



Image shown may not reflect actual package.

STANDBY

**1600 e kW 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

SINGLE-SOURCE SUPPLIER

- Factory-designed systems built at Caterpillar ISO 9001:2000 certified facilities
- Fully prototype tested with certified torsional vibration analysis available

WORLDWIDE PRODUCT SUPPORT

- Caterpillar® dealers provide extensive post sale support including maintenance and repair agreements
- Caterpillar dealers fill 99.7% of parts orders within 24 hours
- Caterpillar dealers have over 1,844 dealer branch stores operating in 166 countries
- The Cat® S•O•SSM 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
- UL 2200 Listed packages are available. Certain restrictions may apply. Consult with your Caterpillar dealer

CAT SR4B GENERATOR

- Matched to the performance and output characteristics of Caterpillar engines
- Optimum winding pitch for minimum total harmonic distortion and maximum efficiency
- Single point access to accessory connections
- UL 1446 recognized Class H insulation

CAT CONTROL PANELS

- Three levels of controls to meet individual customer needs:
 - EMCP II offers digital monitoring, metering, and protection
 - EMCP II+ offers EMCP II features plus full-featured power metering and protective relaying (optional)
 - Switchgear conversions with easy interface for remote switchgear
- UL 508A Listed

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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 • Service indicator 	<ul style="list-style-type: none"> • Dual element & heavy duty air cleaners • Air inlet adapters & shutoff
Cooling	<ul style="list-style-type: none"> • Radiator with guard (43°C) • Coolant drain line with valve • Fan and belt guards • Caterpillar Extended Life Coolant • Low coolant level & high temperature alarm or shutdown 	<ul style="list-style-type: none"> • Radiator with 50°C ambient capability • Radiator removal • Heat exchanger and expansion tank • Radiator duct flange • Coolant level switch gauge • Jacket water heater
Exhaust	<ul style="list-style-type: none"> • Stainless steel exhaust flex and ANSI outlet flange 	<ul style="list-style-type: none"> • Mufflers (10, 25, & 35 dba) • Elbow kit and through-wall installation kit
Fuel	<ul style="list-style-type: none"> • Primary & secondary fuel filters • Fuel priming pump • Flexible fuel lines 	<ul style="list-style-type: none"> • Fuel cooler • Water separator
Generators	<ul style="list-style-type: none"> • Permanent magnet excited • Class H insulation • Class F temperature (105°C prime/130°C standby) • Reactive droop • Digital Voltage Regulator, 3-phase sensing • Bus bar connections • Winding temperature detectors • Anti-condensation space heaters 	<ul style="list-style-type: none"> • Digital Voltage Regulator with KVAR/PF control • Bearing temperature detectors • Oversize & premium generators • Cable access box • Neutral grounding connection • Circuit breakers, IEC compliant, 3 & 4 pole with shunt trip
Governor	<ul style="list-style-type: none"> • Woodward 2301A isochronous 	<ul style="list-style-type: none"> • Electronic load sharing
Control Panels	<ul style="list-style-type: none"> • EMCP II 	<ul style="list-style-type: none"> • EMCP II+ • EMCP II+ with Auto-Paralleling • Switchgear conversion • Customer Communication Module • Local alarm & remote annunciator modules
Lube	<ul style="list-style-type: none"> • Lubricating oil and filter • Oil drain line with valves • Fumes disposal 	<ul style="list-style-type: none"> • Sump pump (manual) • Sump & prelube pump (manual or electric) • Oil level regulator
Mounting	<ul style="list-style-type: none"> • 330 mm (13 in) structural steel rails • Spring-type, anti-vibration mounts (shipped loose) 	
Starting/Charging	<ul style="list-style-type: none"> • 24 volt starting motor(s) • 45 amp charging alternator • Batteries with rack and cables • Battery disconnect switch 	<ul style="list-style-type: none"> • Battery chargers (5 or 10 Amp) • Oversize batteries • Ether starting aids • Heavy duty starting motors • Barring device (manual)
General		<ul style="list-style-type: none"> • Crankcase explosion relief valves • Automatic transfer switches (ATS) • EU Certificate of Conformance

