WES
WOOD ENERGY SOLUTIONS

Think BIG

Commercial Boiler Range 2015

www.woodenergysolutions.co.uk

Think BIG

As RHI tariffs for small scale biomass boilers have been reducing, WES is seeing growing interest in its larger E-COMPACT biomass boiler range. For many businesses with high heating requirements the business case for biomass boilers stands up, irrespective of what happens with RHI.

Founded in 2010, WES specialises in biomass heating systems only. However, our founders pedigree stretches back to the early 70's having designed and produced oil and solid fuel boilers before WES was formed.

Today WES is one of the foremost brands on the UK market. In 2014 the company deployed 12MW (60no. 199kw EcoCabins) to a large Poultry producer the second largest biomass heating project in the UK in that year. Today the E-COMPACT SUPERMAX Commercial pellet boiler range extends from 200kw to 550kw and Multi-fuel options from 200-500kw.

A UK Specialist in Biomass Heating

E-COMPACT
WOOD PELLET BOILER

WES
WOOD ENERGY SOLUTIONS

E-COMPACT 150 - 199 - 215 - 300 kW

WOOD PELLET ONLY
Compact Size

AUTOMATIC BIOMASS BOILERS

E-COMPACT 150-199-215-300 kW

	Boiler	E-Compact 150	E-Compact 199	E-Compact 215	E-Compact 300*
Energy	Nominal (Max) Rated Output - kW	150	199	215	300
	Reduced Rated Output (30%) - Kw	57	57	57	100
	Boiler Class	5	5	5	5
	Efficiency at Nominal Output - %	90	90	90	90
	Test Standard	EN303-5:2012	EN303-5:2012	EN303-5:2012	EN303-5:2012
Water	Water Capacity - litres	450	450	450	1400
	Waterside Resistance - mbar	75	75	75	75
	System design flow rate at 10°C Δt rise @ 80° - l/s	4.8	4.8	4.8	9.0
	System design flow rate at 20°C Δt rise @ 80° - l/s	2.4	2.4	2.4	4.8
	Operating Temperature Range - °C	60-85	60-85	60-85	60-85
	Recommended Return Temperature	60	60	60	60
	Maximum Operating Pressure - bar	3	3	3	3
Flue Gas	Flue Gas Temperature at Maximum Rated Output	175	175	175	175
	Flue Gas Temperature at Reduced Rated Output	100	100	100	100
	Flue Gas Mass Flow - g/s	43 - 85	43 - 85	43 - 85	43 - 85
	Flue Oulet Diameter - mm	205	205	205	305
	Recommended Flue Diameter - mm	200	200	200	300
	Flue Draft Required at Reduced / Nominal Output - Pa	10/25	10/25	10/25	10/25
Fuel	Fuel	6mm Wood Pellets	6mm Wood Pellets	6mm Wood Pellets	6mm Wood Pellets
	Fuel Standard	EnPlus - A1	EnPlus - A1	EnPlus - A1	EnPlus - A1
Connections	Water Flow Connection - inch	2½" (DN 65)	2½" (DN 65)	2½" (DN 65)	3" (DN 75)
	Water Return Connection - inch	2½" (DN 65)	2½" (DN 65)	2½" (DN 65)	3" (DN 75)
	Water Drain Connection - inch	1" (DN 25)	1" (DN 25)	1" (DN 25)	1" (DN 25)
	Safety Valve / Air Vent Connection - inch	½" (DN 15)	½" (DN 15)	½" (DN 15)	½" (DN 15)
Electrical	Electrical Supply	230V 50Hz 0.6A	230V 50Hz 0.6A	230V 50Hz 0.6A	230V 50Hz 0.6A
	Current at Start-Up - Amp	2.5A	2.5A	2.5A	2.5A
	Auxilliary Power at Reduced / Nominal - Watts	132 - 417 W	132 - 417 W	132 - 417 W	132 - 417 W
	Standby Power - Watts	6.7W	6.7W	6.7W	6.7W
	Dimensions (Footprint) mm	2051 (W) x 1699 (D)	2051 (W) x 1699 (D)	2051 (W) x 1699 (D)	1500 (W) x 2200 (D)
	Total Dry Weight - kg	**1450kg**	**1450kg**	**1450kg**	**3000kg**

* Available October 2015

SMART TECHNOLOGY AS STANDARD

E-COMPACT iGen Controller

The ultimate in boiler control, the i-Gen enables 'out of the box' installation with fuzzy logic PID control, meaning the commissioning process is greatly simplified. Combined with Lambda the advanced algorithm within the i-Gen's firmware means E-Compact i-Gen is one of the easiest boilers to install and commission on the market.

– Full reports on fuel usage and operating performance are available as standard.

– Remote access and control is available via GSM or WIFI should technical support or customer service be required.

i-Gen Features

- Remote monitoring (and control) facility
- 7 day programmer
- Monitoring report logs via e mail
- Comprehensive reports menu e.g fuel usage report
- Easy to understand graphics
- Simple to operate in bright colour
- Low fuel level warning
- Notification to clean ash pan and service boiler

E-COMPACT
WOOD PELLET BOILER

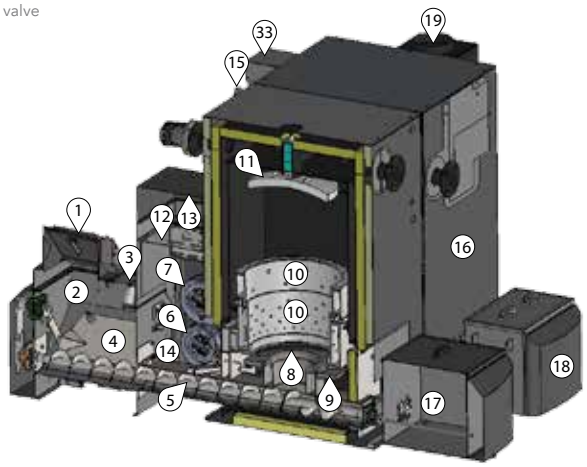
WES
WOOD ENERGY SOLUTIONS

Multi Fuel (Pellet & Chip) 200-500kw

PELLET & CHIP
MULTI-FUEL BOILER

E-COMPACT SUPERMAX 300–500 kW
Inside View - Front

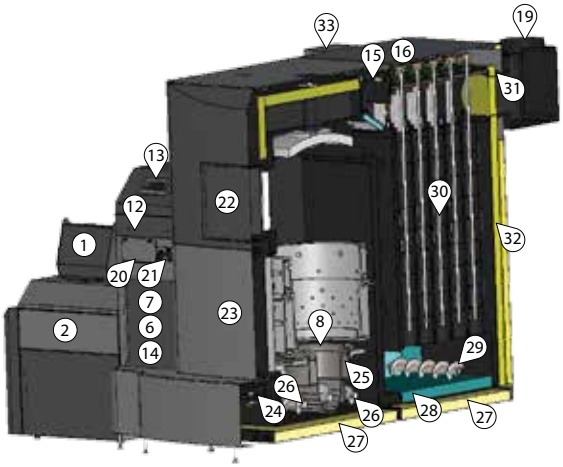
1. Channel and operational bin separation valve
2. Operational fuel bin
3. Fuel level sensor
4. Moving floor mechanism
5. Feeding screw
6. Primary fan
7. Secondary fan
8. Primary burner ring
9. Grating/vibrating wheel
10. Upper/lower burner rings
11. Refractory ceramics
12. Control unit Siemens
13. Control unit cover with display
14. Accessories
    – Ignition gun
    – Emergency extinguishing mechanism
    – Safety temperature sensors
15. Exchanger valve servo-drive
16. Heat exchanger with turbulators
17. Combustion chamber ash bin
18. Exchanger ash bin – option
19. Chimney extension box



