

350KW Cummins Diesel Generator

Prime/COP | Silent Type | Cummins Engine | Non-EPA

General

Model	WDG-350-CUM-P-NE
Fuel Type	Diesel
Power Rating	350 KW
Frequency	60 Hz
Voltage	Any voltage can be customized
Phase	Single Phase or Three Phase
Enclosure Type	Soundproof, Weatherproof
Controller Model	DeepSea DSE 7310



Engine Data

Engine Model	Cummins 6ZTAA13-G4
Configuration	6-cylinder
Aspiration	Turbocharged & Charge Air Cooled
Bore x Stroke (in.)	5.12 x 6.42 (in.)
Rated Speed (RPM)	1800
Displacement (L)	13 L
Compression Ratio	17:1
Cooling Method	Water Cooled
Governor	Electronic

Alternator Data

Alternator Model	Stamford S4L1D-E41
Type	Self-excited, Brushless
Voltage Regulation	AVR
Insulation System	Class H
Protection Level	IP23

Size & Dimensions

Dimensions (L x W x H)	177.2 x 63.0 x 84.6 (in.)
Net Weight (lbs.)	6,000

Other Features

- Electrical System: Schneider brand, Main Circuit Breaker 630A, UL Certified
- Coolant Heater: Phillips & Temro brand, 2250W, 230VAC
- Fuel Tank System: Base fuel tank, Bounded/Double wall tank
- Enclosure Structural Design: 180° full-opening access doors, Anti-corrosion treatment, UV-resistance, 40mm thick cotton sound-absorbing cotton for noise reduction, 75 dB @ 7 m
- Battery Charger: DSE9470 MKII, 12/24 volt, 10 amp



Generator Engine Performance Data

Dongfeng Cummins Engine Co.,Ltd
Xiangyang, Hubei Province, China

Engine Model

6ZTAA13-G4

Curve Number

FR20692

CPL Code

3715

Compression Ratio: 17:1

Cylinders: 6

Bore: 130 mm

Stroke: 163 mm

Displacement: 13.0 L

Engine Configuration: D0C3006GX03

Fuel System: BYC PD/GAC

Aspiration: Turbocharged & Charge Air Cooled

Governor Regulation: ≤3%

Emission Certification: NA

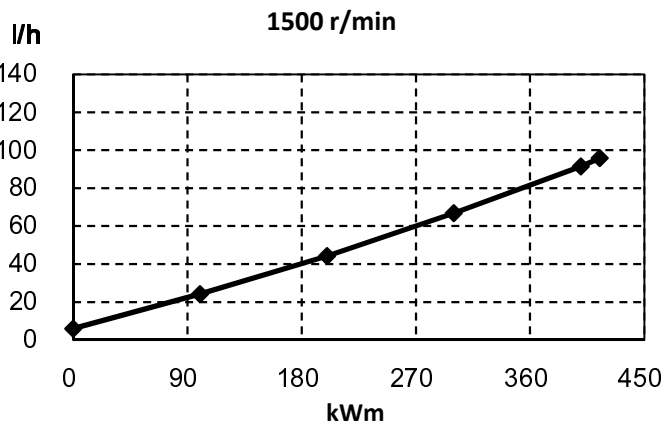
Engine Ratings*:

Engine Speed	Standby Power		Prime Power		Continuous Power	
r/min	bhp	kWm	bhp	kWm	bhp	kWm
1500	557	415	537	400	470	350
1800	557	415	537	400	470	350

* All ratings refer to AEB26.02.

