

# Spark-Ignited Generator Set Model GGDB 60 Hz

Natural Gas - 20.0 kW, 25.0 kVA Standby  
Propane - 20.0 kW, 25.0 kVA, Standby



## Description

The Cummins Power Generation GGDB commercial generator set is a fully integrated power generation system providing optimum performance, reliability, and versatility for stationary standby power applications.

A primary feature of the GGDB GenSet is strong motor-starting capability and fast recovery from transient load changes. The GGDB torque-matched system includes a heavy-duty Ford 4-cycle liquid-cooled spark-ignited engine, an AC alternator with high motor-starting kVA capacity, and an electronic voltage regulator for precise regulation under steady-state or transient loads. The GGDB GenSet accepts 100% of the nameplate standby rating in one step, in compliance with NFPA110 Level 1 requirements.

LP vapor fuel system is standard with several options for natural gas and LP liquid as well as dual fuel.

The GGDB GenSet offers user-friendly operation. The standard PowerCommand<sup>®</sup> digital electronic control is an integrated system that combines engine and alternator controls for high reliability and optimum GenSet performance. Optional display provides NFPA 110 Level 1 compliance.

A wide range of options, accessories, and services are available, allowing configuration to your specific power generation needs.

Every production unit is factory tested at rated load and power factor. This testing includes demonstration of rated power and single-step rated load pickup. Cummins Power Generation manufacturing facilities are registered to ISO9001 quality standards, emphasizing our commitment to high quality in the design, manufacture, and support of our products. The generator set is CSA certified and is available as UL Listed.

All Cummins Power Generation systems are backed by a comprehensive warranty program and supported by a worldwide network of 170 distributors and service branches to assist you with warranty, service, parts, and planned maintenance support.

## Features

- **UL Listed Generator Set** - The complete generator set assembly is available Listed to UL 2200.
- **Ford Heavy-Duty Gas Engine** - Rugged 4-cycle industrial spark-ignited engine delivers reliable power. The electronic governor provides fast response to load changes.
- **Alternator** - Several alternator sizes offer selectable motor starting capability with low reactance 2/3 pitch windings, low waveform distortion with non-linear loads and fault clearing short-circuit capability and class H insulation. The alternator electrical insulation system is UL 1446 Recognized.
- **Control systems** - The PowerCommand electronic control is standard equipment and provides total genset system integration, including automatic remote starting/stopping and precise frequency and voltage regulation. Optional features include alarm and status message display, output metering, auto-shutdown at fault detection, and NFPA 110 Level 1 compliance.
- **Cooling systems** - Standard cooling package provides reliable running up to 40°C ambient temperature.
- **Integral Vibration Isolation** - Robust skid base supports the engine, alternator, and radiator on isolators, minimizing transmitted vibration.
- **E-Coat Finish** - Dual electro-deposition paint system provides high resistance to scratches, corrosion, or fading.
- **Enclosures** - Optional weather protective and sound attenuated enclosures are available.
- **Certifications** - Generator sets are designed, manufactured, tested, and certified to relevant UL, NFPA, ISO, IEC, and CSA standards.
- **Warranty and Service** - Backed by a comprehensive warranty and world wide distributor network.

## Generator Set

The general specifications provide representative configuration details. Consult the outline drawing for installation design.

See outline drawing 500-4134 for installation design specifications.

<b>Unit Width, in (mm)</b>	26.0 (660)
<b>Unit Height, in (mm)</b>	39.9 (1013)
<b>Unit Length, in (mm)</b>	64.0 (1626)
<b>Unit Dry Weight, lb (kg)</b>	847 (384)
<b>Unit Wet Weight, lb (kg)</b>	880 (399)
<b>Rated Speed, rpm</b>	1800
<b>Voltage Regulation, No Load to Full Load</b>	±2.0%
<b>Random Voltage Variation</b>	±1.0%
<b>Frequency Regulation</b>	Isochronous
<b>Random Frequency Variation</b>	±0.3% @ 60Hz, ±0.8% @ 50Hz
<b>Radio Frequency Interference</b>	Meets requirements of most industrial and commercial applications