SIEMENS

Mobile phone control
Internet control
Mobile container solutions

E-COMPACT SUPERMAX 300–500 kW
Inside View - Side



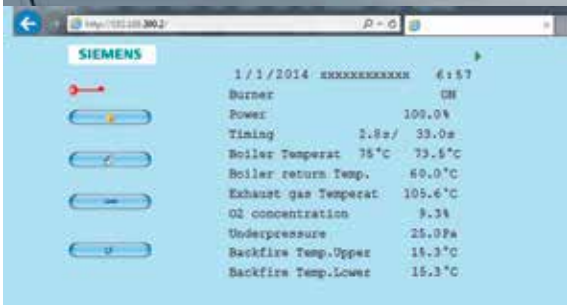
20. Fuses
21. Main switch
22. Small service doors
23. Big service doors
24. Grating/vibrating mechanism
25. Primary air channel
26. Ash screws
27. Bottom insulation
28. Bottom hi-temp exchanger insulation
29. Exchanger de-ashing – optional
30. Turbulators
31. Lambda sensor
32. Dual boiler insulation
33. Turbulators drive motor

UNIT CONVERTER	
1 GJ = 1000 MJ	
1 GJ = 277, 778 kWh	1 GJ = 0,278 MWh
1 GJ = 238 846 kcal	

FUEL – CALORIFIC VALUE
1 kg – Wood Pellets = 16,5–18,5 MJ = 4,6–5,1 kWh
1 kg – Lignite = 10,5–17,2 MJ = 2,9–4,8 kWh
1 kg – Wood chips with moisture 10 % = 16,4 MJ = 4,6 kWh
1 kg – Wood chips with moisture 20 % = 14,3 MJ = 4,0 kWh
1 kg – Wood chips with moisture 30 % = 12,2 MJ = 3,4 kWh
1 kg – Wood chips with moisture 40 % = 10,1 MJ = 2,8 kWh
1 m^3 – Natural Gas = 37,82 MJ = 10,5 kWh

WES SMART BOILERS OPERATING DATA											
Technical data of the boiler											
Marking		150	180	200	220	250	300	350	400	450	500
Nominal Power Pn	kW	150	180	199	220	250	300	350	400	450	500
Partial load (power) Pp k	kW	40	45	50	55	65	75	90	100	115	140
Boiler efficiency at Pn	%	>95	>95	>95	>95	>95	>95	>95	>95	>95	>95
Boiler class		5	5	5	5	5	5	5	5	5	5
Water											
Water volume	l	380	420	460	460	500	690	740	790	850	900
Diameter of water connection	"	3	3	3	3	3	4	4	4	4	4
Diameter of water connection	DN	80	80	80	80	80	100	100	100	100	100
Hydraulic-pressure drop of the boiler at the temperature fall 20°	mbar	65	73	80	80	87	95	102	110	122	130
Boiler temperature	°C	60-90*	60-90*	60-90*	60-90*	60-90*	60-90*	60-90*	60-90*	60-90*	60-90*
Minimal temperature of returnable water	°C	55	55	55	55	55	55	55	55	55	55
Maximal operational pressure	bar	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5
Test pressure	bar	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5
Temperature of furnace	°C	900-1100									
Pressure of furnace	mbar	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04
Required draught of the chimney	mbar	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Requirement for the forced draught		Oui	Oui	Oui	Oui	Oui	Oui	Oui	Oui	Oui	Oui
Combustion terperature at Pn	°C	96,6	97,2	104,9	98	96,6	99,6	99,3	98,9	98,2	97,2
Combustion temperature at Pp	°C	63,1	63,1	72,4	63,1	63,1	63,1	62,9	62,7	62,4	62,2
Diameter of flue gas duct	mm	220	220	220	220	220	300	300	300	300	300
Diameter of chimney	mm	250	250	250	250	250	350	350	350	350	350
Fuel classification according to norm EN 14961											
Wood pellets - C1	Tested fuel	D6, M10, A1,5, DU90,0									
Wood chips - B1		P45, M30, A3.0									

* Boilers can be operated at 90ºC only when special conditions are met.



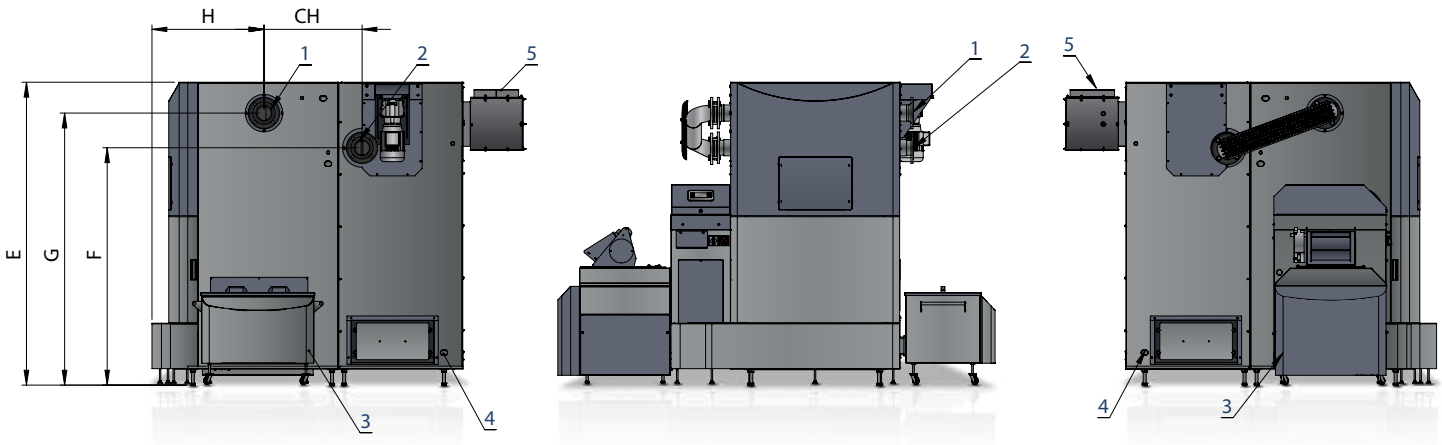
AUTOMATIC BIOMASS BOILERS

E-COMPACT SUPERMAX 300–500 kW

WES WOOD ENERGY SOLUTIONS

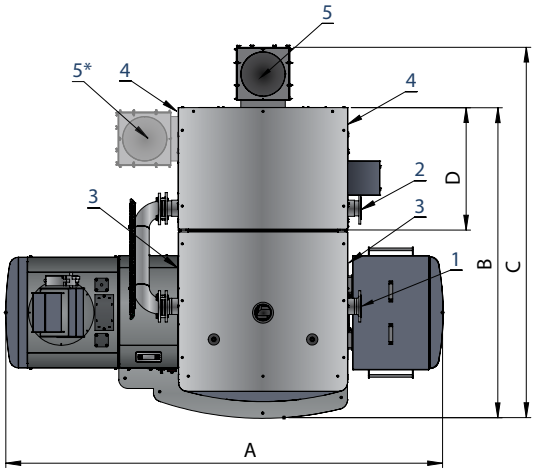
ČSN-EN 303.5/2013
ISO 9001:2009

DIMENSIONS AND WEIGHTS OF BOILERS 300 – 500kW

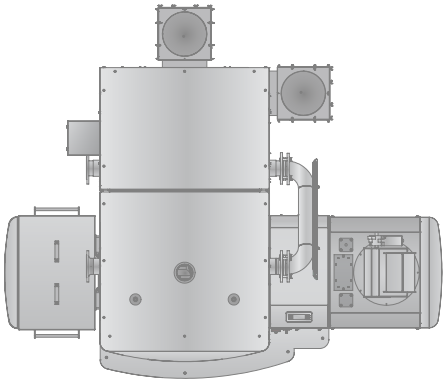


1. Water inlet DN100/PN6
2. Water outlet DN100/PN6
3. In/out water valve ¾" of burning chamber
4. In/out water valve ¾" of heat exchanger
5. Chimney outlet avg. 300mm

