

WOOD GASIFYING BOILER *ATTACK DPX* STANDARD / PROFI / LAMBDA



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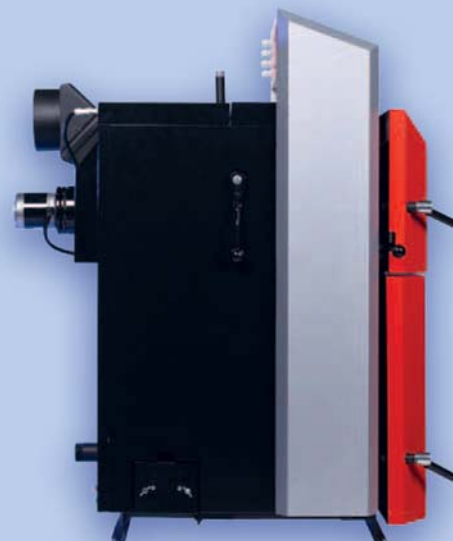
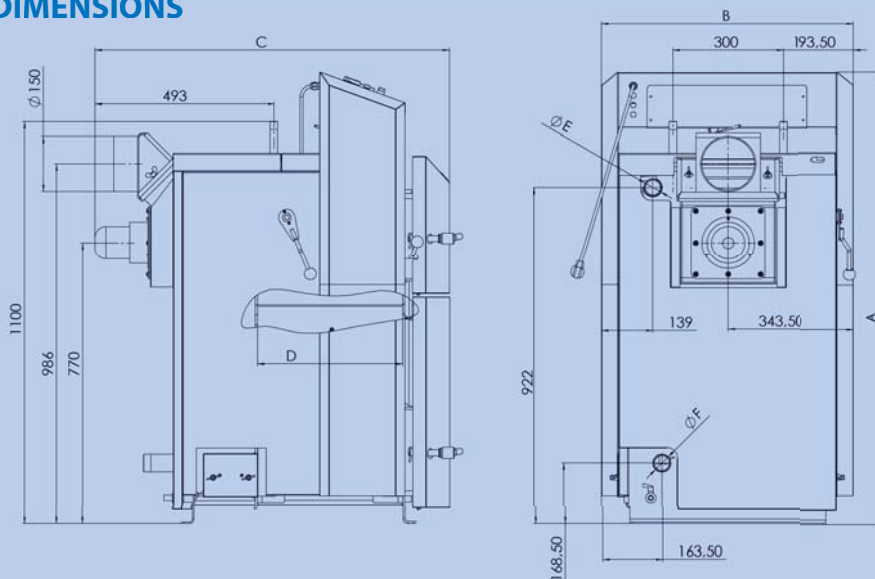
The wood gasifying boilers ATTACK DPX in the versions Standard, Profi and Lambda are intended for economical and ecological heating of dwelling houses, cottages, small plants, work rooms and similar objects. Prescribed fuel for DPX boilers is dry wood. At full utilization of the hopper there is possibility of the continual burning for 8-12 hours.

BOILER ADVANTAGES

- *Modern timeless design*
- *High efficient tubular exchanger „flue gas-water“*
- *High combustion efficiency of 90 %*
- *Low fuel consumption, Low production of emissions and ash*
- *Wide output range of 15–45 kW of boilers made in 3 modifications*
- *Option to control combustion by the Lambda probe*
- *Suction fan ensures balanced and efficient combustion and dustless operation*
- *Fluently modulated fan rotations*
- *Combustion of soft and hard wood*
- *Big boiler hopper ensuring longer heating duration at one load*
- *Possibility to load big wood logs*
- *Minimum of waste*
- *Easy usage and cleaning*
- *Automatic boiler stop when fuel burns out*
- *Automatic control of heat-up flap connected with opening and closing of the feeding door*
- *Equipped with aftercooling circuit against overheating of boiler in the water*
- *Quality boiler steel of 6 mm thickness used for boiler manufacturing*
- *Fireproof pieces resistant up to the temperature of 1350°C*
- *The boiler fulfills criteria of the highest class under the European norm EN303-5*



