

S

**GASIFYING
AND ECOLOGICAL
BOILERS**

**HOT-WATER
BOILERS**



Fire wood

A



VIGAS
&
VIGAS
Lambda Control



Fire wood
Wooden pellets

G



Fire wood
Brown coal

I

**GASIFYING
AND ECOLOGICAL
BOILERS**

**HOT -
AIR BOILERS**



Fire wood

V



Fire wood
Brown coal

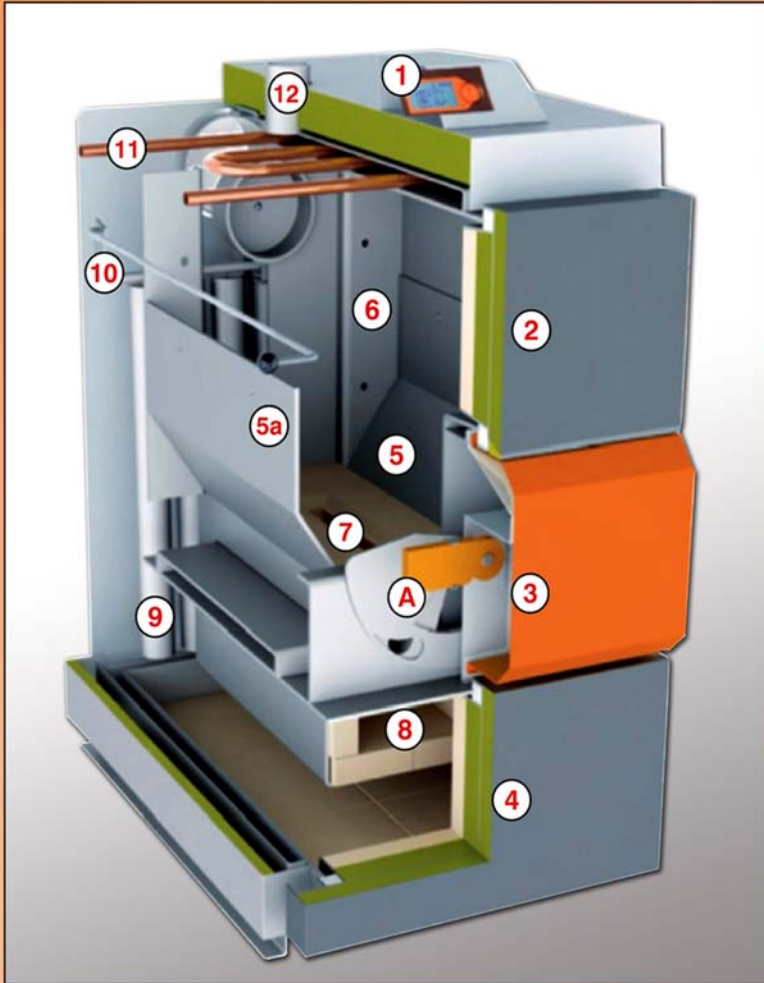


TECHNICAL DATA SHEET

VIGAS		16	25	40	60	80	100	TVZ 25	DP 18	UD 29 WOOD	UD 29 COAL
Nominal Boiler Output	BTU	54k	85k	136k	205k	273k	341k	85k	62k	100k	100k
Boiler Class According to EN 303-5								3			
Maximum Operating Pressure		BAR (3 BAR= 43 psi)						3			
Fuel	Wood maximum moisture 15-20%										Brown Coal
Output Capacity	BTU	41k-61k	17k-105k	27k-140k	51k-245k	85k-314k	85k-341k	17k-95k	41k-62k	27k-100k	27k-119k
Fuel Consumption w/ Nominal Output	Pounds per hour	9.9	16.7	24.6	41.8	55	67	16.8	17.19 wood* 9.92 pellet	17	17.6
Substitute fuel		Wood waste, splinters, saw dust, saw dust briquettes (for UD 29 also wood) max moisture 20%									
Chimney Draught	in. of H ₂ O	.08 - .10		.08 - .14		.12 - .16		.06 - .08		.08 - .10	
Weight	Lbs	882	948	1015	1676	2050	2094	993	1058	948	948
Height w/ Regulator	A Inches	44.68"	44.68"	54.53"	55.90"	55.90"	55.90"	47.24"		44.09"	44.09"
Height of Exhaust Branch	B Inches	38.39"	41.50"	51.57"	55.12"	55.12"	55.12"	40.74"		41.50"	41.50"
Height of Inlet Branch	C Inches	4.53"	4.53"	4.92"	8.46"	8.46"	8.46"			4.33"	4.33"
Height of feed/water valve	D Inches	2.16"	2.36"	2.75"	5.31"	5.31"	5.31"			2.16"	2.16"
Height of Chimney Neck	E Inches	35.03"	35.03"	43.30"	46.02"	46.02"	46.02"			35.03"	
Width Including Rod	F Inches	25.39"	25.39"	25.39"	30.90"	30.90"	30.90"	25.39"		25.39"	25.39"
Width Including Shell	G Inches	23.22"	23.22"	23.22"	29.22"	29.22"	29.22"	23.23"		23.22"	23.22"
Depth	H Inches	33.07"	42.15"	42.15"	49.60"	64.96"	64.96"	45.66"		42.15"	42.15"
Exhaust	I Inches	9.44"	9.44"	9.44"	20.47"	20.47"	20.47"	9.45"		9.44"	9.44"
Dia. OD Draught Neck	J Inches	6.29"	6.29"	7.87"	7.87"	7.87"	7.87"	6.26"		6.29"	6.29"
