



Image shown may not reflect actual package

NATURAL GAS CONTINUOUS (FOR CHP APPLICATION) 2000 kW 2500 kVA 50 Hz 1500 rpm 400 Volts

Caterpillar is leading the power generation market place with power solutions engineered to deliver unmatched flexibility, expandability, reliability 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
- 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

- Caterpillar dealers have over 1,600 branch stores operating in 200 countries
- Comprehensive post-sales support including maintenance and repair agreements that are tailored for your specific equipment and application
- Highly-skilled technicians are trained to service every aspect of your electric power generation system
- Cat® S·O·SSM Service monitors and tracks internal engine component conditions providing the capability to maximize product performance and minimize owning and operating costs

CAT® G3520E GAS ENGINE

- Robust high speed diesel block design provides prolonged life and lower owning operating costs
- Designed for maximum performance on low pressure gaseous fuel supply
- 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

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)	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Two element, single-stage air cleaner with enclosure and service indicator 	<ul style="list-style-type: none"> Air cleaner with precleaner Mounting stand
Control Panel		<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Coolant level drain line with valves, fan with guard Inlet/Outlet connections
Exhaust	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Flange Exhaust expander Elbow Flexible fitting Muffler and spark-arresting muffler with companion flanges
Fuel	<ul style="list-style-type: none"> Electronic fuel metering valve Throttle plate, 24V DC actuator, controlled by GECM Fuel system is sized for 31.5 to 47.2 MJ/Nm³ (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 	<ul style="list-style-type: none"> Fuel filter Gas pressure regulator Gas shutoff valve, 24V, ETR (Energized-To-Run)
Generator	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 Oversized generators
Governing	<ul style="list-style-type: none"> Electronic speed governor as part of GECM Electronically-controlled 24V DC actuator connected to throttle shaft 	<ul style="list-style-type: none"> Woodward load sharing module
Ignition	<ul style="list-style-type: none"> Electronic Ignition System controlled by GECM Individual cylinder Detonation Sensitive Timing (DST) 	
Lubrication	<ul style="list-style-type: none"> Lubricating oil Gear type lube oil pump Oil filter, filler and dipstick Integral lube oil cooler Oil drain valve Crankcase breather 	<ul style="list-style-type: none"> Oil level regulator Pre-lube pump Positive crankcase ventilation system
Mounting	<ul style="list-style-type: none"> 330 mm structural steel base (for low and medium voltage units) Spring-type anti-vibration mounts (shipped loose) 	
Starting/Charging	<ul style="list-style-type: none"> 24V starting motors Battery with cables and rack (shipped loose) Battery disconnect switch 	<ul style="list-style-type: none"> Battery charger Oversized battery Jacket water heater
General	<ul style="list-style-type: none"> Paint — Caterpillar Yellow except rails & radiators Damper guard Operation and Maintenance Manuals Parts Book 	<ul style="list-style-type: none"> Crankcase explosion relief valve Engine barring group EEC D.O.I and other certifications

SPECIFICATIONS

CAT GAS ENGINE

G3520E 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 (5,248)
Compression Ratio 11.6:1
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..... 0.7777
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 synchronous speed . . 125%
Waveform deviation line to line, no load . . less than 3.0%
Paralleling kit droop transformer Standard
Voltage regulator..... CDVR
Voltage regulation with 3% speed change..... ± 0.5%
Telephone Influence Factor (TIF)..... less than 50

Consult your Caterpillar dealer for available voltage.

CAT EMCP II+ 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 potentiometer
- 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
 - 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

TECHNICAL DATA

Generator Set — 1500 rpm /50 Hz/400 Volts		80 CAT MN		70 CAT MN	
		DM5867	DM5866	DM5864	DM5863
G3520E LE Gas Generator Set					
Emission level (NOx)	mg/Nm ³	250	500	250	500
Aftercooler SCAC (Stage 2)	Deg C	54	54	43	43
Package Performance (1)					
Power Rating @ 0.8 pf (without water pumps and without fan)	kVA Continuous	2500	2500	2500	2500
Power Rating @ 0.8 pf (without water pumps and without fan)	ekW Continuous	2000	2000	2000	2000
Power Rating @ 1.0 pf (without water pumps and without fan)	ekW Continuous	2020	2020	2020	2020
Electric Efficiency @ 1.0 pf (ISO 3046/1) (5)	%	41.5	42.5	41.3	42.5
Mechanical Power (without water pumps and without fan)	bkW	2070	2070	2070	2070
Fuel Consumption (2)					
100% load without fan & without engine driven pumps	Nm ³ /hr	492	481	446	434
75% load without fan & without engine driven pumps	Nm ³ /hr	378	369	347	337
50% load without fan & without engine driven pumps	Nm ³ /hr	268	262	245	238
Altitude Capability (3)					
At 25° C ambient, above sea level	M	250	250	400	400
Cooling System					
Ambient air temperature	Deg C	25	25	25	25
Jacket water temperature (maximum outlet)	Deg C	99	99	94	94
Exhaust System					
Combustion air inlet flow rate	Nm ³ /min	138	133	140	134
Exhaust gas stack temperature	Deg C	437	440	438	440
Exhaust gas flow rate	Nm ³ /min	146	141	148	142
Exhaust flange size (internal diameter)	mm	300	300	300	300
Heat Rejection (4)					
Heat rejection to jacket water and oil cooler and A/C — Stage 1	kW	1032	1007	1107	1061
Heat rejection to A/C — Stage 2	kW	168	160	188	176
Heat rejection to exhaust (LHV to 120° C)	kW	1088	1062	1104	1063
Heat rejection to atmosphere from engine	kW	138	138	131	131
Heat rejection to atmosphere from generator	kW	64	64	64	64
Generator					
Frame		828	828	828	828
Temperature rise	Deg C	105	105	105	105
Motor starting capability @ 30% voltage dip (6)	skVA	4557	4557	4557	4557
Lubrication System					
Standard sump refill with filter change	L	541	541	541	541
Emissions (7)					
NOx @ 5% O ₂ (dry)	mg/Nm ³	250	500	250	500
CO @ 5% O ₂ (dry)	mg/Nm ³	1044	1042	1017	1143
THC @ 5% O ₂ (dry)	mg/Nm ³	4383	3439	3638	3105
NMHC @ 5% O ₂ (dry)	mg/Nm ³	658	516	832	710
Exhaust O ₂ (dry)	%	11.1	10.7	9.9	9.6

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/cu ft) 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° 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.

(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° C (77° 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° C (32° F). Emission data shown is subject to instrumentation, measurement, facility, and engine fuel system adjustment.

DIMENSIONS

Package Dimensions		
Length	6244.3 mm	245.84 in
Width	1827.5 mm	71.95 in
Height	2339.6 mm	92.11 in
Est. Shipping Weight	18 350 kg	40,437 lb

Note: Do not use for installation design.
See general dimension drawings
for detail (Drawing # 256-7812).

Performance Number: DM5867
DM5866
DM5847
DM5863

Feature Code: 520GE35
520GE55

Generator Arrangement: 144-1830

Source: U.S. Sourced

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