

# JENBACHER TYPE 6

## Cutting-edge technology

Continuously refined based on our extensive experience, Jenbacher Type 6 engines are reliable, advanced products serving the 2 to 4.5 MW power range. The 1,500 rpm engine speed provides high power density and low specific installation costs. The Type 6 precombustion chamber enables high efficiency with low emissions. Proven design and enhanced components support a service life of 60,000 operating hours before the first major overhaul. The J624 model features the advanced 2-stage turbocharging technology, which offers high electrical and total efficiencies combined with improved flexibility over a wide range of ambient conditions.



## Reference installations

### J616 & J620—BMW Group, Germany



The cogeneration plants installed at BMW Group's<sup>1</sup> factories in Regensburg and Leipzig can generate on-site power and capture engine waste heat for the factories' production processes. Winter heating is obtained through a combination of the engines' waste heat and heat from existing boilers.

<b>Engines</b>	5 x J616, 2 x J620
<b>Electrical output</b>	20.1 MW
<b>Thermal output</b>	18.23 MW
<b>Energy source</b>	Pipeline gas
<b>Commissioning</b>	2009, 2011, 2012, 2016

### J620—Shandong Minhe Biological Technology Co., LTD, China



The Shandong Minhe biogas power generation system in Penglai City is powered by three J320 engines, installed in 2009 and one J620 engine, which was installed in 2018. The plant achieves 6.2 MW of electrical output, using biogas which is produced by using chicken manure and sewage fermentation.

<b>Engines</b>	3 x J320, 1 x J620
<b>Electrical output</b>	6.2 MW
<b>Thermal output</b>	6.4 MW
<b>Energy source</b>	Biogas
<b>Commissioning</b>	2009, 2018

### J624—Hakha CES, South Korea



With a total of six Jenbacher J624 engines running on pipeline gas, the Hakha, Daejeon site reaches 25,182 kW of electrical output while achieving total efficiencies of 87%. The installation of these Jenbacher engines makes the site one of the largest gas engine plants in South Korea.

<b>Engines</b>	6 x J624
<b>Electrical output</b>	25.18 MW
<b>Thermal output</b>	25.35 MW
<b>Energy source</b>	Pipeline gas
<b>Commissioning</b>	2014

### J612 & J624—Den Berk Délice, Belgium



At the Berinckx Greenhouse in Belgium, high-efficiency Jenbacher engines running on pipeline gas provide heat and power to the greenhouse complex while the generated carbon dioxide (CO<sub>2</sub>) fertilizes the tomatoes being grown there. The 1,500-rpm Jenbacher Type 6 engine technology delivers high power density with low installation costs, and its pre-combustion chamber achieves high efficiency with low emissions. The Berinckx Greenhouse is part of Den Berk Délice's greenhouses, which cultivates 82 hectares of tomatoes.

<b>Engines</b>	1 x J612, 2 x J624
<b>Electrical output</b>	11 MW
<b>Thermal output</b>	12.8 MW
<b>Energy source</b>	Pipeline gas
<b>Commissioning</b>	2013, 2018, 2022

Technical features

Feature	Description	Advantages
Four-valve cylinder head	Centrally located purged pre-combustion chamber, developed using advanced calculation and simulation methods (CFD)	Reduced charge-exchange losses, highly efficient and stable combustion, optimal ignition conditions
Heat recovery	Flexible arrangement of heat exchanger, two stage oil plate heat exchanger on demand	High thermal efficiency, even at high and fluctuating return temperatures
Air/fuel mixture charging	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
Pre-combustion chamber	The ignition energy of the spark plug is amplified in the pre-combustion chamber	High efficiency, lowest NO <sub>x</sub> emission values, stable and reliable combustion
Gas dosing valve	Electronically controlled gas dosing valve with high degree of control accuracy (for natural gas)	Very quick response time, rapid adjustment of air/gas ratio, large adjustable calorific value range
2-stage turbocharging	Next generation turbocharging technology concept (for J624 only)	Improved performance in terms of output and efficiency, increased flexibility regarding ambient conditions

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 1/min)			
Scope of supply	Generator set, cogeneration system, containerized package			
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	J616	J620	J624
No. of cylinders	12	16	20	24
Total displacement (lit)	74.9	99.8	124.8	149.7

