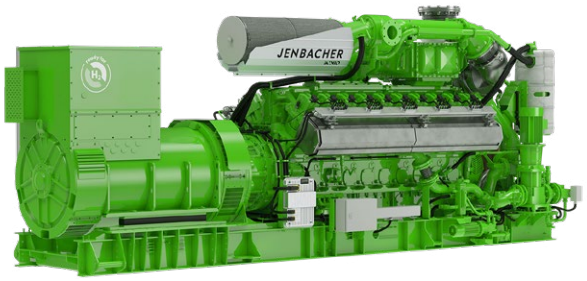
JENBACHER

JENBACHER TYPE 4

An efficiency milestone delivering high reliability and availability

Based on proven design concepts of Types 3 and 6, the modern Jenbacher Type 4 engines in the 800 to 1,560 kW power range are characterized by high power density and outstanding efficiency. Enhanced control and monitoring support simplified preventative maintenance, as well as high reliability and availability.



Reference installations

J416 – AGR Fenland Glasshouse, UK



AGR's Fenland Glasshouse and energy center includes a combined heat and power (CHP) plant comprising three high-efficiency Jenbacher engines that deliver electricity, while an exhaust cooling system supplies recovered CO_2 to help the plants grow. Additionally, an innovative 33 MWth heat pump system provides renewable hot water heating for the facility.

Engines	1 x J416, 1 x J620, 1 x J624
Electrical output	9 MW
Thermal output	11.2 MW
Energy source	Natural gas
Commissioning	2022

J420 – Heslerhof, Germany



With the installation of a Jenbacher J420 engine and investments into a large buffer storage tank and a gas storage tank, the biogas plant at the Heslerhof farm was converted into a renewable storage power plant with flexible, power market-driven operation. The farm generates its own power, which is used to supply all the electricity it requires, and surplus power is fed into the grid at attractive feed-in tariffs at market rates.

Engine	1 x J420
Electrical output	1.56 MW
Thermal output	1.8 MW
Energy source	Biogas
Commissioning	2021

J420 – Chok Yuen Yong Industry Co., Ltd, Thailand



Five Jenbacher J420 biogas-fueled engines produce more than enough electric power to supply Chok Yuen Yong Industry's tapioca starch factory. The excess electricity produced by the engines – about 1,000 kW – is supplied to the public grid to further reduce the facility's power costs.

Engines	5 x J420
Electrical output	7.1 MW
Thermal output	5.2 MW
Energy source	Biogas
Commissioning	2012, 2017

J420 – Hefei Xiaomiao Organic Waste Treatment Center, China



The Hefei Xiaomiao project pretreats organic waste and turns it into biogas through anaerobic digestion at its nearly 67,000-square-meter facility. Two Jenbacher J420 biogas-fueled gensets power the facility and also supply power to the local grid.

Engines	2 x J420
Electrical output	3 MW
Thermal output	1.2 MW
Energy source	Biogas
Commissioning	2021

Technical features

Feature	Description	Advantages
Heat recovery	Flexible arrangement of heat exchanger, including an optional two-stage oil plate heat exchanger on demand	— High thermal efficiency, even at high and fluctuating return temperatures
Gas dosing valve	Electronically controlled gas dosing valve with a high degree of control accuracy	— Fast response time — Rapid adjustment of air/gas ratio — Wide adjustable calorific value range
Four-valve cylinder head	Enhanced swirl and channel geometry developed using advanced computational and simulation methods (CFD)	— Reduced charge-exchange losses — Central spark plug position supporting optimal cooling and combustion conditions
Crack connecting rod	Proven technology from the automotive industry applied in high-performance stationary engines	— High dimensional stability and accuracy — Reduced connecting rod bearing wear — Simplified maintenance

Technical data

Configuration			V 70°
Bore (mm)			145
Stroke (mm)			185
Displacement/cylinder (lit)			3.06
Speed (rpm)			1,800/1,200 (60 Hz) 1,500 (50 Hz)
Mean piston speed (m/s)			7.4 (1,200 1/min) 9.3 (1,500 1/min) 11.2 (1,800 1/min)
Scope of supply			Generator set, cogeneration system, generator set / cogeneration in container
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	J412	J416	J420
No. of cylinders	12	16	20
Total displacement (lit)	36.7	48.9	61.1

