



Diesel generator set QSZ13 series engine

400 kVA - 550 kVA 50 Hz
 350 kWe - 500 kWe 60 Hz



Description

This Cummins® 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 - Standard 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 sound-attenuated enclosures are available.

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

Model	Standby rating		Prime rating		EU Stage/ U.S.EPA	Controller Std/Opt	Data sheet
	50 Hz kVA (kWe)	60 Hz kWe (kVA)	50 Hz kVA (kWe)	60 Hz kWe (kVA)			
C400D5EB	400 (320)		364 (291)		EU Stage IIIa	2.2/3.3	EMERD-6301
C450D5EB	450 (360)		409 (327)		EU Stage IIIa	2.2/3.3	EMERD-5934
C500D5	500 (400)		455 (364)		EU Stage II	2.2/3.3	EMERD-5935
C550D5	550 (440)		500 (400)		UR	2.2/3.3	EMERD-6530
C350D6E		350 (440)		320 (400)	EPA Tier 3	2.2/3.3	EMERD-6302
C400D6E		400 (500)		364 (455)	EPA Tier 3	2.2/3.3	EMERD-5936
C440D6		440 (550)		400 (500)	EPA Tier 2	2.2/3.3	EMERD-5937
C500D6		500 (625)		455 (569)	UR	2.2/3.3	EMERD-6531

Generator set specifications

Performance class	ISO 8528 Genset models have been tested in accordance with ISO 8528-5. Consult factory for transient performance information.
Voltage regulation, no load to full load	± 1%
Random voltage variation	± 1%
Frequency regulation	Isochronous
Random frequency variation	± 0.25%
Electromagnetic Compatibility Performance	Emissions to EN 61000-6-2:2005 Immunity to EN 61000-6-4:2007+A1:2011

Engine specifications

Design	4 cycle, in-line, turbocharged and charge air-cooled
Bore	130 mm (5.12 in)
Stroke	163 mm (6.42 in)
Displacement	13 liter (793 in ³)
Cylinder block	Cast iron, 6 cylinder
Battery capacity	100 AH
Battery charging alternator	80 amps
Starting voltage	24 volts, 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 °F (50 °C) 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 125-163 °C
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 Harmonic Factor (THF)	< 2%

Available voltages

50 Hz Line – Neutral/Line - Line		60 Hz Line – Neutral/Line - Line	
• 120/208*	• 220/380	• 120/208	• 220/380
• 127/220	• 230/400	• 127/220	• 230/400
• 255/440*	• 240/416	• 139/240*	• 240/416
		• 277/480	• 255/440

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

Generator set options

Engine

- Heavy duty air cleaner
- Coolant heater 240 v

Fuel Tank

- Low fuel level warning or shutdown
- High fuel level warning
- Electric fuel transfer pump
- Dual wall fuel tank

Battery charger

- Set mounted
- Standalone
- 5 A or 10 A

Alternator

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

Control panel

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

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

Warranty

- 1 years for prime application
- 2 years/1000hours for standby application
- 3 years for major components

Silencer

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

Enclosure

- Sound attenuated canopy
- Sound attenuated canopy with 4-point chassis lift

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

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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 PCCNet 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).

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

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 (overcrank) 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.

- 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 control of the paralleling breaker.

Masterless Load Demand (MLD)

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

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.

Ratings definitions

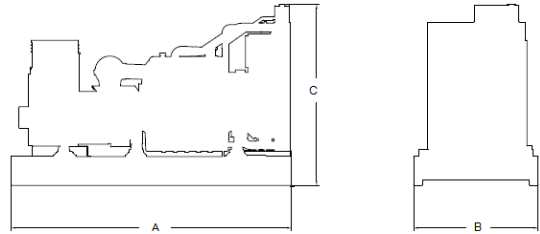
Emergency Standby Power (ESP):

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 ISO15550.

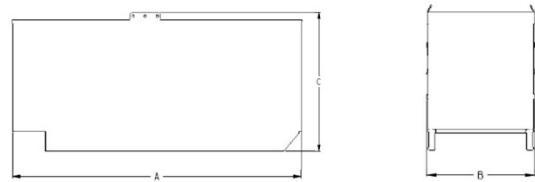
Prime Power (PRP):

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



ENCLOSED



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

Weight and Dimension

Model	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
C400D5EB	3376	1500	2191	3884	3934	5095	1564	2441	5020	5070
						5095**	1564**	2330**	4813**	4863**
C450D5EB	3376	1500	2191	3884	3934	5095	1564	2441	5020	5070
						5095**	1564**	2330**	4813**	4863**
C500D5	3376	1500	2191	3879	3944	5095	1564	2441	5015	5080
						5095**	1564**	2330**	4807**	4872**
C550D5	3376	1500	2191	4120	4239	5095	1564	2441	5439	5558
						5095**	1564**	2330**	5049**	5168**
C350D6E	3376	1500	2191	3884	3934	5095	1564	2441	5021	5071
						5095**	1564**	2330**	4813**	4863**
C400D6E	3376	1500	2191	3884	3934	5095	1564	2441	5021	5071
						5095**	1564**	2330**	4813**	4863**
C440D6	3376	1500	2191	3879	3944	5095	1564	2441	5015	5080
						5095**	1564**	2330**	4807**	4872**
C500D6	3376	1500	2191	4120	4239	5095	1564	2441	5439	5558
						5095**	1564**	2330**	5049**	5168**

* 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

ISO9001	This product was manufactured in a plant whose quality management system is registered as being in conformity with ISO 9001.	EU Stage U.S.EPA	This generator set conforms to former EU Stage IIIa emission levels (50 Hz) and EPA Tier 3 (60 Hz) emissions regulations.
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 standards.
UK CA	The UKCA marking is only valid when equipment is used in a fixed installation application. Material compliance declaration is available upon request.	AS 3000	This generator set has been designed to be compatible with AS/NZS 3000 Standard

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

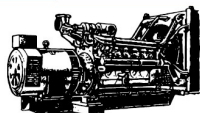
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