Cat® XQ425 Rental Generator Set

Image shown may not reflect actual configuration

Standby 375 kW, 469 kVA
Prime 340 kW, 425 kVA
U.S. EPA Tier 4 Final
50/60 Hz Switchable
1500-1800 rpm

Specification

Generator	Frequency	Speed rpm	Voltage	Standby kW (kVA)	Prime kW (kVA)	Phase	Amp (A)
Standard	60 Hz	1800	480/277V	375 (469)	340 (425)	3-phase	511.19
	60 Hz	1800	240/139V	375 (469)	340 (425)	3-phase	1110.29
	60 Hz	1800	208/120V	350 (438)	320 (400)	3-phase	1022.39
	50 Hz	1500	400/230V	320 (400)	290 (363)	3-phase	523.22
Optional	60 Hz	1800	600V	375 (469)	340 (425)	3-phase	408.96
	60 Hz	1800	480V	320 (400)	292 (365)	3-phase	439.03

Cat® C13 ACERT™ Diesel Engine	Metric	Imperial (English)
Configuration	I-6, 4-Stroke-Cycle Water Cooled Diesel	
Bore	130 mm	5.1 in
Stroke	157 mm	6.2 in
Displacement	12.5 L	763 in^3
Aspiration	Turbocharged-Aftercooled	
Compression Ratio	17.0:1	
Fuel System	MEUIC	
Governor Type	ADEM™ A4	
Aftercooler	ATAAC	
Turbocharger	Single	
Fuel	Requires ULSD	

Benefits & Feature

Fuel/Emissions Strategy
- Meets U.S. EPA Tier 4 Final and CARB Certified for Non-Road Mobile applications at all 50 and 60 Hz ratings

Single-source Supplier
- Factory designed and fully prototype tested with certified torsion vibration analysis available
- ISO 9001:2000 compliant facility

Cat C13 ACERT Tier 4 Final Diesel Engine
- Uses ACERT Technology and Cat NOx Reduction System (NRS)
- Four-stroke diesel engine combines consistent performance and excellent fuel economy with minimum weight
- Electronic engine controller

Cat CEM (Clean Emissions Module)
- Aftertreatment module consists of Caterpillar Regeneration System (CRS), Diesel Oxidation Catalyst (DOC), Diesel Particulate Filter (DPF), and Selective Catalytic Reduction (SCR)

Diesel Exhaust Fluid (DEF) Tank
- 12 gallon DEF tank with on tank fill and integrated pump, level sensor and heating elements
- Electrically heated DEF lines from DEF tank to CEM

Cat EMCP 4.2 Control Panel
- Fully featured power metering, protective relaying and engine/generator control and monitoring
- Simple user friendly interface and navigation
- Automatic set-point adjustment integrated with voltage and frequency changes

Cat SR4B Series Generator
- Designed to match performance and output characteristics of Cat diesel engines
- Permanent magnet excitation
- Segregated AC/DC, low voltage accessory box provides single-point access to accessory connections

*N/A for 600V

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

Enclosure
- Highly corrosion-resistant 12-gauge sheet steel construction
- Two-coat polyester powder-coated finish
- 7 doors and 3 access doors for ease of maintenance
- Secure and safe design with safety glass control panel viewing window with lockable access door
- Fuel fill and battery can only be reached through lockable access doors
- Single-point lift designed to lift complete package

Distribution Panel*
- Switchable via linkboard from 480/277V 3-phase to 240/139V 3-phase (can be adjusted down to 208/120V 3-phase)

Rear Customer Access
- Separate control panel and distribution panel access doors
- Hinged door over main bus connectors
- Emergency stop on panel
- Remote start/stop contacts

Reduced Environmental Impact
- EPA Tier 4 Final technology
- 110% spill containment of onboard engine fluids
- Meets 76 dB(A) at 7 m per SAE J1074 measurement procedure at 75% prime loads
- Variable speed cooling fan for reduced fuel consumption and reduced sound as part load

Rental Ready Features
- Anti-condensation heater 110-120 VAC
- Coolant heater 110-120 VAC
- UL Listed battery charger
- Solar powered battery maintainer

Factory-installed Standard Equipment

Air Inlet
- Air cleaner, two-stage cyclonic/paper with dust cup and service indicator
- Turbocharger and air-to-air aftercooler

