



POLY COMP®



PolyComp, a.s.
Na Hrázce 22
290 01 Poděbrady
Tel.: +420 325 604 111
Fax: +420 325 604 666
E-mail: polycomp@polycomp.cz
Internet: www.polycomp.cz

Universal Steam Boilers

Specifications

KU boilers are flue fire-tube, large-capacity boilers with natural circulation of boiler water for the combustion of liquid and gaseous fuels. The combustion chamber size is designed so as to minimize emissions. The maximum design pressure of KU line boilers is 1.8 MPa. The maximum temperature of superheated steam $t = 450^{\circ}\text{C}$. According to the temperature required, a specific type of super-heater is installed in the boiler. The boilers are supplied on a standard frame, including insulation with sheeting and a service platform. The supply includes the respective fittings, boiler valves and instruments and gauges. Upon the client's request, the boiler is also equipped with a feed pump and feed water control (modulated or ON-OFF). The boilers are fitted with fire-tube or water-tube economizers of feed water, thus increasing the boiler efficiency by 2 to 4 %. Condensation exchangers may be added next to the boilers, using condensation heat of water vapour contained in flue gases. The design, manufacturing, testing and additional equipment of boilers are done according to the CSN technical standards.

Boiler Characteristics

The boiler has excellent accumulating capacity, allowing for reliable operation even in the case of fluctuating steam extraction. This feature, however, does not restrict the boiler output and start-up (start-up time in cool state is from 15 to 20 minutes). The boiler construction facilitates maximum cooling of flue gases at a minimum heating surface and maximum reliability and service life. This feature is also connected with reduced quality requirements for water treatment. The output regulation scope is limited by the regulation scope of the combusting equipment.

Boiler Modulation

The basic modification is a steam boiler with saturated moderated-pressure steam extraction. The boiler can also be supplied in a modification for super-heated steam or hot water.

Equipment for steam-boiler plants operating without constant supervision

The boiler is ready for the installation of equipment for steam-boiler plants operating without constant supervision made by Gestra (supervision intervals every 2 - 24 - 72 hours according to TRD 602 and TRD 604).

TESTING AND CERTIFICATION

The transportable moderated-pressure boiler room is designed and produced according to the CSN standards in force, and the boiler holds a certificate of approved design, issued by the Safety Standards Inspectorate. The construction and the first pressure test in accordance with CSN 070623 are performed in the production plant, and the result is recorded in an inspection book, which is part of the technical documents supplied with the boiler room, together with a certificate of tests carried out on materials used in accordance with CSN 420090.

Technical Parameters - Universal Steam Boilers 200 kg/hour - 8000 kg/hour

Parameters	Units	KU 200	KU 600	KU 1000	KU 2000	KU 4000	KU 5000	KU 6000	KU 7000	KU 8000	
Rated output	kg/hr	200	600	800	2000	4000	5000	6000	7000	8000	
Rated thermal capacity Saturated steam Super-heated steam (220°C)	kW	131 144	392 433	521 676	1303 1352	2606 2704	3258 3380	3910 4056	4561 4732	5213 5408	
Maximum steam overpressure	MPa	1,4 ; (0,6 ; 0,9 ; 1,8)									
Minimum steam overpressure**	MPa	0,2 - 0,4									
Nominal temperature of superheated steam*	°C	do 450 °C									
Boiler efficiency: Natural gas / LO	%	91/89									
Boiler efficiency with economizer: Natural gas / LO	%	92 - 94 / 91 - 92									
Nominal temperature of feed water	°C	105 (70)			105						
Nominal temperature of sucked air	°C	20									
Maximum fuel consumption: - Natural gas - LO	Nm ³ /h kg/hr	14,5 14,7	43,6 44,2	76,7 68,7	154 137	300 275	375 354	466 412	554 481	621 550	
Maximum of air for combustion (lambda=1,1)	Nm ³ /h	155	465	860	1720	3400	4250	4900	5660	6500	
Amount of flue gases	Nm ³ /h	169,3	508	970	1940	3880	4850	5820	6790	7760	
Electrical wiring		3 x 380 V/50 Hz									
Input of electric appliances (burner, feed pump)	kW	6,5	9	6,5	9	11	11	14,5	18,5	22,5	
Noise level	dB	Max.80									
Emissions***											
Natural gas: - standard - low emission	mg/Nm ³	NOx - 160, CO - 100 NOx - 100, CO - 100									
LO	mg/Nm ³	NOx - 450, CO - 175, SO ₂ - 1000, solid substances - 100, smoke rate < 2									
KU Boiler weight											
Boiler weight without super heater	kg	1600	2230	3050	7000	12500	13500	15500	17000	19500	
Boiler weight with super heater	kg	1800	2470	3400	8100	13500	14300	16400	18000	20600	
Boiler operating weight	kg	2300	3870	5800	11100	19500	20500	26500	27000	29500	

