### **DIESEL GENERATOR SET**





## MISSION CRITICAL 4000 ekW 5000 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.

Image shown may not reflect actual package

### 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<sup>®</sup> 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>™</sup> program effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by products.

### CAT C175-20 DIESEL ENGINE

- Reliable, rugged, durable design
- Four-stroke diesel engine combines consistent performance and excellent fuel economy with minimum weight

### CAT SR5 GENERATOR

- Designed to match performance and output characteristics of Cat diesel engines
- Single point access to accessory connections

#### **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> <li>Air cleaner, 4 x single element canister with service indicator(s)</li> <li>Plug group for air inlet shut-off</li> </ul>	<ul> <li>[] Air cleaner, 4 x dual element with service indicator(s)</li> <li>[] Air inlet adapters</li> </ul>	
Cooling	<ul> <li>SCAC cooling</li> <li>Jacket water and AC inlet/outlet flanges</li> </ul>	[] Remote horizontal SCAC radiator [] Remote fuel cooler [] Low coolant level sensor (for remote radiators)	
Exhaust	<ul> <li>Dry exhaust manifold</li> <li>Bolted flange (ANSI 8" &amp; DIN 200) with bellow for each turbo (qty 4)</li> </ul>	<ul> <li>[] Engine exhaust temperature module</li> <li>[] Mufflers (15 dBA,25 dBA, or 40 dBA)</li> <li>[] Dual 20" or single 24" vertical exhaust collector</li> <li>[] Weld flanges: ANSI 20" and ANSI 24"</li> </ul>	
Crankcase Systems	Open crankcase ventilation	[] Crankcase explosion relief valve	
Fuel	<ul> <li>Primary fuel filter with water separator</li> <li>Secondary fuel filters (engine mounted)</li> </ul>		
Generator SR5	<ul> <li>3 phase brushless, salient pole</li> <li>Space heater kit</li> <li>IEC platinum stator RTD's</li> </ul>	[] Oversize generators [] Power connection arrangement	
Governor	ADEM™ A4	[] Redundant shutdown	
Control Panels	Shipp loose EMCP 4 control panel	[] EMCP 4.2 [] EMCP 4.3 [] Local & remote annunciator modules [] Discrete I/O module [] Generator temperature monitoring & protection [] Remote monitoring [] Load share module	
Lube	<ul> <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> <li>Electric prelube pumps</li> </ul>		
Mounting	<ul> <li>Rails-engine / generator</li> <li>Rubber anti-vibration mounts (shipped loose)</li> </ul>	[] Spring type linear vibration isolators [] IBC vibration isolators	
Starting / Charging	<ul> <li>Dual 24 volt electric starting motors</li> <li>Batteries with rack and cables</li> <li>Battery disconnect switch</li> </ul>	<ul> <li>[] Oversized battery set</li> <li>[] 75 amp charging alternator</li> <li>[] Battery chargers (20,35 or 50 Amp)</li> <li>[] Jacket water heater</li> <li>[] Redundant Electric Starter</li> </ul>	
General	<ul> <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>	[] Barring group- manual or air powered [] Factory test reports	

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### **SPECIFICATIONS**

### CAT GENERATOR

Frame Excitation	3055 .PM
Pitch0.6	
Number of poles	4
Number of bearings	
Number of Leads	6
InsulationCla	ss H
IP ratingDrip proof	IP23
Over speed capability - % of rated1	
Wave form deviation	3 %
Voltage regulator3 phase sensing selectable V/Hz regul	

#### CAT DIESEL ENGINE

C175-20 SCAC, V-20, 4 stroke, water-cooled diesel

Bore
Stroke
Compression ratio15.3:1 AspirationTA
Fuel systemCommon Rail
Governor TypeADEM™ A4

### **CAT EMCP 4 CONTROL PANELS**

EMCP 4 controls including:

