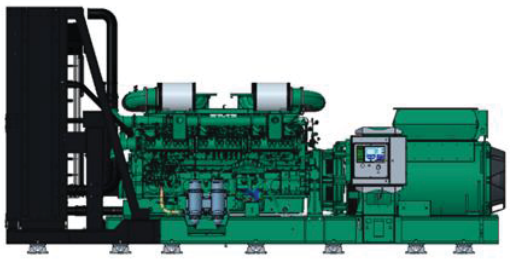
Specification sheet

Centum™ Series Generators QSK78

3000 kW 60 Hz

Emissions Regulated



Note: This document is preliminary. Not all stated specifications, features and options maybe be immediately available, and some details will be subject to change. Please check for latest information and revision.

Description

Cummins® commercial generator sets are fully integrated power generation systems providing optimum performance, reliability, and versatility for stationary Standby, [1]Prime Power and Data Center applications.

Features

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

HVO Fuel Compatible – Approved for use with paraffinic fuels (EN15940), including Hydrotreated vegetable oil which has a very low life cycle carbon emission.

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® electronic 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™ protection, 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 to simplify the facility design requirements for rejected heat.

Warranty and service - Backed by a standard standby two-year warranty and worldwide distributor network.

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

	Standby rating	[1]Prime rating	Data Centre Continuous rating	Emissions Compliance
Model	60 Hz kW (kVA)	60 Hz kW (kVA)	60 Hz kW (kVA)	
C3000D6EB	3000 (3750)	2725 (3406)	2725 (3406)	EPA Tier 2

Notes:
All ratings include radiator fan losses.
[1]Prime rating data provided for reference only.

Generator set specifications

Performance class	Genset models have been tested in accordance with ISO 8528-5. Consult factory for transient performance information
Steady state voltage regulation, no load to full load	± 1.0% (TBC)
Random voltage variation	± 1.0% (TBC)
Frequency regulation	Isochronous
Steady state frequency band	± 0.5% (TBC)
Electromagnetic Compatibility Performance	Emissions to EN 61000-6-2:2005 Immunity to EN 61000-6-4:2007+A1:2011 FCC PART 15 subpart B; ICES-002

Engine specifications

Bore	170.0 mm (6.69 in)
Stroke	190.0 mm (7.48 in)
Displacement	77.6 litres (4735 in^3)
Configuration	Cast iron, V 18 cylinder
Battery capacity	2200 amps minimum at ambient temperature of -18 °C to 0 °C (0 °F to 32 °F)
Battery charging alternator	55 amps
Starting voltage	24 volt, negative ground
Fuel system	Cummins' modular common rail system
Fuel filter	Two stage fuel filtration system with remote mounted stage 1 unit including water separation.
Air cleaner type	Unhoused dry replaceable element as standard; heavy duty optional
Lube oil filter type(s)	Six spin-on, combination full flow filter and bypass filters
Standard cooling system	High ambient cooling system (Ship Loose)

Alternator specifications

Design	Brushless, 4 pole, drip proof, revolving field
Stator	2/3 pitch
Rotor	Two bearing, flexible coupling
Insulation system	Class H
Standard temperature rise	150 ºC Standby at 40 °C ambient
Exciter type	Permanent Magnet Generator (PMG)
Phase rotation	A (U), B (V), C (W)

Available voltages

60 Hz Line-Neutral/Line-Line

• 240/416	• 347/600	• 2400/4160	• 7621/13200
• 277/480		• 7200/12470	• 7976/13800

Note: Consult factory for other voltages.