Dimension from Edge of Boiler	K Inches	7.40"	12.00"	34.64"	47.63"	47.63"			9.05"	9.05"	
Spacing of Feed Pipes	L Inches	15.94"	15.94"	15.94"	2.76"	2.76"	2.76"			13.77"	
Diameter of Inlet Port	G Inches	2"	2"	2"	2"	2"	2"			2"	
Diameter of Exhaust Port	G Inches	2"	2"	2"	2"	2"	2"			2"	
Diameter of Feed Water Valve	G Inches	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"			1/2"	
Volume of Water	I Gallons		19.81	24.56	47.55	54.15	56.79			19.81	
Gas Temperature With Nominal Output	°F	464°	464°	464°	464°	464°	464°			464°	
Gas Temperature With Minimal Output	°F	302°	302°	302°	302°	302°	302°			302°	
DIMENSIONS OF FUEL CHAMBER											
Depth	Inches	14.56"	22.04"	22.04"	29.52"	45.27"	42.91"			19.29"	
Width	Inches	17.32"	17.32"	17.32"	22.63"	22.63"	22.63"			17.32"	
Height	Inches	19.29"	19.29"	29.52"	29.52"	28.74"	28.74"			19.68"	
Max Weight of Fuel	Lbs.	44 lbs	66 lbs	88 lbs	176 lbs	330 lbs	330 lbs			66 lbs	
Fuel Chamber Capacity	Ft ³	2.83	4.23	6.53	11.12	17.05	16.13			3.70	
DIMENSIONS OF GASIFICATION CHAMBER											
Gas. Chamber (W)	Inches	17.12"	17.12"	17.12"	22.63"	22.63"	22.63"			17.12"	
Gas. Chamber (H)	Inches	10.03"	10.03"	10.03"	12.51"	12.51"	12.51"			10.03"	
Noise	Decibel (dB)	45	45.5	47.7	51.4	54.2	54.2			45.5	
Max Electric Input	W	70	70	70	140	140	140			70	
Voltage/Frequency	V/Hz	120 Volts AC /60 Hz									
Pressure Loss of Water △T 10° F △T 20° F	Feet of Head	3/2 of head .03' of head	3/3 of head .03' of head	3/5 of head .08' of head	4/2 of head .10' of head	3/9 of head .09' of head	3/8 of head .09' of head			3/3 of head .03' of head	
Time of Burning with Nominal Output	Hours	4.5	4.2	4.3	4.2	4.2	4			5.60(4.10)	
Cooling exchanger of heat Temperature of inlet water Pressure of inlet water	°F PSI	39°- 59° F Min 14 PSI - Max 58 PSI									
Safety		Release valve Honeywell TS 130 3/4" for safety exchanger against over heating. Opening temperature 203° F									
Weight flow of gases	Kg/s	0.034-0.047									

including chimney dampers
 width casing
 with fan
 exit hot air
 Ascension Throat Dia.

