Specification sheet

Diesel generator set

QSK60 series engine

1450 kW - 2250 kW 60 Hz

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

Features

Cummins® heavy-duty engine - Rugged 4-cycle, industrial diesel 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 and fault clearing short-circuit capability.

Permanent magnet generator (PMG) - Offers enhanced motor starting and fault clearing short-circuit capability.

Control system - The PowerCommand® digital 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™ protective relay, output metering, auto-shutdown at fault detection and NFPA 110 Level 1 compliance.

Cooling system - Standard and enhanced integral set-mounted radiator systems, designed and tested for rated ambient temperatures, simplifies facility design requirements for rejected heat.

NFPA - The genset accepts full rated load in a single step in accordance with NFPA 110 for Level 1 systems.

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Standby rating</th>
<th>Prime rating</th>
<th>Continuous rating</th>
<th>Emissions compliance</th>
<th>Data sheets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60 Hz kW (kVA)</td>
<td>60 Hz kW (kVA)</td>
<td>60 Hz kW (kVA)</td>
<td>EPA</td>
<td>D-3509</td>
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<tr>
<td>DQKAD</td>
<td>1750 (2187)</td>
<td>1600 (2000)</td>
<td>1450 (1812)</td>
<td>EPA</td>
<td>D-3509</td>
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<td>2000 (2500)</td>
<td>1825 (2281)</td>
<td>1600 (2000)</td>
<td>EPA Tier 2</td>
<td>D-3510</td>
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<tr>
<td>DQKAF</td>
<td>2250 (2812)</td>
<td>1825 (2281)</td>
<td></td>
<td>EPA Tier 2</td>
<td>D-3511</td>
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</tbody>
</table>
Generator set specifications

<table>
<thead>
<tr>
<th>Governor regulation class</th>
<th>ISO8528 Part 1 Class G3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage regulation, no load to full load</td>
<td>± 0.5%</td>
</tr>
<tr>
<td>Random voltage variation</td>
<td>± 0.5%</td>
</tr>
<tr>
<td>Frequency regulation</td>
<td>Isochronous</td>
</tr>
<tr>
<td>Random frequency variation</td>
<td>± 0.25%</td>
</tr>
<tr>
<td>Radio frequency emissions compliance</td>
<td>IEC 801.2 through IEC 801.5; MIL STD 461C, Part 9</td>
</tr>
</tbody>
</table>

Engine specifications

| Bore | 158.8 mm (6.25 in) |
| Stroke | 190 mm (7.48 in) |
| Displacement | 60.2 litres (3673 in³) |
| Configuration | Cast iron, V 16 cylinder |
| Battery capacity | 2200 amps minimum at ambient temperature of 0 °C (32 °F) |
| Battery charging alternator | 55 amps |
| Starting voltage | 24 volt, negative ground |
| Fuel system | Cummins’ Modular Common Rail System |
| Fuel filter | Two stage spin-on fuel filter and water separator system. Stage 1 has a three element, 7 micron filter and Stage 2 has a three element, 3 micron filter. |
| Air cleaner type | Dry replaceable element |
| Lube oil filter type(s) | Four spin-on, combination full flow filter and bypass filters |
| Standard cooling system | High ambient cooling system |

Alternator specifications

| Design | Brushless, 4 pole, drip proof, revolving field |
| Stator | 2/3 pitch |
| Rotor | Single bearing, flexible disc |
| Insulation system | Class H on low and medium voltage, Class F on high voltage |
| Standard temperature rise | 125 °C standby / 105 °C prime |
| Exciter type | PMG (permanent magnet generator) |
| Phase rotation | A (U), B (V), C (W) |
| Alternator cooling | Direct drive centrifugal blower fan |
| AC waveform total harmonic distortion | < 5% 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 |

Available voltages

<table>
<thead>
<tr>
<th>60 Hz line-neutral/line-line</th>
</tr>
</thead>
<tbody>
<tr>
<td>220/380</td>
</tr>
<tr>
<td>277/480</td>
</tr>
<tr>
<td>7970/13800</td>
</tr>
</tbody>
</table>

Note: Consult factory for other voltages.

Generator set options and accessories

**Engine**
- 208/240/480 V thermally controlled coolant heater for ambient above and below 4.5 °C (40 °F)
- Dual 208/240/480 V 300 W lube oil heaters
- Heavy duty air cleaner
- Triplex fuel filter

**Alternator**
- 80 °C rise
- 105 °C rise
- 125 °C rise
- 150 °C rise
- 120/240 V 300 W anti-condensation heater
- Increased motor starting capabilities

**Control panel**
- PowerCommand 3.3
- Multiple language support
- 120/240 V 100 W control
- Anti-condensation heater
- Exhaust pyrometer
- Ground fault indication
- Remote annunciator panel
- Paralleling relay package
- Shutdown alarm relay package
- Audible engine shutdown alarm
- AC output analog meters (bargraph)

**Exhaust system**
- Industrial grade exhaust silencer
- Residential grade exhaust silencer
- Critical grade exhaust silencer
- Exhaust packages

**Cooling system**
- Remote cooling
- Enhanced high ambient temperature (50 °C)

**Generator set**
- Battery
- Battery charger
- Bottom entry chute
- Circuit breaker – skid mounted up to 3000 Amp
- Circuit breaker auxiliary and trip contacts
- IBC and OSHPD seismic certification
- In-skid AVM
- LV and MV entrance box
- Manual language – English, French and Spanish
- Spring isolators
- 2 year warranty
- 5 year warranty
- 10 year major components warranty

Note: Some options may not be available on all models - consult factory for availability.

