



**REGIONAL PROGRAMME**  
NATIONAL COHESION STRATEGY



**EUROPEAN UNION**  
EUROPEAN REGIONAL  
DEVELOPMENT FUND



**KOSTRZEWA®**  
Experts in heating

*established in 1978*

## Pellets® Fuzzy Logic 2

group of automated boilers  
with innovative Fuzzy Logic  
2nd generation method

and combustion process controlled by means  
of lambda probe module<sup>2</sup> **saves up to 40% fuel.**

models [ kW ]

15 25 40 50 75 100



**ecoburning**

Pellets Fuzzy Logic 2 boilers comply  
with PN- EN 303-5-2012 standard



automatic



factory  
service



boiler  
steel



heat-resistant  
steel



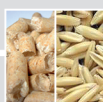
boiler  
efficiency



6 year warranty  
+ 2 years  
extension



pellet



pellet / oats  
50 / 50



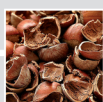
pea coal



sunflower  
pellets



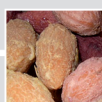
grape  
seeds



hazelnut  
shells



coconut  
shells



olive  
seeds



coal



wood

## Boiler description

Auto ignition boilers Pellets Fuzzy Logic 2, power range: 15, 25, 40, 50, 75, 100 kW, set a new trend for solid fuel boilers in Poland. They are adapted to combust: granulate of sawdust (pellet), pea coal, oats and wood on additional grid. Fuel in form of granulate is poured into a tank of large capacity. Filling in such tank, depending on energy requirement of a building, will allow self-operated work of device for 7 to 30 days<sup>4</sup>.

Advantages of Pellets Fuzzy Logic 2 boiler:

1. Durable steel boiler heat exchanger was constructed according to 3x definition (time, turbulator, temperature).
2. Burner is adapted to combust pellets, oats and pea coal (three burner tips as standard equipment of boiler)

3. To increase operation comfort and reduce the amount of combusted fuel we applied Fuzzy Logic 2nd generation adjustment.
4. Amount of air needed for combustion is to be specified by lambda probe (automatically fed air – option).
5. Rich equipment offered as standard, including function of automatic lighting up of pea coal, pellet and oats<sup>3</sup>.



- 1 **Exhaust turbulator** additional element in boiler exchanger, which reduces exhaust temperature at boiler outlet.
- 2 **Pellets Fuzzy Logic 2nd generation controller** built-in full weather automatics, all sensors are included in the device's set.
- 3 **Extract fan** besides enhancing stack effect, the extract fan may be coupled during cleaning or picking up ash from exchanger. It does not result in dusts and unpleasant smells escaping to the room, in which device is located (back of the boiler)
- 4 **Retort Fuzzy Logic burner** equipped with three burner tips as standard, as well as the device, which ignites the fuel by means of hot air.

- 5 **Fuzzy Logic 2nd generation adjustment system + broadband lambda probe<sup>2</sup>** fully automatically and more precisely regulates the amount of supplied air, it saves up to 20% fuel.

**mixing valve actuator** automatic control over mixing valve actuator, measurement of temperature of water returning to boiler.

- 6 **Peephole** allows viewing flame without necessity to open the door.
- 7 **Tank** with large capacity, single feeding is enough for 7 to 30 days<sup>4</sup> of combustion of pellet, pea coal or oats.
- 8 **Loading chamber** large loading chamber allowing wood combustion on grids without extracting burner.
- 9 **Worm made of acid-resistant steel** high resistance to humid work environment, abrasion and corrosion resistance at least 4 years
- 10 **Pressure fan** separates air into primary and secondary (back of the boiler)
- 11 **Ignition fan** and igniter for automatic ignition of fuels: pellet, oats, pea coal.
- 12 **Gear motor** energy saving gear motor (back of the boiler).
- 13 **Large ash pit** removing ash once in 5 months<sup>5</sup>.

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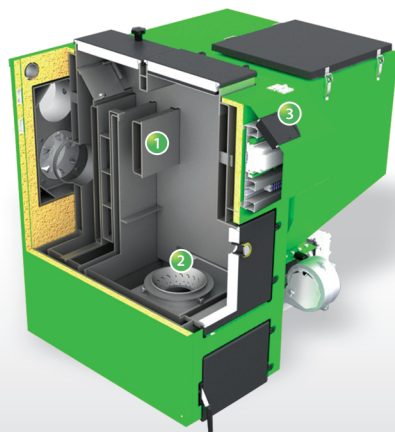
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# Pellets® Fuzzy Logic 2

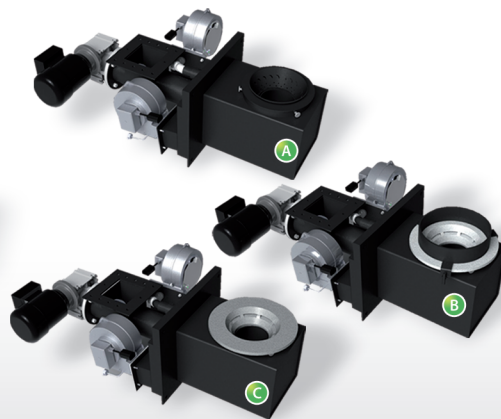
- delivery to your home or construction site
- warranty and after-warranty service
- 6 year warranty with an option to extend it for another 2 years.
- network of authorized service companies all over Poland
- device and spare parts distribution network in the whole country.