DIMENSIONS





TECHNICAL PARAMETERS

Parameter	Unit	DPX15	DPX25	DPX30	DPX35	DPX40	DPX45
Nominal output (STANDARD version)	kW	15	25	30	35	40	45
Output range (PROFI, LAMBDA version)	kW	6–15	10–25	12–30	14–35	16–40	18–45
Heat exchange surface	m²	1,98	2,52	2,78	2,78	3,03	3,03
Volume of feeding chmaber	dm³	65	96	112	112	128	128
Dimension of feeding door	mm	235 x 445	235 x 445	235 x 445	235 x 445	235 x 445	235 x 445
Prescribed chimney draught	Pa	23	23	23	23	23	23
Max. operating overpressure of water	kPa	250	250	250	250	250	250
Boiler weight	kg	370	430	460	460	490	490
Diameter of flue gas connection	mm	150	150	150	150	150	150
Boiler height „A“	mm	1 240	1 240	1 240	1 240	1 240	1 240
Boiler width „B“	mm	700	700	700	700	700	700
Boiler depth „C“	mm	840	1 240	1 340	1 340	1 440	1 440
Length of feeding chamber „D“	mm	400	590	690	690	790	790
Diameter of flow connection	"	G 6/4"				G 2"	
Diameter of return connection	"	G 6/4"				G 2"	
Grade of protection	IP	21					
El. input	W	32	38	48	54	54	78
Boiler efficiency	%	91,3	90,4	90,1	90,1	90,2	90,2
Boiler class	–	3					
Flue gas temperature by nominal output	°C	170	170	180	180	190	190
Flue gas flow by nominal output	kg/s	0,019	0,019	0,021	0,021	0,027	0,027
Max. noise level	dB	65					
Fuel type	–	Wood logs with relative humidity 12 % – max. 20 %, Ø 50–150 mm					
Average fuel consumption	kg ^h -1	3,9	6,5	7,8	9,1	10,4	11,75
Approximate fuel consumption per season	–	1 kW = 0,9 m³					
Max. length of wood logs	mm	350	550	650	650	750	750
Volume of water in the boiler	l	80	100	110	110	128	128
Recommended volume of accumulation tank	l	375	625	750	900	1 000	1 200
Connection voltage	V / Hz	~ 230 / 50					
Range for setting the temperature of heating water	°C	65–90					
Range for setting the room temperature	°C	10–27					
Capacity of the contacts of boiler regulator (PROFI version)	–	2 A / 230 V					

MODIFICATIONS OF THE ATTACK DPX BOILERS

The wood gasifying boiler ATTACK DPX is equipped with three types of regulation: **STANDARD**, **PROFI** and **LAMBDA**.

MAIN ADVANTAGES OF THE NEW BOILER LINE ATTACK DPX

The new boiler line **ATTACK DPX** is equipped with the **more efficient tubular exchanger flue gas – water**. Special movable turbulators installed inside the exchanger serve to brake and to make the turbulent flow of the flue gas through the exchanger. Thereby it comes to higher heat transfer through the steel exchanger wall into the heating water.

Turbulators also enable easy exchanger cleaning. The clean exchanger reaches the most effective operation parameters – the high efficiency.

From technical view it is a boiler line with high efficiency, low flue gas temperature and more effective combustion process. **Achieved efficiency of the ATTACK DPX boiler is 90 %.** By installation of more efficient boiler of the **ATTACK DPX** line it comes to significant decrease of the **operating costs**, projected into the fuel savings, in comparison with less efficient boilers that combust same fuel.

From the social-wide view, it is an environment-friendly source, combusting wooden biomass, which is a kind of CO₂-neutral fuel.

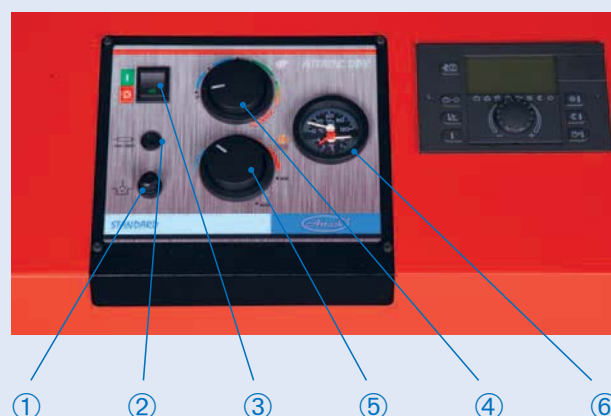
Considering the harmful emissions, the average concentration of CO value in the flue gas, is during operation of the **LAMBDA** version under the level of 200 mg/m³ related to 10 % of O₂.

