



# SMART HEATING TECHNOLOGY

Purity to Nature  
Savings to Clients  
Comfort to Users



AUTOMATIC BIOMASS BOILERS

## SMART 150–500 kW

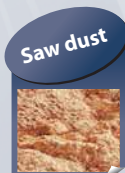
- Fully automatic, ecologic boilers with excellent features
- Multiple fuel possibility
- Efficiency 96 %
- Output modulation 30–100 %
- Lambda sensor
- Ceramic Burner Option
- Vibrating Burner Plate Option
- Low Maintenance & Service requirements
- Heating circuits regulation
- Cascade installation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

# AUTOMATIC BIOMASS BOILERS

## SMART 150–500 kW

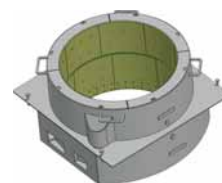


New Boiler Design →

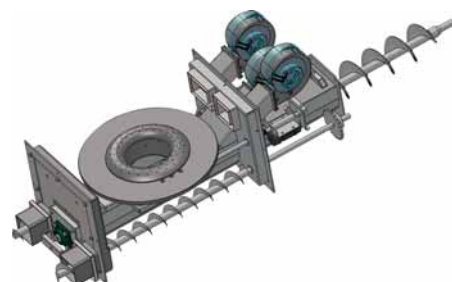


New Design Features ↓

Ceramic Burner



Vibrating Burner plate



SMART Boilers Application Options ↓

- Apartment Buildings
- Multifunctional Buildings
- Shopping Centres
- Production Plants & Industrial Premises & Storage Premises
- Agriculture & Aquaculture & Horticulture Farms
- Hotels/Motels/Wellness Centres/Pools/
- Sport Arenas
- Municipality Buildings
- Schools, Hospitals, Police & Army Complexes
- City Districts

In association with:

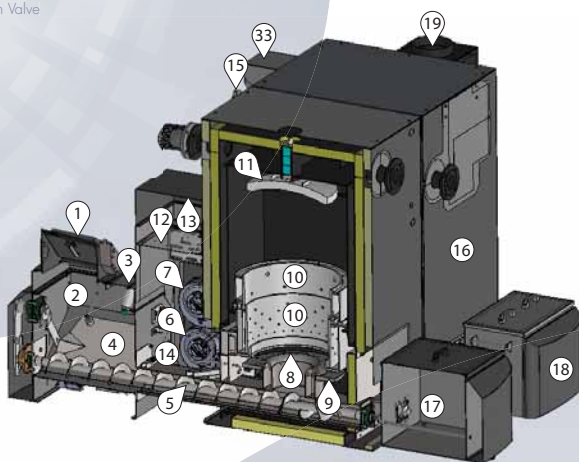
**SIEMENS**



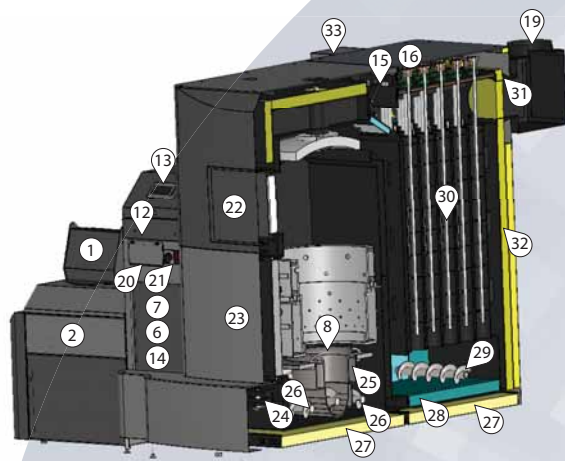
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ISO 9001:2009

## SMART 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 Fans
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



## SMART 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 – Option
30. Turbulators
31. Lambda Sensor
32. Dual Boiler Insulation
33. Turbulators Drive Motor

Mobile phone control  
Internet control  
Mobile container solutions

### UNIT CONVERTER

|                     |                  |
|---------------------|------------------|
| 1 GJ = 1000 MJ      |                  |
| 1 GJ = 277, 778 kWh | 1 GJ = 0,278 MWh |
| 1 GJ = 238 846 kcal |                  |

