Specification sheet

Diesel generator set QSG12 series engine

400 kVA - 450 kVA 50 Hz

320 kWe-400 kWe 60 Hz

Description

This Cummins® Power Generation commercial generator set is a fully integrated power generation system, providing optimum performance, reliability, and versatility for stationary standby and prime power.

Features

Cummins® heavy-duty engine - Rugged 4-cycle industrial diesel delivers reliable power, low emissions and fast response to load changes.

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

Alternator - Low reactance 2/3 pitch windings; low waveform distortion with non-linear loads, fault clearing short-circuits capability, and class H insulation.

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

Control system – The PowerCommand® electronic control is standard equipment and provides total genset system integration, including auto remote start/stop, precise frequency and voltage regulation, alarm and status message display, AmpSentry protection and output metering.

Enclosures - Optional weather-protective and sound-attenuated enclosures.

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

Genset Model	Standby rating		Prime rating		Engine Model	Alternator Model	Genset Controller
	50 Hz kVA (kWe)	60 Hz kWe (kVA)	50 Hz kVA (kWe)	60 Hz kWe (kVA)			
C400D5	400 (320)		360 (288)		QSG12-G3	S4F	PC2.2/PC3.3
C450D5	450 (360)		410 (328)		QSG12-G4	S4G	PC2.2/PC3.3
C350D6		350 (438)		320 (400)	QSG12-G3	S4F	PC2.2/PC3.3
C400D6		400 (500)		365 (456)	QSG12-G4	S4G	PC2.2/PC3.3

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Generator set specifications

Voltage regulation, no load to full load	± 1%
Random voltage variation	± 1%
Frequency regulation	Isochronous
Random frequency variation	± 0.25%
Radio frequency emissions compliance	BS EN 61000-6-2:2005 / BS EN 61000-6-3:2007 +A1:2001

Engine specifications

Design	4 cycle, in-line, turbo-charged and charge air cooled
Bore	132 mm (5.2 in)
Stroke	144 mm (5.67 in)
Displacement	11.8 liter (721 in^3)
Cylinder block	Cast iron, 6 cylinder
Battery capacity	100AH
Battery charging alternator	Output: 28V 110 Amps
Starting voltage	24 volt, negative ground
Fuel system	XPI
Fuel filter	Spin on fuel filters with water separator
Air cleaner type	Dry replaceable element with restriction indicator
Lube oil filter type(s)	Spin on full flow filter
Standard cooling system	122 ºF (50 ºC) ambient radiator

Alternator specifications

Design	Brushless, single bearing, revolving field
Stator	2/3 pitch
Rotor	Single bearing, flexible disc
Insulation system	Class H
Standard temperature rise	Standby 150 ºC
Exciter type	Self excited (PMG optional)
Phase rotation	A (U), B (V), C (W)
Alternator cooling	Direct drive centrifugal blower fan
AC waveform total harmonic distortion (THDV)	No load <1.5%. Non distorting balanced linear load <5%
Telephone influence factor (TIF)	< 50 per NEMA MG1
Telephone harmonic factor (THF)	<2%

Available voltages

50 Hz line – neutral / line - line		60 Hz line – neutral / line - line	
• 230/400	• 220/380	• 230/400	• 220/380
• 127/220	• 240/416	• 127/220	• 255/440
		• 120/208	• 139/240
		• 133/230	• 277/480

Generator set options

Engine
- ☐ Heavy duty air cleaner
- ☐ Water jacket heater 240V

Enclosure
- ☐ Sound attenuated canopy

Alternator
- ☐ Alternator heater
- ☐ Exciter voltage regulator (PMG)
- ☐ High alternator temp shutdown

Circuit breaker
- ☐ 3 or 4 pole main circuit breaker
- ☐ Motorised 3 or 4 pole circuit breaker
- ☐ Aux contacts and trip alarm
- ☐ Shunt trip – 24 VDC

Fuel Tank
- ☐ Low fuel level warning or shutdown
- ☐ High fuel level warning
- ☐ Electric fuel transfer pump

Control panel
- ☐ PowerCommand 3.3
- ☐ PowerCommand 3.3 MLD
- ☐ AC output bargraph
- ☐ Shutdown audible alarm
- ☐ Earth fault shutdown
- ☐ Control cabinet heater

Warranty
- ☐ 2 years for prime application
- ☐ 5 years for standby application
- ☐ 10 years for major components

Silencer
- ☐ 9 dB attenuation critical silencer
- ☐ 25 dB attenuation residential silencer

Battery charger
- ☐ Set mounted
- ☐ Standalone
- ☐ 5A

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

PowerCommand 2.2 control system

The PowerCommand control system is an integrated microprocessor based generator set control system providing voltage regulation, engine protection, alternator protection, operator interface and isochronous governing. Refer to document S-1568 for more detailed information on the control.