Under the valid European norm EN303-5, classifying the solid fuel boilers by efficiency and emissions to individual classes, the **ATTACK DPX** boiler (version **LAMBDA**) **reaches 25 times lower concentration of harmful CO emissions in the flue gas in comparison with the allowed level of this norm!**

ATTACK DPX STANDARD

The wood gasifying boiler **ATTACK DPX Standard** is controlled by the boiler and the flue gas thermostat.

ATTACK DPX 15 – 45 STANDARD



DESCRIPTION

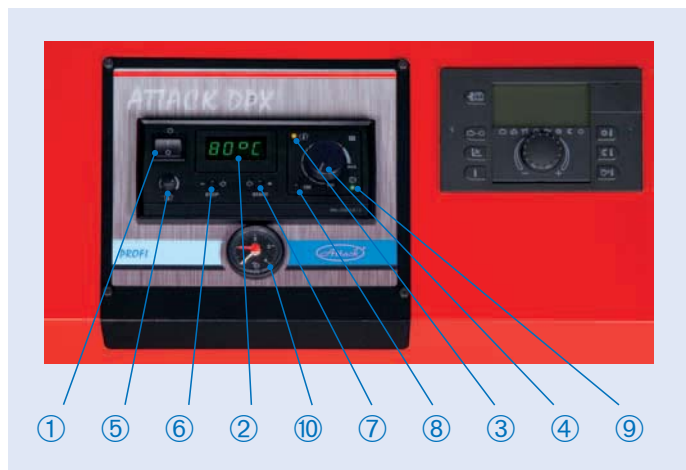
- 1. Reset** – boiler protection against overheating (after exceeding temperature of 95°C is the boiler disconnected from electricity mains)
- 2. Fuse** – protection against short circuit
- 3. Main switch** – boiler start and boiler stop for the case of need
- 4. Flue gas thermostat** – when the temperature of the flue gas decreases under adjusted value, the fan is switched off
- 5. Boiler thermostat** – serves to set the required temperature of the water in the boiler (in case of exceeding the adjusted temperature is the fan switched off and the boiler works at min. output, after decreasing of the required temperature is the fan switched on again and the boiler works at maximum output)
- 6. Thermomanometer** – shows the output temperature and the actual pressure of the heating water in boiler

ATTACK DPX PROFI

Wood gasifying boiler **ATTACK DPX Profi** is controlled by the electronic regulator for regulation of temperature of the wood burning warm water boilers.

Advantage of the PROFI version of the ATTACK® boilers in comparison with the Standard version represents the higher user comfort and option to regulate the boiler output to achieve optimum parameters by wood combustion.

The regulator measures temperature of water in the boiler permanently and indicates it on display and also controls flue gas fan and the C.H. pump.



DESCRIPTION

1. **Main switch**
2. **Display indicating boiler temperature and parameters**
3. **Control light of the additional thermostat**
4. **Knob of the boiler thermostat**
5. **Knob of the additional thermostat**
6. **STOP button** / selection of parameters / deactivation of alarm
7. **START button** / selection of parameters
8. **Button to start programming** in the service mode / confirmation of settings
9. **Control light of the circuit pump**
10. **Thermomanometer** – shows temperature of the water in the boiler



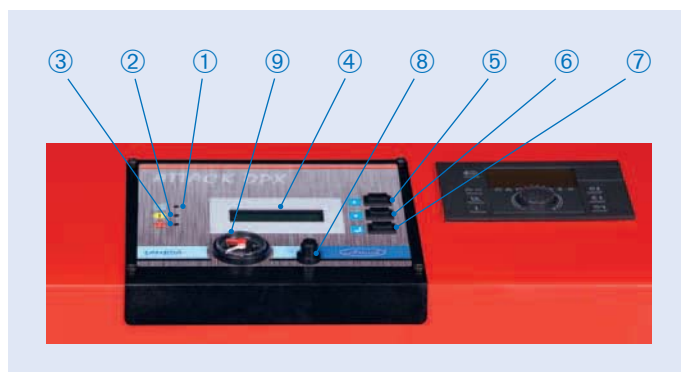
Backward view on the electronic regulator:

1. **Multi-purpose outlet**
2. **Connection of additional thermostat**
3. **Fuse of 2A**

ATTACK DPX LAMBDA

The wood gasifying boiler **ATTACK DPX Lambda** disposes with the most advanced technology of the combustion process control to achieve the excellent values of emissions and efficiency. Controller can individually regulate amount of the primary and the secondary air, adequately to data about oxygene content from Lambda probe, boiler temperature and flue gas temperature. **All the operation parameters are displayed on the well-readable multiline LCD display.** The parameters can be change via buttons placed on the control panel of the boiler. Eventual error or warning messages are signalized by flickering LED diodes.

