

# Jenbacher type 6



## cutting-edge technology

Continuously refined based on our extensive experience, the Jenbacher type 6 engines are reliable, advanced products serving the 1.8 to 3 MW power range. Its 1,500 rpm engine speed results in a high power density and low installation costs. The type 6 pre-combustion chamber achieves maximum efficiency with low emissions. Proven design and optimized components enable a service life of 60,000 operating hours before the first major overhaul.

## reference installations

### model, plant

### key technical data

### description

**J612 GS**  
**Beretta, industry;**  
**Gardone, Italy**

Fuel ..... Natural gas  
Engine type ..... 1 x JMS 612 GS-N.L  
Electrical output ..... 1,457 kW  
Thermal output ..... 1,704 kW  
Commissioning ..... December 1998

The generated electricity covers the entire electricity requirement of the Beretta factory, while the heat is used for the production process. By using our cogeneration system, Beretta was able to reduce the energy supply costs for the factory by 30%.



**J616 GS**  
**Mussafah Industrial**  
**City, residential area;**  
**Abu Dhabi, UAE**

Fuel ..... Natural gas  
Engine type ..... 3 x JGS 616 GS-N.L  
Electrical output ..... 6,018 kW  
Commissioning ..... June 2003

Three Jenbacher generator sets supply power generation for continuous operation of compressor chillers to provide chilled water for cooling to a residential area that incorporates apartments, shopping centres, mosques, a police station, and a cinema complex.



**J616 GS**  
**Van der Arend Roses;**  
**Maasland,**  
**The Netherlands**

Fuel ..... Natural gas  
Engine type ..... 2 x JMS 616 GS-N.LC  
Electrical output ..... 4,376 kW  
Thermal output ..... 5,256 kW  
Commissioning ..... February  
and December 2003

The Jenbacher cogeneration systems provide power for artificial lighting, heat and CO<sub>2</sub> to increase the greenhouse rose production capabilities. The CO<sub>2</sub> produced from the exhaust gas of the engines is used for fertilization in the greenhouses.



**J620 GS**  
**Biomass power plant;**  
**Güssing, Austria**

Fuel ..... Wood gas  
Engine type ..... 1 x JMS 620 GS-S.L  
Electrical output ..... 1,964 kW  
Thermal output ..... 2,490 kW  
(district heating 70°C/90°C)  
Commissioning ..... April 2002

The wood gas produced and cleaned in a fluidized bed/steam reactor is converted into heat and power in the Jenbacher cogeneration plant and forms an important component in an innovative project aimed at meeting 100% of the region's energy needs from renewable sources.



# technical features

feature	description	advantages
<b>Four-valve cylinder head</b>	Centrally located purged pre-combustion chamber, developed using advanced calculation and simulation methods (CFD)	- Minimized charge-exchange losses - Highly efficient and stable combustion - Optimal ignition conditions
<b>Heat recovery</b>	The oil heat exchanger can be specified as a two-stage plate heat exchanger	- Maximum thermal efficiency, even at high and fluctuating return temperatures
<b>Air/fuel mixture charging</b>	Fuel gas and combustion air are mixed at low pressure before entering the turbocharger	- Main gas supply with low gas pressure - Mixture homogenized in the turbocharger
<b>Pre-combustion chamber</b>	The ignition energy of the spark plug is amplified in the pre-combustion chamber	- Highest efficiency - Lowest NOx emission values - Stable and reliable combustion
<b>Special gas mixer</b>	Specific version for special gases with low calorific values	- Trouble-free operation with special gases with large calorific value differences

# technical data

Configuration	V 60°		
Bore (mm)	190		
Stroke (mm)	220		
Displacement/cylinder (lit)	6.24		
Speed (rpm)	1,500 (50 Hz) 1,500 with gearbox (60 Hz)		
Mean piston speed (m/s)	11 (1,500 rpm)		
Scope of supply	Generator set, cogeneration system		
Applicable gas types	Natural gas, flare gas, biogas, landfill gas, sewage gas. Special gases (e.g., coal mine gas, coke gas, wood gas, pyrolysis gas)		
Engine type	J612 GS	J616 GS	J620 GS
No. of cylinders	12	16	20
Total displacement (lit)	74.9	99.8	124.8