SPECIFICATIONS

CAT GENERATOR

SR4B Generator

Frame size.....	825
Excitation.....	Permanent Magnet
Pitch.....	0.6667
Number of poles.....	4
Number of bearings.....	Single Bearing
Insulation.....	UL 1446 Recognized Class H with tropicalization and antiabrasion
IP rating.....	Drip Proof IP22
Alignment.....	Pilot Shaft
Overspeed capability - % of rated.....	180
Wave Form.....	003.00
Paralleling kit/Droop Transformer.....	Standard
Voltage regulator.3 Phase sensing with selectible 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-cycle watercooled diesel

Bore - mm.....	170.00 mm (6.69 in)
Stroke - mm.....	190.00 mm (7.48 in)
Displacement - L.....	69.06 L (4214.3 in ³)
Compression ratio.....	13.5:1
Aspiration.....	TA
Fuel system.....	Direct unit injection
Governor type.....	Woodward

CAT CONTROL PANELS

- EMCP II
- 24 Volt DC Control
- NEMA 1, IP22 enclosure
- Electronically dead front
- Lockable hinged door
- Generator instruments meet ANSI C-39-1
- Terminal box mounted
- Single location for customer connection
- EC compliant - segregated AC/DC connections
- Panel illuminating lights
- Auto start/stop control
- Voltage adjust potentiometer
- True RMS metering, 3-phase
- Digital indications for:
 - RPM
 - Operating hours
 - Oil pressure
 - Coolant temperature
 - System DC volts
 - AC voltage, phase amps, Hz
- Shutdowns with indicating lights for:
 - Low oil pressure
 - High coolant temperature
 - Overspeed
 - Emergency stop
 - Failure to start (overcrank)

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TECHNICAL DATA

Open Generator Set - - 1500 rpm/50 Hz/400 Volts	TM8926
Package Performance Genset Power rating @ 0.8 pf Genset Power rating with fan	2000 kVA 1600 ekW
Fuel Consumption 100% load with fan 75% load with fan 50% load with fan	419.0 L/hr 315.2 L/hr 223.2 L/hr
Cooling System Air flow restriction (system) Engine coolant capacity Radiator coolant capacity Engine Coolant capacity with radiator/exp. tank	0.12 kPa 233.0 L 222.0 L 455.0 L
Exhaust System Combustion air inlet flow rate Exhaust stack gas temperature Exhaust gas flow rate Exhaust flange size (internal diameter) Exhaust system backpressure (maximum allowable)	124.5 m ³ /min 490.3 ° C 332.9 m ³ /min 203.2 mm 6.7 kPa
Heat Rejection Heat rejection to coolant (total) Heat rejection to exhaust (total) Heat rejection to aftercooler Heat rejection to atmosphere from engine Heat rejection to atmosphere from generator	1051 kW 1526 kW 234 kW 166 kW 56.3 kW
Alternator Motor starting capability @ 30% voltage dip Frame Temperature Rise	3950 skVA 825 125 ° C

Ambient capability at 200 m (660 ft) above sea level. For ambient capability at other altitudes, consult your Caterpillar dealer.
Generator temperature rise is based on a 40° C (104° F) ambient per NEMA MG1-32.

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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 1-22, VDE0530, 89/392/EEC, 89/336/EEC

Standby - Output available with varying load for the duration of the interruption of the normal source power. Standby power in accordance with ISO8528. Fuel stop power in accordance with ISO3046/1, AS2789, DIN6271, and BS5514. Standby ambients shown indicate ambient temperature at 100 percent load which results in a coolant top tank temperature just below the shutdown temperature.

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.).

Additional Ratings may be available for specific customer requirements. Consult your Caterpillar representative for details.

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DIMENSIONS

Package Dimensions	
Length	6274.7 mm
Width	2092.0 mm
Height	2529.7 mm
Weight	17 250 kg

Note: Do not use for installation design.
See general dimension drawings for detail (Drawing #1558401).

Performance No.: TM8926

Feature Code:: 516DE04

Source:: European Sourced

4 May 2005

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The International System of Units (SI) is used in this publication.



EMCP II ELECTRONIC MODULAR CONTROL PANEL

The Electronic Modular Control Panel (EMCP II) combines the engine control and AC metering into one, user-friendly control. The displays, along with enhanced self-diagnostic capabilities, take the guesswork out of generator set monitoring. Representative graphics and LCD readouts make engine status and AC metering easy to understand, even for untrained personnel. The advanced microprocessor-based EMCP II combined with the Caterpillar Customer Communication Module (CCM) give you the flexibility to remotely monitor and control your Caterpillar packaged generator set.

