Gaseous Fuel Generator Set
GTA38 Engine Series

Specification Sheet
Model GFJB EPA SI NSPS Compliant Capable

NPower

KW(KVA) @ 0.8 P.F	
Compression Ratio	60 Hz-1800 RPM Standby
8.5:1 (Note 1 & 3)	500 kW (562 kVa)
8.5:1 (Note 2 & 3)	280 kW (350 kVa)

Note:

(1) Natural Gas Rating

(2) Propane Rating - Per EPA SI NSPS this engine cannot operate more than 100 hours annually on propane fuel as back up fuel to natural gas.

(3) 54ºC (130ºF) or lower water temperature to the aftercooler.

NOTE: This engine is EPA compliant capable. A site validation emission test must be performed.

Fuel Application Guide	
Compression Ratio	8.5:1
Dry Processed Natural Gas	Yes
Propane (HD-5)	Yes
All gases such as field gas, digester and sewage gas will require an analysis of the specified gas and pre-approval from CNGE. Consult you Cummins Distributor for details.	

Description

The Cummins NPower GF-series 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 GF 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 with three phase sensing for precise regulation under steady-state or transient loads. The GF GenSet accepts 100% of the nameplate standby rating in one step. * Sets comply with 10 second ready to load per NFPA 110.

The standard PowerCommand® digital electronic control is an integrated system that combines engine and alternator controls for high reliability and optimum GenSet performance.

Optional protective housing and component heaters shield the generator set from extreme operating conditions.** Environmental concerns are addressed by low exhaust emission engines, sound-attenuated housings, and exhaust silencers. 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 NPower manufacturing facilities include quality standards, emphasizing our commitment to high quality in the design, manufacture, and support of our products. The PowerCommand control is UL508 Listed.

All Cummins NPower generator sets are backed by a comprehensive warranty program and supported by a worldwide network of 233 locations to assist with warranty, service, parts, and planned maintenance support.

Features

Cummins Heavy-Duty 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 windings, low waveform distortion with non-linear loads, fault-clearing short-circuit capability, and class H insulation. The alternator electrical insulation system is UL1446 Recognized.

Control Systems - The PowerCommand electronic control is standard equipment and provides total genset system integration, including automatic remote starting/stopping, precise voltage regulation, alarm and status message display, output metering, and auto-shutdown at fault detection. PowerCommand control is Listed to UL508.

Cooling System - Standard cooling package provides reliable running at the rated power level, at up to 104ºF ambient temperature.

Housings - Optional weather-protective housing and sound attenuation housing(s) are available.

Standards - Generators are designed, manufactured and tested to relevant UL, NFPA, ISO and IEC standards. The alternator is certified to CSA 22.2. The controls are CSA C282-M1999 and 22.2 No.14 M91. PowerCommand control is UL508 Listed.

Warranty and Service - Backed by a comprehensive warranty and worldwide distributor service network.

* Adequate fuel pressure and volume must be provided.

Generator Set

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

Specifications - General	
Unit Width	2286 mm (90 in) Open set
Unit Height	2743 mm (108 in) Open set
Unit Length	4775 mm (188in) Open set
Unit Dry Weight	8503 to 9226 kg (18745 to 20341 lbs) - Dependant on selected alternator.
Rated Speed	1800 rpm
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	Optional PMG excitation operates in compliance with BS800 and VDE level G and N. Addition of RFI protection kit allows operation per MIL-STD-461 and VDE level K.
See outline drawing for installation design specifications.	

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. Usage based on ISO 8528.

Site Derating Factors

See engine data sheet FR 996033 for altitude and ambient derate curve.

Gensets with Weather or Sound Enclosures may reduce ambient capability by 2 to 4.5°C (4 to 8°F) depending on enclosure type and site conditions.

1) Data represents gross engine performance capabilities obtained and corrected in accordance with SAEJ1349 conditions of 29.61 in. Hg.(100KPa) barometric pressure [361 ft. (110m) altitude], 77ºF (25ºC) inlet air temperature, and 0.30 in Hg.(100KPa) water vapor pressure using dry processed natural gas fuel with 905 BTU per standard cubic foot (33.72 kJ/L) lower heating value. Deration may be required due to altitude, temperature or type of fuel. Consult your local Cummins Distributor for details.

2) FUEL SYSTEM

Standard Carburetor – IMPCO Make
Low Pressure Dry Processed Natural Gas – (905 BTU/ft.² L.H.V.)
Running Pressure to Engine .....381 to 508 mm H_20(15 to 20 in. H_20)
Minimum Gas Supply Pipe Size @ Engine (NG) .....50.8 mm (2.0 in.)
Gas Supply Filter Pressure Rating .....690 kPa (100psi)

The preceding pipe sizes are only suggestions and piping may vary with temperatures, distance from fuel supply and application of local codes. Gas must be available at adequate volume and pressure for engine at the regulator.

