

## VESKO - B warm-water boilers

### Energy from biomass

Within the framework of its ecological program, TTS concerns itself with the utilization of energy that arises from the combusting of biomass. The basic criterion from comparing this alternative source of energy with the classically used energy system based on the combusting of fossil fuels is to what extent it influences the environment. Whereas the burning of coal, petroleum and natural gas releases carbon dioxide into the atmosphere, which is one of the most significant „greenhouse“ gases, the emission of carbon dioxide isn't increased by the combusting of organic fuels, as practically the same amount the carbon dioxide released in the burning is consumed from the atmosphere during the photosynthetic processes when the organic biomass is created. By the substituting the previous burning of coal with the burning of biomass, the emission of sulphur dioxide and heavy metals is eliminated..



2,0+2,8 MW

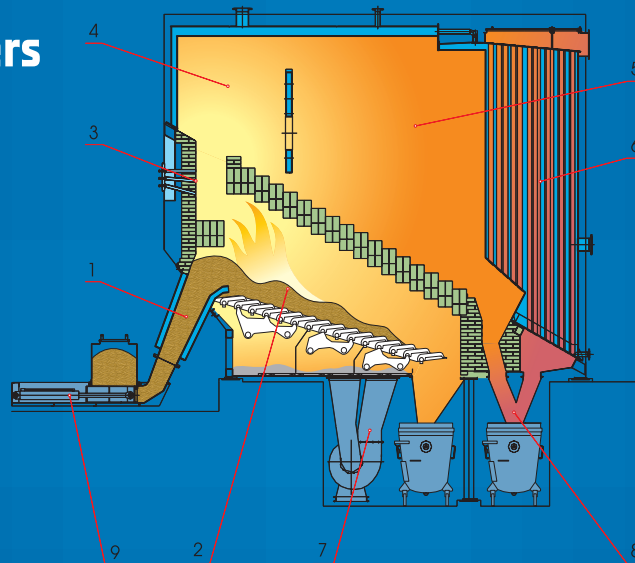


6,0 MW



### Main parts of the boilers

- 1 Input nozzle
- 2 Grate
- 3 Secondary air
- 4 Whirl chamber
- 5 Burn out chamber
- 6 Tubular exchanger
- 7 Primary blower
- 8 Ash removal
- 9 Fuel charging press



### Purpose

VESKO-B boilers are designed for heating plants of a central heating supply. The conception of the VESKO-B makes it possible to manufacture a boiler having optimal parameters in accordance with the concrete requirements of the warm-water net, and that within the range of the parameters.

### Description

The VESKO-B boiler has a self-supporting, entirely welded box construction. The lower part of the boiler forms the furnace chamber with a slanted sliding grate. The grate is controlled by a hydraulic mechanism and is cooled by conditioned primary air. A pressurized section is placed on the furnace chamber. The boiler is furnished with thermal insulation and is covered by a steel sheet with a plastic cover. Fuel is transported into the boiler by means of a hydraulic charging press. The fuel is pressed through a heating tunnel (heating by hot water) and is preliminarily dried before coming to the burning grate. The boiler is furnished with an automatic control mechanism which can operate in either an autonomous mode (without using a superimposed computer) or a mode controlled by a central computer for the whole boiler-house.

