Diesel Generator Set
Model DQHAB 60 Hz
EPA Emissions
300 kW, 375 kVA Standby
270 kW, 338 kVA Prime

Description
Cummins Power Generation commercial generator sets are fully integrated power generation systems providing optimum performance, reliability, and versatility for stationary standby or prime power applications.

A primary feature is strong motor-starting capability and fast recovery from transient load changes. The torque-matched system includes a heavy-duty Cummins 4-cycle diesel 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 GenSet accepts 100% of the nameplate standby rating in one step, in compliance with NFPA 110 Level 1 requirements. The standard PowerCommand® digital electronic control is an integrated system that combines engine and alternator controls for high reliability and optimum GenSet performance.

Optional weather-protective enclosures and coolant heaters allow generators to perform in outdoor weather operating conditions. Environmental concerns are addressed by low exhaust emission engines, sound-attenuated enclosures, exhaust silencers, and dual-wall fuel tanks. 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 (pending) and is available as UL 2200 Listed. The PowerCommand control is UL 508 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 with warranty, service, parts, and planned maintenance support.

Features
UL Listed Generator Set - The complete generator set assembly is available as UL 2200 Listed.
Cummins Heavy-Duty Engine - Rugged 4-cycle industrial diesel 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.
Permanent Magnet Generator (PMG) - Offers enhanced motor starting and fault clearing short circuit capability.
Control System - The PowerCommand electronic control is standard equipment and provides total genset system integration, including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, AmpSentry™ protection, output metering, auto-shutdown at fault detection, and NFPA 110 Level 1 compliance. PowerCommand control is Listed to UL508.
Cooling System - Provides reliable running at the rated power level, at up to 52°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.
Fuel Tanks - Dual wall sub-base fuel tanks are also offered.
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 network.
Generator Set
The general specifications provide representative configuration details. Consult the outline drawing for installation design.

Specifications – General
See outline drawing 500-4645 for installation design specifications.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Standby</th>
<th>Prime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Width, in (mm)</td>
<td>60 (1524)</td>
<td>71 (1803)</td>
</tr>
<tr>
<td>Unit Height, in (mm)</td>
<td>71 (1803)</td>
<td>136 (3453)</td>
</tr>
<tr>
<td>Unit Length, in (mm)</td>
<td>136 (3453)</td>
<td>5900 (2676)</td>
</tr>
<tr>
<td>Unit Dry Weight, lb (kg)</td>
<td>5900 (2676)</td>
<td>6090 (2762)</td>
</tr>
<tr>
<td>Rated Speed, rpm</td>
<td>1800</td>
<td></td>
</tr>
<tr>
<td>Voltage Regulation, No Load to Full Load</td>
<td>±0.5%</td>
<td></td>
</tr>
<tr>
<td>Random Voltage Variation</td>
<td>±0.5%</td>
<td></td>
</tr>
<tr>
<td>Frequency Regulation</td>
<td>Isochronous</td>
<td></td>
</tr>
<tr>
<td>Random Frequency Variation</td>
<td>±0.5%</td>
<td></td>
</tr>
<tr>
<td>Radio Frequency Interference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fan Load, HP (kW)</td>
<td>27 (20.1)</td>
<td>27 (20.1)</td>
</tr>
<tr>
<td>Coolant Capacity with radiator, US Gal (L)</td>
<td>8.9 (33.7)</td>
<td>8.9 (33.7)</td>
</tr>
<tr>
<td>Coolant Flow Rate, Gal/min (L/min)</td>
<td>140 (529.9)</td>
<td>140 (529.9)</td>
</tr>
<tr>
<td>Heat Rejection To Coolant, Btu/min (MJ/min)</td>
<td>10524 (11.10)</td>
<td>8344 (8.80)</td>
</tr>
<tr>
<td>Heat Radiated To Room, Btu/min (MJ/min)</td>
<td>2000 (2.11)</td>
<td>1789 (1.88)</td>
</tr>
<tr>
<td>Maximum Coolant Friction Head, psi (kPa)</td>
<td>10 (68.9)</td>
<td>10 (68.9)</td>
</tr>
<tr>
<td>Maximum Coolant Static Head, ft (m)</td>
<td>46 (14)</td>
<td>46 (14)</td>
</tr>
<tr>
<td>Air</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combustion Air, scfm (m³/min)</td>
<td>866.82 (24.54)</td>
<td>814.59 (23.06)</td>
</tr>
<tr>
<td>Alternator Cooling Air, scfm (m³/min)</td>
<td>1240.0 (35.1)</td>
<td>1240.0 (35.1)</td>
</tr>
<tr>
<td>Radiator Cooling Air, scfm (m³/min)</td>
<td>25000.0 (707.5)</td>
<td>25000.0 (707.5)</td>
</tr>
<tr>
<td>Max. Static Restriction, in H₂O (Pa)</td>
<td>0.50 (124.50)</td>
<td>0.50 (124.50)</td>
</tr>
</tbody>
</table>

