

# Cat® 3616

## Diesel Generator Sets

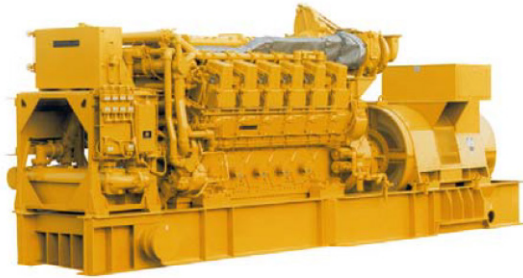


Image shown may not reflect actual configuration.

Bore – mm (in)	280 (11.0)
Stroke – mm (in)	300 (11.8)
Displacement per cylinder – L (in <sup>3</sup> )	18.5 (1127)
Total Displacement – L (in <sup>3</sup> )	296 (8,032)
Compression Ratio	13:1
Aspiration	TA
Fuel System	Direct Unit Injection

### Features

#### Cat® Diesel Engine

- Designed and optimized for low fuel consumption
- Reliable, rugged, durable design

#### Alternators

- Superior motor starting capability minimizes need for oversizing generator
- Designed to match performance and output characteristics of Cat diesel engines

#### Generator Set Package

- Fully prototype tested with certified torsional vibration analysis available

#### Worldwide Product Support

- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- Your local Cat dealer provides extensive post-sale support, including maintenance and repair agreements

#### Cat Generator Set Monitoring System (GSM)

- Simple user friendly interface and navigation
- Provides protection, monitoring, and control of the diesel generator set
- Redundant shutdown protection
- 10 inch (254 mm) color monitor to display all engine parameters and alarm annunciation
- Annunciation of all engine shutdowns, alarms, and status points
- Start/prelube control switch, fuel control switch and emergency stop buttons
- Speed control switch with automatic changing to ball head control when a governor failure occurs, if ball head control is available
- Contacts are available for customer use
- Selection of local/remote control of engine
- Selection of idle/rated control of engine
- Equipped for remote communication
- Four 4-20mA outputs (programmable)
- Relay contact signals to the remote monitoring system (summary shutdown, summary alarm, local operation/remote, engine running, PLC failure, fuel control and idle/rated)

## Standard and Optional Equipment

### Air Inlet

- Aftercooler, fresh water, corrosion resistant coated (air side)
- Air inlet shutoff
- Air cleaner
- Breather, crankcase, top-mounted
- Turbocharger, engine oil lubricated
- Soot filter
- Air cleaner louver assembly
- Vertical support bracket
- Heavy duty air cleaner
- Air inlet adapter
- Boost control valve

### Cooling

- Engine coolant water drains
- Front mounted turbos
- Three-bundle oil cooler
- Water temperature regulator
- Jacket water thermostats
- Heat exchanger for single circuit
- Heating aids
- Cooling system aids
- Auxiliary water pump
- Expansion tank

### Exhaust

- 457 mm (18 in) Cat bolt pattern
- Dry, gas tight, exhaust manifold
- Includes adapter, flexible exhaust fitting
- Flexible exhaust fittings
- Weld flange and related hardware

### Fuel

- Simplex or Duplex
- Fuel Priming Pump
- Duplex Primary Fuel Strainer
- Fuel System Connections

### Generator

- Custom generator
- 3 Phase, six leads, WYE
- Class F insulation
- Busbar connections
- Winding temperature detectors
- Anti-condensation space heaters

### Governor

- UG Actuator
- Electronic / actuators
- Digital programmers
- Battery backup / power supply
- 230 UA
- 723 Plus
- EGB Actuator

### Lube

- Centrifugal oil filters with single shutoff
- Service side engine mounted on cylinder block inspection covers
- Wet oil sump. Includes engine-driven main lubrication pump, installed oil lines, engine-driven oil pump and oil pan
- Oil filler and dipstick
- Valve, oil pressure regulating
- Valves, crankcase explosion relief
- Oil pan drain valve
- Lube ANSI adapter (emergency connection)

### Mounting

- Damper, torsional vibration
- Engine and generator mounting
- Isolator
- Spring type vibration isolator
- Vertically restrained
- Non-vertically restrained

### Starting / Charging

- Vane type air starter
- Two motors, engine mounted at rear, on left side
- Includes air silencer
- Line group for single point custom connection
- Pressure reducing valve
- Compressed air flex hose
- Turbine type air starters
- Redundant air starters

### General

- Paint, Caterpillar yellow
- Pumps, gear driven: fuel, oil, jacket water, aftercooler / oil cooler water
- Custom paint colors

