GAS GENERATOR SET

Image shown may not reflect actual package

AG BIOGAS CONTINUOUS

163 ekW 203 kVA 50 HZ 1500 RPM
177 ekW 221 kVA 60 HZ 1800 RPM

Caterpillar is leading the power generation marketplace with power solutions engineered to deliver unmatched flexibility, expandability, reliability and cost-effectiveness.

FEATURES

FULL RANGE OF ATTACHMENTS

- Wide range of bolt-on system expansion attachments, factory designed and tested.
- Flexible packaging options for easy and cost effective installation.

PROVEN SYSTEM

- Fully prototype tested.
- Field proven in a wide range of applications worldwide.
- Certified torsional vibration analysis available

WORLDWIDE PRODUCT SUPPORT

- Cat® dealers provide extensive post sales support including maintenance and repair agreements
- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- The Cat® S•O•S SM program cost effectively detects internal engine component conditions, even the presence of unwanted fluids and combustion by-products

CAT® G3412 NA GAS ENGINE

- Robust high speed diesel block design provides prolonged life and lower owning and operating costs
- Designed for maximum performance on low pressure gaseous fuel supply.
- Simple open chamber combustion system for reliability and fuel flexibility.

CAT GENERATOR

- Designed to match performance and output characteristics of Cat gas engines
- Industry leading mechanical and electrical design
- High efficiency

CAT EMCP II+ CONTROL PANEL

- Simple user friendly interface and navigation
- Digital monitoring, metering and protection setting
- Fully-featured power metering and protection relayin
- Remote control and monitor capability options

CONTINUOUS 163 ekW 203 kVA @ 50 Hz 1500 rpm
177 ekW 221 kVA @ 60 Hz 1800 rpm

G3412 NA Product Consist (DTO for Ag Biogas Application)

System	Standard
Air Inlet	Air cleaner, single element Service indicator
Cooling	Engine driven pump for jacket water Package mounted radiator sized for 43°C / 110° F ambient up to 304 m / 1000 ft Coolant drain lines with valves piped to edge of base Cat Coolant (not included w/ radiator removal) Low coolant sensor (not included w/ radiator removal)
Exhaust	Exhaust manifolds, watercooled Stainless steel exhaust flex with two ship loose weld flanges
Fuel	Gas pressure regulator, requiring 1.5 to 5 psi pressure Carburetor sized for 500 to 750 btu/scf Ag Biogas (ship-loose) Energized-to-run gas shutoff valve (ETR GSOV)
Generator	SR4B self excited generator, includes: Class H insulation, Class F temperature rise (105° C Continuous) 12 Lead (600 volt generators are 6 lead) VR6 Voltage Regulator, 3-phase sensing with reactive droop, 2:1 Volts/Hz or 1:1 Volts/Hz Power terminal strip termination Extension box Segregated low voltage (AC/DC) wiring panel Random wound
Governing	Woodward 2301A speed control with EG3P actuator
Ignition	Digital Ignition System
Lubrication	Lubricating oil Oil cooler Oil filter Oil drain line with valve piped to edge of base Fumes disposal piped to front of radiator
Mounting	Wide, formed steel base Linear vibration isolators between base and engine-generator
Starting / Charging	24V DC starting motor 45A charging alternator Battery set w/ rack and cables Battery disconnect switch
General	Paint -- Caterpillar Yellow except rails & radiators; Crankshaft vibration damper Lifting eyes Operation and Maintenance Manuals; Parts Book.

CONTINUOUS 163 ekW 203 kVA @ 50 Hz 1500 rpm
177 ekW 221 kVA @ 60 Hz 1800 rpm

SPECIFICATIONS

CAT G3412 NA GAS ENGINE

4-Stroke-Cycle, Spark Ignited	
Number of Cylinders	V12
Bore mm (in)	137 (5.4)
Stroke mm (in)	152 (6.0)
Displacement L (cu in)	27.0 (1649)
Compression Ratio	9.7.1
Aspiration	Naturally Aspirated
Cooling Type	Combined JW and OC
Fuel System	LPG IMPCO
Ignition	Digital Ignition
Governor Type	Woodward 2301A

CAT SR4B GENERATOR

Frame size	591
Excitation	Self Excited
Pitch	0.7333
Number of poles	4
Number of bearings	1
Number of leads	12
Insulation	Class H
IP rating	Drip proof IP22
Alignment	Pilot shaft
Overspeed capability % of rated	50 Hz 180%
	60 Hz 150%
Waveform deviation line to line, no load	less than 5.0%
Voltage regulator -	VR6
Voltage level adjustment	+/- 5.0%
Voltage regulation, steady state	+/- 0.5%
Voltage regulation with 3% speed change	+/- 0.5%
Telephone Influence Factor (TIF)	less than 50

