

A compact boiler designed
to combust ecological fuel- pellet

ORLIGNO 500



ISO 9001   ISO 14001

Compliant with EN 30-5 norm





Biomass - the curse of energetics or the only fuel of the future?

The real threat of depleting world resources, alternative sources of solid fuels, forces research laboratories to search for the new sources of energy in order to satisfy the energetic appetite of human population. It seems that the only way to solve the current situation in a rational way is the use of renewable energy sources. In relation to this phrases like 'energetic plants', 'energetic plantations', 'wind power stations', etc., are mentioned more and more often. In the last decade a rapid development of biomass combustion technology is observed. Boilers ranging from a few kW to a few hundred MW are produced to heat detached houses, residential areas and cities. The efficiency of these boilers is often over 90% and the emissions of harmful gases are comparable to the emissions of the best oil and gas boilers with the advantage that the CO₂ balance for biomass equals zero. The level of automatics in even small boilers allows recognising them as appliances which require minimal human input as they are equipped in fuel feeding, ash removal and combustion process control automatic circuits. The boiler prices are decreasing and starting to be comparable to the oil installations prices. Maintenance costs in the case of biomass do not exceed 30% of the maintenance costs linked with oil. Moreover, biomass is a renewable fuel, it does not contain sulphur, it derives from the post-production waste and it can be cultivated for the sake of energetics only.

One of the most popular natural fuels is pellet, in other words a material which comes from natural wood waste, mainly sawdust and wood shavings, sawmill and carpentry waste, but sometimes using wood bark, hay, sun flower and other organic materials all of which are compressed together. Thanks to the usage of such materials we encounter the ecological biomass. Pellets can take the form of granulated globules or cylinders with various diameters and length. Pellets have got a low humidity (the best one 8%-12%), little amount of ash is created in the combustion process thanks to which using them is convenient and clean.



Modernity, comfort, ecology - ORLIGNO 500

In its brand new assortment the Orlandi company has presented an appliance which, thanks to the technical solutions applied, ensures the comfort of use and reliability regardless of the quality of the fuel used. The Origno 500 boiler's construction was created based on 6 years of experiments and the research of various ideas regarding pellet combustion. The main target posed to the Orlandi company constructors was the creation of an appliance which would be user-friendly, clean while operating, and above all one that would provide the customer with a certainty that during the period of the highest demand for heat there would be no issues related to fuel combustion or supply. Moreover, the boiler's construction enables easy access to the most important mechanical and electrical circuits.



The appliance's advantages:

- ❑ Efficiency over 91%
- ❑ 5-year warranty
- ❑ Modern look
- ❑ Uniquely constructed pellet burner permits the combustion of the lower quality fuel
- ❑ Well-thought construction enables access to the most important boiler elements
- ❑ The possibility to co-operate with an external feeder supply circuit
- ❑ 255-litre fuel tank
- ❑ A complete connection strip for the sensors package
- ❑ Supply circuit based on two independent feeders
- ❑ Standard fitted with fumes sensor and thermal safety device
- ❑ Control system consisting of the operator's panel and the executive module
- ❑ Genuine control of the heat accumulation tank's level of fullness via the application of two measuring sensors
- ❑ Multilingual menu based on Fuzzy Logic algorithm
- ❑ Safety and comfort of work