* Option for limited spaces



Left-sided



Right-sided

FULLY AUTOMATIC Ecologic Boilers **with excellent features!**

	300	350	400	450	500
A	2940	2940	2940	2940	2940
B	2080	2200	2320	2440	2560
C	2480	2600	2720	2840	2960
D	820	940	1060	1180	1300
E	1995	1995	1995	1995	1995
F	1560	1560	1560	1560	1560
G	1790	1790	1790	1790	1790
H	750	750	750	750	750
CH	655	655	655	655	655

WEIGHT		
Burning chamber 300–500 kW	1 550 kg	Boiler Total
Exchanger 300	1 500 kg	3 050 kg
Exchanger 350	1 600 kg	3 150 kg
Exchanger 400	1 700 kg	3 250 kg
Exchanger 450	1 800 kg	3 350 kg
Exchanger 500	1 950 kg	3 500 kg

• Purity to nature • Savings to clients • Comfort to users

AUTOMATIC BIOMASS BOILERS

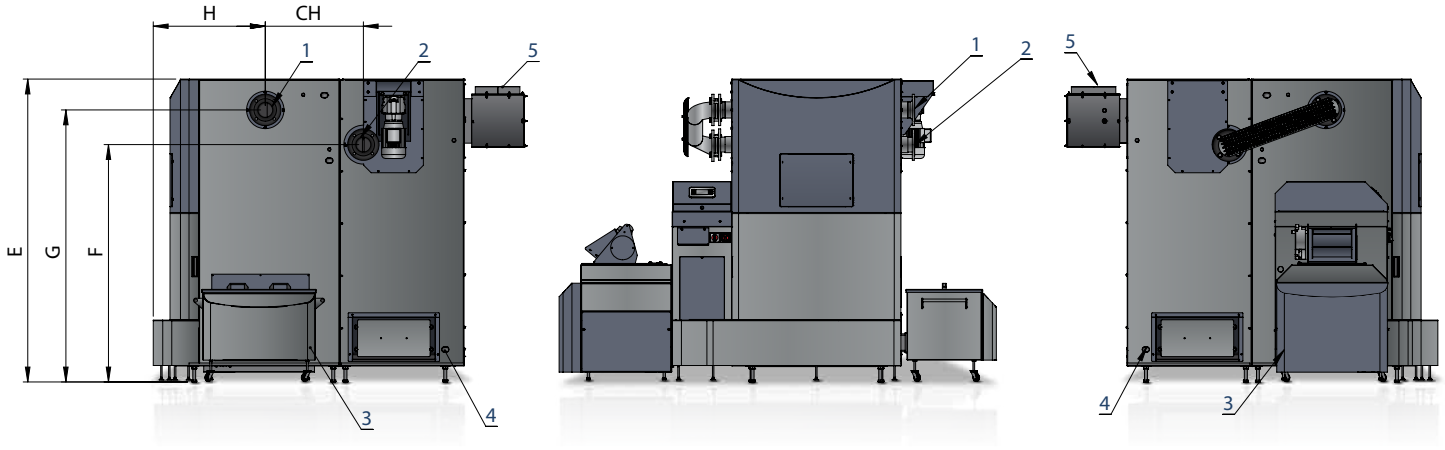
E-COMPACT SUPERMAX 150–250 kW

WES WOOD ENERGY SOLUTIONS

ČSN-EN 303.5/2013

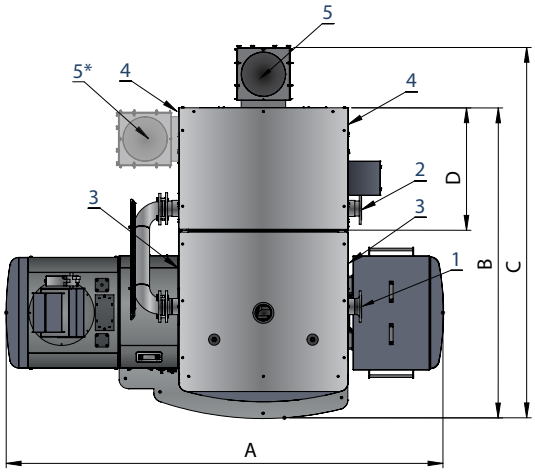
ISO 9001:2009

DIMENSIONS AND WEIGHTS OF TECHNOLOGIES 150 – 250kW



1. Water inlet DN80/PN6
2. Water outlet DN80/PN6
3. In/out water valve ¾" of burning chamber
4. In/out water valve ¾" of heat exchanger
5. Chimney outlet avg. 220mm

* Option for limited spaces



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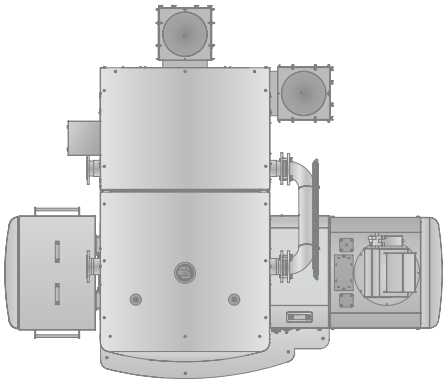


Right-sided

Manufactured in EU to the Highest Standards

	150	180	200	250
A	2825	2825	2825	2825
B	1750	1870	1990	2110
C	2160	2280	2400	2520
D	580	700	820	940
E	1820	1820	1820	1820
F	1345	1345	1345	1345
G	1570	1570	1570	1570
H	715	715	715	715
CH	600	600	600	600

WEIGHTS		
Burning chamber 150–250 kW	1210 kg	Total weight
Exchanger 150	1050 kg	2260 kg
Exchanger 180	1150 kg	2360 kg
Exchanger 200	1200 kg	2410 kg
Exchanger 250	1300 kg	2510 kg

