

# Spark-Ignited Generator Set Model GNAA 60 Hz

**Natural Gas - 6.0 kW, 7.5 kVA Standby  
5.4 kW, 6.8 kVA Prime  
Propane - 7.0 kW, 8.8 kVA, Standby  
6.3 kW, 7.9 kVA, Prime**



## Description

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

LP vapor fuel system is standard with an option for natural gas.

The GN GenSet offers both user- and environment-friendly operation. The standard generator set control provides for local or automatic operation, remote starting and stopping, and automatic shutdown at fault detection. Optional AC meters are available. The control may be upgraded to automatic remote operation or 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 demonstrated capacity at rated power, single-step rated load pickup, and reactive current capability to inductive loads. Cummins Power Generation manufacturing facilities are committed to the highest possible quality in the design, manufacture, and support of our products. The GenSet is CSA certified.

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

- **Onan Heavy-Duty Engine** - Rugged 4-cycle liquid-cooled industrial spark-ignited engine delivers reliable power. The electronic governor provides fast response to load changes.
- **Electronic Voltage Regulator** - Torque-matched regulator provides fast recovery from transient load changes, underfrequency compensation, and precise regulation.
- **Alternator** - Excellent motor starting capability with low reactance 2/3 pitch windings, low waveform distortion with non-linear loads and fault clearing short-circuit capability.
- **Control Systems** - The standard control provides manual starting, operation, and fault protection features. Upgrade to two wire automatic remote operation or to the Detector™ Control for NFPA110 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.
- **Housings** - Optional weather proof 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 worldwide distributor service.

## Generator Set

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

See outline drawing 500-3274 for installation design specifications.

<b>Unit Width, in (mm)</b>	28.0 (711)
<b>Unit Height, in (mm)</b>	38.8 (986)
<b>Unit Length, in (mm)</b>	58.3 (1481)
<b>Unit Dry Weight, lb (kg)</b>	654 (297)
<b>Unit Wet Weight, lb (kg)</b>	675 (306)
<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>	5%
<b>Random Frequency Variation</b>	±0.5%
<b>Radio Frequency Interference</b>	Meets requirements of most industrial and commercial applications

Cooling	Natural Gas		Propane	
	Standby	Prime	Standby	Prime
Fan Load, HP (kW)	0.4 (0.3)	0.4 (0.3)	0.4 (0.3)	0.4 (0.3)
Coolant Capacity with radiator, US Gal (L)	1.7 (6.4)	1.7 (6.4)	1.7 (6.0)	1.7 (6.0)
Coolant Flow Rate, Gal/min (L/min)	12.9 (49.0)	12.9 (49.0)	12.9 (49.0)	12.9 (49.0)
Heat Rejection To Coolant, Btu/min (MJ/min)	560.0 (0.6)	TBD	603.0 (0.6)	TBD
Heat Radiated To Room, Btu/min (MJ/min)	100.0 (0.1)	TBD	119.0 (0.1)	TBD
Maximum Coolant Friction Head, psi (kPa)	1.4 (9.7)	1.4 (9.7)	1.4 (9.7)	1 (9.7)
Maximum Coolant Static Head, ft (m)	12.0 (3.7)	12.0 (3.7)	12.0 (3.7)	12 (3.7)
<b>Air</b>				
Combustion Air, scfm (m <sup>3</sup> /min)	23.4 (0.7)	TBD	24.3 (0.7)	TBD
Alternator Cooling Air, scfm (m <sup>3</sup> /min)	225.0 (6.4)	225.0 (6.4)	225.0 (6.4)	225.0 (6.4)
Radiator Cooling Air, scfm (m <sup>3</sup> /min)	1663.0 (47.1)	1663.0 (47.1)	1663.0 (47.1)	1663.0 (47.1)
Max. Static Restriction, in H <sub>2</sub> O (Pa)	0.25 (62.25)	0.25 (62.25)	0.2 (62.2)	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 500 ft (150 m) at ambient temperatures up to 85°F (30°C). Above 500 ft (150 m) derate at 3.5% per 1000 ft (305 m), and 2% per 10°F (4% per 11°C) above 85°F (30°C).

