



ONE GIANT LEAP FOR ELECTRIC POWER

The 2-4MW family of diesel generator sets powered by the C175

CATERPILLAR®

Building on a proven legacy

Twenty-five years ago, Caterpillar set the standard for electric power generation with the introduction of the 3500 series of diesel generator sets. Now, Caterpillar is raising the bar again.

Building on the fundamentals of proven reliability and efficiency established by the 3500 series, Caterpillar has once again revolutionized electric power with the introduction of the C175 family of diesel generator sets with ACERT™ Technology. This new family of generator sets combines high power density with efficient operation and low emissions. In a wide variety of prime and standby applications—commercial, institutional, industrial, utilities and more—the C175 family delivers cost-effective power in a small, highly versatile package, with the reliability, durability and performance you expect from Caterpillar.

With power capabilities of 2-4MW and a 127 ft² (11.8 m²) footprint, the Cat® C175 family of diesel generator sets delivers more power in less space than any other high-speed generator set in the industry.

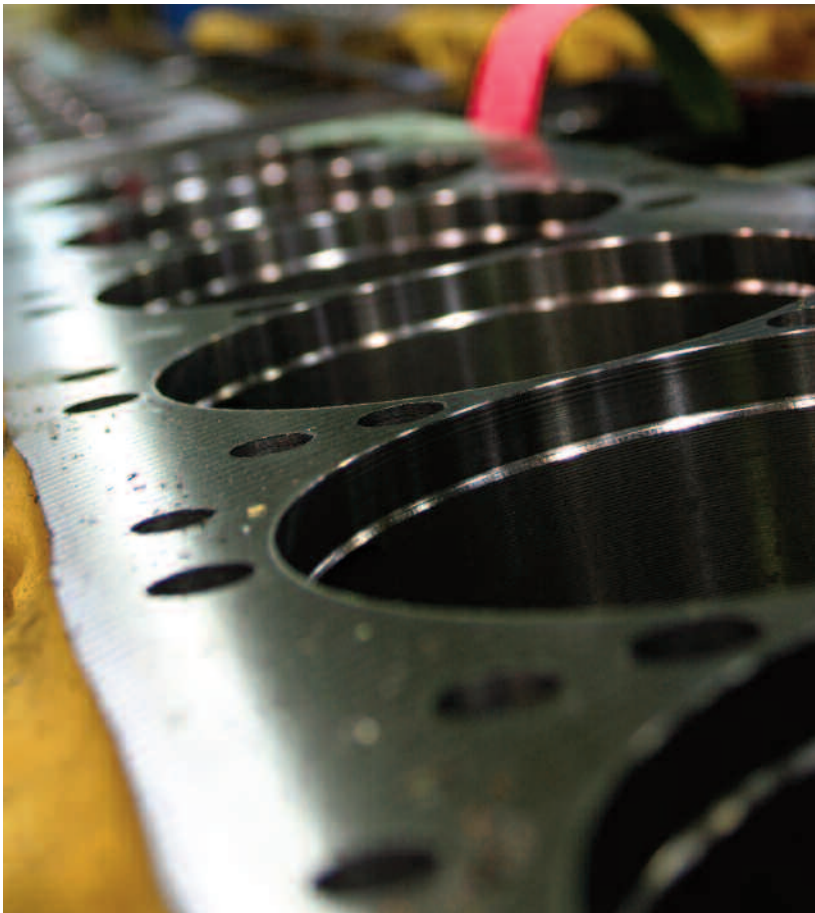
Different by design

The secret to huge benefits is in the design of the C175. Starting with proven Cat 3500 series components built for long, heavy-duty operation, Caterpillar developed the C175 family with the air intake system, fuel management and advanced electronics of ACERT Technology to boost power while improving overall efficiency and lowering emissions.

The result is a generator set capable of delivering 2-4MW of power at 1,800 rpm and 2-4MVA of power at 1,500 rpm, all in a compact package. In three different sizes, the C175 family is well suited for all of today's diverse power applications, delivering clean, reliable power wherever you need it.