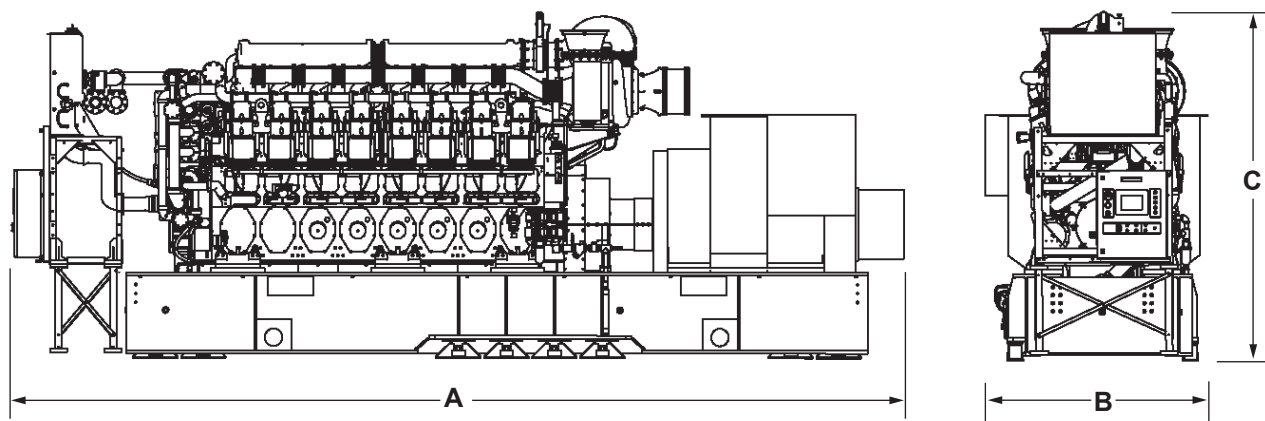
## Package Performance

Performance – 1000 rpm	Notes	Standby	Prime	Continuous
Frequency		50 Hz	50 Hz	50 Hz
Engine power – bkW	(2)	5960	5420	4920
Generator power – ekW	(2)	5720	5200	4700
Performance number		DM5538-01	DM5540-01	DM5413-06
<b>Engine Data</b>				
Fuel consumption (ISO 3046/1) – g/bkW-hr	(1)	192.9	192.7	193.7
Fuel consumption (nominal) – g/bkW-hr	(1)	196.7	196.5	197.5
Fuel Consumption (90% confidence) – g/bkW-hr	(1)	198.9	198.7	199.8
Air flow (@ 25°C, 101.3 kPa) – m <sup>3</sup> /min		580.9	522.5	467.6
Air mass flow – kg/hr		38882	34971	31298
Compressor outlet pressure – kPa (abs)		307.3	266.3	227.5
Compressor outlet temperature – °C		203.0	186.5	170.2
Inlet manifold pressure – kPa (abs)		305.0	264.1	225.4
Inlet Manifold temperature – °C		60.3	59.4	58.5
Timing – °BTDC	(10)	16.5	16.5	16.5
Exhaust stack temperature – °C		395.1	404.5	420.5
Exhaust gas flow (@ stack temperature, 101.3 kPa) m <sup>3</sup> /min		1263.2	1152.5	1056.4
Exhaust gas mass flow – kg/hr		40063	36043	32277
<b>Energy Balance Data (nominal)</b>				
Fuel input energy (LHV) – kW	(1)	10401	12747	11634
Heat rejection to jacket water – kW	(4)	1166	1080	1005
Heat rejection to atmosphere – kW	(5)	281	255	233
Heat rejection to oil cooler – kW	(6)	523	569	545
Heat rejection to exhaust (LHV to 25°C) – kW	(4)	4431	4089	3820
Heat rejection to exhaust (LHV to 177°C) – kW	(4)	3087	2732	2384
Heat rejection to aftercooler – kW	(7), (8)	1537	1231	970
<b>Emissions</b>				
NO <sub>x</sub> – g/bkW-hr	(9)	12.94	13.69	14.09
CO – g/bkW-hr	(3)	0.81	0.70	0.64
HC – g/bkW-hr	(3)	0.90	0.91	0.90
PM – g/bkW-hr	(9)	0.13	0.13	0.13

### Notes

- 1) Fuel consumption tolerance. ISO 3046/1 is 0, + 5% of full load data. Nominal is ± 3% of full load data.
- 2) Engine power tolerance is ± 3% of full load data.
- 3) Emission data shown are not to exceed values.
- 4) Heat rejection to jacket water and exhaust tolerance is ± 10% of full load data. (Heat rate based on treated water.)
- 5) Heat rejection to atmosphere tolerance is ± 50% of full load data. (Heat rate based on treated water.)
- 6) Heat rejection to lube oil tolerance is ± 20% of full load data. (Heat rate based on treated water.)
- 7) Heat rejection to aftercooler tolerance is ± 5% of full load data. (Heat rate based on treated water.)
- 8) Total aftercooler heat = aftercooler heat x ACHRF. (Heat rate based on treated water.)
- 9) Emission data shown are dry and nominal values.
- 10) Timing based on AFM injectors.

## Weights and Dimensions



Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Weight kg (lb)
10261.7 (404.0)	2530.3 (99.6)	3977.7 (156.6)	51 230 (112,690)

**Note:** For reference only. Do not use for installation design. Contact your local Cat dealer for precise weights and dimensions.

## Ratings and Definitions

### 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 rated kW. 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 rated kW. 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.

### Continuous

Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous rated kW. Typical peak demand is 100% of continuous rated kW for 100% of the operating hours.

### Applicable Codes and Standards

AS 1359, CSA, IEC 60034-1, ISO 3046, ISO 8528, NEMA MG 1-22, NEMA MG 1-33, UL508A, 2014/35/EU, 2006/42/EC, 2014/30/EU.

**Note:** Codes may not be available in all model configurations. Please consult your local Cat dealer for availability.

**Engine Rating** obtained and presented in accordance with ISO 3046/1 and SAE J1995 JAN90 standard reference conditions of 25°C, 100 kPa, 30% relative humidity and 150m altitude at the stated aftercooler water temperature. Consult altitude curves for applications above maximum rated altitude and/or temperatures.

**Ratings** are based on SAE J1349 standard conditions. These ratings also apply at ISO 3046 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 15°C (59°F) and weighing 850 g/liter (7.0936 lbs/U.S. gal). Additional ratings may be available for specific customer requirements, also, for information regarding low sulfur fuel and biodiesel capability, please consult your Cat dealer.

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