* The nominal temperature of superheated steam can be changed, depending on the client's request and the fuel used.

** According to the economizer used.

*** Emission relate to 3% of O₂ in dry combustion products at t = 0°C and barometric pressure.

The given emission levels may be maintained only provided that the liquid fuel contains (except for values according to CSN 656506) maximally: S < 5 000 mg/kg, N < 1 000 mg/kg, asp haltenes < 3 %.

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Technical Parameters - Universal Steam Boilers 10000 kg/hour - 20000 kg/hour

Parameters	Units	KU 10000	KU 12000	KU 14000	KU 16000	KU 18000	KU 20000
Rated steam output	kg/hr	10000	12000	14000	16000	18000	20000
Maximum steam output	kg/hr	11000	13200	15400	17600	19800	22000
Temperature of output steam*	°C	Saturated or superheated steam (to 450°C)					
Design overpressure	MPa	1,4 (or 0,6 ; 0,9 ; 1,8)					
Minimum operating overpressure	MPa	0,2 - 0,4					
Rated thermal capacity: Saturated steam Super-heated steam (220°C)	MW	6,5 6,7	7,8 8,4	9,1 9,4	10,4 10,7	11,7 12,1	13 13,4
Maximum thermal capacity: Saturated steam Super-heated steam (220°C)	MW	7,2 7,4	8,6 8,8	10 10,3	11,4 11,8	12,9 13,3	14,3 14,7
Minimal temperature of feed water	°C	105					
Combustion air temperature	°C	20					
Efficiency with economizer	%	92 - 94,5					
Fuel consumption:*							
- Natural gas	Nm ³ /h	673	808	943	1077	1212	1347
- LO	kg/hr	605	726	848	968	1090	1211
Max. of air for combustion*	Nm ³ /h	7191	8629	10068	11506	12944	14382
Amount of flue gases max.*	Nm ³ /h	7861	9433	11005	12577	14149	15721
Boiler resistance at flue gas side-max.	Pa	1250	1350	1350	1350	1350	1400
Temperature of flue gases at boiler output	°C	120 - 180					
Boiler water volume							
At pressure test		14,9	17,8	19,2	20,7	22,5	24,3
Operating - up to medium water level	m ³	10,8	12,8	13,8	14,9	16,2	17,5
Of water heater		1,1	1,3	1,4	1,5	1,6	1,7
Sludge discharging - about 15s	-	Min. once every 8 hours depending on the quality of water					
Maximum noise level of boiler	dB	80					
Emissions***							
Natural gas: - standard - low emission	mg/Nm ³	NOx - 160, CO - 100 NOx - 100, CO - 100					
LO	mg/Nm ³	NOx - 450, CO - 175, SO ₂ - 1000, solid substances - 100, smoke rate < 2					
Transport/operating weight (Applies for design pressure of 1.4 MPa)	t	24,5 / 42,4	32,7 / 51,8	34,6 / 55,1	37,8 / 58,5	40,5 / 46 / 76,1	46 / 76,1
Technical changes are reserved							

* The nominal temperature of superheated steam can be changed, depending on the client's request and the burned fuel.

** The values relate to the maximum boiler output at the steam pressure of 1.4 MPa, superheated steam temperature of 220°C and efficiency of 92%.

*** Emission relate to 3% of O₂ in dry combustion products at t = 0°C and barometric pressure.

The given emission levels may be maintained only provided that the liquid fuel contains (except for values according to CSN 656506) maximally: S < 5 000 mg/kg, N < 1 000 mg/kg, asphaltenes < 3 %.