Generator set options and accessories

Engine

- 480V, 3P, 12kW forced type coolant heaters.
- Heavy-duty air cleaners
- Oil Sampling Valve
- Redundant Starting
- Closed Crankcase Ventilation

Cooling system

- High ambient air temperature (ship loose)
- Enhanced high ambient air temperature (ship loose)

Control panel

- Multiple language support
- left facing mounting
- Masterless load demand
- Warning high bearing temperature

Generator set options and accessories (continued)

Control panel

- Alternator temperature monitoring
- Exhaust gas temperature monitoring
- 6x user-configurable relays
- 120/240 V Heater control cabinet
- Mechanical hour meter
- 2x digital input/output

Exhaust system

- Residential grade exhaust silencer
- Critical grade exhaust silencer

Generator set

- Battery
- Battery rack with hold-down - floor standing
- PowerCommand network
- Remote annunciator panel
- Vibration isolators
- Standby 2,3,4 & 5YR limited hour warranties available.
- DCC 2,3,5 & 10YR unlimited hour warranties available.

Alternator

- 80 ºC rise
- 105 ºC rise
- 125 ºC rise
- 150 ºC rise
- 120/240 V 300 W anti-condensation heater
- Temperature sensor - RTDs, 2/phase
- Temperature sensor – alternator bearing RTD
- Differential current transformers

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

PowerCommand 3.3 – 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.

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.

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

Multi-language support

Operator panel features

Operator panel features – The operator panel, in addition to the alternator, displays the Utility/AC bus data.

Operator/display functions

- 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

- Digital frequency synchronization and voltage matching
- Isochronous kW and kVar load sharing controls
- Droop kW and kVar control
- Sync check
- Extended paralleling (peak shave/base load)
- Digital power transfer control (AMF) provides load transfer operation in open or closed transition or soft (ramping) transfer 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 (optional)

- 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

Standard control functions (continued)

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 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)

Ratings definitions

Emergency Standby Power (ESP):

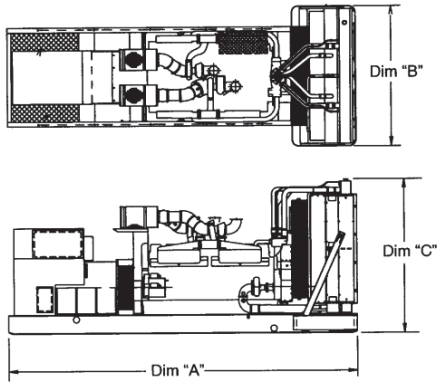
Applicable for supplying power continuously to varying electrical loads for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528 and ISO 3046-1, obtained and corrected in accordance with ISO 15550).

Prime Power (PRP):

Applicable for supplying power to varying electrical loads for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, Data shown above represents gross engine performance and capabilities as per ISO 3046-1, obtained and corrected in accordance with ISO 15550

Notes

[1]Rating definitions provided for reference only.



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

Do not use for installation design

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Set weight* dry kg (lbs)	Set weight* wet kg (lbs)
C3000D6EB	7075 (278.5)	2610 (102.75)	3500 (137.79)	TBC	TBC

Notes: * With standard features and S9 alternator. See outline drawings for other configurations.

Codes and standards

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

ISO 9001 ISO 14001 ISO 45001	This product was manufactured in a facility whose quality management system is certified to ISO 9001 and its Health Safety Environmental Management Systems certified to ISO 14001 and ISO 45001.	**U.S. EPA**	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.
	All genset models are available as CSA certified to CSA C22.2 No.100	**International Building Code**	The generator set package is available certified for seismic application in accordance with International Building Code
	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.		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.

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

Our energy working for you.™

Generator Set Data Sheet

Model: C3000D6EB
Frequency: 60 Hz
Fuel Type: Diesel
kW Rating: 3000 Standby
Emissions level: Pending PEPA NSPS Stationary Emergency Tier 2

Exhaust emission data sheet:	**TBC**
Exhaust emission compliance sheet:	**TBC**
Sound performance data sheet:	**TBC**
Cooling performance data sheet:	**TBC**
Prototype test summary data sheet:	**TBC**
Remote radiator cooling outline:	**N/A**
High ambient cooling system outline (ship loose):	**TBC**
Enhanced high ambient cooling system outline (ship loose):	**TBC**

