

## GAS GENERATOR SET

# CATERPILLAR®



Image shown may not reflect actual package

**NATURAL GAS  
CONTINUOUS  
1660 ekW 2075 kVA  
60 HZ 1800 RPM 480 VOLTS**

Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability

### BENEFITS

#### EMISSIONS

- Meets most worldwide emissions requirements down to .5 g/bhp-hr NOx level without aftertreatment

#### 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 provide extensive post sales support including maintenance and repair agreements
- Caterpillar dealers have over 1,600 dealer branch stores operating in 200 countries
- CAT® S.O.S<sup>SM</sup> program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products

#### CAT® G3516C 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
- UL 508A Listed
- Remote control and monitor capability options

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## Factory Installed Standard & Optional Equipment

System	Standard	Optional
<b>Gas Engine Control Module (GECM)</b>	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.	
<b>Air Inlet</b>	Two element, single-stage air cleaner with enclosure and service indicator	Heavy Duty air cleaner with precleaner; Mounting stand
<b>Control Panel</b>	EMCP II+	Local alarm module; Remote annunciator; Communications Module (PL1000T, PL1000E) Synchronizing module; Engine failure relay
<b>Cooling</b>	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	coolant level drain line with valves, fan with guard; Inlet/Outlet connections.
<b>Exhaust</b>	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.
<b>Fuel</b>	Electronic fuel metering valve; Throttle plate, 24V DC actuator, controlled by GECM; Fuel system is sized for 31.5 to 47.2 MJ/NM <sup>3</sup> (800 to 1200 Btu/cu ft) dry pipeline natural gas with pressure of 4.5 to 34.5 kPa (0.7 to 5 psi) to the engine fuel control valve.	Fuel filter; Gas pressure regulator; Gas shutoff valve, 24V, ETR (Energized-To-Run)
<b>Generator</b>	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.
<b>Governing</b>	Electronic speed governor as part of GECM; Electronically-controlled 24V DC actuator connected to throttle shaft.	Woodward load sharing module
<b>Ignition</b>	Electronic Ignition System controlled by GECM; Individual cylinder Detonation Sensitive Timing (DST)	
<b>Lubrication</b>	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
<b>Mounting</b>	330 mm structural steel base (for low and medium voltage units); Spring-type anti-vibration mounts (shipped loose)	
<b>Starting / Charging</b>	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;
<b>General</b>	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

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## SPECIFICATIONS

### CAT GAS ENGINE

G3516C SCAC 4-stroke-cycle watercooled gas engine	
Number of Cylinders -----	V16
Bore --- mm (in) -----	170 (6.7)
Stroke --- mm (in) -----	190 (7.5)
Displacement --- L (cu in) -----	69 (4210)
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 -----	825
Excitation -----	Permanent Magnet
Pitch -----	0.6667
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 3.0%
Paralleling kit droop transformer -----	Standard
Voltage regulator -----	CDVR
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 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

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

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**TECHNICAL DATA**

<b>G3516C Gas Generator Set</b>		<b>DM 5784</b>		<b>DM 5785</b>		
Emission level (NOx)	mg/Nm <sup>3</sup>	g/bhp-hr	443	1.0	206	0.5
Aftercooler SCAC (Stage 2)	Deg C	Deg F	54	130	54	130
<b>Package Performance (1)</b>						
Power Rating @ 0.8 pf (w/ 2 water pumps and w/o fan)	ekW	Continuous	1660		1660	
Power Rating @ 0.8 pf (w/ 2 water pumps and w/o fan)	kVA	Continuous	2075		2075	
Power Rating @ 1.0 pf (w/ 2 water pumps and w/o fan)	ekW	Continuous	1676		1676	
Electric Efficiency @ 1.0 pf (ISO 3046/1) (2)		%	37.9		36.6	
Mechanical Power (w/ 2 water pumps and w/o fan)	bkW	bhp	1723	2311	1723	2311
<b>Fuel Consumption (3)</b>						
100% load w/o fan	Nm <sup>3</sup> /hr	scf/hr	447	16 672	464	17 303
75% load w/o fan	Nm <sup>3</sup> /hr	scf/hr	349	13 004	362	13 496
50% load w/o fan	Nm <sup>3</sup> /hr	scf/hr	245	9119	254	9463
<b>Altitude Capability (4)</b>						
At 25 Deg C (77 Deg F) ambient, above sea level	M	ft	670	2199	365	1198
<b>Cooling System</b>						
Ambient air temperature	Deg C	Deg F	25	77	25	77
Jacket water temperature ( Maximum outlet )	Deg C	Deg F	99	210	99	210
<b>Exhaust System</b>						
Combustion air inlet flow rate	Nm <sup>3</sup> /min	SCFM	125	4817	131	5053
Exhaust stack gas temperature	Deg C	Deg F	499	930	498	928
Exhaust gas flow rate	Nm <sup>3</sup> /min	CFM	133	3 424	140	14 061
Exhaust flange size ( internal diameter )	mm	in	360	14	360	14
<b>Heat Rejection (5)</b>						
Heat rejection to jacket water and oil cooler and AC - Stag	kW	Btu/min	910	51 749	977	55 578
Heat rejection to AC - Stage 2	kW	Btu/min	151	8603	164	9339
Heat rejection to exhaust (LHV to 350 Deg F)	kW	Btu/min	1010	57 478	1056	60 088
Heat rejection to exhaust (LHV to 120 Deg C)	kW	Btu/min	1189	67 677	1243	70 751
Heat rejection to atmosphere from engine	kW	Btu/min	138	7856	138	7856
Heat rejection to atmosphere from generator	kW	Btu/min	56.6	3222	56.6	3222
<b>Generator</b>						
Frame			825		825	
Temperature rise	Deg C	Deg F	105	221	105	221
Motor starting capability @ 30% voltage dip (6)		skVA	4675		4675	
<b>Lubrication System</b>						
Standard sump refill with filter change	L	gal	401	104	401	104
<b>Emissions (7)</b>						
NOx @ 5% O2 (dry)	mg/Nm <sup>3</sup>	g/bhp-hr	443	1	206	0.5
CO @ 5% O2 (dry)	mg/Nm <sup>3</sup>	g/bhp-hr	1090	2.47	935	2.18
THC @ 5% O2 (dry)	mg/Nm <sup>3</sup>	g/bhp-hr	1923	4.35	2283	5.31
NMHC @ 5% O2 (dry)	mg/Nm <sup>3</sup>	g/bhp-hr	289	0.66	343	0.8
Exhaust O2 (dry)		%	9.1		9.4	

## 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 18 MJ/NM<sup>3</sup> (456 Btu/ft<sup>3</sup>) and 120 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, NO<sub>x</sub>. 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/NM<sup>3</sup> (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.

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## DIMENSIONS

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Package Dimensions		
Length	5518.1 mm	217.25 in
Width	1830.0 mm	72.05 in
Height	2340.0 mm	92.13 in
Approx. Shipping Weight	15 640 kg	34 500 lb

Note: Do not use for installation design.  
See general dimension drawings  
for detail ( Drawing # 255-1320 ).

Performance Number: DM5784,DM5785

Feature Codes 516GE26

Generator Argv 163-8544

Source U.S. Sourced

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