Consult ASC for available voltage

CAT EMCPII+ CONTROL PANEL

- Power by 24 volts DC
- NEMA 12, IP44 dust-proof enclosure
- Lockable hinged door
- Single-location customer connection
- Auto start/stop control switch
- Voltage adjustment potentiomenter
- True RMS AC metering, 3 phase
- Purge cycle and staged shutdown logic
- Digital indication for:
  - RPM
  - Operating hours
  - Oil pressure
  - Coolant temperature
  - DC voltage
  - L-L volts, L-N volts, phase amps, Hz, ekW, kVA, kVAR, kWhr, %kW, pf
  - System diagnostic codes
- Shutdown with indicating lights;
  - Low oil pressure
  - High coolant temperature
  - High oil temperature
  - Overspeed
  - Overcrank
  - Emergency stop
- Programmable protective relaying functions:
  - Under / Over voltage
  - Under / Over frequency
  - Overcurrent
  - Reverse power
- Spare indicator LEDs
- Spare alarm/shutdown inputs

CONTINUOUS 163 ekW 203 kVA @ 50 Hz 1500 rpm
177 ekW 221 kVA @ 60 Hz 1800 rpm

TECHNICAL DATA (With Fan)

G3412 NA Gas Package Generator Set for Ag Biogas			DM 8662 50Hz		DM 8661 60Hz	
Package Performance (1)						
Power Rating @ 0.8 pf (w/ JW pump and w/ fan)	ekW	Continuous	163		177	
Power Rating @ 0.8 pf (w/ JW pump and w/ fan)	kVA	Continuous	203		221	
Mechanical Power (w/ JW pump and w/o fan)	bkW	bhp	183	245	205	275
Fuel Consumption (2)						
100% load w/o fan	Nm^3/hr	scf/hr	97.9	3639	112.9	4205
75% load w/o fan	Nm^3/hr	scf/hr	80.7	3009	94.1	3495
50% load w/o fan	Nm^3/hr	scf/hr	59.3	2203	69.4	2563
Altitude Capability (3)						
At 25° C (77 ° F) ambient, above sea level	m	ft	153	500	153	500
Cooling System						
Ambient air temperature	Deg C	Deg F	25	77	25	77
Jacket water temperature (Maximum outlet)	Deg C	Deg F	99	210	99	210
Exhaust System						
Combustion air inlet flow rate	Nm^3/min	SCFM	10.8	416	12.5	482
Exhaust stack gas temperature	Deg C	Deg F	562	1043	600	1113
Exhaust gas flow rate	Nm^3/min	CFM	11.9	1300	13.8	1573
Exhaust flange size (internal diameter)	mm	in	152.4	6	152.4	6
Heat Rejection (4)						
Heat rejection to jacket water	kW	Btu/min	222	12609	248	14119
Heat rejection to lube oil	kW	Btu/min	35	1994	39	2232
Heat rejection to exhaust (LHV to 350° F)	kW	Btu/min	119	6749	151	8617
Heat rejection to exhaust (LHV to 120° C)	kW	Btu/min	136	7741	172	9790
Heat rejection to atmosphere from engine	kW	Btu/min	25	1441	29	1662
Heat rejection to atmosphere from generator	kW	Btu/min	10.8	615	13.3	757
Generator						
Frame			591		591	
Temperature rise at Continuous Rating	Deg C	Deg F	80	144	80	144
Motor starting capability @ 30% voltage dip **(5)**	skVA		814		956	
Lubrication System						
Standard sump refill with filter change	L	gal	170	45	170	45
Emissions (6)						
NO_x (as NO_2) @ 5% O_2 (dry)	mg/Nm^3	g/bhp-hr	7051	19.92	5618	16.39
CO @ 5% O_2 (dry)	mg/Nm^3	g/bhp-hr	1740	4.92	1254	3.66
THC @ 5% O_2 (dry)	mg/Nm^3	g/bhp-hr	886	2.51	846	2.47
NMHC @ 5% O_2 (dry)	mg/Nm^3	g/bhp-hr	133	0.38	127	0.38
Exhaust O_2 (dry)	%	%	2		2	

CONTINUOUS 163 ekW 203 kVA @ 50 Hz 1500 rpm
177 ekW 221 kVA @ 60 Hz 1800 rpm

TECHNICAL DATA (Without Fan)

