



CONTINUOUS 50 Hz 1900 ekW

Image shown may not reflect actual configuration

Specifications

Frequency	Voltage	Continuous kW (kVA)	Speed rpm
50 Hz	400 V	1900 (2375)	1500

Cat® G3516H High Altitude and Ambient, High Fuel Tolerant Gas Engine	Metric	Imperial (English)
Number of Cylinders	V16	
Bore	170 mm	6.7 in
Stroke	215 mm	8.5 in
Displacement	78 L	4760 in ³
Aspiration	Turbocharged Separate Circuit Aftercooled	
Compression Ratio	11.1:1	
Engine Speed	1500 rpm	
Aftercooler Inlet (deg C)	52	
Jacket Water Outlet (deg C)	99	
Exhaust Manifold	Dry	
Fuel system	Cat Low Pressure w/ Air Fuel Ratio Control	
Governor Type	ADEM™ A4 Control System	
Fuel	Natural Gas	
Fuel Pressure Range (PSI)	1.5 - 5.0	

Benefits & Features

Fuel/Emissions Strategy

- Class leading efficiency
- Meets most worldwide emissions requirements down to 500 mg/Nm³ NO_x level without after treatment

Single-Source supplier

- Generator set manufactured in ISO 9001:2000 compliant facility
- Package factory designed and production tested

Worldwide Product Support

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

Cat® G3516H High Altitude and Ambient, High Fuel Tolerant Mode Gas Engine

- Compact, four-stroke-cycle gas engine provides class leading dependability, fuel economy, and power density for reduced total cost of ownership
- High altitude and ambient hardware improves engine's capability to handle electrical loading and unloading, as well as ambient and altitude capability
- High fuel tolerant hardware improves humidity tolerance and allows usage of lower MN fuel
- 1500 Hr oil change interval and reduced oil consumption for reduced owning and operating cost

Cat Generator

- Cat SR5 1866 frame generator designed to match the performance and output characteristics of the Cat gas engine
- Stator and Bearing temperature monitoring for preventive maintenance
- Anti-condensation heaters for increased reliability
- Generator air inlet filter for reduced cleaning
- Adjustable shims for ease of re-alignment and retention of factory alignment
- Class H insulation operating at Class F temperature rise and System 4 insulation protection for extended life

Cooling System

- Size compatible to rating with energy efficient electric drive fan and core.
- Provides ambient capability with 500 mg/Nm³ NO_x at 100% continuous rating before derate, @ 500m
 - 40°C @ 100% load
 - 45°C @ 95% load
 - 50°C @ 85% load
- Variable frequency drive (VFD) fan speed controls for improved fuel consumption at partial load and/or lower ambient temperatures
- Direct drive fans eliminate belt service

On Package Control Panel System

- Externally accessible, package mounted control panel and power distribution panel improves operator access and serviceability
- EMCP 4.3 offers engine and generator monitoring and protection, voltage regulation with Cat IVR improves transient response performance
- Dedicated IVR status screens on EMCP 4.3
- IVR Fully supported by Cat ET service tool
 - Removes need for additional PC software
- AGC-4 provides paralleling, load sharing, VFD control, and primary generator protection for greater versatility, package utilization and monitoring
- 100 kAIC, 4000A, 3 Pole Breaker Panel with LSIG trip unit for greater electrical protection

Sound Attenuated Container

- Provides 9-high stack CSC rated enclosure for ease of transportation and protection.
- Enclosure doors and access panels located for ease of serviceability to maintenance and service items
- External, critical grade, spark arresting, SST, exhaust silencer with vertical discharge for reduced package internal temperatures and service access
- Single SST, 2 m (6.5 ft) stack for optimized site spacing and requirements management
External silencer and stack are internally stow-able for ease of transportation in one package

Reduced Environmental Impact

- 110% spill containment of onboard engine fluids
- Positive crankcase fumes ventilation

Standard Equipment

Engine

- Cat® G3516H High Altitude and Ambient Gas Engine Operates on 24.10 to 93.95 MJ/Nm³ (615 to 2386 btu/ft³) dry pipeline natural gas
- Cat Gas Engine Control Module (CGECM) includes electronic speed governor and provides transient richening and turbo bypass control
- Electronic Ignition System (controlled by ECM)
- Individual cylinder Detonation Sensitive Timing (DST)
- Engine installed electronic fuel metering valve
- Heavy duty, two element, single stage canister type air cleaner with service sensing and annunciation
- Dual 24V electric starting motors
- Integral lube oil cooler, pre-lube oil pump, oil filter, filler, and dipstick and oil drain lines routed to engine rail
- Pre-lube Pump, 230VAC continuous type
- Jacket Water Heater, 12kW, 400/480V, 50/60 Hz, 3-phase with isolation valves
- Improved absolute humidity/dew point capability, consult factory for instructions on proper site ambient, altitude, and dew point evaluation
- SST engine aftercooler

Generator

- Double bearing, SR5, brushless, form wound
- Permanent magnet excited, three-phase with Cat IVR
- Class H insulation operating at Class F temperature and coastal insulation protection for extended life
- 4-lead design
- Re-Greaseable bearings

Quality

- Factory testing of standard generator set and complete power module
- NEMA, ISO and IEEE standards
- Full package CE certification available
- O&M, parts book and service manuals

Containerized Module

- 40' ISO high cube container, 9-high stack CSC certified
- Sound attenuated air intake louvers and 2 lockable personnel doors with panic release
- Interior walls and ceilings insulated with 100 mm of acoustic paneling
- Floor of container is undercoated for corrosion protection
- One (1) International – style convenience receptacle
- External emergency stop buttons on each side of unit
- Side external access load connection bus bars
- 3" ANSI flange customer fuel connection with cover to prevent vandalism
- Energized-to-run (ETR) shutoff valve (double solenoid, low/high pressure switch, CE approved)
- Wall mounted fuel filter, gas pressure regulator, and shutoff valve
- Sound attenuated 79 dB(A) @ 7 m (23 ft)
- Four (4) 1400 CCA maintenance-free batteries, battery rack and 50-Amp, 400/480V battery charger
- Vibration isolators, corrosion resistant door hardware and fasteners, and stainless steel hinges
- External drain access to standard fluids
- Standard Cat films and painted Cat power module white
- LH and RH engine service doors integrated into container side walls
- Hinged container doors, both ends
- Remote cooling shunt tank for improved venting and positive suction head at pump inlets
- Re-Greaseable Fan motor bearings
- Motor grease lines plumbed for easy access
- Motor grease interval and grease type coincides with generator grease interval and grease type
- Fan modules are removable from above
- Methane sensor located near engine air filters detects gas leaks inside Power Module and causes alarm and shutdown

Standard Equipment (continued)

Lube Oil Make-Up System

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

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 coolant temperature
 - Overcrank
 - Emergency stop
- Display navigation keys including two shortcut keys for Engine Parameters or Generator Parameters

AGC-4/EMCP 4.3 Local Operator Interface Panel

- AGC-4 provides paralleling, voltage and frequency adjust, base load / PF / load sharing / synchronizer, auto start / stop control, generator CB control, SCADA Interface (Ethernet), package protection, power metering, and VFD control
- AGC-4 controls provide 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
- Manual and automatic paralleling capability
- EMCP 4.3 provides power metering, generator protective relaying, and engine and generator control and monitoring.
- Convenient service access for Cat service tools (not included).
- 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, and synchroscope
- Emergency stop pushbutton

AGC-4/EMCP 4.3 Protective Relaying

- Generator protective features
 - 32 rev. power (EMCP 4.3 and AGC-4)
 - 40 loss of excitation (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)

Standard Equipment (continued)

Voltage Regulation and Power Factor Control Circuitry

- Integrated Automatic Voltage Regulation (IVR)
- 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 operator interface panel
- Configure IVR parameters directly from the EMCP screen or Cat ET service tool
- Programmable stability settings
- Soft start control with an adjustable time setting in IVR control mode
- Dual Slope, Configurable Under Frequency (Volts/Hz) regulation
- Configurable line drop compensation

Circuit Breaker

- 4000A-frame, 3-pole, package-mounted, electrically operated, insulated IEC CB
- Solid state trip unit for overload (time overcurrent) and fault (instantaneous) overcurrent protection. LSIG is standard
- Ground fault sensing/trip (requires ground CT)
- Includes DC under voltage trip coil activated on any monitored engine or electrical fault
- Circuit breaker and VFD cabinet and components sized for 100 KAIC

Internal Lighting & Convenience Power

- Six (6) internal DC lights with 60-min timer located at one personnel door
- One (1) International-style convenience receptacle (110V, 3A) located on operator interface panel

Current transformers

- Metering class current transformers rated 4000:5 with secondaries wired to shorting terminal strips

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

- Provides power from load side of generator breaker for generator anti-condensation heater, battery charger, jacket water heater, convenience receptacle, and engine pre-lube pump
- Shore power via distribution block connections for jacket water heater, battery charger, generator space heaters, and engine pre-lube
- 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

Technical Data

Cat® Generator	
Frame Size	1866
Pitch	0.6667
No. of poles	4
Insulation.	Class H
Excitation	Static regulated brushless PM excited
Constructions	Double bearing, close coupled
Enclosure	Drip proof IP22
Temperature rise	105 deg C
Alignment	Close Coupled
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 Adjustable to compensate for engine speed droop and line loss
Wave form deviation	Less than 3% deviation
Telephone Influence Factor (TIF)	Less than 50
Harmonic Distortion (THD)	Less than 5%

	Cat® Generator Set – 50 Hz	
	Units	Continuous
Power Rating	ekW	1900, 50hz
	Performance Specification	
Performance Number		EM4962
Lubricating System Lube Oil Refill Volume with filter change for standard sump	L (gal)	462 (122)
Altitude Capability At 25° C (77°) ambient, above sea level	m (ft)	1250 (4100)
Cooling System Package ambient capability Jacket water temperature (max operation outlet) System coolant capacity System required airflow	 ° C (° F) ° C (° F) L (gal) m3/min (ft³/min)	 40 (104) 100 (212) 947 (253) 2711 (95,738)
Exhaust System Combustion air flow rate Exhaust stack gas temperature, 100% Exhaust gas flow rate	 m³/min (ft³/min) ° C (° F) Nm³/min	 133.2 (4704) 411 (772) 141.8 (5008)

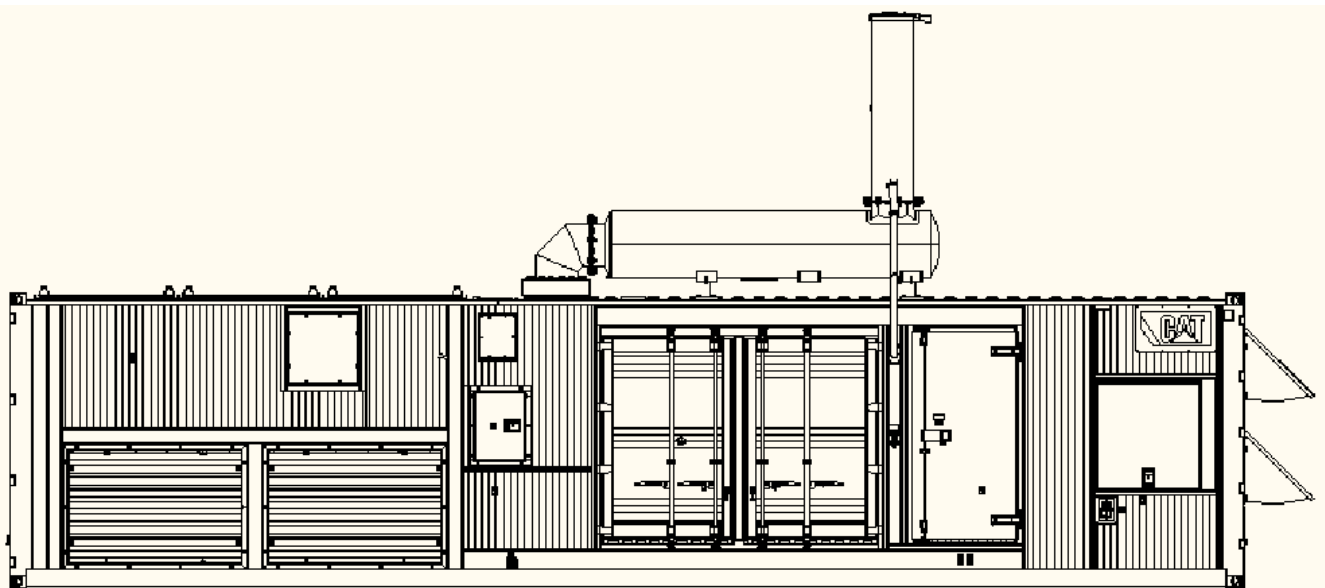
Technical Data (continued)

Cat® Generator Set – 50 Hz		
	Units	Continuous
Sound Performance* Noise Rating @1 meters (per SAE J1074) Noise Rating @7 meters (per SAE J1074) *fan speed on 35C ambient	dB(A)	84 79
Emissions at 100% Load NOx (as NO2)(corr. 5% O2) CO (corr. 5% O2) THC (corr. 5% O2) NMHC (corr. To 5% O2) Exhaust O2	mg/Nm3 (dry) mg/Nm3 (dry) mg/Nm3 (dry) mg/Nm3 (dry) % (dry)	500 822 681 109 9.2
Methane Number without Derate		80 - 100
Methane Number with Derate		27 - 80

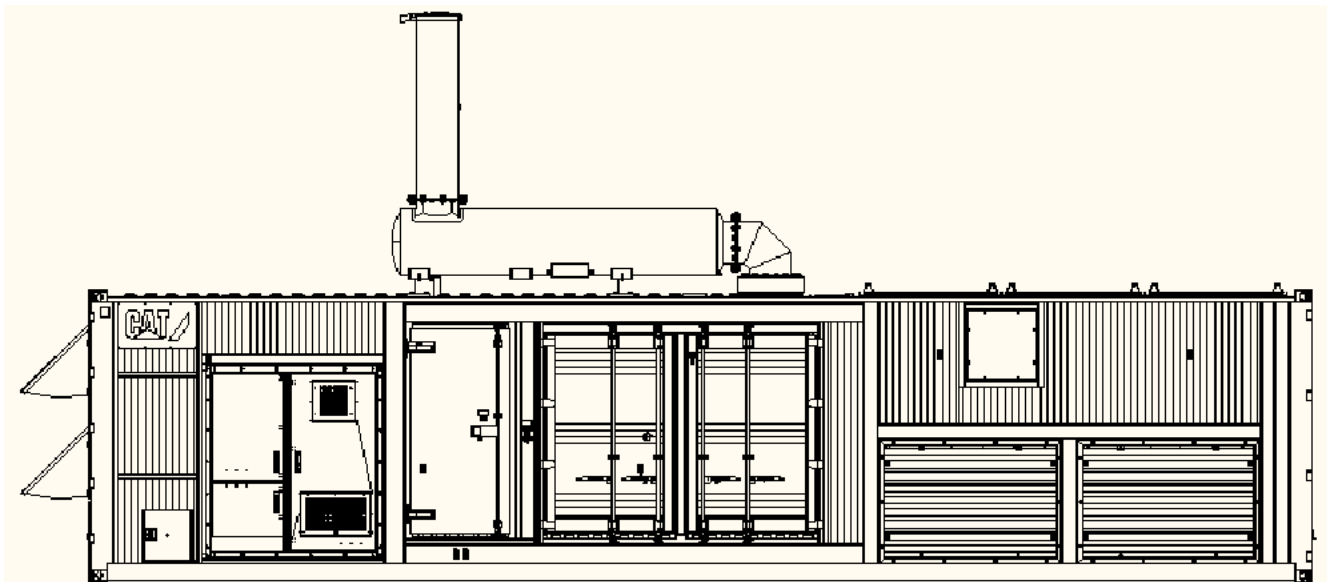
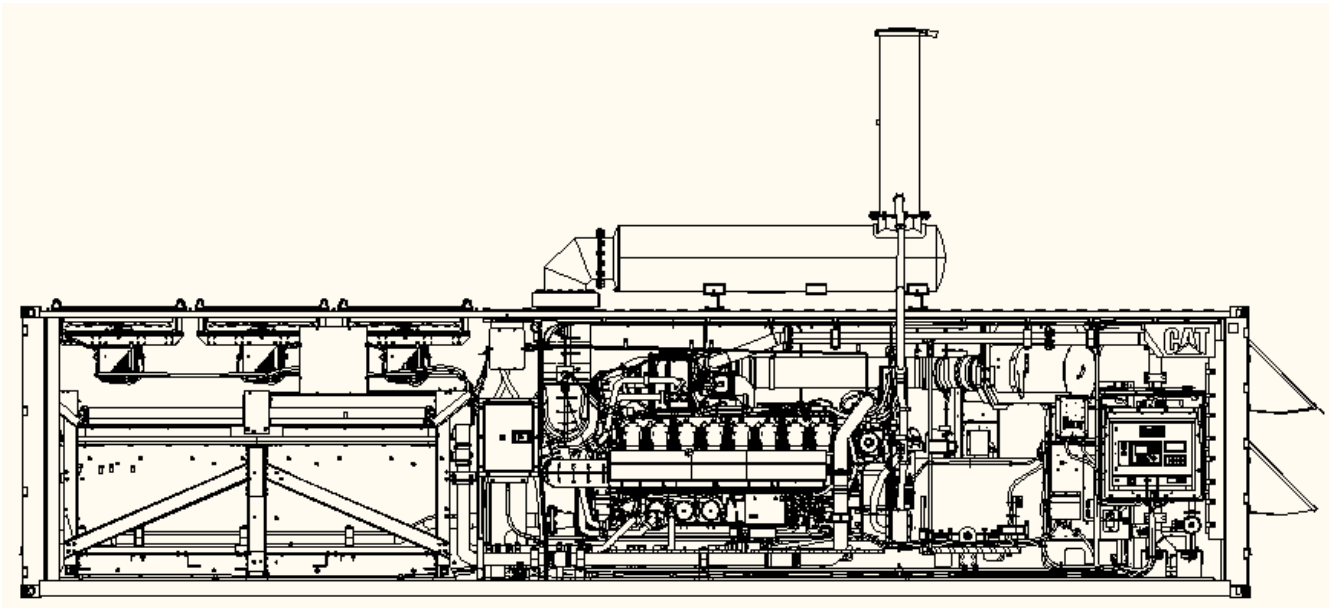
Dimensions and Weight

Model	Length mm (in)	Width mm (in)	Height mm (in)	With Lube Oil & Coolant Kg (lb)
XGC1900 w/o Chassis	12 192 (480)	2 438 (96)	2 896 (114)	35 280 (77 780)

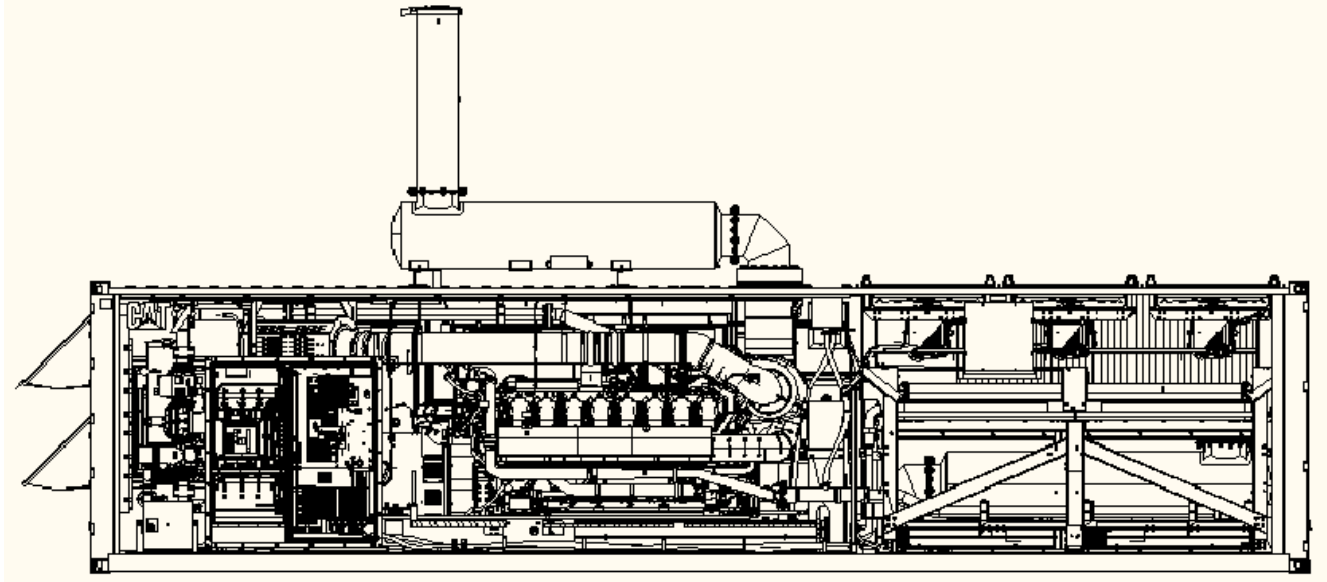
General Layout View



General Layout View (continued)



General Layout View (continued)



Ratings Definitions and Conditions

Conditions:

Power for gas engines is based on fuel having an LHV of 33.74 kJ/L (905 Btu/cu ft) at 101 kPa (29.91 in. Hg) and 15° C (59° F), and the air to turbo dew point temperature. Fuel rate is based on a cubic meter at 100 kPa (29.61 in. Hg) and 15.6° C (60.1° F). Air flow is based on a cubic foot at 100 kPa (29.91 in. Hg) and 25° C (77° F). Exhaust flow is based on a cubic foot at 100kPa (29.61 in. Hg) and stack temperature

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