Fuel Consumption*

	Standby			
	kW (kVA)			
Ratings	3000 (3750)			
Load	**1/4**	**1/2**	**3/4**	**Full**
US gph	61	109	159	210
L/hr	230	413	602	796

* Tolerance within +/- 10%

Engine*

	Standby rating
Engine manufacturer	Cummins Inc.
Engine model	QSK78-G37
Configuration	Cast Iron, V 18 cylinder
Aspiration	Turbocharged and charge air cooled (air to air)
Gross engine power output, kWm (bhp)	3312 (4441)
BMEP at set rated load, kPa (psi)	2848 (413)
Bore, mm (in.)	170.0 (6.69)
Stroke, mm (in.)	190.0 (7.48)
Rated speed, rpm	1800
Piston speed, m/s (ft/min)	11.4 (2243)
Compression ratio	15.5:1
Lube oil capacity, L (qt)	413 (436)
Overspeed limit, rpm	1980
Regenerative power, kW	256

* Tolerance within +/- 10%

Fuel Flow*

	Standby rating
Maximum fuel flow, L/hr (US gph)	1733 (458)
Maximum fuel inlet restriction with clean filters, kPa (in Hg)	20 (6)
Maximum fuel inlet restriction with dirty filters, kPa (in Hg)	34 (10)
Maximum fuel return restriction, kPa (in Hg)	15 (4.5)
Maximum fuel inlet temperature, °C (°F)	70 (158)

* Tolerance within +/- 10%

Air*

Combustion air, m^3/min (scfm) – Normal Duty	267 (9434)
Maximum air cleaner restriction, kPa (in H_2O)	6 (25)
Alternator cooling air, m^3/min (cfm)	3.3 (118)

* Tolerance within +/- 10%

Exhaust*

Exhaust flow at set rated load, m^3/min (cfm)	671 (23680)
Exhaust temperature, °C (°F)	479 (894)
Maximum back pressure, kPa (in H_2O)	6.8 (27.3)

* Tolerance within +/- 10%

High Ambient Cooling System*† (ship loose)

Ambient design, °C (°F)	40 (104)
Coolant capacity (with radiator), L (US gal)	450 (119)
Cooling system air flow, m^3/min (scfm)	2700 (83400)
Maximum cooling air flow static restriction, kPa (in H_2O)	0.25 (1.0)

* Tolerance within +/- 10%
† Values subject to change

Enhanced High Ambient Cooling System (ship loose)

Ambient design, °C (°F)	50 (122)
Coolant capacity (with radiator), L (US gal)	TBC
Cooling system air flow, m^3/min (scfm)	TBC
Maximum cooling air flow static restriction, kPa (in H_2O)	TBC

Weights[1]

Unit dry weight kgs (lbs)	24700 (54454)
Unit wet weight kgs (lbs)	25500 (56218)

[1] Weights represent a set with standard features with cooling system assembled.

Connection[1]	Temp rise ºC	Duty	Alternator	Voltage
Wye	80, 105, 125, 150	ESP, DCC	S9 D, E, F, G	416, 480, 600
Wye	80, 105, 125, 150	ESP, DCC	S9 E, F, G, H	4160
Wye	80, 105, 125, 150	ESP, DCC	S9 E, F, G, H	12470, 13200, 13800

Notes:

[1] Single phase power can be taken from three phase generator sets at up to the value listed in the single phase factor column for the generator set nameplate kW rating at unity power factor.

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, AS 2789, DIN 6271 and BS 5514.

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

Notes:
Rating definitions provided for reference only

Formulas for Calculating Full Load Currents:

Three phase output

$$\frac{\text{kW} \times 1000}{\text{Voltage} \times 1.73 \times 0.8}$$

Single phase output

$$\frac{\text{kW} \times \text{SinglePhaseFactor} \times 1000}{\text{Voltage}}$$

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.