### FUEL – CALORIFIC VALUE

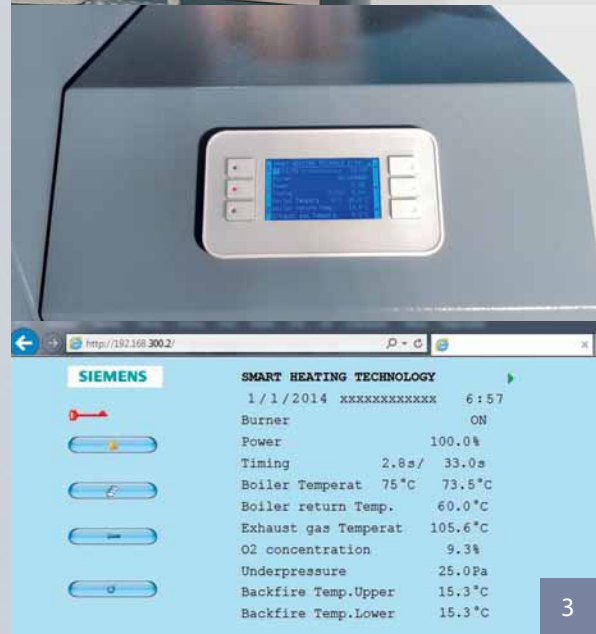
|                                                         |
|---------------------------------------------------------|
| 1 kg – Wood pellets = 16,5–18,5 MJ = 4,6–5,1 kWh        |
| 1 kg – Lignite = 10,5–17,2 MJ = 2,9–4,8 kWh             |
| 1 kg – Wood chips with moisture 10% = 16,4 MJ = 4,6 kWh |
| 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 m³ – Natural gas = 37,82 MJ = 10,5 kWh                |

### SMART BOILERS OPERATING DATA

#### Technical data of the boiler

| Marking                                                           |             | 150                   | 180    | 200    | 220    | 250    | 300    | 350    | 400    | 450    | 500    |
|-------------------------------------------------------------------|-------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Nominal power P <sub>n</sub>                                      | kW          | 150                   | 180    | 199    | 220    | 250    | 300    | 350    | 400    | 450    | 500    |
| Partial load (power) P <sub>p</sub>                               | kW          | 40                    | 45     | 50     | 55     | 65     | 75     | 90     | 100    | 115    | 140    |
| Boiler efficiency at P <sub>n</sub>                               | %           | >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                                |             | Yes                   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    |
| Combustion temperature at P <sub>n</sub>                          | °C          | 96,6                  | 97,2   | 104,9  | 98     | 96,6   | 99,6   | 99,3   | 98,9   | 98,2   | 97,2   |
| Combustion temperature at P <sub>p</sub>                          | °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        |        |        |        |        |        |        |        |        |        |

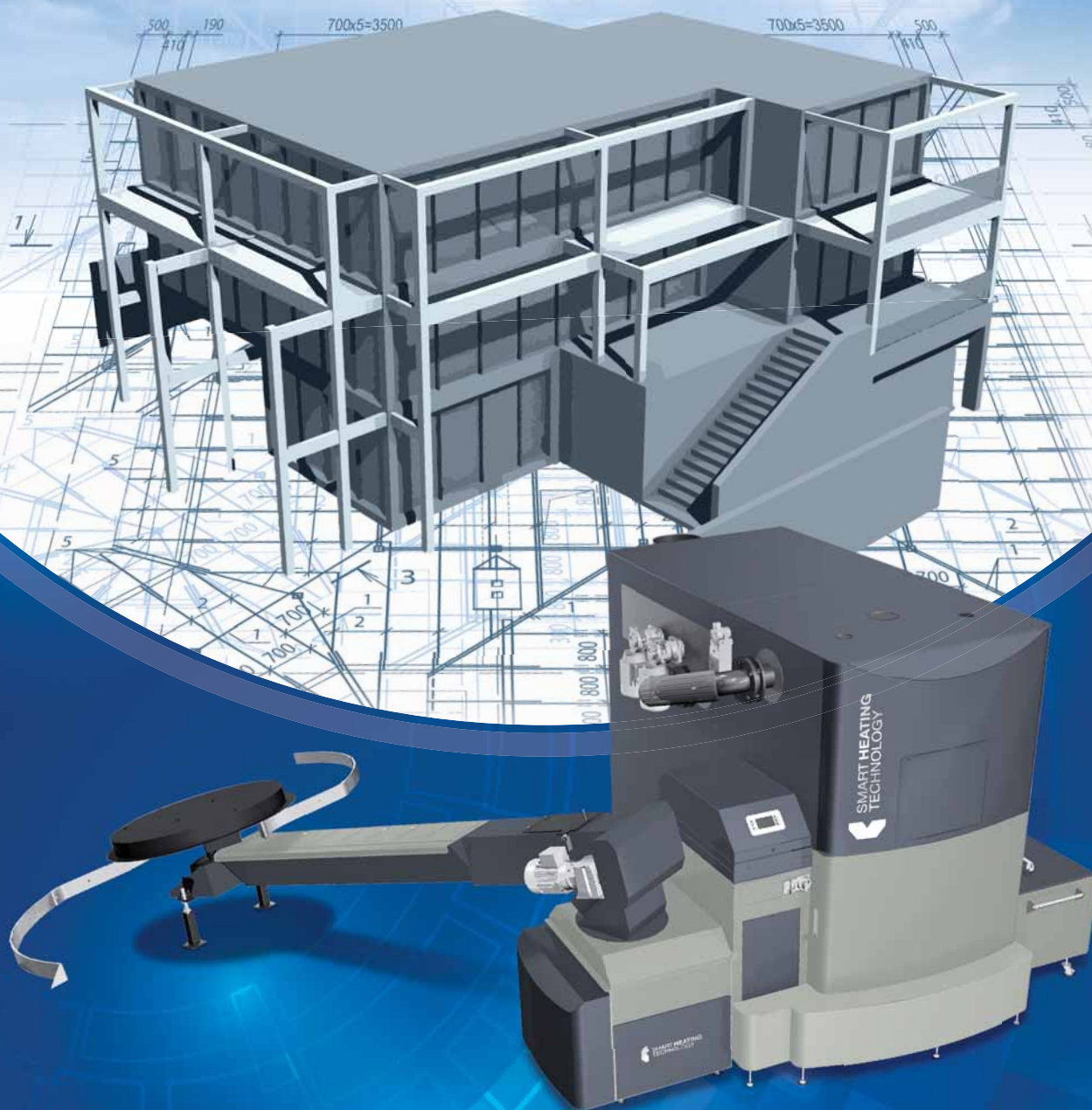
\*Boilers can be operated at 90°C only when special conditions are met