After the fuel burn-out is the boiler automatically stopped according to the flue gas temperature or the oxygene content in the flue gas. All modifications of **the ATTACK DPX** boilers can be equipped with an additional regulator which ensures control of the accumulation tank, solar panels or other sources of heat energy in different designs of the heating systems, according to the customer's demands.



DESCRIPTION

1. **Control light of the boiler operation** – lights by the boiler start with the „+“ (5) button, expires after burning out of fuel or after manual boiler stop by the „-“ (6) button
2. **Control light of error messages** – lights in case of the following faults: Wrong value of the flue gas temperature
3. **Control light of warnings** – following fault importance: Reset – lights, Wrong boiler temperature – lights, Too high temperature – flickers, Boiler overheating – do not open (boiler temperature over 90°C) – flickers
4. **Multi-line LCD display** – displays operation data and enables browsing the menu. If the boiler is out of operation for longer than 15 min. and does not display any error, the display illumination is turned off automatically.
5. **Button for boiler start and parameter change** – turns on display illumination. After repeated pressing turns the boiler on or enables fuel feeding.
6. **Button for boiler stop and parameter change** – serves for emergency boiler stop – only in case, that there is no water in the system or if the sensor for overheating does not work.
7. **Enter (button for confirmation and entering into the menu)** – serves for entering the menu and confirmation of the required value.
8. **Reset** – button of the boiler's safety protection against overheating. If the temperature of the boiler's water exceeds 95°C, the boiler stops. The boiler can be started by unmounting the cover and pressing the button, after temperature decrease to 85°C.
9. **Thermomanometer**

BOILER DESCRIPTION

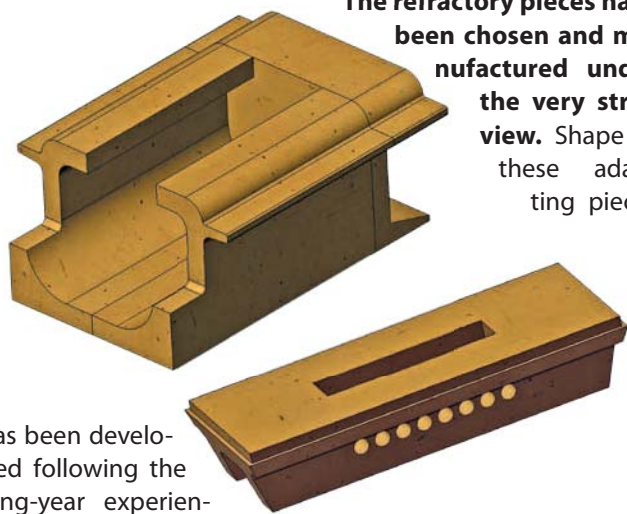
The boiler is constructed for combustion of wood, on principle of wood gasification by usage of the suction fan, which exhausts the flue gas from the boiler and makes underspressure in the boiler hopper. The underpressure in the hopper ensures, that in the moment of opening of the feeding door, the clean air is sucked from the environment to avoid of the small elements elusion from the boiler hopper into the boiler room. The boiler room with this kind of boiler is significantly less dusty.

Basic part of the **ATTACK DPX boilers** is a water cooled boiler body. The welded piece is made from the steel plate up to the 6 mm thickness. The boiler is equipped with high efficient tubular heat exchanger, with the special movable turbulators installed to increase its efficiency and to clean it.

The boiler **consists of two chambers divided by nozzle**. The boiler fuel hopper is in the bottom part equipped with the heatproof adapting piece with longitudinal opening for transfer of the gas and flue gas.

The quality heatproof nozzle is the essential part of the boiler. It guarantees reliable functioning by extremely high operating temperatures of about 1100°C. The refractory adapting pieces are resistant up to the temperatures of 1350°C. The adapting pieces of the boiler's ashtray part accumulate the heat from flue gas. Thereby, their surface temperature increases and they serve as the combustion „catalyzer“ that ensures burning out of the harmful emissions in the boiler and prevents their elusion through chimney into the surrounding atmosphere.

