

XQ500 GENERATOR



Image shown may not reflect actual package.

**STANDBY 500kW
POWER MODULE
60 Hz 1800 rpm 480V**

Frequency	Voltage	Standby kW (kVA)
60Hz	480/277V	500 (625)
60Hz	240/139V	500 (625)
60Hz	208/120V	500 (625)

SPECIFICATIONS

GENERATOR

Frame size LC6134G
 Pitch. 0.6667
 No. of poles 4
 Excitation Static regulated brushless PM excited
 Number of bearings Single bearing, close coupled
 Insulation Single bearing, close coupled
 Enclosure. Drip proof IP23
 Alignment Pilot shaft
 Overspeed capability- % of rated 125% of rated
 Voltage regulator 3 phase sensing with Volts-per-Hertz
 Voltage regulation Less than +/- ½% voltage gain
 Adjustable to compensate for engine speed droop and line loss
 Wave form deviation. 3%
 Telephone Influence Factor (TIF). Less than 50
 Harmonic Distortion (THD). Less than 5%

ENGINE

C15 ATAAC, I-6 4-stroke water cooled diesel
 Bore – mm (in). 137.2 mm (5.4 in)
 Stroke – mm (in) 171.4 mm (6.75 in)
 Displacement – L (cu in). 15.20 L (927.56 in3)
 Compression ratio. 16:1
 Engine RPM. 1800
 Aspiration. TA
 Fuel system. MEUI C
 Governor Type. ADEM A4
 Fuel. Requires ULSD

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TECHNICAL DATA

XQ500

Generator Set Technical Data		60Hz		
	Unit		Standby	
Power Rating	kW	s (kVA)	500	(625)
Performance Specification				
Lubricating System Oil type required: API CF-4	L	(U.S. gal)	74	(19.5)
Fuel System Fuel Consumption				
100% load	L/hr	(gal/hr)	136	(35.9)
75% load	L/hr	(gal/hr)	107	(28.3)
50% load	L/hr	(gal/hr)	78	(20.5)
Fuel tank capacity	L	(gal)	2650	(700)
Running time @ 75% rating		H	24	
Cooling System				
Ambient Capability	°C	(°F)	43	(109)
Engine & Radiator coolant capacity	L	(gal)	100.7	(26.6)
Engine coolant capacity	L	(gal)	26.9	(7.1)
Air Requirements				
Combustion air flow	m ³ /min	(cfm)	19.6	(693.2)
Combustion air flow	kPa	(H ₂ O)	72	(24.9)
Exhaust System				
Exhaust flow at rated kW	m ³ /min	(cfm)	90.2	(3185)
Exhaust temperature at rated kW - dry exhaust	°C	(°F)	490	(914)
Noise Rating (with enclosure)* @ 7 meters (23 feet)	dBA		72	
Emissions (Tier 4 interim regulation)				
NO _x	g/hp-hr		2.6	
CO	g/hp-hr		.11	
HC	g/hp-hr		0.03	
PM	g/hp-hr		0.075	

Model XQ500	Length mm (in)	Width mm (in)	Height mm (in)	Weight kg (lb)
				Lube Oil & Coolant - Empty Fuel Tank
				Fuel Tank 200 Gallons of Fuel
XQ500 w/o chassis	7163 (282)	2438 (96)	2591 (102)	Full Fuel Tank
XQ500 w/ chassis	7163 (282)	2438 (96)	3810 (150)	Chassis Weight Addition

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

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

Ratings are based on SAE J1349 standard conditions. These ratings also apply to ISO3046 standard conditions.

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STANDARD FEATURES

EMCP 4.4 LOCAL CONTROL PANEL

- Generator mounted EMCP 4.4 provides power metering, protective relaying and engine and generator control and monitoring.
- NEMA 12, IP44 Dust Proof Enclosure
- UL508A Listed
- Convenient service access for Cat Service tools (service tools not included)
- Integration with the Cat DVR provides enhanced system monitoring
- Ability to view and reset diagnostics of all controls networked on primary CAN datalink eliminates need for separate service tools for troubleshooting.
- True RMS AC metering, 3 phase

EMCP 4.2 ENGINE OPERATOR INTERFACE

- Controls
 - Run/Auto/Stop
 - Speed Adjust
 - Voltage Adjust
 - Emergency Stop
 - Cycle Crank
 - Cool-down timer
- Engine Monitoring
 - RPM
 - Operating hours
 - Coolant Temperature
 - DC Volts
 - Oil pressure
 - Oil Temperature
- Generator Monitoring:
 - L-L volts, L-N volts, phase amps
 - Average volts, Amps, Frequency
 - kW, kVA, kVAR, kW-hr, %kW
 - Power Factor (Average, Phase)
 - kW-hr, kVA-hr (total)
- Shutdowns with common indicating light for:
 - Low oil pressure
 - High Coolant Temp Failure
 - to Start (Overcrank)
 - Low Coolant level
 - Overspeed
 - High Oil Temperature
 - Emergency stop
- Emergency stop pushbutton
- Panel illuminating lights
- Display navigation keys including two shortcut keys for Engine Parameters or Generator Parameters
- Fuel level monitoring and control

VOLTAGE REGULATION AND POWER FACTOR CONTROL CIRCUITRY

- Generator mounted automatic voltage regulator, microprocessor based
- Manual raise/lower voltage adjust capability and VAR/ power factor control circuitry for maintaining constant generator power factor while paralleled with the utility. Voltage and power factor adjustments are performed on the Generator Paralleling Control
- Includes RFI suppression, exciter limiter and exciter diode monitoring

