Spark-Ignited Generator Set Model GGKB 60 Hz

Natural Gas - 125 kW, 156 kVA Standby
115 kW, 144 kVA Prime
Propane - 125 kW, 156 kVA, Standby
115 kW, 144 kVA, Prime

Description

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

A primary feature of the GG GenSet is strong motor-starting capability and fast recovery from transient load changes. The torque-matched system includes a heavy-duty Cummins 4-cycle 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 GG GenSet accepts 100% of the nameplate standby rating in one step, in compliance with NFPA 110 requirements.

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

The GG GenSet offers both user- and environment-friendly operation. The standard PowerCommand® GenSet control is a microprocessor-based system with local or automatic remote starting/stopping, Smart Starting, integrated governor and voltage regulation, alarm and status message display, AmpSentry protection, output metering, and auto-shutdown at fault detection, all to provide highly reliable GenSet performance.

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 GenSet is CSA certified and is available as UL2200 Listed. The PowerCommand control is UL508 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 UL2200.
- **Cummins Heavy-Duty Gas Engine** - Rugged 4-cycle industrial spark-ignited engine delivers reliable power, low emissions, and fast response to load changes.
- **Alternator** - Several alternator sizes offer selectable motor starting capability with low reactance 2/3 pitch winding, low waveform distortion with non-linear loads, fault clearing short-circuit capability, and class H insulation. The alternator electrical insulation system is UL1446 Recognized.
- **Permanent Magnet Generator (PMG)** - Offers enhanced motor starting and fault-clearing short circuit capability.
- **Control Systems** - The PowerCommand electronic control is standard equipment, providing total genset system integration and NFPA 110 compliance. PowerCommand control is listed to UL508.
- **Cooling Systems** - Standard cooling package provides reliable running at the standby and prime rating, at 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 scratching, corrosion, and fading.
- **Housings** - Weather-protective and sound-attenuated housings 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 worldwide distributor service network.

Generator Set

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

See outline drawing 500-3252 for installation design specifications.

Unit Width, in (mm)	40.0 (1016)
Unit Height, in (mm)	56.4 (1433)
Unit Length, in (mm)	104.8 (2662)
Unit Dry Weight, lb (kg)	3190 (1447)
Unit Wet Weight, lb (kg)	3285 (1490)
Rated Speed, rpm	1800
Voltage Regulation, No Load to Full Load	±0.5%
Random Voltage Variation	±0.5%
Frequency Regulation	Isochronous
Random Frequency Variation	±0.5%
Radio Frequency Interference	IEC 801.2, Level 4 Electrostatic Discharge IEC 801.3, Level 3 Radiated Susceptibility IEC 801.4, Level 4 Electrical Fast Transients IEC 801.5, Level 5 Voltage Surge Immunity

	Natural Gas		Propane	
Cooling	**Standby**	**Prime**	**Standby**	**Prime**
Fan Load, HP (kW)	17.7 (13.2)	17.7 (13.2)	17.7 (13.2)	17.7 (13.2)
Coolant Capacity with radiator, US Gal (L)	6.8 (25.7)	6.8 (25.7)	6.8 (26.0)	6.8 (26.0)
Coolant Flow Rate, Gal/min (L/min)	64.0 (242.2)	64.0 (242.2)	64.0 (242.2)	64.0 (242.2)
Heat Rejection To Coolant, Btu/min (MJ/min)	7131.0 (7.6)	6921.0 (7.3)	7131.0 (7.6)	6921 (7.3)
Heat Radiated To Room, Btu/min (MJ/min)	1374.0 (1.5)	1304.0 (1.4)	1374.0 (1.5)	1304 (1.4)
Maximum Coolant Friction Head, psi (kPa)	5.0 (34.5)	5.0 (34.5)	5.0 (34.5)	5 (34.5)
Maximum Coolant Static Head, ft (m)	60.0 (18.3)	60.0 (18.3)	60.0 (18.3)	60 (18.3)
Air				
Combustion Air, scfm (m^3/min)	400.0 (11.3)	380.0 (10.8)	400.0 (11.3)	380.0 (10.8)
Alternator Cooling Air, scfm (m^3/min)	1308.0 (37.0)	1308.0 (37.0)	1308.0 (37.0)	1308.0 (37.0)
Radiator Cooling Air, scfm (m^3/min)	9187.0 (260.0)	9187.0 (260.0)	9187.0 (260.0)	9187.0 (260.0)
Max. Static Restriction, in H_2O (Pa)	0.50 (124.50)	0.50 (124.50)	0.5 (124.5)	0.5 (124.5)