The refractory pieces have been chosen and manufactured under the very strict view. Shape of these adapting pieces



has been developed following the long-year experiences with the purpose of reaching the best combustion parameters of the boiler. The adapting pieces are thermally strained during the boiler operation and thereby they are suitably divided into several parts to enable their dilatation without the following damage.

Every adapting piece is for several days flame-patterned in the special furnace to gain the required mechanical properties and to get dried. To reach higher tightness, the material for adapting piece is strengthened by the special steel microbracing. This unique manufacturing process ensures the long life of the refractory adapting pieces.

The refractory ashtray is placed in the burning-out space under the nozzle in the boiler rear part. The tubular exchanger

with the heat-up flap above is in the rear part of the boiler. There is also the exhaust connection for chimney. It is possible to turn this connection horizontally or vertically, following requirements at installation.

In the upper part of the front wall, there is the feeding door and in the bottom part is the ashtray door.

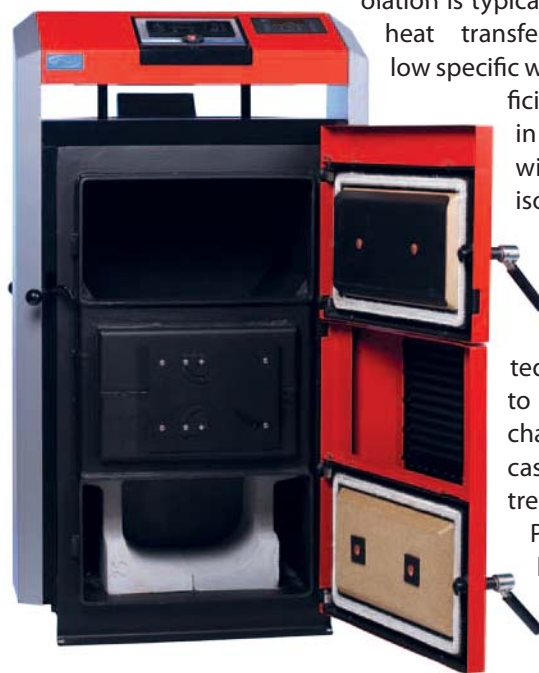
To enable comfortable manipulation, it is necessary to isolate the boiler door from the combustion section of the boiler properly. At the full operation – the insulation ensures, that the door surface will be just a little bit warmer than the surrounding environment. For this purpose, the compressed isolation filling of high quality is used for the ATTACK® boilers. This isolation is typical with the low

heat transfer coefficient, low specific weight and sufficient tightness

in comparison with standard isolation materials. Moreover, in the

boiler door it is protected by the plate to prevent mechanical injury in case of uncareful treating.

Pull rod of the heat – up flap is placed in the front covering.



The boiler body is from external side thermally isolated with mineral wool, fitted under the coverings of external coating. The control panel for electromechanical regulation is placed in the upper part of the boiler. Boiler covering is powder treated.

The channel for the primary and the secondary air inlet is in the front part of the boiler, together with the regulation flap, where it is warmer to the high temperature.

The boiler is equipped with the heat-up flap. This flap opens automatically, when the feeding door is opened and shuts automatically, when the feeding door is closed. The heat up flap ensures direct flue gas exhaust from the boiler hopper into the chimney and eases the heating up in the boiler.

The manufacturer basically adjusts the flap for primary and secondary air.

By the **ATTACK DPX LAMBDA** version is this setting made automatically by electrical servogears following evaluation of the data from the lambda probe during the boiler operation.

The combustion control system with Lambda probe ensures optimal operation conditions for the highest boiler efficiency and also for minimum harmful emissions in the flue gas.