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.

Site Derating Factors

Standby engine power available up to 875 m (2870 ft) at ambient temperature up to 40°C (104°F) or up to 400 m (1312 ft) at ambient temperatures up to 50°C (122°F). Engine power derate for altitude and temperature conditions outside those listed: derate 4% per 300 m (984 ft), and 10% per 10°C (18°F).

Prime engine power available up to 1000 m (3280 ft) at ambient temperature up to 40°C (104°F) or up to 325 m (1066 ft) at ambient temperatures up to 50°C (122°F). Engine power derate for altitude and temperature conditions outside those listed: derate 4% per 300 m (984 ft), and 10% per 10°C (18°F).
Engine
Cummins heavy duty diesel engines use advanced combustion technology for reliable and stable power, low emissions, and fast response to sudden load changes.

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, Inc Model QSM11-G4, Turbocharged, EGR, and CAC, diesel-fueled

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement in³ (L)</td>
<td>661.0 (10.8)</td>
</tr>
<tr>
<td>Overspeed Limit, rpm</td>
<td>2100 ±50</td>
</tr>
<tr>
<td>Regenerative Power, kW</td>
<td>30.6</td>
</tr>
<tr>
<td>Cylinder Block Configuration</td>
<td>Cast iron, In-line 6 cylinder</td>
</tr>
<tr>
<td>Battery Capacity</td>
<td>550 amps at ambient temperature of 32°F (-0°C) and above</td>
</tr>
<tr>
<td>Battery Charging Alternator</td>
<td>70 amps</td>
</tr>
<tr>
<td>Starting Voltage</td>
<td>24-volt, negative ground</td>
</tr>
<tr>
<td>Lube Oil Filter Types</td>
<td>Single spin-on, combination full flow and bypass filters</td>
</tr>
<tr>
<td>Standard Cooling System</td>
<td>125°F (52°C) ambient radiator</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Output Standby Prime</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Engine Power Output, bhp (kWm)</td>
<td>470 (350)</td>
</tr>
<tr>
<td>BMEP at Rated Load, psi (kPa)</td>
<td>314 (2165)</td>
</tr>
<tr>
<td>Bore, in. (mm)</td>
<td>4.92 (125)</td>
</tr>
<tr>
<td>Stroke, in. (mm)</td>
<td>5.79 (147.1)</td>
</tr>
<tr>
<td>Piston Speed, ft/min (m/s)</td>
<td>17.37 (0.88)</td>
</tr>
<tr>
<td>Compression Ratio</td>
<td>17:1</td>
</tr>
<tr>
<td>Lube Oil Capacity, qt. (L)</td>
<td>38.8 (36.72)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fuel Flow</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Flow at Rated Load, US Gal/hr (L/hr)</td>
<td>75 (284)</td>
</tr>
<tr>
<td>Maximum Inlet Restriction, in. Hg (mm Hg)</td>
<td>8 (204)</td>
</tr>
<tr>
<td>Maximum Return Restriction, in. Hg (mm Hg)</td>
<td>8 (204)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Air Cleaner</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Air Cleaner Restriction, in. H₂O (kPa)</td>
<td>25.0 (6.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exhaust</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust Flow at Rated Load, cfm (m³/min)</td>
<td>2345 (66.4)</td>
</tr>
<tr>
<td>Exhaust Temperature, °F (°C)</td>
<td>1011 (543.8)</td>
</tr>
<tr>
<td>Max Back Pressure, in. H₂O (kPa)</td>
<td>40.8 (10.15)</td>
</tr>
</tbody>
</table>

| Fuel System                   | Direct injection, number 2 diesel fuel; fuel filter (with water separator); automatic electric fuel shutoff |

