Cat® XQ2280 Rental Generator Set

Image shown may not reflect actual configuration

Standby 2000 kW
Prime 1825 kW
60 Hz 1800 rpm 480V

Specifications

Frequency	Voltage	Standby kW (kVA)	Prime kW (kVA)	Speed rpm
60 Hz	480/277V	2000 (2500)	1825 (2280)	1800

Cat® 3516C Tier 4 Diesel Engine	Metric	Imperial (English)
Number of Cylinders	16	
Bore	170 mm	6.7 in
Stroke	215 mm	8.5 in
Displacement	78.08 L	4764 in^3
Aspiration	Turbocharged Aftercooled	
Compression Ratio	14.7:1	
Engine Speed	1800 rpm	
Fuel system	EUI	
Governor Type	ADEM™ A4 Control System	
Fuel	Requires Ultra Low Sulfur Diesel (ULSD)	

Features & Benefits

Fuel/Emissions Strategy
- Meets U.S. EPA Tier 4 Final emission standards and CARB certified for non-road mobile applications at all 60 Hz ratings

Design Criteria
- Conforms to ISO 8528 “G2” load acceptance requirements

Single-source Supplier
• Package is factory designed and production tested
• Manufactured in ISO 9001:2015 facility

Cat® 3516C Diesel Engine
- Turbocharged-aftercooled, four-stroke diesel engine
- Reliable, rugged, durable, fuel efficient
- Combines consistent performance and excellent fuel economy with minimum weight
- Electronic ADEM A4 engine control
- Electronic differential pressure monitoring of filters

Cat Clean Emissions Modules (CEM)
- Aftertreatment module consists of Caterpillar Diesel Oxidation Catalyst (DOC), Selective Catalytic Reduction (SCR), and Ammonia Oxidation Catalyst (AMOX)
- Removable insulation blankets to maintain exhaust temperatures for aftertreatment health
- Integrated sound attenuation chambers
- Closed-loop NOx control

Pump Electronic Tank Unit (PETU)
- Stainless steel DEF tank with on-tank fill and remote fill
- Equipped with dosing pump and level sensor to display the Diesel Exhaust Fluid (DEF) level in EMCP & HMI panel
- Integrated heating elements and filter

Cat SR5 Series Generator
- Designed to match the performance and output characteristics of Cat diesel engines
- Class H insulation operating at Class F temperature for extended life
- Coastal insulation protection and anti-condensation space heaters for extended life and increased reliability

Cat EMCP 4.4 Control Panel
- Fully featured power metering, protective relaying engine/generator control and monitoring
- Simple user-friendly interface and navigation

HMI Exterior Controls
- Allows for external operation, including start / stop, after EMCP is placed in Auto

Cat Integrated Voltage Regulator (Cat IVR)
- 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
- Sound level is 81 dB(A) at 7 meters per SAE J1074 measured at 75% prime load and 75% fan speed

Reduced Environmental Impact
- 110% spill containment of onboard engine compartment fluids
- Variable frequency fan drive with smart fan control to prevent overcooling in low ambient temperature conditions and reduced sound at partial loads

Asset Monitoring and Management
- Equipped with Cat Connect PLE743 hardware
- Provides cellular connectivity for remote asset monitoring

Factory-Installed Standard Equipment

Cat 3516C Diesel Engine

- Turbocharged, air-to-water aftercooler
- Electronic ADEM A4 engine control

Air Inlet

- Heavy-duty air element, canister type

Aftertreatment

- Air-assisted DEF delivery ensures proper mixing with exhaust gases and optimal NOx reduction

DEF System

- 78-gallon stainless steel DEF tank provides capacity to meet or exceed fuel tank runtime @ 75% prime
- Electrically heated lines from tank to CEM
- Equipped with electric heaters to prevent freezing when genset is running or connected to shore power
- Equipped with low and critically low-level alarms with a critically low shutdown
- 2x vents with one located at each end of the tank to prevent submersion or plugging.
- External connections for customer supplied DEF transfer system

Fuel System

- 1050-gal (3975 L) double-wall fuel tank, UL 142 and ULc 601 Listed and complies with Transport Canada requirements, 10-hour runtime @ 75% prime, external fuel fill
- Transfer pump to on-board and off-board fuel
- In-line basket style strainer @ 100 Microns
- Electric priming pump
- Auxiliary connections for customer-supplied fuel transfer system with 2-way fuel transfer valve
- Primary fuel filters (3x) with integral water separator
- Redundant high fuel level shut-off switch
- External connections for fuel transfer and fuel tank overflow

