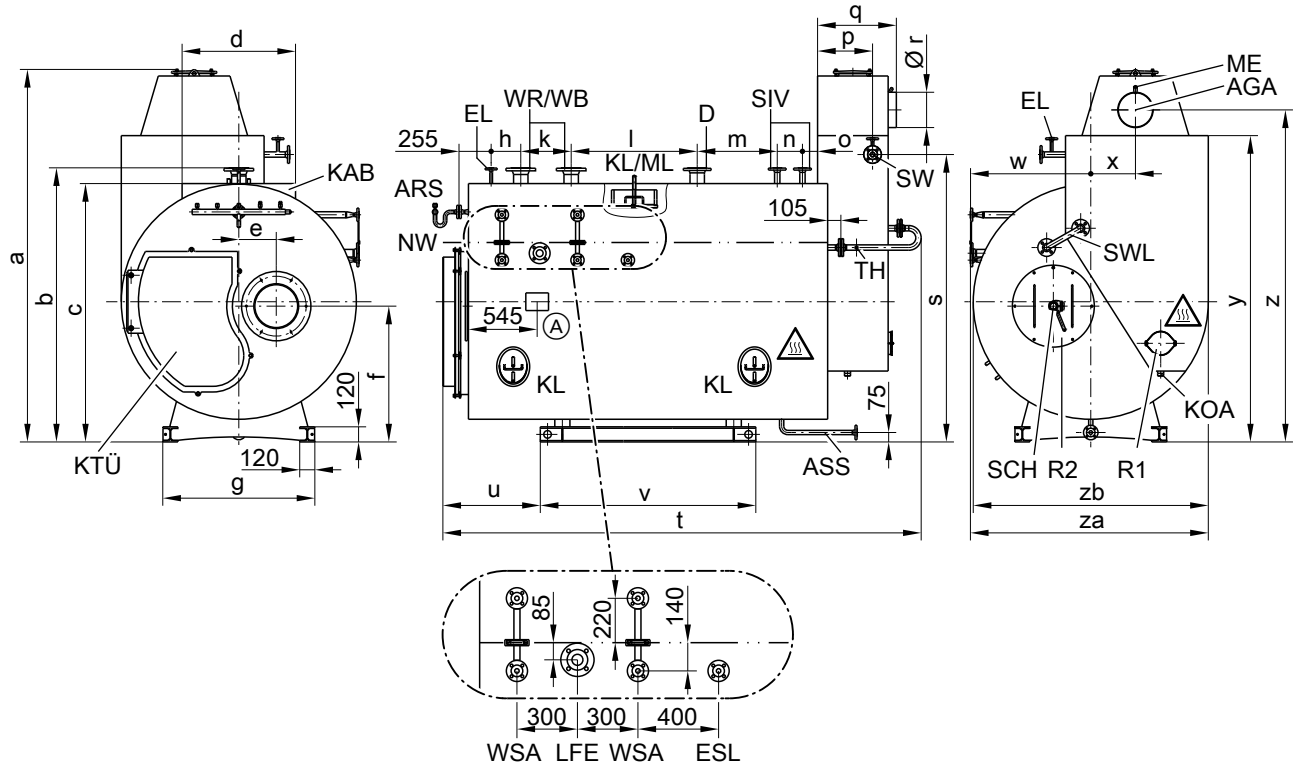
*[*5] The permissible steam output varies depending on the required emission values.*

*[*6] Because of production methods, the total weight (weight when empty) can vary by up to 10 %.*

*[*7] Average water level between pump ON and pump OFF.*

Specification (cont.)

Size		1	2	3	4	5	6	7	8	9
Flue gas parameters		See diagrams on page 10								
Flue gas volume	m^3	0.49	0.63	0.85	1.05	1.29	1.57	1.99	2.67	3.40



Ⓐ Type plate
AGA Flue gas connection
ARS Connector DN 20 PN 40 for instrument base (pressure regulator, pressure limiter and pressure gauge)
ASS Connector DN 25 PN 40 for blow-down valve
D Steam connector
EL Connector DN 15 PN 40 for air vent valve
ESL Connector DN 20 PN 40 for T.D.S. line
KAB Boiler cover
KL Head hole
KOA Condensate drain R 1½
KTÜ Boiler door
LFE Connector DN 50 PN 40 for conductivity electrode
ME Test port R ½
ML Manhole (from size 3)
NW Minimum water level
R Cleaning aperture
SCH Inspection port
SIV Safety valve connector
SW Feedwater connector
SWL Feedwater line
TH Thermometer
WB Connector DN 100 PN 40 for water level limiter
WR Connector DN 100 PN 40 for water level controller
WSA Connector DN 20 PN 40 for water level indicator

Note
Illustration of standard version. The boiler can be designed as a mirror image on request.