CIRCUIT BREAKER

- 2000A fixed type, 3 poles, genset mounted, electrically operated, insulated case CB
- Solid state trip unit for overload (time overcurrent) and fault (instantaneous) overcurrent protection.
- Includes DC shunt trip coil activated on any monitored engine or electrical fault, 100 KA-interrupting capacity at 480 VAC
- Under-voltage release

TRANSFORMERS

- CT's rated 2000:5 with 200:5 secondaries wired to shorting terminal strips
- Potential transformers 4:1 ratio with primary and secondary fuse protection (with optional UMR)

DISTRIBUTION

- Three phase, plus full rated neutral, bus bars are tin-plated copper with NEMA standard hole pattern for connection of customer load cables and generator cables
- Bus bars are sized for full load capacity of the generator set at 0.8 power factor
- Includes ground bus, tin-plated copper, for connection to the generator frame ground and field ground cable
- Customer convenience panel with multiple output receptacles
 - 1 – 240V, 50A Twist Lock
 - 1 – 240V, 20A Twist Lock
 - 2 – 120V, 20A Twist Lock
 - 2 – 120V, 20A Ground Fault Interrupters
 - 2 – 120V, 15A Duplex Receptacles with GFI

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STANDARD FEATURES (CONT'D)

CONTAINER

- 20' ISO high cube container
- Painted standard Cat Power Module white
- Sound attenuated air intake louvers
- Floor insulated with acoustic glass and covered by galvanized steel
- Two lockable personnel doors with panic release
- Two fire extinguishers
- External drain access to standard fluids

EXHAUST SILENCER

- Hospital grade, internally insulated, disc shaped exhaust silencer with vertical discharge

FUEL TANK

- UL Listed 700 gallon double walled tank provides 24hr runtime at 75% prime +10% rating

SHORE POWER Three

- One 110V shore power connections for jacket water heater
- One 110V for generator space heater, battery charger and single duplex service receptacle

INTERNAL LIGHTING

- Three internal DC lights with one timer and two switches installed at each side of the container door
- One single duplex service receptacle connected to shore and generator power with automatic switchover

BATTERY CHARGER AND BATTERIES

- 24 VDC/20A battery charger with float/equalize modes and charging ammeter
- Two oversized maintenance free batteries

EMERGENCY STOP PUSHBUTTON

- One external, emergency stop pushbutton (ESP)

TRAILER

- Two axle with Anti-lock brake system
- Goodyear G314 295/75R225 Load Range G

LINK BOARD ASSEMBLY

- 2000A link board for 208/240/400/480 wye operation
- Reconnection via movable link board
- Includes switch to determine operation mode

AC DISTRIBUTION

- Provides 120 VAC for all module accessories
- Includes controls to de-energize jacket water heaters and generator space heater when the engine is running

UTILITY MULTI-FUNCTION RELAY (UMR) (OPTIONAL)

Basler Utility Multi-function Relay (UMR) IPS-100 provides the following utility/intertie protection features:

- Synch Check (Device 25)
- Phase under voltage, 2 stage (Device 27)
- Reverse Power (Device 32)
- Negative sequence overvoltage (Device 47)
- Phase time overcurrent (Device 51)
- Neutral overcurrent (Device 51N)
- Phase overvoltage, 2 stage (Device 59)
- Under frequency, 2 stage (Device 81U)
- Over frequency (Device 81O)

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STANDARD FEATURES (CONT'D)

MODES OF OPERATION

- Provides for single unit stand-alone operation, island mode paralleling and load sharing with other power modules, and single unit-to-utility mode paralleling for base load control (with open transition between paralleling modes)
- Island mode paralleling features:
 - Lead unit select control allows single unit to connect to a dead bus or HWDBA Hard Wired Dead Bus Arbitration to allow first unit up to voltage and speed to be first unit to connect to a dead bus
 - Auto synchronization (voltage & phase matching)
 - Load sharing (kW) analog signal (like units & legacy compatible)
 - Load sharing (kVAR) analog signal (like units only)
- Utility mode paralleling features:
 - Auto synchronization (voltage & phase matching)
 - Base-load control (programmable set-point or potentiometer adjust)
 - Soft load/unload (programmable, shared set-point)
 - Power Factor control (programmable set-point)

SINGLE UNIT STAND-ALONE AND MULTI-UNIT ISLAND OPERATION

1. Utility Standby Mode (Normal)
 - a. The utility is providing power for the plant loads.
 - b. The PM Generator breaker is open.
 - c. The PM is in automatic standby mode to respond to a utility failure
2. Emergency Mode (Emergency)
 - a. Utility Failure
 - 1) The customer protective relaying senses a utility abnormal condition.
 - 2) A run request is sent to the PM Generator plant.
 - 3) The first PM generator to reach rated to voltage and frequency is closed to the bus.

- 4) In Multi-Unit Island Mode, the remaining PM Generators are paralleled to the bus as they reach rated voltage and frequency. This function is performed via the lead unit select jumper and interconnect wiring connected between the Power Modules.
- 5) Plant load is transferred to the Power Modules, which share load equally via load share lines.

SINGLE UNIT BASE LOAD OPERATION

1. Utility Mode (Normal)
 - a. The utility is providing power for the plant loads.
 - b. The PM is in auto mode and the generator breaker is open.
 - c. The PM is interconnected to the utility breaker aux contact, lead unit jumper is not installed and load share lines are not connected
 - d. The Paralleling controls automatically detect utility parallel mode when the utility aux contact is closed.
2. Base Load Mode
 - a. Unit receives remote run request and starts
 - b. Unit reaches rated voltage and frequency.
 - c. UMR performs sync-check to permit generator breaker to close.
 - d. Unit ramps to Base-Load setpoint at programmed ramp time.
 - e. Unit continues to run until remote run request is removed or unit is stopped at control panel.

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