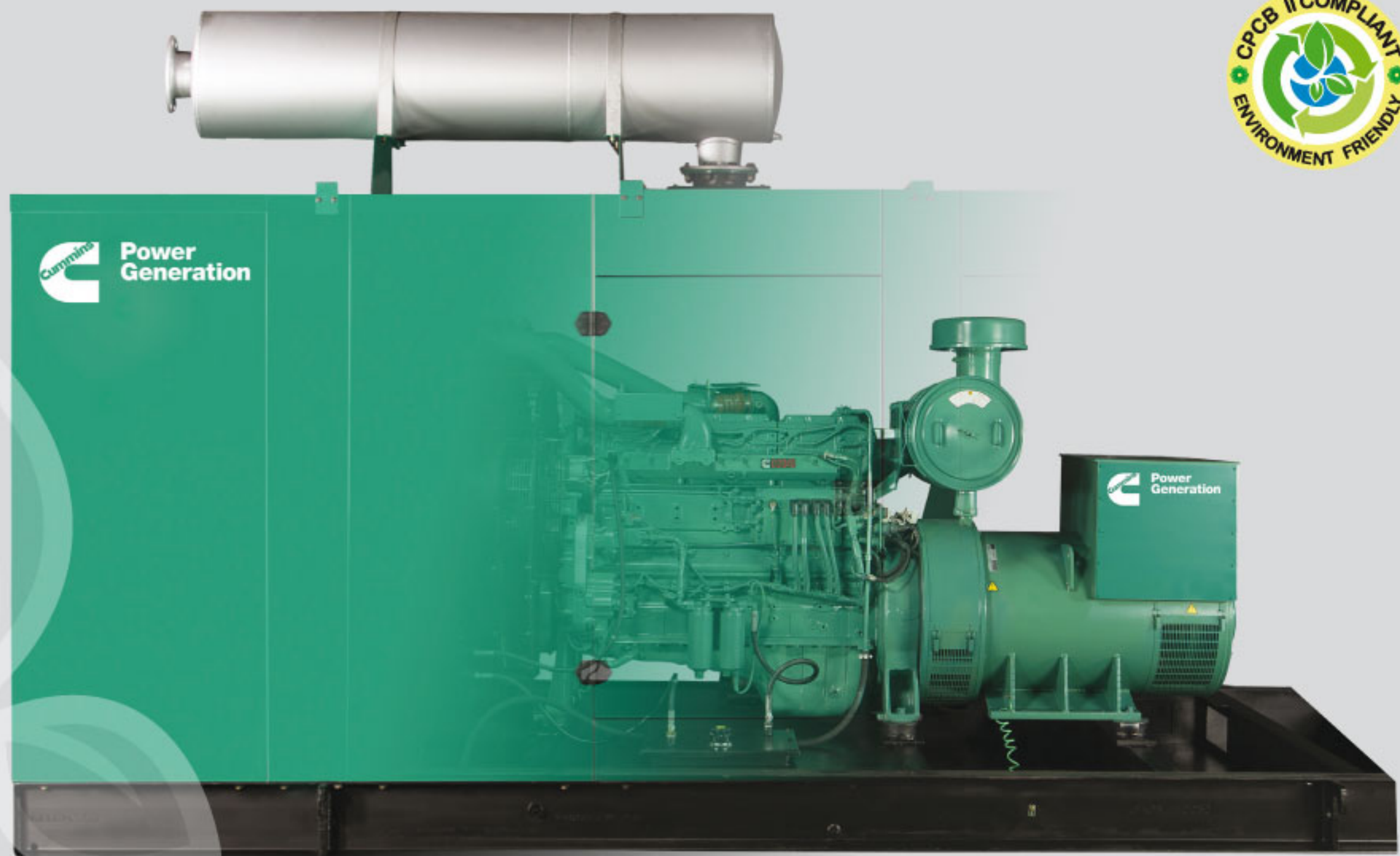




# Diesel Generator Set QSN14 Series

365-400 kVA, 292-320 kWe Prime, 440 kVA, 352 kWe Standby



## Latest Technology Product With Global Cummins Platform

- The Cummins® QSN14 series heavy-duty engine and world class Stamford alternator powered diesel generator set
- Class defining Quantum engine technology with fully integrated subsystems
- 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 QSN14 series, 6 cylinder, In-line 4 stroke, radiator cooled engine
- Well designed air handling system with
  - Dry type, Replaceable paper element air cleaner with restriction indicator
  - Air to air aftercooling
  - Optimised Turbocharger for increased altitude capabilities
- Best in class fuel economy with
  - CELECT 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
- Electrical lift pump for faster response
- 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 HC alternator frames from Cummins Genertor 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 1.2 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 1.2

### 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 and 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, Lube oil drain, Heavy duty air cleaner, Heat exchanger
- **Alternator**: PMG
- **Control Panel**: PC3.3, Microprocessor/ Relay based AMF control panel
- **Others**: Mobile sets with canopy



## 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 (Rockwool) complying to IS 8183
- Air inlet louvers specially designed to operate at rated load

- Base lifting for easy handling at customer site
- Designed to have optimum serviceability
- 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                                   | C365D5P       | C400D5P       | C440D5S       |
|---|---------------|---------------|---------------|
| Duty                                    | Prime         | Prime         | Standby       |
| Power Rating kVA / kWe                  | 365/292       | 400/320       | 440/352       |
| No. of Phases                           | 3             | 3             | 3             |
| Output Voltage and Frequency (V and Hz) | 415 V, 50 Hz  | 415 V, 50 Hz  | 415 V, 50 Hz  |
| Power Factor                            | 0.8 (lagging) | 0.8 (lagging) | 0.8 (lagging) |
| Current (A)                             | 508           | 556           | 612           |
| RPM                                     | 1500          | 1500          | 1500          |

### Engine Specification

| Make  | Cummins                           | Cummins                           | Cummins                           |
|---|-----------------------------------|-----------------------------------|-----------------------------------|
| Model   | QSN14-G1                          | QSN14-G2                          | QSN14-G3                          |
| MoEF Certified Power (hp)                                     | 448                               | 487                               | 531                               |
| Required Power for Rated kVA (hp)                             | 440                               | 475                               | 522                               |
| Cooling   | Liquid Cooled (EG Compleat 50:50) | Liquid Cooled (EG Compleat 50:50) | Liquid Cooled (EG Compleat 50:50) |