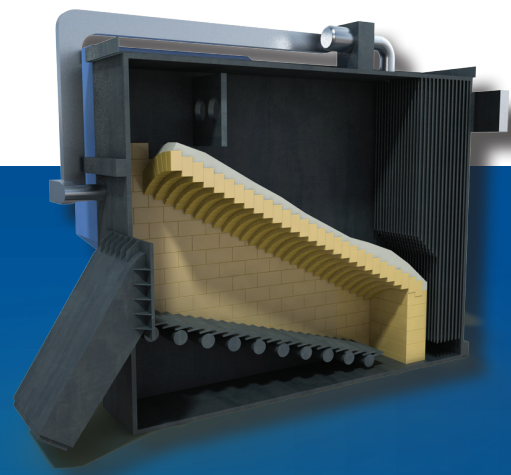
## Fuel

The VESKO-B boiler burns biomass on a sliding grate above which a favourably shaped vault draws off the counter-current arrangement of the flue gases, which helps to shorten the time for drying out the fuel. This construction of the furnace chamber, along with the use of a fuel transport by means of a hydraulic discharger with large through-flow capacity, makes it possible to burn wooden material of a lesser quality which originates when wood is processed in sawmills, or during lumbering or cultivating operations in the forests:

Uncontaminated wooden material:

- wood chips
- sawdust and shavings
- wood clippings (max. length 50 cm)
- bark, peat

Moisture content max. 55%, ash max. 3%, specific weight 250-350 kg/m<sup>3</sup>



Parameters		WARM - WATER BOILERS „VESKO-B“							
Thermal output of boiler	MW	1,0	2,0	3,0	4,0	5,0	6,0	7,0	8,0
Fuel - biomass	-	appropriate qualifications by EN14961-1 „forest, plantation and other virgin wood“							
Moisture content	%	35 -55							
Projected heating value	kJ/kg	8000							
Project overpressure	MPa	0,6 or 1,0							
Min. temper. of input water	°C	80							
Max. temper. of output water	°C	110							
Boiler efficiency	%	min. 85 (by common pollution)							
Output temperature of flue gases	°C	max. 165 (by common pollution)							
Fuel consumption by nominal output	kg.hod <sup>-1</sup>	794	1058	1587	2116	2645	3175	3704	4233
Self - weight	t	41,5	58,5	65	80	100	112	123	123
Water contents of boiler	m <sup>3</sup>	8,4	14,8	18,3	25,3	28,4	34,3	37,2	37,2
Operating weight	t	49,9	73,3	83,3	105,3	128,4	146,3	160,2	160,2
<b>Basic dimensions of boiler</b>									
Length of boiler	mm	5300	6600	7300	8100	11 100	11 100	11 600	11 600
Width of boiler	mm	2450	2600	2600	2950	2950	3450	3450	3450
Height of boiler	mm	4550	5150	5370	5880	6590	6590	6870	6870

Notes: The producer reserved the right to change data in association with the development of the products.

## Conception

### Self-cleansing capability of the boiler

Slanted grate, shape of the ceramic vault, removal to ash container without having to crush the slag permits the burning of very fusible material. The large burn out chamber with the correct slant of the vault eliminates up to 40 % of the escaping light ash. The cooling down of the combustion products in the burn out chamber to a temperature lower than the melting temperature of the light ash prevents it from being baked onto the fire tubes of the exchanger. The vertical orientation of the fire tubes of the exchanger prevents the coating of the exchanger with drifting light ash, which is led off from the reversing chamber into the container.

### Large through-flow capacity of the boiler

A complex system of feeders having a lineal reversible motion causing by hydraulic cylinders forms the transport routes of the fuel. The complete route has large through-flow capacity (minimum cross-section 1200 x 280 mm). The transport route is not inclined to blockage (screw feeders or turnstiles, for example, are not able to transport uncrushed bark, and they are inclined to become blocked through the influence of the chords of uncrushed bark). The transport routes are able to transport even a large percentage of non-combustible admixtures (rocks, pieces of steel etc.).

### Container for grate ash

Grate ash falls into a container which is connected by a special mechanism directly with the boiler; together with the boiler, it forms a single space. There is no closing element included which could reduce the through-flow capacity for the ash.

### Perfect automation of the boiler

The combustion has been perfected on the basis of under-pressure in the combustion chamber and through a surplus of oxygen in the combustion products. The fuel feed and the movement on the grate is regulated in accordance with the fuel's characteristics. All measured quantities, interventions of the safety equipment and defects are transmitted to the dispatching system.