Extensive testing to ensure the highest quality

The development of the C175 family didn't end with groundbreaking design—Cat engineers went on to test the C175 family of diesel generator sets using years of electric power expertise, the latest technology and an integrated, proactive methodology. With more than 20 dedicated focus teams conducting standardized tests for component endurance, plus computer analysis and extensive lab testing, Caterpillar combined these results to identify potential weaknesses and make improvements long before introduction.



The combination of proven Cat components with cutting-edge technologies makes Caterpillar the industry leader in electric power innovation—and the C175 is your proof.



Key C175 benefits include:

- **Performance** – Wider power ranges mean greater versatility for use in more applications: commercial, institutional, industrial, utilities, communications, government and more.
- **Lower installed costs** – Higher power density (more output power from a given footprint), and a complete package that includes SR5 generators, Electronic Modular Control Panel (EMCP) 3 Package Controls and a radiator with flexible packaging options combined to deliver lower installed costs.
- **Lower operating and maintenance costs** – An increase in oil change intervals, longer life of components, longer top-end as well as full-overhaul periods, and reduced fuel consumption result in lower operating and maintenance costs.
- **Improved serviceability** – Every C175 component was designed with serviceability in mind, resulting in simple, robust components that makes servicing fast and easy. The entire engine is built with internationally available tools and hardware.
- **Proven reliability and durability** – With a platform based on the industry-standard Cat 3500 series, the C175 is a family of diesel generator sets you can count on to last.
- **Systems integration** – Your Cat dealer provides easy integration of controls with other electric power products such as Automatic Transfer Switch, Uninterruptible Power Supply, Switchgear, Remote Monitoring and customer building SCADA systems.
- **Lower emissions** – The C175 family of diesel generator sets uses ACERT Technology to meet or outperform emissions standards the world over.

Managing air flow for maximum performance

Air management is a building block of ACERT™ Technology. The C175 has a tall cross-flow cylinder head that accommodates larger ports and helps direct a large amount of cool air into the cylinder with the least resistance, resulting in the best port performance of any engine in the world. The C175 improved breathing enables a greater amount of cool air in and out of the engine, which helps produce higher power ratings and lower emissions. This, along with lower air pumping losses, results in reduced fuel consumption.

Fuel system advances for multiple benefits

The C175 features the Cat Common Rail Fuel System for fuel delivery, one of the building blocks of ACERT Technology. The Cat Common Rail Fuel System offers full control of fuel delivery and fuel pressure at any load or speed for superior transient response and block load acceptance as well as shorter recovery time. Through the use of higher pressures and precise control of time, amount of fuel injection, injection pressure and multiple injections, the Cat Common Rail Fuel System also improves cold start capability, lowers fuel consumption and reduces emissions.

Engine controls that keep you in control

The C175 has a robust control system, featuring more pressure and temperature sensors for enhanced engine monitoring. C175 engine controls use the latest version of the ADEM™ A4 Engine Control Module (ECM) to deliver 50 times the computing power of its predecessor.



A cooling system that just got cooler

The C175 cooling system was designed to minimize heat rejection by cooling only the parts that require cooling, resulting in a 20 to 30 percent improvement in heat rejection per kW produced.

Lube system improvements for exceptional durability

The C175 lube system features two piston cooling jets per piston, plus a large capacity oil pump and a pressure regulation valve that helps maintain optimum oil pressure at all speeds, loads and throughout the life of the engine, increasing durability.

Core engine components built for big power

The components of the C175 are designed for higher strength, durability and compactness. A bigger, robust steel-forged crankshaft handles bigger loads, while the cast iron engine block provides increased strength and lighter weight, so you get more power out of a smaller package.

