WHOLESALE DIESEL GENERATORS
A DIVISION OF NORTH STAR LOGISTICS LLC
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1000KW Cummins Natural Gas Prime Generator

Silent Type | Prime Rated & Continuous Use | K50N-G10S Cummins Engine

General

Model	WDG-1000-CMS-NG-P
Prime Rating	1000 kW / 1250 kVA
Frequency	60 Hz
Voltage	480 / 277 V
Phase	3-Phase
Enclosure Type	Soundproof/Weatherproof
Engine Brand	Cummins
Alternator Brand	Stamford
Controller Model	Deepsea DSE7310

Engine Data

Engine Model	Cummins K50N-G10S
Configuration	4-cylinder, in-line
Aspiration	Turbocharged, Aftercooled
Bore x Stroke (in.)	6.26 x 6.26 in.
Rated Speed (RPM)	1800
Displacement (L)	50.3 L
Compression Ratio	11.5 : 1

Alternator Data

Alternator Model	Stamford S6L1D-E
Type	Self-excited, Brushless
Power Factor	0.8
Voltage Regulation	AVR
Winding Number	311/312
Insulation System	Class H
Protection Level	IP23

Fuel System

Fuel Type	Natural Gas (NG)
Inlet Pressure:	100 kPa
Gas flow rate required at 100% full load	54 m^3/hr / 1,906,200 BTU/hr

Exhaust & Air Intake Systems

Exhaust Gas Flow	3200/6780 L/s
Intake Air Flow	1381/2926 L/s
Maximum Allowable Intake Air Restriction	3.7 kPa

Coolant System

Cooling System	Water-cooled, Vertical copper radiator with electrically driven fan
Coolant Capacity	(Engine only) 165.5 L

Unit Size & Dimensions

Dimensions (L x W x H)	255 x 98 x 110 (in.)
Net Weight (lbs.)	26,455

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S6L1D-E4 Wdg.311/312 - Technical Data Sheet

Standards

STAMFORD industrial alternators meet the requirements of the relevant parts of the IEC 60034 and the relevant sections of other international standards such as BS5000-3, ISO 8528-3, VDE 0530, NEMA MG1-32, CSA C22.2-100 and AS 60034. Other standards and certifications can be considered on request.

Quality Assurance

Alternators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

Excitation and Voltage Regulators

Excitation System					
AVR Type	MX341	MX321/MX322	DECS100	DECS150	
Voltage Regulation	± 1%	± 0.5%	± 0.25%	± 0.25%	with 4% Engine Governing
AVR Power	PMG	PMG	PMG	PMG	

No Load Excitation Voltage (V)	13.5 - 13.6
No Load Excitation Current (A)	0.69 - 0.68
Full Load Excitation Voltage (V)	62
Full Load Excitation Current (A)	2.8
Exciter Time Constant (seconds)	0.16