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 2850 ft (868 m) altitude at ambient temperatures up to 104°F (40°C). Above 2850 ft (868 m) derate at 3% per 1000 ft (305 m), and 1% per 10°F (2% per 11°C) above 104°F(40°C).

Propane

Engine power available up to 2850 ft (868 m) altitude at ambient temperatures up to 104°F (40°C). Above 2850 ft (868 m) derate at 3% per 1000 ft (305 m), and 1% per 10°F (2% per 11°C) above 104°F(40°C).

Engine

Cummins GTA8.3 heavy-duty spark-ignited engines are based on the proven reliability and durability of the Cummins C-series diesel platform. GTA8.3 engines feature state-of-the-art electronic ignition systems for improved fuel consumption and high reliability. The spark plug is centered over a unique piston designed for optimal combustion and prolonged spark plug life. The electronic module that controls the ignition process is fully sealed for maximum protection and minimum maintenance, even when exposed to harsh environments.

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

Base Engine	Cummins Model GTA8.3-LC-G1, Turbocharged and CAC
Displacement in^3 (L)	504.5 (8.3)
Overspeed Limit, rpm	2070 ±50
Regenerative Power, kW	16.40
Cylinder Block Configuration	Cast iron with replaceable wet cylinder liners, In-line 6 cylinder
Battery Capacity	550 amps minimum at ambient temperature of 32°F (0°C)
Battery Charging Alternator	63 amps
Starting Voltage	12-volt, negative ground
Lube Oil Filter Types	Single spin-on canister- combination full flow with bypass
Standard Cooling System	104°F (40°C) ambient radiator cooling system
Standard Fuel	Natural gas is standard. Optional: LP liquid, LP vapor

	Natural Gas		Propane	
Power Output	**Standby**	**Prime**	**Standby**	**Prime**
Gross Engine Power Output, bhp (kWm)	202.0 (150.7)	185.0 (138.0)	202.0 (150.7)	185.0 (138.0)
BMEP at Rated Load, psi (kPa)	167.0 (1151.4)	153.0 (1054.9)	167.0 (1151.4)	153.0 (1054.9)
Bore, in. (mm)	4.49 (114.0)	4.49 (114.0)	4.49 (114.0)	4.49 (114.0)
Stroke, in. (mm)	5.32 (135.1)	5.32 (135.1)	5.32 (135.1)	5.32 (135.1)
Piston Speed, ft/min (m/s)	1596.0 (8.1)	1596.0 (8.1)	1596.0 (8.1)	1596.0 (8.1)
Compression Ratio	8.5:1	8.5:1	8.5:1	8.5:1
Lube Oil Capacity, qt. (L)	20.0 (18.9)	36.0 (34.1)	20.0 (18.9)	36.0 (34.1)
Fuel Flow				
Minimum Operating Pressure, in. H_2O (kPa)	10.0 (2.5)	10.0 (2.5)	10.0 (2.5)	10 (2)
Maximum Operating Pressure, in. H_2O (kPa)	20.0 (5.0)	20.0 (5.0)	20.0 (5.0)	20 (5)
Air Cleaner				
Maximum Air Cleaner Restriction, in. H_2O (kPa)	25.0 (6.2)	25.0 (6.2)	25.0 (6.2)	25.0 (6.2)
Exhaust				
Exhaust Flow at Rated Load, cfm (m^3/min)	1377.0 (39.0)	1337.0 (37.8)	1377.0 (39.0)	1337.0 (37.8)
Exhaust Temperature,°F (°C)	1200.0 (648.9)	1200.0 (648.9)	1200 (649)	1200 (649)
Max Back Pressure, in. H_2O (kPa)	27.0 (6.7)	27.0 (6.7)	27.0 (6.7)	27.0 (6.7)