VIGAS BOILER



1. AK 3000 CONTROL - Controls the burn process
2. UPPER DOOR - Door for adding fuel
3. FAN - Supplies air for optimal burning
4. BOTTOM DOOR - Ash Removal
5. GASIFYING CHAMBER - Space for wood
6. PRIMARY AIR INLET - Supplies pre-heated air to combustion chamber
7. NOZZLE WITH SECONDARY AIR - Provides optimal mix of gases and oxygen
8. COMBUSTION CHAMBER - Ideal burning with minimal amount of ash(at high temperature)
9. HEAT EXCHANGE TUBES - Provides heat exchange to water (Hot gas to water)
10. CHIMNEY FLAP BYPASS DAMPER - Open flap during adding fuel, provides smoke draught to chimney
11. SECURITY EXCHANGER - Along with drain valve is used to chill the boiler when overheated
12. HOT WATER OUTLET BRANCH
- A. LAMBDA DAMPER - Used to adjust primary & secondary air via oxygen sensor
- 5a. REMOVABLE PRIMARY AIR CHAMBER

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 it's owner Mr. Paul Vigas. The Vigas® Model 25 was the first unit in production. After improvements and further development, the range in sizes was expanded. Today, production ranges from hot- water boilers to wood burning (VIGAS® Models 16,25,40,60,80 and 100)as well as combination wood/coal (VIGAS®UD 29) VIGAS® TVZ 25 and the combination wood/pellet VIGAS® DP 18. Today, VIMAR® is the biggest producer of gasifying boilers in Slovakia, and VIGAS® boilers are distributed to all European countries as well as the United States and Canada.

Gasifying principle in VIGAS boilers / How it works

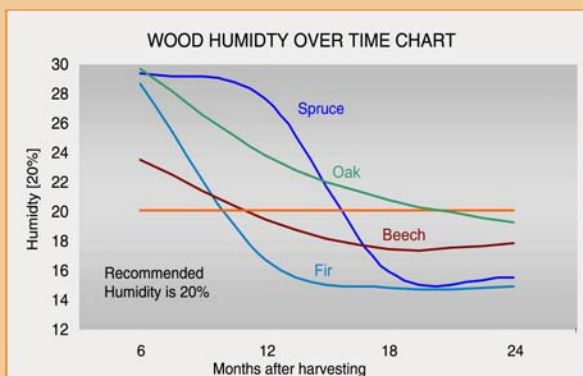
VIGAS® wood gasification boilers differ greatly from standard wood boilers. The gasification process occurs in the first phase with the thermal decomposition of the wood. As the drying and heating of the wood occurs, it releases flammable compounds from the fuel (hydrogen and carbon monoxide). These decomposing compounds are in the closed upper chamber where soft primary air is injected by overpressure which is created by the fan. Next, the burning of the mixed wood gases are mixed in the nozzle with preheated secondary air, burning this gas mixture in the lower chamber at 2200°F. The transfer of the flue gases from the combustion chamber to the heat exchanger on the back of the boiler. These gases are blown through the heat exchanger to the chimney. The best indicator of successful wood gasification is the lack of smoke exiting the chimney.

Fuel for VIGAS boilers

VIGAS® boilers are designed for the combustion of dry wooden material from wood filings to wood logs. Type, size, humidity and heating capacity of used fuel has basic influence on output, the burn time and tar formation. The lower the humidity in the wood, creates higher efficiency. All types of wood can be burned in the units, however, 20% humidity is the most suited. Our Vigas® UD 29 Model provides the ability to burn brown coal (as known as soft coal). Additionally, we offer the Vigas® DP 18 a combination pellet/wood burning unit.