FEATURES

UL 508A

- UL 508A Listed

RELIABLE, DURABLE, AND ACCURATE

- Environmentally sealed, die-cast aluminum housing isolates and protects electrical components against failure caused by moisture and dirt contamination.
- Rigorous vibration testing ensures panel dependability.
- Maintains metering accuracy from -40° C (-40° F) to 70° C (158° F)
- Electrical noise immunity of 100 volts/meter
- True RMS sensing ensures AC metering accuracy is 0.5% for AC volts and amps.
- The digital, microprocessor-based system eliminates the need for a number of switches, meters, and sensing units. That means less wiring and fewer opportunities for mechanical failures.

FULL-FEATURED, EASY-TO-READ METERING

- LCD digital readout for: engine oil pressure, coolant temperature, engine rpm, system DC volts, engine running hours, generator AC volts, generator AC amps, and generator frequency
- Eight LED alarms, two programmable to general fault shutdown or general fault alarm

ADVANCED CONTROLS

- Cycle cranking, with adjustable crank/rest period of 1 – 60 seconds
- Three spare inputs/one spare output activate at customer programmed setpoints
- Expanded remote communication module supported by an open RS-232C architecture — easily interfaced with existing plant systems and equipment

SIMPLIFIED SERVICING

- All high voltages have been removed from the generator set status control module for safer panel servicing.
- Self-diagnostic capability pinpoints operational problems in need of attention.
- Using an SAE format, the panel zeros in on the affected system and identifies the component responsible for the failure.
- Key-pad programmable setpoints

REGULATORY APPROVALS

- U.S. sourced control panels meet CSA requirements.
- Larne sourced control panels meet CE requirements.



STANDARD/OPTIONAL FEATURES

EMCP II	
STANDARD FEATURES	
Digital (LCD) Indication	AC voltage (L-L) AC amps System diagnostics Frequency DC voltage Coolant temperature Oil pressure rpm Hours run
Controls	Auto start/stop Purge cycle (gas packages only) Staged shutdown (gas packages only) Emergency stop Lamp test Cycle crank Voltage control Cooldown timer Phase selector switch
Enclosure	NEMA 1, IP22 Vandal door
Indicating Lights with Shutdown	Low oil pressure High coolant temperature Overspeed Overcrank Emergency stop High inlet air temp (gas TA engines only) Detonation sensitive timing (gas LE engines only) Fault shutdown* Fault alarm* *3 spare inputs — customer programmable *1 spare input — customer programmable (gas packages only)
OPTIONAL FEATURES	
Protective Devices	Low coolant level (standard on some packages) Fixed relays: Over/undervoltage (available on some packages)
Miscellaneous Controls	Electronic governor: Isochronous speed control Load share Alarm modules — local (with horn and silence switch) Frequency control Common alarm/shutdown volt free contact Generator running volt free contact Ether starting aid (not available on gas packages) Manual synchronizing modules Computer communications data link Panel lights Remote annunciator modules

SETPOINT PROGRAMMING PROVIDES CUSTOMER FLEXIBILITY

ENGINE/GENERATOR CONFIGURATION

- Setpoints affect proper operation and serviceability of the engine and accuracy of information shown on the display
- Factory set for optimum performance
- Twenty-four customer-programmable setpoints reflect changes in site condition — example: fuel solenoid type, ring gear teeth, crank termination speed, etc.

SPARE INPUT/OUTPUT

- Designed for meeting the requirements of the customer or application
- Three spare inputs/one spare output accessed on auxiliary terminal strip
- Customer Programmable
 - Input active state
 - Input response:
 - Input time delay
 - Output trigger condition
 - shutdown/alarm

EXPANDED SYSTEM FLEXIBILITY

ALARMS AND ANNUNCIATORS

EMCP II Control Panel includes two slots for optional alarm or synchronizing modules. Each alarm module contains a block of eight LEDs. Customers select from the following:

- NFPA99/110 alarm modules
- Custom alarm module
- Manual synchronizing module

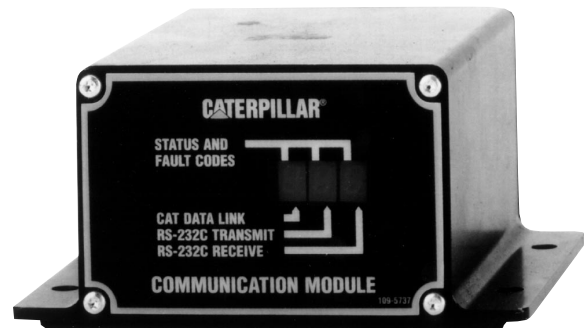


Customer Interface Module (CIM) is a relay board that provides nine contacts for custom remote annunciation.