<table>
<thead>
<tr>
<th>Fuel Consumption 60 Hz Ratings, kW (kVA)</th>
<th>Standby</th>
<th>Prime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load 1/4</td>
<td>1/2</td>
<td>3/4</td>
</tr>
<tr>
<td>US Gal/hr</td>
<td>6.67</td>
<td>11.57</td>
</tr>
<tr>
<td>L/hr</td>
<td>25.25</td>
<td>43.80</td>
</tr>
</tbody>
</table>
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 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

<table>
<thead>
<tr>
<th>Three Phase Reconnectable</th>
<th>Three Phase Non-Reconnectable</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] 110/190</td>
<td>[ ] 347/600</td>
</tr>
<tr>
<td>[ ] 115/200</td>
<td></td>
</tr>
<tr>
<td>[ ] 115/230</td>
<td></td>
</tr>
<tr>
<td>[ ] 120/208</td>
<td></td>
</tr>
<tr>
<td>[ ] 127/220</td>
<td></td>
</tr>
<tr>
<td>[ ] 139/240</td>
<td></td>
</tr>
<tr>
<td>[ ] 120/240</td>
<td></td>
</tr>
<tr>
<td>[ ] 220/380</td>
<td></td>
</tr>
<tr>
<td>[ ] 230/400</td>
<td></td>
</tr>
<tr>
<td>[ ] 240/416</td>
<td></td>
</tr>
<tr>
<td>[ ] 254/440</td>
<td></td>
</tr>
<tr>
<td>[ ] 277/480</td>
<td></td>
</tr>
</tbody>
</table>
# 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**: 125°C Standby, 105°C @ Prime

**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

<table>
<thead>
<tr>
<th>Feature Code</th>
<th>80°C</th>
<th>105°C</th>
<th>105°C</th>
<th>125°C</th>
<th>125°C</th>
<th>125°C</th>
<th>125°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Ranges</td>
<td>B302</td>
<td>B301</td>
<td>B305</td>
<td>B252</td>
<td>B246</td>
<td>B300</td>
<td></td>
</tr>
<tr>
<td>Surge kW</td>
<td>347/600</td>
<td>120/208</td>
<td>347/600</td>
<td>110/190</td>
<td>120/208</td>
<td>277/480</td>
<td>347/600</td>
</tr>
<tr>
<td>Motor Starting kVA (at 90% sustained voltage)</td>
<td>PMG</td>
<td>1372</td>
<td>317</td>
<td>318</td>
<td>318</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Load Current - Amps at Standby Rating</td>
<td>120/208</td>
<td>1042</td>
<td>139/240</td>
<td>985</td>
<td>220/380</td>
<td>903</td>
<td>240/416</td>
</tr>
</tbody>
</table>

**Notes:**
Single phase power can be taken from a three phase generator set at up to 40% of the generator set nameplate kW rating at unity power factor.
## Control System

### PowerCommand Control with AmpSentry™ Protection (PCC2100 CAN)

- The PowerCommand Control is an integrated generator set control system providing governing, voltage regulation, engine protection, and operator interface functions.
- PowerCommand Controls include integral UL Listed AmpSentry protection. AmpSentry provides a full range of alternator protection functions that are matched to the alternator provided.
- Controls provided include Battery monitoring and testing features.
- Integral PCCNet interface, to allow high speed network interconnections to remote input/output (I/O) and annunciator modules.
- InPower PC-based service tool available for detailed diagnostics.
- NEMA 3R enclosure.
- Suitable for operation in ambient temperatures from -40°C to +70°C, and altitudes to 13,000 feet (5000 meters).
- Prototype tested; UL, CSA, and CE compliant.

