# DIESEL GENERATOR SET




Image shown may not reflect actual package.

# STANDBY
## 1400 ekW 1750 kVA 60 Hz 1800 rpm 12 470 Volts

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

## FEATURES

### FUEL/EMISSIONS STRATEGY
- Low Emissions

### 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℠ program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products

### CAT® 3512B 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 HV GENERATOR
- Matched to the performance and output characteristics of Cat engines
- Single point access to accessory connections
- UL 1446 Recognized Class F insulation

### 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 | • Single element canister type air cleaner<br>• Service indicator | [ ] Dual element & heavy duty air cleaners<br>[ ] Air inlet adapters & shut-off |
| Cooling | • Radiator with guard<br>• Coolant drain line with valve<br>• Fan and belt guards<br>• Cat® Extended Life Coolant* | [ ] Radiator duct flange<br>[ ] Jacket water heater |
| Exhaust | • Dry exhaust manifold<br>• Flanged faced outlets | [ ] Mufflers and Silencers<br>[ ] Stainless steel exhaust flex fittings<br>[ ] Elbows, flanges, expanders & Y adapters |
| Fuel | • Secondary fuel filters<br>• Fuel priming pump<br>• Flexible fuel lines<br>• Fuel cooler* | [ ] Water separator<br>[ ] Duplex fuel filter |
| Generator | • Class F insulation<br>• Cat digital voltage regulator (CDVR) with kVAR/PF control, 3-phase sensing<br>• Winding temperature detectors<br>• Anti-condensation heaters | [ ] Oversized generators<br>[ ] Cross current compensation transformer<br>[ ] Bearing temperature detectors |
| Power Termination | • Bus bar (NEMA mechanical lug holes)<br>• Right hand cable entry<br>• Top or bottom cable entry | [ ] Left hand cable entry |
| Governor | • ADEM™ 3 | [ ] Load share module |
| Control Panels | • EMCP 4.2<br>• User Interface panel (UIP) - wall mounted<br>• AC & DC customer wiring area (right side)<br>• Emergency stop pushbutton | [ ] Option for right or left mount UIP<br>[ ] Local & remote annunciator modules<br>[ ] Digital I/O Module<br>[ ] Generator temperature monitoring & protection<br>[ ] Remote monitoring software |
| Lube | • Lubricating oil and filter<br>• Oil drain line with valves<br>• Fumes disposal<br>• Gear type lube oil pump | [ ] Oil level regulator<br>[ ] Deep sump oil pan<br>[ ] Electric & air prelube pumps<br>[ ] Manual prelube with sump pump<br>[ ] Duplex oil filter |
| Mounting | • Rails - Engine / generator / radiator mounting<br>• Rubber anti-vibration mounts (shipped loose) | [ ] Isolator removal<br>[ ] Spring-type vibration isolator (shipped loose)<br>[ ] IBC Isolators |
| Starting/Charging | • 24 volt starting motor(s)<br>• Batteries with rack and cables<br>• Battery disconnect switch | [ ] Battery chargers (5 or 10 amp)<br>[ ] 45 amp charging alternator<br>[ ] Oversize batteries<br>[ ] Ether starting aid<br>[ ] Heavy duty starting motors<br>[ ] Barring device (manual) |

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## SPECIFICATIONS

### CAT GENERATOR

Cat HV Generator
Frame size..... 2730
Excitation..... Permanent Magnet
Pitch..... 0.6670
Number of poles..... 4
Number of bearings..... 2
Number of Leads..... 006
Insulation..... Class H with tropicalization and antiabrasion
Insulation..... Class F with tropicalization and antiabrasion
- Consult your Caterpillar dealer for available voltages
IP Rating..... IP23
Alignment..... Closed Coupled
Overspeed capability..... 125
Wave form Deviation (Line to Line)..... 002.00
Voltage regulator..... 3 Phase sensing with 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

