

Tier4 certified diesel generator set QSK50 series engine

1135 kW-1500 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, prime and continuous 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.

Cummins Aftertreatment System - Fully integrated power generation systems that are certified to EPA Tier 4 standards. They provide optimum performance, reliability and versatility for stationary standby, prime power and continuous duty applications.

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.

	Standby rating	Prime rating	Continuous rating	Emissions compliance	Data sheets
	60 Hz	60 Hz	60 Hz		
Model	kW (kVA)	kW (kVA)	kW (kVA)	EPA	60 Hz
DQGAR	1250 (1563)	1135 (1419)	1000 (1250)	T4F certified	D-3536
DQGAS	1500 (1875)	1365 (1706)	1100 (1375)	T4F certified	D-3537

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 emissions 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 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

Aftertreatment specifications

Model	CA452
Emissions certification	Tier4F certified
Duct diameter	1143 mm (45 in)
Duct quantity	2
Components included	Insulated aftertreatment ducts, saddle supports for aftertreatment, control panel, DEF tank, optional heater with ILB, harness from control panel to engine and AFT, lifting tool. Assembly required at site.

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	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

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

Note: Consult factory for other voltages.

Generator set options and accessories

<p>Engine</p> <ul style="list-style-type: none"> .. 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 <p>Alternator</p> <ul style="list-style-type: none"> .. 80 °C rise .. 105 °C rise .. 125 °C rise .. 150 °C rise .. 120/240 V 300 W anti-condensation heater .. Increased motor starting capabilities 	<p>Control panel</p> <ul style="list-style-type: none"> .. 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) 	<p>Aftertreatment system</p> <ul style="list-style-type: none"> .. DEF lines .. DEF freeze protection kit .. SCR only configuration .. SCR w/heater configuration .. SCR w/heater and DPF <p>Cooling system</p> <ul style="list-style-type: none"> .. Remote cooling .. Enhanced high ambient temperature (50 °C) 	<p>Generator set</p> <ul style="list-style-type: none"> .. 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 .. Spring isolators .. 2 year warranty .. 5 year warranty .. 10 year major components warranty
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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

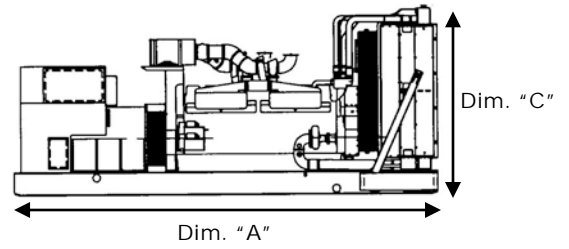
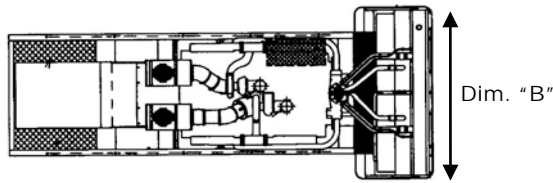
- Battery voltage monitoring, protection and testing
- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Cranking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

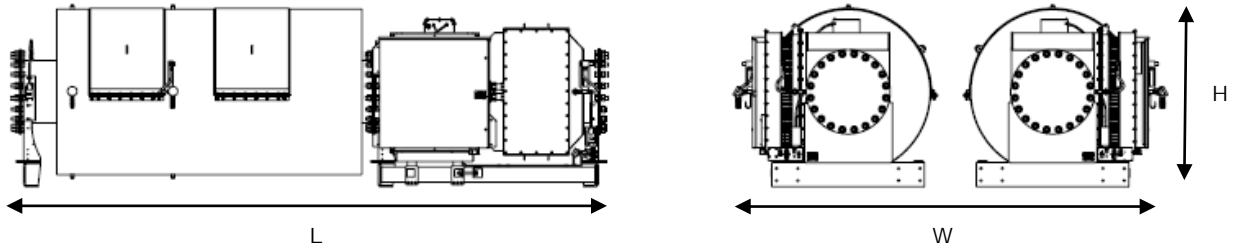
- Auxiliary output relays (2)



Generator set weights and dimensions

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Set Weight* dry kg (lbs)	Set Weight* wet kg (lbs)
DQGAR	6381 (251)	2285 (90)	2468 (97)	12089 (26651)	12722 (28047)
DQGAS	6381 (251)	2285 (90)	2468 (97)	12733 (28071)	13366 (29467)

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



Aftertreatment weights and dimensions






Aftertreatment model number	Genset model	L (Length) mm (in.)	W (Minimum Width) mm (in.)	H (Height) mm (in.)	Weight of aftertreatment system (lbs)
CA452*	DQGAR	4651 (183)	3173 (125)	1260 (50)	8734
CA452*	DQGAS	4651 (183)	3173 (125)	1260 (50)	8734

* Due to multiple configurations of the CA452 model, maximum weight of the model is shown.

Note: Dimension and weights are subject to change. See submittal data for exact details.

Codes and standards

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

 <p>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.</p>	 <p>The generator set is available listed to UL 2200 for all 60 Hz low voltage models, Stationary 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>All low and medium voltage models are CSA certified to product class 4215-01.</p>  <p>The Aftertreatment System bears the ETL Listed Mark as proof of conformity to NFPA 79, UL 61010C-1, and CSA 22.2 No. 61010-1-12.</p>	<p>U.S. EPA</p> <p>Engine certified to US EPA Nonroad 40CFR1039 and Stationary (Emergency and Non-Emergency) US EPA NSPS, 60CFR Subpart IIII Tier4 Emissions Standards.</p>
 <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>International Building Code</p> <p>The genset package is certified for seismic application in accordance with the following International Building Code: IBC2012.</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.

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