# SMART HEATING TECHNOLOGY

Purity to Nature  
Savings to Clients  
Comfort to Users



AUTOMATIC BIOMASS BOILERS

## SMART 150–500 kW

COMPLETE TECHNICAL SPECIFICATION

Dimensions and weights of technologies 150–250 kW ■ Dimensions and weights of technologies 300–500 kW ■ Service zones of technologies 150–500 kW ■ Technical specifications 150–500 kW ■ Certified operating values 150–500 kW

# AUTOMATIC BIOMASS BOILERS

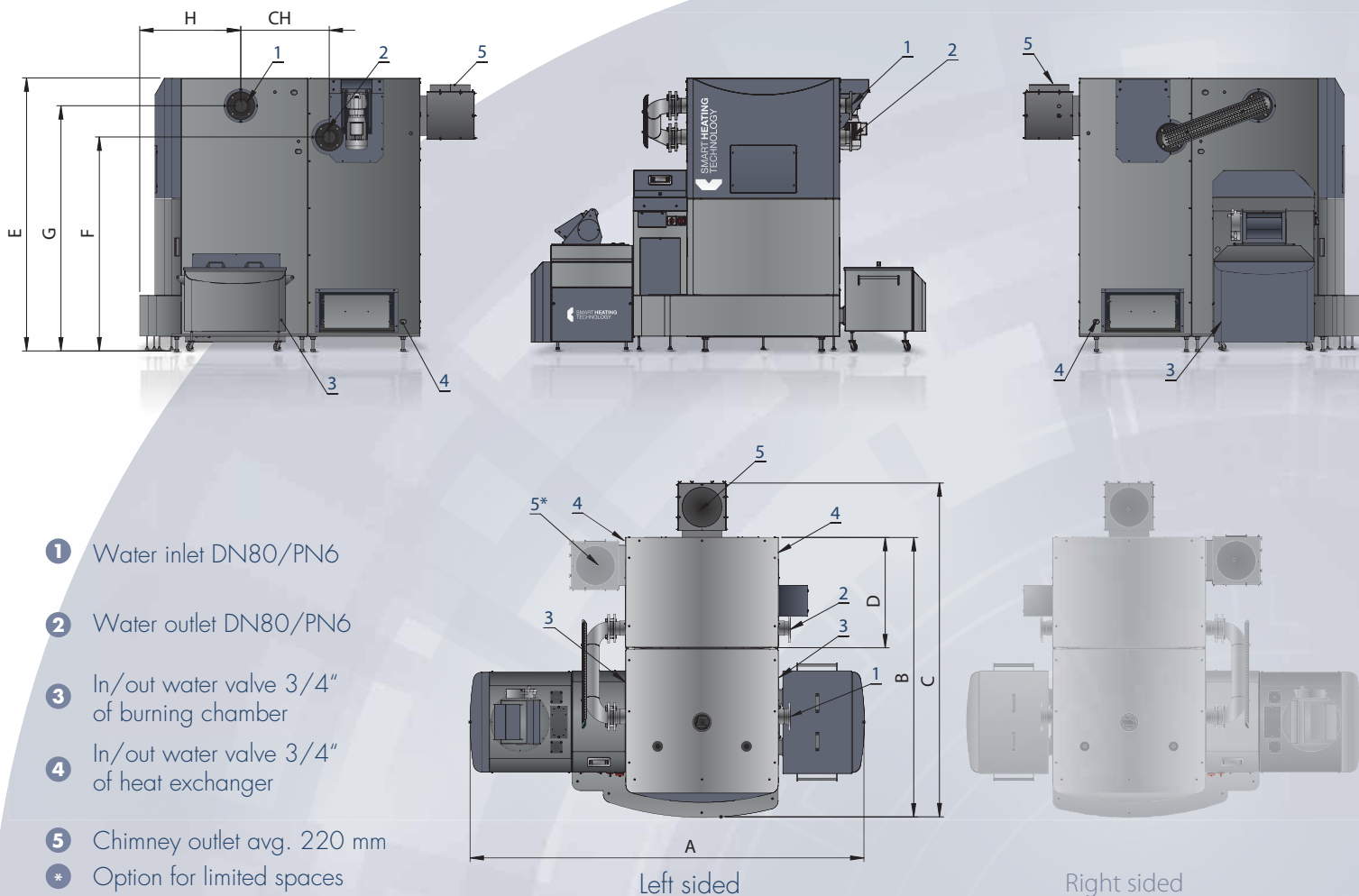
## SMART 150–500 kW

DIMENSIONS AND WEIGHTS  
OF TECHNOLOGIES 150–250 kW



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|    | 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<br>150 – 250 kW | 1 210 kg | Total weight |
