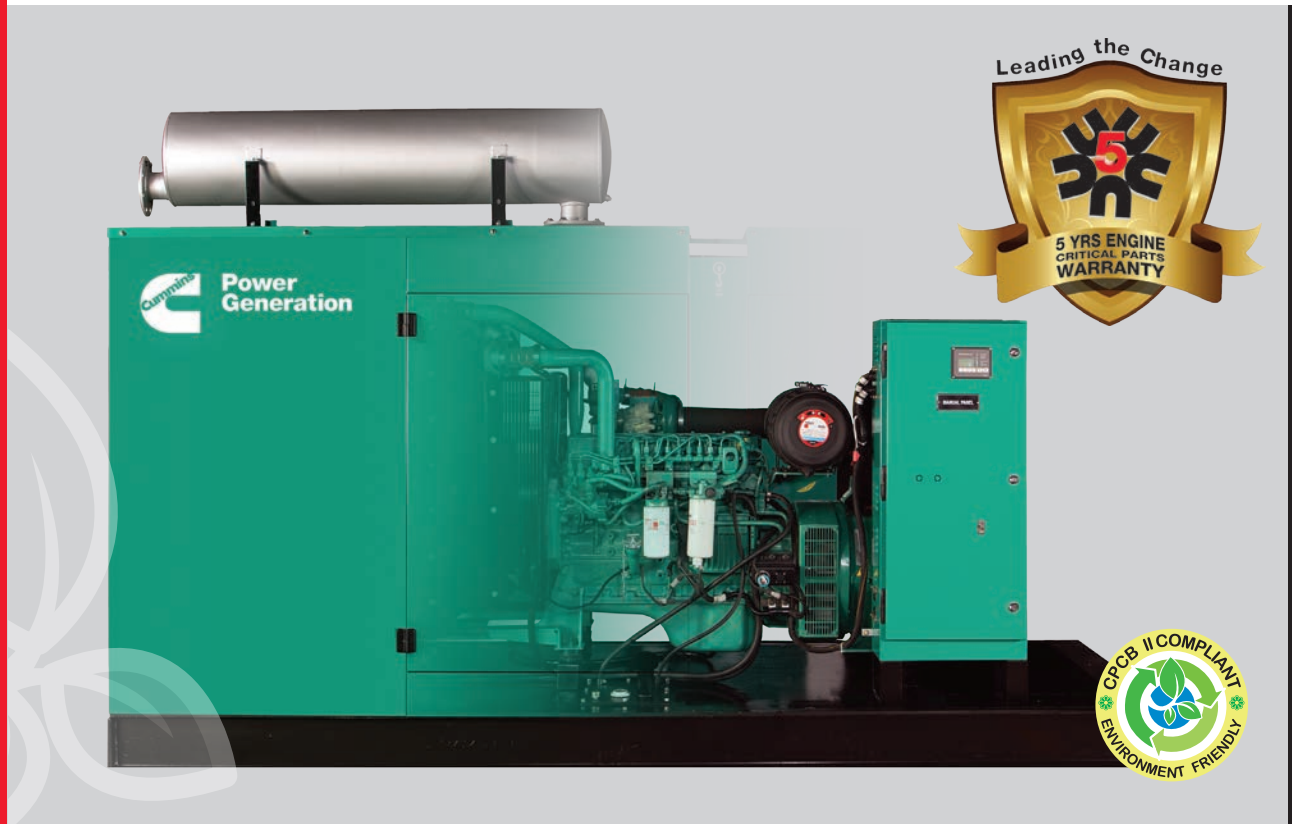


Diesel Generator Set QSB5.9 Series

140-160 kVA, 112-128 kWe Prime



Latest Technology Product With Global Cummins Platform

- The Cummins® QSB5.9 series heavy-duty engine and world class Stamford alternator powered diesel generator set
- Class defining Quantum engine technology with fully integrated subsystems
- Full Authority Electronic Engine
- Advanced in-cylinder technology to meet latest emission norms without any after-treatment device
- Smart aesthetic and superior finish
- Compact in size with optimum power to weight ratio

