



KOVARSON

CZECH PRODUCER OF BOILERS



ADVANTAGES:

Emission class 4/5 per ČSN EN 303 – 5



Combination of manual and automatic operation



Environmentally-friendly and comfortable heating



Wood pieces up to 55cm long!



High efficiency of up to 90%



Heating savings of up to 40%



Stainless steel blades in the feeding chamber



PREDATOR

COMBI BOILER

FUEL: SIZE 2 LUMP BROWN COAL,
WOOD

ECOLOGY AND COMFORT



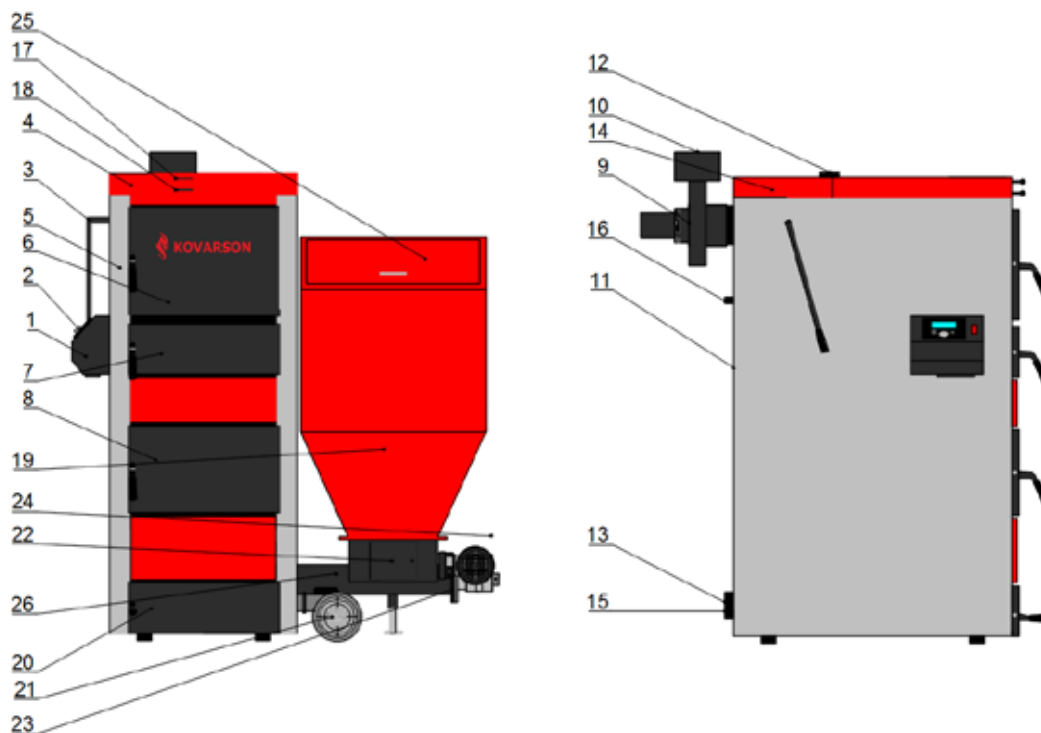
The Czech PREDATOR combination boilers provide economical and environmentally-friendly heating for houses, business premises and medium-large buildings, and offer heating water as well. The boilers comprise a combination of a gasification boiler for wood, chips or briquettes, and an automatic boiler for size 2 lump brown coal. The combustion chamber takes pieces of wood up to 55cm long!

ECOLOGICAL – The combination boilers meet emission class 4 and 5 per EN 303-5, which are the strictest values for emissions released from a boiler into the atmosphere. This combustion system is also highly economical, achieving savings of up to 40% compared to ordinary wood-burning boilers. The boilers achieve efficiency levels of up to 90%!

COMFORT - the large-capacity storage containers for size 2 lump brown coal and the 135 litre storage containers for wood make the boilers easy to use in both manual and automatic mode, with high efficiency levels. With manual operation, the feeding chamber is large enough for about 8 to 12 hours of heating at medium output. In energy-saving mode the boiler will keep going for up to 24 hours. In automatic mode the contents of the storage container will last for 4 days and in energy-saving mode up to 10 days. The boilers must be connected to a storage tank. We recommend a tank of about 40 litres for every 1 kW of boiler output. The heat energy can be used for several days, depending on the size of the tank. The boilers can be controlled by a room thermostat which regulates the mixing valve and switches off the central heating pump as required.