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Electrical Data								
Insulation System	H							
Stator Winding	Double Layer Concentric							
Winding Pitch	2/3							
Winding Leads	12/6							
Winding Number	311/312							
Number of Poles	4							
IP Rating	IP23							
RFI Suppression	BS EN 61000-6-2 & BS EN 61000-6-4,VDE 0875G, VDE 0875N. Refer to factory for others							
Waveform Distortion	NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%							
Short Circuit Ratio	1/Xd							
Steady State X/R Ratio	18.89							
	50 Hz				**60 Hz**			
Telephone Interference	THF<2%				TIF<50			
Cooling Air Flow	1.41 m³/sec				1.69 m³/sec			
Voltage Series Star (V)	380	400	415	440	416	440	460	480
Voltage Parallel Star (V)*	190	200	208	220	208	220	230	240
Voltage Delta (V)	220	230	240	254	240	254	266	277
kVA Base Rating (Class H) for Reactance Values (kVA)	1000	1050	1050	1010	1150	1200	1250	1300
Saturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	2.79	2.64	2.45	2.10	3.21	2.99	2.85	2.72
X'd Dir. Axis Transient	0.18	0.17	0.16	0.13	0.20	0.19	0.18	0.17
X"d Dir. Axis Subtransient	0.14	0.14	0.13	0.11	0.16	0.15	0.15	0.14
Xq Quad. Axis Reactance	2.17	2.05	1.91	1.63	2.50	2.33	2.22	2.12
X"q Quad. Axis Subtransient	0.34	0.32	0.30	0.25	0.39	0.36	0.34	0.33
XL Stator Leakage Reactance	0.08	0.07	0.07	0.06	0.09	0.08	0.08	0.08
X2 Negative Sequence Reactance	0.20	0.19	0.18	0.15	0.23	0.21	0.20	0.20
X0 Zero Sequence Reactance	0.08	0.07	0.07	0.06	0.09	0.08	0.08	0.08
Unsaturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	3.34	3.17	2.94	2.52	3.85	3.59	3.42	3.27
X'd Dir. Axis Transient	0.20	0.19	0.18	0.15	0.23	0.22	0.21	0.20
X"d Dir. Axis Subtransient	0.17	0.16	0.15	0.13	0.19	0.18	0.17	0.16
Xq Quad. Axis Reactance	2.23	2.12	1.97	1.68	2.57	2.40	2.29	2.18
X"q Quad. Axis Subtransient	0.40	0.38	0.35	0.30	0.46	0.43	0.41	0.39
XL Stator Leakage Reactance	0.09	0.08	0.08	0.07	0.10	0.09	0.09	0.09
Xlr Rotor Leakage Reactance	0.10	0.09	0.09	0.07	0.11	0.11	0.10	0.10
X2 Negative Sequence Reactance	0.24	0.23	0.21	0.18	0.28	0.26	0.24	0.23
X0 Zero Sequence Reactance	0.09	0.09	0.08	0.07	0.10	0.10	0.09	0.09

* Parallel Star connection only available with 12 leads winding option

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Time Constants (Seconds)		
T'd Transient Time Const.	0.101	
T''d Sub-Transient Time Const.	0.016	
T'do O.C. Field Time Const.	3.570	
Ta Armature Time Const.	0.024	
T''q Sub-Transient Time Const.	0.0104	
Resistances in Ohms (Ω) at 22^{0}C		
Stator Winding Resistance (Ra), per phase for series connected	0.00220	
Rotor Winding Resistance (Rf)	1.91	
Exciter Stator Winding Resistance	19.56	
Exciter Rotor Winding Resistance per phase	0.1	
PMG Phase Resistance (Rpmg) per phase	1.91	
Positive Sequence Resistance (R1)	0.0028	
Negative Sequence Resistance (R2)	0.0032	
Zero Sequence Resistance (R0)	0.0028	
Saturation Factors	400V	480V
SG1.0	0.29	0.289
SG1.2	1.181	1.063
Mechanical Data		
Shaft and Keys	All alternator rotors are dynamically balanced to better than ISO 21940-11 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key.	
	1 Bearing	2 Bearing
SAE Adaptor	SAE0,1	SAE0,1
Moment of Inertia	20.014 kgm²	19.49 kgm²
Weight Wound Stator	999kg	999kg
Weight Wound Rotor	853kg	811kg
Weight Complete Alternator	2020kg	2102kg
Shipping weight in a Crate	2063kg	2145kg
Packing Crate Size	170x90x153(cm)	170x90x153(cm)
Maximum Over Speed	2250 RPM for two minutes	
Bearing Drive End	-	BALL 6224
Bearing Non-Drive End	BALL 6317	BALL 6317

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RATINGS AT 0.8 POWER FACTOR

	Class - Temp Rise	Standby - 163/27°C				Standby - 150/40°C				Cont. H - 125/40°C				Cont. F - 105/40°C			
50 Hz	Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	Parallel Star (V)*	190	200	208	220	190	200	208	220	190	200	208	220	190	200	208	220
	Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
	kVA	1100	1125	1125	1100	1060	1100	1100	1060	1000	1050	1050	1010	900	945	945	900
	kW	880	900	900	880	848	880	880	848	800	840	840	808	720	756	756	720
	Efficiency (%)	94.8	94.9	95.0	95.2	94.9	95.0	95.1	95.3	95.1	95.1	95.2	95.4	95.3	95.3	95.4	95.5
	kW Input	928	949	947	925	893	927	926	890	841	883	882	847	755	793	792	754

