



Diesel Generator Set QSK60 Series

2000-2250 kVA Prime



Reliable and durable

Cummins® 'QSK60 series' (Quantum leap in product technology) diesel engine with strong regrindable crankshaft, high strength connecting rod, high pressure injection full authority electronic fuel system, 2 pump 2 loop coolant system. 'QSK60 series' generating sets are more reliable and durable. Engines have clocked millions of hours operating in some of the world's most demanding conditions. Current engines are regularly upgraded with new technologies for better performance and economy. The ultimate proof of superior performance and reliability is the fact that Cummins® manufactures these engines in India.

Unmatched Warranty

Cummins® 'QSK60 series' diesel engine generating sets are a truly cost effective solution to long term power need backed by industry best, 2 years / 5000 hrs warranty, for the entire generating set. With superior experience in technology, design capability, commitment, reliability and quality we offer an unmatched 5 years or 5000 hours (including above 2 years) warranty coverage on 5 critical components (5C) of the engine – Cylinder Head, Camshaft, Crankshaft, Cylinder Block, Connecting Rod against manufacturing defect (5C warranty is offered only for India source product).

Cummins Advantage

Special features of Cummins® 'QSK60 series' engines like full authority electronic injection, low temperature aftercooler, optimised turbocharging and precision injection timing make these engines the ultimate in exceptional fuel efficiency all across the operating range.

Single Source Power Assurance

Design, manufacture and testing of engine, alternator and other accessories is done by Cummins Group of companies for optimum performance and is backed by a countrywide product the entire package.

Standard Scope

Engine: Cummins® 'QSK60 series' full authority electronic injection, water cooled engine, 16 cylinder, 4 stroke, rated at 1500 RPM, conforming to ISO 3046 /IS 13018 has the following specifications:

- Cummins Full Authority electronics
- Cummins HPI injectors
- Cummins turbocharger, pulse tuned exhaust manifold, stainless steel exhaust flexible connections (4 Turbos)
- Radiator or heat exchanger, coolant inhibitor
- Plate type lube oil cooler
- Outboard aftercoolers
- Full flow paper element filters - fuel, lube oil and by-pass
- Dry type replaceable paper element air cleaner with restriction indicator
- Flywheel housing & flywheel to suit single bearing alternator
- Starting motor – Electric
- Battery charging alternator
- Cummins PowerCommand® microprocessor based genset controller
- First fill lube oil

Alternator:

- Stamford brushless alternator
- Separately excited, self-regulated
- Salient pole revolving field
- Single / double bearing
- VPI epoxy impregnated insulation technology
- Re-greasable deep groove Single bearing
- Excitation - PMG based brushless
- Space heaters, RTD/BTD - (without scanner).

Accessories:

- Silencer suitably optimized to reduce noise
- Sturdy base rail
- 990 ltrs. free standing fuel tank
- Batteries with connecting leads and terminals



ARYA
SHIRAZ MACHINERY

Optionals

- **Engine:** Lube oil / Coolant heater with thermostatic switch, Air Starter/Alternator: PMG
- **Alternator:** Double Bearing
- **Control Panel:** AMF control panel, Battery charger, Remote/ Auto start panel, Auto/Manual synchronizing panel, Audio/Visual annunciation for faults
- **Others:** 398 lts. oil pan for extended oil change interval for 2000 / 2250 kVA

Control System - PCC3201

The PowerCommand™ 3201 Control is a microprocessor based generator set monitoring, and control system.

The control provides an operator interface to the genset, digital voltage regulation, digital governing and generator set protective functions.

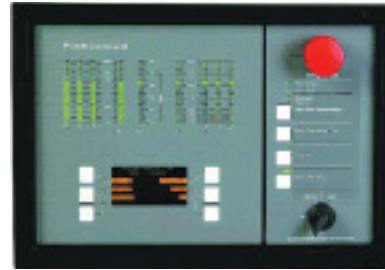
The PowerCommand™ 3201 generator set control is suitable for use on a wide range of generator sets in nonparalleling and paralleling applications.

The PowerCommand™ Control can be configured for any frequency, voltage and power connection configuration from 120 to 13,800 VAC for for 50Hz or 60Hz operation.

Power for the control is derived from the generator set starting batteries. The control functions over a voltage range from 8VDC to 35VDC.

Major Features

- Digital Full Authority Electronic Engine Controls for Cummins HPI-PT fuel systems.
- Digital Voltage Regulation with 3-phase sensing.
- AmpSentry™ Protection for true alternator overcurrent protection.
- Analog and Digital AC Output Metering.
- Battery Monitoring System to sense and warn against a weak battery condition.
- Digital Alarm and Status Message Display.
- Generator set Monitoring: Displays status of all critical engine and alternator generator set functions.
- Smart Starting Control System: Integrated fuel ramping to limit black smoke and frequency overshoot.
- Advanced Serviceability using InPower, a PC-based software service tool.
- Control Panel Enclosure - IP-52



PCC 3201

Control System

Includes all functions to locally or remotely start and stop, and protect the generator set.