| Exchanger 150                   | 1 050 kg | 2 260 kg     |
| Exchanger 180                   | 1 150 kg | 2 360 kg     |
| Exchanger 200                   | 1 200 kg | 2 410 kg     |
| Exchanger 250                   | 1 300 kg | 2 510 kg     |

FULLY AUTOMATIC, ECOLOGIC BOILERS WITH EXCELLENT FEATURES!



# AUTOMATIC BIOMASS BOILERS SMART 300–500 kW

## DIMENSIONS AND WEIGHTS OF TECHNOLOGIES 300–500 kW



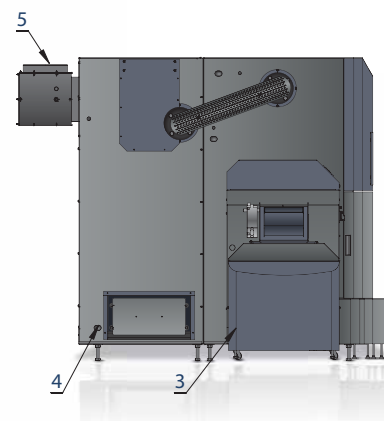
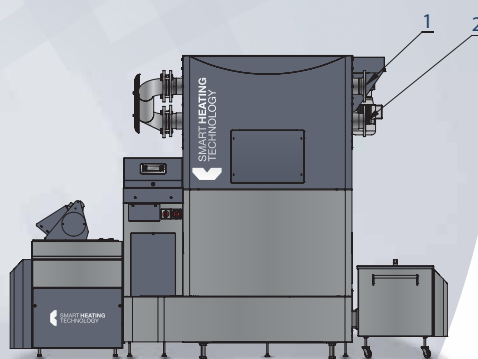
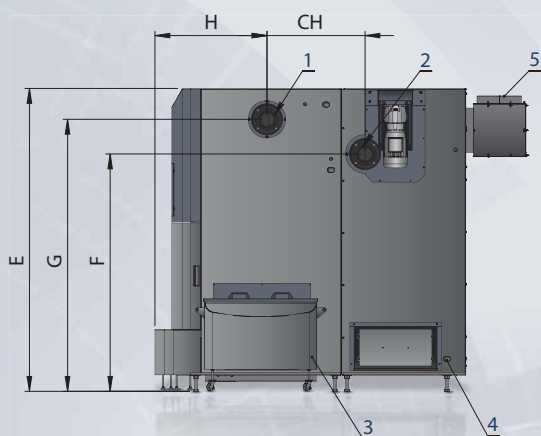
**SMART HEATING  
TECHNOLOGY**