60 Hz	Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)*	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	1250	1300	1350	1400	1206	1250	1300	1350	1150	1200	1250	1300	1063	1100	1150	1188
	kW	1000	1040	1080	1120	965	1000	1040	1080	920	960	1000	1040	850	880	920	950
	Efficiency (%)	95.0	95.1	95.1	95.1	95.1	95.2	95.2	95.2	95.2	95.2	95.3	95.3	95.3	95.4	95.4	95.4
	kW Input	1053	1094	1136	1178	1015	1051	1093	1134	967	1008	1050	1091	892	922	964	996

*** Parallel Star connection only available with 12 leads winding option**

De-rates

All values tabulated above are subject to the following reductions:

- 5% when air inlet filters are fitted
- 3% for every 500 meters by which the operating altitude exceeds 1000 meters above mean sea level
- 3% for every 5°C by which the operational ambient temperature exceeds 40°C @ Class H temperature rise (please refer to applications for ambient temperature de-rates at other temperature rise classes)
- For any other operating conditions impacting the cooling circuit please refer to applications

Note: Requirement for operating in an ambient exceeding 60°C and altitude exceeding 4000 meters (for <690V) or 1500 meters (for >690V) must be referred to applications.

Dimensional and Torsional Drawing

For dimensional and torsional information please refer to the alternator General Arrangement and rotor drawings available on our website (http://stamford-avk.com/)

Note: Continuous development of our products means that the information contained in our data sheets can change without notice, and specifications should always be confirmed with Cummins Generator Technologies prior to purchase.

DSEGenset

DSE

DSE7310/20

AUTO START & AUTO MAINS FAILURE CONTROL MODULES

FEATURES

DSE**7310**

DSE**7320**

KEY FEATURES

- 4-Line back-lit LCD text display
- Five key menu navigation
- Front panel editing with PIN protection
- Customisable status screens
- Power save mode
- Support for up to three remote display units
- 9 configurable inputs
- 8 configurable outputs
- Flexible sender inputs
- Configurable timers and alarms
- 3 configurable maintenance alarms
- Multiple date and time scheduler
- Configurable event log (250)
- Tier 4 CAN engine support
- Integral PLC editor
- Easy access diagnostic page
- CAN and Magnetic Pick-up/Alt. sensing
- Fuel usage monitor and low fuel alarms
- Charge alternator failure alarm
- Manual speed control (on compatible CAN engines)
- Manual fuel pump control
- Engine exerciser
- “Protections disabled” feature
- kW & kV Ar protection
- Reverse power (kW & kV Ar) protection
- LED and LCD alarm indication
- Power monitoring (kW h, kV Ar, kV A h, kV Ar h)
- Load switching (load shedding and dummy load outputs)
- Automatic load transfer (DSE7320)
- Unbalanced load protection
- Independent Earth Fault trip
- True dual mutual standby with load balancing timer (DSE7310 only)
- USB connectivity
- Backed up real time clock
- Fully configurable via DSE Configuration Suite PC software
- Configurable display languages
- Remote SCADA monitoring via DSE Configuration Suite PC software
- User selectable RS232 and RS485 communications
- Configurable Gencomm pages
- Advanced SMS messaging (additional external modem required)
- Start & stop capability via SMS messaging
- Additional display screens to help with modem diagnostics
- Idle control for starting & stopping.
- DSENet® expansion compatible
- Heated display option available

KEY BENEFITS

- 132 x 64 pixel ratio display for clarity
- Real-time clock provides accurate event logging
- Multiple date and time scheduler
- Set maintenance periods can be configured to maintain optimum engine performance
- Ethernet communications (via DSE855 module), provides advanced remote monitoring
- Modules can be integrated into building management systems (BMS)
- Increased input and output expansion capability via DSENet®
- Licence-free PC software
- IP65 rating (with supplied gasket) offers increased resistance to water ingress
- PLC editor allows user configurable functions to meet specific application requirements

SPECIFICATION

DC SUPPLY

CONTINUOUS VOLTAGE RATING
8 V to 35 V Continuous

CRANKING DROPOUTS
Able to survive 0 V for 50 mS, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries. LEDs and backlight will not be maintained during cranking.

