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## DIESEL GENERATOR SET



Image shown may not reflect actual package

## Mission Critical Standby 3100 ekW 3875 kVA 60 Hz 1800 rpm 12470 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 BSFC

### 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 effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by products.

### CAT® C175-16 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 4 CONTROL PANEL

- 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>• Air cleaner, 4 x single element canister with service indicator(s)</li> <li>• Plug group for air inlet shut-off</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Air cleaner, 4 x dual element with service indicator(s)</li> <li><input type="checkbox"/> Air inlet adapters</li> </ul>
Cooling	<ul style="list-style-type: none"> <li>• SCAC cooling</li> <li>• Jacket water and AC inlet/outlet flanges</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Remote horizontal SCAC radiator</li> <li><input type="checkbox"/> Remote fuel cooler</li> <li><input type="checkbox"/> Low coolant level sensor (for remote radiators)</li> </ul>
Exhaust	<ul style="list-style-type: none"> <li>• Dry exhaust manifold.</li> <li>• Bolted flange (ANSI 6" &amp; DIN 150) with bellow for each turbo (qty 4)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Engine Exhaust Temperature Module</li> <li><input type="checkbox"/> Mufflers (15 dBA, 25 dBA, or 40 dBA)</li> <li><input type="checkbox"/> Dual 16" or single 20" vertical exhaust collector</li> <li><input type="checkbox"/> Weld flange ANSI 20"</li> </ul>
Crankcase Systems	<ul style="list-style-type: none"> <li>• Open crankcase ventilation</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Crankcase explosion relief valve</li> </ul>
Fuel	<ul style="list-style-type: none"> <li>• Primary fuel filter with water separator</li> <li>• Secondary fuel filters (engine mounted)</li> </ul>	
Generator SR5	<ul style="list-style-type: none"> <li>• 3 phase brushless, salient pole</li> <li>• IEC platinum stator RTD's</li> <li>• Cat digital voltage regulator (Cat DVR)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Space heater kit</li> <li><input type="checkbox"/> Oversize generators</li> <li><input type="checkbox"/> Power connection arrangement</li> </ul>
Governor	<ul style="list-style-type: none"> <li>• ADEM™ A4</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Redundant shutdown</li> </ul>
Control Panels	<ul style="list-style-type: none"> <li>• EMCP 4.2</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Local &amp; remote annunciator modules</li> <li><input type="checkbox"/> Discrete I/O module</li> <li><input type="checkbox"/> Generator temperature monitoring &amp; protection</li> <li><input type="checkbox"/> Remote monitoring</li> <li><input type="checkbox"/> Load share module</li> </ul>
Lube	<ul style="list-style-type: none"> <li>• Lubricating oil</li> <li>• Oil filter, filler and dipstick</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"/> Electric prelube pumps (standard for Prime and Continuous only)</li> </ul>
Mounting	<ul style="list-style-type: none"> <li>• Rails-engine / generator</li> <li>• Rubber anti-vibration mounts (shipped loose)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Spring type linear vibration isolators</li> <li><input type="checkbox"/> IBC vibration isolators</li> </ul>
Starting / Charging	<ul style="list-style-type: none"> <li>• Dual 24 volt electric starting motors</li> <li>• Batteries with rack and cables</li> <li>• Battery disconnect switch</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Oversized battery set</li> <li><input type="checkbox"/> 75 amp charging alternator</li> <li><input type="checkbox"/> Battery chargers (20, 35 or 50 Amp)</li> <li><input type="checkbox"/> Jacket water heater</li> <li><input type="checkbox"/> Redundant Electric Starter</li> </ul>
Circuit Breakers		(No set mounted circuit breakers available on medium or high voltage packages)
General	<ul style="list-style-type: none"> <li>• RH service (Except LH Service Oil Filter)</li> <li>• Paint - Caterpillar Yellow with high gloss black rails</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"/> Barring group- manual or air powered</li> <li><input type="checkbox"/> Factory test reports</li> </ul>

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## SPECIFICATIONS

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### CAT GENERATOR

Frame ..... 3044  
Excitation .....PM  
Pitch.....0.6667  
Number of poles.....4  
Number of bearings .....2  
Number of Leads.....6  
Insulation .....Class H  
IP rating .....Drip proof IP23  
Over speed capability - % of rated.....125%  
Wave form deviation.....3 %  
Voltage regulator..... 3 phase sensing with load adjustable module

### CAT DIESEL ENGINE

C175 SCAC, V-16, 4 stroke, water-cooled diesel

Bore .....175.00 mm (6.89 in)  
Stroke .....220.00 mm (8.66in)  
Displacement .....84.67 L (5166.88 in<sup>3</sup>)  
Compression ratio.....15.3:1  
Aspiration.....TA  
Fuel system.....Common Rail  
Governor Type.....ADEM™ A4

### 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

<b>Open Generator Set - 1800 rpm/60 Hz/12470 Volts</b>		
<b>Package Performance</b>		
Power rating	3100 ekW	
Power rating @ 0.8 pf	3875 kVA	
<b>Fuel Consumption</b>		
100% load with fan	795.3 L/hr	210.1 Gal/hr
75% load with fan	571.2 L/hr	150.9 Gal/hr
50% load with fan	397.1 L/hr	104.9 Gal/hr
<b>Cooling System*</b>		
Coolant to aftercooler temp max	46° C at 30° C ambient 115° C at 86° F ambient	
<b>Inlet Air</b>		
Combustion air inlet flow rate	261.1 m <sup>3</sup> /min	9226.2 cfm
<b>Exhaust System</b>		
Exhaust stack gas temperature	478.2 °C	892.7 °F
Exhaust gas flow rate	684.1 m <sup>3</sup> /min	24169.4 cfm
Exhaust flange size (internal diameter)	150 mm	6 in
Exhaust system backpressure (maximum allowable)	6.7 kPa	26.9 in. water
<b>Heat Rejection</b>		
Heat rejection to coolant (total)	1350.2 kW	76802 Btu/min
Heat rejection to exhaust (total)	3079.8 kW	175186 Btu/min
Heat rejection to aftercooler	478.2 kW	27204 Btu/min
Heat rejection to atmosphere from engine	272.4 kW	15497 Btu/min
Heat rejection to atmosphere from generator	180.4 kW	10259 Btu/min
<b>Alternator**</b>		
Motor starting capability @ 30% voltage dip	8973 SKVA	
Frame	3044	
Temperature Rise	105°C	189 °F
<b>Lube System</b>		
Lube oil refill volume with filter change for standard sump	540 L	142.6 US Gal
<b>Emissions (Nominal)***</b>		
NO <sub>x</sub>	5.58 g/hp-hr	2537.5 mg/nm <sup>3</sup>
CO	0.59 g/hp-hr	276.7 mg/nm <sup>3</sup>
HC	0.11 g/hp-hr	46.0 mg/nm <sup>3</sup>
PM	0.04 g/hp-hr	14.1 mg/nm <sup>3</sup>

Note: This generator set package is not offered with an engine driven radiator.

The addition of an engine driven fan will reduce the output below the nameplate rating.

\* 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.

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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

**Mission Critical Standby** - Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the standby power rating. Typical peak demand up to 100% of standby rated ekW for 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year. Fuel stop power in accordance with ISO3046. Standby ambients shown indicate ambient temperature at 100% load which results in a coolant top tank temperature just below the shutdown 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.

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## DIMENSIONS

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Package Dimensions		
Length	6631.6 mm	261.1 in
Width	2089.4 mm	82.3 in
Height	2207.9 mm	86.9 in

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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Sourced: U.S. Sourced

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