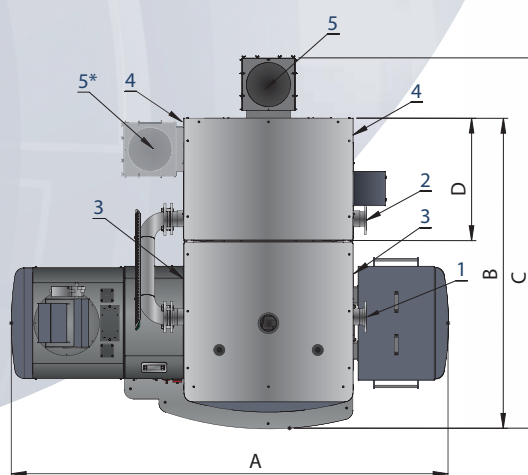
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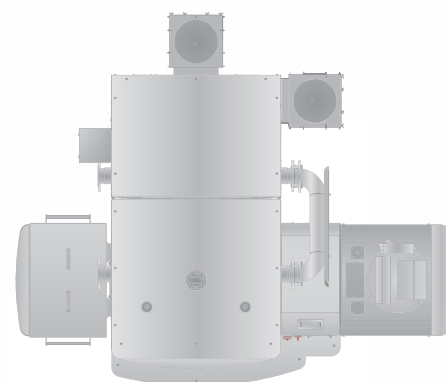
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- ❶ Water inlet DN80/PN6
- ❷ Water outlet DN80/PN6
- ❸ In/out water valve 3/4" of burning chamber
- ❹ In/out water valve 3/4" of heat exchanger
- ❺ Chimney outlet avg. 220 mm
- \* Option for limited spaces



Left sided



Right sided

|    | 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  |

| WEIGHTS                         |          |                 |
|---------------------------------|----------|-----------------|
| Burning chamber<br>300 – 500 kW | 1 550 kg | Total<br>weight |
| 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        |

FULLY AUTOMATIC, ECOLOGIC BOILERS WITH EXCELLENT FEATURES!