MAXIMUM OPERATING CURRENT
340 mA at 12 V, 160 mA at 24 V

MAXIMUM STANDBY CURRENT
160 mA at 12 V, 80 mA at 24 V

CHARGE FAIL/EXCITATION RANGE
0 V to 35 V

MAINS (UTILITY) DSE7320 ONLY

VOLTAGE RANGE
15 V to 415 V AC (Ph to N)
26 V to 719 V AC (Ph to Ph)

FREQUENCY RANGE
3.5 Hz to 75 Hz

OUTPUTS

OUTPUT A (FUEL)
15 A DC at supply voltage

OUTPUT B (START)
15 A DC at supply voltage

OUTPUTS C & D
8 A 250 V (Volt free)

AUXILIARY OUTPUTS E,F,G,H
2 A DC at supply voltage

GENERATOR

VOLTAGE RANGE
15 V to 415 V AC (Ph to N)
26 V to 719 V AC (Ph to Ph)

FREQUENCY RANGE
3.5 Hz to 75 Hz

MAGNETIC PICK UP

VOLTAGE RANGE
+/- 0.5 V to 70 V

FREQUENCY RANGE
10,000 Hz (max)

DIMENSIONS

OVERALL
240 mm x 181 mm x 42 mm
9.4” x 7.1” x 1.6”

PANEL CUT-OUT
220 mm x 160 mm
8.7” x 6.3”

MAXIMUM PANEL THICKNESS
8 mm
0.3”

OPERATING TEMPERATURE RANGE
-30°C to +70°C

STORAGE TEMPERATURE RANGE
-40°C to +80°C

RELATED MATERIALS

TITLE	PART NO’S
DSE7310 Installation Instructions	053-028
DSE7320 Installation Instructions	053-029
DSE7200/7300 Quick Start Guide	057-101
DSE7200/7300 Operator Manual	057-074
DSE7200/7300 Configuration Suite PC Manual	057-077

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DSEGenset

DSE7310/20

AUTO START & AUTO MAINS FAILURE CONTROL MODULES

FEATURES

The DSE7310 is an Auto Start Control Module and the DSE7320 is an Auto Mains (Utility) Failure Control Module suitable for a wide variety of single, diesel or gas, gen-set applications.

Monitoring an extensive number of engine parameters, the modules will display warnings, shutdown and engine status information on the back-lit LCD screen, illuminated LEDs, remote PC and via SMS text alerts (with external modem).

The DSE7320 will also monitor the mains (utility) supply. The modules include USB, RS232 and RS485 ports as well as dedicated DSENet® terminals for system expansion.

Both modules are compatible with electronic (CAN) and non-electronic (magnetic pick-up/alternator sensing) engines and offer an extensive number of flexible inputs, outputs and extensive engine protections so the system can be easily adapted to meet the most demanding industry requirements.

The extensive list of features includes enhanced event and performance monitoring, remote communications, PLC functionality and dual mutual standby (DSE7310 only) to reduce engine wear.

The modules can be easily configured using the DSE Configuration Suite PC software. Selected front panel editing is also available.

ENVIRONMENTAL TESTING STANDARDS

ELECTRO-MAGNETIC COMPATIBILITY
BS EN 61000-6-2
EMC Generic Immunity Standard for the Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the Industrial Environment

ELECTRICAL SAFETY
BS EN 60950
Safety of Information Technology Equipment, including Electrical Business Equipment

TEMPERATURE
BS EN 60068-2-1
Ab/Ae Cold Test -30 °C
BS EN 60068-2-2
Bb/Be Dry Heat +70 °C