Dimensions[*8]

Size		1	2	3	4	5	6	7	8	9
Steam output	t/h	0.5	0.7	1.0	1.3	1.65	2.0	2.5	3.2	4.0
a (with ECO 100)	mm	2185	2275	2365	2495	2581	2665	2825	3000	3110
a (with ECO 200)	mm	2445	2535	2625	2870	2956	2910	3070	3245	3355
b	mm	1830	1920	2010	2090	2175	2260	2370	2500	2610
c	mm	1700	1795	1885	1965	2050	2135	2245	2375	2485
d	mm	500	500	500	600	900	900	900	900	1000
e	mm	222	245	265	278	297	320	348	379	405
f	mm	895	940	995	1046	1078	1122	1199	1300	1385
g	mm	1022	1070	1118	1161	1207	1252	1311	1381	1440
h	mm	235	235	235	235	235	235	235	235	235
k	mm	300	300	300	400	400	400	400	400	400
l	mm	765	860	800	850	1000	1100	1200	1300	1400
m	mm	225	280	550	565	610	650	760	925	1160
n	mm	200	200	200	225	250	250	250	300	300
o	mm	85	85	85	120	120	150	150	150	150

*[*8] Nominal dimensions, subject to modification.*

Specification (cont.)

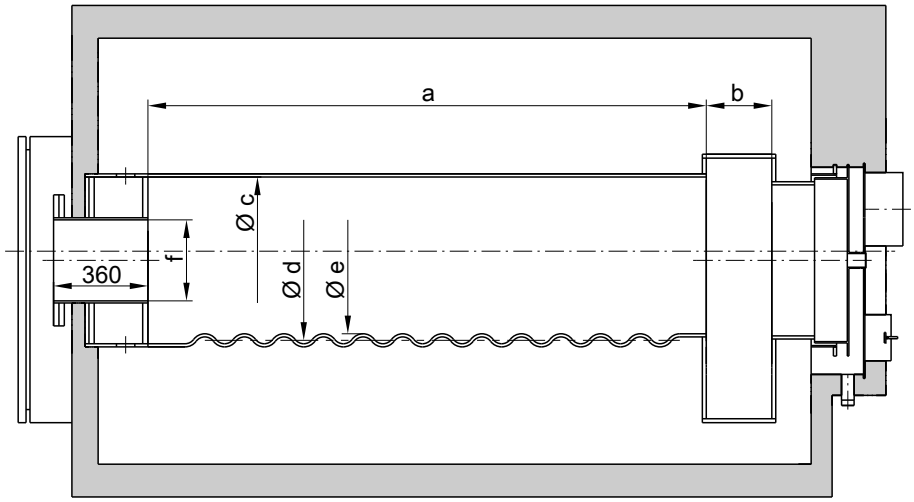
Size		1	2	3	4	5	6	7	8	9
p	mm	436	436	436	436	436	586	586	586	586
q	mm	650	650	650	650	650	800	800	800	800
r (fem.)	∅ mm	152	192	216	242	272	307	346	392	442
s (with ECO 100)	mm	1560	1650	1740	1805	1891	1925	2085	2160	2270
s (with ECO 200)	mm	1820	1910	2000	2195	2281	2185	2345	2420	2530
t	mm	3010	3160	3370	3593	3813	4177	4387	4742	5077
u	mm	581	619	671	721	776	844	896	1015	1099
v	mm	1320	1395	1500	1600	1710	1808	1912	2070	2238
w	mm	815	850	880	910	955	1000	1025	1075	1115
x	mm	295	319	353	325	354	329	334	402	435
y (transportation height with ECO 100)	mm	*9	*9	*9	*9	*9	2142	2302	2377	2487
y (transportation height with ECO 200)	mm	*9	*9	2202	2397	2483	2387	2547	2622	2732
z (with ECO 100)	mm	1889	1979	2069	2174	2260	2319	2479	2604	2714
z (with ECO 200)	mm	2149	2239	2329	2549	2635	2564	2724	2849	2959
za	mm	1575	1655	1730	1800	1888	1975	2055	2170	2264
zb	mm	1520	1610	1700	1780	1865	1950	2060	2190	2300

*9 *Transportation height corresponds to total height dimension a plus 50 mm for packing (with welded-on flue gas hood)*

5822 534 GB

Specification (cont.)