Generator

- 1667-frame, SR-5 generator
- Double bearing, form wound, coastal insulation protection, 0.6667 pitch, permanent magnet excited, Class H insulation
- Sized for 120°C temperature rise at 40°C ambient
- Anti-condensation heater (240V)
- Stator winding temperature sensors (RTD module required)
- Cat IVR with VAR/PF control

Starting/Charging System

- 60 Amp charging alternator
- Dual 24V Electric Starting Motors
- 120V, 50 Amp battery charger
- Four (4) 1400CCA, 24V Maintenance free batteries
- Solar maintainer for batteries

Lube System

- Full flow oil filters with water-cooled oil cooler (Requires API CI-4 or higher lube oil)
- Closed crankcase breather with insulated heater blanket to prevent gas condensate from freezing
- Oil drain lines routed to the engine rail
- 500-hour oil change intervals

Cooling System

- Horizontally, isolation-mounted radiator with vertical air discharge from the container
- Cores are aluminum bar plate construction for durability and weather resistance
- Provides 43°C ambient capability at Prime rating and 500m
- 50/50 Extended Life Coolant

Factory-Installed Standard Equipment

Containerized Module

- 48' ISO high cube container
- Five (3) lockable personnel doors with panic release on each door, (2) service doors for ease of access to engine sides
- Interior walls and ceilings insulated with 100 mm of acoustic panelling
- Side bus bar access door with external access load connection bus bars
- External Emergency Stop pushbuttons (2)
- Duplex service receptacle (1), 120V, from generator power
- Eight (8) internal LED DC lights with two (2) 60-minute timers, grouped as (4) lights per timer
- Corrosion resistant hardware and hinges
- Double door access at both ends of the container
- Cat power module white with Rental Power decals
- External DEF and Fuel fill access hatches accessible from personnel ladder at front bolster ladder pockets

Shore Power

- 2x 240V Shore power connections (30A & 50A) via distribution block connections for jacket water heater, space heaters, generator anti-condensate heaters, DEF tank heater, and air compressor heater
- 120V external, twist lock receptacle for battery charger power
- Includes controls to de-energize jacket water heaters and generator space-heater when the engine is running
- DEF tank heater, air compressor heater, fuel transfer pump and battery charger automatically switch over to generator power when genset is running and no shore power is present

Trailer

- Three-axle, air-ride chassis with anti-lock brake system
- Axles have 10’ spacing from front-most to rear-most axle and 40’ from kingpin to rear-most axle for California compliance
- Designed for “jump jeep” capability

Generator Set Controls and Protection

- EMCP 4.4 controller for advanced operations and monitoring
- Externally mounted HMI operator interface eliminates need to enter container during normal operation
- HMI is relocatable for ease of operation in both on-chassis and off-chassis configurations
- Automatic start/stop with cooldown timer
- Generator features: 32, 50/51, 27/59, 81 O/U
- Utility Multi-function Relay (UMR) protective features: 25, 27, 32, 40, 47, 50, 51, 51N, 59, 81O/U
- Multiple Genset Control Data Link (MGDL) for convenient paralleling connection
- Multi-mode operation (island, multi-island, and utility parallel)
- Manual and automatic paralleling capability
- Metering display: voltage, current, frequency, power factor, kW, WHM, kVAR, and synchroscope

Distribution System

- 3200A LSIG, UL Listed, 100 kAIC breaker with advanced protections and power metering
- 3500:5 Current Transformers with secondaries wired to shorting terminal strips
- Three phase, plus full rated neutral bus bars are tin-plated copper with NEMA standard 2-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
- Removable plexiglass plate w/safety switch for live bus protection

Quality

- Factory testing of standard generator set and complete power module
- UL, NEMA, ISO, and IEEE standards
- O&M manuals
- Full manufacturer’s warranty

Modes of Operation

- Provides for single unit standalone 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 Hard Wired Dead Bus Arbitration (HWDBA) to allow first unit up to voltage and speed to be first unit to connect to a dead bus
  - Multiple Genset Control Data Link (MGDL) for convenient paralleling connection
  - Auto synchronization (voltage and phase matching)
  - Load sharing (kW) analog signal (like units and legacy compatible)
  - Load sharing (kVAR) analog signal (like units only)
- Utility mode paralleling features:
  - Auto synchronization (voltage and 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 Standalone and Multi-unit Island Operation

- Utility standby mode (normal)
  - The utility is providing power for the plant loads
  - The Power Module (PM) generator breaker is open
  - The PM is in automatic standby mode to respond to a utility failure
- Emergency mode (emergency)
  - Utility failure
    a. The customer protective relaying senses a utility abnormal condition
    b. A run request is sent to the PM generator plant
    c. The first PM generator to reach rated voltage and frequency is closed to the bus
    d. In multi-unit island mode, the remaining PM generators are paralleled to the bus as they reach rated voltage and frequency
    e. This function is performed via the lead unit select jumper and interconnect wiring connected between the power modules
    f. Plant load is transferred to the power modules, which share load equally via load share lines

