Generator Set

Natural Gas - 100 kW, 125 kVA, Standby

Propane - 80 kW, 100 kVA, Standby

GGHD 60 Hz Generator Set

Optional Features Shown

Description

The Cummins® Onan® GG series spark ignited generator set is a fully integrated power generation system, providing optimum performance, reliability, and versatility for standby operation in stationary 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 Ford 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 NFPA110 requirements.

An 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 two wire remote control system provides for automatic remote operation and automatic shutdown for fault detection. Controls may be upgraded to the Detector™ Control for NFPA110 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 Onan 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.

All Cummins Onan brand 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

- **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, fault clearing short-circuit capability, and class H insulation.
- **Control Systems** - The standard 2-wire remote control provides remote starting, operation, and protection features. Upgrade to the Detector™ Control for NFPA 110 compliance
- **Cooling Systems** - Standard cooling package provides reliable running at up to 40°C ambient temperature. An optional 50°C cooling system is offered.
- **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 in this document provide representative configuration details, but the outline drawing must be used for installation design.

See outline drawing 500-3228 for installation design specifications.

Unit Width, in.(mm)	40.0 (1016)
Unit Height, in.(mm)	49.3 (1252)
Unit Length, in.(mm)	104.8 (2662)
Unit Dry Weight, lbs. (kgs)	2254 (1022)
Unit Wet Weight, lbs. (kgs)	2342 (1062)
Rated Speed, rpm	1800
Voltage Regulation, No Load to Full Load	±1.0%
Random Voltage Variation	±1.0%
Frequency Regulation	Isochronous
Random Frequency Variation	±0.5%
Radio Frequency Interference	Meets requirements of most industrial and commerical applications

	Natural Gas		**Propane**	
Cooling	**Standby**		**Standby**	
Fan Load, HP (kW)	9.0 (6.7)		9.0 (6.7)	
Coolant Capacity with radiator, US Gal (L)	7.9 (29.9)		7.9 (30)	
Coolant Flow Rate, Gal/min (L/min)	49.0 (185.5)		49.0 (185)	
Heat Rejection To Coolant, Btu/min (MJ/min)	7500.0 (8.0)		5300 (5.6)	
Heat Radiated To Room, Btu/min (MJ/min)	3300.0 (3.5)		3060 (3.2)	
Maximum Coolant Friction Head, psi (kPa)	2.0 (13.8)		2 (14)	
Maximum Coolant Static Head, psi (kPa)	10.0 (3.0)		10 (3.0)	
Air				
Combustion Air, cfm (m^3/min)	225.0 (6.4)		181.0 (5.1)	
Alternator Cooling Air, cfm (m^3/min)	1308.0 (37.0)		1308.0 (37.0)	
Radiator Cooling Air, scfm (m^3/min)	10900.0 (308.5)		10900.0 (308.5)	
Minimum Air Opening to Room, ft^2(m^2)	13.1 (1.2)		13.1 (1.2)	
Minimum Discharge Opening, ft^2(m^2)	8.7 (0.8)		8.7 (0.8)	
Max. Static Restriction, in H_2O (Pa)	0.5 (125.0)		0.5 (125.0)	

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 4300 ft (1309 m) at ambient temperatures up to 85°F (29°C). Above 4300 ft (1309 m) derate at 3% 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 4300 ft (1309 m) at ambient temperatures up to 85°F (29°C). Above 4300 ft (1309 m) derate at 3% 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 systems, non-linear loads, or sensitive electronic loads. Optional coolant heaters are recommended for all emergency standby installations or any application requiring fast load acceptance after start-up.

Specifications – Engine

Base Engine	LSG-875, Turbocharged
Displacement in^3 (L)	460.0 (7.5)
Overspeed Limit, rpm	2100 ±50
Regenerative Power, kW	11.00
Cylinder Block Configuration	Cast iron, 90°V 8 cylinder
Cranking Current	300 amps at ambient temperature of 32°F (0°C)
Battery Charging Alternator	65 amps
Starting Voltage	12-volt, negative ground
Lube Oil Filter Types	Spin-on, full flow
Standard Cooling System	104°F (40°C) ambient radiator cooling system
Standard Fuel	Natural gas