#### Propane

Engine power available up to 500 ft (150 m) at ambient temperatures up to 85°F (30°C). Above 500 ft (150 m) derate at 3.5% per 1000 ft (305 m), and 2% per 10°F (4% per 11°C) above 85°F (30°C).

# Engine

Onan heavy-duty spark-ignited engines provide stable power, low fuel consumption, quiet operation, and fast response to sudden load changes. Fuel system options available for natural gas, and LP vapor.

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>	LPG-2, naturally aspirated
<b>Displacement in<sup>3</sup> (L)</b>	56.7 (0.9)
<b>Overspeed Limit, rpm</b>	2100 ±50
<b>Regenerative Power, kW</b>	3.10
<b>Cylinder Block Configuration</b>	Cast iron, In-line 2 cylinder
<b>Battery Capacity</b>	160 amps minimum at ambient temperature of 32°F(0°C)
<b>Battery Charging Alternator</b>	45 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 radiator cooling system
<b>Standard Fuel</b>	LP vapor is standard

Power Output	Natural Gas		Propane						
	Standby	Prime	Standby	Prime					
Gross Engine Power Output, bhp (kWm)	10.1 (7.5)	9.2 (6.9)	11.7 (8.7)	10.7 (8.0)					
BMEP at Rated Load, psi (kPa)	77.4 (533.7)	71.3 (491.6)	90.2 (621.9)	82.9 (571.6)					
Bore, in. (mm)	3.38 (85.9)	3.38 (85.9)	3.38 (85.9)	3.38 (85.9)					
Stroke, in. (mm)	3.15 (80.0)	3.15 (80.0)	3.15 (80.0)	3.15 (80.0)					
Piston Speed, ft/min (m/s)	945.0 (4.8)	945.0 (4.8)	945.0 (4.8)	945.0 (4.8)					
Compression Ratio	9.5:1	9.5:1	9.5:1	9.5:1					
Lube Oil Capacity, qt. (L)	3.6 (3.4)	3.6 (3.4)	3.6 (3.4)	3.6 (3.4)					
<b>Fuel Flow</b>									
Minimum Operating Pressure, in. H <sub>2</sub> O (kPa)	5.5 (1.4)	5.5 (1.4)	5.5 (1.4)	6 (1)					
Maximum Operating Pressure, in. H <sub>2</sub> O (kPa)	13.6 (3.4)	13.6 (3.4)	13.6 (3.4)	14 (3)					
<b>Air Cleaner</b>									
Maximum Air Cleaner Restriction, in. H <sub>2</sub> O (kPa)	10.0 (2.5)	10.0 (2.5)	10.0 (2.5)	10.0 (2.5)					
<b>Exhaust</b>									
Exhaust Flow at Rated Load, cfm (m <sup>3</sup> /min)	77.8 (2.2)	TBD	89.9 (2.5)	TBD					
Exhaust Temperature, °F (°C)	1000.0 (537.8)	TBD	1100 (593)	TBD					
Max Back Pressure, in. H <sub>2</sub> O (kPa)	15.0 (3.7)	15.0 (3.7)	15.0 (3.7)	15.0 (3.7)					
<b>Fuel Consumption - Natural Gas</b>	<b>Standby</b>				<b>Prime</b>				
60 Hz Ratings, kW (kVA)	<b>6.0 (7.5)</b>				<b>5.4 (6.8)</b>				
	Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
	cfh	54.1	67.3	81.8	94.7	TBD	TBD	TBD	88.5
	m <sup>3</sup> /hr	1.5	1.9	2.3	2.7	TBD	TBD	TBD	2.5
<b>Fuel Consumption - Propane</b>	<b>Standby</b>				<b>Prime</b>				
60 Hz Ratings, kW (kVA)	<b>7.0 (8.8)</b>				<b>6.3 (7.9)</b>				
	Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
	cfh	24.7	30.0	36.7	45.0	TBD	TBD	TBD	42.1
	m <sup>3</sup> /hr	0.7	0.8	1.0	1.3	TBD	TBD	TBD	1.2

