



# XQ800 RENTAL



**STANDBY 795 kW**  
**PRIME 725 kW**  
**POWER MODULE**  
**50 Hz 1500 rpm**  
**60 Hz 1800 rpm**

Frequency	Voltage	Standby kW (kVA)	Prime kW (kVA)
60 Hz	480/277V	795 (994)	725 (906)
60 Hz	240/139V	795 (994)	725 (906)
60 Hz	208/120V	795 (994)	725 (906)
50 Hz	400V	660 (825)	600 (750)

## FEATURES

### FUEL/EMISSIONS STRATEGY

- EPA Tier 4 Interim

### DESIGN CRITERIA

- Accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response
- CSA Approved

### SINGLE-SOURCE SUPPLIER

- Factory designed and fully prototype tested with certified torsional vibration analysis available
- ISO 9001:2000 compliant facility

### WORLDWIDE PRODUCT SUPPORT

- Cat® dealers provide extensive post sale support including maintenance and repair agreements
- Cat dealers have over 1600 dealer branch stores operating in 200 countries
- The Cat S•O•S<sup>SM</sup> program effectively detects internal engine component condition, even the presence of unwanted fluids and combustion byproducts

### CAT C27 ATAAC DIESEL ENGINE

- Utilizes ACERT™ Technology
- Reliable, rugged, durable design
- Four-stroke diesel engine combines consistent performance and excellent fuel economy with minimum weight
- Electronic engine control

### CAT® GENERATOR

- Matched to the performance and output characteristics of Cat engines
- Single point access to accessory connections
- UL 1446 Recognized Class H insulation

### CAT EMCP 4.4 CONTROL PANEL

- Simple user friendly interface and navigation
- Integrated, automatic genset paralleling facilitates multi-unit systems meeting a wide range of customer applications
- Integrated Control System and Communications Gateway

### CAT DIGITAL VOLTAGE REGULATOR (CAT DVR)

- Three-phase sensing
- Adjustable volts-per-hertz regulation
- Provides precise control, excellent block loading, and constant voltage in the normal operating range

### SOUND ATTENUATED CONTAINER

- Provides ease of transportation and protection
- Meets 74 dB(A) at 7 meters per SAE J1074 measurement procedure at 110% prime load

### ENVIRONMENTALLY FRIENDLY

- 110% spill containment of onboard engine fluids



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## FACTORY INSTALLED STANDARD EQUIPMENT

SYSTEM	STANDARD EQUIPMENT
<b>Engine</b>	<p>EPA approved Tier 4 interim Cat C27 heavy duty diesel engine            Heavy duty air cleaner with pre-cleaner and service indicator            65-Amp charging alternator            Fuel filters – Duplex primary with integral water separator and change-over valve, engine mounted secondary filter            Fuel cooler and electric priming pump            Lubricating oil system including pump, integral oil cooler, lube oil, filter, filtered crankcase breather system and oil drain line with internal valve routed to connection point accessible from exterior            500 hour oil change intervals            Jacket water heater (6kW)            Electronic ADEM™ A4 controls            24V electric starting motors with battery rack and cables</p>
<b>Generator</b>	<p>SR4B, three-phase, brushless, salient pole, 0.6667 pitch, permanent magnet excited, Class H insulation            Anti-condensation heaters (120V, 600V)            12-lead design, with voltage changeover link board            Cat Digital Voltage Regulator (Cat DVR) with VAR/PF control</p>
<b>Containerized Module</b>	<p>30' ISO high cube container            2-axle, 30' ISO container chassis            Sound attenuated air intake louvers and 3 lockable personnel doors with panic release            Interior walls and ceilings insulated with 100 mm of acoustic paneling            Floor of container insulated with acoustic glass and covered with galvanized steel            Sound attenuated 74 dB(A) @ 7m            Side bus bar access door, external access load connection bus bars            Shore power connection via distribution block connections for jacket water heater, battery charger, and generator condensate heaters            Lighting 3 DC, one single duplex service receptacle, 2 external emergency stop push buttons            1,250 gal fuel tank, UL listed, double wall, 24 hr runtime @ 75% prime +10% rating (ULC + CGSB43-146)            External lockable connections for fuel            Spill containment 110% of all engine fluids            Fuel transfer system and controls            Two oversized maintenance-free batteries, battery rack and 20-Amp battery charger, and solar powered battery maintainer            Hospital grade, internally insulated, disc shaped exhaust silencer with vertical discharge            Vibration isolators, corrosion resistant hardware and hinges            External drain access to standard fluids            Two 4.5 kg (10lb) carbon dioxide fire extinguishers            Standard Cat rental decals and painted standard Cat power module white</p>
<b>Cooling</b>	<p>Standard cooling provides 43° C ambient capability at prime +10% rating            Vertically mounted radiator, with vertical air discharge from the container            Coolant drain line with internal valve            Coolant sight gauge, level switch and shutdown            50/50 Ethylene Extended Life Glycol</p>
<b>Genset Controls and Protection</b>	<p>EMCP 4.4 genset mounted controller            Automatic start/stop with cool down timer            Generator Protection features: 32, 46, 50/51, 27/59, 81 O/U, and phase sequence            Utility multi-function relay (UMR) protection features: 25, 27/59, 32, 47, 40Z, 51, 51N, 60FL, 81O, 81U (<b>Optional</b>)            Reverse compatible for interface to legacy power modules            3000A electrically operated generator circuit breaker            Multi-mode operation (island, multi-unit island and utility parallel (requires optional UMR))            Manual and automatic paralleling capability, with load sharing (multi-unit only)            Metering display: voltage, current, frequency, power factor, kW, WHM, kVAR, and synchroscope</p>
<b>Quality</b>	<p>Factory testing of standard generator set and complete power module            UL, NEMA, ISO, IEEE, CSA standards            O&amp;M manuals</p>