Charging System
- UL/CSA listed 120V, 20A battery charger, shock mounted and enclosed in dust-proof housing
- Charging alternator; 24V-45A, heavy-duty with integral regulator and belt guards

Control Panel
- EMCP 4.2 generator set mounted controller
- NEMA 2, IP23 dust-proof enclosure, UL508 listed
- Idle/rated and 50/60 Hz frequency switches
- Generator protection features: 32, 32RV, 46, 50/51, 27/59, 81 O/U
- Metering display: voltage, current, frequency, power factor, kW, WHM, and kVAR
- Panel illumination lights and emergency stop switch

Cooling System
- Package-mounted radiator with vertical air discharge provides 43°C ambient capability
- Blower fan, fan drive, fan guard, and belt guards
- 120VAC coolant heater, fuse protected, thermostatically controlled, automatically disconnected on start-up
- Coolant drain line with shut off valve piped to base-frame
- Coolant sight gauge, level switch, and shutdown
- 50% coolant antifreeze with corrosion inhibitor

Distribution System
- NEMA 1 steel enclosure, separate hinged, lockable door with rust-resistant pinned hinges
- Main bus connections with hinged load cover with Plexiglas window closed for operation
- Main circuit breaker 3-pole, 240/480V-1600A with 24V DC shunt trip wired to load door safety switch
- Current transformers, hard mounted
- Multiple duplex and twist-lock receptacles with individual circuit breakers
- Two-wire remote start/stop terminals and 120 VAC shore power connection for rapid starting

Enclosure
- Sound attenuating, 12-gauge sheet metal enclosure
- Modular panel construction and one-piece welded roof design with 2 degree pitch
- Interior walls and ceilings insulated with flame retardant, precision cut foam materials meeting NFPA220
- Black stainless steel pad-lockable latches, doorkeepers on all doors and zinc die-cast hinges/grab handles
- Single-point lifting
- Painted Cat power module white with Cat rental decals

Engine
- EPA Tier 4 Final certified Cat C13 ACERT ATAAC heavy duty diesel engine
- Electronic ADEM A4 controls

CEM
- Cat CEM comes with integrated DOC, DPF, and SCR and is located in separate compartment

DEF System
- 12 gal plastic DEF tank provides 33 hours run time @ 75% Prime
- DEF tank is equipped with integrated pump, level sensor to display the DEF level in EMCP panel, and electrically heated lines from DEF tank to CEM
- Equipped with low and critically low level alarms with a critically low shutdown

Fuel System
- 520 gal (1970 L) double wall fuel tank, UL142, ULC, and Transport Canada certified, 29 hours run time @ 75% prime
- Engine mounted primary and secondary fuel filter with water separator
- Radiator mounted fuel cooler
- Switch operated, electric priming pump
- Auxiliary connections for customer supplied fuel transfer system with 6-way fuel transfer valve

Factory-installed Standard Equipment (continued)

Generator
- SR4B 450 frame, three-phase, random wound, 12-lead design, permanent magnet excited, 0.750 pitch
- 240-480 volt link board built into distribution system provides either 480/277 volt or 240/139 volt*
- Coastal insulation protection
- Windings impregnated in a triple dip, thermo-setting moisture, oil and acid resisting polyester varnish; heavy coat of anti-tracking varnish for additional protection
- Cat DVR with VAR/PF control, RFI suppression, exciter diode monitor
- 120VAC anti-condensation heater

Lube System
- Pump, integral oil cooler, lube oil, filter, filler and dipstick, and oil sampling valve
- Open crankcase breather with 75% filter
- Oil drain line with internal brass ball valve routed to connection point accessible from exterior
- 500-hour oil change intervals

Mounting System
- Generator set soft mounted to the heavy-duty, fabricated steel base frame
- Skiddable steel base frame with tie-down eyes contains integral fuel tank
- Provides 110% spill containment of all engine fluids

Starting System
- Single electric starting motor, 24V
- Dual 12V (1400 CCA) maintenance free batteries with disconnect switch, battery rack, and cables
- UL listed, 120V single-phase jacket water heater with thermostat and shut-off valves

General
- Canadian Standards Authority (CSA) certified
- Factory testing of standard generator set
- Full manufacturer's warranty
- O&M manuals