G3412 NA Gas Package Generator Set for Ag Biogas			DM 8705 50Hz		DM 8704 60Hz	
Package Performance (1)						
Power Rating @ 0.8 pf (w/ JW pump and w/o fan)	ekW	Continuous	172		191	
Power Rating @ 0.8 pf (w/ JW pump and w/o fan)	kVA	Continuous	215		238	
Mechanical Power (w/ JW pump and w/o fan)	bkW	bhp	183	245	205	275
Fuel Consumption (2)						
100% load w/o fan	Nm^3/hr	scf/hr	97.9	3639	112.9	4205
75% load w/o fan	Nm^3/hr	scf/hr	80.7	3009	94.1	3495
50% load w/o fan	Nm^3/hr	scf/hr	59.3	2203	69.4	2563
Altitude Capability (3)						
At 25° C (77 ° F) ambient, above sea level	m	ft	153	500	153	500
Cooling System						
Ambient air temperature	Deg C	Deg F	25	77	25	77
Jacket water temperature (Maximum outlet)	Deg C	Deg F	99	210	99	210
Exhaust System						
Combustion air inlet flow rate	Nm^3/min	SCFM	10.8	416	12.5	482
Exhaust stack gas temperature	Deg C	Deg F	562	1043	600	1113
Exhaust gas flow rate	Nm^3/min	CFM	11.9	1300	13.8	1573
Exhaust flange size (internal diameter)	mm	in	152.4	6	152.4	6
Heat Rejection (4)						
Heat rejection to jacket water	kW	Btu/min	222	12609	248	14119
Heat rejection to lube oil	kW	Btu/min	35	1994	39	2232
Heat rejection to exhaust (LHV to 350° F)	kW	Btu/min	119	6749	151	8617
Heat rejection to exhaust (LHV to 120° C)	kW	Btu/min	136	7741	172	9790
Heat rejection to atmosphere from engine	kW	Btu/min	25	1441	29	1662
Heat rejection to atmosphere from generator	kW	Btu/min	11.2	638	13.9	791
Generator						
Frame			591		591	
Temperature rise at Continuous Rating	Deg C	Deg F	80	144	80	144
Motor starting capability @ 30% voltage dip (5)	skVA		814		956	
Lubrication System						
Standard sump refill with filter change	L	gal	170	45	170	45
Emissions (6)						
NO_x (as NO_2) @ 5% O_2 (dry)	mg/Nm^3	g/bhp-hr	7051	19.92	5618	16.39
CO @ 5% O_2 (dry)	mg/Nm^3	g/bhp-hr	1740	4.92	1254	3.66
THC @ 5% O_2 (dry)	mg/Nm^3	g/bhp-hr	886	2.51	846	2.47
NMHC @ 5% O_2 (dry)	mg/Nm^3	g/bhp-hr	133	0.38	127	0.38
Exhaust O_2 (dry)	%	%	2		2	

RATING DEFINITIONS AND CONDITIONS

(1) Continuous – Maximum output available for an unlimited time.

Ratings are based on low energy gas having a Low Heat Value (LHV) of 23.3 MJ/Nm^3 (593 Btu/ft^3) and 1.9 of THC: Free Inert Ratio.
For values in excess of altitude. ambient temperature, inlet/exhaust restriction, or different from the conditions listed, contact your Cat Dealer.

(2) Ratings and fuel consumption are based on ISO 3046/1 standard reference conditions of 25° C (77° F) of ambient temperature and 100 kPa (29.61 in Hg) of total barometric pressure, 30% relative humidity with 0, +5% fuel tolerance.

(3) Altitude capability is based on 2.5 kPa air filter and 5.0 kPa exhaust stack restrictions.

(4) Heat rejection – Values based on nominal data with fuel tolerance of +/-2.5% and 2.5 kPa inlet and 5.0 kPa exhaust restrictions.

(5) Assume synchronous driver

(6) Emissions data measurements are consistent with those described in EPA CFR 40 Part 89 Subpart D & E and ISO8178-1 for measuring HC, CO, PM NO_X. Data shown is based on steady state engine operating conditions of 25°C (77°F), 96.28 kPa (28.43 Hg) and fuel having a LHV of 35.6 MJ/Nm^3 (905 Btu/cu ft) and 80 Cat Methane Number at 101.60 kPa (30.00 in Hg) absolute and 0° C (32° F). Emission data shown is subject to instrumentation, facility and engine fuel system adjustment.

CONTINUOUS 103 ekW 129 kVA @ 50 Hz 1500 rpm
132 ekW 165 kVA @ 60 Hz 1800 rpm

DIMENSIONS

Package Dimensions		
Length	4542.0 mm	178.9 in
Width	2238.0 mm	88.2 in
Height	2189.0 mm	86.2 in
Approx. Shipping Weight	4383.5 kg	9664 lb

Note: Do not use for installation design.
See general dimension drawings
for details
(Drawing Number 328-1904)

Performance Number : DM8661, DM8662, DM8704, DM8705
Feature Codes: DTO
Generator Arr:: 1737078
Source: US Sourced

www.Cat-ElectricPower.com