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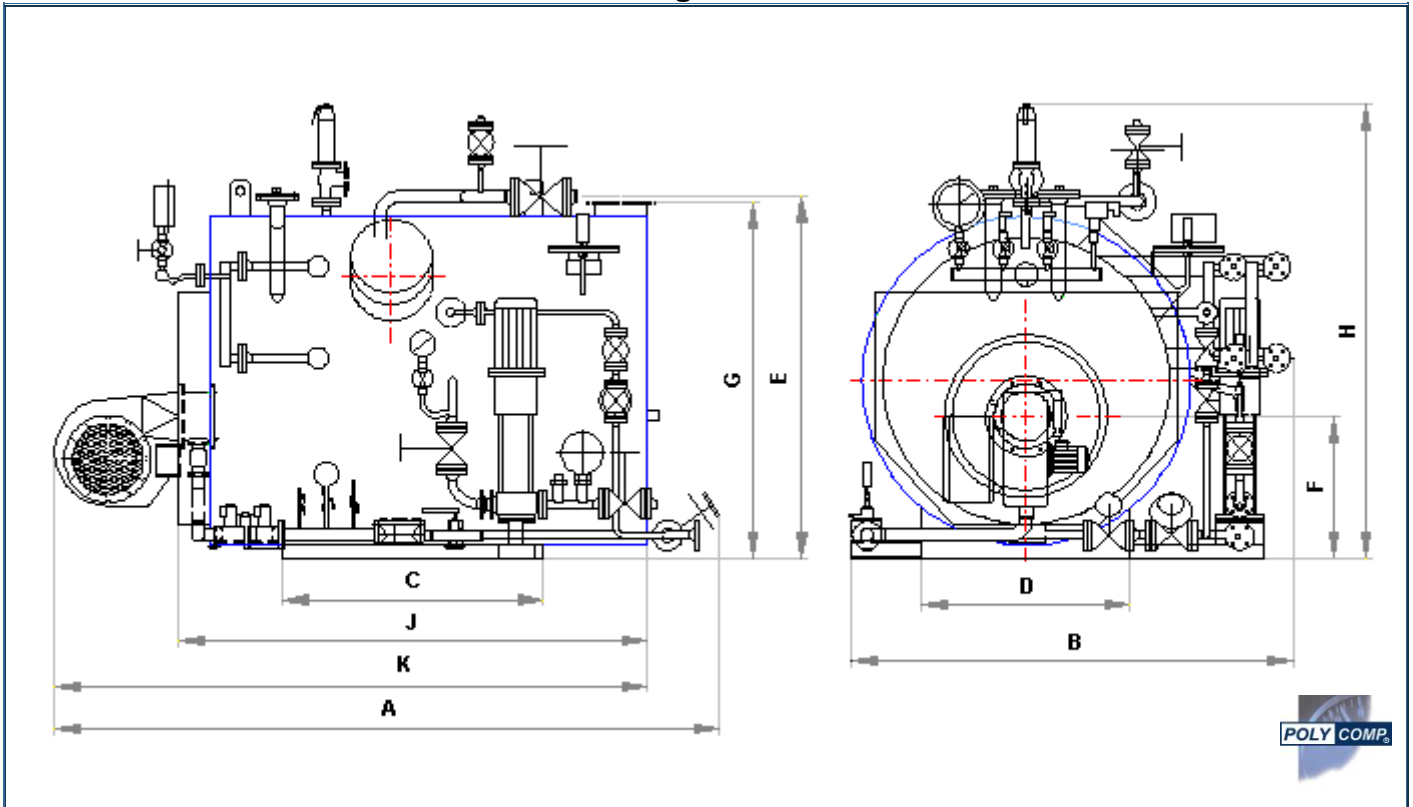
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Universal Steam Boilers KU 200 - 1000 kg/hr



