SMART **HEATING** TECHNOLOGY

Purity to Nature
Savings to Clients
Comfort to Users

AUTOMATIC BIOMASS BOILER

SMART 450 kW

▪ Fully automatic, ecologic boiler with excellent features ▪ Technical solution flexibility ▪ Multiple fuel possibility ▪ Economical and ecological operation ▪ Efficiency 96 % ▪ Output modulation 30–100 % ▪ Lambda sensor ▪ Ceramic Burner Option ▪ Vibrating Burner Plate Option ▪ Low Maintenance & Service requirements ▪ Heating circuits regulation ▪ Cascade installation solutions ▪ Mobile phone control ▪ Internet control ▪ Mobile container solutions ▪ Special boiler accessories

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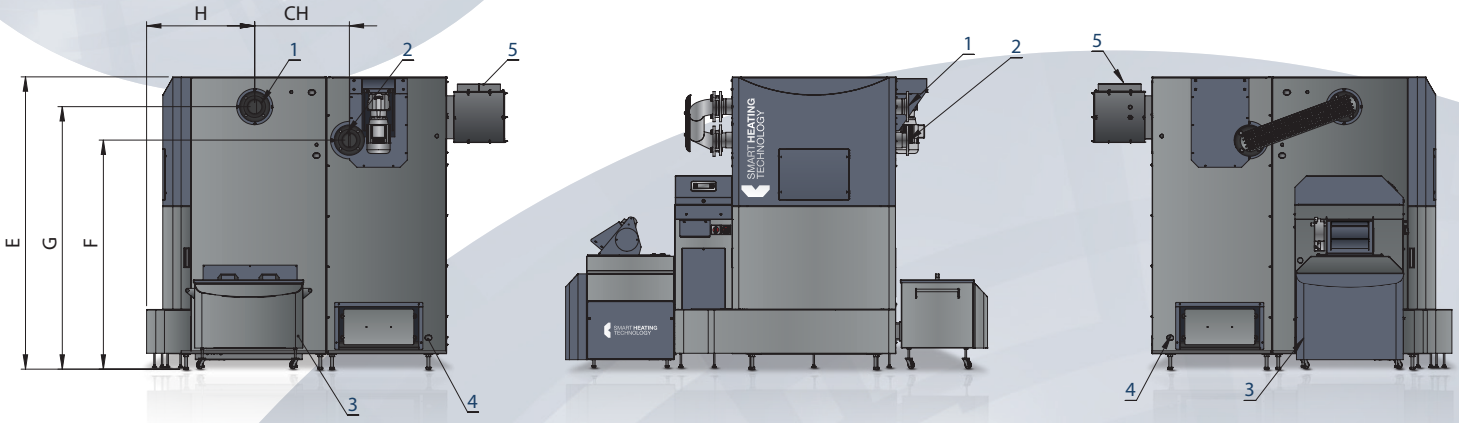
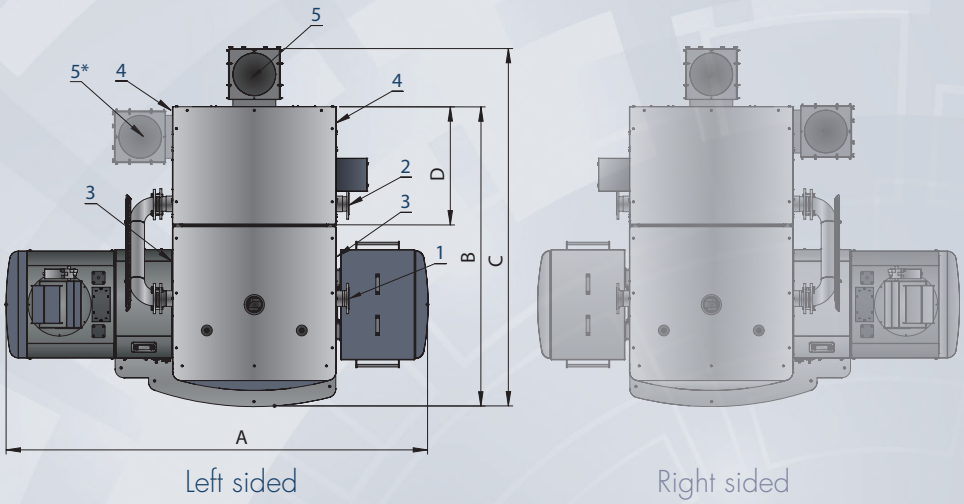
ČSN-EN 303.5/2013