BOILER EFFICIENCY IS **UP TO 90 %**

BOILER DESIGN



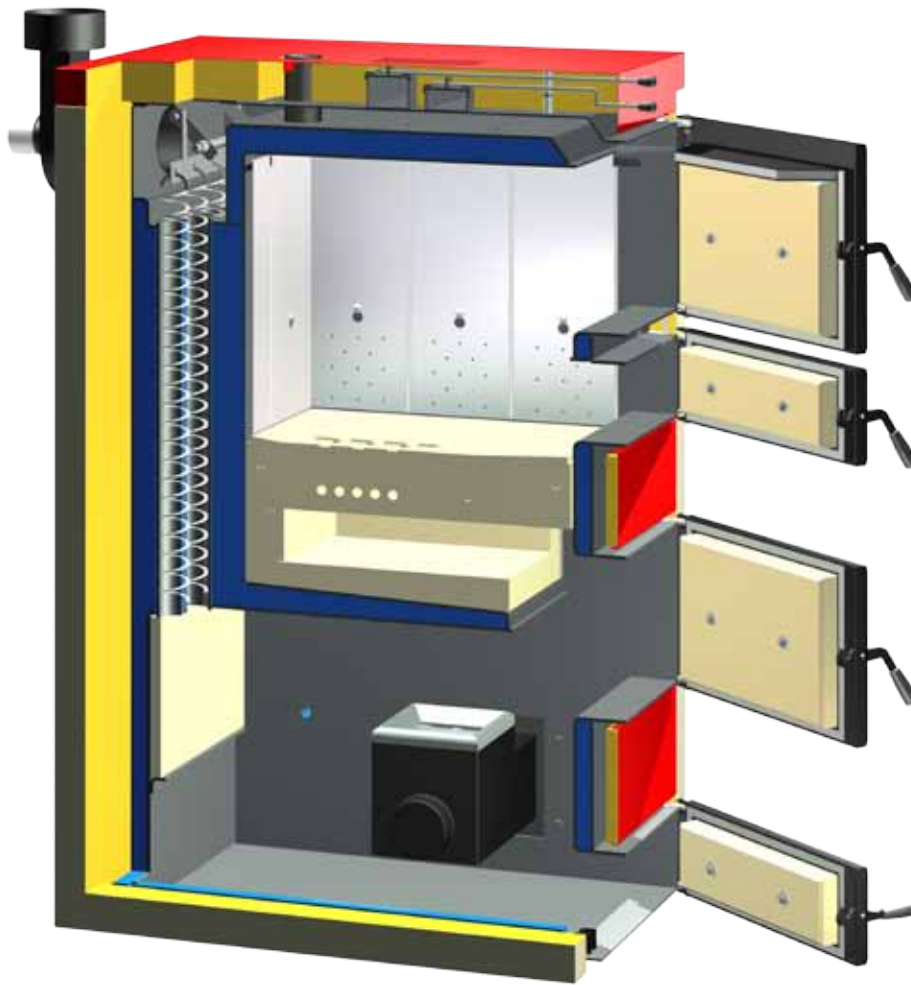
1) control unit panel	7) cleaning (ignition) door	13) drain valve	19) storage container	25) storage container cover
2) control unit	8) cleaning (ignition) door of the burner	14) top cover for cleaning heat exchanger	20) lower ashtray door	26) feeder tube
3) handle for cleaning	9) exhaust fan	15) heating water drain	21) fan	
4) upper boiler plate	10) output to smoke flue	16) coolant loop, connection to water supply	22) storage container cleaning cover	
5) side boiler plate	11) rear boiler plate	17) primary air regulation	23) transmission	
6) feeding door	12) heating water inlet	18) secondary air regulation	24) motor	

The inner boiler body is welded from high quality 6mm boiler plate. We use 8mm plate for the most stressed and critical parts. The plate for the outer body is 4 mm thick. The feeding chamber is fitted with 3 mm stainless steel inserts. They protect the boiler from condensates and tar, prolonging its working life. The upper part houses the feeding chamber, which has a refractory concrete section at the bottom with a nozzle for the gas to go through. The hot gases pass through the concrete to a burn-out area made of vermiculite and refractory concrete. The main heat exchanger tube with walls 6.1 mm thick lines the rear wall of the boiler, with the upper part opening into a collection channel, after which the cooled gases go out to the chimney. The tubes are fitted with turbulators for easy, problem-free cleaning.