Specification for burner selection

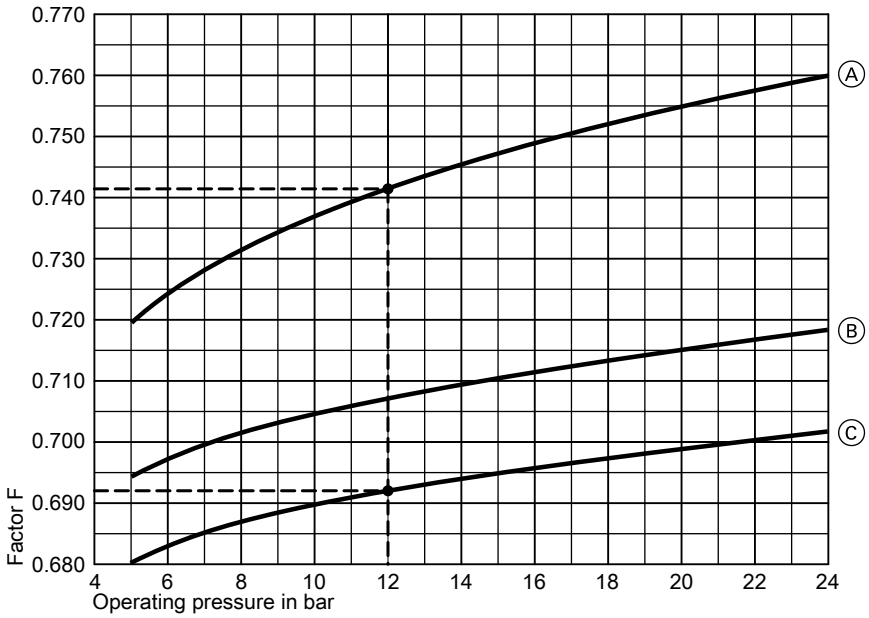


Size			1	2	3	4	5	6	7	8	9
Steam output *10 (at 102 °C feedwater temperature)		t/h	0.5	0.7	1.0	1.3	1.65	2.0	2.5	3.2	4.0
Max. permissible combustion heating output		MW	0.380	0.530	0.760	0.985	1.250	1.510	1.890	2.415	3.020
– **Natural gas**											
Max. flue gas pressure drop without ECO		mbar	4.2	4.7	6.4	7.9	10.4	10.5	10.9	10.9	12.5
Max. flue gas pressure drop with ECO 100		mbar	4.6	5.3	7.2	8.9	11.4	11.5	12.4	12.4	14.0
Max. flue gas pressure drop with ECO 200		mbar	4.8	5.5	7.9	9.9	11.9	12.0	13.4	13.4	15.5
– **Fuel oil EL**											
Max. flue gas pressure drop without ECO		mbar	3.8	4.2	5.8	7.1	9.3	9.4	9.8	9.9	11.1
Max. flue gas pressure drop with ECO 100		mbar	4.2	4.8	6.6	8.1	10.3	10.4	11.3	11.4	12.6
Max. flue gas pressure drop with ECO 200		mbar	4.4	5.0	7.3	9.1	10.8	10.9	12.3	12.4	14.1
			Combustion chamber dimensions								
Length											
Flame tube	Dimension a	mm	1350	1500	1710	1910	2130	2325	2535	2850	3185
Reversing chamber	Dimension b	mm	250	250	250	250	250	250	250	250	250
Diameter											
Internal smooth tube min.	Dimension c	mm	468	508	549	582	620	653	696	746	791
Internal smooth tube max.	Dimension c	mm	486	524	569	602	642	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	360	360	360	360	360	360	360	360	360
Max. flame head diameter	Dimension f	mm	240	240	290	290	320	320	370	420	420
			Combustion chamber volume (average)								
Flame tube		m^3	0.24	0.31	0.42	0.53	0.67	0.81	1.00	1.28	1.61
Flame tube and reversing chamber depth		m^3	0.29	0.37	0.48	0.59	0.74	0.89	1.10	1.40	1.74

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

Specification (cont.)