## 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	[ ]	110/220	[ ]	347/600
[ ]	120/240	[ ]	120/240		
[ ]	127/220				
[ ]	220/380				
[ ]	227/480				
[ ]	139/240				
[ ]	240/416				
[ ]	255/440				
[ ]	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 F 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		N/A	N/A	N/A						
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		7.4	7.4	7.4						
Motor Starting kVA (at 90% sustained voltage)	Shunt	35	29	29						
Full Load Current - Amps at Standby Rating		<u>120/208</u> 21	<u>127/220</u> 20	<u>139/240</u> 18	<u>220/380</u> 11	<u>240/416</u> 10	<u>277/480</u> 9	<u>347/600</u> 7		

Propane										
Three Phase Table <sup>1</sup>		105° C	105° C	105° C						
Feature Code		B256	B268	B304						
Alternator Data Sheet Number		N/A	N/A	N/A						
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		7.5	7.5	7.5						
Motor Starting kVA (at 90% sustained voltage)	Shunt	29	35	29						
Full Load Current - Amps at Standby Rating		<u>120/208</u> 24	<u>120/240</u> 21	<u>127/220</u> 23	<u>139/240</u> 21	<u>220/380</u> 13	<u>240/416</u> 12	<u>255/440</u> 11	<u>277/480</u> 11	<u>347/600</u> 8

**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		N/A	N/A	N/A						
Voltage Ranges		120/240 <sup>2</sup>	120/240 <sup>1</sup>	120/240 <sup>2</sup>						
Surge kW		7.4	7.4	7.4						
Motor Starting kVA (at 90% sustained voltage)	Shunt	18	18	21						
Full Load Current - Amps at Standby Rating		<u>110/220<sup>1</sup></u> 18	<u>110/220<sup>2</sup></u> 27	<u>120/240<sup>1</sup></u> 17	<u>120/240<sup>2</sup></u> 25					

Propane										
Single Phase Table		105° C	105° C	105° C						
Feature Code		B274	B256	B268						
Alternator Data Sheet Number		N/A	N/A	N/A						
Voltage Ranges		120/240 <sup>2</sup>	120/240 <sup>1</sup>	120/240 <sup>2</sup>						
Surge kW		7.5	7.5	7.5						
Motor Starting kVA (at 90% sustained voltage)	Shunt	18	18	21						
Full Load Current - Amps at Standby Rating		<u>110/220<sup>1</sup></u> 21	<u>110/220<sup>2</sup></u> 32	<u>120/240<sup>1</sup></u> 19	<u>120/240<sup>2</sup></u> 29					

**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



Optional Features Shown



Optional Features Shown



Optional Features Shown

<b>Standard Manual Control System</b>	
<ul style="list-style-type: none"> <li>Manual starting</li> <li>Controls generator set starting and shutdown</li> <li>Control components designed to withstand the vibration levels typical in generator sets</li> </ul>	
<b>Standard Control Description</b>	
<ul style="list-style-type: none"> <li>Manual starting, 12 volt</li> </ul>	<ul style="list-style-type: none"> <li>Remote Starting, 12 V, 2 wire</li> <li>Run-off-auto switch</li> </ul>
<b>Standard Features</b>	<b>Optional Features</b>
<ul style="list-style-type: none"> <li>High temperature shutdown</li> <li>Low oil pressure shutdown</li> </ul>	<ul style="list-style-type: none"> <li>AC meter package</li> <li>Oil pressure gauge (engine mounted)</li> <li>Running time meter (engine mounted)</li> <li>Water temperature gauge (engine mounted)</li> </ul>

