



Diesel Generator set QSK50 series engine

1135 kW – 1365kW 60 Hz
Data Center Continuous
EPA emissions



Description

Cummins® commercial generator sets are fully integrated power generation systems providing optimum performance, reliability and versatility for Data Center applications.

Features

Data Center Continuous (DCC) - Applicable for supplying power continuously to a constant or varying electrical load for unlimited hours in a data center application.

Uptime compliant - Meets the requirement of a Tier III and IV data center site by being rated to run for unlimited hours of operation when loaded to 'N' demand for the engine generator set.

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 and 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.

| Model | 60 Hz kW (kVA) | Emissions compliance EPA | Data sheets 60 Hz |
|-------|----------------|--------------------------|-------------------|
| DQGAE | 1135 (1419) | EPA Tier 2 | D-3488DC |
| DQGAF | 1365 (1706) | EPA Tier 2 | D-3489DC |

Generator set specifications

| | |
|--|---|
| Governor regulation class | ISO 8528 Part 1 Class G3 |
| Voltage regulation, no load to full load | ± 0.5% |
| Random voltage variation | ± 0.5% |
| Frequency regulation | Isochronous |
| Random frequency variation | ± 0.25% |
| Radio Frequency (RF) emission compliance | IEC 801.2 through IEC 801.5; MIL STD 461C, Part 9 |

Engine specifications

| | |
|-----------------------------|--|
| Bore | 159 mm (6.25 in.) |
| Stroke | 159 mm (6.25 in.) |
| Displacement | 50.3 litres (3067 in ³) |
| Configuration | Cast iron, V 16 cylinder |
| Battery capacity | 1800 amps minimum at ambient temperature of 0 °C (32 °F) |
| Battery charging alternator | 55 amps |
| Starting voltage | 24 volts, 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 |
| 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 fan |
| AC waveform Total Harmonic Distortion (THDV) | < 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

| | | |
|-----------|-----------|-------------|
| • 220/380 | • 240/416 | • 255/440 |
| • 277/480 | • 347/600 | • 2400/4160 |

Note: Consult factory for other voltages.

Generator set options and accessories

Engine

- 208/240/480 V thermo-statically controlled coolant heater for ambient above and below 4.5 °C (40 °F)
- Dual 120/208/240/480 V 300 W lube oil heaters
- Heavy duty air cleaner
- Triplex fuel filter

Cooling system

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

Exhaust system

- Exhaust silencer packages

Control panel

- 120/240 V 100 W control anti-condensation heater
- Exhaust pyrometer
- Remote annunciator panel
- Paralleling relay package
- Shutdown alarm relay package
- Audible engine shutdown alarm

Generator set options and accessories (continued)

Generator set

- Battery
- Battery charger
- Bottom entry chute
- Circuit breaker – skid mounted up to 3000 Amp
- IBC and OSHPD seismic certification
- In-skid AVM
- Spring isolators
- 2 year warranty
- 5 year warranty
- 10 year major components warranty

Data Center options

- Automatic oil make up system
- Closed crank ventilation system
- Oil sampling valve
- Propylene glycol coolant
- Customized testing

Note: Some options may not be available on all models - consult factory for availability. Data Center options are available through RFQ with the Custom Applications Group and could result in additional leadtimes. Please consult with the Custom Applications Group to understand feasibility.

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

Operator/display functions

- 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 (base load/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

Standard control functions (continued)

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

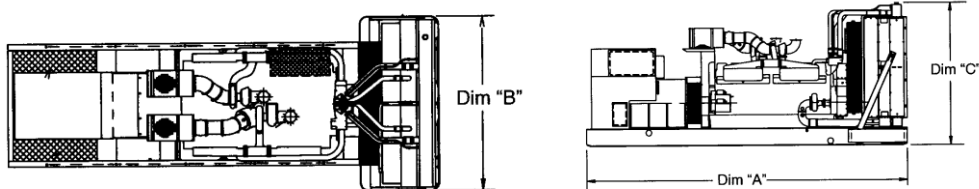
- Battery voltage monitoring, protection and testing
- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Cranking 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)



Do not use for installation design





This outline drawing is for reference only. See respective model data sheet for specific model outline drawing number.

| Model | Dim "A" mm (in.) | Dim "B" mm (in.) | Dim "C" mm (in.) | Set weight* dry kg (lbs) | Set weight* wet kg (lbs) |
|-------|---------------------|---------------------|---------------------|-----------------------------|-----------------------------|
| DQGAE | 6381 (251) | 2285 (90) | 2474 (97) | 11293 (24897) | 11926 (26292) |
| DQGAF | 6381 (251) | 2285 (90) | 2474 (97) | 11551 (25465) | 12184 (26861) |

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

Codes and standards

Codes or standards compliance may not be available with all model configurations – consult factory for availability.

| | | | |
|---|---|--|---|
|  | <p>This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.</p> |  | <p>This generator set is available listed to UL 2200 for all 60 Hz low voltage models, Stationery Engine Generator Assemblies. 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.</p> |
|  | <p>The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.</p> | <p>U.S. EPA</p> | <p>Engine certified to Stationary Emergency U.S. EPA New Source Performance Standards, 40 CFR 60 subpart IIII Tier 2 exhaust emission levels. U.S. applications must be applied per this EPA regulation.</p> |
|  | <p>All low voltage models are CSA certified to product class 4215-01.</p> | <p>International Building Code</p> | <p>The genset package is certified for seismic application in accordance with the following international Building Code: IBC2000, IBC2003, IBC2006, and IBC2009.</p> |

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.

For more information contact your local Cummins distributor or visit power.cummins.com

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