» Generator set data sheet

Model: C22 D5 (X-Series)
Frequency: 50
Fuel Type: Diesel

Spec sheet:	**SS26-CPGK**
Noise data sheet (Open/enclosed):	**ND50-OS550 / ND50-CS550**
Airflow data sheet:	**AF50-550**
Derate data sheet (Open/enclosed):	**DD50-OS550 / DD50-CS550**
Transient data sheet:	**TD50-550**

Fuel consumption

	Standby				Data Center Continuous			
	kVA (kW)				kVA (kW)			
Ratings	22 (17.6)				19.8 (15.84)			
Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
gph	0.3	0.6	0.8	1.1	0.3	0.5	0.8	1.0
L/hr	1.28	2.56	3.84	5.12	1.18	2.36	3.53	4.71

Engine

	Standby rating	Data Center Continuous
Engine manufacturer	Cummins	
Engine model	X2.5G2	
Configuration	4 Cycle; In-line; 3 Cylinder Diesel	
Aspiration	Naturally Aspirated	
Gross engine power output, kWm	27	24.37
BMEP at set rated load, kPa	851	768.1
Bore, mm	91.7	
Stroke, mm	127	
Rated speed, rpm	1500	
Piston speed, m/s	7.62	
Compression ratio	18.5:1	
Lube oil capacity, L	6.5	
Overspeed limit, rpm	1650	
Regenerative power, kW	2	
Governor type	Mechanical - Std	
Starting voltage	12 Volts DC	

Fuel flow

Maximum fuel flow, L/hr	40
Maximum fuel inlet restriction, mm Hg	28.0249
Maximum fuel inlet temperature (°C)	60

Document no. DS340-CPGK-RevD - 29/11/2011

Air	Standby rating	Data Center Continuous
Combustion air, m^3/min	2.30	2.30
Maximum air cleaner restriction, kPa	4	

Exhaust		
Exhaust gas flow at set rated load, m^3/min	N/A	N/A
Exhaust gas temperature, °C	660	660
Maximum exhaust back pressure, kPa	3.38	

Standard set-mounted radiator cooling		
Ambient design, °C	50	
Fan load, KW_m	0.6	
Coolant capacity (with radiator), L	7	
Cooling system air flow, m3/sec @ 12.7mmH2O	0.78	
Total heat rejection, BTU/min	2561	N/A
Maximum cooling air flow static restriction mmH2O	N/A	

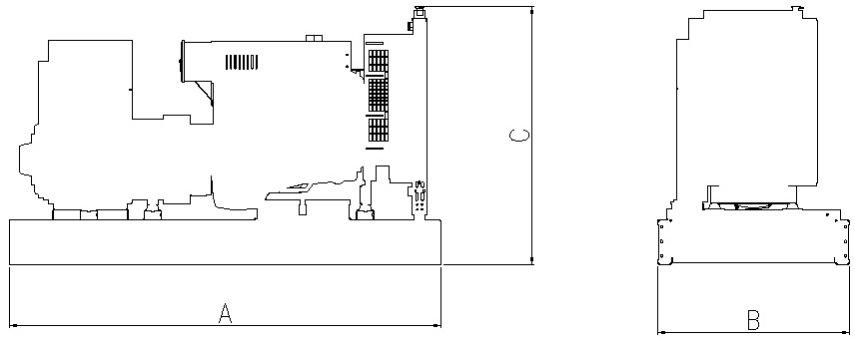
Weights*	Open	Enclosed
Unit dry weight kgs	418.5	743.5
Unit wet weight kgs	582	907

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

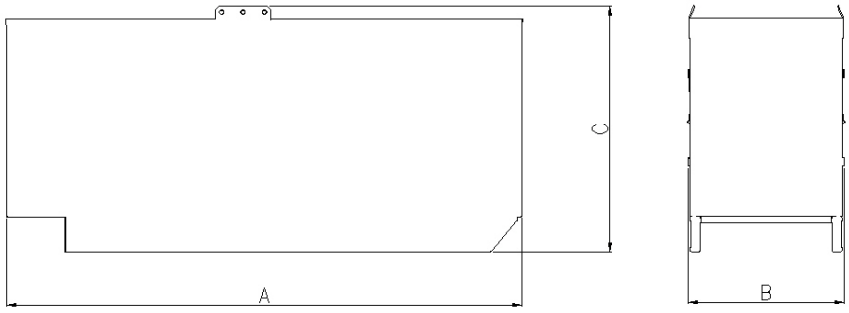
Dimensions	Length	Width	Height
Standard open set dimensions	1667	930	1247
Enclosed set standard dimensions	2082	930	1448

Genset outline

Open set



Enclosed set



Outlines are for illustrative purposes only. Please refer to the genset outline drawing for an exact representation of this model.

