
Diesel Generator Set



Image shown may not reflect actual package

Standby 2500 ekW 3125 kVA 60 Hz 1800 rpm 12 470 Volts

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

FUEL/EMISSIONS STRATEGY

- EPA Tier 4 Interim

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

CAT 3516C-HD ATAAC DIESEL ENGINE

- Reliable, rugged, durable design
- Field proven in thousands of applications worldwide
- Four-stroke diesel engine combines consistent performance and excellent fuel economy with minimum weight
- Engine performance optimized for use with Cat clean emissions module (CEM)

CAT CLEAN EMISSIONS MODULE (CEM)

- Diesel oxidation catalyst for particulate matter (PM) and hydrocarbon (HC) control
- Selective catalytic reduction (SCR) with integrated sound attenuation
- Integrated electronics for monitoring, protection, and closed loop NO_x control
- Reliable, compact, and lightweight system gives maximum installation flexibility

CAT HV GENERATOR

- Matched to the performance and output characteristics of Caterpillar 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 style="list-style-type: none"> • Single element canister type air cleaner with service indicator | <ul style="list-style-type: none"> [] Dual element air cleaners [] Air inlet adapters & shutoff |
| Cooling | <ul style="list-style-type: none"> • Radiator with guard • Fan and belt guards • Coolant drain line with valve • Coolant level sensors* • Cat Extended Life Coolant* | <ul style="list-style-type: none"> [] Jacket water heater [] Radiator duct flange [] Radiator options |
| Exhaust | <ul style="list-style-type: none"> • Exhaust manifold - dry - dual • 254 mm (10 in) ID round flanged engine outlets • Clean Emissions Module (CEM) • CEM control cabinet • Flanged outlet | <ul style="list-style-type: none"> [] Mufflers [] Stainless steel exhaust flex fittings [] Elbows, flanges, expanders, & Y adapters [] CEM installation package including support, exhaust connection kit, harness, and heated urea lines. |
| Fuel | <ul style="list-style-type: none"> • Secondary fuel filters • Fuel cooler* • Fuel priming pump • Flexible fuel lines-shipped loose | <ul style="list-style-type: none"> [] Duplex secondary fuel filter [] Primary fuel filter with fuel waters separator |
| Generator | <ul style="list-style-type: none"> • 3 Phase brushless, Salient pole • Class F insulation • Cat digital voltage regulator (CDVR) with VAR/PF control, 3-phase sensing • Winding temperature detectors • Anti-condensation space heaters | <ul style="list-style-type: none"> [] Oversize generators |
| Power Termination | <ul style="list-style-type: none"> • Bus bar (NEMA mechanical lug holes) • Right hand bottom cable entry | <ul style="list-style-type: none"> [] Left and/or rear power termination |
| Governor | <ul style="list-style-type: none"> • ADEM™ A4 | <ul style="list-style-type: none"> [] Load share module |
| Control Panel | <ul style="list-style-type: none"> • User interface panel (UIP) – wall mount • EMCP 4.2 Genset Controller • AC & DC customer wiring area • Emergency Stop Pushbutton | <ul style="list-style-type: none"> [] Local & remote annunciator modules [] Digital I/O Module [] Generator temperature monitoring & protection |
| Lube | <ul style="list-style-type: none"> • Lubricating oil • Gear type lube oil pump • Integral lube oil cooler • Oil filter, filler and dipstick • Oil drain line and valve • Closed crankcase ventilation (CCV) system | <ul style="list-style-type: none"> [] Oil level regulator [] Deep sump oil pan [] Electric & air prelube pumps [] Manual prelube with sump pump [] Duplex oil filter |
| Mounting | <ul style="list-style-type: none"> • Rails - engine / generator / radiator mounting • Rubber anti-vibration mounts (shipped loose) | <ul style="list-style-type: none"> [] Spring type vibration isolator |
| Starting / Charging | <ul style="list-style-type: none"> • 24 volt starting motor(s) • Batteries with rack and cables • Battery disconnect switch • 60A charging alternator | <ul style="list-style-type: none"> [] Battery chargers (10, 20, & 50 Amp) [] Oversize batteries [] Ether starting aids [] Heavy duty starting motors [] Barring device (manual) [] Air starting motor with control & silencer |
| General | <ul style="list-style-type: none"> • Right hand service • Paint – Cat yellow except rails and radiators gloss black • SAE standard rotation • Flywheel and flywheel housing – SAE No. 00 | |

*Not included with packages without radiators



SPECIFICATIONS

CAT GENERATOR

| | |
|---|---|
| Frame | 2770 |
| Excitation | Permanent Magnet |
| Pitch..... | 0.6667 |
| Number of poles..... | 4 |
| Number of leads..... | 6 |
| Number of bearings | Two Bearing |
| 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 |
| Voltage regulation.... | Less than $\pm 1/2\%$ (steady state) Less than $\pm 1/2\%$ (3% speed change) |
| Telephone Influence Factor | Less than 50 |
| Harmonic Distortion | Less than 5% |

CAT DIESEL ENGINE

3516C-HD ATAAC, V-16, 4 stroke, water-cooled diesel

| | |
|------------------------|------------------------------------|
| Bore | 170.00 mm (6.69 in) |
| Stroke | 215.00 mm (8.64in) |
| Displacement | 78.08 L (4764.73 in ³) |
| Compression ratio..... | 14.0:1 |
| Aspiration..... | TA |
| Fuel system..... | Electronic unit injection |
| Governor Type..... | ADEM™ A4 |

CAT EMCP 4 CONTROL PANELS

EMCP 4 controls including:

- Run / Auto / Stop Control
- Speed & 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

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 & 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
- 4 programmable relay outputs (Form A)
- 2 programmable relay outputs (Form C)
- 2 programmable digital outputs