ISO 9001:2009

DIMENSIONS AND WEIGHTS OF TECHNOLOGY 450 kW



1. Water outlet DN100/PN6
2. Water inlet DN100/PN6
3. In/out water valve 3/4" of burning chamber
4. In/out water valve 3/4" of heat exchanger
5. Chimney outlet avg. 300 mm
* Option for limited spaces



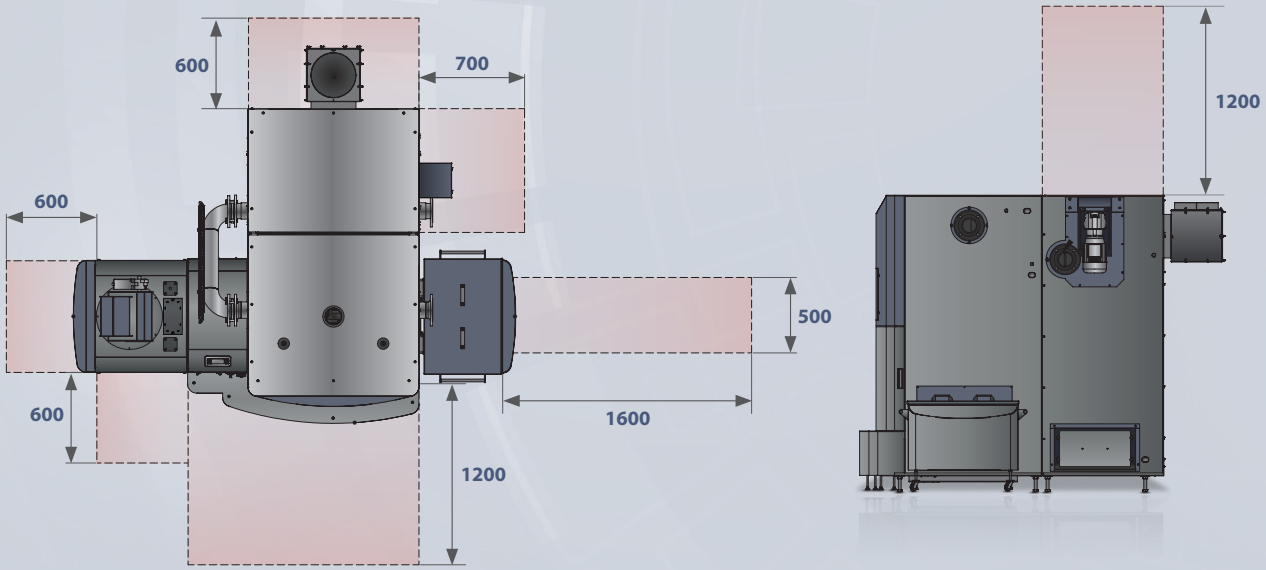
Left sided

Right sided

A	B	C	D	E	F	G	H	CH
2940	2440	2840	1180	1995	1560	1790	750	655

WEIGHTS		
Burning chamber 450 kW	1 550 kg	Total weight
Exchanger 450	1 800 kg	3 350 kg

SERVICE ZONES OF TECHNOLOGY 450 kW



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TECHNICAL SPECIFICATIONS 450 kW