Optional Equipment

Available Options
- Tandem axle trailer with electric brakes

Cat EMCP 4.4 Control Panel
- Simple user-friendly interface and navigation
- Automatic set-point adjustment integrated with voltage and frequency selection
- UL508A recognized
- Convenient service access for Cat 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 data link 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
  - DC volts
  - Oil pressure
  - Oil temperature
  - L-L volts, L-N volts, phase amps, Hz
  - ekW, kVA, kVAR, kW-hr, %kW, PF
- Shutdowns with common indicating light for
  - Low oil pressure
  - High coolant temp
  - Failure to start (overcrank)
  - Low coolant level
  - Overspeed
  - High oil temp
  - Emergency stop
- Emergency stop pushbutton
- Panel illuminating lights
- Display navigation keys including two shortcut keys for engine parameters, generator parameters, control, and main menu
- Fuel level monitoring and control

EMCP 4.4 Generator Protective Relaying
- 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

*N/A for 600V

Optional Equipment (continued)

Modes Of Operation

- Provides for:
  - Single unit standalone mode
  - Island mode paralleling and load sharing (multi-unit mode) with other EMCP4.4 product
- Single unit standalone mode
  - The utility is providing power for the plant loads
  - The PM generator breaker is open
  - The PM is in automatic standby mode to respond to a utility failure
- Multi-unit mode
  - Features auto synchronization (voltage and phase matching), load sharing (kW) analog signal (like units only), and load sharing (kVAR) analog signal (like units only)
  - The customer protective relaying senses a utility abnormal condition
  - A run request is sent to the PM generator plant
  - The first PM generator to reach rated to voltage and frequency is closed to the bus and remaining units are paralleled to the bus as they reach rated voltage and frequency
  - Plant load is transferred to the power modules, which share load equally via load share lines

Technical Data

Cat Generator	
Frame size	SR4B – 450
Pitch	0.750
No. of poles	4
Excitation	Static regulated brushless PM excited
Number of bearings	Single bearing, close coupled
Insulation	Class H
Temperature rise	105°C
Enclosure	Drip proof IP23
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%

Technical Data (continued)

Cat Generator Set					
	Units	50 Hz		60 Hz	
		Standby	Prime	Standby	Prime
Performance Specification		EM0677	EM0678	EM0675	EM0676
Power Rating	**kW (kVA)**	**320 (400)**	**290 (360)**	**375 (468)**	**340 (425)**
Lubricating System					
Total oil pan capacity	L (gal)	37 (9.8)			
Fuel System					
Fuel Consumption – 100% Load	L/hr (gal/hr)	82.1 (21.6)	75.3 (19.8)	95.7 (25.1)	88.0 (23.1)
75% Load	L/hr (gal/hr)	62.4 (16.4)	57.3 (15.1)	73.4 (19.2)	67.9 (17.7)
50% Load	L/hr (gal/hr)	43.9 (11.5)	40.2 (10.6)	52.3 (13.6)	48.6 (12.7)
Fuel Tank Capacity	L (gal)	1970 (520)	1970 (520)	1970 (520)	1970 (520)
Running Time @ 75% rating	Hr	31	34	26	29
DEF System					
DEF Tank Capacity	L (gal)	48 (12)	48 (12)	48 (12)	48 (12)
DEF Consumption – 100% Load	L/hr (gal/hr)	—	—	2.5 (0.7)	2.4 (0.6)
75% Load	L/hr (gal/hr)	—	—	1.8 (0.5)	1.5 (0.4)
Running Time @ 75% rating	Hr	—	—	27	33
Cooling System					
Ambient capability	°C (°F)	43			
Engine & radiator coolant capacity	L (gal)	61 (16.2)			
Air Requirements					
Combustion air flow	m^3/min (cfm)	19.7 (693.2)	18.3 (646.1)	(828.3)	(803.3)
Exhaust System					
Exhaust flow at rated (dry exhaust	m^3/min (cfm)	13.8 (485.1)	13.1 (460.3)	16.0 (565.7)	15.9 (558.9)
Exhaust temperature at rated kW	°C (°F)	496.4 (924.7)	488.9 (911.8)	473.4 (880)	454.1 (846.9)
Noise rating					
@ 7 meters and 75% load					
25ºC, Sea Level	dB(A)	—	69	—	72
43ºC, 500m	dB(A)	—	71	—	76
Emissions (not to exceed data)					
NOx	g/hp-hr	1.42	1.28	1.55	1.56
CO	g/hp-hr	0.08	0.07	0.08	0.07
HC	g/hp-hr	0.01	0.01	0.02	0.02
PM	g/hp-hr	0.02	0.02	0.01	0.02