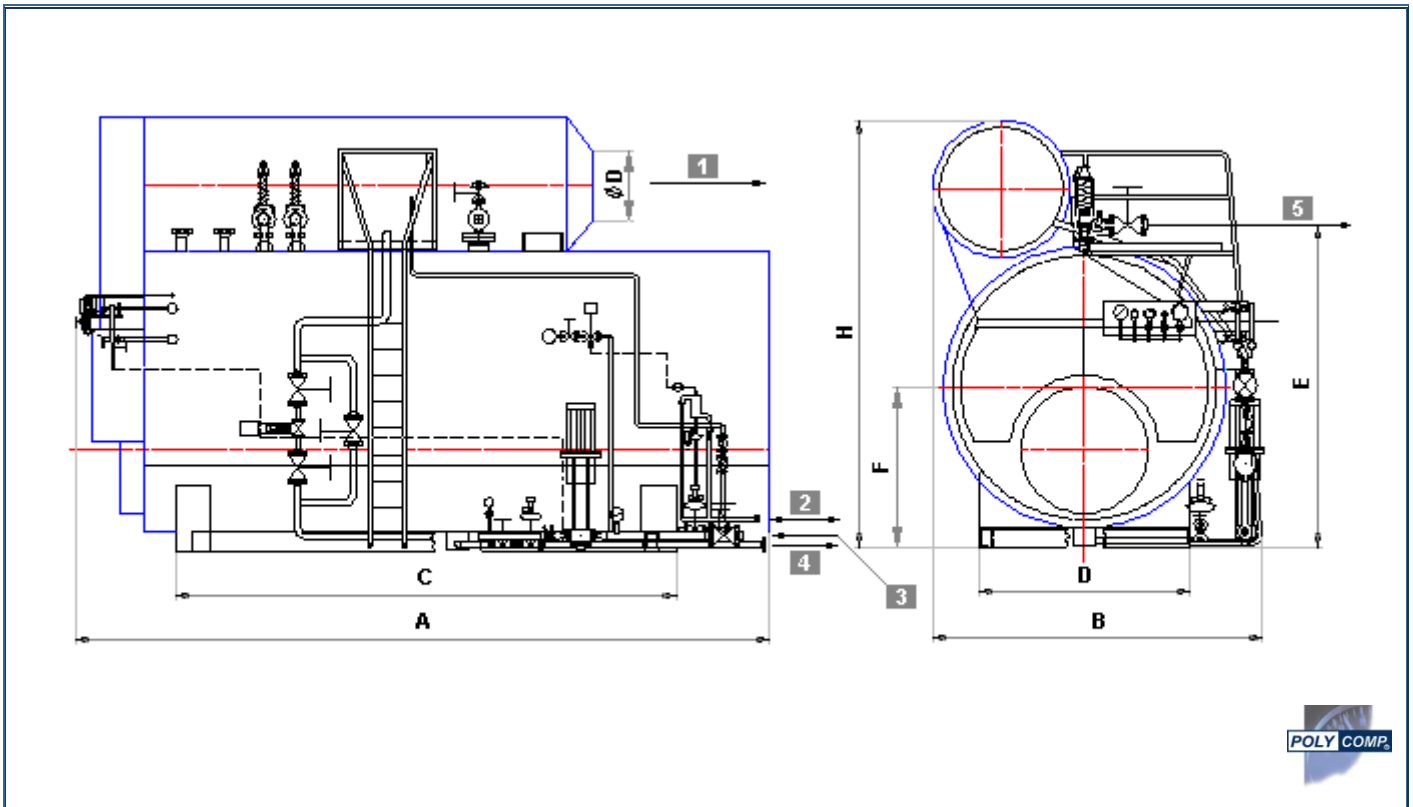
BOILER	PROPORTIONS (mm)									
	A	B	C	D	E	F	G	H	J	K
KU200	2250	1680	1000	800	1375	545	1365	1744	1800	2276
KU600	3500	1750	1900	900	1535	595	1525	2005	2450	3250
KU1000	3700	1800	1900	1000	1720	630	1705	2200	2830	3450

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Universal Steam Boilers KU 2000 - 8000 kg/hr