	Natural Gas		Propane	
	Standby		Standby	
<b>Cooling</b>				
Fan Load, HP (kW)	2.2 (1.6)		2.2 (1.6)	
Coolant Capacity with radiator, US Gal (L)	3.0 (11.4)		3.0 (11.0)	
Coolant Flow Rate, Gal/min (L/min)	18.8 (71.2)		18.8 (71.2)	
Heat Rejection To Coolant, Btu/min (MJ/min)	1200.0 (1.3)		1200.0 (1.3)	
Heat Radiated To Room, Btu/min (MJ/min)	638.0 (0.7)		638.0 (0.7)	
<b>Air</b>				
Combustion Air, scfm (m <sup>3</sup> /min)	65.0 (1.8)		65.0 (1.8)	
Alternator Cooling Air, scfm (m <sup>3</sup> /min)	250.0 (7.1)		250.0 (7.1)	
Radiator Cooling Air, scfm (m <sup>3</sup> /min)	2690.0 (76.1)		2690.0 (76.1)	
Max. Static Restriction, in H <sub>2</sub> O (Pa)	0.25 (62.25)		0.2 (62.2)	

### Rating Definitions

**Standby Rating based on:** Applicable for supplying emergency power for the duration of normal power interruption. No sustained overload capability is available for this rating. (Equivalent to Fuel Stop Power in accordance with ISO3046, AS2789, DIN6271 and BS5514). Nominally rated.

**Prime (Unlimited Running Time) Rating based on:** Applicable for supplying power in lieu of commercially purchased power. Prime power is the maximum power available at a variable load for an unlimited number of hours. A 10% overload capability is available for limited time. (Equivalent to Prime Power in accordance with ISO8528 and Overload Power in accordance with ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

**Base Load (Continuous) Rating based on:** Applicable for supplying power continuously to a constant load up to the full output rating for unlimited hours. No sustained overload capability is available for this rating. Consult authorized distributor for rating. (Equivalent to Continuous Power in accordance with ISO8528, ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

### Site Derating Factors

#### Natural Gas

Engine power available up to 3500 ft (1067 m) at ambient temperatures up to 85°F (29°C). Above 3500 ft (1067 m) derate at 5% per 1000 ft (305 m), and 1% per 10°F (2% per 11°C) above 85°F (29°C).

#### Propane

Engine power available up to 6000 ft (1829 m) at ambient temperatures up to 85°F (29°C). Above 6000 ft (1829 m) derate at 4% per 1000 ft (305 m), and 1% per 10°F (2% per 11°C) above 85°F (29°C).

# Engine

Rugged Ford® spark-ignited engines are designed to operate efficiently on gaseous fuels. Fuel system options available for natural gas, LP vapor, and LP liquid. In addition, for extra system reliability, combination natural gas/LP vapor or natural gas/LP liquid with automatic changeover are available.

Electronic governing provides precise speed regulation, especially useful for applications requiring constant (isochronous) frequency regulation such as Uninterruptible Power Supply (UPS) systems, non-linear loads, or sensitive electronic loads. Optional coolant heaters are recommended for all emergency standby installations or for any application requiring fast load acceptance after start-up.

## Specifications – Engine

<b>Base Engine</b>	Ford Model LRG-425I, naturally aspirated
<b>Displacement in<sup>3</sup> (L)</b>	150.0 (2.5)
<b>Overspeed Limit, rpm</b>	2500 ±50
<b>Cylinder Block Configuration</b>	Cast iron, In-line 4 cylinder
<b>Battery Capacity</b>	150 amps minimum at ambient temperature of 32°F (0°C)
<b>Battery Charging Alternator</b>	95 amps
<b>Starting Voltage</b>	12-volt, negative ground
<b>Lube Oil Filter Types</b>	Spin-on, full flow
<b>Standard Cooling System</b>	104°F (40°C) ambient cooling system
<b>Standard Fuel</b>	LP vapor is standard. Optional LP liquid, natural gas, LP liquid/natural gas and LP vapor/natural gas