REMOTE COMMUNICATION

The Caterpillar Customer Communication Module (CCM) provides a means to remotely monitor and control single or multiple packaged generator sets at a common site. By accessing the CCM from a personal computer or other RS-232C device, each unit can be remotely started and stopped, and all engine and generator parameters can be monitored on a 'real time' basis. Published, open architecture enables you to connect the CCM to an existing plant information system.



SYSTEM SOFTWARE

CCM PC is a user-friendly, IBM compatible, windows-based program. CCM PC interfaces with the CCM and the EMCP II. Remote control ability, parameter status display, diagnostic viewing/clearing options and parameter logging are among its standard tools. An on-line help system provides fingertip access to software questions and instructions. Integrated file management facility allows you to copy, move, delete, view, print, and rename documents and files from within CCM PC without the use of DOS file names or the Windows file manager.

EMCP II SPECIFICATIONS

EMI Immunity

IEC 801-2, IEC 801-3, IEC 801-4, EN 5082-2

Enclosure

NEMA 1, IP22

Humidity

0 to 100% relative humidity

Impervious to:

salt spray, fuel, oil and oil additives, coolant, spray cleaners, chlorinated solvents, hydrogen sulfide and methane gas, and dust

Input and output protection

all inputs and outputs are protected against short circuits to (+/-) battery

Input voltage range (24 VDC nominal)

14 to 45 VDC

Power requirements

10 watts (with generator set in standby mode — no alarms)

Reverse polarity protected

Shock, withstands 20 g

Temperature range

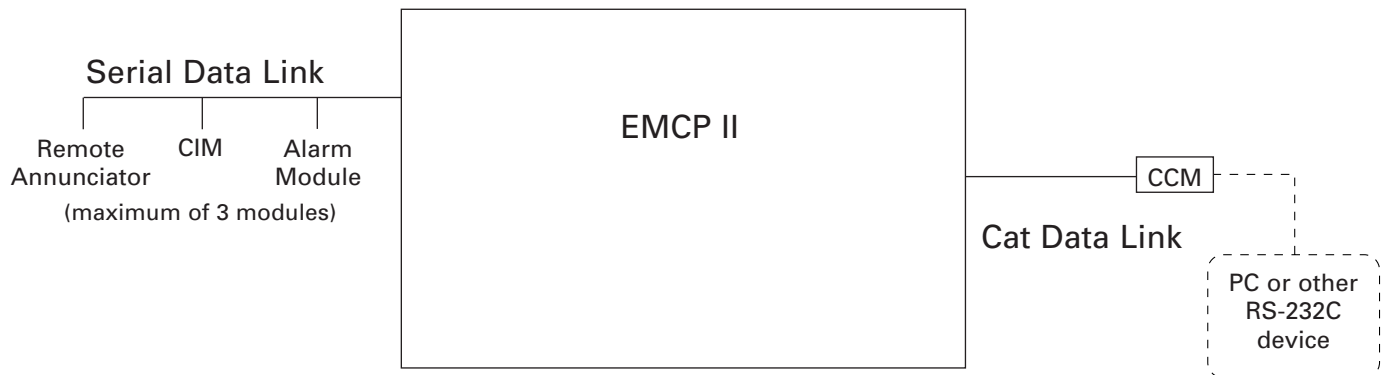
Operating: -40° C to 70° C (-40° F to 158° F)

Storage: -55° C to 85° C (-67° F to 185° F)

Vibration

withstands 2.0 g @ 18 to 500 Hz

EMCP II SYSTEM HIERARCHY DRAWING



www.CAT-ElectricPower.com

U.S./European sourced

LEHX9589-02 (06-01)
Supersedes LEHX9589-01

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