- Run / Auto / Stop Control
- Speed Adjust
- Voltage Adjust
- Engine Cycle Crank
- Emergency stop pushbutton
- EMCP 4.2 controller features:
  - 24-volt DC operation
  - Environmental sealed front face
  - Text alarm/event descriptions
  - True RMS AC metering, 3-phase,  $\pm 1\%$

accuracy. 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)
- Power Factor (per phase & average)
- kW (per phase, average & percent)
- kVA (per phase, average & percent)
- kVAr (per phase, average & percent)
- kW-hr (total)
- kVAr-hr (total)

Warning/shutdown with common LED indication of shutdowns for:

- 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

- Customer data link (Modbus RTU)
- Accessory module data link
- Serial annunciator module data link
- 6 programmable digital inputs
- 6 programmable relay outputs (Form A)
- 2 programmable relay outputs (Form C)
- 2 programmable digital outputs

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### **Technical Data**

Open Generator Set - 1800 rpm/60 Hz/12 470 Volts	EMO	EM0373-00	
Low Fuel Consumption			
Generator Set Package Performance			
Genset Power rating @ 0.8 pf	5000 kVA		
Genset Power Rating without fan	4000 ekW		
Fuel Consumption			
100% Load with fan	1038.5 L/hr	274.4 Gal/hr	
75% Load with fan	739.2 L/hr	195.3 Gal/hr	
50% Load with fan	518.9 L/hr	137.1 Gal/hr	
Inlet Air			
Combustion air inlet flow rate	338.3 m <sup>3</sup> /min	11946.4 cfm	
Exhaust System			
Exhaust stack gas temperature (engine out)	479.1 °C	894.4 °F	
Exhaust gas flow rate	870.0 m <sup>3</sup> /min	30722 cfm	
Exhaust system backpressure (maximum allowable)	6.7 kPA	26.9 in water	
Heat Rejection			
Heat rejection to coolant	2124 kW	120753 Btu/min	
Heat rejection to exhaust (total)	3957 kW	224969 Btu/min	
Heat rejection to aftercooler	438 kW	24882 Btu/min	
Heat rejection to atmosphere from engine	207 kW	11748 Btu/min	
Heat rejection to atmosphere from generator	197 kW	11213 Btu/min	
Alternator			
Motor starting capabiliy @30% voltage dip	10728 skVA		
Frame	3055		
Temperature Rise	130 °C	234 °F	
Lube System			
Sump refill with filter	675 L	178.3 gal	
Emissions (Nominal) <sup>2</sup>			
NOx g/hp-hr	5.27 g/hp-hr		
CO g/hp-hr	0.5 g/hp-hr		
HC g/hp-hr	0.18 g/hp-hr		
PM g/hp-hr	0.04 g/hp-hr		

Note: This generator set is not offered with an engine driven radiator. Addition of an engine driven fan will reduce the output below the nameplate rating.

<sup>1</sup> Some 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 NEM A M G1-32.

<sup>2</sup> Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8 178-11 or measuring HC, CO, PM, NOx. Data shown is based on steady state operating conditions of 77%, 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. Emissions values are tailpipe out with aftertreatment installed. Values shown as zero may be greater than zero but were below the detection level of the equipment used at the tie of measurement. 60 Hz 1800 rpm 12470 Volts



### **RATING DEFINITIONS AND CONDITIONS**

#### Applicable Codes and Standards:

AS1359,CSAC22.2 No100-04, UL142,UL489, UL869, UL2200, NFPA37, NFPA70, NFPA99, NFPA110,IBC, IEC60034-1, ISO3046, ISO8528, NEMA MG1-22, NEMA MG1-33, 72/23/EEC, 98/37/EC, 2004/108/EC

**MISSION CRITICAL** – Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical power rating. Typical peak demand up to 100% of mission critical rated ekW for 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year. **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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# **CAT**®

### DIMENSIONS

Package Dimensions					
Length	6642 mm	261.5 in			
Width	2336 mm	92.0 in			
Height	2555 mm	100.6 in			
Weight	23400 kg	51588 lbs			

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

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

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Performance No: EM0373-00 Feature Code: 175DR1G Gen. Arr. Number: 331-3046

Sourced: U.S. Sourced

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