Environment Friendly Power

- Class defining technology engine is designed to meet stringent exhaust emission tests as per revised MoEF norms, thus offering environment friendly power
- The Cummins® diesel generator sets are available with the lowest noise levels in its range

Lowest Operating Cost And Comprehensive Warranty

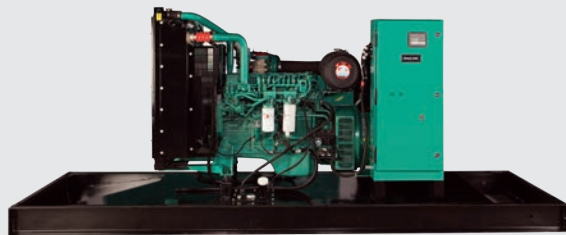
- Highly reliable and durable product
- All elements are designed to work together to maximize efficiency even at part loads, offering the advantage of lowest operating costs.
- 500 Hours/ 1 Year service interval
- Industry acknowledged best-in-class comprehensive warranty on the entire package including rubber components

Single Source Power Assurance

- All the major components – the engine, alternator, control system and canopy are designed, manufactured and tested by Cummins India.
- Best and largest customer support network in India, capable of providing round-the-clock service and spares support
- All these things put together, Cummins® offers you SINGLE SOURCE POWER ASSURANCE

Engine

- Cummins QSB5.9 series, 6 cylinder, in-line 4 stroke, radiator cooled engine
- Full Authority Electronic Engine
- Well designed air handling system with
 - Dry type, Heavy duty, Replaceable paper element air cleaner with restriction indicator
 - Air to air aftercooling
 - Optimised turbocharger for increased altitude capabilities
- Best in class fuel economy with
 - Bosch HPCR fuel system with A1 class electronic governing
 - Dual fuel filter system: Pre filter including water separator and Water In Fuel (WIF) sensor and main filter
- Standard integral set-mounted radiator system, designed and tested for 50°C ambient temperature
- Full flow spin on lube oil filter
- Plate type lube oil cooler
- First fill of lube oil and coolant
- Electrical starter motor with soft start engagement feature
- Battery charging alternator
- 2 x 12 V DC batteries



Alternator

- Stamford UC27 alternator frames from Cummins Generator Technologies
- Brushless type, screen protected, revolving field, self excited alternator conforming to IS/IEC 60034-1
- 3 Phase reconnectable winding with 12 terminals brought out for connection
- Better motor starting capability
- Best in class efficiency
- Compact design with sealed bearings for longer life and lesser maintenance
- Impregnation on all wound components for better mechanical strength

Control Panel

Control panel is manufactured with 14/16 gauge CRCA sheet and is powder coated for weather-proof and long lasting finish. The control panel consists of the following parts:

- PowerCommand 1.1 Controller
- Aluminum bus bars with suitable capacity with incoming/outgoing terminals
- Indicating lamps for 'Load ON' and 'Set Running'
- Instrument fuses duly wired and ferruled
- MCCB of suitable rating with overload and short circuit protections

PowerCommand 1.1 features

The PowerCommand® control system is a microprocessor-based generator set monitoring, metering and control system with LCD display designed to meet the demands of today's engine driven generator sets



- Intuitive operator interface which includes LED backlit LCD display with tactile feel soft-switches & generator set status LED lamps
- Digital AVR for shunt or PMG excitation with torque matching.
- Digital electronic governing with temperature compensation and smart starting.
- SAE J1939 interface to Full Authority Electronic (FAE) engines.
- Remote start-stop
- Engine metering: Oil pressure, Coolant temperature, Battery voltage, Engine speed
- AC Alternator metering: L-L Voltage and L-N Voltage, Current (1 and 3 phase), Volt-Amperes (phase and total) and Frequency.
- Engine protection: Low lube oil pressure, High/Low coolant temperature, Over speed, Battery Over/Under/Weak Volts, Fail to crank/start, Sensor failure.
- AC Alternator protection: Over/Under voltage, Over/Under frequency, Over current, Short circuit and Loss of AC sensing.
- Data logging: Engine hours, Control hours, Engine starts and upto 10 recent fault codes
- Configurable glow plug control
- Configurable cycle cranking
- 12 and 24 Volt DC operation
- Sleep mode
- Programmable I/Os (4 inputs and 2 outputs), expandable with AUX101/102 modules
- Modbus interface (RS485 RTU)
- InPower compatible (PC based service tool)
- Certifications - meets the requirement of relevant UL, NFPA, ISO, IEC, Mil Std., CE and CSA standards