AUTOMATIC BIOMASS BOILERS

E-COMPACT SUPERMAX 150–500 kW

WOOD ENERGY SOLUTIONS

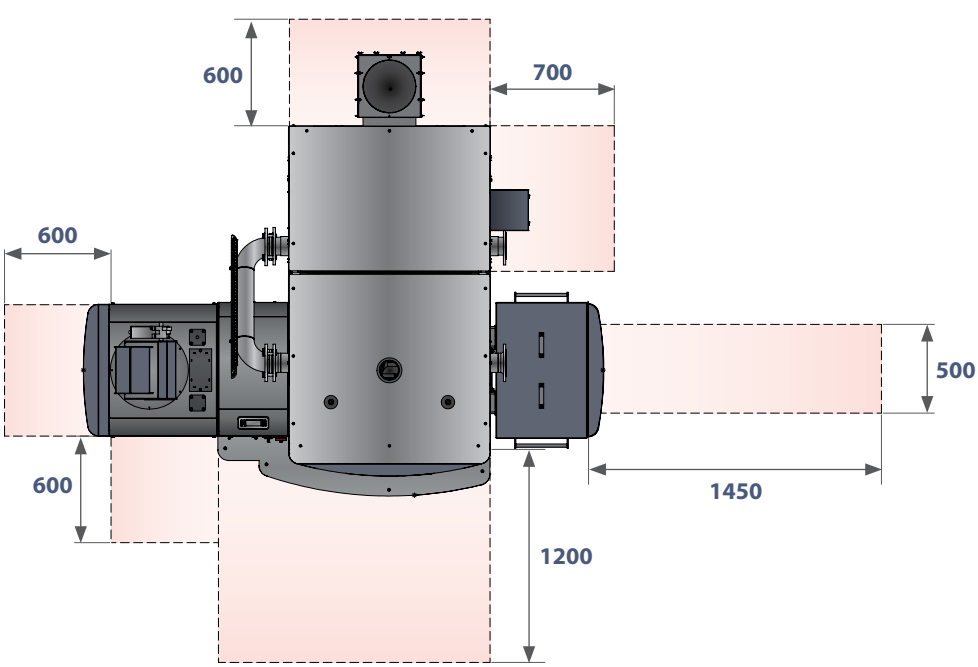
ČSN-EN 303.5/2013

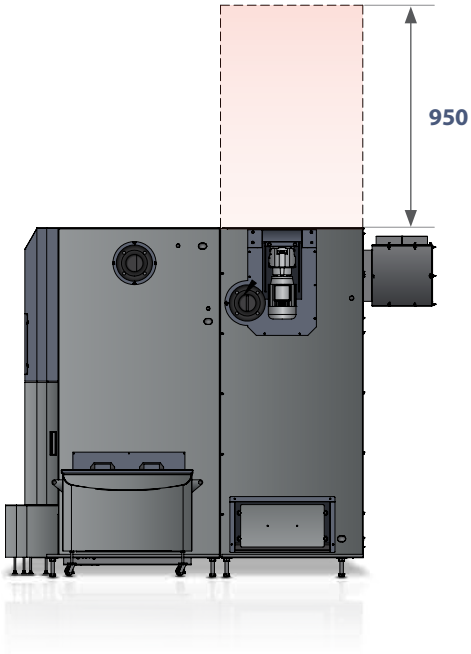
ISO 9001:2009

SERVICE CLEARANCES OF TECHNOLOGIES 150 – 250kW

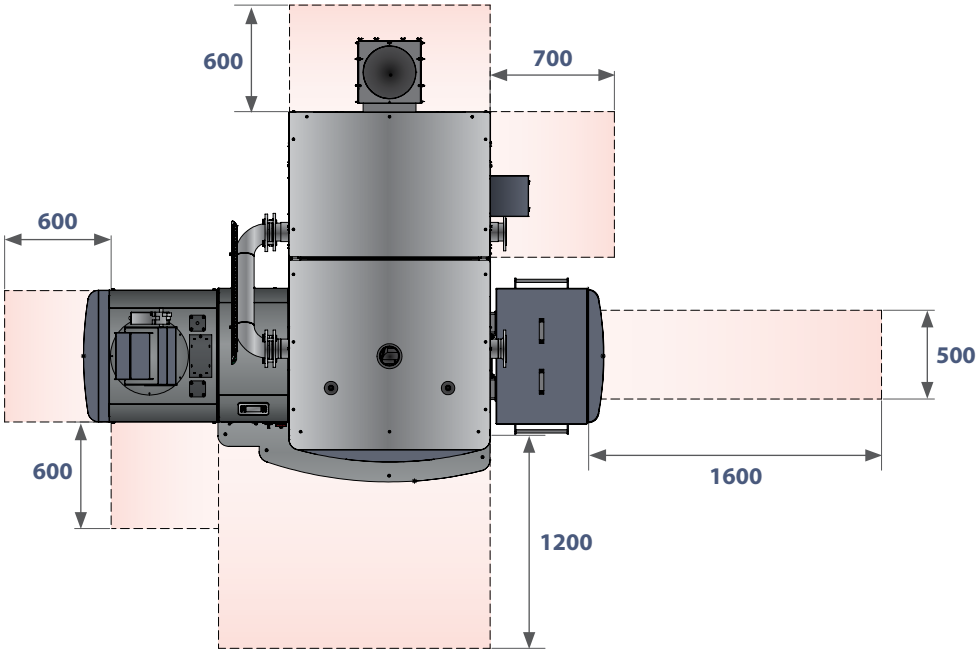
Using INDUSTRY leading components

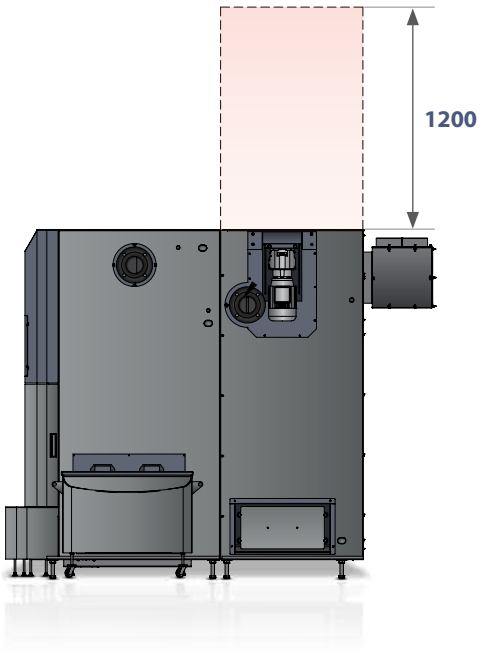
E-COMPACT SUPERMAX 150–250 kW





E-COMPACT SUPERMAX 300–500 kW





• Purity to nature • Savings to clients • Comfort to users

AUTOMATIC BIOMASS BOILERS

E-COMPACT SUPERMAX 150–500 kW

WOOD ENERGY SOLUTIONS

ČSN-EN 303.5/2013

ISO 9001:2009

TECHNICAL SPECIFICATIONS
150 – 500kW

Backed by excellent **UK Technical Support**

E-COMPACT SUPERMAX OPERATING DATA											
Technical data of the boiler											
Marking		150	180	200	220	250	300	350	400	450	500
Nominal power Pn	kW	150	180	199	220	250	300	350	400	450	500
Partial load (power) Pp	kW	40	45	50	55	65	75	90	100	115	140
Boiler efficiency Pn	%	>95	>95	>95	>95	>95	>95	>95	>95	>95	>95
Boiler class		5	5	5	5	5	5	5	5	5	5
Water											
Water volume	l	380	420	460	460	500	690	740	790	850	900
Diameter of water connection	"	3	3	3	3	3	4	4	4	4	4
Diameter of water connection	DN	80	80	80	80	80	100	100	100	100	100
Hydraulic-pressure drop of the boiler at the temperature fall 20°	mbar	65	73	80	80	87	95	102	110	122	130
Boiler temperature	°C	60-90*	60-90*	60-90*	60-90*	60-90*	60-90*	60-90*	60-90*	60-90*	60-90*
Minimal temperature of returnable water	°C	55	55	55	55	55	55	55	55	55	55
Maximal operational pressure	bar	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5
Test pressure	bar	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5
Temperature of furnace	**°C**	**900-1100**									
Pressure of furnace	mbar	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04
Required draught of the chimney	mbar	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Requirement for the forced draught		Oui	Oui	Oui	Oui	Oui	Oui	Oui	Oui	Oui	Oui
Combustion temperature at Pn	°C	96,6	97,2	104,9	98	96,6	99,6	99,3	98,9	98,2	97,2
Combustion temperature at Pp	°C	63,1	63,1	72,4	63,1	63,1	63,1	62,9	62,7	62,4	62,2
Diameter of flue gas duct	mm	220	220	220	220	220	300	300	300	300	300
Diameter of chimney	mm	250	250	250	250	250	350	350	350	350	350
Fuel classification 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	550	550	550	550	550	550	550	550	550
Feeding auger engine	W	550	550	550	550	550	550	550	550	550	550
Exchanger cleaning engine (s)	W	550	550	550	550	550	2 x 550	2 x 550	2 x 550	2 x 550	2 x 550
Ash-removing engine	W	550	550	550	550	550	550	550	550	550	550
Fan of primary air	W	66	66	66	66	66	66	66	66	66	66
Fan of secondary air 1	W	66	66	66	66	66	170	170	170	170	170
Fan of secondary air 2	W	66	66	66	66	66	170	170	170	170	170
Chimney exhaust fan	W	300	300	300	300	300	1100	1100	1100	1100	1100
Electrical ignition	W	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Separation flap valve	W	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5
Total	W	4304,5	4304,5	4304,5	4304,5	4304,5	4762,5	4762,5	4762,5	4762,5	4762,5

* Boilers can be operated at 90ºC only when special conditions are met.