## Dimensions l x w x h (mm)<sub>1</sub>

Generator set	J612 GS	7,600 x 2,200 x 2,800
	J616 GS	8,300 x 2,200 x 2,800
	J620 GS	8,900 x 2,500 x 2,800
Cogeneration system	J612 GS	7,600 x 2,200 x 2,800
	J616 GS	8,300 x 2,200 x 2,800
	J620 GS	8,900 x 2,500 x 2,800

## Weights empty (kg)<sub>1</sub>

	J612 GS	J616 GS	J620 GS
Generator set	19,100	22,400	28,000
Cogeneration system	19,600	22,900	28,600

1) Dimensions and weights are valid for 50 Hz applications.

# outputs and efficiencies

## Natural gas

### 1,500 rpm | 50 Hz

### 1,500 rpm | 60 Hz

NOx <	Type	Pel (kW) <sub>2</sub>	η <sub>el</sub> (%)	Pth (kW) <sub>3</sub>	η <sub>th</sub> (%)	η <sub>tot</sub> (%)	Pel (kW) <sub>2</sub>	η <sub>el</sub> (%)	Pth (kW) <sub>3</sub>	η <sub>th</sub> (%)	η <sub>tot</sub> (%)
500 mg/Nm <sup>3</sup>	612	1,820	43.3	1,792	42.7	86.0	1,803	42.9	1,814	43.2	86.1
	616	2,433	43.4	2,399	42.8	86.2	2,390	42.6	2,431	43.4	86.0
	620	3,041	43.0	3,020	42.7	85.7	2,994	42.3	3,062	43.3	85.6
250 mg/Nm <sup>3</sup>	612	1,820	42.6	1,843	43.2	85.8	1,803	42.2	1,865	43.7	85.9
	616	2,433	42.9	2,420	42.7	85.6	2,390	42.2	2,452	43.3	85.5
	620	3,041	42.3	3,070	42.7	85.0	2,994	41.6	3,112	43.3	84.9

## Biogas

### 1,500 rpm | 50 Hz

### 1,500 rpm | 60 Hz

NOx <	Type	Pel (kW) <sub>2</sub>	η <sub>el</sub> (%)	Pth (kW) <sub>3</sub>	η <sub>th</sub> (%)	η <sub>tot</sub> (%)	Pel (kW) <sub>2</sub>	η <sub>el</sub> (%)	Pth (kW) <sub>3</sub>	η <sub>th</sub> (%)	η <sub>tot</sub> (%)
500 mg/Nm <sup>3</sup>	612	1,458	39.8	1,648	45.0	84.8	1,433	39.1	1,671	45.6	84.7
	616	1,946	39.8	2,196	45.0	84.8	1,914	39.2	2,220	45.4	84.6
	620	2,425	39.7	2,746	45.0	84.7	2,388	39.1	2,779	45.5	84.6
250 mg/Nm <sup>3</sup>	612	1,458	39.2	1,645	44.2	83.4	1,433	38.5	1,668	44.8	83.3
	616	1,946	39.2	2,194	44.2	83.4	1,914	38.6	2,218	44.7	83.3
	620	2,425	39.1	2,743	44.2	83.3	2,388	38.5	2,776	44.7	83.2

2) Electrical output based on ISO standard output and standard reference conditions according to ISO 3046/-1991 and p.f. = 1.0 according to VDE 0530 REM with respective tolerance; minimum methane number 80 for natural gas

3) Total heat output with a tolerance of +/- 8%, exhaust gas outlet temperature 120°C, for biogas exhaust gas outlet temperature 180°C

All data according to full load and subject to technical development and modification.