### DIESEL GENERATOR SET





Image shown may not reflect actual package.

# CONTINUOUS 1600 ekW 2000 kVA 50 Hz 1500 rpm 400 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<sup>SM</sup> program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products

#### **CAT® 3516B-HD 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 GENERATOR**

- Matched to the performance and output characteristics of Cat engines
- · Industry leading mechanical and electrical design
- Industry leading motor starting capabilities
- High Efficiency

#### **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              | [] Dual element & heavy duty air cleaners               |
|                   | Service indicator                                     | [] Air inlet adapters & shut-off                        |
| Cooling           | Radiator with guard                                   | [] Radiator duct flange                                 |
|                   | Coolant drain line with valve                         |   |
|                   | Fan and belt guards                                   |   |
|                   | Cat® Extended Life Coolant                            |   |
| Exhaust           | Dry exhaust manifold                                  | [] Mufflers and Silencers                               |
|                   | Flanged faced outlets                                 | [] Stainless steel exhaust flex fittings                |
|                   |   | [] Elbows, flanges, expanders & Y adapters              |
| Fuel              | Secondary fuel filters                                | [] Water separator                                      |
|                   | Fuel priming pump                                     | [] Duplex fuel filter                                   |
|                   | Flexible fuel lines                                   |   |
|                   | • Fuel cooler*  |   |
| Generator         | Cat digital voltage regulator (CDVR) with kVAR/PF     | [] Oversize & premium generators                        |
|                   | control, 3-phase sensing                              | [] Winding temperature detectors                        |
|                   |   | [ ] Bearing temperature detectors                       |
|                   |   | [] Anti-condensation heaters                            |
| Power Termination | Bus bar (NEMA or IEC mechanical lug holes)            | [] Circuit breakers, UL listed, 3 pole with shunt       |
|                   | Top cable entry                                       | trip,100% rated, manual or electrically operated []     |
|                   |   | Circuit breakers, IEC compliant, 3 or 4 pole with shunt |
|                   |   | trip, manual or electrically operated                   |
|                   |   | [] Bottom cable entry                                   |
|                   |   | [] Power terminations can be located on the right, left |
|                   |   | and/or rear as an option.                               |
| Governor          | • ADEM™ 3   | [] Load share module                                    |
| Control Panels    | • EMCP 4.2  | [ ] Local & remote annunciator modules                  |
|                   |   | [] Digital I/O Module                                   |
|                   |   | [] Generator temperature monitoring & protection        |
|                   |   | [] Remote monitoring software                           |
| Lube              | Lubricating oil and filter                            | [] Oil level regulator                                  |
|                   | Oil drain line with valves                            | [] Deep sump oil pan                                    |
|                   | Fumes disposal  | [] Electric & air prelube pumps                         |
|                   | Gear type lube oil pump                               | [] Manual prelube with sump pump                        |
|                   |   | [] Duplex oil filter                                    |
| Mounting          | Rails - Engine / generator / radiator mounting        | [] Isolator removal                                     |
| · ·               | Rubber anti-vibration mounts (shipped loose)          | [] Spring-type vibration isolator (shipped loose)       |
|                   |   | [] IBC Isolators  |
| General           | Right-hand service                                    | [] UL 2200  |
|                   | Paint - Caterpillar Yellow except rails and radiators | [] CSA certification                                    |
|                   | are gloss black                                       | [ ] CE Certificate of Conformance                       |
|                   | SAE standard rotation                                 |   |
|                   | Flywheel and flywheel housing - SAE No. 00            |   |
|                   | -   | •   |

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### **SPECIFICATIONS**

#### **CAT GENERATOR**

| Cat Generator   |                       |
|---|-----------------------|
| Frame size  | 1844                  |
| Excitation  | Permanent Magnet      |
| Pitch   | 0.6667                |
| Number of poles   | 4                     |
| Number of bearings  | 2                     |
| Number of Leads   | 006                   |
| InsulationUL 1446 Reco  | ognized Class H with  |
| tropicalization and antiabrasion<br>- Consult your Caterpillar dealer for a | available voltages    |
| IP Rating   | IP23                  |
| Alignment   | Closed Coupled        |
| Overspeed capability  | 150                   |
| Wave form Deviation (Line to Line)  | 003.00                |
| Voltage regulator3 Phase se   | nsing with selectible |
| volts/Hz<br>Voltage regulationLess than +                                   | •                     |
| Less than +/- 1% (no load to full load)                                     | )                     |