Silencer

- Hospital grade silencer suitably optimized to meet stringent noise emission standards laid down by MoEF / CPCB

Mounting Arrangement

- Engine and alternator are mounted on a common MS fabricated base frame with AVM pads.
- Base frame with integral fuel tank is provided with drain plug, air vent, inlet and outlet connection, level indicator and provision for cleaning

Optional

- **Engine:** Coolant heater, Oil drain pump
- **Alternator:** PMG
- **Control Panel:** PC3.3, Microprocessor / relay based AMF control panel
- **Others:** Trolley mounted mobile sets

Acoustic Enclosure

- Specially designed to meet stringent MoEF/ CPCB norms of 75 dBA @ 1mtr at 75% load under free field conditions
- The acoustic enclosure is made of CRCA sheets in munsel green shade and a structural/ sheet metal base frame painted in black
- High quality noise absorbant and fire-retardant grade acoustic insulation material (PU Foam) complying to IS 8183
- Two point lifting for easy handling at customer site

- Designed to have optimum serviceability
- Air inlet louvers specially designed to operate at rated load
- Made on special purpose CNC machines for consistency in quality and workmanship
- 11 tank pretreatment process and UV resistant powder coating of all parts to withstand extreme environment
- Use of special hardware for longer life
- Flush styling - no projections
- Fluid drains for lube oil and fuel
- Fuel filling arrangement inside the enclosure

Technical Data

Generator Set Specification

| | | |
|---|---------------|---------------|
| Model | C140D5P | C160D5P |
| Duty | Prime | Prime |
| Power Rating kVA / kWe | 140/112 | 160/128 |
| No. of Phases | 3 | 3 |
| Output Voltage and Frequency (V and Hz) | 415 V, 50 Hz | 415 V, 50 Hz |
| Power Factor | 0.8 (lagging) | 0.8 (lagging) |
| Current (A) | 195 | 223 |
| RPM | 1500 | 1500 |

Engine Specification:

| | | |
|---|-----------------------------------|-----------------------------------|
| Make | Cummins | Cummins |
| Model | QSB5.9-G1 | QSB5.9-G2 |
| MoEF Certified Power (hp) | 184 | 206 |
| Required Power for Rated kVA (hp) | 174 | 197 |
| Cooling | Liquid Cooled (EG Compleat 50:50) | Liquid Cooled (EG Compleat 50:50) |
| Aspiration | Turbocharged, Charge Air Cooled | Turbocharged, Charge Air Cooled |
| No. of cylinders | 6, In-line | 6, In-line |
| Bore (mm) x Stroke (mm) | 102 x 120 | 102 x 120 |
| Compression ratio | 16.5:1 | 16.5:1 |
| Displacement (litre) | 5.88 | 5.88 |
| Fuel | High Speed Diesel | High Speed Diesel |
| Fuel consumption @75% load with radiator and fan* (litre/hr) | 26.07 | 30.05 |
| Fuel consumption @100% load with radiator and fan* (litre/hr) | 32.15 | 36.4 |
| Performance class of generator set | ISO 8528-5 G2 | ISO 8528-5 G2 |
| Starting system | 24 V DC Electrical | 24 V DC Electrical |
| Lube oil specification | CI4+ 15W40 | CI4+ 15W40 |
| Lube oil sump capacity, High-Low level (litre) | 14.2- 12.3 | 14.2- 12.3 |
| Total lubrication system capacity (litre) | 15.7 | 15.7 |
| Lube oil consumption @ full load** (litre/hr) | 0.02 | 0.02 |
| Total coolant capacity (litre) | 25.6 | 25.6 |
| Exhaust pipe size (inch) | 4 | 4 |
| Total wet weight (Engine+Radiator)** (kg) | 552 | 552 |
| Length x Width x Height (Engine) (mm) | 1066 x 642 x 1029 | 1066 x 642 x 1029 |
| Mean piston speed (m/s) | 5.9 | 5.9 |
| Combustion air intake @100% load (±5%) (cfm) | 382 | 400 |
| Exhaust Temperature (°C) | 496 | 522 |