BOILER PROTECTION

Boilers must be connected to a storage vessel in order to allow any excess energy to escape to store heat energy. Protection is also provided at the boiler outlet by a thermostat which shuts off the fan, switches on all pumps and opens all of the mixing valves when the temperature passes the 95°C mark. The cooling loop is an additional feature. If the boiler temperature passes the 95°C mark, the cooling loop's bimetal thermostat opens a valve, releasing cold water into the boiler from the water supply and draining hot water from the other side.

BOILER OPERATION



Manual mode:

Burning is encouraged by an exhaust fan which blows primary air into the feeding chamber and secondary air into the nozzle.

The wood is gasified in the upper feeding chamber, producing wood gas.

The wood gas is sucked into the nozzle by the secondary air and burned in the space below the nozzle.

The hot gases then pass through the main rear heat exchanger tube, where they transfer most of their energy, and the cooled gases go out to the chimney through the collection tube.

Automatic mode:

In automatic mode, combustion is encouraged by a fan in universal burners, the fuel is supplied using an electric motor and the exhaust fan must always operate at minimum speed.

All of the material is combusted in the burner and the hot gases go straight to the rear main heat exchanger tube, where they transfer most of their energy, and the cooled gases go out through a collection tube to the chimney.

The boilers are fitted with an exhaust fan which goes to full speed after the feeding door is opened, and sucks all of the smoke into the chimney through the air chamber located above the feeding chamber so that it does not get into the boiler room.

Cleaning a boiler with turbulators using the handle on the side of the boiler. Lifting the turbulators causes any deposits to fall down from the tubes into the ashtray area. The cleaning can be performed on both the right and the left side of the boiler.

The ash remaining in the feeding chamber can be collected through the ignition doors. The rest of the ash can be collected through the lower ashtray openings.

EASY OPERATION / UNIVERSAL BURNER



UNIVERSAL BURNER:

The boilers are fitted with a 35 kW universal burner consisting of a cast-iron furnace, air mixing chamber and feeder. The feeder screw is made of metal and runs along the entire length of the feeder right up to the furnace and is fitted with an opposing thread where it meets the furnace, forcing the material upwards as required. This gets rid of any sinter, which is forced out through the sides into the ashtray. Thanks to its extended shaft, the feeder is firmly anchored on both sides and makes no squeaking noises during operation. The burners take size 2 lump brown coal, up to a granulation of 3 cm. Thanks to the square shape and drawing in of air from four sides to the centre to encourage combustion, the burners achieve high combustion temperatures and efficiency levels.



BOILER REGULATION

The FOX temperature regulator is designed for combination boilers fitted with a screw feeder with fan and an exhaust fan for the wood gas. It controls the central heating pump, hot water pump, underfloor heating pump, mixing valve pump, burner fan and fuel feeder. The regulator includes a control module for one mixing valve. The device can work with more mixing valves (with the help of additional modules), traditional room regulators (two-position ones) or with RS communications, GSM modules and Internet modules.

This regulator has the advantage of being very easy to use. The user makes all changes to parameters from the control unit. Another advantage is the large and well-arranged graphic display, where users can see the exact operating state of the boiler at any given moment. The FOX regulator provides an interrupted output signal. With this type of regulator, the fan speed is set by measuring the temperature of the boiler and of the flue gases at the boiler outlet.



Using this type of regulator with a flue gas temperature sensor brings fuel savings of over twenty percent; the water output temperature is very stable, and this prolongs the life of the heat exchanger (boiler). Controlling the temperature of the flue gases at the boiler outlet results in **low emissions** of harmful gases. Heat energy from the flue gases is not wasted, but used to heat water.

MODERN TECHNOLOGY - retrofitting



FLUE GAS SENSOR

this sensor provides information about the flue gas temperature; if the temperature is high, the boiler needs cleaning.



