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## DIESEL GENERATOR SET

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# CATERPILLAR®



Image shown may not reflect actual package

## CONTINUOUS 965 ekW 1206 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.

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### 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 1600 dealer branch stores operating in 200 countries.
- The Cat® S•O•S<sup>SM</sup> program effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by products.

### CAT 3512 DIESEL ENGINE

- Reliable, rugged, durable design
- Four-stroke 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
- Single point access to accessory connections
- UL 1446 Recognized Class H insulation

### CAT EMCP 3 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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50 Hz 1500 rpm 400 Volts



**FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT**

System	Standard	Optional
Air Inlet	<ul style="list-style-type: none"> <li>• Single element canister type air cleaner</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Dual element &amp; heavy duty air cleaners with pre-cleaners)</li> <li><input type="checkbox"/> Air inlet adapters &amp; shutoff</li> </ul>
Cooling	<ul style="list-style-type: none"> <li>• Radiator with guard (43°C)</li> <li>• Coolant drain line with valve piped to edge of base frame</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"/> Radiator with 50°C ambient capability</li> <li><input type="checkbox"/> Heat exchanger and expansion tank</li> <li><input type="checkbox"/> Radiator duct flange</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>• Exhaust manifold - dry - single - 8 in.</li> <li>• 203 mm (8in)ID round flanged outlet</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Mufflers</li> <li><input type="checkbox"/> Mounting kits</li> </ul>
Fuel	<ul style="list-style-type: none"> <li>• Primary and 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"/> Primary fuel filter with fuel water separator</li> </ul>
Generator	<ul style="list-style-type: none"> <li>• Class H insulation</li> <li>• Cat digital voltage regulator (CDVR) with VAR/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 space heaters</li> </ul>
Power Termination	<ul style="list-style-type: none"> <li>• Bus bar (IEC mechanical lug holes)</li> <li>• Top cable entry</li> </ul>	<ul style="list-style-type: none"> <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.</li> </ul>
Governor	<ul style="list-style-type: none"> <li>• Woodward 2301A isochronous</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Electronic load sharing governor</li> </ul>
Control Panel	<ul style="list-style-type: none"> <li>• EMCP 3.1</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"/> EMCP 3.2 ... <input type="checkbox"/> EMCP 3.3</li> <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 and filter</li> <li>• Oil drain line with valves</li> <li>• Fumes disposal</li> <li>• Gear type lube oil pump</li> <li>• Integral lube oil cooler</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Oil level regulator</li> <li><input type="checkbox"/> Electric &amp; air prelube pumps</li> <li><input type="checkbox"/> Manual prelube with sump pump</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</li> <li>• Battery rack with cables</li> <li>• Battery disconnect switch</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> 45 amp charging alternator</li> <li><input type="checkbox"/> Battery chargers (10 and 20 Amp)</li> <li><input type="checkbox"/> Oversized batteries</li> <li><input type="checkbox"/> Air Starting system</li> <li><input type="checkbox"/> Heavy duty starting motors</li> <li><input type="checkbox"/> Ether starting aids</li> <li><input type="checkbox"/> Barring device (manual)</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"/> Front stub shaft</li> <li><input type="checkbox"/> CSA certification</li> <li><input type="checkbox"/> CE Certificate of Conformance</li> </ul> <p>* Not included with packages without radiators</p>

**SPECIFICATIONS**

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**CAT GENERATOR**

Frame ..... 1445  
 Excitation .....IE  
 Pitch.....0.6667  
 Number of poles.....4  
 Number of bearings .....Single Bearing  
 Insulation .....Class H  
 IP rating .....Drip proof IP23  
 Over speed capability - % of rated.....150%  
 Wave form deviation.....3 %  
 Voltage regulator..... 3 phase sensing with load  
 adjustable module  
 Telephone Influence Factor .....Less than 50  
 Harmonic Distortion .....Less than 5%

**CAT DIESEL ENGINE**

3512 TA, V-12, 4 stroke, water-cooled diesel

Bore .....170.00 mm (6.69 in)  
 Stroke .....190.00 mm (7.48in)  
 Displacement .....51.80 L (3161.03 in<sup>3</sup>)  
 Compression ratio.....13.5:1  
 Aspiration.....TA  
 Fuel system.....Direct unit injection  
 Governor Type.....Woodward