Control Switch - RUN/OFF/AUTO

- OFF Mode - the generator set is shut down and cannot be started.
- RUN mode the generator set will execute its start sequence.
- AUTO mode, the generator set can be started with a start signal from a remote device

LED Indicating Lamps - includes LED indicating lamps for the following functions:

- Not-in-auto mode
- Common wiring
- Shutdown
- Remote start command
- Panel lamps and switch.
- Operator panel can be illuminated by a series of high intensity LED Lamps
- Fault Reset Switch. Allows the operator to reset the control after a warning or shutdown condition.
- Emergency Stop Switch. Immediate shut down of the generator set on operation.

Base Engine Protection:

- Overspeed shutdown
- Low Oil Pressure Warning / Shutdown
- High Engine Temperature Warning / Shutdown
- Underspeed / Sensor Fail Shutdown
- Fail to Start / Fail to Crank
- Low / high battery voltage

Optionals

- Remote monitoring
- Modbus Convertor
- Extendable I/O modules
- Network Annunciators

Technical Data

Generator set specifications

Model	C2000 D5 P	C2250 D5 P
Prime Power Rating kVA	2000	2250
Output Voltage and Frequency	415V/ *3.3/ *6.6/ 11KV - 50Hz	415V/ *3.3/ *6.6/ 11KV - 50Hz
Power Factor	0.8 (lag)	0.8 (lag)
No. of phases	3 phase	3 phase

Engine specifications

Make	Cummins®	Cummins®
Model	QSK 60 G4	QSK 60 G8
No. of cylinders	16	16
Aspiration	Turbocharged - LTA Aftercooled	Turbocharged - LTA Aftercooled
Bore x Stroke	159 mm x 190 mm	159 mm x 190 mm
Displacement	60.2 ltrs	60.2 ltrs
Output - Prime	2319 bhp (1730 kWm)	2603 bhp (1942 kWm)
Fuel consumption @ 75% load with Rad/HE	291/281 ltr/hr	331/321 ltr/hr
Fuel consumption @ 100% load with Rad/HE 390/380 ltr/hr	390/380 ltr/hr	441/430 ltr/hr
Total wet weight (engine + radiator)	9904 kg	9904 kg
Length x Width x Height (engine)	2780 x 1591 x 1960 mm	2780 x 1591 x 1960 mm
Compression Ratio	14.5:1	14.5:1
Piston Speed	9.5 m/s	9.5 m/s
Governor / Class	Electronic / A1	Electronic / A1
Lubricating oil sytem capacity	280/398 ltrs	398 ltrs
Coolant capacity (engine + radiator)	621 ltrs	621 ltrs
Combustion air intake @ 100% load (+/- 5%)	136 m3/min	156 m3/min
Exhaust Temperature	430 °C	485 °C

Alternator specifications

Make	Stamford-LT	Stamford-HT	Stamford-LT	Stamford-HT
Frame size / Model No.	PI734F	HVSI804R	PI734H	HVSI804R
Voltage Regulation	± 0.5%	± 0.5%	± 0.5%	± 0.5%
Insulation	Class H	Class F	Class H	Class F
Standard Enclosure	IP 23	IP 23	IP 23	IP 23
Winding Pitch	2 / 3 Pitch	2 / 3 Pitch	2 / 3 Pitch	2 / 3 Pitch
Stator Winding	Double layer lap, form wound	Double layer lap, form wound	Double layer lap, form wound	Double layerlap, form wound
Rotor Dynamically balanced with grade 2.5	Dynamically balanced with grade 2.5	Dynamically balanced with grade 2.5	Dynamically balanced with grade 2.5	
Wave form distortion	No load < 1.8 %, non distorting balanced linear load < 5 %	No load < 1.5 %, non distorting balanced linear load < 3 %	No load < 1.8 %, non distorting balanced linear load < 5 %	No load < 1.5 %, non distorting balanced linear load < 5 %
Total Harmonic Factor	Better than 2%	Better than 2%	Better than 2%	Better than 2%

* Refer to Factory for 3.3/6.6 KV & Alternator frame

Conformance standards

IS/IEC 60034-1, BS 5000, IS 1460, ISO 8528, IS 13018, ISO 3046, ISO 9001

Rating definitions

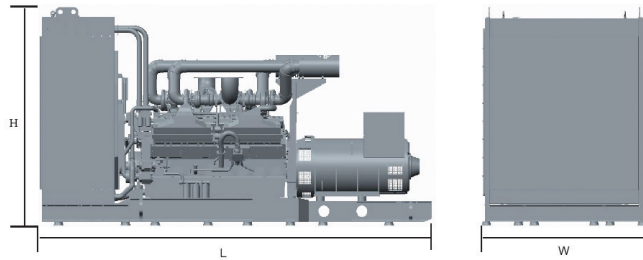
Prime Power (PRP):

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 ISO 3046 and IS 13018.

- Fuel consumption data is based on diesel having specific gravity of 0.85 and conforming to IS:1460
- Fuel consumption tolerance is +5%

Typical Diesel Genset Dimensions*

Genset Model	Rating (kVA)	Length (mm)	Width (mm)	Height (mm)	Weight (kgs.) (Wet)	Std. Fuel Tank Capacity (Ltrs - External)
C2000D5P	2000 kVA	5950	2594	3304	17333	990
C2250D5P	2250 kVA	6175	2494	3115	16546	990



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