• Purity to nature • Savings to clients • Comfort to users

AUTOMATIC BIOMASS BOILERS

E-COMPACT SUPERMAX 150–200 kW

WES WOOD ENERGY SOLUTIONS

Qualifies for **20 YEAR** Non-Domestic RHI

ČSN-EN 303.5/2013

ISO 9001:2009

CERTIFIED OPERATING VALUES 150 – 200kW

AUTOMATIC BIOMASS BOILERS **E-COMPACT SUPERMAX 150-200kW**		SUPERMAX 150				SUPERMAX 180				SUPERMAX 200			
		Wood Pellets		Wood chip		Wood Pellets		Wood chip		Wood Pellets		Wood chip	
		Rated	Minimum	Rated	Minimum	Rated	Minimum	Rated	Minimum	Rated	Minimum	Rated	Minimum
Measured values													
Rated heat capacity	kW	150	150	150	150	180	180	180	180	199	199	199	199
Combustion product temperature	°C	116,1	72,4	96,6	63,1	111,4	70,8	97,2	63,1	96,1	73,1	104,9	72,4
Fuel consumption	kg/h	36,30	9,78	37,18	9,45	42,50	11,10	44,80	11,30	42,60	12,48	50,60	14,50
Input water temperature	°C	60,2	67,1	60,3	62,4	59,5	65,7	60,0	61,4	57,8	67,2	55,0	71,3
Output water temperature	°C	80,5	85,2	78,8	79,2	79,1	83,3	78,0	78,4	73,0	82,6	77,1	79,0
Cooling water temperature	°C	9,6	11,1	9,6	11,0	9,6	11,1	9,6	11,0	11,1	7,8	10,6	11,5
Cooling water flow rate	m^3/h	6,733	2,033	7,080	1,950	8,433	2,401	9,034	2,304	2,695	0,650	2,673	0,755
Draught behind boiler	Pa	125,0	35,0	125,0	35,0	126,0	33,0	126,0	33,0	130,0	30,0	130,0	30,0
Ambient temperature	°C	24,0	26,3	24,2	22,6	24,0	25,3	25,0	23,0	25,2	24,9	24,1	26,2
Relative air humidity	%	45,3	44,7	38,6	37,2	45,0	44,5	40,0	39,0	42,3	41,1	41,0	40,0
Barometric pressure	kPa	99,23	99,24	99,10	99,20	99,00	99,25	99,00	99,22	98,92	98,95	99,07	99,07
Flue gas analysis													
Oxygen O_2	%	8,12	12,66	8,08	11,40	7,92	12,39	7,89	11,46	8,02	12,71	8,02	12,71
Carbon Dioxide CO_2	%	11,37	7,28	11,61	8,70	11,43	7,65	11,73	8,65	11,79	7,53	11,79	7,53
Carbon monoxide CO	ppm	46	175	100	146	49	171	93	153	58	181	58	181
Higher hydrocarbons OGC	ppm	4	2	3	5	4	3	3	5	7	4	7	4
Nitrogen dioxides NOX	ppm	81	47	83	55	81	49	84	54	65	38	65	38
Dust	mg/m^3	28	17	52	41	29	44	47	41	29	18	51	44
02 = 10 %													
Carbon monoxide CO	mg/m^3	49	289	106	209	51	275	97	220	62	301	112	244
Higher hydrocarbons OGC	mg/m^3	2	1	1	3	2	2	1	3	10	8	2	4
Nitrogen dioxides NOX	mg/m^3	143	126	144	130	140	127	144	127	113	102	151	120
Dust	mg/m^3	24	23	44	47	25	25	39	47	25	25	44	51
Auxiliary combustion values (solid fuels)													
Mass flow rate gases	kg/sec	0,109	0,044	0,099	0,033	0,126	0,047	0,117	0,040	0,155	0,053	0,148	0,066
Stoichiometric oxygen value	m^3/kg	0,957	0,957	0,832	0,832	0,957	0,957	0,832	0,832	0,949	0,948	0,848	0,848
Stoichiometric air value	m^3/kg	4,559	4,556	3,963	3,960	4,559	4,556	3,963	3,958	4,520	4,512	4,037	4,036
Stoichiometric volume of dry combustion products	m^3/kg	4,448	4,445	3,884	3,881	4,448	4,445	3,884	3,879	4,445	4,438	3,949	3,948
Stoichiometric air multiple		1,61	2,48	1,61	2,16	1,59	2,41	1,59	2,19	1,61	2,51	1,60	2,50
Volume of dry combustion products, actual	m^3/kg	7,436	11,573	6,474	8,622	7,400	11,107	6,397	8,669	7,411	11,553	6,435	10,048
Volume of H_2O in the combustion air	m^3/kg	0,102	0,177	0,076	0,089	0,100	0,164	0,081	0,114	0,101	0,150	0,081	0,140
Volume of H_2O in the combustion products	m^3/kg	0,956	1,032	0,922	0,935	0,954	1,019	0,927	0,942	0,867	0,916	0,956	1,015
Maximum volume CO_2	%	19,01	19,01	19,37	19,37	19,01	19,01	19,40	19,40	19,60	19,66	19,22	19,22
Calculated values – heat overview													
Loss of sensible heat of combustion products (chimney)	%	6,4	4,7	4,8	3,5	6,0	4,5	4,8	3,5	4,5	4,5	5,3	4,5
Loss of gas underburning	%	0,0	0,2	0,1	0,1	0,0	0,2	0,1	3,5	0,0	0,2	0,0	0,2
Loss of mechanical underburning	%	0,1	0,1	0,3	0,3	0,1	0,1	0,3	0,1	0,1	0,2	0,0	0,1
Loss of heat transfer into the environment	%	0,8	1,1	0,8	2,1	0,8	1,2	0,8	0,4	0,6	0,9	0,6	0,7
Total loss	%	7,3	6,1	6,0	6,0	6,9	6,0	5,9	5,9	5,2	5,8	6,0	5,4
Efficiency - indirect method	%	92,7	93,9	94,0	94,0	93,1	94,0	94,1	94,1	94,8	94,2	94,0	94,6
Heat input	kW	167,0	45,0	158,9	40,4	195,4	51,1	191,7	48,3	203,3	59,5	216,8	62,1
Heat capacity	kW	159,2	43,0	152,0	38,4	186,1	48,8	183,0	46,0	193,7	56,6	206,2	59,3
Uncertainty of determining heat capacity	%+/-	6,7	1,8	6,4	1,6	7,8	2,0	7,7	1,9	8,1	2,4	8,7	2,5
Efficiency – direct method	**%**	**95,3**	**95,6**	**95,6**	**95,1**	**95,0**	**95,0**	**95,5**	**95,2**	**95,3**	**95,1**	**95,1**	**95,5**
Capacity / rated output	%	106,1	28,7	101,3	25,6	103,4	27,1	101,5	25,6	97,3	28,4	103,6	29,8