# AUTOMATIC BIOMASS BOILERS SMART 300–500 kW

SERVICE ZONES OF TECHNOLOGIES  
150–500 kW



SMART HEATING  
TECHNOLOGY

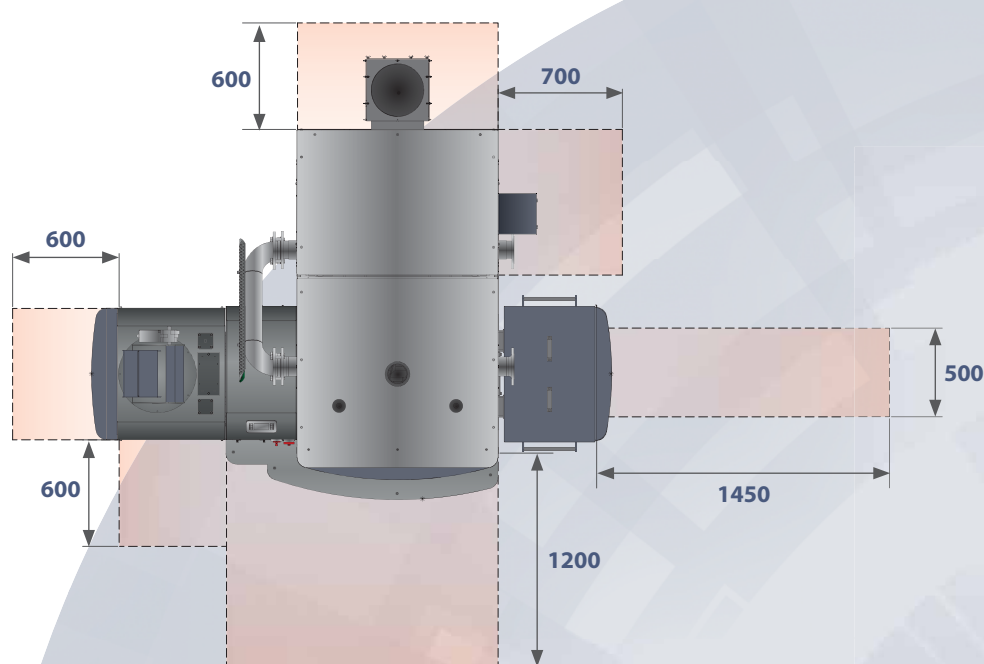


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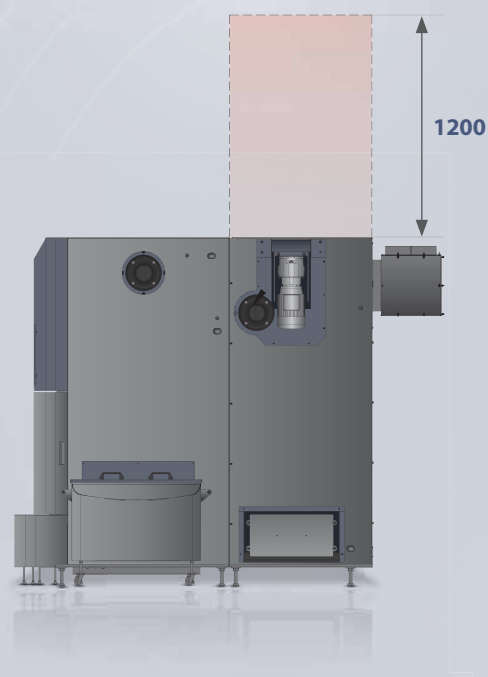
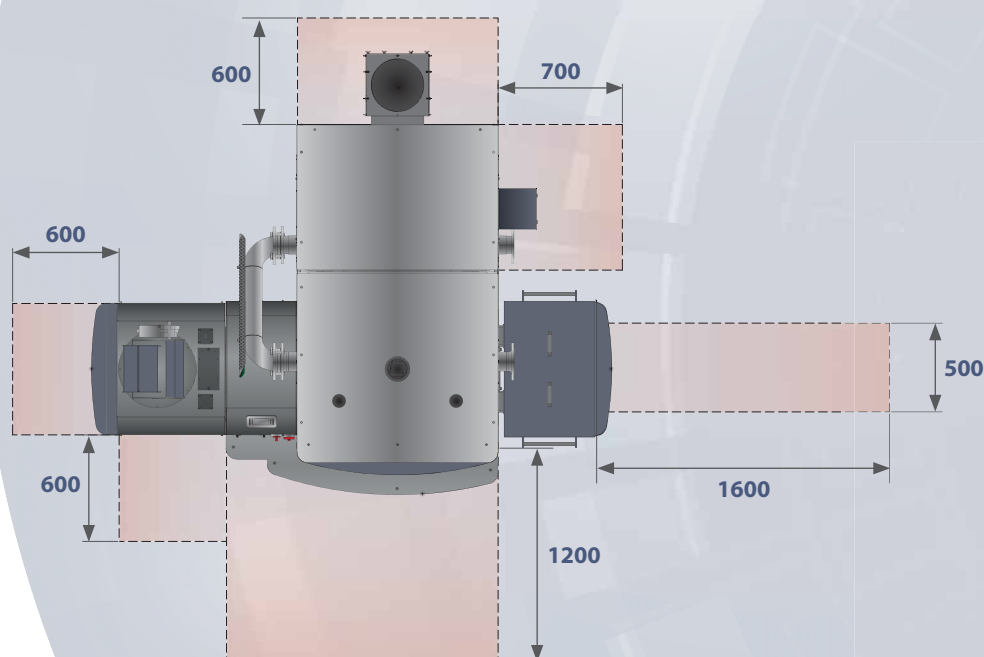
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## SMART 150–250 kW



## SMART 300–500 kW



FULLY AUTOMATIC, ECOLOGIC BOILERS WITH EXCELLENT FEATURES!



# AUTOMATIC BIOMASS BOILERS

## SMART 150–500 kW



### TECHNICAL SPECIFICATIONS 150–500 kW



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| 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                                           | 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                                |             | Yes                        | Yes    | Yes    | Yes    | Yes    | Yes     | Yes     | Yes     | Yes     | Yes     |
| 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 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 230/400VTN-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 90°C only when special conditions are met

FULLY AUTOMATIC, ECOLOGIC BOILERS WITH EXCELLENT FEATURES!