Factor for determining combustion heating output using the steam heating output
Values determined over all boiler sizes
Feedwater temperature 102 °C



Ⓐ Without flue gas/water heat exchanger (economiser)
Ⓑ With flue gas/water heat exchanger (ECO 100)
Ⓒ With flue gas/water heat exchanger (ECO 200)

Combustion heating output in kW = Factor F x steam heating output in kg/h

Example:

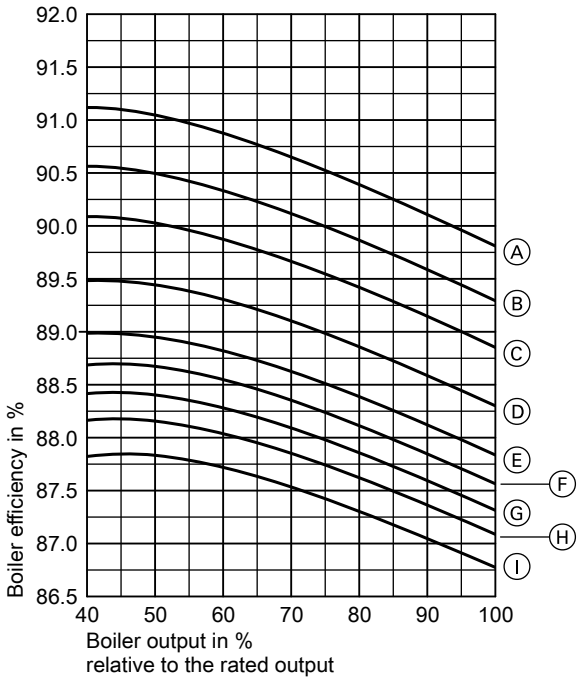
Steam output	1400 kg/h
Operating pressure	12 bar

1. Operation without economiser
   Factor F = 0.741 (see diagram) produces a combustion heating output of 1037 kW
2. Operation with ECO 200
   (boiler efficiency 94.6 %)
   Factor F = 0.692 (see diagram) produces a combustion heating output of 969 kW

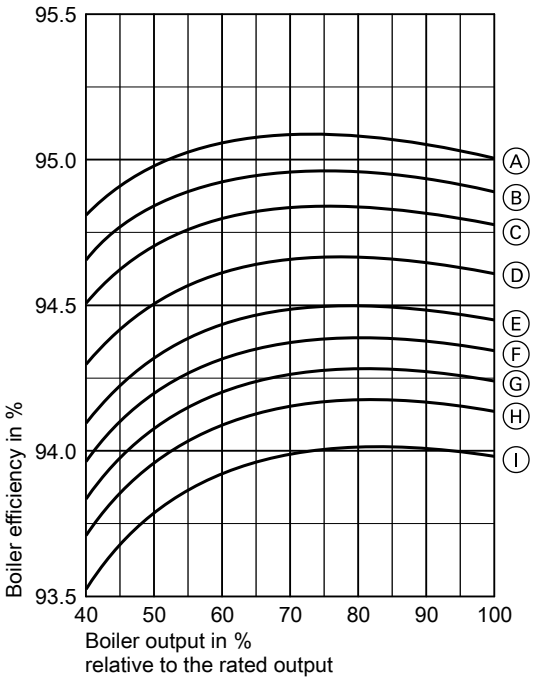
5822 534 GB

Specification (cont.)

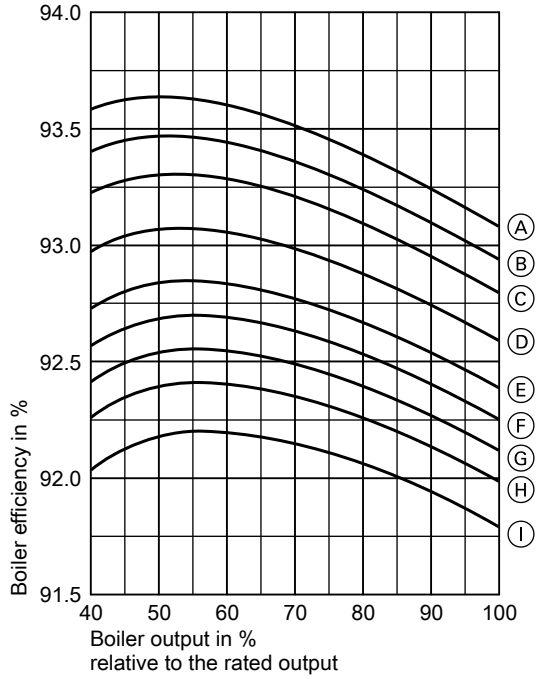
Boiler efficiency in relation to the operating pressure without economiser
Values determined over all boiler sizes
Residual oxygen content of flue gas 3 %, feedwater temperature 102 °C