* Measured * Interpolace is in compliance with EN303.5 coll. 5.3.1

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AUTOMATIC BIOMASS BOILERS

E-COMPACT SUPERMAX 250–350 kW

WES WOOD ENERGY SOLUTIONS

ČSN-EN 303.5/2013

ISO 9001:2009

CERTIFIED OPERATING VALUES 250 – 350kW

AUTOMATIC BIOMASS BOILERS **E-COMPACT SUPERMAX 150-200kW**		SUPERMAX 250				SUPERMAX 300				SUPERMAX 350			
		Wood Pellets		Wood chip		Wood Pellets		Wood chip		Wood Pellets		Wood chip	
		Rated	Minimum	Rated	Minimum	Rated	Minimum	Rated	Minimum	Rated	Minimum	Rated	Minimum
Measured values													
Rated heat capacity	kW	250	250	250	250	300	300	300	300	350	350	350	350
Combustion product temperature	°C	100,4	66,9	98,6	63,1	92,5	64,2	99,6	63,1	93,8	63,1	99,3	62,9
Fuel consumption	kg/h	56,90	14,20	62,70	15,60	67,15	16,42	75,50	18,70	78,90	18,50	86,90	20,80
Input water temperature	°C	57,9	62,4	59,4	59,1	56,7	60,0	59,0	57,4	58,4	60,6	59,3	57,7
Output water temperature	°C	75,7	78,9	76,1	76,4	73,3	75,8	74,7	75,0	75,5	76,1	75,0	74,5
Cooling water temperature	°C	9,6	11,0	9,6	11,0	9,6	11	9,6	11,0	9,5	10,7	9,6	11,0
Cooling water flow rate	m^3/h	12,400	3,300	13,600	3,130	15,234	3,873	16,850	3,720	17,272	4,492	19,438	4,428
Draught behind boiler	Pa	128,0	28,0	128,0	28,0	130,0	25,0	130,0	25,0	151,0	25,0	150,0	25,0
Ambient temperature	°C	24,3	23,1	25,7	23,3	24,4	21,5	26,4	23,6	26,0	23,0	27,0	24,0
Relative air humidity	%	43,7	44,0	44,1	43,9	42,9	43,7	46,9	47,2	37,0	38,0	41,0	41,0
Barometric pressure	kPa	99,21	99,30	99,10	99,30	99,20	99,30	99,10	99,30	99,20	99,30	99,07	99,22
Flue gas analysis													
Oxygen O_2	%	7,45	11,77	7,43	11,59	7,12	11,32	7,11	11,68	7,59	10,37	7,17	11,20
Carbon Dioxide CO_2	%	11,56	8,51	12,10	8,53	11,66	9,13	12,35	8,44	11,46	9,61	12,15	8,88
Carbon monoxide CO	ppm	55	162	75	169	59	155	63	180	82	133	101	173
Higher hydrocarbons OGC	ppm	3	5	4	6	2	6	4	7	6	5	3	6
Nitrogen dioxides NOX	ppm	80	52	86	50	80	55	87	48	74	61	93	56
Dust	mg/m^3	33	26	34	41	35	31	25	41	30	30	45	54
02 = 10 %													
Carbon monoxide CO	mg/m^3	55	243	77	246	58	220	63	265	87	182	101	246
Higher hydrocarbons OGC	mg/m^3	1	3	2	4	1	4	2	4	3	3	2	4
Nitrogen dioxides NOX	mg/m^3	134	128	143	121	130	129	142	116	124	129	153	128
Dust	mg/m^3	26	31	28	48	27	35	20	48	24	32	25	48
Auxiliary combustion values (solid fuels)													
Mass flow rate gases	kg/s	0,167	0,055	0,160	0,055	0,196	0,060	0,191	0,066	0,236	0,064	0,224	0,070
Stoichiometric oxygen value	m^3/kg	0,958	0,957	0,832	0,831	0,958	0,957	0,832	0,830	0,958	0,957	0,832	0,830
Stoichiometric air value	m^3/kg	4,560	4,557	3,963	3,953	4,560	4,558	3,963	3,950	4,560	4,558	3,962	3,951
Stoichiometric volume of dry combustion products	m^3/kg	4,449	4,446	3,883	3,874	4,449	4,446	3,883	3,871	4,449	4,447	3,882	3,872
Stoichiometric air multiple		1,54	2,25	1,54	2,25	1,50	2,14	1,50	2,23	1,56	1,99	1,51	2,19
Volume of dry combustion products, actual	m^3/kg	7,315	10,021	6,217	8,779	7,254	9,245	6,088	8,857	7,388	8,843	6,191	8,481
Volume of H_2O in the combustion air	m^3/kg	0,095	0,133	0,091	0,172	0,091	0,111	0,099	0,124	0,087	0,098	0,089	0,174
Volume of H_2O in the combustion products	m^3/kg	0,949	0,988	0,937	0,959	0,946	0,966	0,945	0,971	0,942	0,953	0,935	0,953
Maximum volume CO_2	%	19,01	19,00	19,37	19,40	19,01	19,01	19,37	19,36	19,01	19,01	19,40	19,40
Calculated values – heat overview													
Loss of sensible heat of combustion products (chimney)	%	5,2	4,0	4,7	3,5	4,6	3,6	4,7	3,5	4,7	3,3	4,7	3,3
Loss of gas underburning	%	0,0	0,1	0,0	0,1	0,0	0,1	0,0	0,1	0,0	0,1	0,0	0,1
Loss of mechanical underburning	%	0,0	0,1	0,3	0,5	0,0	0,1	0,3	0,6	0,0	0,1	0,3	0,6
Loss of heat transfer into the environment	%	0,7	1,6	0,7	1,6	0,7	1,8	0,6	1,4	0,6	1,4	0,5	1,2
Total loss	%	6,0	5,8	5,7	5,7	5,4	5,6	5,5	5,5	5,3	4,9	5,4	5,1
Efficiency - indirect method	%	94,0	94,2	94,3	94,3	94,6	94,4	94,5	94,5	94,7	95,1	94,6	95,0
Heat input	kW	261,5	65,3	268,1	66,8	308,8	75,5	322,7	80,0	363,0	85,2	371,4	89,0
Heat capacity	kW	248,8	62,2	255,4	63,7	293,6	71,8	307,1	76,4	345,8	81,4	354,5	85,2
Uncertainty of determining heat capacity	%+/-	10,4	2,6	10,7	2,7	12,3	3,0	12,9	3,2	14,5	3,4	14,9	3,6
Efficiency – direct method	**%**	**95,0**	**95,0**	**95,3**	**95,4**	**95,1**	**95,0**	**95,2**	**95,5**	**95,3**	**95,5**	**95,4**	**95,7**
Capacity / rated output	%	99,5	24,9	102,0	25,5	97,9	23,9	102,4	25,5	98,8	23,3	101,6	24,7

* Measured * Interpolace is in compliance with EN303.5 coll. 5.3.1

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AUTOMATIC BIOMASS BOILERS

E-COMPACT SUPERMAX 400–500 kW

WES WOOD ENERGY SOLUTIONS

ČSN-EN 303.5/2013

ISO 9001:2009

FULLY AUTOMATIC Ecologic Boilers with excellent features!