MIXING VALVE SERVO

output for controlling the mixing valve with a servomotor.



ROOM THERMOSTAT

output for a room thermostat to regulate the boiler and the central heating pump.



INTERNET MODULE

possibility of setting and regulating the boiler via a web browser.



GSM MODULE

making it possible to transmit current boiler parameters and set the boiler temperature. Automated sending of alarms by SMS.



EXTERNAL SENSOR

a sensor providing information about the external temperature. This helps in the evaluation of the algorithms controlling the mixers.



MIXING VALVE MODULE

for regulating any additional mixing valves. It provides protection of return and regulation based on external sensors or room thermostats.

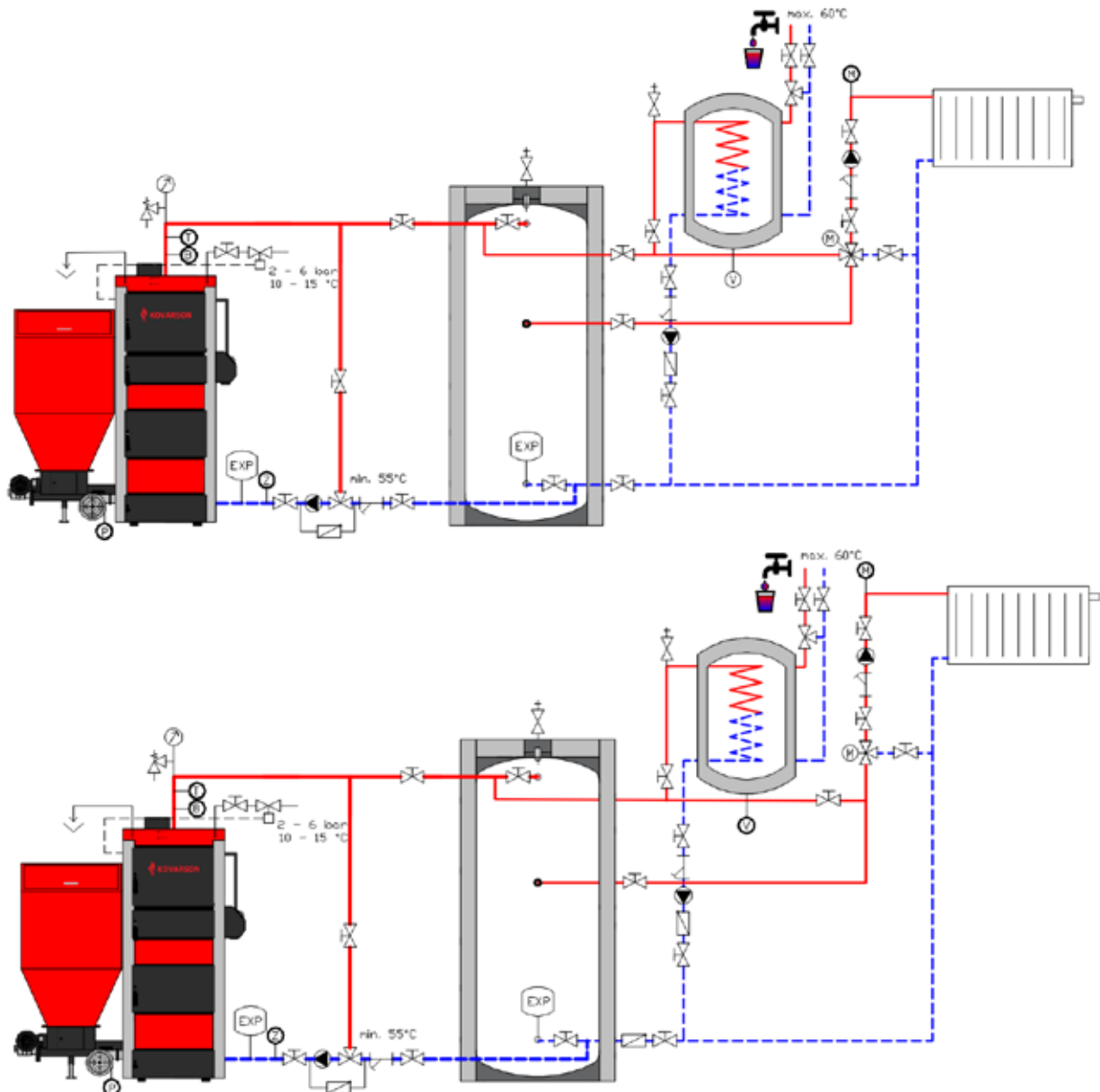


ELECTRONICAL COTTER PIN

monitors the engine from overload, in case of the screw feeder block and high limit load informs the user via audio signal, system prevents damage of the cotter pin.