Single Unit Base Load Operation

- Utility mode (normal)
  - The utility is providing power for the plant loads
  - The PM is in auto mode and the generator breaker is open
  - The PM is interconnected to the utility breaker aux contact, lead unit jumper is not installed, and load share lines are not connected
  - The paralleling controls automatically detect utility parallel mode when the utility aux contact is closed
- Base load mode
  - Unit receives remote run request and starts
  - Unit reaches rated voltage and frequency
  - UMR performs sync-check to permit generator breaker to close
  - Unit ramps to base-load set point at programmed ramp time
  - Unit continues to run until remote run request is removed or unit is stopped at control panel

Technical Data

Cat Generator	
Frame Size	1667
Pitch	0.6667
No. of poles	4
Insulation.	Class H
Excitation	Static regulated, brushless, Permanent Magnet excited
Constructions	Double bearing, close coupled
Enclosure	Drip proof IP23
Temperature rise	120º C
Over speed capability – % of rated	125% of rated
Voltage regulator	3 phase sensing with Volts-per-Hertz
Voltage regulation	Less than ± 0.5% voltage gain
Wave form deviation	3%
Telephone Influence Factor (TIF)	Less than 50
Harmonic Distortion (THD)	Less than 5%

Cat Generator Set *			
	Units	**60 Hz — Standby**	**60 Hz — Prime**
Power Rating	kW (kVA)	2000 (2500)	1825 (2280)
Performance Specification			
Lubricating System Oil pan capacity	L (gal)	429 (110)	
Fuel System Fuel consumption — 100% Load 75% Load 50% Load Fuel tank capacity Running time @ 75% rating	 L/hr (gal/hr) L/hr (gal/hr) L/hr (gal/hr) L (gal) Hr	 522.8 (138.1) - - - -	 478.5 (126.4) 376.6 (99.5) 273.7 (72.3) 3975 (1050) 10.7
Diesel Exhaust Fluid (DEF) consumption 100% Load 75% Load 50% Load DEF tank capacity Running time @ 75% rating	 L/hr (gal/hr) L/hr (gal/hr) L/hr (gal/hr) L (gal) Hr	 38.1 (10.1) - - - -	 33.8 (8.9) 21.1 (5.6) 12.0 (3.2) 295 (78) 13.9
Cooling System Ambient capability @ 500m Engine & radiator coolant capacity Engine coolant capacity	 °C (°F) L (gal) L (gal)	 43 (104) 450 (118.4) 238.5 (63.0)	

