## History and present of VIMAR company

**VIMAR company**, the producer of the VIGAS - gasifying and ecological boilers, was established in 1993 as a small family company, by its owner, Mr. Pavol Vigas. The smallest boiler VIGAS 25 was the first prodcut in production. With the improvements and further development, the range of boilers was extended. Nowadays, in production are hot-water boilers to burn wood (VIGAS 16, 25, 40, 60, 80, 100), in combination wood - coal VIGAS 29 UD, hot-air VIGAS 25 TVZ or in combination wood – pellets VIGAS 18 DP. Nowadays, VIMAR is the biggest producer of gasifying boilers in Slovakia, and VIGAS boilers are distributed to all European countries.

## Gasifying principle in VIGAS boilers / How it works

VIGAS boilers with gasification are very differ in comparison to standard boilers. Gasifying proces is in progress during wood gasification. Gasifying proces consist in thermal decomposition of organic and anorganic compounds in closed boiler chamber where soft primary air overpressure which is created by fan. Gasifying proces is in progress in boiler tank, above the fireproof nozzle. First phase, wood is dried and released siccative compounds from fuel. Second phase, released gas is mixed in the nozzle with preheated secondary air and it produce the burning gas. Third phase, gases are burned in combustion chamber of the boiler and gases are blown through pipe exchanger to the chimney. This way of burning is very efficient, what significanlty decrease the fuel consumption in comparison to standard boilers.

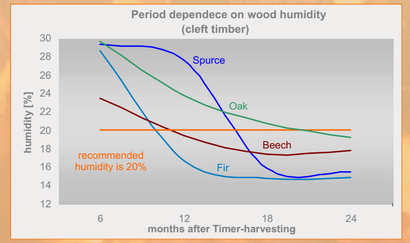
## Fuel for VIGAS boilers

VIGAS boilers are dedicated for the combustion of dry wooden material from fillings up to logs. Type, size, humidity and heating capacity of used fuel has basic influence on output, burning time and tar formation in VIGAS boilers. Higher efficiency of the wood is caused by low humidity of wood. All types of wood could be burned in VIGAS boilers, but the most suitable are at 20% humidity. In VIGAS 29 UD is also possible to burn brown coal and in VIGAS 18 DP besides wood also pellets.

Wood properties chart

| Wood | Fuel effciency [MJ/kg] at 20% humidity | Fuel effciency [MJ/kg] at 25% humidity | Hardness* | weight [kg/m³] at 25% humidity |
|---|---|---|---|---|
| Poplar | 12,9 | 12,3 | 1 | 530 |
| Fir | 15,9 | 14,0 | 1 | 575 |
| Spurce | 15,3 | 13,1 | 1 | 575 |
| Sallow | 16,9 | 12,8 | 1 | 665 |
| Pine | 18,4 | 13,6 | 1 | 680 |
| Alder | 16,7 | 12,9 | 2 | 640 |
| Birch | 15 | 13,5 | 2 | 780 |
| Maple | 15 | 13,6 | 4 | 660 |
| Beech | 15,5 | 12,5 | 4 | 865 |
| Ashen | 15,7 | 12,7 | 4 | 865 |
| Locust | 16,3 | 12,7 | 4 | 930 |
| Oak | 15,9 | 13,2 | 4,5 | 840 |

[kg/m³]=[kg/plm], plm - plnometer, * (1 very soft....5 very hard)





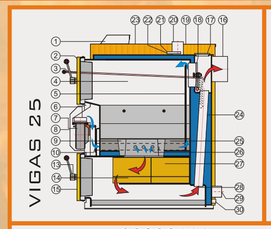

## VIGAS boiler electronical control

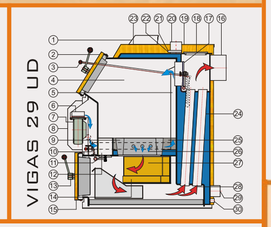
AK 3000 electronical control is a modern control unit implemented in VIGAS boilers.
It contains, general display and circular regulator, boiler is controled with five buttons. All elements that AK 3000 controls are indicated on display by chosen configuration. In gasifying and burning proces, AK 3000 monitors changes in temperature and in accordence to need, increase or decrease operating speed that regulate boiler´s output. VIGAS Lambda Control boiler utilizes informations from lambda sensor of oxygen overflow in gases, to control the flap of primary and secundary air. This system allows to burn all kinds of wood more efficiently and at the same time, decreasing the fuel consumption by 20-25%.