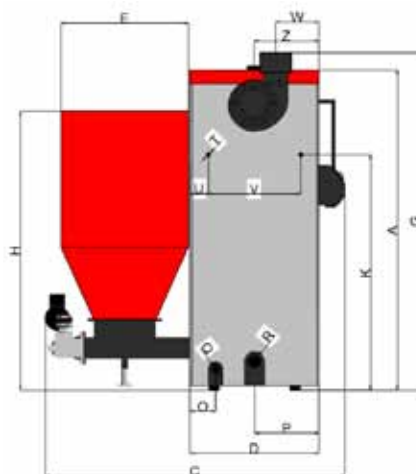
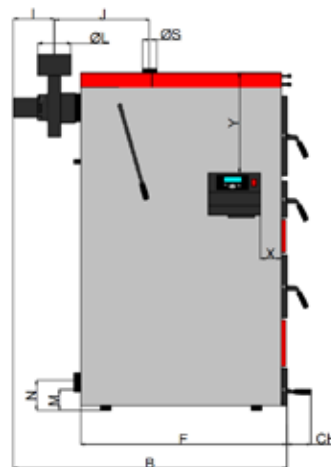
RECOMMENDED INSTALLATION

Boiler model		PREDATOR 20	PREDATOR 25	PREDATOR 30	PREDATOR 35	PREDATOR 40
Nominal output with wood	kW	20	25	30	35	40
Nominal output with coal	kW	20	25	30	35	36
Minimal output with coal	kW	6,5	8	10	12	12
Efficiency with wood	%	84,9	86,2	87,5	88,8	90,3
Efficiency with coal – nominal output	%	86,2	87,2	88,1	90	90
Flue gas temperature with wood	°C	73,1	87,3	101,5	116	130
Flue gas temperature with coal - nominal output	°C	118,1	124,4	130,7	140	140,3
Flue gas temperature with coal - minimal output	°C	60,4	60,4	60,4	60,4	60,4
Chimney draft	Pa		20			25
Recommended operating temperature of heating water	°C			70 - 90		
Minimum temperature of return water	°C			55		
Input voltage	V			230		
Power input	W			60		
Heating areas of up to:	m ²	200	250	300	350	400



IT IS POSSIBLE TO USE THE PUMP SYSTEM WITH THE THERMOSTATIC VALVE TO PROTECT THE RETURN WATER FROM CH.

Boiler type		PREDATOR 20	PREDATOR 25	PREDATOR 30	PREDATOR 35	PREDATOR 40
Efficiency with wood	%	84,9	86,2	87,5	88,8	90,3
Efficiency with coal	%	86,2	87,2	88,1	90	90
Weight	kg	750				
Water volume capacity	l	140				
Wood combustion chamber volume	dm ³	135,5				
Coal storage container volume	dm ³	350				
Wood combustion chamber depth	mm	550				
Dimensions of wood storage container filling hole	mm	440x300				
Dimensions of coal storage container filling hole	mm	370x335				
Boiler class per ČSN EN 303-5 wood/coal	-	4/4	5/4	5/4	5/4	5/4
Boiler dimensions	A	mm	1615	M	mm	77
	B	mm	1310	N	mm	115
	C	mm	1510	O	mm	129
	D	mm	650	P	mm	325
	E	mm	642	Q	mm	1"
	F	mm	989	R	mm	2"
	G	mm	1702	S	mm	2"
	H	mm	1406	T	mm	½"
	CH	mm	116	U	mm	92
	I	mm	197,5	V	mm	466
	J	mm	456	W	mm	219
	K	mm	1187	X	mm	100
	øL	mm	159	Y	mm	480



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