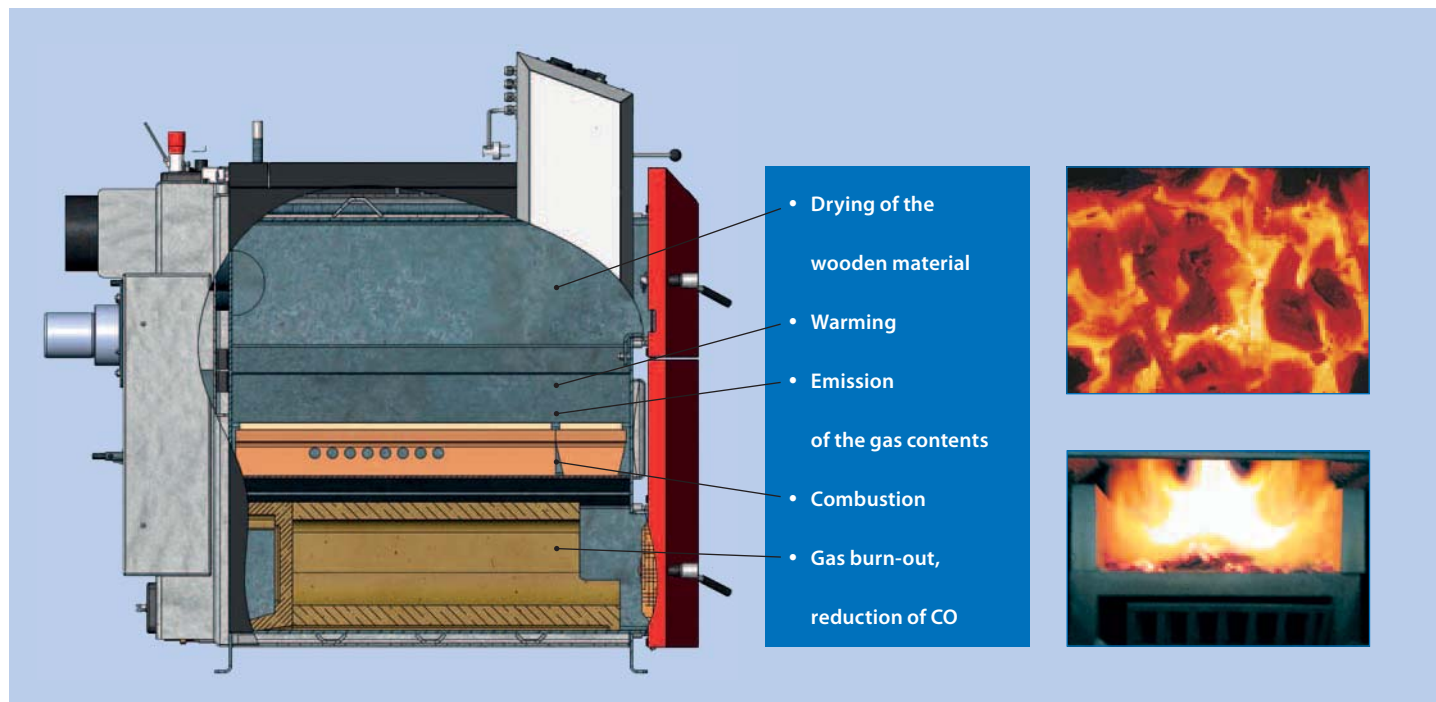
The boiler is equipped with all functional and security elements. The boiler is equipped with the safety thermostat, that turns the ventilator electrically off in the state of emergency when the temperature exceeds 95°C.

PYROLYSIS OF WOOD

The wood gasification is a traditional technology, that improves efficiency of the wood combustion. The combustion means rapid oxidation of material, when the warmth is released.

Operation of the pyrolysing boiler can be divided into three processes – warming and drying of the wooden material in the hopper, emission of the water steams and the gas elements and combustion of the solid content (charcoal).

Each of these phases requires different conditions. However, by ordinary devices there is the only possibility of regulation – closing of the air inlet. Thereby, there is lack of air for one process and too much air for another one and also the temperature is sometimes sufficient and sometimes not. Because of unperfect combustion, many combustible contents wastely flow out through the chimney or react with other products of combustion and make tar.



BOILER FUNCTION

By feeding of new fuel - at the temperature under 200°C – it comes to drying of wood.

Near to the nozzle, at temperature of 200–700°C and limited air inlet, the wood is scanned, the wood gas is emitted and the solid elements are produced. The emitted gas flows into the combustion chamber, burns and emits heat under the sufficient air inlet.

Charcoal is burned on the grate, under the sufficient air inlet. It reacts with air and emits combustible CO, that is immediately burned.