	Natural Gas		Propane						
	Standby		Standby						
<b>Power Output</b>									
Gross Engine Power Output, bhp (kWm)	40.0 (29.8)		42.0 (31.3)						
BMEP at Rated Load, psi (kPa)	105.0 (723.9)		105.0 (723.9)						
Bore, in. (mm)	3.74 (95.0)		3.74 (95.0)						
Stroke, in. (mm)	3.40 (86.4)		3.40 (86.4)						
Piston Speed, ft/min (m/s)	1021.0 (5.2)		1021.0 (5.2)						
Compression Ratio	9.4:1		9.4:1						
Lube Oil Capacity, qt. (L)	4.5 (4.3)		4.5 (4.3)						
<b>Fuel Flow</b>									
Minimum Operating Pressure, in. H <sub>2</sub> O (kPa)	7.0 (1.7)		7.0 (1.7)						
Maximum Operating Pressure, in. H <sub>2</sub> O (kPa)	13.6 (3.4)		13.6 (3.4)						
<b>Air Cleaner</b>									
Maximum Air Cleaner Restriction, in. H <sub>2</sub> O (kPa)	15.0 (3.7)		15.0 (3.7)						
<b>Exhaust</b>									
Exhaust Flow at Rated Load, cfm (m <sup>3</sup> /min)	210.0 (5.9)		210.0 (5.9)						
Exhaust Temperature, °F (°C)	1250.0 (676.7)		1250 (677)						
Max Back Pressure, in. H <sub>2</sub> O (kPa)	41.0 (10.2)		41.0 (10.2)						
<b>Fuel Consumption - Natural Gas</b>	<b>Standby</b>								
60 Hz Ratings, kW (kVA)	<b>20.0 (25.0)</b>								
	Load	1/4	1/2	3/4	Full				
	cfh	122.0	163.0	201.0	252.0				
	m <sup>3</sup> /hr	3.5	4.6	5.7	7.1				
<b>Fuel Consumption - Propane</b>	<b>Standby</b>								
60 Hz Ratings, kW (kVA)	<b>20.0 (25.0)</b>								
	Load	1/4	1/2	3/4	Full				
	cfh	44.0	64.0	74.0	84.0				
	m <sup>3</sup> /hr	1.2	1.8	2.1	2.4				

## Alternator

Single-bearing alternators couple directly to the engine flywheel with flexible discs for drivetrain reliability and durability. No gear reducers or speed changers are used. Two-thirds pitch windings eliminate third-order harmonic content of the AC voltage waveform and provide the standardization desired for paralleling of generator sets. The standard excitation system is a self (shunt) excited system with the voltage regulator powered directly from the generator set output. The standard alternator is a single-phase 4-lead 105°C rise. Optional alternators include 3-phase and 3-phase with full single-phase output capability.

### Alternator Application Notes

**Alternator Space Heater** - is recommended to inhibit condensation.

### Available Output Voltages

<u>Three Phase Reconnectable</u>	<u>Single Phase Non-Reconnectable</u>	<u>Three Phase Non-Reconnectable</u>
[ ] 120/208	[ ] 120/240	[ ] 347/600
[ ] 120/240		
[ ] 127/220		
[ ] 139/240		
[ ] 220/380		
[ ] 240/415		
[ ] 254/440		
[ ] 277/480		

### Specifications – Alternator

<b>Design</b>	Revolving field, single bearing, 4-pole, brushless, drip-proof construction.
<b>Stator</b>	Skewed stator and 2/3 pitch windings minimize field heating and voltage harmonics.
<b>Rotor</b>	Dynamically balanced assembly. Direct coupled to engine by a flexible drive disc. Complete amortisseur (damper) windings help minimize voltage deviations and heating effects under unbalanced loads. The rotor is supported by a pre-lubricated, maintenance-free ball bearing.
<b>Insulation System</b>	Class H per NEMA MG1-1.65 and BS2757
<b>Standard Temperature Rise</b>	At rated load is less than 105°C at standby rating, per NEMA MG1.22.40, IEEE 115 and IEC 34-1.
<b>Exciter Type</b>	The excitation system derives its power from the main output of the generator, eliminating the need for a separate excitation power source.
<b>Phase Rotation</b>	A (U), B (V), C (W)
<b>Alternator Cooling</b>	Direct drive centrifugal blower
<b>AC Waveform Total Harmonic Distortion</b>	Less than 7% total no load to full linear load, and less than 3% for any single harmonic.
<b>Telephone Influence Factor (TIF)</b>	Less than 40 per NEMA MG1-22.43.
<b>Telephone Harmonic Factor (THF)</b>	Less than 3

Natural Gas										
Three Phase Table <sup>1</sup>		105° C	105° C	105° C						
Feature Code		B268	B256	B304						
Alternator Data Sheet Number		107	106	106						
Voltage Ranges		120/208 Thru 139/240 240/416 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	347/600						
Surge kW		25	25.6	24.7						
Motor Starting kVA (at 90% sustained voltage)	Shunt	70	52	52						
Full Load Current - Amps at Standby Rating		<u>120/208</u> 69	<u>127/220</u> 66	<u>139/240</u> 60	<u>220/380</u> 38	<u>240/416</u> 35	<u>277/480</u> 30	<u>347/600</u> 24		