Fuel Consumption - Natural Gas		**Standby**				**Prime**			
60 Hz Ratings, kW (kVA)		**125 (156)**				**115 (144)**			
	Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
	cfh	778.0	1092.0	1414.0	1746.0	749.0	1037.0	1329.0	1614.0
	m^3/hr	22.0	30.9	40.0	49.4	21.2	29.3	37.6	45.7

Fuel Consumption - Propane		**Standby**				**Prime**			
60 Hz Ratings, kW (kVA)		**125 (156)**				**115 (144)**			
	Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
	cfh	373.0	523.0	677.0	836.0	359.0	497.0	636.0	773.0
	m^3/hr	10.6	14.8	19.2	23.7	TBD	14.1	18.0	21.9

 Specifications subject to change without notice

Alternator

Several alternators are available for application flexibility based on the required motor-starting kVA and other requirements. Larger alternator sizes have lower temperature rise for longer life of the alternator insulation system. In addition, larger alternator sizes can provide a cost-effective use of engine power in across-the-line motor-starting applications and can be used to minimize voltage waveform distortion caused by non-linear loads.

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 PMG excited system.

Alternator Application Notes

Separately Excited Permanent Magnet Generator (PMG) System - This standard system uses an integral PMG to supply power to the voltage regulator. A PMG system generally has better motor-starting performance, lower voltage dip upon load application, and better immunity from problems with harmonics in the main alternator output induced by non-linear loads. This system provides improved performance over self-excited regulators in applications that have large transient loads, sensitive electronic loads (especially UPS applications), harmonic content, or that require sustained short-circuit current (sustained 3-phase short circuit current at approximately 3 times rated for 10 seconds).

Alternator Sizes - On any given model, various alternator sizes are available to meet individual application needs. Alternator sizes are differentiated by maximum winding temperature rise, at the generator set standby or prime rating, when operated in a 40°C ambient environment. Available temperature rises range from 80°C to 150°C. Not all temperature rise selections are available on all models. Lower temperature rise is accomplished using larger alternators at lower current density. Lower temperature rise alternators have higher motor-starting kVA, lower voltage dip upon load application, and they are generally recommended to limit voltage distortion and heating due to harmonics induced by non-linear loads.

Alternator Space Heater - is recommended to inhibit condensation.

Available Output Voltages

Three Phase Reconnectable		Single Phase Non-Reconnectable		Three Phase Non-Reconnectable	
[ ]	110/190	[ ]	120/240	[ ]	347/600
[ ]	115/200				
[ ]	120/208				
[ ]	127/220				
[ ]	139/240				
[ ]	220/380				
[ ]	240/415				
[ ]	254/440				
[ ]	277/480				

Specifications – Alternator

Design	Brushless, 4 pole, drip proof, revolving field
Stator	2/3 pitch
Rotor	Direct coupled by flexible disc
Insulation System	Class H per NEMA MG1-1.65
Standard Temperature Rise	150°C Standby
Exciter Type	Permanent Magnet Generator (PMG)
Phase Rotation	A (U), B (V), C (W)
Alternator Cooling	Direct drive centrifugal blower
AC Waveform Total Harmonic Distortion	<5% total no load to full linear load <3% for any single harmonic
Telephone Influence Factor (TIF)	<50 per NEMA MG1-22.43
Telephone Harmonic Factor (THF)	<3