3512B TA, V-12, 4-Stroke Water-cooled Diesel
Bore..... 170.00 mm (6.69 in)
Stroke..... 190.00 mm (7.48 in)
Displacement..... 51.80 L (3161.03 $in^3$)
Compression Ratio..... 14.0:1
Aspiration..... TA
Fuel System..... Electronic unit injection
Governor Type..... ADEM3

### 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/12 470 Volts | DM8193 | |
|---|---|---|
| **Low Emissions** | | |
| **Generator Set Package Performance** | | |
| Genset Power rating @ 0.8 pf | 1750 kVA | |
| Genset Power rating with fan | 1400 ekW | |
| **Coolant to aftercooler** | | |
| Coolant to aftercooler temp max | 90 ° C | 194 ° F |
| **Fuel Consumption** | | |
| 100% load with fan | 384.7 L/hr | 101.6 Gal/hr |
| 75% load with fan | 294.9 L/hr | 77.9 Gal/hr |
| 50% load with fan | 211.4 L/hr | 55.8 Gal/hr |
| **Cooling System**[1] | | |
| Air flow restriction (system) | 0.12 kPa | 0.48 in. water |
| Air flow (max @ rated speed for radiator arrangement) | 1671 m³/min | 59011 cfm |
| Engine Coolant capacity with radiator/exp. tank | 305.8 L | 80.8 gal |
| Engine coolant capacity | 156.8 L | 41.4 gal |
| Radiator coolant capacity | 149.0 L | 39.4 gal |
| **Inlet Air** | | |
| Combustion air inlet flow rate | 122.4 m³/min | 4322.5 cfm |
| **Exhaust System** | | |
| Exhaust stack gas temperature | 485.0 ° C | 905.0 ° F |
| Exhaust gas flow rate | 327.2 m³/min | 11555.0 cfm |
| Exhaust flange size (internal diameter) | 203.2 mm | 8.0 in |
| Exhaust system backpressure (maximum allowable) | 6.7 kPa | 26.9 in. water |
| **Heat Rejection** | | |
| Heat rejection to coolant (total) | 633 kW | 35999 Btu/min |
| Heat rejection to exhaust (total) | 1456 kW | 82803 Btu/min |
| Heat rejection to aftercooler | 314 kW | 17857 Btu/min |
| Heat rejection to atmosphere from engine | 147 kW | 8360 Btu/min |
| Heat rejection to atmosphere from generator | 76.8 kW | 4367.6 Btu/min |
| **Alternator**[2] | | |
| Motor starting capability @ 30% voltage dip | 2839 skVA | |
| Frame | 2730 | |
| Temperature Rise | 105 ° C | 189 ° F |
| **Lube System** | | |
| Sump refill with filter | 310.4 L | 82.0 gal |
| **Emissions (Nominal)**[3] | | |
| NOx g/hp-hr | 9.56 g/hp-hr | |
| CO g/hp-hr | 1.44 g/hp-hr | |
| HC g/hp-hr | .41 g/hp-hr | |
| PM g/hp-hr | .097 g/hp-hr | |

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

[2] 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.

[3] 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.

## RATING DEFINITIONS AND CONDITIONS

**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

**Standby** - Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year. Standby power in accordance with ISO8528. 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 Cat representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Cat dealer.

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## DIMENSIONS

| Package Dimensions | | |
|---|---|---|
| **Length** | **5540.8 mm** | **218.14 in** |
| **Width** | **2286.0 mm** | **90 in** |
| **Height** | **2367.2 mm** | **93.2 in** |
| **Weight** | **14 325 kg** | **31,581 lb** |

NOTE: For reference only - do not use for installation design. Please contact your local dealer for exact weight and dimensions. (General Dimension Drawing #2748720).

Performance No.: DM8193

Feature Code: 512DE5M

Gen. Arr. Number: 2524216

Source: U.S. Sourced

August 03 2011

18359946

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