The Genset (engine) performance is based on processed natural gas fuel with 905 BTU per standard cubic foot (33.72 kJ/L) lower heating value. Variations in fuel composition and/or supply pressure must be eliminated during steady state operation. Locate the gas regulator as near to the engine as possible. Some systems may need an accumulator or other device(s) for startup or unstable conditions, contact the Fuel Supply utility for details.

Engine

Cummins heavy-duty spark ignited engines use advanced combustion technology for reliable and stable power, low emissions, and fast response to sudden load changes.

Electronic governing is standard 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 GTA38
Displacement	37.7 L (2301 in^3)
Overspeed Limit	2100 rpm
Regenerative Power	22 kW
Cylinder Block Configuration	Cast iron with replaceable wet cylinder liners
Engine Only Cold Cranking Amps	1800 CCA (cold soak at -18°C (0°F) or above)
Battery Charging Alternator	37 amps
Battery Type	8D
Starting Voltage	24-volt, negative ground
Standard Cooling System	40°C (104°F) ambient radiator
Lube Oil Filter Types	Four spin-on canisters-combination full flow with bypass

Fuel		**STANDBY**		
Fuel Consumption	Load	1/2	3/4	Full
(Approximate)	kW	250	375	500
Natural Gas	CFH	4253	5835	7422
Propane Vapor *	CFH	1526	2095	2664
Propane Liquid *	GPH	46	63	80

Cooling	**Full Load**
Jacket Water Heat Rejection to Coolant	700 kW (39817 BTU/min)
Aftercooler Heat Rejection to Coolant	59 kW (3350 BTU/min)
Heat Rejection to Room	96 kW (5467 BTU/min)
Jacket Water Coolant Capacity (w/radiator)	356 L (94 USG)
Jacket Water Coolant Flow Rate	1192 L/min (315 GPM)
Aftercooler Coolant Capacity (w/radiator)	61 L (16 USG)
Aftercooler Coolant Flow Rate	397 L/min (105 GPM)
Maximum Coolant Friction Head **	34 kPa (5 psi)
Maximum Coolant Static Head **	18.3 m (60 ft)
Radiator Fan Load	48 kW (65 hp)

Air	**Full Load**
Combustion Air	548 L/sec (1161 cfm)
Maximum Air Cleaner Restriction	381 mm H_2O (15 in H_2O)
Alternator Cooling Air (306E)	1.31 m^3/s (2780 cfm)
Radiator Cooling Air	31479 L/sec (66700 cfm)
Maximum Restriction at Radiator Discharge (static)	12.7 mm H_2O (0.5 in H_2O)

Exhaust	**Full Load**
Gas Flow (Full Load)	2053 L/sec (4350 cfm)
Gas Temperature	652° C (1205° F)
Maximum Back Pressure	51 mm Hg (2 in Hg)

Engine	**Full Load**
Gross Engine Power Output	599 kWm (803 hp)
BMEP ***	1057 kPa (153 psi)
Piston Speed	9.53 m/s (1875 ft/min)
Oil Capacity	129 - 155 L (34 - 41 gal)

* Emergency use only. Not for primary fuel use.

** Jacket water only.

*** BMEP @ rated load on NG.

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 drive train 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 alternator sizes are available to meet individual application needs. Alternator sizes are differentiated by maximum winding temperature rise, at the generator set standby rating, when operated in a 40ºC (104ºF) ambient environment. Available temperature rises range from 80ºC to 150ºC (176ºF to 302ºF). 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
☐ 120/208 ☐ 240/416	☐ 120/240	☐ 220/380
☐ 127/220 ☐ 254/440		☐ 347/600
☐ 139/240 ☐ 277/480		
☐ 120/240		

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 or better
Standard Temperature Rise *	125° C *
Exciter Type	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

	80° C Alternator			105° C Alternator			125° C Alternator		
Voltage Ranges	120/208 Thru 139/240 240/416 Thru 277/480	277/480	347/600	120/208 Thru 139/240 240/416 Thru 277/480	277/480	347/600	120/208 Thru 139/240 240/416 Thru 277/480	277/480	347/600
Motor Starting	Broad Range	480	600	Broad Range	480	600	Broad Range	480	600
Maximum KVA (90% Sustained Voltage)	2944	2429	2429	2208	2208	2208	2208	1896	1896
Alternator Datasheet No.	ADS309E	ADS308E	ADS308E	ADS307E	ADS307E	ADS307E	ADS307E	ADS306E	ADS306E

Full Load Current	120/208V	127/220	139/240	220/380	240/416	254/440	277/480	347/600
(Amps @ Standby Rating)	1735	1640	1504	950	867	820	752	601

* Other Temp Rises Available. See options at end of datasheet for more details.