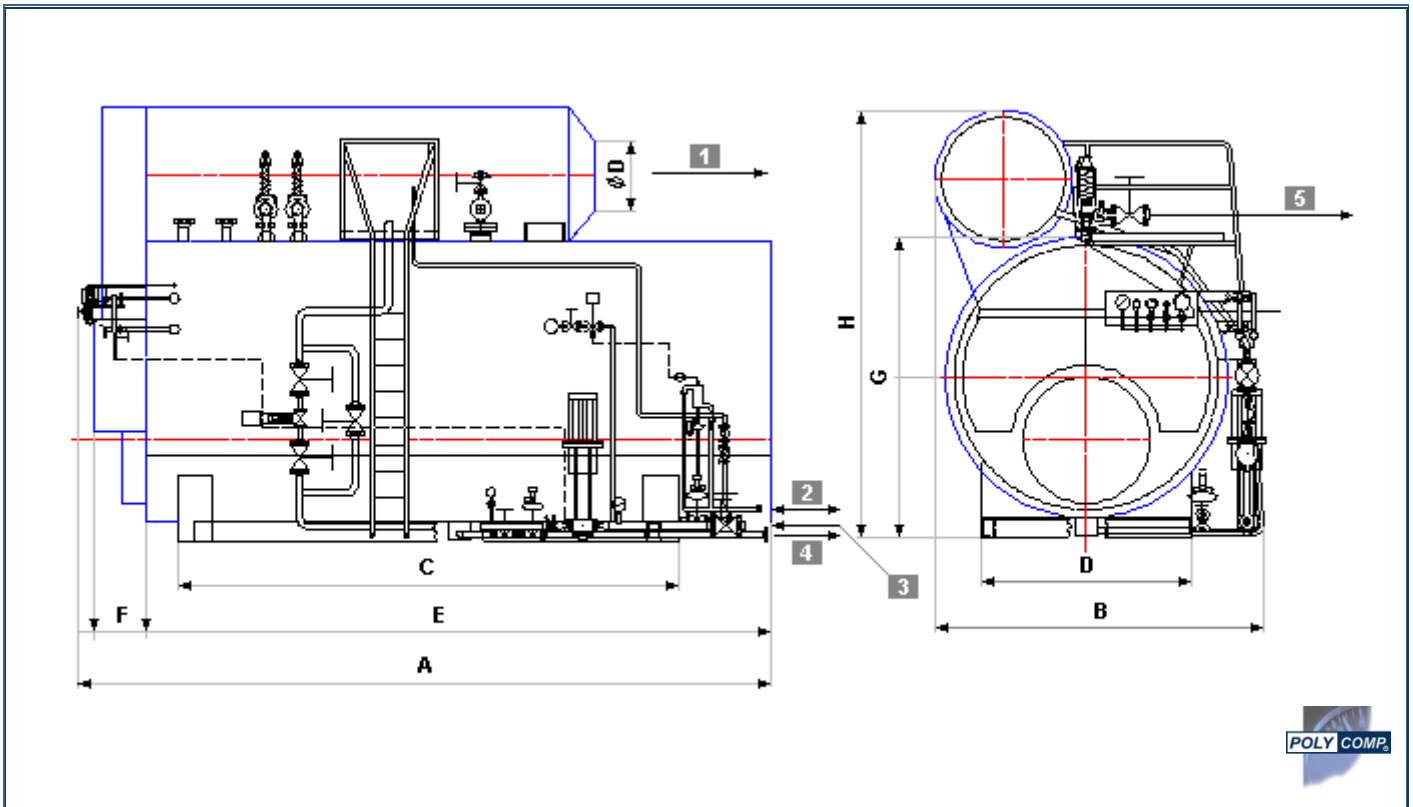
BOILER	PROPORTIONS (mm)							
	A	B	C	D	E	F	H	Ø D
KU2000	4120	2550	2590	1200	2370	950	3230	320
KU4000	4900	2980	3250	1500	2812	1165	3670	505
KU5000	5655	2995	3430	1500	2812	1165	3711	505
KU6000	6055	3035	3630	1500	2812	1165	3725	505
KU7000	6400	3055	3800	1500	2812	1165	3725	636
KU8000	6610	3110	3930	1500	2812	1165	3765	636

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Universal Steam Boilers KU 10000 - 20000 kg/hr



BOILER	PROPORTIONS (mm)							
	A	B	C	D	E	F	H	Ø D
KU10000	6600	3600	4600	2350	6400	600	4850	799
KU12000	6800	3600	4600	2350	6400	600	4850	799
KU14000	7095	3600	4600	2350	6600	600	4850	799
KU16000	7900	3750	5700	2400	7200	600	4855	799
KU18000	8785	3950	5700	2400	7400	800	5000	896
KU20000	9670	3950	5800	2400	8000	800	5000	896

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