1l oil = 2kg pellets



- 1 Triple-pass, steel, vertical exchanger made of boiler steel from 4 to 6 mm thick, triple-pass



- 2 Fuzzy Logic 2 retort burner equipped with automatic igniter for three fuel types
- A) Steel tip for pellet combustion
  - B) Steel tip with overlay for oats combustion
  - C) Cast iron tip for coal combustion



- 3 Second generation Fuzzy Logic automatics with broadband lambda probe
- Fuzzy Logic 2 generation adjustment method in combination with lambda probe saves 40 percent fuel.**

Vertical, triple-pass Pellets Fuzzy Logic 2 exchanger made of boiler steel P265GH with a thickness ranging from 4 to 6 mm. Suitable shape and length are the features characterizing this structure. Less sensitivity to ash gathering on exchanger walls is one of the major advantages of this solution. Ash pours itself into the ash-pit by gravitation. With the exchanger extended in such a way significant resistance of exhaust flow was predicted and exhaust extract fan was applied, placed on the flue, supporting natural stack effect.

## Why did we choose steel?

- reaching maximum efficiency;
- possibility to freely design highly efficient exchangers
- little sensitivity to lack of water
- little sensitivity to boiler scale
- little sensitivity to sudden temperature changes.

1. Fuzzy Logic 2 generation method saves up to 20 per cent fuel
2. Lambda probe saves up to 20 per cent fuel
3. Recommended mix pellet/oats in 50/50 proportion
4. Depending on building's heat requirements
5. While heating hot tap water



You may obtain detailed technical information from manufacturer or distributor  
Manufacturer reserves the right to make construction changes of boiler improving functioning of the device.  
Power selection for the device has been made for 4 climate zone of Poland (max. - 24°C)

## Why the retort burner?

- extremely even and precise feeding – lets you control combustion process by means of lambda probe;
- possibility of combustion of pellets, oats and coal with high efficiency;
- automatic ignition of pellets, oats and coal.

Retort burner Fuzzy Logic 2 is equipped with automatic igniter for three fuel types – pellets, oats, coal. Feeding screw made of stainless steel – resistant to humid work environment. Boiler efficiency does not depend only on the efficiency of heat transmission to the exchanger, but also on the efficiency of fuel combustion process itself. In the case of liquid or gas fuel combustion there are no major issues, whereas combustion of solid fuels is an extraordinarily problematic process. It depends on delivering suitable quantity of air for combustion and its precise mixing with fuel, as well as "getting rid" of redundant combustion products that is ash. Applying of retort hearth solves these issues. Till recently pellets combustion was done by means of cast iron burners, which were applied for pea coal combustion. After a series of attempts steel burner was created, adapted to combustion of pellets and oats grains, which plays its role faultlessly.

The heart of the boiler is boiler controller. Specialized electronic system, which is not only responsible for maintaining constant boiler temperature through correct dosing of fuel and air, but also for controlling the heating system of the building, including: heat buffer, solar system and 16 additional heating circuits.

## Why Fuzzy Logic 2 generation method?

- saves up to 20 per cent fuel;
- significantly reduces gathering of impurities and soot in the boiler;
- high stabilization of boiler working temp. which eliminates water vapour condensation in the boiler;
- combustion chamber temperature is high and stable thus reducing emissivity of carbon oxides;
- burner power is calculated by means of advanced algorithm while applying Pellets Fuzzy Logic second generation method;
- Pellets Control M Fuzzy Logic regulator selects the power of burner according to energy requirements of building;
- burner works longer with heated combustion chamber, and only in this condition maximum efficiency is reached;
- large number of burner start ups cause the reduction of resultant device efficiency;
- algorithm of Fuzzy Logic 2 generation is more advanced than PID algorithm and than algorithm of Fuzzy Logic 1 generation used in other devices.

TYPE	PFL 15	PFL 25	PFL 40	PFL 50	PFL 75	PFL 100
Building area [sqm]	50–200	100–300	200–530	370–660	550–1000	600–1300
Power range [kW]	5–15	8–25	12–40	15–50	23–75	30–100
Depth [mm]	1075	1145	1145	1355	1465	1535
Width [mm]	1030	1160	1300	1380	1410	1580
Height [mm]	1130	1210	1220	1220	1550	1565
Stack diameter [mm]	160	160	160	160	180	250

Distributor: