

GAS GENERATOR SET



Image shown may not reflect actual package

CATERPILLAR®

Natural Gas Continuous (Island Mode Operation) 1966 ekW 2458 kVA 50 Hz 1500 rpm 400 Volts

Caterpillar® is leading the power generation market place with power solutions engineered to deliver unmatched performance, reliability, durability and cost-effectiveness.

BENEFITS

EMISSIONS

- Meets most worldwide emissions requirements down to 250 mg/NM³ No_x level without after-treatment.

FULL RANGE OF ATTACHMENTS

- Wide range of bolt-on system expansion attachments, factory designed and tested

WORLDWIDE PRODUCT SUPPORT

- Caterpillar dealers have over 1,600 dealer branch stores operating in 200 countries.
- Comprehensive post-sales support including maintenance and repair agreements that are re-tailored to your specific equipment application.
- High skilled technicians are trained to service every aspect of your electric power generation system.
- The Cat® SOSsm Service monitors and tracks internal engine component condition providing the capability to maximize product performance and minimizing owning and operating costs.

CAT G3520C GAS ENGINE

- Robust high speed block design provides prolonged life and lower owning and operating costs.
- Designed for maximum performance on low pressure pipeline natural gas
- Simple open chamber combustion system for reliability and fuel flexibility
- Leading edge technology in ignition system and air/fuel ratio control for lower emission and engine efficiency.
- One electronic control module handles all engine functions: ignition, governing, air/fuel ratio control and engine protection
- Island Mode feature improves engine's capability to handle electrical loading and unloading.

CAT® SR4B GENERATOR

- Designed to match performance and output characteristics of Caterpillar 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 protective relaying.
- Remote control and monitor capability options

Factory Installed Standard & Optional Equipment

System	Standard	Optional
Gas Engine Control Module (GECM)	Fuel/air ratio control; Start/stop logic: gas purge cycle, staged shutdown; Engine Protection System: detonation sensitive timing, high exhaust temperature shutdown; Governor: Transient richening and turbo bypass control; Ignition. Island Mode Feature -- additional engine control module, new software and engine sensors	
Air Inlet	Two element, single-stage air cleaner with enclosure and service indicator	Air cleaner with precleaner; Mounting stand
Control Panel	EMCP II+ Kilowatt transducer (ship loose for LV & MV, installed in wall mounted EMCP for HV)	Local alarm module; Remote annunciator; Communications Module (PL1000T, PL1000E) Synchronizing module; Engine failure relay
Cooling	Engine driven water pumps for jacket water and aftercooler; Jacket water and SCAC thermostats; ANSI/DN customer flange connections for JW inlet and outlet Cat flanges on SCAC circuit	Remote radiator for JW and SCAC circuits, level switch included but not wired, coolant level drain line with valves, fan with guard; Inlet/Outlet connections.
Exhaust	Dry exhaust manifolds, insulated and shielded; Center section cooled turbocharger with Cat flanged outlet; Individual exhaust port and turbocharger outlet wired to Integrated Temperature Sensing Module (ITSM) with GECM providing alarms and shutdowns.	Flange; Exhaust expander; Elbow; Flexible fitting; Muffler and spark-arresting muffler with companion flanges.
Fuel	Electronic fuel metering valve; Throttle plate, 24V DC actuator, controlled by GECM; Fuel system is sized for 31.5 to 47.2 MJ/NM ³ (800 to 1200 Btu/cu ft) dry pipeline natural gas with pressure of 10.2 to 34.5 kPa (1.5 to 5 psi) to the engine fuel control valve.	Fuel filter; Gas pressure regulator; Gas shutoff valve, 24V, ETR (Energized-To-Run)
Generator	SR4B generator, includes: Caterpillar's Digital Voltage Regulator (CDVR) with 3-phase sensing and KVAR/PF control; Reactive droop; Bus bar connections; Winding temperature detectors; Anti-condensation space heater.	Medium and high voltage generators and attachments; Low voltage extension box; Cable access box; Air filter for generator; Bearing temperature detectors; Manual voltage control; European bus bar.
Governing	Electronic speed governor as part of GECM; Electronically-controlled 24V DC actuator connected to throttle shaft.	Woodward load sharing module
Ignition	Electronic Ignition System controlled by GECM; Individual cylinder Detonation Sensitive Timing (DST)	
Lubrication	Lubricating oil; Gear type lube oil pump; Oil filter, filler and dipstick Integral lube oil cooler; Oil drain valve; Crankcase breather.	Oil level regulator; Prelube pump; Positive crankcase ventilation system
Mounting	330 mm structural steel base (for low and medium voltage units); Spring-type anti-vibration mounts (shipped loose)	
Starting / Charging	24V starting motors; Battery with cables and rack (shipped loose) Battery disconnect switch; 60A, 24V charging alternator (standard on 60Hz 1800rpm only)	Charging alternator; Battery charger; Oversized battery; Jacket water heater;
General	Paint -- Caterpillar Yellow except rails & radiators; Damper guard. Operation and Maintenance Manuals; Parts Book.	Crankcase explosion relief valve; Engine barring group; EEC D.O.I and other certifications

SPECIFICATIONS

CAT GAS ENGINE

G3520C SCAC 4-stroke-cycle watercooled gas engine	
Number of Cylinders -----	V20
Bore --- mm (in) -----	170 (6.7)
Stroke --- mm (in) -----	190 (7.5)
Displacement --- L (cu in) -----	86.3 (5266)
Compression Ratio -----	11.3:1
Aspiration ----- Turbocharged Separate Circuit Aftercooled	
Cooling Type ---- Two stage aftercooler, JW + O/C + A/C 1 combined	
Fuel System -----	Low Pressure
Governor Type -----	Electronic (ADEM™ III)

CAT SR4B GENERATOR

Frame size -----	828
Excitation -----	Permanent Magnet
Pitch -----	0.7778
Number of poles -----	4
Number of bearings -----	2
Number of leads -----	6
Insulation -----	Class H
IP rating -----	Drip proof IP22
Alignment -----	Pilot shaft
Overspeed capability -- % of rated -----	125%
Waveform deviation line to line, no load -----	less than 2.0%
Paralleling kit droop transformer -----	Standard
Voltage regulator -----	CDVR
Voltage regulation -----	+/- 0.5%
Telephone Influence Factor (TIF) -----	less than 50
Total Harmonic Distortion (THD) -----	less than 3.0%

Consult your Caterpillar dealer for available voltage

CAT EMCPII+ CONTROL PANAL

- * 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 potentiometer
- * True RMS AC metering, 3 phase
- * Pruge 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
 - High inlet air temperature (for TA engine only)
 - Detonation sensitive timing (for LE engine only)
- * Programmable protective relaying functions:
 - Under / Over voltage
 - Under / Over frequency
 - Overcurrent
 - Reverse power
- * Spare indicator LEDs
- * Spare alarm/shutdown inputs

Materials and specifications are subject to change without notice.
The International System of Units (SI) is used in this publication.

TECHNICAL DATA			
G3520C Gas Generator Set (Island Mode)		DM 8636	DM 8637
Emission level (NOx)	mg/N.M3	500	250
Aftercooler SCAC (Stage 2)	Deg C	54	54
Package Performance (1)			
Power Rating @ 0.8 pf (w/ 2 water pumps and w/o fan)	ekW Continuous	1966	1966
Power Rating @ 0.8 pf (w/ 2 water pumps and w/o fan)	kVA Continuous	2458	2458
Power Rating @ 1.0 pf (w/ 2 water pumps and w/o fan)	ekW Continuous	1986	1986
Electric Efficiency @ 1.0 pf (ISO 3046/1) (2)	%	40.4	39.5
Mechanical Power (w/ 2 water pumps and w/o fan)	bkW	2035	2035
Fuel Consumption (3)			
100% load w/o fan	NM3/hr	498	509
75% load w/o fan	NM3/hr	385	394
50% load w/o fan	NM3/hr	271	277
Altitude Capability (4)			
At 25 Deg C (77 Deg F) ambient, above sea level	M	1250	950
Cooling System			
Ambient air temperature	Deg C	25	25
Jacket water temperature (Maximum outlet)	Deg C	99	99
Exhaust System			
Combustion air inlet flow rate	NM3/min	143	148
Exhaust stack gas temperature	Deg C	472	471
Exhaust gas flow rate	NM3/min	152	157
Exhaust flange size (internal diameter)	mm	360	360
Heat Rejection (5)			
Heat rejection to jacket water and oil cooler and AC - Stage 1	kW	1030	1074
Heat rejection to AC - Stage 2	kW	175	180
Heat rejection to exhaust (LHV to 25 Deg C)	kW	1629	1689
Heat rejection to exhaust (LHV to 120 Deg C)	kW	1259	1295
Heat rejection to atmosphere from engine	kW	138	138
Heat rejection to atmosphere from generator	kW	69	69
Generator			
Frame		828	828
Temperature rise	Deg C	105	105
Motor starting capability @ 30% voltage dip (6)	skVA	4557	4557
Lubrication System			
Standard sump refill with filter change	L	541	541
Emissions (7)			
NOx @ 5% O2 (dry)	mg/N.M3	500	250
CO @ 5% O2 (dry)	mg/N.M3	1076	974
THC @ 5% O2 (dry)	mg/N.M3	2331	2548
NMHC @ 5% O2 (dry)	mg/N.M3	350	383
Exhaust O2 (dry)	%	9.4	9.7

CONDITIONS AND DEFINITIONS

DEFINITIONS AND CONDITIONS

(1) **Continuous** --- Maximum output available for an unlimited time

Ratings are based on pipeline natural gas having a Low Heat Value (LHV) of 35.6 MJ/NM³ (905 Btu/ft³) and 80 Caterpillar Methane Number. For values in excess of altitude, ambient temperature, inlet/exhaust restriction, or different from the conditions listed, contact your local Caterpillar dealer.

(2) **Efficiency** of standard generator is used. For higher efficiency generators, contact your local Caterpillar dealer.

(3) **Ratings and fuel consumption** are based on ISO3046/1 standard reference conditions of 25 deg C (77 deg F) of ambient temperature and 100 kPa (29.61 in Hg) of total barometric pressure, 30% relative humidity with 0, +5% fuel tolerance.

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

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

(6) Assume synchronous driver

(7) **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, NOx. Data shown is based on steady state engine operating conditions of 25 deg C (77 deg F), 96.28 kPa (28.43 in Hg) and fuel having a LHV of 35.6 MJ/NM³ (905 Btu/cu ft) and 80 Caterpillar Methane Number at 101.60 kPa (30.00 in Hg) absolute and 0 deg C (32 deg F). Emission data shown is subject to instrumentation, measurement, facility, and engine fuel system adjustment.

DIMENSIONS

Package Dimensions		
Length	6316.0 mm	248.66 in
Width	1827.5 mm	71.95 in
Height	2254.0 mm	88.74 in
Approx. Shipping Weight	18 350 kg	40 437 lb

Note: Do not use for installation design.
See general dimension drawings
for detail (Drawing # 326-8028).

Performance Number: DM8636, DM8637
Feature Code: 520GE59
Generator Arrangement: 144-1830

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