CERTIFIED OPERATING VALUES 400 – 500kW

AUTOMATIC BIOMASS BOILERS **E-COMPACT SUPERMAX 400-500kW**		SUPERMAX 400				SUPERMAX 450				SUPERMAX 500			
		Wood Pellets		Wood chip		Wood Pellets		Wood chip		Wood Pellets		Wood chip	
		Rated	Minimum	Rated	Minimum	Rated	Minimum	Rated	Minimum	Rated	Minimum	Rated	Minimum
Measured values													
Rated heat capacity	kW	400	400	400	400	450	450	450	450	500	500	500	500
Combustion product temperature	°C	95,1	62,0	98,9	62,7	96,3	60,9	98,6	62,4	97,6	59,8	98,2	62,2
Fuel consumption	kg/h	90,70	20,60	98,30	22,90	102,48	22,74	109,60	25,00	114,26	24,85	121,00	27,12
Input water temperature	°C	60,2	61,1	59,7	57,9	61,9	61,7	60,0	58,2	63,6	62,2	60,3	58,4
Output water temperature	°C	77,8	76,5	75,4	74,1	80,0	76,8	75,7	73,6	82,2	77,1	76,0	73,1
Cooling water temperature	°C	9,4	10,4	9,6	11,0	9,3	10,0	9,6	11,0	9,2	9,7	9,6	11,0
Cooling water flow rate	m^3/h	19,311	5,110	22,025	5,135	21,349	5,729	24,613	5,843	23,387	6,347	27,200	6,550
Draught behind boiler	Pa	173,0	25,0	170,0	26,0	194,0	25,0	190,0	26,0	215,0	25,0	210,0	26,0
Ambient temperature	°C	27,0	24,0	28,0	24,0	29,0	25,7	28,5	24,6	30,2	27,1	29,2	24,9
Relative air humidity	%	32,0	33,0	35,0	35,0	27,0	28,0	29,5	28,6	21,1	22,8	23,7	22,4
Barometric pressure	kPa	99,10	99,30	99,05	99,15	99,20	99,30	99,02	99,07	99,20	99,30	98,99	98,99
Flue gas analysis													
Oxygen O_2	%	8,06	9,43	7,24	10,73	8,52	8,48	7,30	10,25	8,99	7,53	7,36	9,77
Carbon Dioxide CO_2	%	11,26	10,10	11,95	9,31	11,05	10,58	11,74	9,75	10,85	11,06	11,54	10,18
Carbon monoxide CO	ppm	105	111	139	167	128	89	176	160	151	67	214	153
Higher hydrocarbons OGC	ppm	9	3	2	6	13	2	1	5	16	0	0	4
Nitrogen dioxides NOX	ppm	68	67	100	65	62	72	106	73	56	78	112	81
Dust	mg/m^3	25	29	66	67	19	28	86	79	14	27	106	92
02 = 10 %													
Carbon monoxide CO	mg/m^3	116	144	140	227	144	106	178	207	173	68	216	188
Higher hydrocarbons OGC	mg/m^3	5	2	1	3	6	1	1	3	8	0	0	2
Nitrogen dioxides NOX	mg/m^3	118	130	164	139	111	130	174	151	105	130	185	162
Dust	mg/m^3	20	29	30	48	17	25	34	48	13	22	39	48
Auxiliary combustion values (solid fuels)													
Mass flow rate gases	kg/s	0,276	0,068	0,257	0,074	0,316	0,072	0,290	0,077	0,356	0,076	0,323	0,081
Stoichiometric oxygen value	m^3/kg	0,958	0,957	0,832	0,830	0,958	0,957	0,831	0,830	0,958	0,957	0,831	0,830
Stoichiometric air value	m^3/kg	4,560	4,559	3,961	3,951	4,560	4,559	3,960	3,952	4,560	4,559	3,959	3,952
Stoichiometric volume of dry combustion products	m^3/kg	4,449	4,447	3,882	3,872	4,448	4,448	3,881	3,873	4,448	4,448	3,880	3,873
Stoichiometric air multiple		1,62	1,85	1,52	2,08	1,67	1,70	1,52	1,96	1,73	1,55	1,53	1,85
Volume of dry combustion products, actual	m^3/kg	7,521	8,442	6,294	8,106	7,655	8,040	6,396	7,730	7,788	7,638	6,499	7,354
Volume of H_2O in the combustion air	m^3/kg	0,082	0,085	0,080	0,134	0,078	0,072	0,070	0,093	0,073	0,059	0,060	0,053
Volume of H_2O in the combustion products	m^3/kg	0,937	0,940	0,926	0,935	0,933	0,927	0,916	0,917	0,928	0,914	0,906	0,899
Maximum volume CO_2	%	19,01	19,01	19,37	19,36	19,00	19,01	19,37	19,36	19,01	19,01	19,37	19,36
Calculated values – heat overview													
Loss of sensible heat of combustion products (chimney)	%	4,8	3,0	4,7	3,2	4,8	2,6	4,6	3,0	4,9	2,3	4,6	2,8
Loss of gas underburning	%	0,1	0,1	0,1	0,1	0,1	0,0	0,1	0,1	0,1	0,0	0,1	0,1
Loss of mechanical underburning	%	0,0	0,1	0,4	0,6	0,0	0,1	0,4	0,5	0,0	0,1	0,4	0,5
Loss of heat transfer into the environment	%	0,5	1,1	0,5	0,9	0,3	0,7	0,3	0,7	0,2	0,3	0,2	0,4
Total loss	%	5,3	4,2	5,4	4,6	5,2	3,4	5,3	4,2	5,2	2,7	5,2	3,7
Efficiency - indirect method	%	94,8	95,9	94,7	95,4	94,8	96,6	94,7	95,9	94,8	97,3	94,8	96,3
Heat input	kW	417,2	94,9	420,1	98,1	471,3	104,6	468,7	107,1	525,5	114,3	517,4	116,1
Heat capacity	kW	398,0	91,0	401,8	94,0	450,2	100,6	449,2	102,7	502,4	110,2	496,5	111,5
Uncertainty of determining heat capacity	%+/-	16,7	3,8	16,9	4,0	18,9	4,2	18,9	4,3	21,1	4,6	20,9	4,7
Efficiency – direct method	**%**	**95,4**	**95,9**	**95,6**	**95,8**	**95,5**	**96,2**	**95,8**	**96,0**	**95,6**	**96,4**	**96,0**	**96,1**
Capacity / rated output	%	99,5	22,8	100,9	23,9	100,0	22,4	100,1	23,1	100,5	22,0	99,3	22,3

* Measured * Interpolace is in compliance with EN303.5 coll. 5.3.1

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E-COMPACT EcoCabin 125-300kW

WES
WOOD ENERGY SOLUTIONS

GREEN PRODUCT of the year 2014

comes with INTEGRATED FUEL STORE (Wood Exterior)

The award winning EcoCabin solution is a firm favourite by Agri-businesses, hotels, leisure centres and golf clubs and municipal buildings throughout the UK.

Standard specifications in all EcoCabins are:

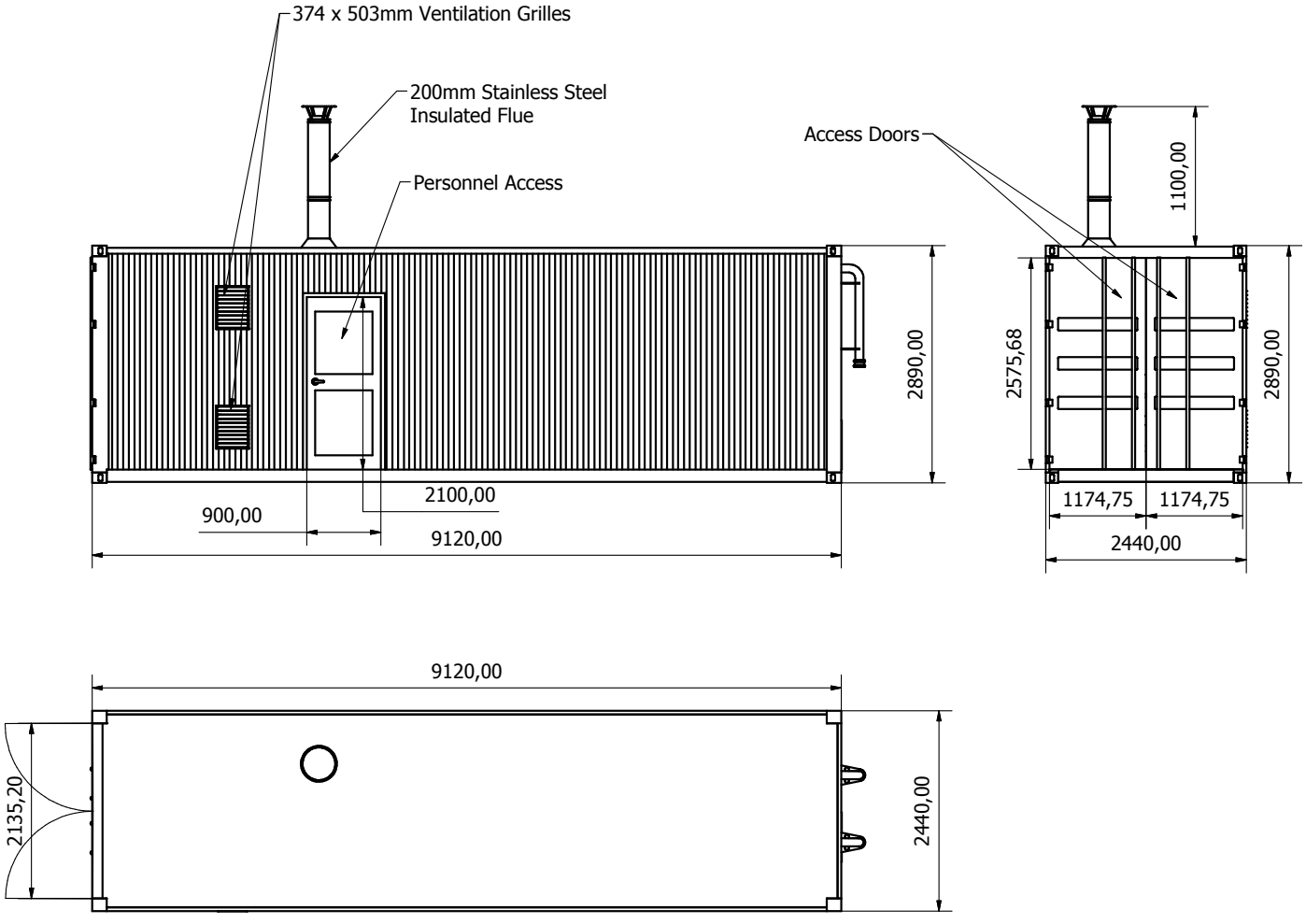
- E-COMPACT Commercial Pellet boiler
- Buffer Tank 1500-3000L
- Heat Metre (Kamstrup) RHI Compliant
- Fuel Transportation system (Cyclomatic or Flexi Auger)
- Plate Heat Exchanger
- Pre wired & plumbed in 2" mappress pipework
- Remote Control and wireless modem
- Wilo Stratos 40 Pumps
- Chimney (8" Twin wall Stainless Steel)