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## TECHNICAL DATA

CAT GENERATOR		CAT DIESEL ENGINE	
Frame Size . . . . .	598	C27 ATAAC, V-12 4-stroke water cooled diesel	
Pitch . . . . .	0.6667	Bore – mm (in) . . . . .	137.2 mm (5.4 in)
No. of poles . . . . .	4	Stroke – mm (in) . . . . .	152.4 mm (6.0 in)
Excitation . . . . .	Static regulated brushless PM excited	Displacement – L (cu in) . . . . .	27.03 L (1958.9 in <sup>3</sup> )
Number of bearings. . . . .	Single bearing, close coupled	Compression ratio. . . . .	16:1
Insulation. . . . .	Class H	Aspiration. . . . .	TA
Enclosure . . . . .	Drip proof IP23	Fuel system . . . . .	MEUIC
Alignment. . . . .	Pilot shaft	Governor type . . . . .	ADEM™ A4
Overspeed capability – % of rated . . . . .	125% of rated		
Voltage regulator . . . . .	3 phase sensing with Volts-per-Hertz		
Voltage regulation. . . . .	Less than ± 1/2% 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%		

Generator Set Technical Data	Units	50Hz	50 Hz	60 Hz	60Hz
		Prime	Standby	Prime	Standby
<b>Power Rating</b>	kW (KVA)	600 (750)	660 (825)	725 (906)	795 (994)
<b>Performance Specification</b>					-
<b>Lubricating System</b> Oil pan capacity with filter change	L (gal)	99 (26)	99 (26)	99 (26)	99 (26)
<b>Fuel System</b>					
Fuel consumption					
100% Load	L/hr (gal/hr)	142 (37.4)	178 (47.1)	203 (53.5)	223 (58.8)
75% Load	L/hr (gal/hr)	108 (28.5)	135 (35.7)	152 (40.2)	167 (44.2)
50% Load	L/hr (gal/hr)	74 (19.6)	92 (24.4)	109 (28.7)	118 (31.1)
Fuel Tank Capacity	L (gal)	4730 (1250)	4730 (1250)	4730 (1250)	4730 (1250)
Running time @ 75% rating	Hr	44)	35	31	28
<b>Cooling System</b>					
Ambient Capability	°C (°F)	43 (109)	43 (109)	43 (109)	43 (109)
Radiator & engine coolant capacity	L (gal)	100.7 (26.6)	100.7 (26.6)	100.7 (26.6)	100.7 (26.6)
Engine coolant capacity	L (gal)	70 (18.5)	70 (18.5)	70 (18.5)	70 (18.5)
<b>Air Requirements</b>					
Combustion air flow	m <sup>3</sup> /min (cfm)	42.5 (1500)	45.3 (1600)	54.6 (1927)	57.9 (2044)
Maximum dirty air cleaner restriction	kPa (in H <sub>2</sub> O)	2.5 (10)	2.5 (10)	2.5 (10)	2.5 (10)
<b>Exhaust System</b>					
Exhaust flow at rated	m <sup>3</sup> /min (cfm)	106 (3743)	116 (4097)	135 (4766)	148 (5224)
Exhaust temperature at rated kW – dry exhaust	°C (°F)	470 (878)	493 (919)	460 (860)	485 (905)
<b>Noise Rating (with enclosure)*</b> @ 7 meters (23 feet)	dB(A)	71	71	73	73
<b>Emissions (Regulation)</b>					
NO <sub>x</sub>	g/hp-hr	2.6	2.6	2.6	2.6
CO	g/hp-hr	0.11	0.11	0.11	0.11
HC	g/hp-hr	0.03	0.03	0.03	0.03
PM	g/hp-hr	0.075	0.075	0.075	0.075