* EM6135 − 50 state, EM6255 − 49 state

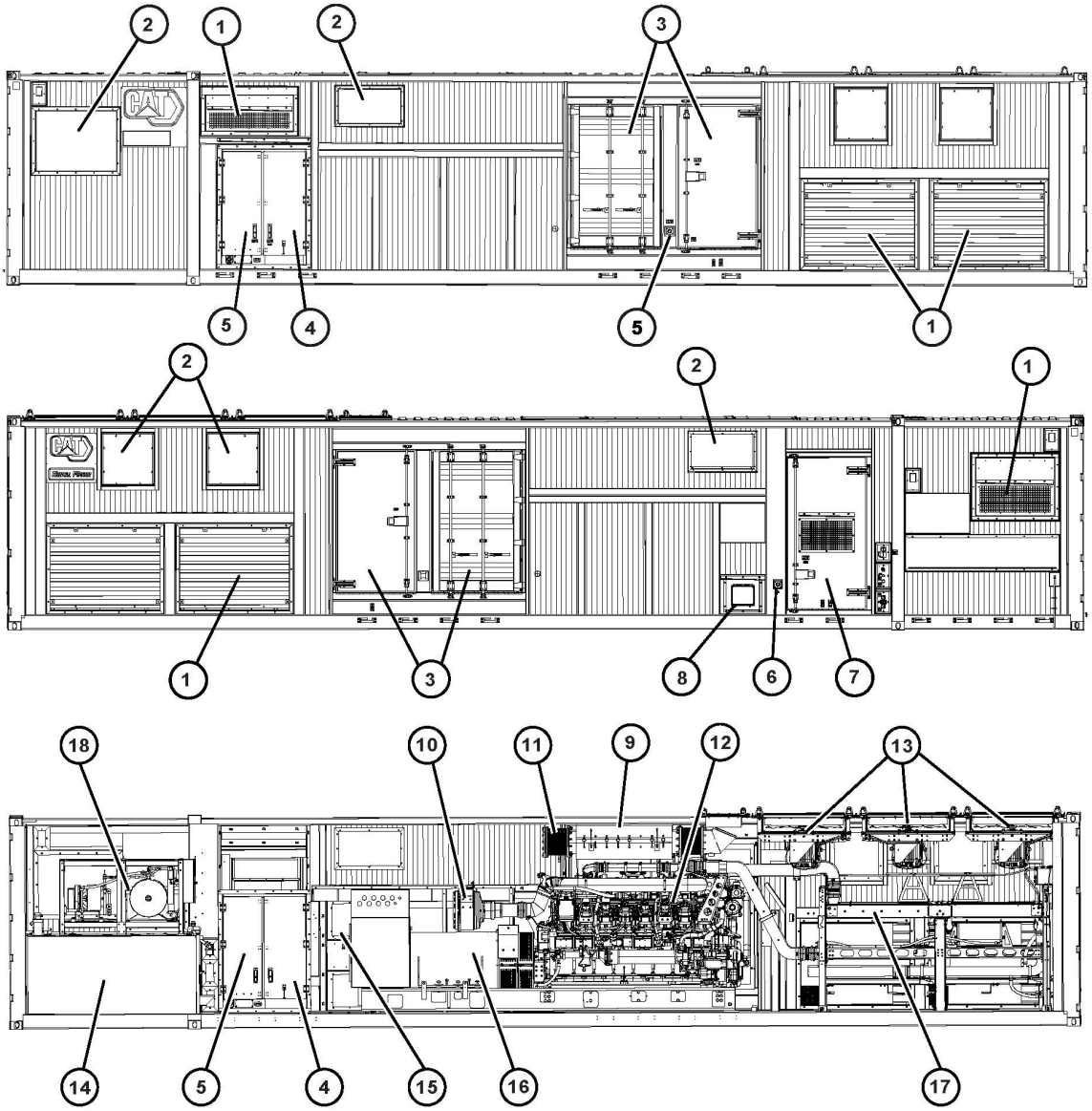
Technical Data (continued)

Cat Generator Set*			
	Units	**60 Hz — Standby**	**60 Hz — Prime**
Power Rating	kW (kVA)	2000 (2500)	1825 (2280)
Performance Specification			
Air Requirements Combustion air flow Max dirty air cleaner restriction	 m3/min (cfm) kPa (in H2O)	 173.3 (6117.8) 12.4 (49.8)	 161.9 (5706.4) 12.4 (49.8)
Exhaust System Exhaust flow at rated Exhaust temp at rated kW – dry exhaust	 m3/min (cfm) °C (°F)	 461.5 (16297) 491.6 (916.8)	 427.4 (15092) 488.8 (911.8)
Noise Rating (with enclosure) * @ 7 meters (23 feet) @ 75% rating	dB(A)	81	81

* EM6135 − 50 state, EM6255 − 49 state

Dimensions and Weights				
	Length mm (in)	**Width mm (in)**	**Height mm (in)**	**With Lube Oil & Coolant Kg (lb)**
w/o chassis (full fluids)	14630 (576)	2438 (96)	2896 (114)	40980 (90,344)
w/o chassis (coolant, lube oil, no fuel, no DEF)	14630 (576)	2438 (96)	2896 (114)	37195 (82,000)
With chassis (full fluids)	14925 (588)	2488 (98)	4100 (162)	45062 (99,344)
Tridem axle group weight, dependent on specific tractor details and dealer added equipment weight	NA	NA	NA	26,308 (58,000)

Package Layout



1	Air Inlets	10	Air filter
2	Service access panel	11	Exhaust
3	Engine access door	12	3516C Engine
4	Load cables access door*	13	Radiator fan (3 x dual fan modules)
5	Circuit Breaker and Variable Speed Drive (VFD) access door*	14	Fuel tank, DEF Tank, Dosing cabinet
6	5 Emergency stop switch	15	EMCP 4.4 Control panel
7	6 Personnel access door	16	Generator
8	HMI Exterior Control Panel	17	Radiator
9	Clean Emission Module (CEM)	18	Air Compressor

** The door has a lock handle that requires a Cat key to unlock*

Ratings Definitions and Conditions

Meets or Exceeds International Specifications:
CSA 22.2 No. 100-4, 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, IEEE 43, UL1741, NFPA 99/110, 97/68/EC, BS4999, BS5000, IEC60034-5.

Assists with Site Certifications:
NFPA 99, NFPA 110.

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 – Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating.
Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

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 ekW 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 ambientes shown indicate
ambient temperature at 100% load which results in a coolant top tank temperature below the alarm temperature.

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