Weights and Dimensions

Model	Length mm (in)	Width mm (in)	Height mm (in)	Weight with Lube Oil & Coolant kg (lbs)	Weight with Fuel, Lube Oil, & Coolant kg (lbs)
XQ425 without trailer	5080 (208.7)	1524 (60)	2642 (104)	6667 (14,700)	8571 (18,900)
XQ425 with trailer	7206 (283.7)	2591 (102)	3204 (126.1)	8132 (17,930)	10 036 (22,130)

Standard Features

- NEMA 2, IP23 dust-proof enclosure with hinged lockable door and viewing window
- EMCP 4.2 display
- Panel light on/off switch
- Emergency stop pushbutton
- Lamp test/reset pushbutton
- Voltage adjust potentiometer
- Alarm and shutdown indicators
- Idle/rated switch
- Regeneration alarm indications for DPF 80% soot level and high exhaust temperature
- 50/60 Hz frequency adjustment
- Fuel level display
- Convenient service access for Cat dealers (service tools not included)

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
  - Crank attempt and successful start counter
- Generator monitoring
  - L-L volts, L-N volts, current (phase)
  - Average volts, amps, frequency
  - ekW, kVA, kVAR, kW-hr
  - Power factor (average, phase)
  - kW-hr, kVA-hr (total)
  - Excitation voltage and current (with Cat DVR)
- Shutdowns with common indicating light for
  - Low oil pressure
  - High coolant temp
  - Failure to start (overcrank)
  - Low coolant level
  - Overspeed
  - High oil temp
  - Emergency stop

EMCP 4.2 Generator Protective Relaying

- Generator phase sequence
- Over/under voltage (27/59)
- Over/under frequency (81 O/U)
- Reverse power (kW) (32)
- Reverse reactive power (kVAR) (32RV)
- Over current (50/51)

*N/A for 600V

Distribution Panel

- Separate load and control sections
- Access using a hinged padlock-able door
- Main busbar with hinged cover door with a clear Plexiglas window
- Customer convenience power receptacles protected by miniature circuit breaker:
  1 – 240V, 50A California-style twist lock
  1 – 240V, 20A twist lock
  2 – 120V, 20A ground fault interrupters
  2 – 120V, 15A duplex receptacles with GFI

Circuit Breaker

- Includes DC shunt trip coil activated on any monitored engine or electrical fault
- 100 KA-interrupting capacity at 480 VAC
- Undervoltage release
- 1600A fixed type, 3 poles, generator set mounted*
- 600A fixed type 3 poles, generator set mounted (600 V only)

Link Board Assembly*

- High/low voltage output reconnection via movable link board
- Includes switch providing voltage setting input to the EMCP 4.2 for automatic set point configuration

Ratings Definitions and Condition

Meets or Exceeds International Specifications: CSA 22.0 No. 100, IEC60034-22, ISO3046, ISO8528, NEMA MG1-22, NEMA MG1-16, UL1004B, NEC,CEC, 2006/42/EEC, 2006/95/EC, 2004/108/EC, 2000/EC/14, UL142, Ulc601, IBC CGSB43, API 546, EGSA 101P, IEEE 43, DEFRA, UL1741, NFPA 99/110, OSHA, 97/68/EC, BS4999, BS5000, IEC60034-5.

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 lb/U.S. gal).

Additional ratings may be available for specific customer requirements, contact your Caterpillar representative for details. For information regarding low sulfur fuel and biodiesel capability, consult your Cat dealer.

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

Standby – Applicable for supplying continuous electrical power (at variable load) in the event of a utility power failure. No overload is permitted on these ratings. The generator on the generator set is peak prime rated (as defined in ISO8528 at 30°C (86°F).

Prime – Applicable for supplying continuous electrical power (at variable load) in lieu of commercially purchased power. There is no limitation on the annual hours of operation and the generator can supply 10% overload power.

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