Propane										
Three Phase Table <sup>1</sup>		105° C	105° C	105° C						
Feature Code		B268	B256	B304						
Alternator Data Sheet Number		107	106	106						
Voltage Ranges		120/208 Thru 139/240 240/416 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	347/600						
Surge kW		26.3	26.9	25.9						
Motor Starting kVA (at 90% sustained voltage)	Shunt	70	52	52						
Full Load Current - Amps at Standby Rating		<u>120/208</u> 69	<u>127/220</u> 66	<u>139/240</u> 60	<u>220/380</u> 38	<u>240/416</u> 35	<u>277/480</u> 30	<u>347/600</u> 24		

**Notes:**

1. Single phase power can be taken from a three phase generator set at up to 2/3 set rated 3-phase kW at 1.0 power factor. Also see Note 2 below.

Natural Gas										
Single Phase Table		105° C	105° C	105° C						
Feature Code		B274	B256	B268						
Alternator Data Sheet Number		106	106	107						
Voltage Ranges		120/240 <sup>2</sup>	120/240 <sup>1</sup>	120/240 <sup>2</sup>						
Surge kW		23.5	23.5	24						
Motor Starting kVA (at 90% sustained voltage)	Shunt	38	39	49						
Full Load Current - Amps at Standby Rating		<u>120/240<sup>1</sup></u> 56	<u>120/240<sup>2</sup></u> 83							

Propane										
Single Phase Table		105° C	105° C	105° C						
Feature Code		B274	B256	B268						
Alternator Data Sheet Number		106	106	107						
Voltage Ranges		120/240 <sup>2</sup>	120/240 <sup>1</sup>	120/240 <sup>2</sup>						
Surge kW		24.8	24.8	25.2						
Motor Starting kVA (at 90% sustained voltage)	Shunt	38	39	49						
Full Load Current - Amps at Standby Rating		<u>120/240<sup>1</sup></u> 56	<u>120/240<sup>2</sup></u> 83							

**Notes:**

1. The broad range alternators can supply single phase output up to 2/3 set rated 3-phase kW at 1.0 power factor.
2. The extended stack (full single phase output) and 4 lead alternators can supply single phase output at full set rated kW at 1.0 power factor.

# Control System



**Standard Control Panel, Control Board, & Optional Display**

## PowerCommand Control

- The PowerCommand Control is an integrated generator set control system providing governing, voltage regulation, engine protection, and operator interface functions.
- Controls provided include battery monitoring and testing features, and Smart-Starting control system.
- InPower PC-based service tool is available for detailed diagnostics
- Standard PCCNet RS485 network interface to remote annunciator for NFPA110 applications.
- Standard control boards are potted for environmental protection.
- Control is suitable for operation in ambient temperatures from -40C to +70C, and altitudes to 13,000 feet (5000 meters)
- Prototype tested; UL, CSA, and CE compliant for use on a UL listed, CSA certified, or CE marked generator set

