

JENBACHER TYPE 4 H2-ENGINE

Our hydrogen technology is working today and accelerating a cleaner tomorrow.

Since the beginning of 2022, INNIO's entire 50 Hz pipeline gas product portfolio has been offered with a "Ready for H₂"* option. All Jenbacher engines can be offered with a "Ready for H₂" package that allows acceptance of up to 20% (vol) of hydrogen in pipeline gas.

Fueled by either 100% hydrogen or a variable hydrogen / pipeline gas mixture of up to 100% hydrogen content, our proven Jenbacher Type 4 engines are setting a benchmark on the path towards a net-zero future. Even existing engines can be converted to 100% H₂ operation.

The innovative Jenbacher Type 4 engines in the 800 to 1,000 kW power range for standard gaseous fuels are characterized by high-power density and outstanding efficiency. Backed by INNIO's cloud-based intelligent digital platform myPlant, these engines provide easy preventive maintenance, high reliability, and excellent availability.



Jenbacher H2-Engine reference

J416 HanseWerk Natur in Hamburg, Germany

Energy Source	Engine type	Electrical output	Total efficiency	Commissioning
Pipeline gas / 100% H ₂	1 x J416	100% pipeline gas: 999 kW / 100% H ₂ : > 600 kW	93.5%	2020



HanseWerk Natur, an E.ON company, is showcasing a flagship CHP project in Hamburg. The 1 MW Jenbacher J416 is optimized for pipeline gas operation and high total efficiency. Additionally, the engine can run on a variable hydrogen mixture from 0% up to 100% (100% H₂ for short-term demo operation). This is powerful proof that our Jenbacher Type 4 engines can operate exclusively on hydrogen and demonstrates the convertibility of existing engines to 100% H₂ operation.

H2-Engine

Feature	Description	Advantages
Port injection	Includes individual cylinder H ₂ fuel injection valves for combustion optimization and balancing. Also an increased safety feature during H ₂ operation	<ul style="list-style-type: none"> - Very quick response time - Rapid adjustment of cylinder individual air / gas ratio - Increased safety to avoid pre-ignition, overloading of individual cylinders, reduction of back-fire risk during irregular combustion events
Cylinder selective combustion control	Enables cylinder individual combustion optimization with high control accuracy, e.g., fuel injection balancing per cylinder. Fast response during irregular combustion events	<ul style="list-style-type: none"> - Very quick response time - Increased safety feature with fast response during irregular combustion events, e.g., pre-ignition, etc. - Rapid adjustment of engine or cylinder individual operation point
Optimized turbocharger with waste gate	Enables dual fuel operation and efficiency optimization	<ul style="list-style-type: none"> - Maintains turbocharger speed limits - Optimization of engine and turbocharger operation point

* Optional Scope on Demand.

Technical data

Configuration		V 70°		Dimensions l x w x h (in)	
Bore (mm)	145	Generator set	J416	250 x 75 x 90	
Stroke (mm)	185		J420	280 x 75 x 90	
Displacement / cylinder (lit)	3.06	Cogeneration system	J416	270 x 75 x 90	
Speed (rpm)	1,800 (60 Hz)		J420	280 x 75 x 90	
Mean piston speed (m/s)	11.2 (1,800 1/min)	Container	J416	480 x 120 x 114	
			J420	480 x 120 x 114	
Scope of supply	Generator set, cogeneration system, generator set / cogeneration in container		Weights empty (lbs)		
Applicable gas types	Pipeline gas / hydrogen and mixtures of both		Generator set	J416	27,780
				J420	34,620
Engine type	J416	J420	Cogeneration system	J416	29,100
No. of cylinders	16	20		J420	35,940
Total displacement (lit)	48.9	61.1			

Subject to technical development and modification.

Outputs and efficiencies: 100% hydrogen

Expected values*		60 Hz	
Engine version		JMS 420 E980	JMS 416 E980
Energy input	kW	2,744	2,179
Electrical output	kW	1,070	850
Thermal output	MMbtu/hr	4,398	3,494
Electrical efficiency		39%	39%
Thermal efficiency (158/ 194°F)		47%	47%
Total efficiency		86%	86%
H ₂ gas amount	Scfh	34,163	27,107
H ₂ gas amount	kg/h	83	66
NO _x @5%O ₂ dry	g/bhp_hr	<0,2	<0,2

*target values for demo plant



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