<b>Optional 2-Wire Remote Control System</b>	
<ul style="list-style-type: none"> <li>Automatic remote starting</li> <li>Controls generator set starting and shutdown</li> <li>Control components designed to withstand the vibration levels typical in generator sets</li> </ul>	
<b>Standard Control Description</b>	
<ul style="list-style-type: none"> <li>Crank timer</li> <li>Fault reset button</li> </ul>	<ul style="list-style-type: none"> <li>Remote Starting, 12 V, 2 wire</li> <li>Run-off-auto switch</li> </ul>
<b>Standard Features</b>	<b>Optional Features</b>
<ul style="list-style-type: none"> <li>Fault circuit breaker</li> <li>High temperature shutdown</li> <li>Low oil pressure shutdown</li> <li>Overcrank shutdown</li> <li>Overspeed shutdown</li> <li>Running time meter</li> </ul>	<ul style="list-style-type: none"> <li>AC meter package</li> <li>Oil pressure gauge (engine mounted)</li> <li>Running time meter (engine mounted)</li> <li>Water temperature gauge (engine mounted)</li> </ul>

<b>Optional Detector Control System</b>	
<ul style="list-style-type: none"> <li>Automatic remote starting</li> <li>Control components designed to withstand the vibration levels typical in generator sets</li> <li>Controls generator set starting and shutdown</li> </ul>	
<b>Standard Detector 12 Light (NFPA110) Control Description</b>	
<ul style="list-style-type: none"> <li>12 light engine monitor (NFPA110 level)</li> <li>Common alarm contact</li> <li>Coolant temperature gauge</li> <li>Cycle cranking control</li> <li>DC voltmeter</li> <li>Field circuit breaker</li> <li>Individual 1/2 A relay signals</li> </ul>	<ul style="list-style-type: none"> <li>Lamp test switch</li> <li>Oil pressure gauge</li> <li>Remote starting, 12 volt, 2 wire</li> <li>Reset switch</li> <li>Run-Off-Auto switch</li> <li>Running time meter</li> </ul>

<b>Standard Features</b>	<b>Optional Features</b>
<ul style="list-style-type: none"> <li>5% voltage adjust rheostat</li> <li>AC ammeter (dual scale)</li> <li>AC voltmeter (dual scale)</li> <li>Dual scale frequency/tachometer</li> <li>Engine gauges</li> <li>High coolant temperature shutdown (red light)</li> <li>Low coolant temperature (yellow light)</li> <li>Low oil pressure shutdown (red light)</li> </ul>	<ul style="list-style-type: none"> <li>Overcrank shutdown (red light)</li> <li>Overspeed shutdown (red light)</li> <li>Pre-alarm high coolant temp (yellow light)</li> <li>Pre-alarm low oil pressure (yellow light)</li> <li>Run indicator (green light)</li> <li>Two customer selected faults (red light)</li> <li>Voltmeter/Ammeter phase selector</li> </ul>
	<ul style="list-style-type: none"> <li>Audible alarm</li> <li>Emergency stop</li> <li>Low battery voltage warning</li> <li>Low coolant level warning or shutdown</li> <li>Remote fault signal package</li> <li>Speed adjust rheostat</li> <li>Time delay start/stop</li> </ul>

## Generator Set Options

### Engine

- 120/240 V coolant heater
- Heavy duty air cleaner
- Oil pressure gauge
- Water temperature gauge

### Fuel System

- Natural gas

### Alternator

- 120/240 V, 100 W anti-condensation heater
- Broad range 12-lead extended stack with full single phase output capability

### Control Panel

- 120/240 V, 100 W control anti-condensation heater
- AC meters (for manual and remote control)
- Auxiliary relay contacts (Detector control only)
- Detector 12 control w/AC meters (meets NFPA 110 code requirements)
- Remote - ATS: Automatic transfer switch compatible 2-wire control with low oil pressure and high coolant temperature shut downs

### Exhaust System

- Critical grade exhaust silencer

### Generator Set

- Circuit breakers
- Quiet Site Stage II Housing w/silencer
- Weather protective enclosure w/exhaust silencer
- 2 year prime power warranty
- 2 year standby warranty
- 5 year basic 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



**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.

**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.**