WOOD	Fuel Efficiency [BTU/Lbs] at 20% Humidity	Fuel Efficiency [BTU/Lbs] at 25% Humidity	Hardness*	Weight [Lbs/Cord] at 25% Humidity**
POPLAR	5550	5284	1	4235
FIR	6830	6014	1	4595
SPRUCE	6573	5628	1	4595
SALLOW	7260	5499	1	5314
PINE	7904	5842	1	5434
PINE	7174	5542	2	5114
ALDER	6444	5799	2	6233
BIRCH	6444	5842	4	5274
BEECH	6659	5370	4	6912
ASH	6745	5456	4	6912
LOCUST	7002	5456	4	7413
OAK	6830	5671	4.5	6713

* (1 very soft..... 5 very hard) ~ ** (Cord 4 x 4 x 8)



VIGAS boiler electronical control

AK3000 electronic control is a modern control unit implemented in the VIGAS® Boilers. It contains a general display and circular regulator, and the boiler is controlled with five buttons. All elements that the AK3000 controls are indicated on the display by chosen configuration. In the gasifying and burning process, the AK3000 monitors changes in temperature and in accordance to need, increases or decreases operating speed that regulates the boiler's output. The VIGAS® Lambda Control boiler utilizes information from the lambda sensor of oxygen overflow in gases, to control the flap of primary and secondary air. The system allows the burn of all kinds of wood more efficiently and at the same time, decreasing the fuel consumption by 20-25%.

In the basic configuration, VIGAS® Boilers provide:

- To control the temperature of outgoing water 60 to 80°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 extended modules via bus-AK Bus(Expander)
- Option to connect Ethernet module and SD-Card

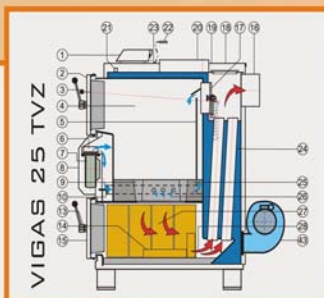
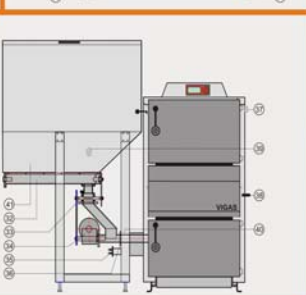
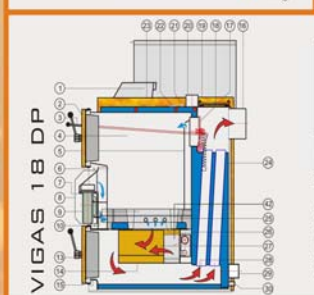
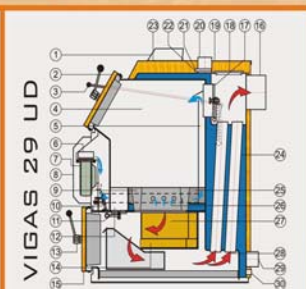
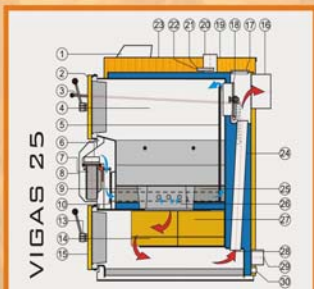
The VIGAS® Lambda Control also provides:

Automatic adjustment of the primary and secondary air

Standard Equipment: Exhaust Gas Thermometer



TVIGAS boiler technical description



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

Boilers are welded from boiler steel sheets, thickness 4mm to 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 in-wall is made of refractory concrete mixture, fireclay molded bricks are used in the combustion portion of the boiler. The boiler is insulated with rock wool.

Installation

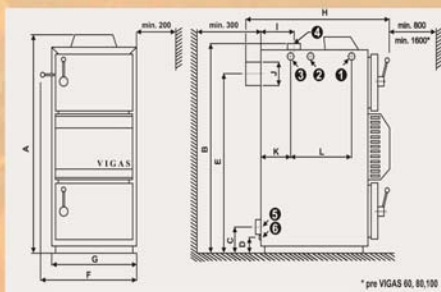
- Boiler can be connected only to central heating system that correspond with output of the boiler. Its possible to order left-sided or right-sided door open.
- If forced circulation is used and there is mains failure (boiler and pump stop to operate), the system of central heating must be adapted to 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 possible 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 140 °F.
- Boiler room must be ventilated permanently through the opening of min. diameter 1525.59 in³.
- Work and health safety regulations must be followed in accordance with current instruction requirements.