# AUTOMATIC BIOMASS BOILERS

## SMART 150–500 kW

CERTIFIED OPERATING VALUES  
150–200 kW



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TECHNOLOGY



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| AUTOMATIC BIOMASS BOILERS<br>SMART 150–200 kW          |          | SMART 150    |             |             |             | SMART 180    |             |             |             | SMART 200    |             |             |             |
|--------------------------------------------------------|----------|--------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|
|                                                        |          | Wood pellets |             | Wood chips  |             | Wood pellets |             | Wood chips  |             | Wood pellets |             | Wood chips  |             |
|                                                        |          | 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/hour  | 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        |
| Outlet 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                                | m³/hod   | 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 <sub>2</sub>                                  | %        | 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 <sub>2</sub>                         | %        | 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/m³    | 28           | 17          | 52          | 41          | 29           | 44          | 47          | 41          | 29           | 18          | 51          | 44          |
| O <sub>2</sub> = 10%                                   |          |              |             |             |             |              |             |             |             |              |             |             |             |
| Carbon monoxide CO                                     | mg/m³    | 49           | 289         | 106         | 209         | 51           | 275         | 97          | 220         | 62           | 301         | 112         | 244         |
| Higher hydrocarbons OGC                                | mg/m³    | 2            | 1           | 1           | 3           | 2            | 2           | 1           | 3           | 10           | 8           | 2           | 4           |
| Nitrogen dioxides Nox                                  | mg/m³    | 143          | 126         | 144         | 130         | 140          | 127         | 144         | 127         | 113          | 102         | 151         | 120         |
| Dust                                                   | mg/m³    | 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                            | m³/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                               | m³/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       | m³/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              | m³/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 <sub>2</sub> O in the combustion air       | m³/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 <sub>2</sub> O in the combustion products  | m³/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 <sub>2</sub>                         | %        | 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         |
| <b>Efficiency - direct method</b>                      | <b>%</b> | <b>95,3</b>  | <b>95,6</b> | <b>95,6</b> | <b>95,1</b> | <b>95,0</b>  | <b>95,0</b> | <b>95,5</b> | <b>95,2</b> | <b>95,3</b>  | <b>95,1</b> | <b>95,1</b> | <b>95,5</b> |
| 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 ■ Interpolate is in compliance with EN303.5 coll. 5.3.1

FULLY AUTOMATIC, ECOLOGIC BOILERS WITH EXCELLENT FEATURES!



# AUTOMATIC BIOMASS BOILERS

## SMART 250–350 kW



### CERTIFIED OPERATING VALUES

#### 250–350 kW



ČSN-EN 303.5/2013  
ISO 9001:2009

■ Purity to Nature ■ Savings to Clients ■ Comfort to Users

| AUTOMATIC BIOMASS BOILERS<br>SMART 250–350 kW          |         | SMART 250    |             |             |             | SMART 300    |             |             |             | SMART 350    |             |             |             |
|--------------------------------------------------------|---------|--------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|
|                                                        |         | Wood pellets |             | Wood chips  |             | Wood pellets |             | Wood chips  |             | Wood pellets |             | Wood chips  |             |
|                                                        |         | Rated        | Minimum     | Rated       | Minimum     | Rated        | Minimum     | Rated       | Minimum     | Rated        | Minimum     | Rated       | Minimum     |
| <b>Measured values</b>                                 |         |              |             |             |             |              |             |             |             |              |             |             |             |
| 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/hour | 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        |
| Outlet 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                                | m³/hod  | 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       |
| <b>Flue gas analysis</b>                               |         |              |             |             |             |              |             |             |             |              |             |             |             |
| Oxygen O <sub>2</sub>                                  | %       | 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 <sub>2</sub>                         | %       | 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/m³   | 33           | 26          | 34          | 41          | 35           | 31          | 25          | 41          | 30           | 30          | 45          | 54          |
| <b>O<sub>2</sub> = 10%</b>                             |         |              |             |             |             |              |             |             |             |              |             |             |             |
| Carbon monoxide CO                                     | mg/m³   | 55           | 243         | 77          | 246         | 58           | 220         | 63          | 265         | 87           | 182         | 101         | 246         |
| Higher hydrocarbons OGC                                | mg/m³   | 1            | 3           | 2           | 4           | 1            | 4           | 2           | 4           | 3            | 3           | 2           | 4           |
| Nitrogen dioxides Nox                                  | mg/m³   | 134          | 128         | 143         | 121         | 130          | 129         | 142         | 116         | 124          | 129         | 153         | 128         |
| Dust                                                   | mg/m³   | 26           | 31          | 28          | 48          | 27           | 35          | 20          | 48          | 24           | 32          | 25          | 48          |
| <b>Auxiliary combustion values (solid fuels)</b>       |         |              |             |             |             |              |             |             |             |              |             |             |             |
| Mass flow rate gases                                   | kg/sec  | 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                            | m³/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                               | m³/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       | m³/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              | m³/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 <sub>2</sub> O in the combustion air       | m³/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 <sub>2</sub> O in the combustion products  | m³/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 <sub>2</sub>                         | %       | 19,01        | 19,00       | 19,37       | 19,40       | 19,01        | 19,01       | 19,37       | 19,36       | 19,01        | 19,01       | 19,40       | 19,40       |
| <b>Calculated values - heat overview</b>               |         |              |             |             |             |              |             |             |             |              |             |             |             |
| 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         |
| <b>Efficiency - direct method</b>                      | %       | <b>95,0</b>  | <b>95,0</b> | <b>95,3</b> | <b>95,4</b> | <b>95,1</b>  | <b>95,0</b> | <b>95,2</b> | <b>95,5</b> | <b>95,3</b>  | <b>95,5</b> | <b>95,4</b> | <b>95,7</b> |
| 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

