Diesel Generator Set

X2.5 Series Engine

> Specification Sheet

15 kVA — 27 kVA @ 50Hz

10.8 kVA — 20 kVA @ 50Hz

Description

This Cummins® 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.

This generator set is designed in facilities certified to ISO9001 and manufactured in facilities certified to ISO9001 or ISO9002.

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 requirement of NFPA 110 for Level 1 systems.

This generator set is available with CE certification.

Features

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-circuit capability.

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

Cooling system - Standard radiator system, designed and tested for rated ambient temperatures, simplifies facility design requirement for rejected heat.

Enclosures - weather-protective and sound-attenuated enclosure.

Warranty - Backed by a comprehensive warrant and worldwide distributor network.

3-Phase Ratings

	Standby Rating		Prime Rating	
Model	50Hz kVA (kW)	60Hz kVA (kW)	50Hz kVA (kW)	60Hz kVA (kW)
C17 D5	17 (13.2)		15 (11.88)	
C22 D5	22 (17.6)		20 (15.84)	
C28 D5	28 (22)		25 (19.8)	
C12 D6		12 (15)		10.8 (14)
C16 D6		16 (20)		14.4 (18)
C20 D6		20 (25)		18 (23)

*1.0PF

1-Phase Ratings*

Standby Rating		Prime Rating		
50Hz kVA (kW)	60Hz kVA (kW)	50Hz kVA (kW)	60Hz kVA (kW)	Datasheet
13 (13)		11.8 (11.8)		DS336-CPGK
17 (17)		15.5 (15.5)		DS338-CPGK
22 (22)		20 (20)		DS340-CPGK
	12 (12)		10.9 (10.9)	DS337-CPGK
	16 (16)		14.5 (14.5)	DS339-CPGK
	20 (20)		18.1 (18.1)	DS341-CPGK

Generator Set Specifications

Governor Regulation	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%
EMC Compatibility	Yes

Engine Specifications

Design	4 cycle, in-line, naturally aspirated
Bore	91.7 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°C—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	< 5% no load to full linear load, <3% for any single harmonic
Telephone Influence Factor (TIF)	< 50 per NEMA MG1-22.43
Telephone Harmonic Factor (THF)	< 3

Available Voltages

50 Hz Line–Line/Line–Neutral			60 Hz Line–Line/Line–Neutral		
3-Phase		1 Phase	3-Phase		1 Phase
• 240/416	• 127/220	• 220	• 277/480	• 127/220	• 220
• 255/480	• 120/208	• 230	• 240/416	• 120/208	• 230
• 230/400	• 115/200	• 240	• 255/440		• 240
• 220/380	• 110/190				

Note: Consult factory for other voltages.

Generator Set Options

Engine

- ☐ Electronic engine governing
- ☐ Coolant heater 120/240 V

Cooling

- ☐ Antifreeze 50/50 (ethylene glycol)

Enclosure

- ☐ Optional silent power canopy

Alternator

- ☐ Alternator heater
- ☐ Excite boost system (EBS)

Control panel

- ☐ PowerCommand 1.1
- ☐ 2/4 pole main circuit breaker

Base frame

- ☐ Dual skin fully contained fuel tank
- ☐ 500 litre fuel tank

Warranty

- ☐ 5 years for standby application
- ☐ 2 years for prime application

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

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 backlit 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 8 VDC 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 and line-to-neutral).
- 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.

PowerStart 500 control operator/ display panel

Ratings Definitions

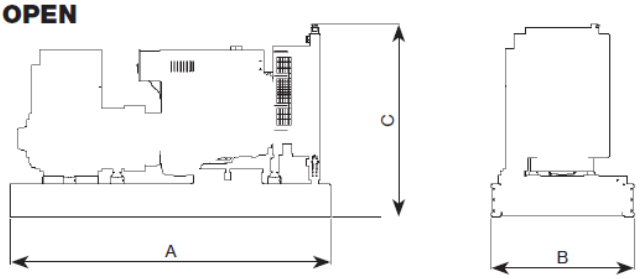
Emergency Standby Power (ESP):
Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

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

OPEN



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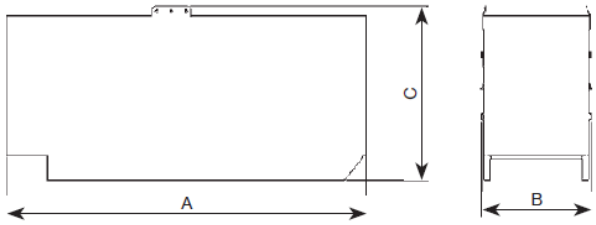

This outline drawing is to provide representative configuration details for Model series only.

See respective model data sheet for specific model outline drawing number.

Do not use for installation design

Weight and dimensions

	Open					Enclosed				
Model	A mm	B mm	C mm	Dry wt.* (kg)	Wet wt.* (kg)	A mm	B mm	C mm	Dry wt.* (kg)	Wet wt.* (kg)
C17 D5	1667	930	1247	418.5	582	2082	930	1448	743.5	907
C22 D5	1667	930	1247	418.5	582	2082	930	1448	743.5	907
C28 D5	1667	930	1247	441.5	605	2082	930	1448	766.5	930
C12 D6	1667	930	1247	405	568.5	2082	930	1448	730	893.5
C16 D6	1667	930	1247	405	568.5	2082	930	1448	730	893.5
C20 D6	1667	930	1247	418.5	582	2082	930	1448	743.5	907

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

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