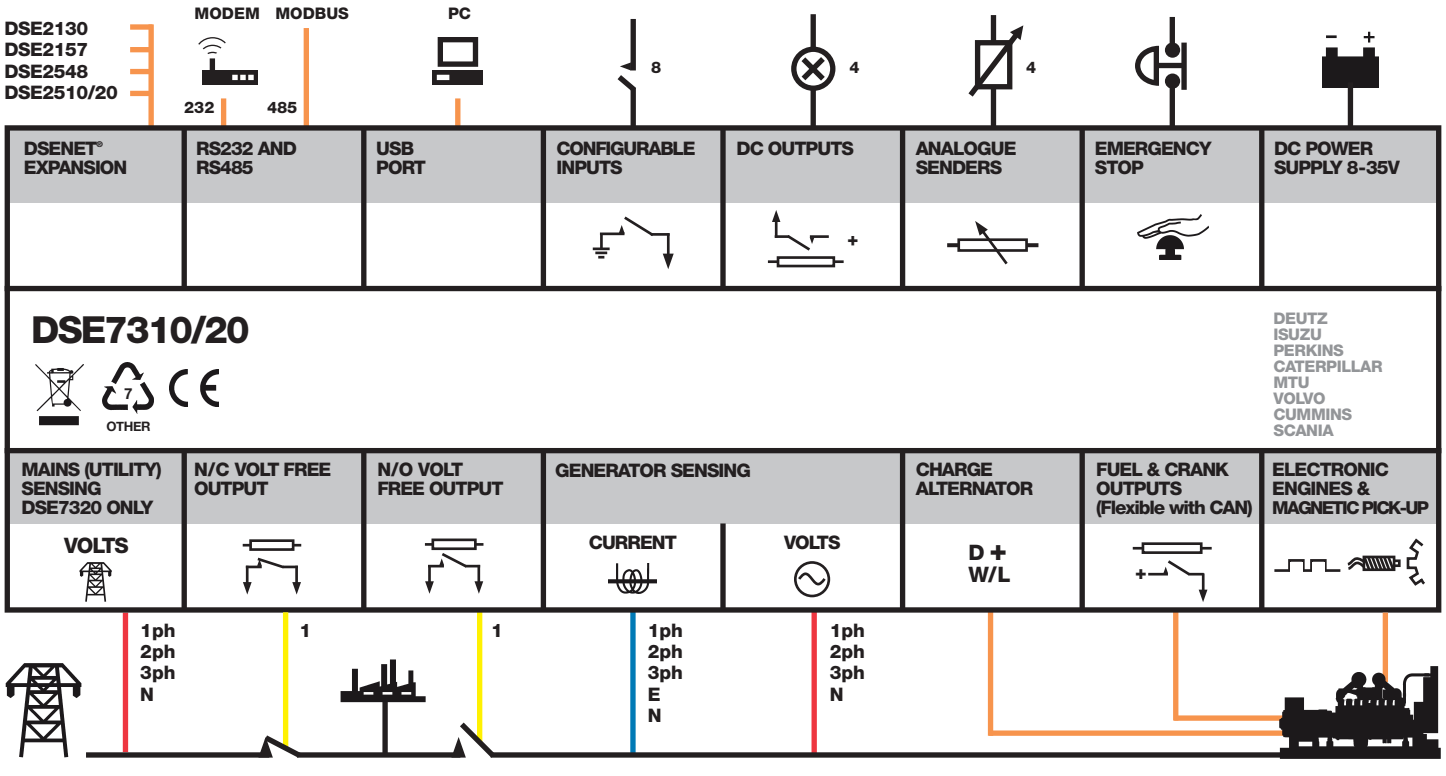
VIBRATION
BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz @ +/-7.5 mm,
8 Hz to 500 Hz @ 2 gn

HUMIDITY
BS EN 60068-2-30
Db Damp Heat Cyclic 20/55 °C @ 95% RH 48 Hours
BS EN 60068-2-78
Cab Damp Heat Static 40 °C @ 93% RH 48 Hours

SHOCK
BS EN 60068-2-27
Three shocks in each of three major axes
15 gn in 11 mS

DEGREES OF PROTECTION PROVIDED BY ENCLOSURES
BS EN 60529
IP65 - Front of module when installed into the control panel with the supplied sealing gasket.

COMPREHENSIVE FEATURE LIST TO SUIT A WIDE VARIETY OF GEN-SET APPLICATIONS



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