## FULLY AUTOMATIC, ECOLOGIC BOILERS WITH EXCELLENT FEATURES!



# AUTOMATIC BIOMASS BOILERS

## SMART 400–500 kW

### CERTIFIED OPERATING VALUES 400–500 kW



SMART HEATING  
TECHNOLOGY



ČSN EN 303.5/2013

ISO 9001:2009

■ Purity to Nature ■ Savings to Clients ■ Comfort to Users

| AUTOMATIC BIOMASS BOILERS<br>SMART 400–500 kW          |         | SMART 400    |             |             |             | SMART 450    |             |             |             | SMART 500    |             |             |             |
|--------------------------------------------------------|---------|--------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|
|                                                        |         | Wood pellets |             | Wood chips  |             | Wood pellets |             | Wood chips  |             | Wood pellets |             | Wood chips  |             |
|                                                        |         | Rated        | Minimum     | Rated       | Minimum     | Rated        | Minimum     | Rated       | Minimum     | Rated        | Minimum     | Rated       | Minimum     |
| <b>Measured values</b>                                 |         |              |             |             |             |              |             |             |             |              |             |             |             |
| 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/hour | 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        |
| Outlet 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                                | m³/hod  | 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       |
| <b>Flue gas analysis</b>                               |         |              |             |             |             |              |             |             |             |              |             |             |             |
| Oxygen O <sub>2</sub>                                  | %       | 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 <sub>2</sub>                         | %       | 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/m³   | 25           | 29          | 66          | 67          | 19           | 28          | 86          | 79          | 14           | 27          | 106         | 92          |
| <b>O<sub>2</sub> = 10%</b>                             |         |              |             |             |             |              |             |             |             |              |             |             |             |
| Carbon monoxide CO                                     | mg/m³   | 116          | 144         | 140         | 227         | 144          | 106         | 178         | 207         | 173          | 68          | 216         | 188         |
| Higher hydrocarbons OGC                                | mg/m³   | 5            | 2           | 1           | 3           | 6            | 1           | 1           | 3           | 8            | 0           | 0           | 2           |
| Nitrogen dioxides Nox                                  | mg/m³   | 118          | 130         | 164         | 139         | 111          | 130         | 174         | 151         | 105          | 130         | 185         | 162         |
| Dust                                                   | mg/m³   | 20           | 29          | 30          | 48          | 17           | 25          | 34          | 48          | 13           | 22          | 39          | 48          |
| <b>Auxiliary combustion values (solid fuels)</b>       |         |              |             |             |             |              |             |             |             |              |             |             |             |
| Mass flow rate gases                                   | kg/sec  | 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                            | m³/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                               | m³/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       | m³/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              | m³/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 <sub>2</sub> O in the combustion air       | m³/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 <sub>2</sub> O in the combustion products  | m³/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 <sub>2</sub>                         | %       | 19,01        | 19,01       | 19,37       | 19,36       | 19,00        | 19,01       | 19,37       | 19,36       | 19,01        | 19,01       | 19,37       | 19,36       |
| <b>Calculated values - heat overview</b>               |         |              |             |             |             |              |             |             |             |              |             |             |             |
| 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         |
| <b>Efficiency - direct method</b>                      | %       | <b>95,4</b>  | <b>95,9</b> | <b>95,6</b> | <b>95,8</b> | <b>95,5</b>  | <b>96,2</b> | <b>95,8</b> | <b>96,0</b> | <b>95,6</b>  | <b>96,4</b> | <b>96,0</b> | <b>96,1</b> |
| 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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