Diesel Generator Set

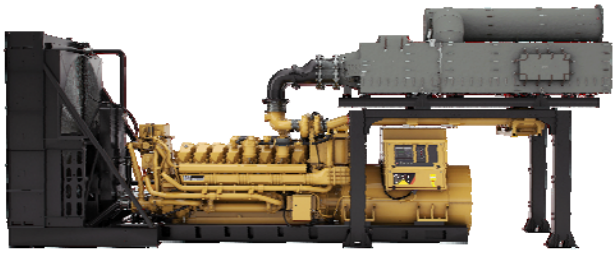

Image shown may not reflect actual package

Mission Critical Standby
3000 ekW 3750 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.

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

CAT C175-16 DIESEL ENGINE
- Reliable, rugged, durable design
- 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 GENERATOR
- Matched to the performance and output characteristics of Cat 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	• Air cleaner; 4 x single element canister with service indicator(s) • Plug group for air inlet shut-off	[ ] Air cleaner; 4 x dual element with service indicator(s) [ ] Air inlet adapters
Cooling	• SCAC cooling • Jacket water and AC inlet/outlet flanges	[ ] Package mounted vertical SCAC radiator [ ] Remote horizontal SCAC radiator [ ] Remote fuel cooler
Exhaust	• Exhaust manifold - dry - dual • Bolted flange (ANSI 6" & SIN 150) with bellow for each turbo (qty 4) • Clean Emissions Module (CEM) • CEM control cabinet • Flanged CEM outlet	[ ] Stainless steel exhaust flex fittings [ ] CEM installation package including support, exhaust connection kit, harness, and heated urea lines.
Fuel	• Primary fuel filter with water separator • Secondary fuel filters	
Generator	• 3 Phase brushless, Salient pole • Cat digital voltage regulator (CDVR) with VAR/PF control, 3-phase sensing • Winding temperature detectors	[ ] Oversize generators [ ] Anti-condensation space heaters
Power Termination	• Bus bar (NEMA mechanical lug holes) • Top cable entry	[ ] Bottom cable entry [ ] Right or left power termination
Governor	• ADEM™ A4	[ ] Load share module
Control Panel	• User interface panel (UIP) - rear mount • EMCP 4.2 Genset Controller • AC & DC customer wiring area (right side) • Emergency Stop Pushbutton	[ ] Local & remote annunciator modules [ ] Digital I/O Module [ ] Generator temperature monitoring & protection
Lube	• Lubricating oil • Gear type lube oil pump • Integral lube oil cooler • Oil filter, filler and dipstick • Oil drain line and valve • Prelube pump • Closed crankcase ventilation (CCV) system	
Mounting	• Rails - engine / generator / radiator mounting • Rubber anti-vibration mounts (shipped loose)	[ ] Spring type vibration isolator
Starting / Charging	• 24 volt starting motor(s) • Batteries with rack and cables • Battery disconnect switch	[ ] Battery chargers (20, 35, & 50 Amp) [ ] Oversize batteries [ ] Heavy duty starting motors [ ] Barring device (manual) [ ] 75A charging alternator
General	• Right hand service • Paint – Cat Yellow except rails and radiators gloss black • SAE standard rotation • Flywheel and flywheel housing – SAE No. 00	

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SPECIFICATIONS

CAT GENERATOR

Frame …….……..…….. 3020
Excitation ……..…Permanent Magnet
Pitch…….……0.6667
Number of poles……..……4
Number of leads……..……6
Number of bearings ……..……Two Bearing
Insulation ……Class F
IP rating ……..Drip proof IP23
Over speed capability - % of rated……125%
Wave form deviation……..2 %
Voltage regulator……. ……3 phase sensing with selectable V/Hz regulation
Voltage regulation….Less than ±1/2% (steady state)
Less than ±1/2% (3% speed change)

CAT DIESEL ENGINE

C175, SCAC, V-16, 4 stroke, water-cooled diesel

Bore …….175.00 mm (6.89 in)
Stroke ……..220.00 mm (8.66in)
Displacement …….84.67 L (5166.88 in^3)
Compression ratio……15.3:1
Aspiration……TA
Fuel system……Common Rail
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	MISSION CRITICAL STANDBY	
Generator Set Package Perfomance		
Genset Power rating @ 0.8 pf	3750 kVA	
Genset Power Rating with fan	3000 ekW	
Fuel Consumption[1]		
100% Load with fan	790.3 L/hr	208.8 Gal/hr
75% Load with fan	616.2 L/hr	162.8 Gal/hr
50% Load with fan	465.9 L/hr	123.1 Gal/hr
Diesel Exhaust Fluid (DEF) Consumption[2]		
100% Load with fan	50.7 L/hr	13.4 Gal/hr
75% Load with fan	30.3 L/hr	8.0 Gal/hr
50% Load with fan	15.5 L/hr	4.1 Gal/hr
Cooling System[3]		
Airflow Restriction (system)	0.12 kPA	0.5 in water
Airflow (max @rated speed)	3188 mm^3/min	112583 cfm
Engine coolant capacity with radiator	988.7 L	261.2 gal
Engine coolant capacity	303.5 L	80.2 gal
Radiator coolant capacity	685.2 L	181 gal
Inlet Air		
Combustion air inlet flow rate	259.2593 mm^3/min	9155 cfm
Exhaust System[4]		
Exhaust stack gas temperature	472 °C	882.2 °F
Exhaust gas flow rate	667 mm^3/min	23557 cfm
Exhaust system backpressure (maximum allowable)	6.7 kPA	26.9 in water
Heat Rejection		
Heat rejection to cooolant (total)	1373 kW	78075 Btu/min
Heat rejection to exhaust (total)	3112 kW	176964 Btu/min
Heat rejection to aftercooler	379 kW	21574 Btu/min
Heat rejection to atmosphere from engine	175 kW	9978 Btu/min
Heat rejection to atmosphere from CEM	48 kW	2756 Btu/min
Heat rejection to atmosphere from generator	3.1 kW	178 Btu/min
Alternator[5]		
Motor starting capabiliy @30% voltage dip	7879 skVA	
Frame	3020	
Temperature Rise	130 °C	234 °F
Emissions (Nominal)[7]		
NOx g/hp-hr	0.53 g/hp-hr	
CO g/hp-hr	0.01 g/hp-hr	
HC g/hp-hr	0.00 g/hp-hr	
PM g/hp-hr	0.01 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.

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 the standby rated ekW for 5% of the operating type. 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 35º API [16º C (60º F)] gravity having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 29º C (85º 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	7359 mm	289.7 in
Width	3041 mm	119.7 in
Height	3613 mm	142.2 in

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

CEM Dimensions		
Length	4580 mm	180.3 in
Width	2361 mm	92.9 in
Height	1714 mm	67.5 in

Performance No: EM0315

Feature Code: 175DE52

Gen. Arr. Number: 2628258

Sourced: U.S. Sourced

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