Boiler efficiency in relation to the operating pressure with ECO 200
Values determined over all boiler sizes
Residual oxygen content of flue gas 3 %, feedwater temperature 102 °C



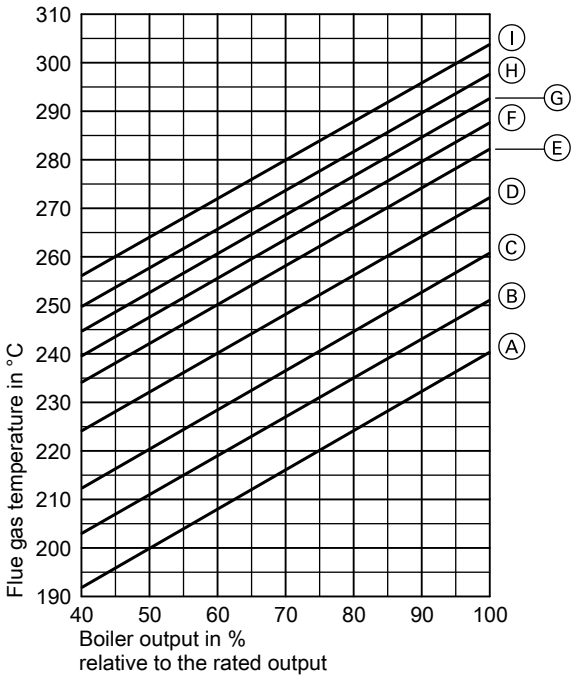
Boiler efficiency in relation to the operating pressure with ECO 100
Values determined over all boiler sizes
Residual oxygen content of flue gas 3 %, feedwater temperature 102 °C



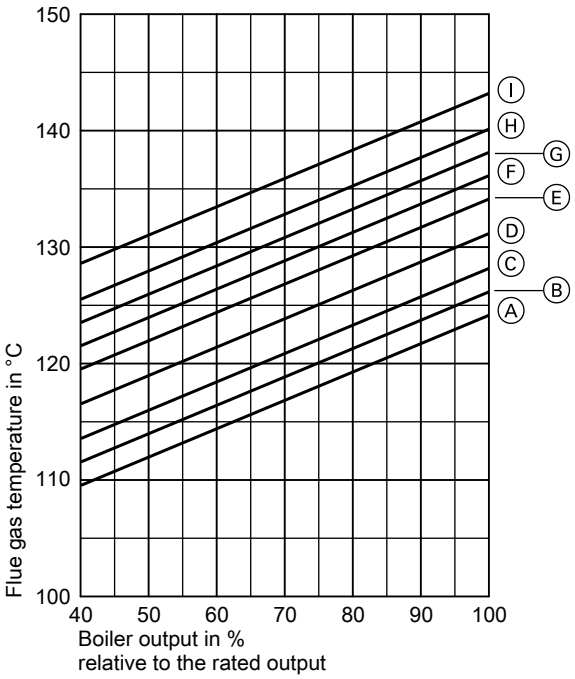
Ⓐ Operating pressure 5 bar
Ⓑ Operating pressure 7 bar
Ⓒ Operating pressure 9 bar
Ⓓ Operating pressure 12 bar
Ⓔ Operating pressure 15 bar
Ⓕ Operating pressure 17 bar
Ⓖ Operating pressure 19 bar
Ⓗ Operating pressure 21 bar
Ⓘ Operating pressure 24 bar

Specification (cont.)

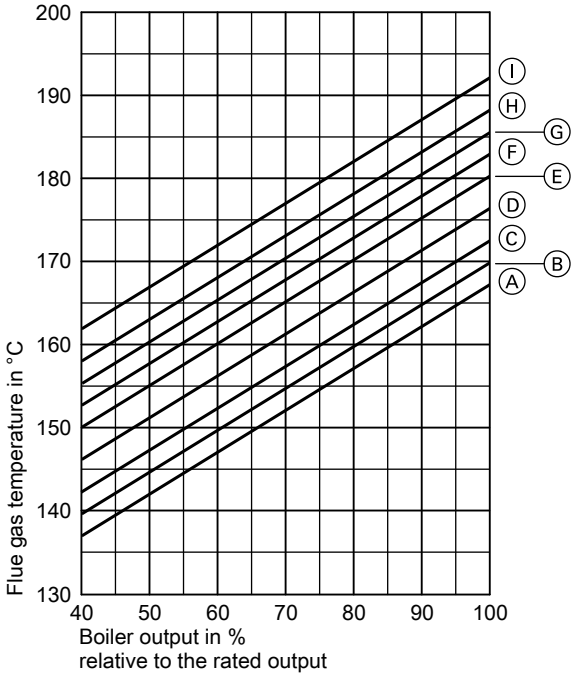
Flue gas temperature in relation to the operating pressure without economiser
Values determined over all boiler sizes
Residual oxygen content of flue gas 3 %, feedwater temperature 102 °C