Dimensions l x w x h (mm)		
Generator set	J612	7,600 x 2,200 x 3,000
	J616	8,300 x 2,200 x 3,000
	J620	9,500 x 2,200 x 3,000
	J624	12,800 x 2,500 x 3,100
Cogeneration system	J612	7,600 x 2,200 x 3,000
	J616	8,300 x 2,200 x 3,000
	J620	9,300 x 2,200 x 3,000
Containerized package <sup>2</sup>	J624	12,800 x 2,500 x 3,100
	J612–J624	12,000 – 20,500 x 3,000 – 6,000 x 3,800 – 15,000
Weights empty (kg)		
Generator set	J612	24,000
	J616	29,200
	J620	36,900
	J624	52,100
Cogeneration system	J612	24,500
	J616	29,700
	J620	37,500
	J624	52,100

Dimensions and weights are valid for 50 Hz applications

Outputs and efficiencies

Natural gas		1,500 1/min   50 Hz					1,800 1/min   60 Hz				
NO <sub>x</sub> <sup>c</sup>	Type	Pel (kW) <sup>3</sup>	Pth (kW) <sup>4</sup>	η <sub>el</sub> (%) <sup>3</sup>	η <sub>th</sub> (%) <sup>4</sup>	η <sub>tot</sub> (%)	Pel (kW) <sup>3</sup>	Pth (kW) <sup>4</sup>	η <sub>el</sub> (%) <sup>3</sup>	η <sub>th</sub> (%) <sup>4</sup>	η <sub>tot</sub> (%)
500 mg/m <sup>3</sup> <sub>N</sub>	J612	2,000	1,904	45.2	43.0	88.2	1,986	1,904	44.9	43.0	87.9
	J616	2,677	2,503	45.7	42.7	88.4	2,662	2,503	45.4	42.7	88.1
	J620	3,349	3,179	45.4	43.1	88.5	3,328	3,179	45.1	43.1	88.3
	J624	4,496	3,957	46.5	41.1	87.6	4,467	3,975	46.5	41.3	87.8
250 mg/m <sup>3</sup> <sub>N</sub>	J612	2,000	1,958	44.5	43.6	88.1	1,986	1,958	44.2	43.6	87.7
	J616	2,677	2,598	44.9	43.6	88.4	2,662	2,598	44.6	43.6	88.2
	J620	3,349	3,191	44.6	42.5	87.1	3,328	3,191	44.3	42.5	86.8
	J624	4,496	4,023	45.5	41.0	86.6	4,467	4,041	45.5	41.2	86.7

Biogas		1,500 1/min   50 Hz					1,800 1/min   60 Hz				
NO <sub>x</sub> <sup>c</sup>	Type	Pel (kW) <sup>3</sup>	Pth (kW) <sup>4</sup>	η <sub>el</sub> (%) <sup>3</sup>	η <sub>th</sub> (%) <sup>4</sup>	η <sub>tot</sub> (%)	Pel (kW) <sup>3</sup>	Pth (kW) <sup>4</sup>	η <sub>el</sub> (%) <sup>3</sup>	η <sub>th</sub> (%) <sup>4</sup>	η <sub>tot</sub> (%)
500 mg/m <sup>3</sup> <sub>N</sub>	J612	2,000	1,770	44.6	39.5	84.1	1,986	1,770	44.3	39.5	83.8
	J616	2,677	2,360	44.8	39.5	84.2	2,662	2,360	44.5	39.5	84.0
	J620	3,349	2,950	44.8	39.5	84.3	3,326	2,950	44.5	39.5	84.0
250 mg/m <sup>3</sup> <sub>N</sub>	J612	2,000	1,825	43.6	39.8	83.4	1,986	1,825	43.3	39.8	83.1
	J616	2,677	2,432	43.8	39.8	83.6	2,662	2,432	43.6	39.8	83.3
	J620	3,349	3,042	43.8	39.8	83.6	3,326	3,042	43.5	39.8	83.3

<sup>2</sup> The dimensions refer to the standard base models with horizontal exhaust silencer.

<sup>3</sup> Technical data according to ISO 3046

<sup>4</sup> Total heat output with a tolerance of +/- 8%, exhaust gas outlet temperature 120°C, for biogas gas outlet temperature 180°C

All data according to full load and subject to technical development and modification. Further engine versions available on request.



In general, "Ready for H<sub>2</sub>" Jenbacher units can be converted to operate on up to 100% hydrogen in the future. Details on the cost and timeline for a future conversion may vary and need to be clarified individually.

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