**CAT EMCP 3 CONTROL PANELS**

- EMCP 3.1 Standard
- EMCP3.2 & 3.3 (Optional)
- 24 Volt DC Control
- Single location for customer connection
- Auto start/stop control
- True RMS metering, 3-phase
- Digital indications for:
  - RPM
  - Operating hours
  - Oil pressure
  - Coolant temperature
  - System DC volts
  - L-L volts, L-N volts, Phase amps, Hz
  - ekW, kVA, kVAR, kWhr, %kW, PF (EMCP3.2/3.3)
- Shutdowns with common indicating light for:
  - Low oil pressure
  - High coolant temperature
  - Low coolant level
  - Overspeed
  - Emergency stop
  - Failure to start (overcrank)
- Programmable protective relaying functions (EMCP 3.2 & 3.3)
  - Under and over voltage
  - Under and over frequency
  - Reverse power
  - Overcurrent
- Modbus isolated data link (RS-485 half-duplex EMCP3.2 & 3.3)

**TECHNICAL DATA**

Open Generator Set - 1500 rpm/50 Hz/400 Volts	CONTINUOUS DM8223	
<b>Package Performance</b> Power rating Power rating @ 0.8 pf	965 ekW 1206 kVA	
<b>Fuel Consumption</b> 100% load with fan 75% load with fan 50% load with fan	251.1 L/hr 185.2 L/hr 134.3 L/hr	66.3 Gal/hr 51.0 Gal/hr 35.5 Gal/hr
<b>Cooling System*</b> Engine coolant Capacity with radiator arrangement) Engine coolant capacity Radiator coolant capacity	286.8 L 156.8 L 130.0 L	75.4 US Gal 41.4 US Gal 34.0 US Gal
<b>Inlet Air</b> Combustion air inlet flow rate	87.6 m <sup>3</sup> /min	3093.6 cfm
<b>Exhaust System</b> Exhaust stack gas temperature Exhaust gas flow rate Exhaust flange size (internal diameter) Exhaust system backpressure (maximum allowable)	446.2 °C 212.4 m <sup>3</sup> /min 203.2 mm 6.7 kPa	835.2 °F 7772.8 cfm 8 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	581 kW 958 kW 140 kW 113 kW 52.9 kW	33041 Btu/min 54481 Btu/min 7962 Btu/min 6426 Btu/min 3008 Btu/min
<b>Alternator**</b> Motor starting capability @ 30% voltage dip Frame Temperature Rise	3087 SKVA 1445 105°C	189 °F
<b>Lube System</b> Lube oil refill volume with filter change for standard sump	310.4 L	82.0 US Gal
<b>Emissions (Nominal)***</b> NO <sub>x</sub> mg/nm <sup>3</sup> CO mg/nm <sup>3</sup> HC mg/nm <sup>3</sup> PM mg/nm <sup>3</sup>	n/a n/a n/a n/a	

\* For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to existing restriction from factory.

\*\* 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.

\*\*\* 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, NO<sub>x</sub>. 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.

## **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

**Continuous** – Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous power rating. Typical peak demand is 100% of continuous rated ekW for 100% of operating hours. Continuous power in accordance with ISO3046. Continuous ambients shown indicate ambient temperature at 100% load which results in a coolant top tank temperature 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 Caterpillar representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Cat dealer.

# CONTINUOUS 965 ekW 1206 kVA

50 Hz 1500 rpm 400 Volts



## DIMENSIONS

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Package Dimensions		
Length	5237.1 mm	206.2 in
Width	1974.8 mm	77.7 in
Height	2367.2 mm	93.2 in
Weight	9,071.8 kg	20,000 lb

NOTE: For reference only - do not use for installation design. Please contact your local dealer for exact weight and dimensions.

[www.Cat-ElectricPower.com](http://www.Cat-ElectricPower.com)

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Performance No.: DM8223  
Feature Code: 512DE6V  
Generator Arrangement: 2523790  
Sourced: European Sourced

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