E-COMPACT Ecocabin 125 - 300 kW

MOST COMMON ECOCABIN CONFIGURATIONS

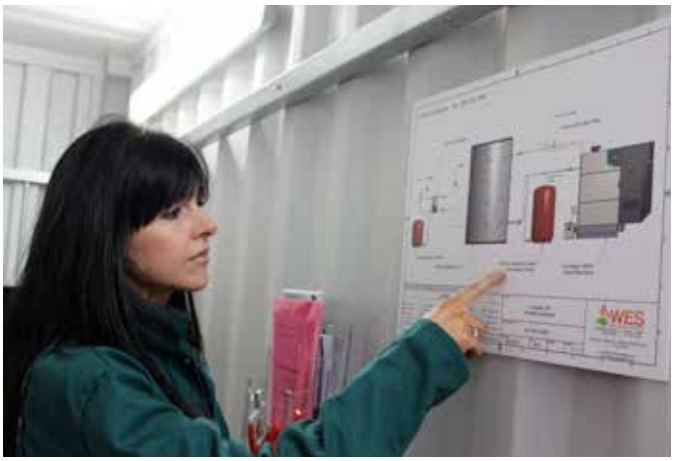
Boiler	Buffer Size (Litres)	EcoCabin Dimensions	Fuel Store
150	2500	6.1m x 2.4m	x
150	2500	9.15m x 2.4m	√
199	2500	6.1m x 2.4m	x
199	2500	9.15m x 2.4m	√
215	2500	6.1m x 2.4m	x
215	2500	9.15m x 2.4m	√
300	5000	9.15m x 2.4m	x
2 x 150	5000	12.03m x 2.4m	x
2 x 199	5000	12.03m x 2.4m	x
2 x 215	5000	12.03m x 2.4m	x
2 x 300	5000	12.03m x 2.4m	x

EcoCabin 199kw
with external 20 tonne Fuel Store



EcoCabin 199 with Integrated Fuel Store

E-COMPACT EcoCabin 125-300kW



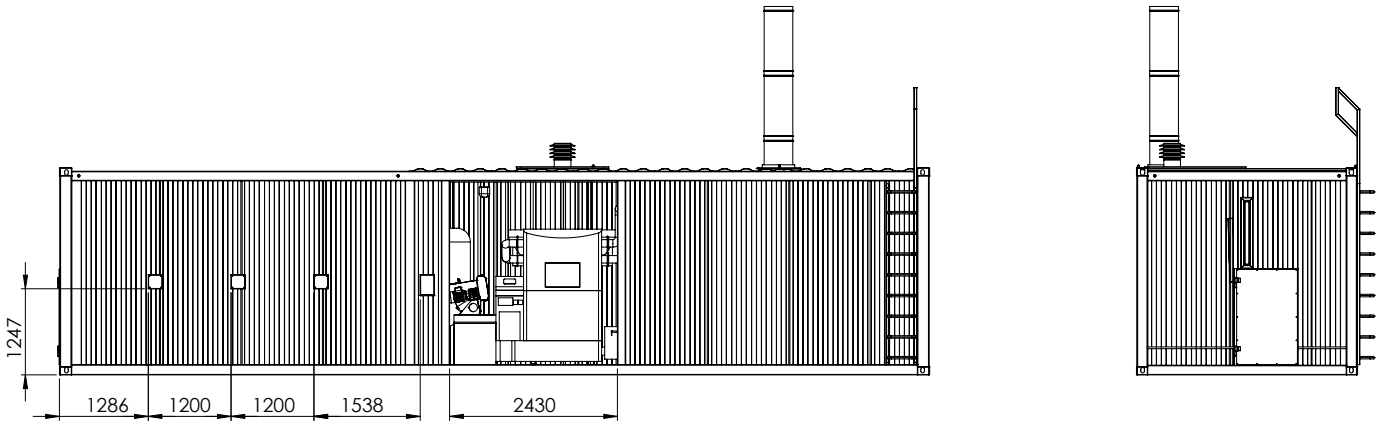
Interior of E-COMPACT EcoCabin

EcoCabin

www.woodenergysolutions.com

E-COMPACT SUPERMAX
EcoCabin 300 - 500kW

500kW E-COMPACT SUPERMAX EcoCabin



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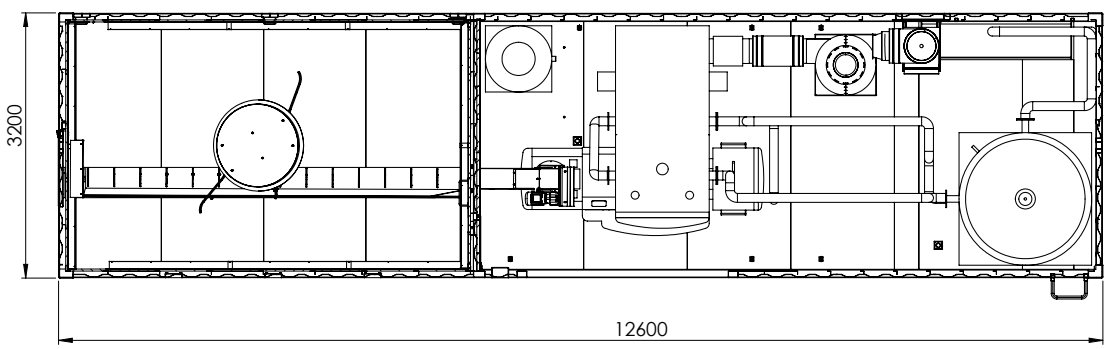

E-COMPACT SUPERMAX
EcoCabin 300 - 500kW

550kW E-COMPACT SUPERMAX (Multi Fuel) EcoCabin with Viewing Door

MOST COMMON ECOCABIN SUPERMAX CONFIGURATIONS

Boiler	Buffer Size (Litres)	EcoCabin Dimensions	Fuel Store
300	4000	12.6m x 3.2m	√
300	4000	9.6m x 3.2m	x
500	4000	12.6m x 3.2m	√
2 x 300	4000	12.6m x 3.2m	x

E-COMPACT SUPERMAX
EcoCabin 300 - 500kW

Standard specifications of SUPERMAX EcoCabin:

- E-COMPACT SUPERMAX boiler c/w Exhaust Gas Separator
- DN350 Flue (on 500kW Boiler)
- Magna 3 Pump
- SIEMENS Remote monitoring
- Siemens HC1 Regulation Module
- RHI Metre
- Silo (Option) includes Filling Pipes, Retractable Hydraulic Roof, Fuel Level sensors

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