	Natural Gas		Propane	
Power Output	**Standby**		**Standby**	
Gross Engine Power Output, bhp (kWm)	173.0 (129.1)		144.0 (107.4)	
BMEP, psi (kPa)	150.0 (1034.2)		122.0 (841.2)	
Bore, in. (mm)	4.36 (110.7)		4.36 (110.7)	
Stroke, in. (mm)	3.85 (97.8)		3.85 (97.8)	
Piston Speed, ft/min (m/s)	1155.0 (5.9)		1155.0 (5.9)	
Compression Ratio	8.6:1		8.6:1	
Lube Oil Capacity, qt. (L)	10.0 (9.5)		10.0 (9.5)	
Fuel Flow				
Minimum Operating Pressure, in. H_2O (kPa)	7.0 (1.7)		7 (2)	
Maximum Operating Pressure, in. H_2O (kPa)	20.0 (5.0)		20 (5)	
Air Cleaner				
Maximum Air Cleaner Restriction, in. H_2O (kPa)	15.0 (3.7)		15.0 (3.7)	
Exhaust				
Gas Flow (Full Load), cfm (m^3/min)	760.0 (21.5)		650.0 (18.4)	
Gas Temperature, °F (°C)	1115 (602)		1089 (587)	
Maximum Back Pressure, in. H_2O (kPa)	20.0 (5.0)		20.0 (5.0)	

Fuel Consumption - Natural Gas		**Standby**							
60 Hz Ratings, kW (kVA)		**100 (125)**							
	Load	1/4	1/2	3/4	Full				
	cfh	590.0	853.0	1066.0	1322.0				
	m^3/hr	2233.2	3228.6	4034.8	5003.8				

Fuel Consumption - Propane		**Standby**							
60 Hz Ratings, kW (kVA)		**80 (100)**							
	Load	1/4	1/2	3/4	Full				
	cfh	162.0	232.0	297.0	387.0				
	m^3/hr	4.6	6.6	8.4	11.0				

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 reduce voltage waveform distortion caused by non-linear loads.

These 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.

Alternator Application Notes

Separately Excited Permanent Magnet Generator (PMG) System - This option 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 option is recommended for use 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 alternators sizes are available to meet individual application needs. Alternators 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 available and recommended, to inhibit condensation.

Available Output Voltages

Three Phase Reconnectable		Single Phase Non-Reconnectable		Three Phase Non-Reconnectable	
[ ]	120/208	[ ]	120/240	[ ]	220/380
[ ]	127/220			[ ]	347/600
[ ]	139/240				
[ ]	120/240				
[ ]	240/416				
[ ]	254/440				
[ ]	227/480				

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	Shunt
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		208	208	210	207	207	207	209	207	206	207	206	
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		112.9	112.9	113.7	112.2	110.9	110.9	113.6	112.2	110.3	110.9	111.4	
Motor Starting kVA (at 90% sustained voltage)	Shunt	422	422	563	360	360	360	516	360	313	360	313	
	PMG	497	497	663	423	423	423	607	423	368	423	368	

Full Load Current - Amps at Standby Rating	120/208	127/220	139/240	220/380	240/416	277/480	347/600
	347	328	301	190	173	150	120

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		208	208	209	210	207	207	208	209				
Voltage Ranges		120/240	120/240	120/240	120/240	120/240	120/240	120/240	120/240				
Surge kW		111.1	111.1	113	111.4	109.1	109.1	111.9	110.7				
Motor Starting kVA (at 90% sustained voltage)	Shunt	250	250	305	330	215	215	250	305				
	PMG	290	290	360	385	250	250	290	360				

Full Load Current - Amps at Standby Rating	120/240[1]	120/240[2]
	278	417

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.

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		208	208	210	207	207	207	209	207	206	207	206	
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		93.1	93.1	93.6	92.8	92	92	93.5	92.8	91.9	92	92.4	
Motor Starting kVA (at 90% sustained voltage)	Shunt	422	422	563	360	360	360	516	360	313	360	313	
	PMG	497	497	663	423	423	423	607	423	368	423	368	

Full Load Current - Amps at Standby Rating	120/208	127/220	139/240	220/380	240/416	277/480	347/600
	278	262	241	152	139	120	96

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.

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		208	208	209	210	207	207	208	209				
Voltage Ranges		120/240	120/240	120/240	120/240	120/240	120/240	120/240	120/240				
Surge kW		91.4	91.4	93.1	91.9	90.5	90.5	92.9	91.7				
Motor Starting kVA (at 90% sustained voltage)	Shunt	250	250	305	330	215	215	250	305				
	PMG	290	290	360	385	250	250	290	360				

Full Load Current - Amps at Standby Rating	120/240[1]	120/240[2]
	222	333

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.

