

# PRELIMINARY SPEC SHEET

Diesel Generator Set – 3,000 kVA – 50 Hz



## C175-16 Standby 2,400 ekW / 3,000 kVA - 50 Hz – 1500 RPM 400 and 3,300 Volts

<i>System</i>	<i>Standard</i>
Air Inlet	<ul style="list-style-type: none"><li>• Single element canister type air cleaners</li><li>• Service indicator</li></ul>
Cooling	<ul style="list-style-type: none"><li>• Radiator with guard (43°C ambient temperature)</li><li>• Coolant drain line with valve</li><li>• Caterpillar Extended Life Coolant</li></ul>
Exhaust	<ul style="list-style-type: none"><li>• Dry exhaust manifold</li><li>• Flanged faced outlets (ANSI / DIN)</li></ul>
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 (optional)</li></ul>
Generator	<ul style="list-style-type: none"><li>• IE (LV) and PMG (MV, HV)</li><li>• Class H insulation</li><li>• Class H temperature (150°C rise)</li><li>• CDVR voltage regulator</li><li>• Reactive droop</li><li>• Bus bar connections</li><li>• Winding temperature sensors std PM @ 480 Volt (opt for LV)</li><li>• Anti-condensation space heaters (opt for LV)</li><li>• Bearing temperature sensors – option (opt for LV)</li></ul>
Governing System	<ul style="list-style-type: none"><li>• Caterpillar ADEM™ A4 speed control governor</li></ul>
Control Panels	<ul style="list-style-type: none"><li>• EMCP 3 (package mounted)</li></ul>
Lube System	<ul style="list-style-type: none"><li>• Lubricating oil and filter</li><li>• Oil drain line with valves</li><li>• Fumes disposal</li><li>• Gear type lube oil pump</li></ul>
Mounting	<ul style="list-style-type: none"><li>• Rubber, anti-vibration mounts (shipped loose)</li></ul>
Starting/Charging	<ul style="list-style-type: none"><li>• 24 Volt starting motor(s)</li><li>• 45 Amp charging alternator</li><li>• Batteries with rack and cables</li><li>• Battery disconnect switch</li></ul>
General	<ul style="list-style-type: none"><li>• Right-hand service</li><li>• Paint – Caterpillar Yellow except rails and radiators gloss black</li><li>• SAE standard rotation</li><li>• Flywheel and flywheel housing – SAE No. 0</li></ul>
Note	For any additional options, consult the factory

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10/10/2005

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## Specifications

### **CAT Generator**

Excitation .....IE  
Pitch.....2/3  
Number of poles ..... 4  
Number of bearings ..... 2  
Insulation ..... UL 1446 Recognized Class H  
IP rating ..... Drip Proof IP23  
Alignment ..... closed coupled  
Overspeed capability - % of rated ..... 125  
Wave form ..... Less than 5% deviation  
Paralleling kit/Droop transformer ..... Standard  
Telephone Influence Factor ..... Less than 50  
Harmonic distortion ..... Less than 5%

### **CAT Digital Voltage Regulator**

Microprocessor based  
VAR/PF control ..... Standard  
Direct 3 Phase sensing with selectable volts/Hz  
Communicates with EMCP 3  
Programmable operating characteristics  
Voltage regulation ... Less than +/- 0.25% (steady state), Less than +/- 1% (no load to full load)  
Compatible with self-excited, PMG, and IE

### **CAT Diesel Engine**

C175-16, 4-stroke-cycle water-cooled diesel  
Bore – mm ..... 175 mm (6.89 in)  
Stroke – mm ..... 220 mm (8.66 in)  
Displacement – L ..... 84.6 L (5165.1 cu. in)  
Compression ratio ..... 16.7:1  
Aspiration ..... SCAC  
Fuel system ..... Common Rail  
Governor type ..... Caterpillar ADEM™ A4

### **CAT EMCP3 Control Panels**

- EMCP 3.1 (Standard)
- EMCP 3.2 & 3.3 (Optional)
- 24 Volt DC control
- Generator instruments designed to meet UL/CSA/CE/UL508A
- Integral generator terminal box
- Single location for customer connection
- MODBUS isolated data link (RS-485 half-duplex) supports serial communication at data rate up to 115.2 kbaud
- Auto start/stop control
- True RMS metering, 3-phase
- Digital indication for:
  - RPM
  - Operating hours
  - Oil pressure
  - Coolant temperature
  - System DC volts
  - L-L Volts, L-N Volts, phase amps, Hz
  - kW, kVA, kVAR, kW-hr, %kW, PF
- Shutdowns with indicating lights for:
  - Low oil pressure
  - High coolant temperature
  - Low coolant level
  - Overspeed
  - Emergency stop
  - Failure to start (over crank)
- Programmable protective relay functions:
  - Under and over voltage
  - Under and over frequency
  - Reverse power
  - Overcurrent (phase & total)
- Programmable kW level relay

