

Jenbacher type 4

an efficiency milestone



Based on the proven design concepts of types 3 and 6, the modern type 4 engine in the 1.5 MW power range is characterized by a high power density and outstanding efficiency. The optimized control and monitoring provides easy preventive maintenance and maximum reliability and availability.

reference installations

model, plant

J420 GS
Landfill site
Bootham Lane;
Doncaster, UK

key technical data

Fuel..... Landfill gas
Engine type..... 2 x JGC 420 GS-L.L
Electrical output..... 2,832 kW
Commissioning..... May 2001,
December 2002

description

At this landfill site, the methane content of the landfill gas can drop as low as 35%. The fluctuations in the methane content can be handled easily by the Jenbacher engines due to the patented LEANOX® lean mixture combustion system. Thus these variations do not cause any reduction in the high output level of our power systems. The installation is operated by United Utilities Green Energy Limited.



J420 GS
Hospital;
Padua, Italy

Fuel..... Natural gas
Engine type..... 2 x JMS 420 GS-N.LC
Electrical output..... 2,832 kW
Thermal output..... 8,789 MBTU/hr
Commissioning..... February 2002,
October 2003

Two Jenbacher cogeneration systems help the Padua hospital to control its energy costs by providing power and heat at high efficiency levels.



J420 GS
Containerized
solution
Biogas plant SBR;
Kogel, Germany

Fuel..... Biogas
Engine type..... 1 x JMC 420 GS-B.LC
Electrical output..... 1,413 kW
Thermal output..... 2,565 MBTU/hr
Steam production..... 2,286 pounds/hr
at 43.5 psi or 2,384 MBTU/hr
Commissioning..... October 2003

This biogas plant utilizes leftover food from hospitals, hotels and canteens as well as organic residual waste from the food industry for producing biogas that fuels our gas engine. The electricity generated is entirely fed into the public grid, and the exhaust gas from the engine is used for steam production. The steam serves for the pasteurization of the waste, which can then be used as sterilized fertilizer.



technical features

feature	description	advantages
Heat recovery	The oil heat exchanger can be specified as a two-stage plate heat exchanger	- Maximum thermal efficiency, even at high and fluctuating return temperatures
TecJet™ gas dosing valve	Electronically controlled gas dosing valve with high degree of control accuracy	- Very quick response time - Rapid adjustment of air/gas ratio - Large adjustable calorific value range
Four-valve cylinder head	Optimized swirl and channel geometry using advanced calculation and simulation methods (CFD)	- Minimized charge-exchange losses - Central spark-plug position resulting in optimal cooling and combustion conditions
Crack connecting rod	Applying a technology – tried and tested in the automotive industry – in our powerful stationary engines	- High dimensional stability and accuracy - Reduced connecting rod bearing wear - Easy to maintain

technical data

Configuration	V 70°
Bore (inch)	5.71
Stroke (inch)	7.28
Displacement/cylinder (cu.in)	186.7
Speed (rpm)	1,800 (60 Hz)
Mean piston speed (in/s)	437
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	J420 GS
No. of cylinders	20
Total displacement (cu.in)	3,728

Dimensions l x w x h (inch)

Generator set	280 x 80 x 90
Cogeneration system	280 x 80 x 90
Container	490 x 120 x 110

Weights empty (lbs)

Generator set	32,800
Cogeneration system	34,300
Container (generator set)	78,200
Container (cogeneration)	79,700

outputs and efficiencies

Natural gas

1,800 rpm | 60 Hz

NOx <	Type	PeI (kW) ¹	η _{el} (%)	Pth (MBTU/hr) ²	η _{th} (%)	η _{tot} (%)
1.1 g/bhp.hr	420	1,426	40.8	5,459	45.8	86.6
0.6 g/bhp.hr	420	1,426	39.8	5,696	46.6	86.4

Biogas

1,800 rpm | 60 Hz

NOx <	Type	PeI (kW) ¹	η _{el} (%)	Pth (MBTU/hr) ²	η _{th} (%)	η _{tot} (%)
1.1 g/bhp.hr	420	1,426	40.3	5,163	42.8	83.1
0.6 g/bhp.hr	420	1,426	39.4	5,412	43.8	83.2

1) Electrical output based on ISO standard output and standard reference conditions according to ISO 3046/I-1991 and p.f. = 1.0 according to VDE 0530 REM with respective tolerance; minimum methane number 70 for natural gas

2) Total heat output with a tolerance of +/- 8%, exhaust gas outlet temperature 248°F, for biogas exhaust gas outlet temperature 356°F

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