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## DIESEL GENERATOR SET

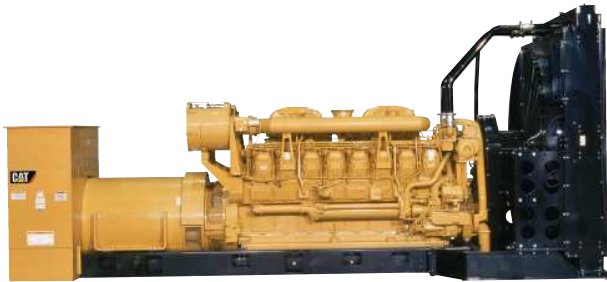


Image shown may not reflect actual package.

## PRIME

**1600 e kW 2000 kVA  
60 Hz 1800 rpm 480 Volts**

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

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## FEATURES

### FUEL/EMISSIONS STRATEGY

- Low Fuel consumption

### DESIGN CRITERIA

- The generator set accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response.

### 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

### SINGLE-SOURCE SUPPLIER

- Fully prototype tested with certified torsional vibration analysis available

### WORLDWIDE PRODUCT SUPPORT

- Cat dealers provide extensive post sale support including maintenance and repair agreements
- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- The 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® 3516 TA DIESEL ENGINE

- Reliable, rugged, durable design
- Field-proven in thousands of applications worldwide
- Four-stroke-cycle diesel engine combines consistent performance and excellent fuel economy with minimum weight

### CAT SR5 GENERATOR

- Matched to the performance and output characteristics of Cat engines
- Industry leading mechanical and electrical design
- Industry leading motor starting capabilities
- High Efficiency

### CAT EMCP 4 CONTROL PANELS

- Simple user friendly interface and navigation
- Scalable system to meet a wide range of customer needs
- Integrated Control System and Communications Gateway

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## FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT

System	Standard	Optional
Air Inlet	<ul style="list-style-type: none"> <li>• Single element canister type air cleaner</li> <li>• Service indicator</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Dual element &amp; heavy duty air cleaners</li> <li><input type="checkbox"/> Air inlet adapters &amp; shut-off</li> </ul>
Cooling	<ul style="list-style-type: none"> <li>• Radiator with guard</li> <li>• Coolant drain line with valve</li> <li>• Radiator fan and fan drive</li> <li>• Fan and belt guards</li> <li>• Cat® Extended Life Coolant*</li> <li>• Coolant level sensors</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Duct flange</li> <li><input type="checkbox"/> Heat exchanger and expansion tank</li> <li><input type="checkbox"/> Coolant level switch gauge</li> <li><input type="checkbox"/> Jacket water heater</li> </ul>
Exhaust	<ul style="list-style-type: none"> <li>• Dry exhaust manifold</li> <li>• Flanged faced outlets</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Mufflers and Silencers</li> <li><input type="checkbox"/> Stainless steel exhaust flex fittings</li> <li><input type="checkbox"/> Elbows, flanges, expanders &amp; Y adapters</li> </ul>
Fuel	<ul style="list-style-type: none"> <li>• Secondary fuel filters</li> <li>• Fuel priming pump</li> <li>• Flexible fuel lines</li> <li>• Fuel cooler*</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Water separator</li> <li><input type="checkbox"/> Duplex fuel filter</li> <li><input type="checkbox"/> Primary Fuel Filter</li> </ul>
Power Termination	<ul style="list-style-type: none"> <li>• Bus bar (NEMA and IEC mechanical lug holes)</li> <li>• Top cable entry</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Circuit breakers, UL listed, 3 pole with shunt trip, 100% rated, choice of trip units, manual or electrically operated (low voltage only)</li> <li><input type="checkbox"/> Circuit breakers, IEC compliant, 3 or 4 pole with shunt trip (low voltage only), choice of trip units, manual or electrically operated</li> <li><input type="checkbox"/> Bottom cable entry</li> <li><input type="checkbox"/> Power terminations can be located on the right, left and/or rear as an option. Multiple circuit breaker options</li> </ul>
Generator	<ul style="list-style-type: none"> <li>• Class H insulation</li> <li>• Cat digital voltage regulator (CDVR) with kVAR/PF control, 3-phase sensing</li> <li>• Reactive droop</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Oversize &amp; premium generators</li> <li><input type="checkbox"/> Winding temperature detectors</li> <li><input type="checkbox"/> Anti-condensation heaters</li> </ul>
Governor	<ul style="list-style-type: none"> <li>• Woodward 2301 isochronous</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Load share governor</li> </ul>
Control Panel	<ul style="list-style-type: none"> <li>• EMCP 4.2</li> <li>• User Interface panel (UIP) - rear mount</li> <li>• AC &amp; DC customer wiring area (right side)</li> <li>• Emergency stop pushbutton</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Option for right or left mount UIP</li> <li><input type="checkbox"/> Local &amp; remote annunciator modules</li> <li><input type="checkbox"/> Digital I/O Module</li> <li><input type="checkbox"/> Generator temperature monitoring &amp; protection</li> <li><input type="checkbox"/> Remote monitoring software</li> </ul>
Lube	<ul style="list-style-type: none"> <li>• Lubricating oil</li> <li>• Gear type lube oil pump</li> <li>• Oil filter, filler and dipstick</li> <li>• Oil drain lines and valve</li> <li>• Fumes disposal</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Oil level regulator</li> <li><input type="checkbox"/> Deep sump oil pan</li> <li><input type="checkbox"/> Electric &amp; air prelube pumps</li> <li><input type="checkbox"/> Manual prelube with sump pump</li> <li><input type="checkbox"/> Duplex oil filter</li> </ul>
Mounting	<ul style="list-style-type: none"> <li>• Rails - Engine / generator / radiator mounting</li> <li>• Rubber anti-vibration mounts (shipped loose)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Isolator removal</li> <li><input type="checkbox"/> Spring-type vibration isolator (shipped loose)</li> </ul>
Starting/Charging	<ul style="list-style-type: none"> <li>• 24 volt starting motor(s)</li> <li>• Batteries with rack and cables</li> <li>• Battery disconnect switch</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Battery chargers (10 or 20 amp)</li> <li><input type="checkbox"/> 45 amp charging alternator</li> <li><input type="checkbox"/> Oversize batteries</li> <li><input type="checkbox"/> Ether starting aid</li> <li><input type="checkbox"/> Heavy duty starting motors</li> <li><input type="checkbox"/> Barring device (manual)</li> <li><input type="checkbox"/> Air starting motor with control &amp; silencer</li> </ul>
General	<ul style="list-style-type: none"> <li>• Right hand service</li> <li>• Paint - Caterpillar Yellow (with high gloss black rails &amp; radiator)</li> <li>• SAE standard rotation</li> <li>• Flywheel and flywheel housing - SAE No. 00</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> CSA certification</li> <li><input type="checkbox"/> CE Certificate of Conformance</li> <li><input type="checkbox"/> Seismic Certification per Applicable Building Codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007</li> <li>* Not included with packages without radiators</li> </ul>
Note	Standard and optional equipment may vary for UL 2200 Listed Packages. UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics.	

