



**IPP Rated 1515 kW**

**IPP Overload 1590 kW**

## POWER MODULE

50/60Hz Switchable Rating

Frequency	Voltage	IPP Rated kW (kVA)	IPP Overload kW (kVA)
50 Hz	400V	1515 (1893)	1590 (1987)
60 Hz	480V	1705 (2131)	1790 (2237)

## FEATURES

### SINGLE SOURCE SUPPLIER

- Generator set manufactured in ISO 9001:2000 compliant facility
- Package factory designed and production tested
- Generator set and components meet or exceed the following specifications: AS1359, AS2789, BS4999, DIN6271, DIN6280, EGSA101P, JEM1359, IEC 34/1, ISO3046/1, ISO8528, NEMA MG1-22

### WORLDWIDE PRODUCT SUPPORT

- Cat® dealers provide extensive post sale support including maintenance and repair agreements
- Supported 100% by your Cat dealer with warranty on parts and labor

### RELIABLE, FUEL EFFICIENT DIESEL ENGINE

- The compact, four-cycle Cat 3516C-HD turbocharged-aftercooled (SCAC) diesel engine provides durability and dependability
- Best-in-class fuel economy
- Fuel system operates on a variety of fuels
- 50/60 Hz switchable with no software re-flashing nor iron changes required
- Electric fuel priming, individual cylinder temperature monitoring, and extended filter change intervals

### CAT SR5 SERIES GENERATOR

- 1844-frame generator designed to match the performance and output of Cat diesel engines
- Double bearing, wye-connected, brushless, permanent magnet excited, form wound design
- Coastal insulation protection and anti-condensation space heaters
- Generator inlet air filters
- Stator winding and bearing temperature monitoring

### REDUCED ENVIRONMENTAL IMPACT

- 110% spill containment of onboard engine fluids
- Positive crankcase fumes ventilation
- Low BSFC and Low Emissions\* ratings, switchable via Cat Electronic Technician (ET)
- \* Does not conform to EPA/EU emissions standards

### SOUND-ATTENUATED ENCLOSURE

- Provides 9-high stackable, CSC enclosure for ease of transportation and protection
- Double personnel doors on both sides of the engine for service access, plus 1 additional personnel door for general access
- Double container doors on each end
- Externally-accessible controls behind hinged door
- Service access doors for engine air filters
- Foldable, stowable awnings on engine compartment air inlets
- Hinged, sound-attenuated radiator louvers for ease of cleaning and maintenance
- Externally-accessible, 100kA IC, 3-pole breaker (Optional 4-pole breaker)

### CAT COOLING SYSTEM

- Vertical, non-stacked radiator cores with dimpled fins to minimize clogging
- Provides 49C (120F) ambient compatibility at 750m (2,460 ft) above sea level
- Energy efficient fans (4) and VFD fan drive

### ON-PACKAGE PARALLELING CONTROLS

- Auto paralleling using package mounted controls
- EMCP 4.3 offers engine and generator monitoring and protection
- AGC-4 provides paralleling, load sharing, VFD control, and primary generator protection

### OTHER FEATURES

- 946-L (250gal) fuel tank with solenoid fill valve
- 113-L (30gal) engine lube oil make-up system
- Oil evacuation system for faster, cleaner oil changes
- 1.8-m (6ft) stainless steel exhaust stack; stows inside container for transport
- Triple, primary fuel filters with water separators, service valves, and differential pressure monitoring

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## FACTORY INSTALLED STANDARD EQUIPMENT

SYSTEM	STANDARD EQUIPMENT
<b>Engine</b>	<p>Cat 3516C-HD heavy duty diesel engine                      Heavy duty, dual element, PowerCore air cleaners with service indicators                      Triple, primary fuel filters with water separators and bypass valves for on-the-fly filter changes                      Secondary fuel filters on engine                      Full flow oil filters with water-cooled oil cooler. Requires API CI-4 or higher lube oil.                      Lubricating oil system includes make-up system (113-L tank), oil drain lines routed to the engine rail, and quick evacuation system for faster, cleaner oil changes                      Jacket water heater (9 kW, 3-phase 480VAC) with electric pump                      Fuel cooler and electric fuel priming pump                      Electronic differential pressure monitoring of all filters                      Electronic ADEM™ A4 engine controls                      Dual 24V electric starting motors</p>
<b>Generator</b>	<p>Double-bearing, 1844-frame, SR-5 generator with anti-condensation space heaters (1.2 kW, 480V)                      Brushless, form-wound, permanent magnet excited, three-phase, 4-lead design                      Class H insulation operating at Class F temperature for extended life                      Cat Integrated Voltage Regulator (Cat IVR)                      Stator winding and bearing temperature detectors monitored by RTD module                      Metallic mesh generator air inlet filters (2)                      System 4 insulation protection</p>
<b>Containerized Module</b>	<p>40-ft ISO high-cube container, 9-High stackable, CSC certified                      Sound attenuated, hinged, radiator intake louvers                      Sound attenuated package air intake louvers with foldable awnings                      Five (5) lockable personnel doors with panic releases                      Interior walls and ceilings insulated with 100 mm of acoustic paneling                      Side bus bar access door with external access load cable connections                      Shore power via distribution block connections for jacket water heater, battery charger, space heaters, and generator anti-condensation heaters                      Six (6) DC lights with 60-min timer                      Single-wall, 946-L (250gal) fuel tank; certified to BS799-5                      Solenoid fuel fill control valve for automated filling                      Sound attenuated to 75 dB(A) (50Hz) 81 dB(A) (60Hz) at 7m (23 ft)                      Four (4) 1400-CCA, Group 4D, maintenance-free batteries, and 50A battery charger                      Insulated exhaust silencer with 1.8-m (6ft) stainless steel exhaust stack for increased site power density                      Engine vibration isolators                      Easy drain access to standard fluids                      Standard Cat decals (Optional) and painted Cat Power Module White</p>
<b>Cooling</b>	<p>Cooling package provides 49°C (120°F) ambient capability (50 &amp; 60 Hz) at IPP Ratings @ 750m (2,460 ft)                      Vertical, non-stacked radiator cores with dimpled fins and vertical air discharge                      Variable frequency fan drive with smart fan control                      Cat Extended Life Coolant</p>
<b>Generator Controls and Protection</b>	<p>EMCP 4.3 generator set controller                      Automatic start/stop with cool down timer                      Generator Protection features: 25, 32, 40, 50/51, 27/59, 81 O/U                      AGC-4 provides voltage and frequency adjust, base load / PF / load sharing / synchronizer, auto start / stop control &amp; generator CB control, SCADA Interface (Ethernet), fuel level indications &amp; alarms, fuel tank fuel transfer control                      Reverse compatibility for interface to legacy power modules                      100 kAIC, 4000A-frame generator circuit breaker with LSIG trip unit                      Multi-mode operation (Island (kW/kVAR sharing, Auto Mains Failure, Peak Shaving, Base Load Power, Export, zero power transfer, power management with multiple units)                      Manual and automatic paralleling capability                      Metering Display: voltage, current, frequency, power factor, kW, WHM, kVAR, and synchroscope</p>
<b>Quality</b>	<p>Factory testing of complete power module                      NEMA, ISO and IEEE standards O&amp;M manuals</p>

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## SPECIFICATIONS

GENERATOR	CAT 3516C-HD DIESEL ENGINE
Frame Size . . . . . 1844	3516C-HD, 4-Stroke diesel
Pitch . . . . . 0.6667	Bore – mm (in) . . . . . 170 (6.7)
No. of poles . . . . . 4	Stroke – mm (in) . . . . . 215 (8.5)
No. of bearings . . . . . 2	Displacement – L (cu in) . . . . . 78.08 (4,764)
Excitation . . . . . Static regulated brushless PM excited	Compression ratio . . . . . 14.7:1
Insulation . . . . . Class H	Aspiration . . . . . TA
Enclosure . . . . . Drip proof IP23	Fuel system . . . . . EUI
Alignment . . . . . Close-coupled	Governor type . . . . . Cat ADEM A4 Control System
Overspeed capability – % of rated . . . . . 125%	
Voltage regulator . . . . . 3 phase sensing with Volts-per-Hertz	
Voltage regulation . . . . . Less than ± 0.5% voltage gain	
Adjustable to compensate for engine speed droop and line loss	
Wave form deviation . . . . . Less than 5% deviation	
Telephone Influence Factor (TIF) . . . . . Less than 50	
Harmonic Distortion (THD) . . . . . Less than 5%	

## TECHNICAL DATA\*

\*Materials and specifications are subject to change without notice  
 \*\*Data represented is at standard conditions

Generator Set Technical Data	Units	50 Hz (60 Hz)	
		Low BSFC	Low Emissions
Continuous Power Rating	kW	1515 (1705)	1515 (1705)
	(kVA)	1893 (2131)	1893 (2131)
Overload Power Rating	kW	1590 (1790)	1590 (1790)
	(kVA)	1987 (2237)	1987 (2237)
Lubricating System	L	405	
Total oil pan capacity	(US gal)	107	
Fuel System			
Generator set fuel consumption**			
105% Load	L/hr	382 (448.8)	400.5 (461.8)
	(gal/hr)	100.91 (118.56)	105.8 (121.99)
100% Load	L/hr	365.29 (429.26)	382.4 (442.8)
	(gal/hr)	96.5 (113.4)	101.0 (116.97)
75% Load	L/hr	282.39 (325.16)	294.7 (337.4)
	(gal/hr)	74.6 (85.9)	77.8 (89.1)
50% Load	L/hr	200.25 (231.66)	208.3 (238.0)
	(gal/hr)	52.9 (61.2)	55.0 (62.87)
Fuel Tank Capacity	L	946	
	(gal)	250	
Max Rated Running Time	hours	2.5	2.3
Cooling System			
Radiator Capacity	L (U.S. gal)	233 (61.6)	
Package Noise Rating @ 7m (23 ft.)	dBA	75 dB(A) (81 dB(A))	75 dB(A) (81 dB(A))

# XQC1600 Power Module



## TECHNICAL DATA\* (CONT.)

Model	Length in (mm)	Width in (mm)	Height in (mm)	Weight without Lube oil and Coolant lb (kg)	Weight with fuel, lube oil and coolant (kg)
XQC1600 w/o chassis	480 (12,192)	97.5 (2,438)	114 (2,896)	TBD (TBD)	70,000 (31,818)
Center of gravity	x = + TBD +/- 300 mm (from rear of container); y = +TBD mm +/- 300 mm (from container floor); z = 0 +/- 150 mm (centerline)				

## RATING DEFINITIONS

**International Power Projects (IPP)** – Output available without varying load for an unlimited time. Average power output is 70 – 100% of the continuous power Rating. Typical peak demand is 105% of continuous rated kW for a maximum of 1 hour in 12 hours, not to exceed 500 hours per year. Typical applications are IPP power plants. Continuous power is in accordance with ISO8528. Fuel stop power is in accordance with ISO3036.

## STANDARD FEATURES

### EMCP 4.3 LOCAL CONTROL PANEL

- Package-mounted EMCP 4.3 provides power metering, protective relaying and engine and generator control and monitoring.
- Convenient service access for Cat service tools (not included).
- Integration with the Cat Integrated Voltage Regulator (Cat IVR) provides enhanced system monitoring.
- Ability to view and reset diagnostics of all controls networked on J1939 data link eliminates need for separate service tools for troubleshooting.
- Real-time clock allows for date and time-stamping of diagnostics and events.
- True RMS AC metering, 3 phase: L-L volts, L-N volts, Phase, Amps, Hz, ekW, kVA, kVAR, kWhr, % kW, PF

### EMCP 4.3 ENGINE OPERATOR INTERFACE

- Graphical display with positive image, transfective LCD, adjustable white backlight/contrast.
- Digital indication for
  - RPM
  - DC Volts
  - Operating hours
  - Oil pressure
  - Coolant Temperature
  - Oil Temperature
- Two LED status indicators (1 red, 1 amber)
- Engine cool-down timer
- Engine cycle crank
- Three engine control keys and status indicators (Run/Auto/Stop).
- Lamp test and alarm acknowledgement keys
- Warnings/shutdowns with indicating text for:
  - Low oil pressure
  - Overspeed
  - High oil temperature
  - Overcrank
  - Emergency stop
  - AGC-4
- Emergency stop pushbutton
- Display navigation keys including two shortcut keys for Engine Parameters or Generator Parameters

### GENERATOR PROTECTIVE RELAYING

- Generator protective features
  - Phase over/under voltage (Device 27/59)
  - Over/Under frequency (Device 81 O/U)
  - Reverse Power (Device 32)
  - Overcurrent (Device 50/51) (GCB trip unit)
  - Loss of Excitation (Device 40) (Cat IVR)

### AGC-4/EMCP 4.3 PROTECTIVE RELAYING

- Generator protective features
  - 25 sync-check ( AGC-4)
  - 32 rev. power (EMCP 4.3 and AGC-4)
  - 40 loss of excitation (Cat IVR and AGC-4 impedance based)
  - 50/51 Inst. and time overcurrent (GCB trip unit and AGC-4)
  - 47 Negative Voltage Sequence (AGC-4)
  - 46 Negative Sequence Current (AGC-4)
  - 27/59 phase under/over voltage (EMCP 4.3 and AGC-4)
  - 81O/U under/over frequency (EMCP 4.3 and AGC-4)
- Package-mounted AGC-4 controls provide auto paralleling, CAN-bus, Ethernet communications, PWM and Analog outputs, and legacy analog load sharing (real and reactive)
- AGC-4 main display and Additional Operator Panel (AOP) secondary display

### VOLTAGE REGULATION AND POWER FACTOR CONTROL CIRCUITRY

- Generator mounted automatic voltage regulator
- 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

- 4000A-frame (set to 3000A), 3-pole, package-mounted, electrically operated, insulated IEC CB (Optional 4-pole)
- Solid state trip unit for overload (time overcurrent) and fault (instantaneous) overcurrent protection. LSIG is standard.
- Includes DC shunt trip coil activated on any monitored engine or electrical fault, 100 kA-interrupting capacity at 480 VAC.
- Ground fault sensing/trip (requires optional ground CT)

## CONTAINER

- 40-ft ISO, high cube container, 9-High Stack CSC Certified
- Painted standard Cat Power Module White, per Caterpillar Specifications
- Sound-attenuated, air intake louvers with foldable awnings on engine room inlets
- Sound-attenuated, hinged, radiator intake louvers for ease of maintenance and cleaning
- Five (5) lockable personnel doors with panic releases on each door

## INTERNAL LIGHTING & CONVENIENCE POWER

- Six (6) internal DC lights with 60-min timer located at one personnel door
- One (1) International-style convenience receptacle

## BATTERY CHARGER AND BATTERIES

- 24 VDC/50A battery charger with float/equalize modes and charging ammeter
- Four (4) 1400CCA, maintenance-free batteries

## EMERGENCY STOP PUSHBUTTON

- Single emergency stop pushbutton (ESP) located on package-mounted controls area
- ESP located on each side of the container (2)

## EXHAUST SILENCER

- Internally mounted, insulated, puck-style exhaust silencer suspended from container roof
- 1.8m (6-ft) vertical discharge exhaust stack, stows for shipping inside container

## FUEL TANK

- 946-L single-wall fuel tank
- BS799-5 certified
- Solenoid fuel fill control valve
- Triple, primary fuel filters with water separators and bypass valves mounted to tank

## SHORE POWER

- One (1) shore power connections for generator anti-condensation heater, battery charger, jacket water heater, and convenience receptacle

## LUBE OIL MAKE-UP SYSTEM

Includes oil pan-mounted oil level regulator and personnel-door mounted, 114 L (30 gal) oil tank for maintaining oil pan levels in extended run applications. Tank can be remotely filled without shutting down engine.

## CURRENT TRANSFORMERS

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

## POTENTIAL TRANSFORMERS

- 4:1 ratio with primary and secondary fuse protection.

## BUS BARS

- 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.
- Includes ground bus, tin-plated copper, for connection to the generator frame ground and field ground cable.

## AC DISTRIBUTION

- Transformer distributes utility voltage for the 16 spaces (minimum) Power Module AC panel board.
- Provides 240 and 480 VAC for module accessories
- Includes controls to de-energize jacket water heaters and generator anti-condensation heater when the engine is running.

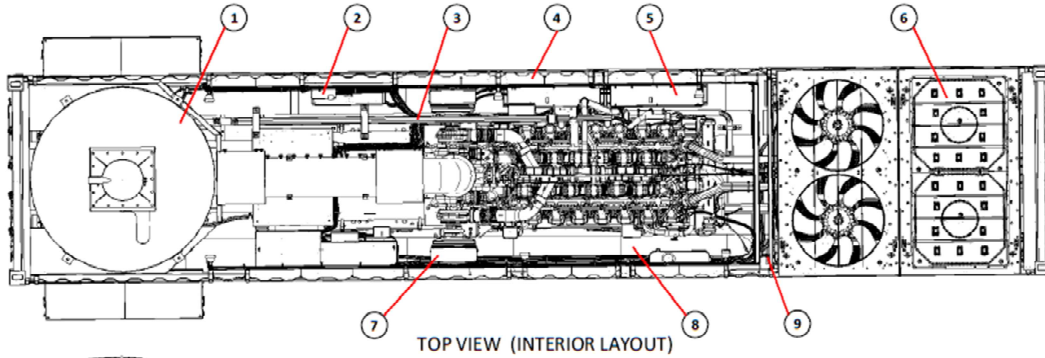
## MODES OF OPERATION

- 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:
  - AGC-4 control allows single 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 (selectable: programmable set-point or potentiometer adjust)
  - Soft load/unload (programmable, shared set-point)
  - Power Factor control (programmable set-point)

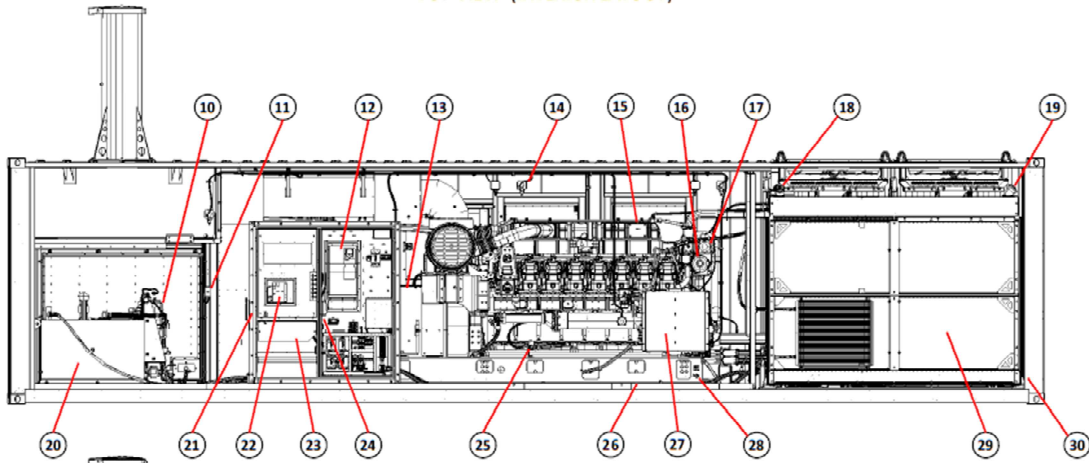
# XQC1600 Power Module



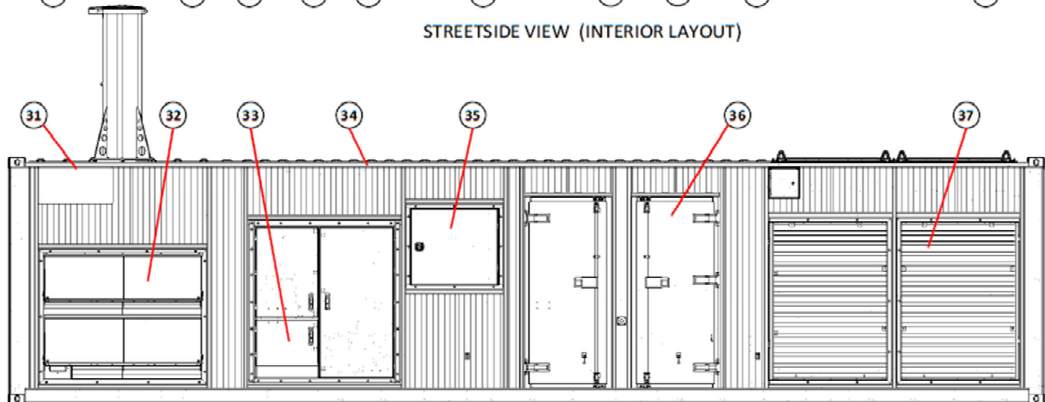
## EQUIPMENT LAYOUT



TOP VIEW (INTERIOR LAYOUT)

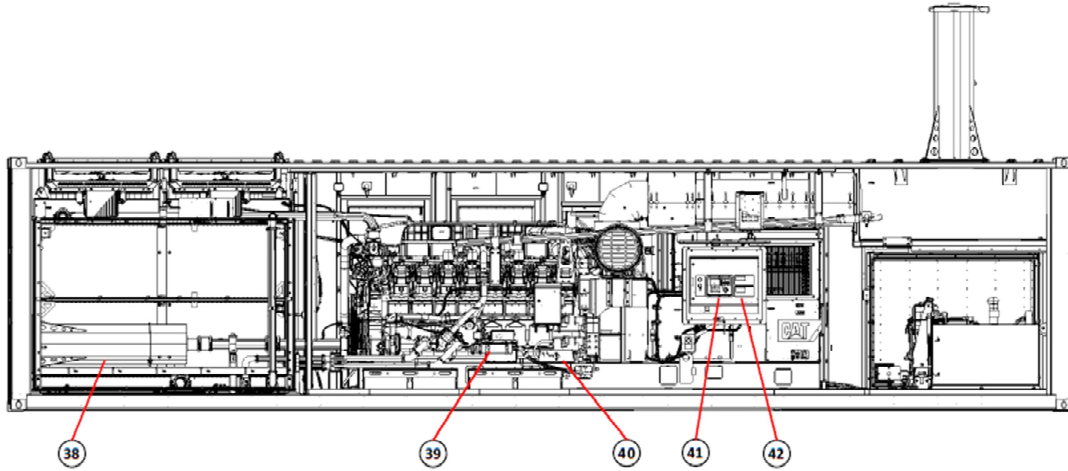


STREETSIDE VIEW (INTERIOR LAYOUT)

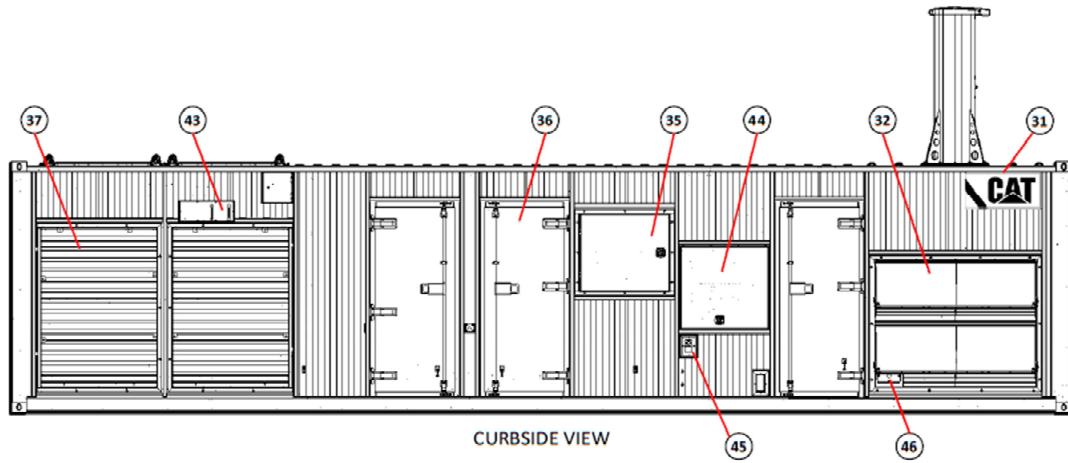


STREETSIDE VIEW

# XQC1600 Power Module



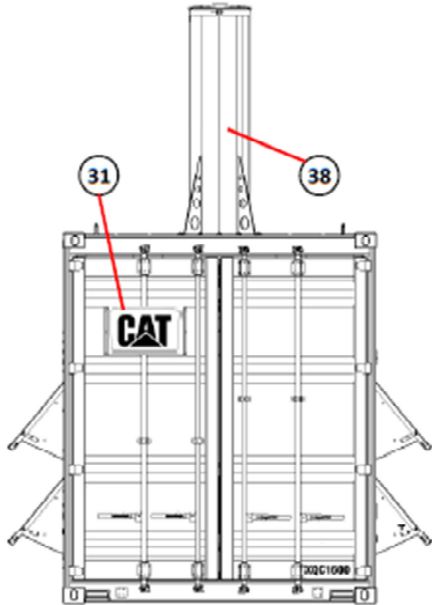
CURBSIDE VIEW (INTERIOR LAYOUT)  
(NEAREST RADIATOR CORE REMOVED)



CURBSIDE VIEW



# XQC1600 Power Module



# XQC1600 Power Module



Item	Description
1	Internally-mounted, insulated, Puck-Style Silencer
2	Battery Charger (480VAC Input, 50A DC Output)
3	Crankcase Ventilation System (Plumbed to Exhaust)
4	Acoustic Paneling (100mm)
5	24 VDC Batteries w/ Cover Grating (Qty 4)
6	Vertical Radiator Discharge
7	PowerCore Dual Element Air Cleaners (Qty 2)
8	Spill Containment System (110% Engine Fluids)
9	Partition Wall
10	Triple Fuel/Water Separators w/ Bypasses (Qty 3)
11	DC Lamp Time Switch
12	Variable Frequency Fan Drive Controller
13	1844 Frame, Form Wound, SR5 Generator
14	DC Lamps (Qty 6)
15	3516C-HD Engine (50/60 Hz) w/ Tubular Rails
16	Engine Lube Oil Filters
17	Engine Secondary Fuel Filters
18	Separate Circuit Aftercooler (SCAC) Fill Cap (Qty 2)
19	Jacket Water Circuit Fill Cap (Qty 2)
20	946-L Fuel Tank w/ Solenoid Fill Valve
21	Literature Storage
22	3 Pole, 100 kAIC Breaker
23	Customer Load Cable Connections
24	External Shore Power Connection Terminal Block
25	Lube Oil Quick Evacuation/Fill Valve
26	Generator Set Isolators (Qty 10)
27	Lube Oil Make-Up Tank (113-L)
28	Engine Oil Drain (Manual), Plumbed to Rail
29	Vertical Radiator Cores (1 per container side)
30	Radiator Drain Valves (Qty 2)
31	Standard CAT Trade Dress Decals
32	Engine Room Air Inlet Louvers w/ Awnings (Qty 4)
33	Customer Load Access Door
34	40-ft Purpose Built, High-Cube, ISO Container
35	Air Cleaner Access Door (Qty 2)
36	Personnel Entrance Door (Qty 5)
37	Radiator Air Inlet Louvers (Hinged) (Qty 4)
38	Exhaust Stack w/ Rain Cap (1.8m, 457 mm Dia.)
39	Jacket Water Heater (9 kW)
40	Battery Disconnect Switch
41	EMCP 4.3 Generator Set Controller
42	AGC-4 Paralleling Controller
43	External Radiator Sight Glasses (1 per circuit)
44	Control Access Door
45	Customer Communications Wiring Access
46	External Fuel Supply Connection (1"-11 BSPP)

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