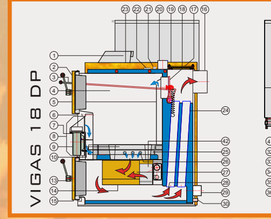

**In basic configuration VIGAS boilers provides:**
- To control of temperature of outgoing water 60 ÷ 85 °C
- To control fan operation
- To control discharge fan
- To control circulation pump
- Option to connect gases thermometer
- Option to connect indoor thermostat
- Option to connect extedned modules via bus - AK BUS (Expander)
- Option to connect Ethernet module and SD-card

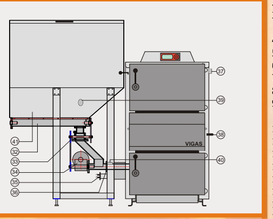
**In configuration VIGAS Lambda Control also provides :**
- Servo control of the flap for primary and secondary air by Lambda sensor
- Boiler is equipped with gases thermometer, standardly

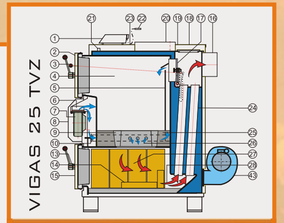
## TVIGAS boiler technical description






1. AK 3000 control
2. Upper door
3. Chimney flap operating rod
4. Gasifying chamber
5. Primary air inlet
6. Fan flap
7. Fan
8. Fan cover
9. Refractory concrete nozzle
10. Secondary air screen
11. Cleaning flap
12. Cleaning hole
13. Door handle
14. Fireclay bricks
15. Bottom door
16. Chimney neck
17. Chimney flap
18. Heat exchanger top cover
19. Upper back cover
20. Outlet branch
21. Thermal fuse
22. Thermometer
23. Upper front cover
24. Pipe exchanger
25. Refractory concrete inwall
26. Secondary air
27. Combustion chamber
28. Direction of waste gases
29. Neck of return water
30. Filling neck
31. Ash of 29 UD
32. Feed elevator
33. Feeder
34. Driving-gear
35. Starting device
36. Separation flange
37. Sockets for TS 130
38. Flap Wood-Pellets
39. Ultrasonic sensor
40. Safety thermometer
41. Pellets reservoir
42. Pellets burner
43. Cooling fan

Boilers are welded from boiler steel sheets, thickness 4mm and 6mm. Inner parts of the boilers that are in contact with fuel and combustion products, are welded from sheets 6mm thick. Other parts of the boilers are welded from 4mm thick sheet. The exchanger of the boilers is welded from steel pipes. The inwal is made of refactory concrete mixture, fireclay moudled bricks are used in combustion part. Boiler is insulated by the insulation – rockwool. The control is provided by moredn control unit.



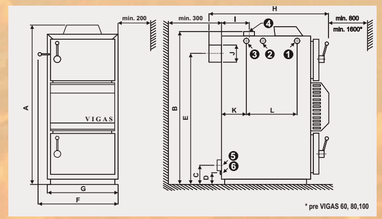


## Installation

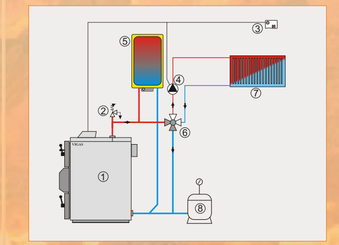
- Boiler can be connected only to central heating system that correspond with output of the boiler. Its possible to order left-sided or right-sided door open.
- If forced circulation is used and there is mains failure (boiler and pump stop to operate), the system of central heating must be adapted to ensure minimum boiler power take-off, 5 kW. This is provided with safety cooling exchanger with drain valve, Honeywell TS 130.
- Boiler must be connected correctly and as short as possible to chimney. Other appliances must not be connected to chimney. To rise the chimney draught, is posible to order discharge fan.
- We do not recommend permanent connection to water supply through feed water valve to avoid unpermitted increase in pressure if valve is not tightly sealed.
- The room where boiler is placed must be ventilated properly.
- Boiler assembly must be done by specialists.
- Recommended minimum temperature of reversible water at boiler inlet is 60 °C
- Boiler room must be ventilated permanently through the opening of min. diameter 0,025 m².
- Work and health safety regulations must be followed in accordance with current instruction requirements.

