

wp3.160 – Synthesis Gas System (wood gas)

A reliable and fully automatic system

The system is made of high-quality components and materials for a long service life. Wear parts such as filter elements or air nozzles cause only low costs. The core of the system is a direct current fixed-bed gasifier developed over many years in combination with a specially adapted fabric filter. Solutions have also been developed for many other plant components, such as the fuel lock (port) or the coal dust discharger, which are less susceptible to failure and easier to maintain than standard solutions. For the CHP, we use MAN gas engines with electronic ignition and high-quality synchronous generators.

The system can be operated and monitored locally or via smartphone or via the Internet, warning and fault messages are transmitted via e-mail or SMS.



Technical data

Electrical output 3x400V	160 kW	
Thermal output (water circuit 90°C)	320 kW	
Nominal fuel capacity of wood chips (G30 – 50)	561 kW	
Electrical efficiency	28.5 %	
Thermal efficiency (water circuit 90°C)	57 %	
Gas output (cold gas efficiency)	477 kW (85 %)	
Gas volumetric flow	318 Nm ³ /h	
CHP efficiency	33.5 %	
Ideal water content of wood chips	7 %	
Wood chip consumption - spruce/fir	15,2 srm* per day	(ca. 108 kg / atro** / h)
Wood chip consumption - beech	10,4 srm* per day	(ca. 112 kg / atro** / h)
Power consumption (without drying)	6.4 kW	
Power adjustability range	70 – 100 %	

*srm = loose cubic meter **atro = absolutely dry = 0 % water content

Dimensions and space requirements

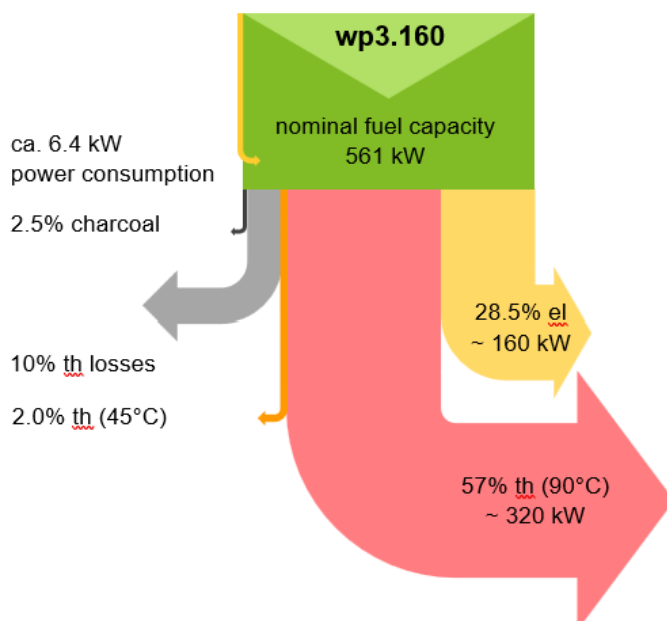
In addition to the specified dimensions, a minimum distance of 1,2 meters is recommended between the systems or system modules and equally to the building walls. This facilitates the access to the systems and guarantees efficient maintenance and service work.

Gasification unit (L x W x H)	3.51 x 1.90 x 2.35 m
L x W x H without required space for lifting equipment	
CHP unit (L x W x H)	2.80 x 1.30 x 2.10 m
L x W x H without required space for lifting equipment	
Required room height min.	4 m
Floor space ca.	45 m ²

Competitive advantages

- ✓ Overall solution: wood chip drying and sieving, gasification unit, CHP unit and charcoal disposal
- ✓ Operation with standard wood chips incl. fines and bark (according to specification)
- ✓ Very high system availability
- ✓ High electrical efficiency (> 28.5%)
- ✓ Minimal self-consumption of electricity (approx. 4% of output el.)
- ✓ Maintenance-friendly and compact design with little space requirements
- ✓ Low maintenance due to high-quality components
- ✓ No condensates and residues other than charcoal
- ✓ All system components / functions are integrated into one control system
- ✓ Complete documents for official approval procedures
- ✓ Service and remote maintenance, spare parts in stock
- ✓ Warranty

Efficiency scheme - Combined heat and power generation (approx. values)



CHP emission values (Standard version with oxidation catalytic converter)

Gas volume flow rate	880 Nm ³ /h dry
Exhaust gas temperature	180 °C
Carbon monoxide (CO)*	< 1500 mg/Nm ³ down to < 200 mg/Nm ³ with catalytic converter
Nitrogen oxides (NOx)*	< 500 mg/Nm ³ lean operation down to < 200 mg/Nm ³ with SCR catalyser + AdBlue
Dust*	< 8 mg/Nm ³ (except start-up)
NMHC*	< 100 mg / Nm ³

* Reference oxygen content: 5 vol% O₂.

* Lower emission values available on request.

Maintenance intervals

Maintenance interval gasifier	1 500 h
Maintenance time gasifier	ca. 3 h / maintenance, cooling-down period ca. 12 h
Maintenance interval CHP	800 h
Maintenance time CHP	1 h / maintenance
General maintenance	1 x year, ca. 1 day effort

Wear parts and consumables

Depending on the fuel used, the specifications of the wear parts and the consumption of operating materials and supplies, may deviate significantly from the values given.

Filter elements (synthesis gas and air)	Service life ca. 10 000 h
Gasifier air nozzles	Service life ca. 12 000 h
Gasifier rust with shaft	Service life ca. 15 000 h
Engine oil (and oil filter)	ca. 800 l per year
Spark plugs	Service life ca. 5 000 h
Catalysts	Service life ca. 20 000 h
AdBlue ^R	0 – 10 000 l per year depending on the exhaust emission regulations
Sealings, etc.	

All information in this product datasheet is to be understood as guide values and when using an optimal fuel in accordance with "VEE_272 Specification Wood Chips G30 – 50".