#### **CAT DIESEL ENGINE**

| Water-cooled Diesel                |
|------------------------------------|
| 170.00 mm (6.69 in)                |
| 215.00 mm (8.46 in)                |
| 78.08 L (4764.73 in <sup>3</sup> ) |
| 15.5:1                             |
| TA                                 |
| Electronic unit injection          |
| 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 1500 rpm/50 Hz/400 Volts     |                           | DM7979         |  |  |
|---|---------------------------|----------------|--|--|
| Low Emissions                                   |                           |                |  |  |
|   |                           |                |  |  |
| Generator Set Package Performance               |                           |                |  |  |
| Genset Power rating @ 0.8 pf                    | 2000 kVA                  |                |  |  |
| Genset Power rating with fan                    | 1600 ekW                  |                |  |  |
| Fuel Consumption                                |                           |                |  |  |
| 100% load with fan                              | 437.2 L/hr                | 115.5 Gal/hr   |  |  |
| 75% load with fan                               | 326.3 L/hr                | 86.2 Gal/hr    |  |  |
| 50% load with fan                               | 220.9 L/hr                | 58.4 Gal/hr    |  |  |
| Cooling System <sup>1</sup>                     |                           |                |  |  |
| Engine Coolant capacity with radiator/exp. tank | 382.0 L                   | 100.9 gal      |  |  |
| Engine coolant capacity                         | 233.0 L                   | 61.6 gal       |  |  |
| Radiator coolant capacity                       | 149.0 L                   | 39.4 gal       |  |  |
| Inlet Air                                       |                           |                |  |  |
| Combustion air inlet flow rate                  | 163.8 m³/min              | 5784.5 cfm     |  |  |
| Exhaust System                                  |                           |                |  |  |
| Exhaust stack gas temperature                   | 451.0 ° C                 | 843.8 ° F      |  |  |
| Exhaust gas flow rate                           | 410.4 m³/min              | 14493.2 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)               | 563 kW                    | 32018 Btu/min  |  |  |
| Heat rejection to exhaust (total)               | 1726 kW                   | 98157 Btu/min  |  |  |
| Heat rejection to aftercooler                   | 474 kW                    | 26956 Btu/min  |  |  |
| Heat rejection to atmosphere from engine        | 131 kW                    | 7450 Btu/min   |  |  |
| Heat rejection to atmosphere from generator     | 71.9 kW                   | 4088.9 Btu/min |  |  |
| Alternator <sup>2</sup>                         |                           | ·              |  |  |
| Motor starting capability @ 30% voltage dip     | 6537 skVA                 |                |  |  |
| Frame   | 1844                      |                |  |  |
| Temperature Rise                                | 105 ° C                   | 189 ° F        |  |  |
| Lube System                                     |                           |                |  |  |
| Sump refill with filter                         | 401.3 L                   | 106.0 gal      |  |  |
| Emissions (Nominal) <sup>3</sup>                |                           |                |  |  |
| NOx mg/nm3                                      | 1488.4 mg/nm <sup>3</sup> |                |  |  |
| CO mg/nm3                                       | 261.4 mg/nm <sup>3</sup>  |                |  |  |
| HC mg/nm3                                       | 65.4 mg/nm <sup>3</sup>   |                |  |  |
| PM mg/nm3                                       | 29.5 mg/nm <sup>3</sup>   |                |  |  |

<sup>&</sup>lt;sup>1</sup> For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to existing restriction from factory.

<sup>&</sup>lt;sup>2</sup> Generator temperature rise is based on a 40° C (104° F) ambient per NEMA MG1-32.

<sup>&</sup>lt;sup>3</sup> 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.

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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

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 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             | 6324.9 mm | 249.01 in |  |  |
| Width              | 2286.0 mm | 90 in     |  |  |
| Height             | 2367.2 mm | 93.2 in   |  |  |

NOTE: For reference only - do not use for installation design. Please contact your local dealer for exact weight and dimensions. (General Dimension Drawing #3274640).

Performance No.: DM7979

Feature Code: 516DE7A

Gen. Arr. Number: 3111142

Source: U.S. Sourced

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