Control System

Optional Features Shown

Standard 2-Wire Remote Control System

- Automatic remote starting
- Control components designed to withstand the vibration levels typical in generator sets
- Controls generator set starting and shutdown

Standard Control Description

- Crank timer
- Fault reset button
- Remote starting, 12 V, 2 wire
- Run-Off-Auto switch

Standard Features	Optional Features
• Field circuit breaker • High temperature shutdown • Low oil pressure shutdown • Overcrank shutdown • Overspeed shutdown • Running time meter	• AC meter package (same as Detector) • Oil pressure gauge • Water temperature gauge

Optional Features Shown

Optional Detector Control System

- Automatic remote starting
- Control components designed to withstand the vibration levels typical in generator sets
- Controls generator set starting and shutdown

Standard Detector 12 Light (NFPA110) Control Description

- 12 light engine monitor (NFPA110 level)
- Common alarm contact
- Coolant temperature gauge
- Cycle cranking control
- DC Voltmeter
- Field circuit breaker
- Individual 1/2 A relay signals
- Lamp test switch
- Oil pressure gauge
- Remote starting, 12 V, 2 wire
- Reset switch
- Run-Off-Auto switch
- Running time meter

Standard Features		Optional Features
• 5% voltage adjust rheostat • AC ammeter (dual scale) • AC voltmeter (dual scale) • Dual scale frequency/tachometer • Engine gauges • High coolant temp shutdown (red light) • Low coolant temperature (yellow light) • Low fuel (yellow light) • Low oil pressure shutdown (red light)	• Overcrank shutdown (red light) • Overspeed shutdown (red light) • Pre-alarm high coolant temp (yellow light) • Pre-alarm low oil pressure (yellow light) • Run indicator (green light) • Two customer selected faults (red light) • Voltmeter/Ammeter phase selector	• Audible alarm • Emergency stop • Low battery voltage warning • Remote fault signal package • Speed adjust rheostat • Time delay start/stop

Generator Set Options

Engine
[ ] 120/240 V, 1500 W coolant heaters

Cooling System
[ ] 122°F (50°C) ambient cooling system
[ ] Remote radiator cooling

Fuel System
[ ] LP liquid
[ ] 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
[ ] 150°C rise alternator
[ ] 120/240 V, 100 W anti-condensation heater
[ ] 12 lead, broad range, extended stack (full single phase output)
[ ] Lower broad range
[ ] PMG excitation
[ ] Upper broad range
[ ] Single phase (4 lead)

Control Panel
[ ] 120/240 V, 100 W control anti-condensation heater
[ ] CSA 282 compliance package
[ ] Detector 12 control (required for any NFPA 110 application)
[ ] Emergency stop
[ ] Engine gauges
[ ] Low battery voltage warning
[ ] Low coolant level warning/shutdown
[ ] Remote fault signal package

Exhaust System
[ ] Adapter NPT to Slip Fit
[ ] Mounted residential muffler

Generator Set
[ ] AC entrance box
[ ] Battery charger
[ ] Battery rack
[ ] Coolant drain extension
[ ] Duct Adapter
[ ] Export box packaging
[ ] Main line circuit breaker
[ ] Oil drain extension
[ ] Quiet Site I housing with silencer
[ ] Quiet Site II housing with silencer
[ ] Remote annunciator panel
[ ] Weather protective enclosure with silencer
[ ] 2 year standby warranty
[ ] 5 year basic power warranty

Accessories and Services

A wide range of products and services is available to match your power generation system requirements. Cummins Onan 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.

Other available warranties include: 2-year prime power, 2-year standby, 5-year basic power, 5-year comprehensive power and 10-year major component. The 2-year prime power and the 10-year major component warranties are available in North America only.

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.

NFPA Testing - The Prototype Test Support program verifies the performance integrity of the generator set design. Cummins Onan products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems. A complete representative prototype generator set has been subjected to a number of demanding tests to verify the design integrity and performance under both normal and abnormal operating conditions per the requirements of NFPA 110 for Level 1 systems. Tests include short circuit, endurance, temperature rise, torsional vibration, and transient response, including full load pickup in one step.

See your distributor for more information

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Important: Backfeed to a utility system can cause electrocution and/or property damage. Do no connect to any building's electrical system except through an approved device or after building main switch is open.