| Technical data | | |
|--|-------------------------------|-----------------|
| Description | Measured in | Quantity |
| Boiler heat power | kW | 25 |
| A Boiler power range | kW | from 7 to 25 |
| Boiler class | according to PN-EN 303-5 norm | 3 (the highest) |
| Boiler efficiency | % | ~91 |
| Type of fuel: pellets | | |
| length | mm | 10-50 |
| diameter | mm | 6-8 |
| humidity | % | 8-12 |
| Fuel usage for: | | |
| nominal power | kg/h | 5,5 |
| minimal power | kg/h | 1,5 |
| Estimated surface area of heated rooms | m ² | up to 250 |
| Maximum operating pressure | bar | 2,5 |
| Maximum water temperature | °C | 85 |
| Minimal temperature of the return | °C | 60 |
| Diameter of chimney flue | mm | 160 |
| Required chimney draft | mbar | from 0.1 to 0.2 |
| Fumes temperature for: | | |
| nominal power | °C | 160 |
| minimal power | °C | 130 |
| Exhaust gases flow for: | | |
| nominal power | kg/s | 0,02 |
| minimal power | kg/s | 0,01 |
| Boiler's weight | kg | 320 |
| Water capacity in the boiler | litres | 60 |
| Pellet tank capacity | litres | 255 |
| Loading slot size width/length | mm | 260/432 |
| Cold water temperature in the heat exchanger | °C | 10 |
| Minimal pressure on the supply of cooling coil | bar | 2 |
| Voltage/ AC frequency | ~V/Hz | 230/50 |
| Ancillary power | W | 250 |
| Recommended capacity of the accumulation tank | litres | 1000 - 2000 |
| Width | A - mm | 1230 |
| Height | B - mm | 1332 |
| Depth | C - mm | 690 |

5-year warranty for boiler thickness



Modernity, comfort, ecology - ORLIGNO 500

The compact Origno 500 boiler with an integrated pellet tank is an appliance which is designed to combust ecological fuel- pellet with a diameter 6-8 mm and length 10-50 mm. It is fitted with an automatic igniter and granule feeding system. The ignition process takes place by using a 400 W ceramic heater. The boiler is available with a nominal power of 25 kW, however, the range of work covers the power from 7 to 25 kW. The uniquely constructed burner, made of heatproof steel, ensures the total combustion of supplied fuel while maintaining emissions which are safe for the natural environment. The feeding system which consists of two independently working feeders (upper and lower) enables not only the pellet supply but is also a safety device which prevents the possibility of the flame retracting back to the feeder due to the use of elastic, gravitational connection. The fuel container whose capacity is 255 litres allows the boiler to operate for up to 170 hours. Depending on the customer's preferences the boiler may be adjusted to co-operate with an outer fuel container feeding system through the use of a suitable control system and a sensor package regulating the level of feeder fullness. The boiler regulator, apart from basic functions essential to boiler operation, also controls the central heating pump, hot water for domestic use pump and heat accumulation tank's feeding pump, and moreover controls its level of fullness. The customer, when deciding on the brand new product from Orlandi company, receives a fully automated boiler whose efficiency is over 91% and his input is reduced to periodical controls and re-fuelling.



5-year warranty for boiler thickness

An innovative solution - ORLIGNO 500

Orligno 500 is made of high quality boiler steel which ensures the durability and reliability of the appliance. Ceramic elements used in the construction are produced from a special fireproof blend which is high temperature resistant and which guarantees suitable physical and chemical properties. The openly constructed steel burner enables the combustion of pellet granules regardless of their level of pollution. The fuel feeding system is based on two 72 W speed gearmotors. The system is protected by a feeder temperature sensor. Fan located next to the burner co-operates with a heating element which lasts up to a 100 thousand ignitions. Orligno 500 has got a five-year warranty for its tightness and a 2-year warranty for the remaining component parts.



1. Feeder
2. Feeder flap
3. Cooling coil
4. Heating water exit
5. Insulation
6. Heat exchanger lid
7. Boiler outer door
8. Ceramic moulder
9. Combustion chamber
10. Ashtray chamber
11. Burner
12. Lower feeder
13. Upper feeder

5-year warranty for boiler thickness

New solutions - ORLIGNO 500

The burner

The burner is the central element of every pellet combusting boiler. The most commonly used ones belong to the retort or chute type. Their ways of operating are different, they have certain advantages and disadvantages. Based on their experiments, the Orlandski company has fitted the Orligno 500 boiler with an openly constructed so called "shovel burner" which combines all the positive features of its market opponents.