| Aspiration  | Turbocharged, Charge Air cooled   | Turbocharged, Charge Air cooled   | Turbocharged, Charge Air cooled   |
| No. of cylinders  | 6, In-line                        | 6, In-line                        | 6, In-line                        |
| Bore (mm) x Stroke (mm)                                       | 140 x 152                         | 140 x 152                         | 140 x 152                         |
| Compression ratio   | 16.5: 1                           | 16.5: 1                           | 16.5: 1                           |
| Displacement (litre)  | 14                                | 14                                | 14                                |
| Fuel  | High Speed Diesel                 | High Speed Diesel                 | High Speed Diesel                 |
| Fuel consumption @75% load with radiator and fan* (litre/hr)  | 61.05                             | 67.45                             | 73.52                             |
| Fuel consumption @100% load with radiator and fan* (litre/hr) | 77.69                             | 88                                | 93.89                             |
| Performance class of generator set                            | ISO 8528-5 G2                     | ISO 8528-5 G2                     | ISO 8528-5 G2                     |
| Starting system   | 24 V DC Electrical                | 24 V DC Electrical                | 24 V DC Electrical                |
| Lube oil specification  | CI4+ 15W40                        | CI4+ 15W40                        | CI4+ 15W40                        |
| Lube oil sump capacity, High-Low level (litre)                | 36-28.4                           | 36-28.4                           | 36-28.4                           |
| Total lubrication system capacity (litre)                     | 38.6                              | 38.6                              | 38.6                              |
| Lube oil consumption @ full load** (litre/hr)                 | 0.08                              | 0.09                              | 0.10                              |
| Total coolant capacity (litre)                                | 51                                | 51                                | 51                                |
| Exhaust pipe size (inch)                                      | 6                                 | 6                                 | 6                                 |
| Total wet weight (Engine+Radiator)** (kg)                     | 1706                              | 1706                              | 1706                              |
| Length x Width x Height (Engine) (mm)                         | 1502 x 888 x 1219                 | 1502 x 888 x 1219                 | 1502 x 888 x 1219                 |
| Mean Piston speed (m/s)                                       | 7.5                               | 7.5                               | 7.5                               |
| Combustion air intake @100% load (±5%) (cfm)                  | 954                               | 1024                              | 1059                              |
| Exhaust Temperature (°C)                                      | 475                               | 491                               | 492                               |