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PowerCommand 3.3 Control System

An integrated microprocessor based generator set control system providing voltage regulation, engine protection, alternator protection, operator interface and isochronous governing. Refer to document S-1570 for more detailed information on the control.

**AmpSentry** – Includes integral AmpSentry protection, which provides a full range of alternator protection functions that are matched to the alternator provided.

**Power management** – Control function provides battery monitoring and testing features and smart starting control system.

**Advanced control methodology** – Three phase sensing, full wave rectified voltage regulation, with a PWM output for stable operation with all load types.

**Communications interface** – Control comes standard with PCCNet and Modbus interface.

**Regulation compliant** – Prototype tested: UL, CSA and CE compliant.

**Service** – InPower™ PC-based service tool available for detailed diagnostics, setup, data logging and fault simulation.

**Easily upgradeable** – PowerCommand controls are designed with common control interfaces.

**Reliable design** – The control system is designed for reliable operation in harsh environment.

**Multi-language support**

**Operator panel features**

**Operator/display functions**
- Displays paralleling breaker status
- Provides direct control of the paralleling breaker
- 320 x 240 pixels graphic LED backlight LCD
- Auto, manual, start, stop, fault reset and lamp test/panel lamp switches
- Alpha-numeric display with pushbuttons
- LED lamps indicating genset running, remote start, not in auto, common shutdown, common warning, manual run mode, auto mode and stop

**Paralleling control functions**
- First Start Sensor System selects first genset to close to bus
- Phase Lock Loop Synchronizer with voltage matching
- Sync check relay
- Isochronous kW and kVar load sharing
- Load govern control for utility paralleling
- Extended Paralleling (baseload/peak shave) Mode
- Digital power transfer control, for use with a breaker pair to provide open transition, closed transition, ramping closed transition, peaking and base load functions,

**Alternator data**
- Line-to-neutral and line-to-line AC volts
- 3-phase AC current
- Frequency
- kW, kvar, power factor kVA (three phase and total)

**Engine data**
- DC voltage
- Engine speed
- Lube oil pressure and temperature
- Coolant temperature
- Comprehensive FAE data (where applicable)

**Other data**
- Genset model data
- Start attempts, starts, running hours, kW hours
- Load profile (operating hours at % load in 5% increments)
- Fault history
- Data logging and fault simulation (requires InPower)

**Standard control functions**

**Digital governing**
- Integrated digital electronic isochronous governor
- Temperature dynamic governing

**Digital voltage regulation**
- Integrated digital electronic voltage regulator
- 3-phase, 4-wire line-to-line sensing
- Configurable torque matching

**AmpSentry AC protection**
- AmpSentry protective relay
- Over current and short circuit shutdown
- Over current warning
- Single and three phase fault regulation
- Over and under voltage shutdown
- Over and under frequency shutdown
- Overload warning with alarm contact
- Reverse power and reverse var shutdown
- Field overload shutdown

**Engine protection**
- Battery voltage monitoring, protection and testing
- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Cranking lockout
- Sensor failure indication
- Low fuel level warning or shutdown
- Fuel-in-rupture-basin warning or shutdown
- Full authority electronic engine protection

**Control functions**
- Time delay start and cool down
- Real time clock for fault and event time stamping
- Exerciser clock and time of day start/stop
- Data logging
- Cycle cranking
- Load shed
- Configurable inputs and outputs (4)
- Remote emergency stop

**Options**
- Auxiliary output relays (2)
Emergency standby power (ESP):
Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Limited-time running power (LTP):
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

Prime power (PRP):
Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Base load (continuous) power (COP):
Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.

<table>
<thead>
<tr>
<th>Model</th>
<th>Dim “A” mm (in.)</th>
<th>Dim “B” mm (in.)</th>
<th>Dim “C” mm (in.)</th>
<th>Set Weight* dry kg (lbs)</th>
<th>Set Weight* wet kg (lbs)</th>
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<tbody>
<tr>
<td>DQKAD</td>
<td>3096 (121.9)</td>
<td>2479 (97.6)</td>
<td>6759 (266.1)</td>
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<tr>
<td>DQKAF</td>
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<td>2479 (97.6)</td>
<td>6759 (266.1)</td>
<td>17837 (39323)</td>
<td>18537 (40867)</td>
</tr>
</tbody>
</table>

* Weights represent a set with standard features. See outline drawings for weights of other configurations.

Codes and standards

This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.

The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins Power Generation products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.

The generator set is available listed to UL 2200, Stationary Engine Generator Assemblies, for all 60 Hz low voltage models. The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage. Circuit breaker assemblies are UL 489 Listed for 100% continuous operation and also UL 869A Listed Service Equipment.

All low and medium voltage models are CSA certified to product class 4215-01.


Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building’s electrical system except through an approved device or after building main switch is open.

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