**2. Technical data** *Tab. 1*

| THERMAL BOILERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| VIGAS | | 16 | 25 | 40 | 60 | 80 | 100 | UD 29 |
| Nominal boiler output | kW | 16 | 25 | 40 | 60 | 80 | 100 | 29 |
| Boiler class according to EN 303-5 | | 3 | | | | | | |
| Max. operating pressure | bar | 3 | | | | | | |
| Fuel | | Wood, max. moisture 20% ;heating min. 15 MJ/kg | | | | | | Brown doa |
| Output capacity | kW | 12 - 18 | 5 - 31 | 8 - 41 | 15 - 72 | 25 - 92 | 25-100 | 8356(29) |
| Fuel consumption with nominal output | kg/hod | 4,5 | 7,6 | 11,2 | 19 | 25 | 30,4 | 7,8 (8,0) |
| Substituite fuel | | Wood waste, splinters, saw dust, saw dust briquettes (for UD 29 also wood of max. moisture 20%) | | | | | | |
| Chimney daught | mBar | 0,20 – 0,25 | | 0,20 – 0,35 | | 0,30 – 0,40 | | 0,20 – 0,25 |
| Weight | kg | 400 | 430 | 460 | 760 | 930 | 950 | 430 |
| Height with regulation | A mm | 1135 | 1135 | 1385 | | 1420 | | 1120 |
| Height of exhaust branch | B mm | 975 | 1045 | 1310 | | 1400 | | 1045 |
| Height of inlet branch | C mm | 115 | | 125 | | 215 | | 110 |
| Height of feed-water valve | D mm | 55 | 60 | 70 | | 135 | | 55 |
| Height of chimney neck | E mm | 890 | | 1110 | | 1170 | | 890 |
| Width including rod | F mm | 645 | | | | 785 | | 645 |
| Width including shell | G mm | 590 | | | | 760 | | 590 |
| Depth | H mm | 840 | 1070 | | 1260 | 1650 | | 1070 |
| Exhaust brand | I mm | 240 | | | 520 | | | 240 |
| Diameter od draught neck | J mm | 160 | | | 200 | | | 160 |
| Dimmension from edge of boiler | K mm | 188 | 305 | | 880 | 1210 | | 230 |
| Spacing of feed pipes | L mm | 405 | | | 70 | | | 350 |
| Diameter of inlet brand | G/mm | 2" | | | | | | |
| Diameter of exhaust brand | G/mm | 2" | | | | | | |
| Diameter of feed-water valve | G | ½" | | | ¾" | | | ½" |
| Volume of water | l | 75 | 93 | | 180 | 205 | 215 | 75 |
| Gases temperature<br>With nominal output<br>With minimal output | °C<br>°C | 240<br>150 | | | | | | |
| Dimensions of gasification chamber<br>Depth | mm | 370 | 560 | | 750 | 1150 | 1090 | 490/440 |
| Height | mm | 490 | | 750 | 730 | | | 500 |
| Width | mm | 440 | | | 575 | | | 440 |
| Dimensions of gasification chamber (width-height) | mm | 435 -255 | | | 575 – 318 | | | 435 - 255 |
| Max. weight of fuel | kg | 20 | 30 | 40 | 80 | 150 | | 30 |
| Capacity of gasification chamber | dm³ | 80 | 120 | 185 | 315 | 483 | 457 | 105 |
| Noisness | dB | 45 | 45,5 | 47,7 | 51,4 | 54,2 | | 45,5 |
| Max. electric input | W | 70 | | | 140 | | | 70 |
| Voltage/Frequency | V/Hz | 230ACV / 50 Hz | | | | | | |
| Pressure loss of water :<br>Δt 10 °C<br>Δt 20 °C | mBar<br>mBar | 9,70<br>1,00 | 9,75<br>1,05 | 10,48<br>2,55 | 12,77<br>3,19 | 11,83<br>2,96 | 11,53<br>2,84 | 9,97<br>1,15 |
| Time of burning with nominal output | hod | 4,5 | 4,20 | 4,30 | 4,20 | 4,20 | 4.0 | 5,60 (4,10) |

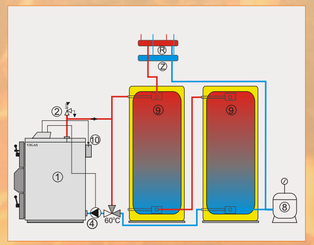



❶ Inlet water neck for valve TS 130 ¾
❷ Hole for summersible case valve TS 130 ½"
❸ Exhaust brand of cooling water ¾"
❹ Exhaust brand of hot water
❺ Inner water neck of reverse water
❻ Filling valve



Recommended schema of basic connection with AK 3000 regulation.