Major Features

- 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 PCC Net and Modbus interface.
- 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

- 128 x 128 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 mode.

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.

Engine protection

- Battery voltage monitoring, protection and testing.
- Overspeed shutdown.
- Low oil pressure warning and shutdown.
- High/low coolant temperature warning or shutdown.
- Low coolant level warning or shutdown.
- Fail to start (over crank) shutdown.
- Fail to crank shutdown.
- Cranking lockout.
- Sensor failure indication.
- Low fuel level warning or shutdown (optional).
- Fuel-in-rupture-basin warning or shutdown (optional).
- 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.

PowerCommand 3.3 control system (MLD)

The PowerCommand 3.3 has the following additional features and benefits over the PowerCommand 2.2. Refer to document S-1570 for more detailed information on the control.

Operator panel features

- 320 x 240 pixels graphic LED backlight LCD.
- In addition to the 2.2 functions, the operator panel displays paralleling breaker status and provides for direct control of the paralleling breaker.

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.

Master less Load Demand (MLD)

- Load dependant start/stop of multi-gen system
- Predictive load input
- Run hour equalization

Ratings definitions

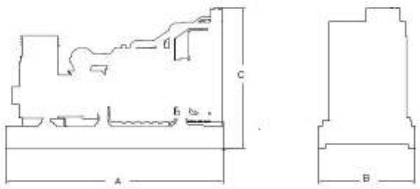
Emergency standby power (ESP):

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 3046-1, obtained and corrected in accordance with ISO 15550.

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 ISO8528, ISO 3046-1 and corrected in accordance with ISO15550.

OPEN



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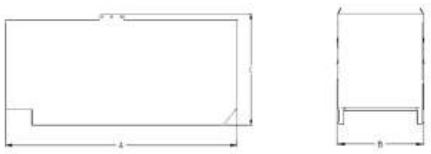

This outline drawing is to provide representative configuration details for Model series only.
See respective model data sheet for specific model outline drawing number.

Do not use for installation design

Dimension and Weight

Model	Chassis	Open					Enclosed				
		Dim"A" mm	Dim"B" mm	Dim"C" mm	Dry wt.* kg	Wet wt.* kg	Dim"A" mm	Dim"B" mm	Dim"C" mm	Dry wt.* kg	Wet wt.* kg
C400D5	Narrow	3686	1100	2180	3186	3869					
	Dual Wall	3849	1500	2167	3162	3987	5092	1564	2440	4504	5329
	Wide	3376	1500	2103	3219	3949	5092	1564	2375	4460	5190
							5095**	1500**	2252**	4317**	5067**
C450D5	Narrow	3686	1100	2180	3216	3899					
	Dual Wall	3849	1500	2167	3192	4017	5092	1564	2440	4534	5359
	Wide	3376	1500	2103	3249	3979	5092	1564	2375	4490	5220
							5095**	1500**	2252**	4347**	5097**
C350D6	Narrow	3686	1100	2180	3186	3869					
	Dual Wall	3849	1500	2167	3162	3987	5092	1564	2440	4504	5329
	Wide	3376	1500	2103	3219	3949	5092	1564	2375	4560	5290
							5095**	1500**	2252**	4317**	5067**
C400D6	Narrow	3686	1100	2180	3216	3899					
	Dual Wall	3849	1500	2167	3192	4017	5092	1564	2440	4534	5359
	Wide	3376	1500	2103	3249	3979	5092	1564	2375	4590	5320
							5095**	1500**	2252**	4347**	5097**

* Note: Weights represent a set with standard features. See outline drawings for weights of other configurations.
**Note: Weights and dimensions are for 4-point Chassis Lift.

Codes and standards

ISO 9001	This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.	Emissions Compliance	Non-Certified
CE	The CE marking is only valid when equipment is used in a fixed installation application. Material compliance declaration is available upon request.	ISO 8528	This generator set has been designed to comply with ISO 8528 regulation.
UKCA	The UKCA marking is only valid when equipment is used in a fixed installation application. Material compliance declaration is available upon request.		

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

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