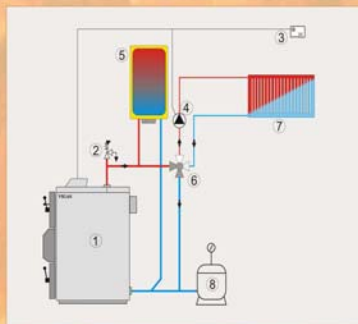
Gasifying chamber view while burning



Combustion chamber view while burning

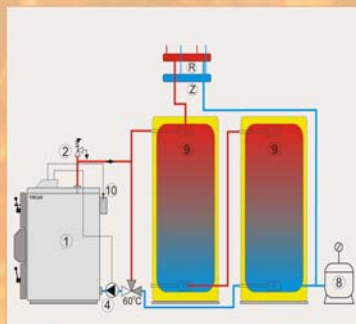


- ❶ Inlet water neck for valve TS 130 ¼"
- ❷ Hole for summersible case valve TS 130 ¼"
- ❸ Exhaust brand of cooling water ¼"
- ❹ Exhaust brand of hot water
- ❺ Inner water neck of reverse water
- ❻ Filling valve



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

Additional equipment

Wood hydrometer

The hydrometer is needed for measuring of wood proper humidity during fuel purchasing but also for current control of stored wood.

Boiler fired with wood of proper humidity warrants complete and correct fuel utilization. Long term use of inappropriate wood causes the onset of tar on boiler internal walls, which causes difficulty in correct boiler operation.

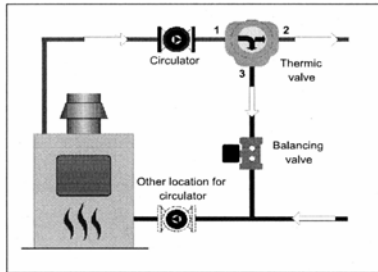
Wood hydrometer



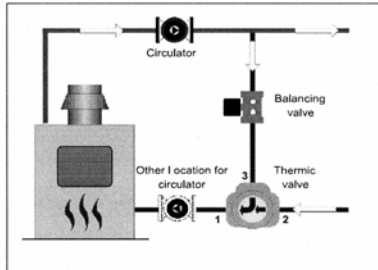
TV ESBE Thermic Valve Data Sheet

Installation

To ensure proper flow to the system an adjustable balancing valve such as Danfoss' MSV-U is recommended to be installed on the bypass between the supply and return piping. The piping of the balancing valve creates a similar resistance as the system to reduce the constant recirculation of heated fluid through the boiler and not out to the system.

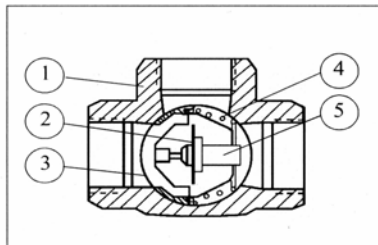


When the temperature of the fluid leaving the boiler is 160F (72C) the thermic valve will begin to allow the heated fluid to the system. Between 160F and 170F, the TV valve continues to bypass allowing supply to mix with the return water, keeping the fluid temperature levels high. At approximately 180F (82C) a majority of flow is directed to the system.



The thermic valve, when placed on the return side, port 2, will open when the minimum return temperature of 140F (60C) or 113F (45C) is reached. When the fluid temperature reaches approximately 158F (70C), a majority of the flow is directed to the system.

Construction:



No.	Description
1	Valve Body - Cast iron
2	Close off valve seat
3	O-ring - EPDM
4	Spring - Stainless Steel
5	Thermostat - Copper

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Accessories VIGAS boiler



Indoor thermostat

After the connection to control unit, it allows the controller to operate the boiler in accordance to the requested temperature.



Expander

After the connection to the control unit, it is used for optimal control of the other devices connected to the heating scheme: tank, water storage tank, two heating systems, gas boiler, solar cell etc.



Drain security valve

After the connection to cooling exchanger, it is used for emergency temperature reduction of the boiler.



Discharge fan

Its used for smoke elimination to the boiler-room when fuel is added to VIGAS boiler.



Lambda sensor

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

Exhaust Gas Thermometer PT 1000



After the connection to the control unit, it is used for the termination of maximum chimney temperature, in connection with storage tank, it shuts down the boiler when the burn is finished.

Test certificates and quality



The Vigas® Wood Gasification Boilers carry the CE testing certificates. See website for copies of all test certificates and quality certifications.

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