



Image shown may not reflect actual package.

## Mission Critical Standby 1600 ekW 2000 kVA 50 Hz 1500 rpm 11 000 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 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 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® 3516 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

# Mission Critical Standby 1600 kW 2000 kVA

50 Hz 1500 rpm 11 000 Volts



## FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT

System	Standard	Optional
Air Inlet	<ul style="list-style-type: none"> <li>• Single element canister type air cleaner</li> <li>• Service indicator</li> </ul>	<input type="checkbox"/> Dual element & heavy duty air cleaners <input type="checkbox"/> Air inlet adapters & shut-off
Cooling	<ul style="list-style-type: none"> <li>• Radiator with guard</li> <li>• Coolant drain line with valve</li> <li>• Radiator fan and fan drive</li> <li>• Fan and belt guards</li> <li>• Cat® Extended Life Coolant*</li> <li>• Coolant level sensors</li> </ul>	<input type="checkbox"/> Duct flange <input type="checkbox"/> Heat exchanger and expansion tank <input type="checkbox"/> Coolant level switch gauge <input type="checkbox"/> Jacket water heater
Exhaust	<ul style="list-style-type: none"> <li>• Dry exhaust manifold</li> <li>• Flanged faced outlets</li> </ul>	<input type="checkbox"/> Mufflers and Silencers <input type="checkbox"/> Stainless steel exhaust flex fittings <input type="checkbox"/> Elbows, flanges, expanders & Y adapters
Fuel	<ul style="list-style-type: none"> <li>• Secondary fuel filters</li> <li>• Fuel priming pump</li> <li>• Flexible fuel lines</li> <li>• Fuel cooler*</li> </ul>	<input type="checkbox"/> Water separator <input type="checkbox"/> Duplex fuel filter <input type="checkbox"/> Primary Fuel Filter
Power Termination	<ul style="list-style-type: none"> <li>• Bus bar (NEMA mechanical lug holes)</li> <li>• Right hand cable entry</li> <li>• Top or bottom cable entry</li> </ul>	<input type="checkbox"/> Left hand cable entry
Generators	<ul style="list-style-type: none"> <li>• Class F insulation</li> <li>• Cat digital voltage regulator (CDVR) with kVAR/PF control, 3-phase sensing</li> <li>• Winding temperature detectors</li> <li>• Anti-condensation heaters</li> </ul>	<input type="checkbox"/> Oversized generators <input type="checkbox"/> Cross current compensation transformer
Governor	<ul style="list-style-type: none"> <li>• Woodward 2301 isochronous</li> </ul>	<input type="checkbox"/> Load share governor
Control Panel	<ul style="list-style-type: none"> <li>• EMCP 4.2</li> <li>• User Interface panel (UIP) - rear mount</li> <li>• AC &amp; DC customer wiring area (right side)</li> <li>• Emergency stop pushbutton</li> </ul>	<input type="checkbox"/> Option for right or left mount UIP <input type="checkbox"/> Local & remote annunciator modules <input type="checkbox"/> Digital I/O Module <input type="checkbox"/> Generator temperature monitoring & protection <input type="checkbox"/> Remote monitoring software
Lube	<ul style="list-style-type: none"> <li>• Lubricating oil</li> <li>• Gear type lube oil pump</li> <li>• Oil filter, filler and dipstick</li> <li>• Oil drain lines and valve</li> <li>• Fumes disposal</li> </ul>	<input type="checkbox"/> Oil level regulator <input type="checkbox"/> Deep sump oil pan <input type="checkbox"/> Electric & air prelube pumps <input type="checkbox"/> Manual prelube with sump pump <input type="checkbox"/> Duplex oil filter
Mounting	<ul style="list-style-type: none"> <li>• Rails - Engine / generator / radiator mounting</li> <li>• Rubber anti-vibration mounts (shipped loose)</li> </ul>	<input type="checkbox"/> Isolator removal <input type="checkbox"/> Spring-type vibration isolator (shipped loose)
Starting/Charging	<ul style="list-style-type: none"> <li>• 24 volt starting motor(s)</li> <li>• Batteries with rack and cables</li> <li>• Battery disconnect switch</li> </ul>	<input type="checkbox"/> Battery chargers (10 or 20 amp) <input type="checkbox"/> 45 amp charging alternator <input type="checkbox"/> Oversize batteries <input type="checkbox"/> Ether starting aid <input type="checkbox"/> Heavy duty starting motors <input type="checkbox"/> Barring device (manual) <input type="checkbox"/> Air starting motor with control & silencer
General	<ul style="list-style-type: none"> <li>• Right hand service</li> <li>• Paint - Caterpillar Yellow (with high gloss black rails &amp; radiator)</li> <li>• SAE standard rotation</li> <li>• Flywheel and flywheel housing - SAE No. 00</li> </ul>	<input type="checkbox"/> CSA certification <input type="checkbox"/> CE Certificate of Conformance <input type="checkbox"/> Seismic Certification per Applicable Building Codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007 * Not included with packages without radiators