Also featured:

SR5 Generator

We listened to you and designed the next generation of generators to your requirements:

- Class H Insulation
- Improved Motor Starting
- 2/3 pitch standard on all generators
- Permanent Magnet or Internal Excitation
- IP23 ingress protection

EMCP3 Package Controls

The new generation of controls places fully featured power metering, protective relaying and engine and generator control and monitoring at your fingertips. You can obtain all information and diagnostics through one port with open communication protocol Modbus™. The controls are scalable and configurable to meet site-specific needs.

Package Cooling System

The C175 features two types of radiators—horizontal remote and vertical package radiators. Radiators are sized for generator set ratings and optimized for lower airflow, resulting in lower installation cost.





The benefits of working with the technology leader

Greater power. Smaller package. Higher performance. Reduced emissions. Enhanced reliability. Improved durability. Lower installed and operating costs. The C175 family of diesel generator sets offers benefits that outpace the competition by leaps and bounds.

Add it all up with an integrated approach to products and services from your Cat Dealer and it's easy to see why Caterpillar is the one company the world turns to for electric power.

To find your nearest dealer go to: www.cat-electricpower.com.



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CATERPILLAR®
TODAY'S WORK. TOMORROW'S WORLD.™

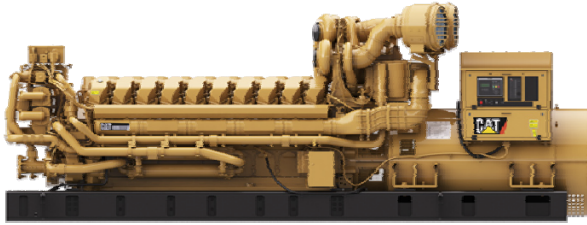


Image shown may not reflect actual package

STANDBY 4000 ekW 5000 kVA 60 Hz 1800 rpm 4160 Volts

Caterpillar is leading the power generation Market place with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

FUEL/EMISSIONS STRATEGY

- EPA Certified for Stationary Emergency Applications (EPA Tier 2 emissions level)

DESIGN CRITERIA

- The generator set accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response.

FULL RANGE OF ATTACHMENTS

- Wide range of bolt-on system expansion attachments, factory designed and tested
- Flexible packaging options for easy and cost effective installation

SINGLE-SOURCE SUPPLIER

- Fully prototype tested with certified torsional vibration analysis available

WORLDWIDE PRODUCT SUPPORT

- Cat[®] dealers provide extensive post sale support including maintenance and repair agreements
- Cat dealers have over 1600 dealer branch stores operating in 200 countries.
- The Cat[®] S•O•SSM program effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by products.

CAT C175-20 DIESEL ENGINE

- Reliable, rugged, durable design
- Four-stroke diesel engine combines consistent performance and excellent fuel economy with minimum weight

CAT SR5 GENERATOR

- Designed to match performance and output characteristics of Cat diesel engines
- Single point access to accessory connections

CAT EMCP 4 CONTROL PANELS

- Simple user friendly interface and navigation
- Scalable system to meet a wide range of customer needs
- Integrated Control System and Communications Gateway

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FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT

System	Standard	Optional
Air Inlet	<ul style="list-style-type: none"> • Air cleaner, 4 x single element canister with service indicator(s) • Plug group for air inlet shut-off 	<input type="checkbox"/> Air cleaner, 4 x dual element with service indicator(s) <input type="checkbox"/> Air inlet adapters
Cooling	<ul style="list-style-type: none"> • SCAC cooling • Jacket water and AC inlet/outlet flanges 	<input type="checkbox"/> Remote horizontal SCAC radiator <input type="checkbox"/> Remote fuel cooler <input type="checkbox"/> Low coolant level sensor (for remote radiators)
Exhaust	<ul style="list-style-type: none"> • Dry exhaust manifold • Bolted flange (ANSI 8" & DIN 200) with bellow for each turbo (qty 4) 	<input type="checkbox"/> Engine Exhaust Temperature Module <input type="checkbox"/> Mufflers (15 dBA, 25 dBA, or 40 dBA) <input type="checkbox"/> Dual 20" or single 24" vertical exhaust collector <input type="checkbox"/> Weld flanges: ANSI 20" and ANSI 24"
Crankcase Systems	<ul style="list-style-type: none"> • Open crankcase ventilation 	<input type="checkbox"/> Crankcase explosion relief valve
Fuel	<ul style="list-style-type: none"> • Primary fuel filter with water separator • Secondary fuel filters (engine mounted) 	
Generator SR5	<ul style="list-style-type: none"> • 3 phase brushless, salient pole • Space heater kit • IEC platinum stator RTD's • Cat digital voltage regulator (CDVR) 	<input type="checkbox"/> Oversize generators <input type="checkbox"/> Power connection arrangement
Governor	<ul style="list-style-type: none"> • ADEM™ A4 	<input type="checkbox"/> Redundant shutdown
Control Panels	<ul style="list-style-type: none"> • EMCP 4.2 Genset Controller 	<input type="checkbox"/> Local & remote annunciator modules <input type="checkbox"/> Discrete I/O module <input type="checkbox"/> Generator temperature monitoring & protection <input type="checkbox"/> Remote monitoring <input type="checkbox"/> Load share module
Lube	<ul style="list-style-type: none"> • Lubricating oil • Oil filter, filler and dipstick • Oil drain line with valves • Fumes disposal • Gear type lube oil pump • Integral lube oil cooler • Electric prelube pumps 	
Mounting	<ul style="list-style-type: none"> • Rails-engine / generator • Rubber anti-vibration mounts (shipped loose) 	<input type="checkbox"/> Spring type linear vibration isolators <input type="checkbox"/> IBC vibration isolators
Starting / Charging	<ul style="list-style-type: none"> • Dual 24 volt electric starting motors • Batteries with rack and cables • Battery disconnect switch 	<input type="checkbox"/> Oversized battery set <input type="checkbox"/> 75 amp charging alternator <input type="checkbox"/> Battery chargers (20,35 or 50 Amp) <input type="checkbox"/> Jacket water heater <input type="checkbox"/> Redundant Electric Starter
General	<ul style="list-style-type: none"> • RH service (Except LH Service Oil Filter) • Paint - Caterpillar Yellow with high gloss black rails • SAE standard rotation • Flywheel and flywheel housing - SAE No. 00 	<input type="checkbox"/> Barring group- manual or air powered <input type="checkbox"/> Factory test reports



SPECIFICATIONS

CAT GENERATOR

Frame	3055
Excitation	PM
Pitch.....	0.6667
Number of poles.....	4
Number of bearings	2
Number of Leads.....	6
Insulation	Class F
IP rating	Drip proof IP23
Over speed capability - % of rated.....	125%
Wave form deviation.....	3 %
Voltage regulator.....	3 phase sensing with selectable V/Hz regulation
Telephone Influence Factor	Less than 50
Harmonic Distortion	Less than 5%

CAT DIESEL ENGINE

C175-20 SCAC, V-20, 4 stroke, water-cooled diesel

Bore	175.00 mm (6.89 in)
Stroke	220.00 mm (8.66in)
Displacement	105.8 L (6456.31 in ³)
Compression ratio.....	15.3:1
Aspiration.....	TA
Fuel system.....	Common Rail
Governor Type.....	ADEM™ A4

CAT EMCP 4 CONTROL PANELS

EMCP 4 controls including:

- Run / Auto / Stop Control
- Speed Adjust
- Voltage Adjust
- Engine Cycle Crank
- Emergency stop pushbutton

EMCP 4.2 controller features:

- 24-volt DC operation
- Environmental sealed front face
- Text alarm/event descriptions
- True RMS AC metering, 3-phase, ±1% accuracy.