AUTOMATIC BIOMASS BOILER SMART 450 kW		Wood pellets		Wood chips	
		Rated	Minimum	Rated	Minimum
Measured values					
Rated heat capacity	kW	450	450	450	450
Combustion product temperature	°C	96,3	60,9	98,6	62,4
Fuel consumption	kg/hour	102,48	22,74	109,60	25,00
Input water temperature	°C	61,9	61,7	60,0	58,2
Outlet water temperature	°C	80,0	76,8	75,7	73,6
Cooling water temperature	°C	9,3	10,0	9,6	11,0
Cooling water flow rate	m^3/hod	21,349	5,729	24,613	5,843
Draught behind boiler	Pa	194,0	25,0	190,0	26,0
Ambient temperature	°C	29,0	25,7	28,5	24,6
Relative air humidity	%	27,0	28,0	29,5	28,6
Barometric pressure	kPa	99,20	99,30	99,02	99,07
Flue gas analysis					
Oxygen O_2	%	8,52	8,48	7,30	10,25
Carbon dioxide CO_2	%	11,05	10,58	11,74	9,75
Carbon monoxide CO	ppm	128	89	176	160
Higher hydrocarbons OGC	ppm	13	2	1	5
Nitrogen dioxides Nox	ppm	62	72	106	73
Dust	mg/m^3	19	28	86	79
02 = 10 %					
Carbon monoxide CO	mg/m^3	144	106	178	207
Higher hydrocarbons OGC	mg/m^3	6	1	1	3
Nitrogen dioxides Nox	mg/m^3	111	130	174	151
Dust	mg/m^3	17	25	34	48
Auxiliary combustion values (solid fuels)					
Mass flow rate gases	kg/sec	0,316	0,072	0,290	0,077
Stoichiometric oxygen value	m^3/kg	0,958	0,957	0,831	0,830
Stoichiometric air value	m^3/kg	4,560	4,559	3,960	3,952
Stoichiometric volume of dry combustion products	m^3/kg	4,448	4,448	3,881	3,873
Stoichiometric air multiple		1,67	1,70	1,52	1,96
Volume of dry combustion products, actual	m^3/kg	7,655	8,040	6,396	7,730
Volume of H_2O in the combustion air	m^3/kg	0,078	0,072	0,070	0,093
Volume of H_2O in the combustion produts	m^3/kg	0,933	0,927	0,916	0,917
Maximum volume CO_2	%	19,00	19,01	19,37	19,36
Calculated values - heat overview					
Loss of sensible heat of combustion products (chimney)	%	4,8	2,6	4,6	3,0
Loss of gas underburning	%	0,1	0,0	0,1	0,1
Loss of mechanical underburning	%	0,0	0,1	0,4	0,5
Loss of heat transfer into the environment	%	0,3	0,7	0,3	0,7
Total loss	%	5,2	3,4	5,3	4,2
Efficiency – indirect method	%	94,8	96,6	94,7	95,9
Heat input	kW	471,3	104,6	468,7	107,1
Heat capacity	kW	450,2	100,6	449,2	102,7
Uncertainty of determining heat capacity	%+/-	18,9	4,2	18,9	4,3
Efficiency – direct method	**%**	**95,5**	**96,2**	**95,8**	**96,0**
Capacity / rated output	%	100,0	22,4	100,1	23,1

*Boilers can be operated at 90 °C only when special conditions are met

CERTIFIED OPERATING VALUES 450 kW

SMART BOILER OPERATING DATA		
Technical data of the boiler		
Marking		450
Nominal power Pn	kW	450
Partial load (power) Pp	kW	115
Boiler efficiency at Pn	%	>95
Boiler class		5
Water		
Water volume	l	850
Diameter of water connection	"	4
Diameter of water connection	DN	100
Hydraulic-pressure drop of the boiler at the temperature fall 20°	mbar	122
Boiler temperature	°C	60-90*
Minimal temperature of returnable water	°C	55
Maximal operational pressure	bar	3,5
Test pressure	bar	6,5
Temperature of furnace	°C	900-1100
Pressure of furmace	mbar	-0,04
Required draught of the chimney	mbar	0,2
Requirement for the forced draught		Yes
Combustion temperature at Pn	°C	98,2
Combustion temperature at Pp	°C	62,4
Diameter of flue gas duct	mm	300
Diameter of chimney	mm	350
Fuel clasification according to norm EN 14961		
Wood pellets - C1	Tested fuel	D6, M10, A1,5, DU90,0
Wood chips - B1		P45, M30, A3.0
Electrical installation		
Electrical connection		3+N+PE 50Hz 230/400V TN-C-S
Conveyor engine	W	550
Feeding auger engine	W	550
Exchanger cleaning engine (s)	W	2 x 550
Ash-removing engine	W	550
Fan of primary air	W	66
Fan of secondary air 1	W	170
Fan of secondary air 2	W	170
Chimney exhaust fan	W	1100
Electrical ignition	W	1600
Separation flap valve	W	6,5
Total	W	4762,5

▪ Measured ▪ Interpolace is in complience with EN303.5 coll. 5.3.1