Natural Gas												
Three Phase Table[1]		**105° C**	**105° C**	**105° C**	**105° C**	**125° C**	**125° C**	**125° C**	**125° C**	**150° C**	**150° C**	**150° C**
Feature Code		B418	B415	B268	B304	B417	B414	B267	B303	B416	B413	B419
Alternator Data Sheet Number		209	209	211	208	208	208	211	208	208	208	208
Voltage Ranges		110/190 Thru 120/208 220/380 Thru 240/416	120/208 Thru 139/240 240/416 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	347/600	110/190 Thru 120/208 220/380 Thru 240/416	120/208 Thru 139/240 240/416 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	347/600	110/190 Thru 120/208 220/380 Thru 240/416	120/208 Thru 139/240 240/416 Thru 277/480	347/600
Surge kW		130	131	132	131	129	129	132	131	129	129	131
Motor Starting kVA (at 90% sustained voltage)	Shunt	516	516	672	422	422	422	672	422	422	422	422
	PMG	607	607	791	497	497	497	791	497	497	497	497

Full Load Current - Amps at Standby Rating	120/208	127/220	139/240	220/380	240/416	277/480	347/600
	434	410	376	237	217	188	150

Propane												
Three Phase Table[1]		**105° C**	**105° C**	**105° C**	**105° C**	**125° C**	**125° C**	**125° C**	**125° C**	**150° C**	**150° C**	**150° C**
Feature Code		B418	B415	B268	B304	B417	B414	B267	B303	B416	B413	B419
Alternator Data Sheet Number		209	209	211	208	208	208	211	208	208	208	208
Voltage Ranges		110/190 Thru 120/208 220/380 Thru 240/416	120/208 Thru 139/240 240/416 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	347/600	110/190 Thru 120/208 220/380 Thru 240/416	120/208 Thru 139/240 240/416 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	347/600	110/190 Thru 120/208 220/380 Thru 240/416	120/208 Thru 139/240 240/416 Thru 277/480	347/600
Surge kW		130	131	132	131	129	129	132	131	129	129	131
Motor Starting kVA (at 90% sustained voltage)	Shunt	516	516	672	422	422	422	672	422	422	422	422
	PMG	607	607	791	497	497	497	791	497	497	497	497

Full Load Current - Amps at Standby Rating	120/208	127/220	139/240	220/380	240/416	277/480	347/600
	434	410	376	237	217	188	150

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**	**105° C**	**125° C**	**125° C**	**125° C**	**125° C**			
Feature Code		B418	B415	B274	B268	B417	B414	B273	B267			
Alternator Data Sheet Number		209	209	210	211	208	208	209	211			
Voltage Ranges		120/240[1]	120/240[1]	120/240[2]	120/240[2]	120/240[1]	120/240[1]	120/240[2]	120/240[2]			
Surge kW		129	129	131	130	127	127	130	130			
Motor Starting kVA (at 90% sustained voltage)	Shunt	305	305	330	395	250	250	305	395			
	PMG	360	360	385	465	290	290	360	465			

Full Load Current - Amps at Standby Rating	120/240[1]	120/240[2]
	347	521

Propane												
Single Phase Table		**105° C**	**105° C**	**105° C**	**105° C**	**125° C**	**125° C**	**125° C**	**125° C**			
Feature Code		B418	B415	B274	B268	B417	B414	B273	B267			
Alternator Data Sheet Number		209	209	210	211	208	208	209	211			
Voltage Ranges		120/240[1]	120/240[1]	120/240[2]	120/240[2]	120/240[1]	120/240[1]	120/240[2]	120/240[2]			
Surge kW		129	129	131	130	127	127	130	130			
Motor Starting kVA (at 90% sustained voltage)	Shunt	305	305	330	395	250	250	305	395			
	PMG	360	360	385	465	290	290	360	465			

Full Load Current - Amps at Standby Rating	120/240[1]	120/240[2]
	347	521

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 up to full set rated 3-phase kW at 1.0 power factor.