Incombustible waste goes through the nozzle to the ashtray. Advantage of this approach is, that every combustion phase has ideal conditions - in the regulated amount of primary and secondary air, as well as in optimum differentiation of temperatures for individual phases of combustion.

Thanks to the better usage of warmth in the wooden material, there is lower fuel consumption and wide scale of the output regulation at keeping the high combustion efficiency.

WOOD GAS

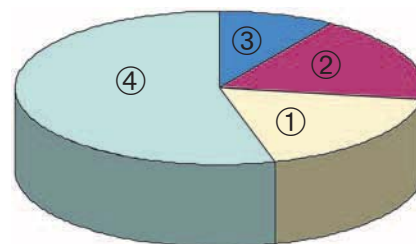
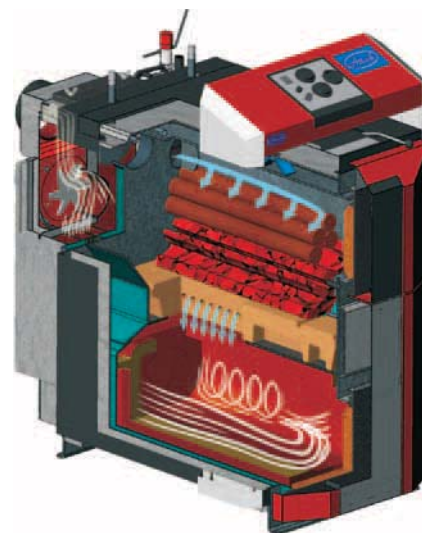
Under the certain conditions (temperature, air inlet), the wood is decomposed into gas, liquid and solid contents. The gas content is represented by the wood gas, solid one is the charcoal – basically pure carbon.

The wood gas is emitted while warming the wood with minimum oxygene inlet, and thereby it is only produced, not burned.

Heat capacity of the material depends on its chemical content and content of combustible substances.

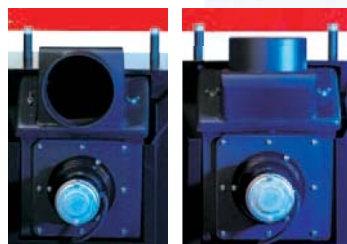
Wood gas contents 20 % of hydrogen ①, 20 % of combustible CO ②, 0-10 % of methane ③ and 50-60 % of non-combustible nitrogen ④.

Thanks to the high content of inerth nitrogen, the heat capacity of the wood gas is in the level of 3,5–8,9 MJ/m³.



CHIMNEY INSTALLATION

The chimney can be horizontally or vertically oriented by turning the flange for 180°.



FUEL

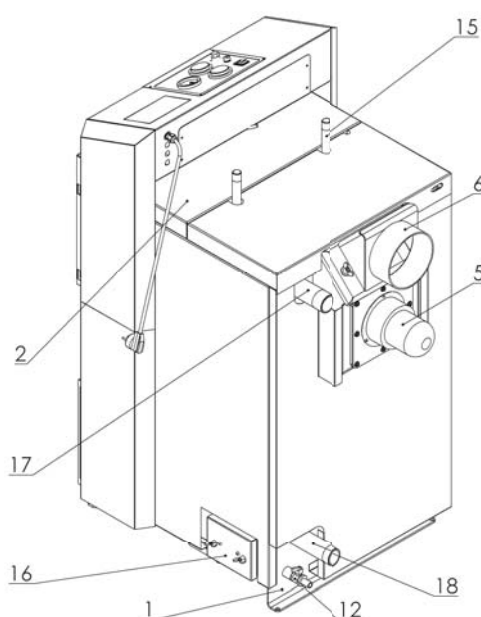
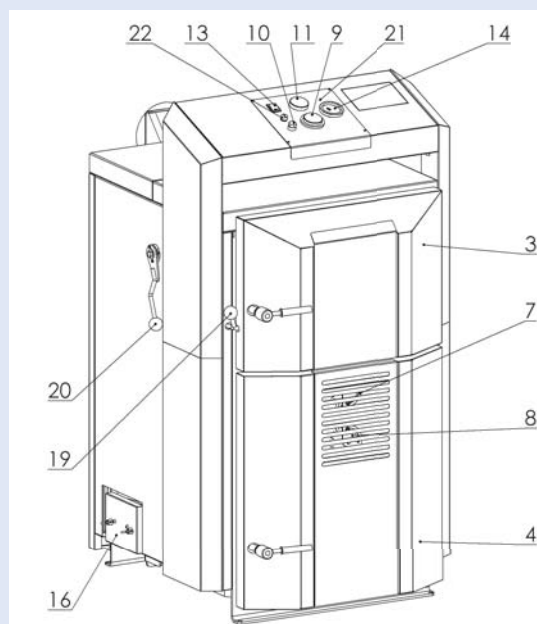
Chopped dry wood logs with humidity of **12–20 %** and heat value of **15–17 MJ/kg** are the prescribed fuel. It is also possible to use big pieces of the wooden waste together with thick wood logs.