1- VIGAS boiler
2- Safety valve
3- Indoor thermostat
4- Circulation pump
5- Water tank
6- Four-way valve
7- Heating circuit
8- Expansion tank
9- Storage tank
10- Gases thermometer
R – Distributer
Z – Collector

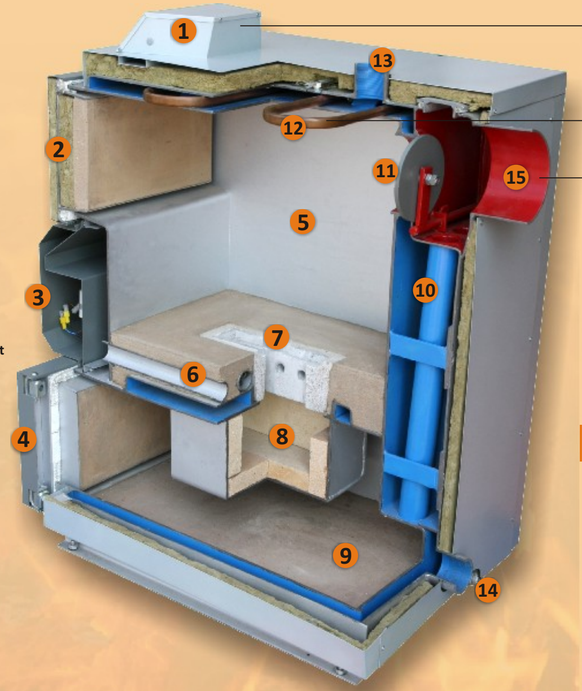


Example of connection VIGAS boiler with AK 3000 regulation, in the line with storage tank.

**See other schemes of connection and other possible regulations on www.vimar.sk, www.ers.sk , www.vigas.eu**

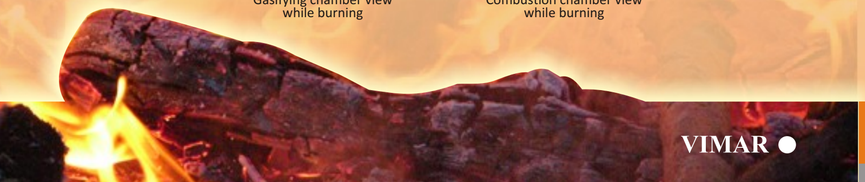
## Cut-away view of VIGAS boiler

1. **AK 3000 control**
   Controls the burning proces
2. **Upper door**
   Door for fuel adding
3. **Fan**
   Supplies air for optimal burning
4. **Bottom door**
   Ash removal
5. **Gasifying chamber**
   Space for added fuel
6. **Primary air inlet**
   Supplies preheated air to combustion chamber
7. **Nozzle with secondary air**
   Provides optimal mix of gases and oxygene
8. **Combustion chamber**
   Ideal burning with minimal amount of ash (at high temperature)
9. **Ash chamber**
10. **Pipe exchanger**
    Provides heat exchange to water
11. **Chimney flap**
    Open flap during adding fuel, provides smoke draught to chimney
12. **Security exchanger**
    Along with drain valve is used to chill the boiler when overheated
13. **Outlet branch**
14. **Inlet branch**
15. **Chimney branch**




Gasifying chamber view while burning

Combustion chamber view while burning




## Accessories VIGAS boiler

**Indoor thermostat**
Afetr the connection to control unit, allows to controll the boiler in accordence to requested temperature.

**Expander**
Afer the connection to control unit, is used for optimized controll of other devices connetcted to heating scheme: tank, storage tank, two heating systems, gas boiler, sollar cell, etc.

**Drain security valve**
After the connection to colling exchanger, is used to emergency temperature reduction of the boiler when overheated.

**Discharge fan**
Its used for smoke elimination to the boiler-room when fuel is adding to VIGAS boiler.

**Lambda sensor**
Provides efficient burning with the minimal gases creation, which effect on lower fuel consumption by 20-25%.

**Gases thermometer PT 1000**
After the connection to control unit, is used for termination of maximal chimney temperature, in connection with storage tank is used to shot-down the boiler when burned is finisehd.

## Test certificates and quality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HOT-WATER BOILERS


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