 Specifications subject to change without notice

Control System

Optional Features Shown

PowerCommand® Control with AmpSentry™ Protection

- AmpSentry Protection guards the electrical integrity of the alternator and power system from the effects of overcurrent, over/under voltage, under frequency and overload conditions.
- Control components are designed to withstand the vibration levels typical in generator sets.
- Integrated automatic voltage regulator and engine speed governor

Standard Control Description

- Analog % of current meter (amps)
- Analog % of load meter (kW)
- Analog AC frequency meter
- Analog AC voltage meter
- Cycle cranking control
- Digital display panel
- Emergency stop switch
- Idle mode control
- Menu switch
- Panel backlighting
- Remote starting, 12 V, 2 wire
- Reset switch
- Run-Off-Auto switch
- Sealed front panel, gasketed door
- Self diagnostics
- Separate customer interconnection box
- Voltmeter/Ammeter phase selector switch

Standard Protection Features

Warnings

- High coolant temperature
- High DC voltage
- Low coolant temperature
- Low DC voltage
- Low oil pressure
- Oil pressure sender fault
- Overcurrent
- Overload load shed contacts
- Temperature sender fault
- Up to four customer fault inputs
- Weak battery

Shutdowns

- Emergency stop
- Fail to crank
- High AC voltage
- High coolant level (option for alarm only)
- High coolant temperature
- Low AC voltage
- Low coolant level (option for alarm only)
- Low oil pressure
- Magnetic pickup failure
- Overcrank
- Overcurrent
- Overspeed
- Short circuit
- Underfrequency

Standard Performance Data

AC Alternator

- Current by phase
- Kilowatts
- Kilowatt hours
- Power factor
- Voltage line to line
- Voltage line to neutral

Engine Data

- Battery voltage
- Coolant temperature
- Engine running hours
- Engine starts counter
- Oil pressure
- Oil temperature
- RPM

Generator Set Options

Engine
[ ] 120 V, 1500 W coolant heater
[ ] 240 V, 1500 W coolant heater
[ ] 120/240 V, 150 W lube oil heater

Fuel System
[ ] LP liquid
[ ] LP vapor
[ ] Natural gas
[ ] Natural gas/LP vapor with automatic changeover
[ ] Natural gas/LP liquid with automatic changeover

Alternator
[ ] 105°C rise alternator
[ ] 125°C rise alternator
[ ] 120/240 V, 100 W alternator anti-condensation heater
[ ] 12-lead broad range extended stack (full single phase output)
[ ] Single phase (4-lead)

Control Panel
[ ] 120/240 V, 100 W control anti-condensation heater
[ ] Exhaust pyrometer
[ ] Low coolant level warning
[ ] Remote fault signal package
[ ] Run relay package

Exhaust System
[ ] Critical grade exhaust silencer
[ ] Industrial grade exhaust silencer
[ ] Residential grade exhaust silencer
[ ] Exhaust pipe packages

Enclosures
[ ] Weather protective housing w/silencer
[ ] Quiet Site Stage I housing w/silencer
[ ] Quiet Site Stage II housing w/silencer

Generator Set
[ ] AC entrance box
[ ] Battery
[ ] Battery charger
[ ] Battery rack
[ ] Coolant drain extension
[ ] Duct adapter
[ ] Export box packaging
[ ] Main line circuit breakers
[ ] Oil drain extension
[ ] Paralleling accessories
[ ] PowerCommand Network
[ ] Remote annunciator panel
[ ] Spring isolators
[ ] UL 2200 Listed
[ ] 2 year prime power, 6000 hours
[ ] 2 year standby warranty
[ ] 5 year basic power warranty
[ ] 5 year comphehensive 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 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. The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage.

See your distributor for more information

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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.