Flue gas temperature subject to the operating pressure with ECO 200
Values determined over all boiler sizes
Residual oxygen content of flue gas 3 %, feedwater temperature 102 °C



Flue gas temperature subject to the operating pressure with ECO 100
Values determined over all boiler sizes
Residual oxygen content of flue gas 3 %, feedwater temperature 102 °C



Ⓐ Operating pressure 5 bar
Ⓑ Operating pressure 7 bar
Ⓒ Operating pressure 9 bar
Ⓓ Operating pressure 12 bar
Ⓔ Operating pressure 15 bar
Ⓕ Operating pressure 17 bar
Ⓖ Operating pressure 19 bar
Ⓗ Operating pressure 21 bar
Ⓘ Operating pressure 24 bar

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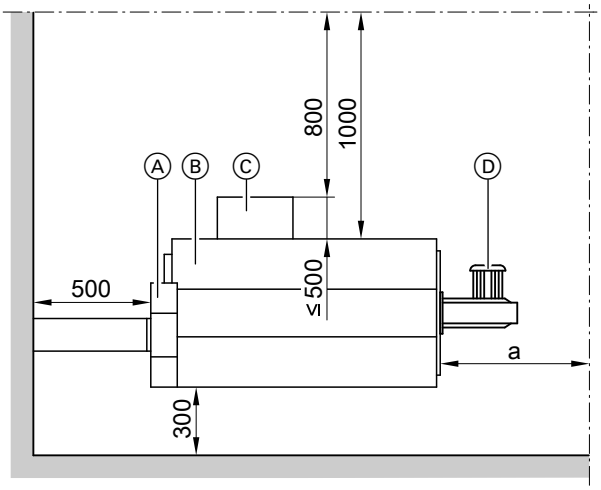
Specification (cont.)

Siting

Recommended minimum clearances to TRD 403-3.2



Illustrative example

Observe the stated dimensions to ensure easy installation and maintenance.
Clearances relate to the boiler.
The clearances must be checked in accordance with the applicable regulations at the installation site, subject to the fitted equipment (accessories).

Ⓐ Economiser
Ⓑ Boiler
Ⓒ Regulating and control systems
Ⓓ Burner

Size		1	2	3	4	5	6	7	8	9
a	mm	2100	2200	2400	2600	2850	3000	3250	3600	3900
a min.	mm	1000	1100	1300	1300	1400	1500	1700	1900	2100

Dim. a: This clearance is recommended for boiler cleaning.
Dim. a min.: A greater minimum clearance may be required because of the burner dimensions.

Siting
Install steam boiler in rooms that comply with TRD 403.
- Avoid very dusty conditions
- Avoid high levels of humidity
- Frost-proof and well ventilated

Otherwise, the system may suffer faults and damage.
In rooms where air contamination through **halogenated hydrocarbons** may occur, install the boiler only if adequate measures can be taken to provide a supply of uncontaminated combustion air.

Standard delivery

Boiler with burner plate, boiler door, flue gas collector with cleaning apertures and fitted thermal insulation.
The following are also supplied for the version with economiser: feedwater pipe with thermal insulation between boiler and economiser and flue gas hood (from a transportation height > 2.6 m) for installation on site.

With transportation protection, fitting assembly and dummy flanges for connectors that are not required for every application.

Design information

Test periods

The pressure vessel complies with the requirements of the applicable TRD regulations and the association agreements.
Therefore, the following test periods are suggested:
- Annually: external inspection
- Every three years: internal inspection
- Every nine years: strength test in the form of a water pressure test.

Country-specific test requirements must be taken into consideration.

Note
For more information see technical guide, installation instructions, operating and service instructions.

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Subject to technical modifications.

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