### **CAT Control Options**

- Programmable annunciator (local and remote or both) (2 max)
- Spare discrete I/O (16 in/8 out) (1 max)
- Generator temperature monitor/protection (stator & bearing)
- Engine temperature monitor/protection

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## Generator Set Technical Data

C175-16, 50Hz, 1500 RPM	Standby – Low BSFC	
<b>Package Performance</b> Genset Power rating with fan Genset Power rating @ 0.8 pf	2,400 ekW 3,000 kVA	
<b>Fuel Consumption</b> 100% load with fan 75% load with fan 50% load with fan	599.4 L/hr 436.6 L/hr 301.6 L/hr	158.3 Gal/hr 115.3 Gal/hr 79.7 Gal/hr
<b>Cooling System</b> Radiator air flow rate @ 0.25 external static restriction	3602.2 m <sup>3</sup> /min	127,212 cfm
<b>Inlet Air</b> Combustion air inlet flow rate	195 m <sup>3</sup> /min	6,886.4 cfm
<b>Exhaust System</b> Exhaust stack gas temperature Exhaust gas flow rate Exhaust flange size (internal diameter) Exhaust system backpressure (maximum allowable)	423°C 456 m <sup>3</sup> /min 355.6 mm 100 kPa	793°F 16,103.5 cfm 14 in. 401.5 in. H <sub>2</sub> O
<b>Heat Rejection</b> Heat rejection to coolant (total) Heat rejection to exhaust (total) Heat rejection to aftercooler Heat rejection to atmosphere from engine	1,462.4 kW 1,700.2 kW 368.9 kW 65.6 kW	83,240.7 Btu/min 96,773.5 Btu/min 20,997.7 Btu/min 3,734.6 Btu/min
<b>Noise</b> Exhaust Sound Data: 23.0 Feet @ 100% Load Mechanical Sound Data: 23.0 Feet @ 100% Load	Overall Sound DB(A) n/a Overall Sound DB(A) n/a	
<b>Emissions (Estimate Nominal)</b> NOx g/hp-hr HC g/hp-hr CO g/hp-hr PM g/hp-hr	<u>@ rated performance</u> 7.44 g/hp-hr 0.12 g/hp-hr 0.25 g/hp-hr n/a g/hp-hr	

Ambient capability at 750 m (2,461 ft) @ 43°C above sea level. For ambient capability at other altitudes, consult the Caterpillar factory.

## Preliminary Package Dimensions without Radiator

1840 Frame Package Dimensions		
Length	5,894.8 mm	232.1 in
Width	1,650.5 mm	65.0 in
Height	2,248.5 mm	88.5 in
Weight	18,800 kg	41,500 lbs

Note: Do not use for installation design.  
Consult factory for final configuration.

1860 Frame Package Dimensions		
Length	6,004.8 mm	236.4 in
Width	1,650.5 mm	65.0 in
Height	2,248.5 mm	88.5 in
Weight	18,800 kg	41,500 lbs

Note: Do not use for installation design.  
Consult factory for final configuration.

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## Generator Technical Data

C175-16, Standby, 50Hz, 1500 RPM	400 Volts (std)	400 Volts (opt)	3,300 Volts (opt)
<b>Heat Rejection</b> Heat rejection to atmosphere from generator	84.47 kW    4,808.5 Btu/min	79.34 kW    4,516.0 Btu/min	81.90 kW    4,661.7 Btu/min
<b>Generator</b> Motor starting capability @32.5% voltage dip, 0.4 PF	5975 skVA	6957 skVA	7404 skVA
Frame	1846	1866	1846
Winding	Random	Form	Form
Temperature Rise	150°C            302°F	150°C            302°F	150°C            302°F

Generator temperature rise is based on a 40°C ambient per NEMA MG1-32.