Compatible with the following optional modules:

- Digital I/O module
- Local Annunciator
- Remote annunciator
- RTD module
- Thermocouple module

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Technical Data

| Open Generator Set - 1800 rpm/60 Hz/12 470 Volts | DM9301 | |
|---|----------------------------|----------------|
| Tier 4 Interim | | |
| Generator Set Package Performance | | |
| Genset Power rating @ 0.8 pf | 3125 kVA | |
| Genset Power Rating with fan | 2500 ekW | |
| Fuel Consumption¹ | | |
| 100% Load with fan | 654.5 L/hr | 172.9 Gal/hr |
| 75% Load with fan | 495.9 L/hr | 131.0 Gal/hr |
| 50% Load with fan | 355.6 L/hr | 93.9 Gal/hr |
| Diesel Exhaust Fluid (DEF) Consumption² | | |
| 100% Load with fan | 50.8 L/hr | 13.4 Gal/hr |
| 75% Load with fan | 35.0 L/hr | 9.2 Gal/hr |
| 50% Load with fan | 18.1 L/hr | 4.8 Gal/hr |
| Cooling System³ | | |
| Engine coolant capacity with radiator | 537 L | 141.9 gal |
| Engine coolant capacity | 233 L | 61.6 gal |
| Radiator coolant capacity | 304 L | 80.3 gal |
| Inlet Air | | |
| Combustion air inlet flow rate | 197.8 mm ³ /min | 6985.4 cfm |
| Exhaust System⁴ | | |
| Exhaust stack gas temperature (engine out) | 522.7 °C | 972.9 °F |
| Exhaust gas flow rate | 556.8 mm ³ /min | 19660 cfm |
| Exhaust system backpressure (maximum allowable) | 6.7 kPA | 26.9 in water |
| Heat Rejection | | |
| Heat rejection to coolant (total) | 842 kW | 47859 Btu/min |
| Heat rejection to exhaust (total) | 2570 kW | 146173 Btu/min |
| Heat rejection to aftercooler | 665 kW | 37831 Btu/min |
| Heat rejection to atmosphere from engine | 168 kW | 9535 Btu/min |
| Heat rejection to atmosphere from CEM | 311 kW | 17702 Btu/min |
| Heat rejection to atmosphere from generator | 106.9 kW | 6085 Btu/min |
| Alternator⁵ | | |
| Motor starting capability @30% voltage dip | 4478 skVA | |
| Frame | 2770 | |
| Temperature Rise | 130 °C | 234 °F |
| Lube System⁶ | | |
| Sump refill with filter | 401.3 L | 106 gal |
| Emissions (Nominal)⁷ | | |
| NOx g/hp-hr | 0.59 g/hp-hr | |
| CO g/hp-hr | 0.03 g/hp-hr | |
| HC g/hp-hr | 0.00 g/hp-hr | |
| PM g/hp-hr | 0.03 g/hp-hr | |

¹ EPA Tier 4 Interim diesel engines required the use of Ultra Low Sulfur Diesel (ULSD) fuel in order to protect emissions control systems, help comply with emissions standards, and meet published maintenance intervals. ULSD fuel will have ≤ 15 ppm (0.0015%) sulfur using the ASTM D5453, ASTM 2622, or SIN 51400 test methods.

² Diesel Exhaust Fluid (DEF) is 32.5% urea in de-ionized water, defined by ISO-22241

³ For ambient and altitude capabilities consult your Caterpillar dealer. Air flow restriction (system) is added to existing restriction from factory.

⁴ Backpressure allowance is total backpressure available for the customer excluding the clean emissions module (CEM).

⁵ 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 NEMA MG1-32.

⁶ Requires the use of CJ4 oil in order to meet published maintenance intervals.

⁷ 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. 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 time of measurement.

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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 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 Cat representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Cat dealer.



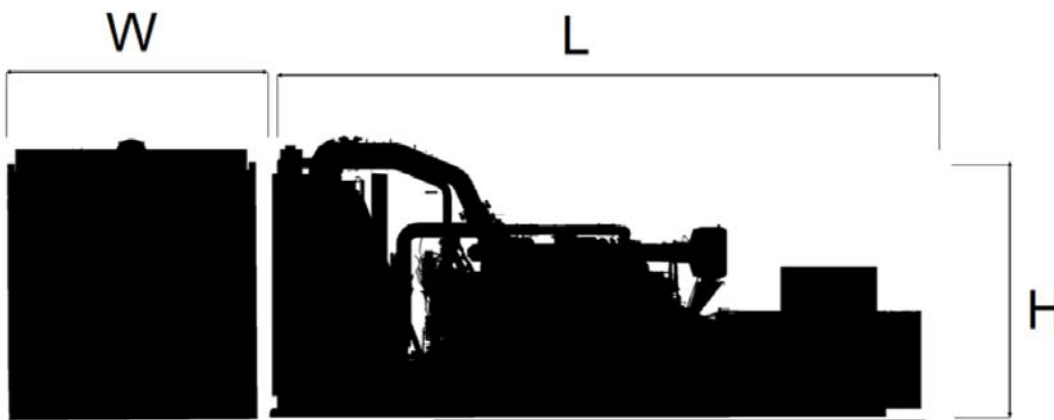
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DIMENSIONS

| Package Dimensions | | |
|--------------------|----------|-----------|
| Length | 7100mm | 279.5 in |
| Width | 2588 mm | 101.88 in |
| Height | 2880 mm | 113.38 in |
| Weight | 19400 kg | 42769 lb |

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



| CEM Dimensions | | |
|----------------|---------|----------|
| Length | 3366 mm | 132.5 in |
| Width | 2230 mm | 87.8 in |
| Height | 894 mm | 35.2 in |
| Weight | 1814 kg | 4000 lb |



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