		Dimensions l x w x h (mm)
Generator set	J412	5,400 x 1,800 x 2,200
	J416	6,200 x 1,800 x 2,200
	J420	7,100 x 1,900 x 2,200
Cogeneration system	J412	6,000 x 1,800 x 2,200
	J416	6,700 x 1,800 x 2,200
	J420	7,100 x 1,800 x 2,200
Container[1] 40-foot	J412	12,200 x 3,000 x 2,700 – 5,300
	J416	12,200 x 3,000 x 2,700 – 5,300
	J420	12,200 x 3,000 x 2,700 – 5,300
		Weights empty (kg)
Generator set	J412	11,200
	J416	13,500
	J420	17,200
Cogeneration system	J412	11,800
	J416	14,100
	J420	17,800

Outputs and efficiencies

Natural gas		1,500 1/min | 50 Hz					1,800 1/min | 60 Hz					1,200 1/min | 60 Hz				
NO_x<	Type	Pel (kW)[2]	Pth (kW)[3]	ηel (%)[2]	ηth (%)[3]	ηtot (%)	Pel (kW)[2]	Pth (kW)[3]	ηel (%)[2]	ηth (%)[3]	ηtot (%)	Pel (kW)[2]	Pth (kW)[3]	ηel (%)[2]	ηth (%)[3]	ηtot (%)
500 mg/m³N	J412	902	928	43.4	44.6	88.0	853	960	41.7	46.9	88.6	630	641	41.8	42.5	84.4
	J416	1201	1244	43.4	44.9	88.3	1142	1281	41.8	46.9	88.7	846	856	42.1	42.6	84.7
	J416	1003	1029	43.5	44.6	88.1	-	-	-	-	-	-	-	-	-	-
	J420	1562	1649	43.7	46.1	89.9	1427	1602	41.8	46.9	88.8	1057	1085	41.7	42.8	84.6
	J420	1562	1833	42.4	49.7	92.1	-	-	-	-	-	-	-	-	-	-
250 mg/m³N	J412	902	967	42.2	45.2	87.4	853	1003	40.7	47.9	88.5	630	618	42.8	41.9	84.7
	J416	1201	1285	42.3	45.2	87.5	1142	1338	40.9	47.9	88.7	846	824	43.0	41.9	85.0
	J416	1003	1045	42.9	44.7	87.6	-	-	-	-	-	-	-	-	-	-
	J420	1501	1605	42.7	45.6	88.4	1427	1648	41.1	47.5	88.7	1057	1029	43.0	41.9	84.9
	J420	1562	1906	41.4	50.5	91.9	-	-	-	-	-	-	-	-	-	-

Biogas		1,500 1/min | 50 Hz					1,800 1/min | 60 Hz				
NO_x<	Type	Pel (kW)[2]	Pth (kW)[3]	ηel (%)[2]	ηth (%)[3]	ηtot (%)	Pel (kW)[2]	Pth (kW)[3]	ηel (%)[2]	ηth (%)[3]	ηtot (%)
500 mg/m³N	J412	751	750	42.2	42.2	84.4	-	-	-	-	-
	J412	902	916	42.7	43.3	86.0	853	916	41.2	44.2	85.4
	J412	935	914	43.3	42.3	85.6	-	-	-	-	-
	J416	1004	994	42.5	42.1	84.6	-	-	-	-	-
	J416	1201	1217	42.7	43.3	86.0	1142	1220	41.4	44.2	85.5
	J416	1248	1225	43.3	42.4	85.7	-	-	-	-	-
	J420	1501	1518	42.8	43.3	86.1	1427	1527	41.3	44.2	85.6
	J420	1562	1538	43.3	42.6	85.9	-	-	-	-	-
250 mg/m³N	J412	902	930	42.0	43.4	85.4	853	933	40.5	44.3	84.8
	J416	1201	1236	42.1	43.4	85.5	1142	1237	40.6	44.0	84.7
	J420	1501	1544	42.2	43.4	85.6	1427	1556	40.6	44.3	85.0

[1] The dimensions refer to the standard base models with horizontal exhaust silencer.
[2] Technical data according to ISO 3046
[3] 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. Additional engine versions available on request.

In general, "Ready for H_2" 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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