Specification sheet

Diesel generator set
X2.5 series engine
15 kVA - 28 kVA 50 Hz
10.8 kW - 20 kW 60 Hz

Description
This Cummins® Power Generation commercial generator set is a fully integrated power generation system, providing optimum performance, reliability, and versatility for stationary standby, prime power, and continuous duty applications.

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

Optional excitation boost system (EBS) – Offers enhanced motor starting and fault clearing short circuit capability.

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-circuits capability.

Cooling system - Standard integral set-mounted radiator system, designed and tested for rated ambient temperatures, simplifies facility design requirements for rejected heat.

Control system – PowerStart control, microprocessor-based generator set monitoring and control system provides a simple operator interface to the generator set, manual and remote start/stop control and shutdown fault indication.

Enclosures - Optional weather-protective and sound-attenuated enclosure.

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

3-Phase ratings

<table>
<thead>
<tr>
<th>Model</th>
<th>Standby rating 50 Hz (kVA)</th>
<th>Prime rating 50 Hz (kVA)</th>
<th>Standby rating 60 Hz (kVA)</th>
<th>Prime rating 60 Hz (kVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C17 D5</td>
<td>16.5 (13)</td>
<td>15 (12)</td>
<td>16.5 (13)</td>
<td>15 (12)</td>
</tr>
<tr>
<td>C22 D5</td>
<td>22 (18)</td>
<td>20 (16)</td>
<td>22 (18)</td>
<td>20 (16)</td>
</tr>
<tr>
<td>C28 D5</td>
<td>27.5 (22)</td>
<td>25 (20)</td>
<td>27.5 (22)</td>
<td>25 (20)</td>
</tr>
<tr>
<td>C12 D6</td>
<td>12 (15)</td>
<td>10.9 (13.6)</td>
<td>12 (15)</td>
<td>10.9 (13.6)</td>
</tr>
<tr>
<td>C16 D6</td>
<td>16 (20)</td>
<td>15 (18)</td>
<td>16 (20)</td>
<td>15 (18)</td>
</tr>
<tr>
<td>C20 D6</td>
<td>20 (25)</td>
<td>18 (22)</td>
<td>20 (25)</td>
<td>18 (22)</td>
</tr>
</tbody>
</table>

1-Phase ratings*

<table>
<thead>
<tr>
<th>Data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS338-CPGK</td>
</tr>
<tr>
<td>DS340-CPGK</td>
</tr>
<tr>
<td>DS342-CPGK</td>
</tr>
<tr>
<td>DS339-CPGK</td>
</tr>
<tr>
<td>DS341-CPGK</td>
</tr>
<tr>
<td>DS343-CPGK</td>
</tr>
</tbody>
</table>

*1.0 PF
Generator set specifications

Governor regulation class | ISO 8528 Part 1 G2
Voltage regulation, no load to full load | ± 1%
Random voltage variation | ± 1%
Frequency regulation | Droop
Random frequency variation | ± 0.25%
Radio frequency emissions compliance | Yes

Engine specifications

Design | 4 cycle, in-line, naturally aspirated
Bore | 91.4 mm
Stroke | 127 mm
Displacement | 2.5 liter (153 in³)
Cylinder block | Alloy cast iron, in-line, 3 cylinder
Battery charging alternator | 36 A
Starting voltage | 12 volt, negative ground
Fuel system | Direct injection
Fuel filter | Spin on fuel filters with water separator
Air cleaner type | Dry replaceable element
Lube oil filter type(s) | Spin on full flow filter, filtration efficiency 25 micron 99% (min)
Standard cooling system | 122 °F (50 °C) ambient radiator with coolant recovery system

Alternator specifications

Design | Brushless, single bearing
Stator | 2/3 pitch
Insulation system | Class H
Standard temperature rise | 125-163 °C
Exciter type | Self excited
Phase rotation | A (U), B (V), C (W)
Alternator cooling | Direct drive centrifugal blower fan
AC waveform total harmonic distortion (THDV) | No load to full linear load < 5%. For any single harmonic < 3%
Telephone influence factor (TIF) | < 50% per NEMA MG1-22.43
Telephone harmonic factor (THF) | < 3%

Available voltages

<table>
<thead>
<tr>
<th>50 Hz line – line / line - neutral</th>
<th>1-phase</th>
<th>60 Hz line – line / line - neutral</th>
<th>1-phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-phase</td>
<td>1-phase</td>
<td>3-phase</td>
<td>1-phase</td>
</tr>
<tr>
<td>• 480/255</td>
<td>• 240</td>
<td>• 480/277</td>
<td>• 240</td>
</tr>
<tr>
<td>• 440/255</td>
<td>• 220/110</td>
<td>• 440/255</td>
<td>• 220/110</td>
</tr>
<tr>
<td>• 416/240</td>
<td>• 200/115</td>
<td>• 416/240</td>
<td>• 220/127</td>
</tr>
<tr>
<td>• 400/230</td>
<td>• 190/110</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>• 380/220</td>
<td>•</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Consult factory for other voltages.