Model	Length mm (in)	Width mm (in)	Height mm (in)	Weight with Lube oil and Coolant kg (lb)	Weight with fuel, lube oil and coolant Kg (lb)
<b>XQ800 w/o chassis</b>	9144 (360)	2438 (96)	2896 (114)	16129 (35500)	16810 (37000)
<b>XQ800 w/ chassis</b>	9144 (360)	2438 (96)	4115 (162)	20484 (45160)	21113 (46547)

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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
- UL508 recognized
- Convenient service access for Caterpillar service tool (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
- Multiple stored setpoint group selection via switched input eliminates need to reprogram control when switching voltages and frequencies

### EMCP 4.4 ENGINE OPERATOR INTERFACE

- Controls
  - Run/Auto/Stop
  - Speed Adjust
  - Voltage Adjust
  - Emergency Stop
  - Cycle crank
  - Cool-down timer
- Digital indication for
  - RPM
  - Operating hours
  - Coolant Temperature
  - L-L volts, L-N volts, phase amps, Hz
  - kW, kVA, kVAR, kW-hr, %kW, PF
  - DC Volts
  - Oil pressure
  - Oil Temperature
- Shutdowns with common indicating light for
  - Low oil pressure
  - High Coolant Temp
  - Failure to Start (Overcrank)
  - Emergency stop
  - Overspeed
  - High Oil Temperature
  - Low Coolant level
- Emergency stop pushbutton
- Display navigation keys including four shortcut keys for Engine Parameters, Generator Parameters, Control and main menu
- Fuel level monitoring and control

### EMCP 4.4 GENERATOR PROTECTIVE RELAYING

- Generator protective features provided by EMCP 4.4
  - Phase over/under voltage (Device 27/59)
  - Over/Under frequency (Device 81 O/U)
  - Reverse Power (Device 32/32RV)
  - Current Balance (46)
  - Overcurrent (Device 50/51)
  - Bus Phase Sequence

### VOLTAGE REGULATION AND POWER FACTOR CONTROL CIRCUITRY

- Generator mounted automatic voltage regulator, microprocessor based
- Automatic voltage and VAR/power factor control 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

- 3000A fixed type, 3 poles, genset mounted, electrically operated, insulated case circuit breaker
- Solid state trip unit for overload (time overcurrent) and fault (instantaneous) overcurrent protection
- 100 KA-interrupting capacity at 480 VAC
- Under-voltage release

### CURRENT TRANSFORMERS

- CT's rated 3000:5 with 200:5 secondaries wired to shorting terminal strips

### POTENTIAL TRANSFORMERS

- 4:1 ratio with primary and secondary fuse Protection (with optional UMR)

### BUS BARS

- 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 studs for connection to the generator frame ground and field ground cable

### LINK BOARD ASSEMBLY

- 3000A link board for 208/240/400/480 wye operation
- Reconnection via movable link board
- Includes switch to determine the mode of operation

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## CONTAINER

- 30' ISO high cube container designed to meet CSC but not certified
- Painted standard Cat Power Module white
- Sound attenuated air intake louvers
- Floor insulated with acoustic glass and covered by galvanized steel
- Three 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 1250 gallon double walled tank provides 24 hr runtime at 75% prime +10% rating (ULC + TC (CGSB43-146))
- AC Fuel transfer system connected to shore and generator power with automatic switchover

## SHORE POWER

- Two shore power connections for jacket water heaters and fuel transfer pump
- One for generator space heater and battery charger

## INTERNAL LIGHTING

- Three internal DC lights with one timer installed at 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
- Solar power battery maintainer

## EMERGENCY STOP PUSHBUTTON

- Two external, emergency stop pushbuttons (ESP) located near each access door

## TRAILER

- Two axle with Anti-lock brake system
- 295/75R225 Load Range G Tires
- Air suspension chassis (optional)

## 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) BE1-11i 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)
- Loss of field (Device 402)

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## 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.

## RATING DEFINITIONS AND CONDITIONS

### Meets or Exceeds International Specifications:

AS1359, CSA, IEC60034-1, ISO3046, ISO8528, NEMA MG 1-22, NEMA MG 1-33, 72/23/EEC, 98/37/EC, 2004/108/EC

**Prime** - Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand is 100% of prime rated kW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year. Prime power in accordance with ISO3046. Prime ambients shown indicate ambient temperature at 100% load which results in a coolant top tank temperature just below the alarm 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 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 Cat representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Cat dealer.

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