## Preliminary Horizontal Radiator Dimensions

	43°C Radiator	
Length	4,714.2 mm	185.6 in
Width	2,279.7 mm	89.75 in
Height	2,561.8 mm	100.86 in
Weight	5,102 kg	11,248 lbs

Note: Do not use for installation design.  
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## Rating Definitions and Conditions

**Meets or Exceeds International Specifications:** ABGSM TM3, AS1359, AS2789, BS4999, BS5000, BS5514, DIN6271, DIN6280, EGSA101P, IEC34/1, ISO3046/1, ISO8528, JEM1359, NEMA MG 1-32

**Ratings** are based on SAE J1995 standard conditions. These ratings also apply at ISO3046/1, DIN6271, and BS5514 standard conditions.

**Fuel rates** are based on fuel oil of 35° API (16°C or 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.)

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EMCP 3.1

## EMCP 3.1 GENSET CONTROLLER FOR DIESEL GENSETS ≤ 200 kW

The EMCP 3.1 control panel is a cost effective solution for control and monitoring of your generator set. It includes manual and automatic start/stop and an engine cool down timer. The 32-bit microprocessor-based system eliminates individual meters, gauges and switches, reduces wiring and results in a highly durable and robust system.

The EMCP 3.1 panel combines generator set control and monitoring in one module for easy access to controls, metering, protection device settings and diagnostic information.

### FEATURES

- Programmable protective relaying, available as alarm and shutdown, protects against underspeed, overspeed, low battery voltage, high battery voltage
- Digital, 32-bit microprocessor-based system eliminates the need for multiple switches, meters, transducers, relays, and sending units, which translates to less wiring and fewer opportunities for mechanical failures
- Simultaneous viewing of all AC L-L voltages, all AC L-N voltages, or all AC line currents saves time
- User-friendly, convenient, customer programmability directs the customer to logical parameter groups (Ex. AC metering, protective relaying, engine monitoring) for quick keypad access
- Set points & software are stored in nonvolatile memory, preventing loss during a power outage
- True RMS sensing ensures AC metering accuracy of 2% for AC voltage, current
- Five levels of security allow operators to have different access privileges
- Display available in English, French or Spanish, switchable to Technician English for Service

## STANDARD/OPTIONAL FEATURES

EMCP 3.1	
STANDARD FEATURES	
<b>Panel Construction and Finish</b>	Components installed in a heavy duty sheet steel enclosure Phosphate chemical pre-coating of steel provides corrosion resistant surface Polyester composite powder topcoat forms high gloss and extremely durable finish
<b>Mounting</b>	Mounted to generating set baseframe on robust steel stand Vibration isolated from generating set
<b>Instrumentation</b>	LCD display with adjustable contrast and backlight with auto power off AC metering: Volts 3-phase (L-L & L-N); Amps (per phase & average); Frequency DC metering: Battery Volts; Engine hours run; Engine Jacket Water Temperature (in °C or °F); Lube oil pressure (in psi, kPa or bar); Engine speed (rpm)
<b>Protection</b>	Fail to start shutdown Low oil pressure shutdown High engine temperature Low/High battery voltage Battery charger failure (if fitted) Underspeed/Overspeed Loss of engine speed detection 2 spare fault channels 20 event fault log (name of event, engine hours at first occurrence of event, engine hours at latest occurrence of event, number of occurrences of event)
<b>Controls</b>	2 LED status indicators (1 red shutdown, 1 amber warning) Run key and LED indicator Auto key and LED indicator Stop key and LED indicator Lamp test key Alarm acknowledge key Menu navigation keys Engine and AC metering shortcut keys All control module keys have tactile feedback Lock down emergency stop push button
<b>Languages</b>	English, French or Spanish

OPTIONAL FEATURES
Battery chargers: PBC3UL UL 3A 120V AC, PBC10UL UL 10A 120V AC, PBC5, PSB3 Boost, PMBCUL5 UL 5A 120V AC
PMA4 A battery charge ammeter
PAC1 Volt free contacts for common alarm
PGR1 Volt free contacts for genset running
PAA1 Audible alarm
PSB5 Lockdown emergency stop button with security key
PSV1 Volts adjust potentiometer
PSS1 Speed adjust potentiometer
Spare shutdown/alarm channel can include FSS2 Low fuel level alarm, PFS2 Panel circuit for low fuel level alarm, FSS1 Low fuel level shutdown, PFS1 Panel circuitry for low fuel level shutdown, FSS5 High fuel level, PFS5 Panel circuitry for high fuel level alarm, LGA1 Low gas pressure alarm, LUBS1 High lube oil temperature shutdown, WCA1 Low coolant temperature alarm, WSS1 Low coolant level shutdown

Note: All options are not available on all genset models.