The boiler is not intended for combustion of the saw dust and small wooden waste. The small wooden waste can be burned together with the wood logs (**max. 10 %** share).

Thanks to the long feeding chamber there is no need to cut the wood into smaller pieces.

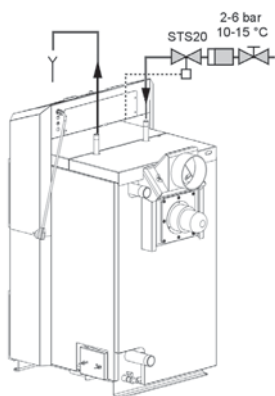
Boiler output depends also on the humidity of the wood. The correct output and the proper function of the boiler are guaranteed by the humidity up to **20 %**.

DESCRIPTION OF THE ATTACK DPX BOILER



KEY

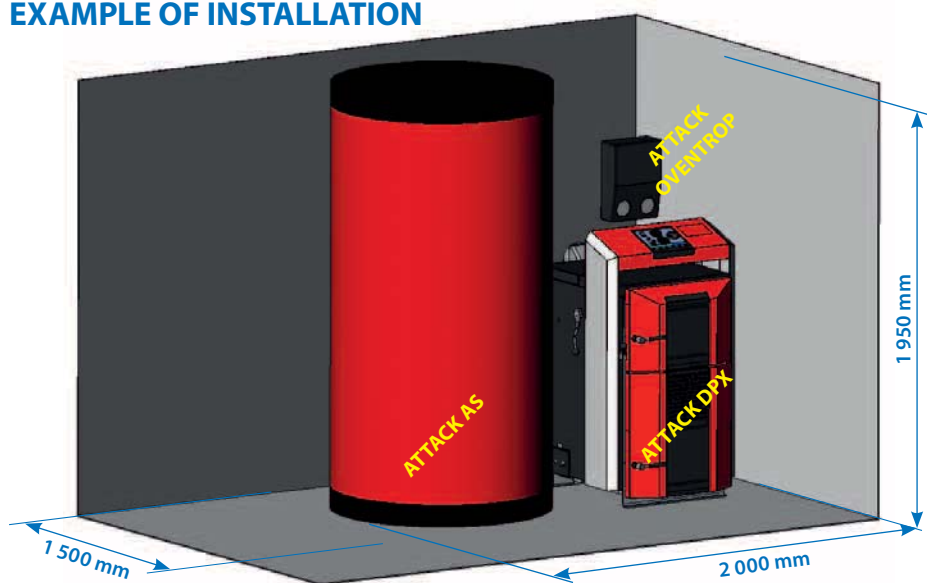
1. Boiler body
2. Front upper cover
3. Feeding door
4. Door of the combustion chamber
5. Suction fan
6. Chimney
7. Primary air suction
8. Secondary air suction
9. Boiler thermostat
10. Reset of emergency thermostat
11. Flue gas thermostat
12. Inlet valve
13. Main switch
14. Thermomanometer
15. Aftercooling circuit
16. Cover of the cleaning opening
17. C.H. flow connection
18. C.H. return connection
19. Pull rod of the chimney flap
20. Lever of turbulators
21. Control panels
22. Electrical fuse



BOILER PROTECTION AGAINST OVERHEATING

Each model of the ATTACK DPX is equipped with an exchanger against overheating. After connection of the STS 20 valve with the probe placed in the rear part of the boiler, it protects the boiler against overheating. When the temperature of water in the boiler exceeds 95°C, it lets the water flow into the cooling circuit to absorb the surplus heat and to discharge it into the drain.

EXAMPLE OF INSTALLATION



The required dimension of the boiler room with the **ATTACK DPX** boiler connected to the accumulation tank **ATTACK AS** and the solar collectors.