



EMCP 3.3 GENSET CONTROLLER

GENERAL DESCRIPTION

The Caterpillar EMCP 3.3 places fully featured power metering, protective relaying, engine and generator control and monitoring, and expanded AC metering at your fingertips. Engine and generator controls, diagnostics, and operating information are accessible via the control panel keypads; diagnostics from other J1939 modules can be viewed and reset through the EMCP 3.3. The EMCP 3.3 features a graphical display with a white backlight visible in all types of light as well as an advanced engine monitoring system. These features add to the sense of value and dependability that comes with your purchase of Caterpillar products.

OPERATOR INTERFACE

- Graphical display with positive image, transfective LCD, adjustable white backlight/contrast
- Two LED status indicators (1 red, 1 amber)
- Three Engine Control Keys & Status Indicators (Run/Auto/Stop)
- Lamp Test Key
- Alarm Acknowledgement Key
- Display Navigation Keys
- Two Shortcut Keys: Engine Operating Parameters & Generator Operating Parameters

FEATURES/BENEFITS

- A 64 x 240 pixel, 28 mm x 100 mm, white backlit graphical display denotes text alarm/event descriptions and is visible in all lighting conditions.
- Advanced engine monitoring is available on systems with an electronic engine control module.
- Ability to view and reset diagnostics on other J1939 modules via the control panel removes the need for a separate service tool for troubleshooting.
- Fully featured power metering, protective relaying, simultaneous engine and generator parameter viewing, and expanded AC metering are all integrated into this controller.
- Real-time clock allows for time stamping of diagnostics & events in the control's logs as well as service maintenance reminders based on engine operating hours or calendar days.
- Customer programmable protective relaying, available as alarm and shutdown, protects against undervoltage, overvoltage, underfrequency, overfrequency, overcurrent, and reverse power.
- 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.
- Expanded remote customer communications are supported by MODBUS protocol using RS-485, which easily interfaces with existing plant systems and equipment.

FEATURES/BENEFITS (CONT'D)

- Simultaneous viewing of all AC L-L voltages, all AC L-N voltages, or all AC line currents.
- 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.
- Compatibility with both mechanical and electronic engines makes it versatile.
- True RMS sensing ensures AC metering accuracy of $\pm 1\%$ for AC voltage, current, and power parameters.
- Three levels of security allow for configurable operator privileges.
- Single, standard 70-pin connector

COMMUNICATION

- J1939 (Primary Data Link)
- J1939 #2 (Accessory Data Link)
- MODBUS RS-485 (Customer Communication)

ENVIRONMENTAL SPECIFICATIONS

- Environmentally sealed front face rated for IP56
- Salt Spray Resistant Front Face
- Vibration testing to 4.3G sinusoidal and 15G shock ensures panel dependability
- Meets (EMC), USFCC & CE Standards
- Monitoring Functionality & Controls Operational from -40°C to 70°C (-40°F to 158°F)
- Display Operational from -20°C to 70°C (-4°F to 158°F)
- Storable from -40°C to 85°C (-40°F to 185°F)

STANDARD FEATURES

CONTROLS

- Auto/Start/Stop
- Engine Cool-Down timer
- Emergency Stop
- Engine Crank Cycle
- Lamp Test
- Generator Voltage
- Engine Speed/Generator Frequency

DIGITAL (LCD) INDICATION

- Generator AC Voltage – 3 phase (L-L & L-N)
- Generator AC Current (per phase & average)
- Generator Power (kW) (total & per phase)
- Generator kVAR (Total & per phase)
- Generator kVAR-hr (Total)
- Generator % of rated (Total)
- Generator kVA (Total & per phase)
- Generator kW-hr (Total)
- Generator Power Factor (PF) (Average and per phase)
- Generator Frequency
- Engine RPM
- Battery Voltage
- Engine Hours
- Engine Successful Start Counter
- Engine Oil Temperature ($^{\circ}\text{F}$ or $^{\circ}\text{C}$)
- Engine Oil Pressure (in psi, kPa, or bar)
- Engine Coolant Temperature
- Engine Crank Attempt Counter
- Service Maintenance Interval (Engine Operating Hours or Calendar Days)
- Real Time Clock

Also available with Electronic Engines:

- Fuel Temperature*
- Fuel Pressure (in psi, kPa, or bar) (Filtered)*
- Total Fuel Consumed*
- Engine Exhaust Temperature (L & R)*
- Engine Intake Manifold Temperature*
- Fuel Consumption* (US/Imperial gal/hr or Liters/hr)

* Engine information obtained from electronic engine controller over J1939 data link when available. Refer to Engine Installation Guide for specific engine application.