### Alternator Specification

| Make   | Stamford (CGT)   | Stamford (CGT)   | Stamford (CGT)   |
|--|--|--|--|
| Alternator frame                               | HCI444F  | HCI544C  | HCI544C  |
| Enclosure                                      | IP23   | IP23   | IP23   |
| Voltage regulation (Max.)                      | ±1%  | ±1%  | ±1%  |
| Class of Insulation                            | H Class  | H Class  | H Class  |
| Winding Pitch                                  | 2/3  | 2/3  | 2/3  |
| Stator Winding                                 | Double layer lap   | Double layer lap   | Double layer lap   |
| Rotor  | Dynamically Balanced                                       | 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 % | 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%                                  | less than or equal to 25%                                  |
| Telephonic Harmonic factor                     | < 2%   | < 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.

### Standby Power (SP):

Applicable for supplying power to varying electrical load for

the duration of power interruption of a reliable utility source, for maximum of 500 hours per year. Standby Power (SP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046.

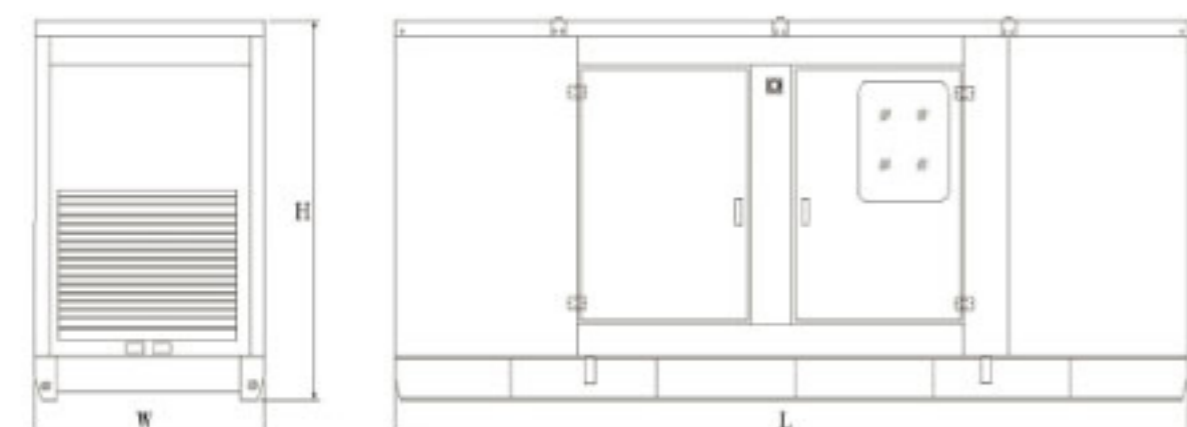
## Conformance Standards

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

## Typical Enclosed Genset Dimensions

| Genset Model | Rating (kVA) | Length (mm) | Width (mm) | Height (mm) | Wet Weight <sup>**</sup> (kg) | Standard Fuel tank Capacity (litre) |
|--------------|--------------|-------------|------------|-------------|-------------------------------|-------------------------------------|
| C365D5P      | 365          | 5500        | 1900       | 2150        | 6165                          | 450                                 |
| C400D5P      | 400          | 5500        | 1900       | 2150        | 6250                          | 450                                 |
| C440D5S      | 440          | 5500        | 1900       | 2150        | 6250                          | 450                                 |

<sup>\*\*</sup>Approximate weight



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