### AmpSentry AC Protection

- Overcurrent and short circuit shutdown
- Overcurrent warning
- Single & 3-phase fault regulation
- Over and under voltage shutdown
- Over and under frequency shutdown
- Overload warning with alarm contact
- Reverse power and reverse Var shutdown
- Excitation fault

### Engine Protection

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

### Operator Interface

- OFF/MANUAL/AUTO mode switch
- MANUAL RUN/STOP switch
- Panel lamp test switch
- Emergency Stop switch
- Alpha-numeric display with pushbutton access, for viewing engine and alternator data and providing setup, controls, and adjustments
- LED lamps indicating genset running, not in auto, common warning, common shutdown
- (5) configurable LED lamps
- LED Bargraph AC data display (optional)

### Alternator Data

- Line-to-line and line-to-neutral AC volts
- 3-phase AC current
- Frequency
- Total and individual phase kW and kVA

### Engine Data

- DC voltage
- Lube oil pressure
- Coolant temperature
- Lube oil temperature (optional)

### Other Data

- Genset model data
- Start attempts, starts, running hours
- KW hours (total and since reset)
- Fault history
- Load profile (hours less than 30% and hours more than 90% load)
- System data display (optional with network and other PowerCommand gensets or transfer switches)

### Governing

- Digital electronic isochronous governor
- CAN data-link interface to full authority electronic engine control

### Voltage Regulation

- Integrated digital electronic voltage regulator
- 3-phase line to neutral sensing
- PMG (Optional)
- Single and three phase fault regulation
- Configurable torque matching

### Control Functions

- Data logging on faults
- Fault simulation (requires InPower)
- Time delay start and cooldown
- Cycle cranking
- (4) Configurable customer inputs
- (4) Configurable customer outputs
- PCCNet Interface, network interconnections to I/O modules, annunciators, and other equipment

### Options

- [ ] Analog AC Meter Display
- [ ] Thermostatically-Controlled Space Heater
- [ ] Key-type mode switch
- [ ] Engine oil temperature sensing and alarm
- [ ] Auxiliary Relays (3)
- [ ] Echelon LonWorks interface
- [ ] LonWorks network input and output module(s) (loose) (8) Configurable inputs and (16) outputs
- [ ] Remote network annunciator (loose) - LonWorks

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Generator Set Options

Engine
[ ] 240 V, 300 W lube oil heater
[ ] 480 V, 300 W lube oil heater
[ ] 208/240-480 V, 4500 W coolant heater
[ ] 208/240-480 V, 6500 W coolant heater
[ ] Heavy Duty Air Cleaner

Fuel System
[ ] 270 Gallon (L) sub-base tank
[ ] 300 Gallon (L) sub-base tank
[ ] 400 Gallon (L) sub-base tank
[ ] 500 Gallon (L) sub-base tank
[ ] 600 Gallon (L) sub-base tank
[ ] 660 Gallon (L) sub-base tank
[ ] 850 Gallon (L) sub-base tank
[ ] 1700 Gallon (L) sub-base tank
[ ] Day Tank with pump control

Alternator
[ ] 80°C Rise Alternator
[ ] 105°C rise alternator
[ ] 125°C rise alternator
[ ] 120 V, 100 W anti-condensation heater
[ ] 240 V, 100 W anti-condensation heater

Control Panel
[ ] 120 V, 30 W control anti-condensation heater
[ ] 240 V, 30 W control anti-condensation heater
[ ] Exhaust pyrometer
[ ] Ground fault indication
[ ] Remote fault signal package
[ ] Run relay package

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

Generator Set
[ ] AC entrance box
[ ] Batteries
[ ] Battery charger
[ ] Export box packaging
[ ] UL 2200 Listed
[ ] Main line circuit breaker
[ ] PowerCommand Network Communication Module (NCM)
[ ] QuietSite Stage 1 housing w/silencer
[ ] QuietSite Stage 2 housing w/silencer
[ ] Remote annunciator panel
[ ] Spring isolators
[ ] Weather protective enclosure with silencer
[ ] 2 year prime power warranty
[ ] 2 year standby warranty
[ ] 5 year basic power warranty
[ ] 10 year major components warranty

Available Products 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. 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 (pending).

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 (pending). The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage.

See your distributor for more information

Cummins Power Generation
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Minneapolis, MN 55432
763.574.5000
Fax: 763.574.5298
www.cumminspower.com

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Detector and AmpSentry are trademarks of Cummins Inc.

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.