STANDARD FEATURES (CONT'D)

WARNING/SHUTDOWN INDICATION

- Overcrank
- Low Coolant Temperature Warning
- High Coolant Temperature Warning/Shutdown
- Low Oil Pressure Warning/Shutdown
- Overspeed
- Control Switch Not In Auto
- High/Low Battery Voltage
- Emergency Stop Activated
- Low Fuel Pressure Warning/Shutdown
- High Fuel Pressure Warning/Shutdown
- Fuel Filter Restriction Warning/Shutdown
- High Intake Manifold Air Temperature Warning/Shutdown
- High Fuel Temperature Warning/Shutdown
- High Oil Temperature Warning/Shutdown

Notes:

- Warning condition activates common alarm output signal and common flashing yellow indicating lamp.
- Shutdown condition activates common alarm output signal and common flashing red indicating lamp.
- Warning/Shutdown conditions result in text message on EMCP 3 display.

DIGITAL INPUTS (8 TOTAL)

- Emergency Stop
- Remote Start
- 6 Programmable

Digital inputs can be programmed for various alarm, shutdown, & status conditions including: Low Fuel Level, High Fuel Level, Fuel Leak Detected, High Exhaust Temperature, Air Damper Closed, Circuit Breaker Open/Closed, Low Engine Oil Level, Low Coolant Level, Low Starting Air Pressure, Low/High Ambient Air Temperature, Spare Fault #1-6.

Inputs can be programmed for either high or low activation using programmable Normally Open or Normally Closed contacts.

PROTECTIVE RELAYING

- Generator Over/Under Voltage
- Generator Over/Under Frequency
- Generator Reverse Power Relay
- Generator Overcurrent

DIGITAL OUTPUTS (8 TOTAL)

- Starter Motor
- Fuel Control
- 6 Programmable

Relay outputs can be programmed for various operating conditions including: Air shut-off, or pre-lube, Common Alarm, Common Shutdown, Common Warning, Engine Running, Crank Alert, & Idle/Rated.

Relays are rated for 2A @ 30 VDC and consist of 6 Form A (Normally Open) contacts. Two of the programmable outputs are Form C (Normally Open & Normally Closed) contacts.

Note: These are only rated for DC.

DISCRETE OUTPUTS (2 TOTAL)

- 2 Programmable

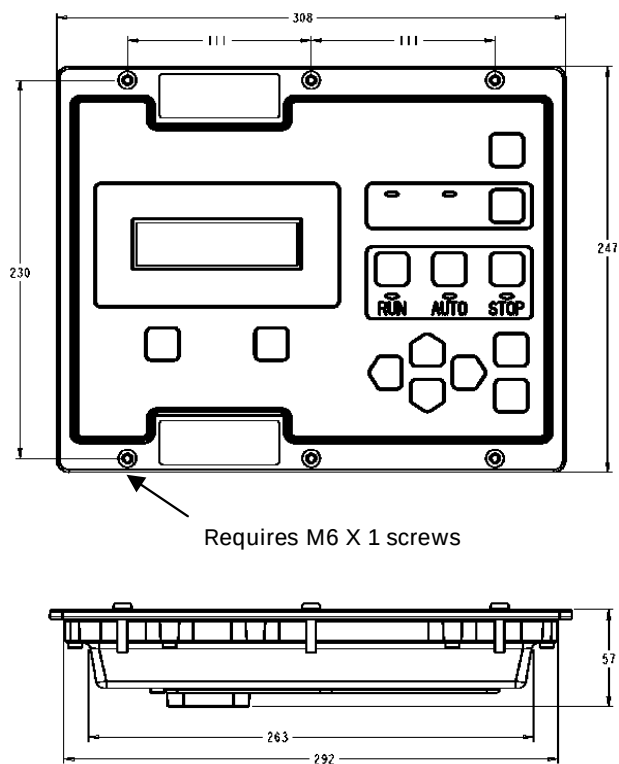
Discrete outputs can be programmed for various operating conditions including: Air shut-off, pre-lube, Common Alarm, Common Shutdown, Common Warning, Engine Running, Crank Alert, & Idle/Rated.

Discrete outputs can sink up to 300mA and are suitable for driving relay coils or incandescent lamps.

SENSOR INPUTS

- Engine Speed (Magnetic Pick-up)
- Engine Oil Pressure (0-2 k Ω resistive sender, 1 or 2-wire)
- Engine Coolant Temperature (0-2 k Ω resistive sender, 1 or 2-wire)
- Configurable Input (0-2 k Ω resistive sender) (for Eng Oil Temp, etc)

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