Regarding the combustion process itself, Orlandski burner's parameters correspond with the retort burner parameters. In both cases the supplied fuel is heated beforehand which positively influences the level of emissions. In the Orlandski's burner, issues related to fuel blockages on the burner and tracking do not occur due to the use of the feeding mechanism based on a roller and an open, lengthwise burner construction. The Orligno 500 boiler's burner, similarly to a chute burner, is very well protected from the flame retraction due to the application of an elastic, vertical chute pipe as well as the feeder temperature sensor.

Table of advantages and disadvantages of currently used burners

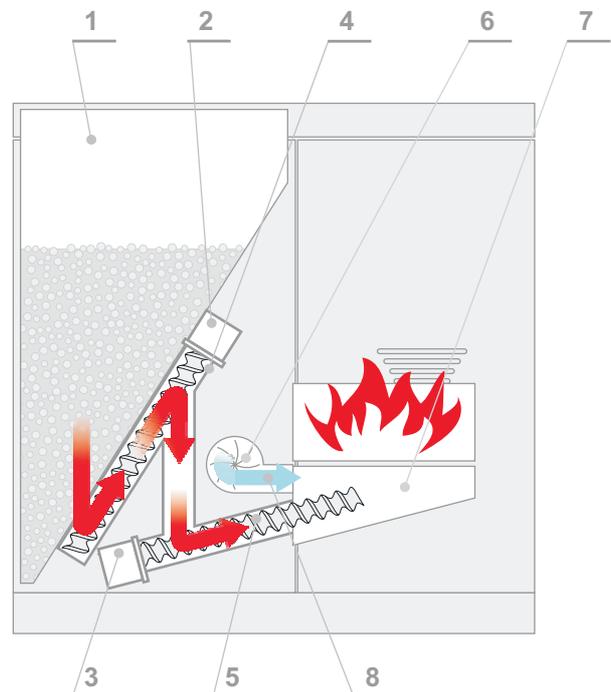
| Classification | Burner | CHUTE BURNER | RETORT BURNER | ORLIGNO 500 |
|--|--------|---|--|---|
| General appearance | |  |  |  |
| Combustion process | | (-) | (+) | (+) |
| Blocking the addition of fuel | | (+) | (-) | (+) |
| Hearth tracking | | (-) | (-) | (+) |
| Retracting the flame to the source of fuel | | (+) | (-) | (+) |
| Extinguishing | | (+) | (-) | (+) |

(-) – disadvantage of the solution

(+) – advantage of the solution

Fuel feeding process

1. Pellet feeder
2. Feeder no. 1 gearmotor
3. Feeder no. 2 gearmotor
4. Feeder no. 1
5. Feeder no. 2
6. Fan
7. Burner
8. Heater



5-year warranty for boiler thickness

New solutions - ORLIGNO 500

Automatics

Controlling the pellet combusting process is not just about maintaining a certain operating temperature but also selecting an appropriate burner power depending on the current energetic need, monitoring the fuel combustion process and the appliance's level of cleanliness and above all the provision of work safety via fuel cut-off in case of the increase of temperature.

Orligno 500 boiler regulator consists of the operator's panel and the executive module which are connected with a special tape. Such solution enables easy access to the executive module and makes the boiler work unaffected by faults in the operator's panel. The regulator has got a large display with an intuitive, descriptive menu.

The control system is based on an advanced work algorithm- Fuzzy Logic which ensures a fluent and intelligent adjustments of the supplied fuel and air as well as a 15% decrease in the amount of combusted fuel. The regulation enables two modes of setting the boiler working temperature:

automatic and manual. With regard to the manual system, the temperature is set by the user whereas in the automatic mode the temperature is set automatically based on the need for energy. The range of control entails: central heating, hot water for domestic use, buffer and the mixing valve with actuator. In the basic version the boiler is fitted with boiler, exhaust gases temperature sensor and the feeder temperature sensor.

The control over more advanced systems is conducted by the Orligno 500 boiler regulator co-operating with a Unicontrol type, modern, microprocessor system.

The Unicontrol driver controls the work of circulation pumps and the settings of three-way valves based on the outside temperature measurement, boiler temperature on feeding and the return of the heating element and the signal from room regulators.



5-year warranty for boiler thickness

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Possible to obtain ecological grant

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