Digital indication for:

- RPM
- DC volts
- Operating hours
- Oil pressure (psi, kPa or bar)
- Coolant temperature
- Volts (L-L & L-N), frequency (Hz)
- Amps (per phase & average)
- Power Factor (per phase & average)
- kW (per phase, average & percent)
- kVA (per phase, average & percent)
- kVAr (per phase, average & percent)
- kW-hr (total)
- kVAr-hr (total)

Warning/shutdown with common LED indication of shutdowns for:

- Low oil pressure
- High coolant temperature
- Overspeed
- Emergency stop
- Failure to start (overcrank)
- Low coolant temperature
- Low coolant level

Programmable protective relaying functions:

- Generator phase sequence
- Over/Under voltage (27/59)
- Over/Under Frequency (81 o/u)
- Reverse Power (kW) (32)
- Reverse Reactive Power (kVAr) (32RV)
- Overcurrent (50/51)

Communications

- Customer data link (Modbus RTU)
- Accessory module data link
- Serial annunciator module data link
- 6 programmable digital inputs
- 6 programmable relay outputs (Form A)
- 2 programmable relay outputs (Form C)
- 2 programmable digital outputs

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Technical Data

Open Generator Set - 1800 rpm/60 Hz/4160 Volts	DM8854	
Stationary Emergency (EPA Tier 2)		
Generator Set Package Performance		
Genset Power rating @ 0.8 pf	5000 kVA	
Genset Power Rating without fan	4000 ekW	
Fuel Consumption		
100% Load with fan	1039.3 L/hr	274.6 Gal/hr
75% Load with fan	770.6 L/hr	203.6 Gal/hr
50% Load with fan	615.0 L/hr	162.5 Gal/hr
Inlet Air		
Combustion air inlet flow rate	339.1 m ³ /min	11975 cfm
Exhaust System		
Exhaust stack gas temperature (engine out)	473.9 °C	885 °F
Exhaust gas flow rate	871.4 m ³ /min	30771 cfm
Exhaust system backpressure (maximum allowable)	6.7 kPA	26.9 in water
Heat Rejection		
Heat rejection to coolant (total)	2148 kW	122133 Btu/min
Heat rejection to exhaust (total)	3928 kW	223338 Btu/min
Heat rejection to aftercooler	447 kW	25437 Btu/min
Heat rejection to atmosphere from engine	304 kW	17303 Btu/min
Heat rejection to atmosphere from generator	171 kW	9733 Btu/min
Alternator		
Motor starting capability @30% voltage dip	10253 skVA	
Frame	3055	
Temperature Rise	130 °C	234 °F
Lube System		
Sump refill with filter	675 L	178.3 gal
Emissions (Nominal)²		
NOx g/hp-hr	5.07 g/hp-hr	
CO g/hp-hr	0.52 g/hp-hr	
HC g/hp-hr	0.17 g/hp-hr	
PM g/hp-hr	0.04 g/hp-hr	

Note: This generator set is not offered with an engine driven radiator. Addition of an engine driven fan will reduce the output below the nameplate rating.

¹ Some packages may have oversized generators with a different temperature rise and motor starting characteristics. Generator temperature rise is based on a 40 degree C ambient per NEMA MG1-32.

² Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx.

Data shown is based on steady state operating conditions of 77°F, 28.42 in HG and number 2 diesel fuel with 35° API and LHV of 18,390 btu/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle. Emissions values are tailpipe out with aftertreatment installed. Values shown as zero may be greater than zero but were below the detection level of the equipment used at the tie of measurement.

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RATING DEFINITIONS AND CONDITIONS

Meets or Exceeds International Specifications:

AS1359, CSA, IEC60034-1, ISO3046, ISO8528, NEMA MG 1-22, NEMA MG 1-33, UL508A, 72/23/EEC, 98/37/EC, 2004/108/EC

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. Standby power in accordance with ISO8528. Fuel stop power in accordance with ISO3046. Standby ambients shown indicate ambient temperature at 100% load which results in a coolant top tank temperature just below the shutdown temperature.

Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 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 29° C (85° F) and weighing 838.9 g/liter (7.001 lbs/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, please consult your Cat dealer.