# Mission Critical Standby 1600 kW 2000 kVA

50 Hz 1500 rpm 11 000 Volts



## SPECIFICATIONS

### CAT GENERATOR

Cat HV Generator	
Frame size.....	2750
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

3516 TA, V-16, 4-Stroke Water-cooled Diesel	
Bore.....	170.00 mm (6.69 in)
Stroke.....	190.00 mm (7.48 in)
Displacement.....	69.00 L (4210.64 in <sup>3</sup> )
Compression Ratio.....	13.5:1
Aspiration.....	TA
Fuel System.....	Mechanical unit injection
Governor Type.....	Woodward

### 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)
- kW, 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

# Mission Critical Standby 1600 kW 2000 kVA

50 Hz 1500 rpm 11 000 Volts



## TECHNICAL DATA

Open Generator Set - - 1500 rpm/50 Hz/11 000 Volts		
<b>Low Fuel Consumption</b>		
<b>Generator Set Package Performance</b>		
Genset Power rating @ 0.8 pf Genset Power rating with fan	2000 kVA 1600 kW	
<b>Coolant to aftercooler</b>		
Coolant to aftercooler temp max	82 ° C	180 ° F
<b>Fuel Consumption</b>		
100% load with fan	419.1 L/hr	110.7 Gal/hr
75% load with fan	315.8 L/hr	83.4 Gal/hr
50% load with fan	224.4 L/hr	59.3 Gal/hr
<b>Cooling System<sup>1</sup></b>		
Air flow restriction (system)	0.12 kPa	0.48 in. water
Air flow (max @ rated speed for radiator arrangement)	1543 m <sup>3</sup> /min	54491 cfm
Engine Coolant capacity with radiator/exp. tank	398.0 L	105.1 gal
Engine coolant capacity	233.0 L	61.6 gal
Radiator coolant capacity	165.0 L	43.6 gal
<b>Inlet Air</b>		
Combustion air inlet flow rate	124.5 m <sup>3</sup> /min	4396.7 cfm
<b>Exhaust System</b>		
Exhaust stack gas temperature	490.3 ° C	914.5 ° F
Exhaust gas flow rate	333.0 m <sup>3</sup> /min	11759.8 cfm
Exhaust flange size (internal diameter)	203.2 mm	8.0 in
Exhaust system backpressure (maximum allowable)	6.7 kPa	26.9 in. water
<b>Heat Rejection</b>		
Heat rejection to coolant (total)	1051 kW	59770 Btu/min
Heat rejection to exhaust (total)	1527 kW	86840 Btu/min
Heat rejection to aftercooler	234 kW	13308 Btu/min
Heat rejection to atmosphere from engine	166 kW	9440 Btu/min
Heat rejection to atmosphere from generator	71.9 kW	4088.9 Btu/min
<b>Alternator<sup>2</sup></b>		
Motor starting capability @ 30% voltage dip	3928 skVA	
Frame	2750	
Temperature Rise	130 ° C	234 ° F
<b>Lube System</b>		
Sump refill with filter	401.3 L	106.0 gal
<b>Emissions (Nominal)<sup>3</sup></b>		
NOx mg/nm <sup>3</sup>	6743.6 mg/nm <sup>3</sup>	
CO mg/nm <sup>3</sup>	354.7 mg/nm <sup>3</sup>	
HC mg/nm <sup>3</sup>	104.2 mg/nm <sup>3</sup>	
PM mg/nm <sup>3</sup>	34.1 mg/nm <sup>3</sup>	

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

<sup>2</sup> 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.

<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.

# Mission Critical Standby 1600 ekW 2000 kVA

50 Hz 1500 rpm 11 000 Volts



## 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

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

# Mission Critical Standby 1600 ekW 2000 kVA

50 Hz 1500 rpm 11 000 Volts



## DIMENSIONS

---

Package Dimensions		
Length	6233.2 mm	245.4 in
Width	2286.0 mm	90 in
Height	2342.0 mm	92.2 in
Weight	17 909 kg	39,483 lb

NOTE: For reference only - do not use for installation design. Please contact your local dealer for exact weight and dimensions. (General Dimension Drawing #2748728).

[www.Cat-ElectricPower.com](http://www.Cat-ElectricPower.com)

2012 Caterpillar  
All rights reserved.

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

CAT, CATERPILLAR, their respective logos, "Caterpillar Yellow," the "Power Edge" trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.