Control System

PowerCommand Control 1.1

The PowerCommand Control is an integrated generator set control system providing voltage regulation, engine protection, operator interface and isochronous governing (optional). The integration of all functions into a single control system provides enhanced reliability and performance compared to conventional generator set control systems.Prototype

Features

- Battery monitoring and testing features and smart starting control system.
- Standard PCCNet interface to devices such as remote annunciator for NFPA 110 applications.
- Control boards potted for environmental protection.
- InPower™ PC-based service tool available for detailed diagnostics.

AC Protection

- Over current warning and shutdown.
- Over and under voltage shutdown.
- Over and under frequency shutdown.
- Over excitation (loss of sensing) fault.
- Field overload.

Digital Voltage Regulation

- 2-phase line-to-line sensing.
- Configurable torque matching.

Engine Protection

- Overspeed shutdown.
- Low oil pressure warning and shutdown.
- High coolant temperature warning and shutdown.
- Low coolant level warning or shutdown.
- Low coolant temperature warning.
- High, low and weak battery voltage warning.
- Fail to start (overcrank) shutdown.
- Fail to crank shutdown.
- Redundant start disconnect.
- Cranking lockout.
- Sensor failure indication.
- Low fuel level warning or shutdown.

Operator / Display Panel

- Manual off switch.
- Alpha-numeric display with pushbutton access for viewing engine and alternator data and providing setup, controls and adjustments (English or international symbols).
- LED lamps indicating genset running, not in auto, common warning, common shutdown, manual run mode and remote start.
- Bargraph display (optional).

Other Display Data

- Genset model data.
- Start attempts, starts, running hours.
- Fault history.
- RS485 Modbus® interface.
- Data logging and fault simulation (requires InPower service tool).

Control Functions

- Time delay start and cooldown.
- Cycle cranking.
- PCCNet interface.
- (2) Configurable inputs.
- (2) Configurable outputs.

PCC Options

- ❑ Integrated digital electronic isochronous governing.
- ❑ Temperature dynamic governing.
- ❑ Auxiliary output relays (2).
- ❑ 120/240 V, 100 W anti-condensation heater.
- ❑ Remote annunciator with (3) configurable inputs and (4) configurable outputs.
- ❑ Remote operator panel.
- ❑ PMG alternator excitation.
- ❑ PowerCommand iWatch web server for remote monitoring and alarm notification (loose).
- ❑ Auxiliary, configurable signal inputs (8) and configurable relay outputs (8).
- ❑ AC output analog meters (bargraph).
  Color-coded graphical display of:
  - 3-phase AC voltage
  - 3-phase current
  - Frequency
  - kVa
- ❑ PowerCommand 3.3 control with AmpSentry protection.

PowerCommand Control Values

	PCC	Genset Reference Values
Ambient Operating Temperature	-40 to +70ºC (-40 to 158ºF) HMI -20 to +70ºC (-4 to 158ºF)	-
Operating Altitude	up to 5000 meters (13,000 ft.)	-
Alternator Data		
Voltage	AC: Single or Three Phase Line-to-line or Line-to-neutral	-
Digital Output Voltage Regulation	Within +/-1.0% any loads between no load to full. Drift = no more than +/-1.5% for 40ºC (104ºF) temp change in 8 hours.	-
Current	3-Phase AC	
Frequency	60 Hz	-
Battery Config	12 VDC	12 VDC
Engine Data		
Voltage	DC	DC
Lube Oil Pressure	Adjustable	Adjustable
Engine Idle Speed	Adjustable	Adjustable

Genset values are for reference only. For unit data see genset data tag.

Generator Set Options

Engine
- ❑ 240/480 V, 8000 W coolant heaters
- ❑ 240 V, 300 W lube oil heater

Cooling System
- ❑ Heat exchanger cooling
- ❑ Remote radiator cooling

Fuel System
- ❑ Flexible fuel connector
- ❑ Fuel strainer

Alternator
- ❑ 80° C rise alternator
- ❑ 105° C rise alternator
- ❑ 125° C rise alternator
- ❑ 120/240 V, 100 W anti-condensation heater
- ❑ Single phase

Exhaust System
- ❑ GenSet mounted muffler (Enclosure Models Only)
- ❑ Heavy duty exhaust elbow
- ❑ Slip on exhaust connection

Generator Set
- ❑ AC entrance box
- ❑ Batteries
- ❑ Battery charger
- ❑ Export box packaging
- ❑ Main line circuit breaker
- ❑ PowerCommand Network Communication Module (NCM)
- ❑ Stage I enclosure w/silencer
- ❑ Stage II enclosure w/silencer
- ❑ Remote annunciator panel
- ❑ Spring isolators
- ❑ Weather protective enclosure with silencer
- ❑ 2 year standby warranty
- ❑ 5 year basic power warranty

Available Products 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 - The alternator is certified to CSA 22.2. The controls are CSA C282-M1999 and 22.2 No.14 M91.

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 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.