AC Protection	Engine Protection	Control Functions
<ul style="list-style-type: none"> <li>• Over and under voltage shutdown</li> <li>• Over and under frequency shutdown</li> <li>• Over Excitation (loss of sensing) fault</li> <li>• Field Overload</li> <li>• Overcurrent warning and shutdown (requires optional operator panel)</li> </ul>	<ul style="list-style-type: none"> <li>• Overspeed shutdown</li> <li>• Low oil pressure shutdown</li> <li>• Low oil pressure warning (requires operator panel)</li> <li>• High coolant temperature warning and shutdown</li> <li>• Low coolant level warning or shutdown</li> <li>• Low coolant temperature warning</li> <li>• High and low battery voltage</li> <li>• Weak battery</li> <li>• Dead battery</li> <li>• Fail to start (overcrank) shutdown</li> <li>• Fail to crank shutdown</li> <li>• Redundant start disconnect</li> <li>• Cranking lockout</li> <li>• Sensor failure indication</li> </ul>	<ul style="list-style-type: none"> <li>• Run/Preheat-Off-Auto Control Switch</li> <li>• Fault Flashout Lamp</li> <li>• Running Hourmeter</li> <li>• Time delay start and cooldown</li> <li>• Glow plug control (some models, operational in RUN and AUTO modes)</li> <li>• Cycle cranking</li> <li>• (2) Configurable inputs</li> <li>• (2) Configurable outputs</li> <li>• Remote Emergency Stop</li> <li>• Integrated digital electronic isochronous governor</li> <li>• Temperature dynamic governing</li> </ul>
Digital Voltage Regulation		
<ul style="list-style-type: none"> <li>• Integrated digital electronic voltage regulator</li> <li>• 2-phase line to line sensing</li> <li>• Configurable Torque Matching</li> </ul>		
Alternator Data	Engine Data	Other Data
<ul style="list-style-type: none"> <li>• Line to Neutral AC Volts</li> <li>• Line to Line AC volts (direct reading up to 480VAC)</li> <li>• 3-phase AC current</li> <li>• Frequency</li> <li>• Total kVA</li> <li>• Optional Operator Panel or PowerCommand for Windows Required for Display of Data</li> </ul>	<ul style="list-style-type: none"> <li>• DC voltage</li> <li>• Lube oil pressure</li> <li>• Coolant temperature</li> <li>• Optional Operator Panel or PowerCommand for Windows Required for Display of Data</li> </ul>	<ul style="list-style-type: none"> <li>• Genset model data</li> <li>• Start attempts, Starts, running hours</li> <li>• Fault history</li> <li>• RS485 Modbus Interface</li> <li>• Data Logging (Requires PowerCommand for Windows and PC)</li> <li>• Optional Operator Panel or PowerCommand for Windows and PC Required for Display of Data</li> </ul>
Options		
<b>Operator Panel</b> <ul style="list-style-type: none"> <li>• MANUAL OFF switch</li> <li>• Alpha-numeric display with pushbutton access, for viewing engine and alternator data and providing setup, controls, and adjustments (English or International Symbols)</li> <li>• LED lamps indicating genset running, not in auto, common warning, common shutdown, manual run mode, remote start</li> <li>• Suitable for operation in ambient temperatures from -20 to +70C.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> PowerCommand for Windows remote monitoring software. (Direct connect)</li> <li><input type="checkbox"/> Remote Annunciator with (3) configurable inputs to genset control</li> <li><input type="checkbox"/> Local Operator Panel</li> <li><input type="checkbox"/> Remote Operator Panel</li> </ul>	

## Generator Set Options

### Engine

- 120/240 V, 1500 W coolant heaters
- Engine gauges

### Cooling System

- Remote radiator cooling

### Fuel System

- Fuel strainer
- LP liquid
- Natural gas
- Natural gas/LP vapor with automatic changeover
- Natural gas/LP liquid with automatic changeover

### Alternator

- 120/240 V, 150 W anti-condensation heater
- 12-lead broad range (full output single phase)
- Single phase (4-lead)

### Control Panel

- LCD Display Panel (required for any NFPA 110 and CSA 282 application)
- Emergency stop
- Low battery voltage warning
- Low coolant level warning/shutdown
- Remote fault signal package

### Exhaust System

- Mounted residential muffler

### Generator Set

- Coolant drain extension
- Duct Adapter
- Enclosure, Quiet Site Level 2, sound attenuated
- Enclosure, weather protective, with residential silencer
- Export box packaging
- Main line circuit breakers
- Remote annunciator panel
- UL2200 Listed
- 2 year standby warranty
- 5 year basic power warranty
- 5 year comprehensive warranty

## Accessories and Services

A wide range of products and services is available to match your power generation system requirements. Cummins Power Generation products and services include:

- Diesel and Spark-Ignited Generator Sets
- Transfer Switches
- Bypass Switches
- Parallel Load Transfer Equipment
- Digital Paralleling Switchgear
- PowerCommand Network and Software
- Distributor Application Support
- Planned Maintenance Agreements

## Warranty

All components and subsystems are covered by an express limited one-year warranty. Other optional and extended factory warranties and local distributor maintenance agreements are available. Contact your distributor/dealer for more information.

## Certifications



**ISO9001** - This generator set was designed and manufactured in facilities certified to ISO9001.



**CSA** - This generator set is CSA certified to product class 4215-01.



**PTS** - The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Products bearing the PTS symbol have been subjected to demanding tests in accordance to NFPA 110 Level 1 to verify the design integrity and performance under both normal and abnormal operating conditions including short circuit, endurance, temperature rise, torsional vibration, and transient response, including full load pickup.



**UL** - The generator set is available Listed to UL 2200, Stationary Engine Generator Assemblies.

**See your distributor for more information**



**Cummins Power Generation**  
1400 73rd Avenue N.E.  
Minneapolis, MN 55432  
763.574.5000  
Fax: 763.574.5298  
[www.cumminspower.com](http://www.cumminspower.com)

Cummins and PowerCommand are registered trademarks of Cummins Inc.  
Detector and AmpSentry are trademarks of Cummins Inc.  
Ford is a registered trademark of the Ford Motor Company.

**Important: Backfeed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.**