2G Bio-Energietechnik

Technical data

JMS 420 GS-B.LC, Biogas 1,416 kW el.

CHP module data

Electric power	1,416 kW el.
Useful thermal output (180 °C)	1,459 kW
Supplied power	3,375 kW
Gas consumption at a heating value of 5 kWh/Nm³	675 Nm³/h
Electrical efficiency rating Thermal efficiency rating Overall efficiency rating	42.0% 43.2% 85.2%
Thermal output to be dissipated (NT cycle)	51 kW
Emissions values	NO_x < 500 mg/Nm³ (5% O_2) CO < 650 mg/Nm³ (5% O_2)

Engine data

Engine type	GE Jenbacher Gasmotor J 420 GS-A21
Design	V 70°
Cylinder number	20
Bore	145 mm
Stroke	185 mm
Engine capacity	61.10 l
Nominal speed	1,500 1/min
Mean piston speed	9.25 m/s
Mean effective pressure at nominal power and engine speed	19.00 bar
Compression ratio	12.5 Epsilon
Block. ISO standard performance ICFN	1,451 kW
Specific fuel consumption	2.33 kWh/kWh
Specific oil consumption	0.30 g/kWh
Dry weight (engine)	6,600 kg
Oil fill quantity	457 l
Quantity of methane	100 MZ

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Supplementary installation data

Sound pressure level motor (mean value 1m)	97 dB(A)
Sound pressure level exhaust gas (1 m distance, 30° lateral)	115 dB(A)
Exhaust gas mass flow rate humid Exhaust gas volume humid	7,585 kg/h 5,897 Nm³/h
max. exhaust gas back pressure from engine exhaust emiss.	60 mbar
Exhaust gas temperature at full load	448 °C [8]
Combustion air mass flow rate Combustion air volume flow rate	6,982 kg/h 5,401 Nm³/h
max. admissible GKW temp. (inflow mixture coolers)	55 °C
max. admissible intake resistance on the air filter	10 mbar
Return flow temperature	70 °C
Supply temperature	90 °C
Hot water flow rate	62.7 m³/h

Generator

Make	STAMFORD
Model	PE 734 F2
Type output	2,080 kVA
Efficiency rating cos phi = 1,0 Efficiency rating cos phi = 0,8	97.6% 96.8%
Nominal power cos phi = 1,0 Nominal power cos phi = 0,8	1,416 kW 1,405 kW
Frequency	50 Hz
Voltage	400 V
Protection category	IP 23
Insulation class	H
Engine speed	1,500 1/min
Mass	3,807 kg

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Technical boundary conditions

Standard performance conditions	in complicance with DIN-ISO 3046 in compliance with VDE 0530 REM with the corresponding tolerance
Standard reference conditions	air pressure: 1000 mbar or 100 m over NN air temperature: 25 °C or 298 K relative air humidity: 30%
Engine power reductions	For height installations > 500 m and/or air temperatures > 30°C the engine output reduction shall be determined specific to each project.
Gas quality	in accordance with technical instruction TA 1000-0300 gas pressure flow: 80 (110 landfill) - 200 (mbar) (lower gas pressures possible on request) Variation limitsof the preset flow pressure: ±10%

All data relate to the engine's full load at the specific media temperature and are subject to technical advancements.
The production facilities and installation systems must correspond to the technical instruction TA 1100-0110 „RANDBEDINGUNGEN FÜR GE Jenbacher GAS ENGINES".

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Scope of supply for Genset - JGS 420 GS-B.LC
Engine basic equipment

- Exhaust gas turbo charger, mixture cooler
- Motor-driven fuel gas/air mixture as a LEANOX regulating valve
- Electronic non-contacting high-voltage ignition system
- Lubricating oil gear wheel pump
- Lubricating oil filter in the main current
- Oil pan; lubricating oil heat exchanger
- Engine cooling water pump
- Fuel gas-, lubricatig- and cooling water lines on the engine
- Flywheel for generator operation; exhaust gas collector
- Vibration damper
- Knock sensors

Anciliary engine equipment

- Electric powered starter
- Electronic speed control
- Electronic rotation speed measurement with pulse pickup sensor with start and excess rotation speed monitoring
- Transmitter and switch for oil pressure, cooling water temperature, cooling water pressure, loading pressure and mixture temperature
- One thermocouple per cylinder

Supplied separately to the unit

Gas pressure control process acc. to DIN-DVGW consisting of

- Hand shutoff valve, gas filter, two electromagnetic valves, leak test equipment, gas pressure regulator

Documentation

- Operating and maintenance manual
- Spare parts list
- Drawings

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Power unit fittings

- Frame for engine construction, generator and heat exchangern
- Generator as internal pole alternator and exciter alternator and automatic voltage regulator; cos.-phi 0.8 inductive to 1.0
- Elastic coupling, clutch bell (housing)
- Elastic storage
- Intake air filter
- Automatic lubricating oil refilling incl. level monitoring
- Wiring of the components in the module interface cabinet
- Crankcase ventilation
- Electrical heat retaining facility

- Oxydation catalyser (for CO threshold values acc. to TA-Luft or 1/2 TA-Luft; for natural gas and PROPANE)

Module control cabinet

- One-door enclosed steel cabinet, wired to terminals ready for production, protection category IP 41 exterior, IP 10 inside, according to VDE standards

Essential facilities:

- Engine Management System dia.ne (Dialog Network)
  - Visualisation (Industry PC-10“ colour graphics display): operating data, regulator displays, exhaust gas temp. measurement, generator bonding, etc.
  - Central engine and power unit control: rotational speed, power, LEANOX regulator and knock control, etc.
- Multi-transducer
- Lockable operating mode selector switch with settings: „OFF“, „MANUAL“, „AUTOMATIC“
- Request switch

Installation, finishing, and power unit test run in Jenbach/Austria

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Scope of supply for module - JMS 420 GS-B.LC

basically like Genset, but including heat recovery

- Engine cooling water heat exchanger attached to the module frame
- Exhaust gas heat exchanger as a separate unit
- All heat exchangers with complete piping
- Heat exchangers with auxiliary equipment

Scope of supply for container - JG(M)C 420 GS-B.LC

- Basically like the module or Genset integrated in 40‘ standard container (65 dB(A) in 10m); completely tubed
- Dual-circuit table cooler to reject mixture, engine cooling water and oil heat; supply and exhaust air plant
- Gas and smoking warning station; sound absorber; lubricating oil system; start system; elastic connexions
- Own control room, completely wired; individual synchronisation; network decoupling; generator field

Scope of supply and design specification subject to country specific requirements and technical modifications.

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