Document no. DS340-CPGK-RevD - 29/11/2011

Alternator data

Connection[1]	Temp rise °C	Duty[2]	Alternator	Voltage
3 Phase	163/150C	S/P	PI144D	380-415V
3 Phase	125/105C	S/P	PI144E	380-440V

Ratings definitions

Emergency Standby Power (ESP)	Limited-Time running Power (LTP):	Prime Power (PRP)	Data Center Continuous Power (COP)
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.	Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.	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.	Applicable for supplying back-up power for data center applications evaluated at specific site conditions. This rating is based on load profiles and performance requirements consistent with the data center industry. This rating is site specific and changes in application type or location would require further consideration.

Formulas for calculating full load currents:

Three phase output

$$\frac{kW \times 1000}{Voltage \times 1.73 \times 0.8}$$

Single phase output

$$\frac{kW \times SinglePhaseFactor \times 1000}{Voltage}$$

See your distributor for more information.

Cummins Power Generation
Manston Park, Columbus Avenue
Manston, Ramsgate
Kent CT12 5BF, UK
Telephone: +44 (0) 1843 255000
Fax: +44 (0) 1843 255902
E-Mail: cpg.uk@cummins.com
Web: www.cumminspower.com

Document no. DS340-CPGK-RevD - 29/11/2011

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® 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 - Backed by a comprehensive warranty and worldwide distributor network.

	3-Phase ratings				1-Phase ratings*				
	Standby rating		Prime rating		Standby rating		Prime rating		Data sheet
Model	50 Hz kVA (kW)	60 Hz kW (kVA)	50 Hz kVA (kW)	60 Hz kW (kVA)	50 Hz kVA (kW)	60 Hz kW (kVA)	50 Hz kVA (kW)	60 Hz kW (kVA)	
C17 D5	16.5 (13)		15 (12)		13 (13)		11.8 (11.8)		DS338-CPGK
C22 D5	22 (18)		20 (16)		17 (17)		15.5 (15.5)		DS340-CPGK
C28 D5	27.5 (22)		25 (20)		22 (22)		20 (20)		DS342-CPGK
C12 D6		12 (15)		10.9 (13.6)		12 (12)		10.9 (10.9)	DS339-CPGK
C16 D6		16 (20)		15 (18)		16 (16)		14.5 (14.5)	DS341-CPGK
C20 D6		20 (25)		18 (22)		20 (20)		18.1 (18.1)	DS343-CPGK

*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 in^3)
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 ºF (50 ºC) 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 ºC
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

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

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

Base frame

- Dual skin fully contained fuel tank
- 500 litre fuel tank
- Set mounted battery

Alternator

- Alternator heater
- Excite Boost System (EBS)

Control panel

- PowerCommand 1.1
- 2/4 pole main circuit breaker
- Aux 101

Warranty

- 2 years for Prime application
- 5 years for Standby application

- 1500/3000 hours service kit
- Optional language literature
- Engine oil heater 120/240 V
- External fuel fill (3 way valve)

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 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 Off (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.

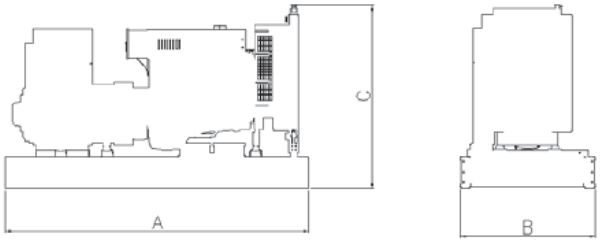
Prime Power (PRP):

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.

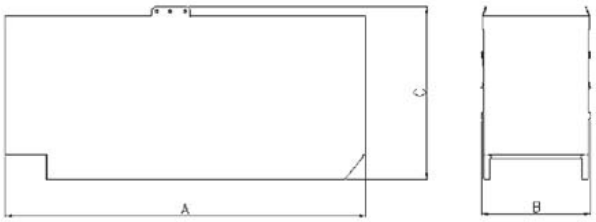
Base Load (Continuous) Power (COP):

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

OPEN



ENCLOSED



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

	Open					Enclosed				
Model	**Length "A" mm**	**Width "B" mm**	**Height "C" mm**	**Dry Wt.* kg**	**Wet Wt.* kg**	**Length "A" mm**	**Width "B" mm**	**Height "C" mm**	**Dry Wt.* kg**	**Wet Wt.* kg**
C17 D5	1667	930	1282	641	752	2082	987	1525	881	1032
C22 D5	1667	930	1282	625	776	2082	987	1525	905	1056
C28 D5	1667	930	1282	648	799	2082	987	1525	928	1079
C12 D6	1667	930	1282	594	745	2082	987	1525	874	1025
C16 D6	1667	930	1282	612	763	2082	987	1525	892	1043
C20 D6	1667	930	1282	625	776	2082	987	1525	905	1056

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

Codes and standards

ISO 9001	This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.	PTS	The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.
CE	This generator set is available with CE certification.		

For more information contact your local Cummins distributor or visit power.cummins.com

Our energy working for you.™

SS26-CPGK (10/17)