Alternator Specification:

| | | |
|--|---|---|
| Make | Stamford (CGT) | Stamford (CGT) |
| Alternator Frame | UCI274E | UCI274F |
| Enclosure | IP 23 | IP 23 |
| Voltage regulation (Max.) | ±1% | ±1% |
| Class of Insulation | H Class | H class |
| Winding Pitch | 2/3 Pitch | 2/3 Pitch |
| Stator Winding | Double layer lap | Double layer lap |
| Rotor | Dynamically Balanced | Dynamically Balanced |
| Waveform distortion/ Total Harmonic Distortion | No load < 1.5 %, Non distorting balanced linear load < 5 % | No load < 1.5 %, Non distorting balanced linear load < 5 % |
| Maximum Unbalanced Load across phases# | less than or equal to 25% | less than or equal to 25% |
| Telephonic Harmonic factor | < 2% | < 2% |

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

** Oil consumption data is based on oil having specific gravity of 0.89 and meeting CI4+ API categories

With the condition that none of the phases exceeds its rated current

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.

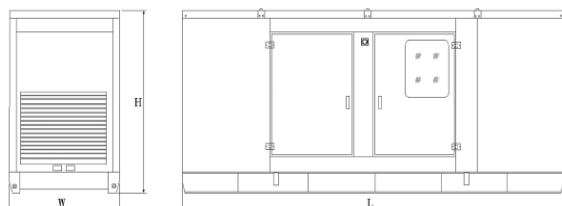
Conformance Standards

- IS/IEC 60034-1 ■ IS 1460 ■ ISO 8528
- ISO 3046 ■ ISO 9001 ■ IS 13018

Typical Enclosed Genset Dimensions

| Genset Model | Rating (kVA) | Length (mm) | Width (mm) | Height (mm) | Wet Weight ^{##} (kg) | Standard Fuel tank Capacity (litrr) |
|--------------|--------------|-------------|------------|-------------|-------------------------------|-------------------------------------|
| C140D5P | 140 | 4000 | 1150 | 1850 | 2565 | 330 |
| C160D5P | 160 | 4000 | 1150 | 1850 | 2603 | 330 |

^{##} Approximate Weight



Authorised Representative

Cummins Power Generation Offices

| | |
|-------------|--|
| Bengaluru: | Tel.: (080) 2325 9161 / 63, 2325 9165 / 67 Fax: (080) 2325 9164 |
| Chandigarh: | Tel.: (0172) 224 0371-73 Fax: (0172) 224 0372 |
| Chennai: | Tel.: (044) 2446 8110 / 2446 8113 Fax: (044) 2491 1120 |
| Gurgaon: | Tel.: (0124) 391 0900-01 Fax: (0124) 391 0916 |
| Hyderabad: | Tel.: (040) 2340 9970 / 2340 9980 Fax: (040) 2340 9990 |
| Jaipur: | Tel.: (0141) 236 4944 Fax: (0141) 403 8794 |
| Kolkata: | Tel.: (033) 2287 8065 / 2287 2481 Fax: (033) 2290 3839 |
| Lucknow: | Tel.: (0522) 230 5049 / 230 5059 Fax: (0522) 230 5035 |
| Mohali: | Tel.: (0172) 224 0371 / 72 / 73 Fax: (0172) 224 0371 / 72 / 73 |
| Vadodara: | Tel.: (0265) 233 0627 / 3053627 Fax: (0265) 234 0623 |



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PGBU/CIL/010/QSB5.9 140-160 kVA/CPG/VW/July 2014/1000



**Power
Generation**

Cummins India Limited Power Generation Business Unit

Cummins India Office Campus
Tower-A, 6th Floor, S. No. 21,
Balewadi, Pune – 411 045 (India)

Phone: +91 20 6706 7000
Email: cpgindia@cummins.com
www.cumminsindia.com