Generator set options and accessories

<table>
<thead>
<tr>
<th>Engine</th>
<th>Control panel</th>
<th>Warranty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic engine governing</td>
<td>PowerCommand 1.1</td>
<td>2 years for prime application</td>
</tr>
<tr>
<td>Coolant heater 120/240 V</td>
<td>2/4 pole main circuit breaker</td>
<td>5 years for standby application</td>
</tr>
<tr>
<td>Cooling</td>
<td>Aux 101</td>
<td>1500/3000 hours service kit</td>
</tr>
<tr>
<td>Antifreeze 50/50 (Ethylene glycol)</td>
<td>Base Frame</td>
<td>Engine oil heater 120/240 V</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Dual skin fully contained fuel tank</td>
<td>Optional language literature</td>
</tr>
<tr>
<td>Optional silent power canopy</td>
<td>500 litre fuel tank</td>
<td>Set mounted battery</td>
</tr>
<tr>
<td>Alternator</td>
<td>Set mounted battery</td>
<td>External fuel fill (3 way valve)</td>
</tr>
<tr>
<td>Alternator heater</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excite boost system (EBS)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Generator set control PowerStart 500 – The PowerStart control is a microprocessor-based generator set monitoring and control system. The control provides a simple operator interface to the generator set, manual and remote start/stop control and shutdown fault indication. The integration of all control functions into a single control provides enhanced reliability and performance compared to conventional generator set control systems. This control has been designed and tested to meet the harsh environment in which gensets are typically applied.

- The PowerStart generator set control is suitable for use on a wide range of generator sets in non-paralleling applications. It is suitable for use with reconnectable or non-reconnectable generators, can be configured for either 50 Hz or 60 Hz and voltage and power connection from 190-600 VAC line-to-line.

- This control includes an intuitive operator interface that allows for complete genset control as well as system metering, fault annunciation, configuration and diagnostics. The interface includes seven generator set status LED lamps with both internationally accepted symbols and English text to comply with customer needs. The interface also includes an LED backlight LCD display with tactile-feel soft-switches for easy operation and screen navigation. The manual/auto/stop switch function is integrated into the interface panel.

- All data on the control can be viewed by scrolling through screens with the navigation keys. The control displays the current active fault and a time-ordered history of the five previous faults.

- Power for this control is derived from the generator set starting batteries and functions over a voltage range from 8VDC to 16 VDC.

Major Features

- LCD display – 16 characters x 2 line alphanumeric LED backlight LCD.
- Generator set monitoring and protection.
- 12 VDC battery operation.
- Engine starting – Includes solid state output to operate external relays start the engine, fuel shut FSO), and glow plugs. Start disconnect is achieved by monitoring main alternator frequency.
- Remote start capability – Interface to transfer switch.
- Environmental protection – The control is designed for reliable operations in harsh environments.
- Warranty and service – Backed by a comprehensive warranty and worldwide distributor service network.
- Certification – Suitable for use on generator sets are designed, manufactured, tested and certified to relevant ISO, IEC Mil Std. and CE standards.

Base control functions

- LCD display – 16 character x 2 line alphanumeric LED backlight LCD.
- Operation interface – Six tactile-feel membrane switches for LCD navigation, genset operation and control setup. These switches are indicated by internationally accepted symbols and English text.

- Data logs – Includes engine run time and controller on time.
- Fault history – Provides a record of the most recent fault conditions with control hour’s time stamp. Up to 5 events are stored in the control non-volatile memory.

- Alternator data
  - Voltage (single or three phase line-to-line).
  - Current (single or three phase).
  - KVA (three phase and total).
  - Frequency.

- Engine data
  - Starting battery voltage.
  - Engine running hours.
  - Engine temperature.
  - Engine oil pressure.

Service adjustments – The control includes provisions for adjustment and calibration of generator set control functions. Functions include:

- Voltage selection.
- Frequency selection.
- Configurable input set up.
- Configurable output set up.
- Meter calibration.
- Units of measurement.

Protective functions

On operation of a protective function the control will indicate a fault by illuminating the appropriate status LED, as well as display the fault code and fault description on the LCD. The nature of the fault and time of occurrence are logged in the control. The service manual and InPower Service Tool provide service keys and procedures based on the service codes provided.

Field control interface

Input signals to the base control include

- Remote start.
- Local and emergency stop.
- Configurable inputs: Control includes (4) input signals from customer.

Output signals from the control include

- Configurable output: Control includes (1) solid state driver rated at 1 A. This output can be configured to activate on ready to load, or common warning and common shutdown condition.

Communications connections include

- PC tool interface: This RS-485 communication port allows the control to communicate with a personal computer running InPower software. Note – An RS-232 or USB to RS-485 converter is required for communication between PC and control.
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.

Limited-time running power (LTP):
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

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, AS 2789, DIN 6271 and BS 5514.

Base load (continuous) power (COP):
Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Length “A” mm</th>
<th>Width “B” mm</th>
<th>Height “C” mm</th>
<th>Dry wt.* kg</th>
<th>Wet wt.* kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>C17 D5</td>
<td>1667</td>
<td>930</td>
<td>1282</td>
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<tr>
<td>C16 D6</td>
<td>1667</td>
<td>930</td>
<td>1282</td>
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<tr>
<td>C20 D6</td>
<td>1667</td>
<td>930</td>
<td>1282</td>
<td>625</td>
<td>776</td>
</tr>
</tbody>
</table>

* Note: Weights represent a set with standard features. See outline drawings for weights of other configurations.

Codes and standards

This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.

This generator set is available with CE certification.

The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins Power Generation products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.

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