# PRIME 1600 ekW 2000 kVA

60 Hz 1800 rpm 480 Volts



## SPECIFICATIONS

### CAT GENERATOR

Cat Generator  
Frame size..... 1602  
Excitation..... Internal Excitation  
Pitch..... 0.6667  
Number of poles..... 4  
Number of bearings..... Single bearing  
Number of Leads..... 006  
Insulation..... UL 1446 Recognized Class H with tropicalization and antiabrasion  
Insulation..... Class F with tropicalization and antiabrasion  
- Consult your Caterpillar dealer for available voltages  
IP Rating..... IP23  
Alignment..... Pilot Shaft  
Overspeed capability..... 125  
Wave form Deviation (Line to Line)..... 002.00  
Voltage regulator..... 3 Phase sensing with selectable volts/Hz  
Voltage regulation..... Less than +/- 1/2% (steady state)  
Less than +/- 1% (no load to full load)  
Telephone influence factor..... Less than 50  
Harmonic Distortion..... Less than 5%

### CAT DIESEL ENGINE

3516 TA, V-16, 4-Stroke Water-cooled Diesel  
Bore..... 170.00 mm (6.69 in)  
Stroke..... 190.00 mm (7.48 in)  
Displacement..... 69.00 L (4210.64 in<sup>3</sup>)  
Compression Ratio..... 13.0:1  
Aspiration..... TA  
Fuel System..... Mechanical unit injection  
Governor Type..... Woodward

### CAT EMCP 4 SERIES CONTROLS

EMCP 4 controls including:

- Run / Auto / Stop Control
- Speed and Voltage Adjust
- Engine Cycle Crank
- 24-volt DC operation
- Environmental sealed front face
- Text alarm/event descriptions

Digital indication for:

- RPM
- DC volts
- Operating hours
- Oil pressure (psi, kPa or bar)
- Coolant temperature
- Volts (L-L & L-N), frequency (Hz)
- Amps (per phase & average)
- ekW, kVA, kVAR, kW-hr, %kW, PF

Warning/shutdown with common LED indication of:

- Low oil pressure
- High coolant temperature
- Overspeed
- Emergency stop
- Failure to start (overcrank)
- Low coolant temperature
- Low coolant level

Programmable protective relaying functions:

- Generator phase sequence
- Over/Under voltage (27/59)
- Over/Under Frequency (81 o/u)
- Reverse Power (kW) (32)
- Reverse reactive power (kVAr) (32RV)
- Overcurrent (50/51)

Communications:

- Six digital inputs (4.2 only)
- Four relay outputs (Form A)
- Two relay outputs (Form C)
- Two digital outputs
- Customer data link (Modbus RTU)
- Accessory module data link
- Serial annunciator module data link
- Emergency stop pushbutton

Compatible with the following:

- Digital I/O module
- Local Annunciator
- Remote CAN annunciator
- Remote serial annunciator

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## TECHNICAL DATA

Open Generator Set - - 1800 rpm/60 Hz/480 Volts	DM7959	
<b>Low Fuel Consumption</b>		
<b>Generator Set Package Performance</b> Genset Power rating @ 0.8 pf Genset Power rating with fan	2000 kVA 1600 ekW	
<b>Coolant to aftercooler</b> Coolant to aftercooler temp max	82 ° C	180 ° F
<b>Fuel Consumption</b> 100% load with fan 75% load with fan 50% load with fan	437.6 L/hr 337.7 L/hr 238.9 L/hr	115.6 Gal/hr 89.2 Gal/hr 63.1 Gal/hr
<b>Cooling System<sup>1</sup></b> Air flow restriction (system) Air flow (max @ rated speed for radiator arrangement) Engine Coolant capacity with radiator/exp. tank Engine coolant capacity Radiator coolant capacity	0.12 kPa 1671 m <sup>3</sup> /min 398.0 L 233.0 L 165.0 L	0.48 in. water 59011 cfm 105.1 gal 61.6 gal 43.6 gal
<b>Inlet Air</b> Combustion air inlet flow rate	150.1 m <sup>3</sup> /min	5300.7 cfm
<b>Exhaust System</b> Exhaust stack gas temperature Exhaust gas flow rate Exhaust flange size (internal diameter) Exhaust system backpressure (maximum allowable)	505.4 ° C 408.3 m <sup>3</sup> /min 203.2 mm 6.7 kPa	941.7 ° F 14419.0 cfm 8.0 in 26.9 in. water
<b>Heat Rejection</b> Heat rejection to coolant (total) Heat rejection to exhaust (total) Heat rejection to aftercooler Heat rejection to atmosphere from engine Heat rejection to atmosphere from generator	954 kW 1850 kW 268 kW 140 kW 77.1 kW	54254 Btu/min 105209 Btu/min 15241 Btu/min 7962 Btu/min 4384.7 Btu/min
<b>Alternator<sup>2</sup></b> Motor starting capability @ 30% voltage dip Frame Temperature Rise	5077 skVA 1602 105 ° C	189 ° F
<b>Lube System</b> Sump refill with filter	401.3 L	106.0 gal
<b>Emissions (Nominal)<sup>3</sup></b> NOx g/hp-hr CO g/hp-hr HC g/hp-hr PM g/hp-hr	10.24 g/hp-hr 1.37 g/hp-hr .13 g/hp-hr .159 g/hp-hr	

<sup>1</sup> For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to existing restriction from factory.

<sup>2</sup> UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics. Generator temperature rise is based on a 40 degree C ambient per NEMA MG1-32.

<sup>3</sup> Emissions data measurement procedures 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 operating conditions of 77°F, 28.42 in HG and number 2 diesel fuel with 35° API and LHV of 18,390 btu/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle.

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## RATING DEFINITIONS AND CONDITIONS

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**Meets or Exceeds International Specifications:** AS1359, CSA, IEC60034-1, ISO3046, ISO8528, NEMA MG 1-22, NEMA MG 1-33, UL508A, 72/23/EEC, 98/37/EC, 2004/108/EC

**Prime** - Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand is 100% of prime rated ekW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year. Prime power in accordance with ISO3046. Prime ambients shown indicate ambient temperature at 100% load which results in a coolant top tank temperature just below the alarm temperature.

**Ratings** are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions. **Fuel rates** are based on fuel oil of 35° API [16° C (60° F)] gravity having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 29° C (85° F) and weighing 838.9 g/liter (7,001 lbs/U.S. gal.). Additional ratings may be available for specific customer requirements, contact your Cat representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Cat dealer.

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## DIMENSIONS

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Package Dimensions		
Length	5808.6 mm	228.68 in
Width	2286.0 mm	90 in
Height	1435.0 mm	56.5 in
Weight	9072 kg	20,000 lb

NOTE: For reference only - do not use for installation design. Please contact your local dealer for exact weight and dimensions. (General Dimension Drawing #2858792).

Performance No.: DM7959

Feature Code: 516DE5D

Gen. Arr. Number: 2523828

Source: U.S. Sourced

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