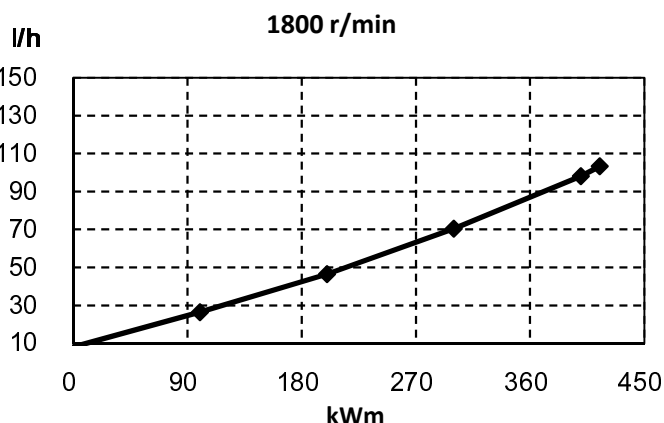
Engine Fuel Consumption @1500 r/min

OUTPUT POWER			FUEL CONSUMPTION			
%	bhp	kWm	lb/bhp.h	g/kWm.h	gal/h	l/h
Standby Power						
100	557	415	0.319	194	363	95.8
Prime Power						
100	537	400	0.316	192	347	91.4
75	403	300	0.308	187	253	66.8
50	268	200	0.306	186	168	44.3
25	134	100	0.334	203	92	24.2
Continuous Power						
100	470	350	0.311	189	298	78.8



Engine Fuel Consumption @1800 r/min

OUTPUT POWER			FUEL CONSUMPTION			
%	bhp	kWm	lb/bhp.h	g/kWm.h	gal/h	l/h
Standby Power						
100	557	415	0.344	209	391	103.3
Prime Power						
100	537	400	0.339	206	372	98.1
75	403	300	0.324	197	267	70.4
50	268	200	0.321	195	176	46.4
25	134	100	0.363	221	100	26.3
Continuous Power						
100	470	350	0.329	200	316	83.3



Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with GB/T18297 conditions of 29.61 in Hg (100 kPa) barometric pressure [263 ft (80 m) altitude], 77 deg F (25 deg C) inlet air temperature, and 0.30 in Hg (1 kPa) water vapor pressure with No. 2 diesel fuel.

All data obtained is based on the engine operating, under the test conditions of 14.9 in H₂O (3.7kPa) inlet air restriction and 2.95 in Hg (10 kPa) exhaust restriction, not included are alternator, fan, optional equipment and driven components.

The engine may be operated up to 4500 m altitude.



Generator Engine Performance Data

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Xiangyang, Hubei Province, China

Engine Model

6ZTAA13-G4

Curve Number

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3715

GENERAL ENGINE DATA

Type: Four cycle; Inline; 6 Cylinder
 Aspiration: Turbocharged Charge Air Cooled
 Compression Ratio: 17:1
 Fire Order: 1-5-3-6-2-4
 Bore x Stroke: - mm 130 x 163
 Displacement: - L 13.0
 Low Idle Speed: - r/min 800 -1000
 Maximum altitude for continuous operation: - m 4500
 Approximate Engine Weight - Dry: - kg 1200
 Approximate Engine Weight - Wet: - kg 1265
 Center of Gravity from front face of block: - mm 519
 Center of Gravity above crankshaft centerline: - mm 201
 Rotation inertia of Complete Engine (without flywheel): - kg.m² 1.48

ENGINE MOUNTING

Maximum static mounting surface bending moment
 Rear face of block: - N.m 1356
 Maximum static bending moment of FAN: - N.m 21
 Maximum allowable weight on Engine Support: - kg 1500

AIR INDUCTION SYSTEM

Whole air intake pipe size (recommendatory): - mm 200
 Charge air cooler pipe size(recommendatory): - mm 110
 *Maximum temperature rise between ambient air and engine air inlet: - °C 11.1
 *Maximum Temp Rise Between Air Intake and Intake Manifold : - °C 30
 *Maximum Intake Manifold Temperature (unable to result in power loss at sea level):
 - °C 60
 Maximum Intake Manifold Temperature : - °C 85
 *Maximum intake air restriction (heavy duty air cleaner):
 clean filter: - kPa 3.2
 dirty filter: - kPa 6.2
 *Maximum allowable pressure drop across charge air cooler and OEM CAC
 piping (CACDP): - kPa 13

EXHAUST SYSTEM

*Max. back pressure imposed at Standby Power by complete exhaust system: - kPa 13
 Maximum allowable static bending moment at exhaust outlet flange: - N.m 27
 Exhaust pipe size (recommendatory):..... - mm 130

*At the engine rated power point



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LUBRICATION SYSTEM

Oil pressure @ idle - minimum:	- kPa	82.7
Typical oil pressure range - warm engine:	- kPa	207 - 276
Total system capacity (standard pan):	- L	45.42
Maximum lube oil flow to all accessories:	- L/min	7.57

COOLING SYSTEM

Coolant Capacity (Engine Only):	- L	23.1
Engine coolant circuit thermostat opening temperature:	- °C	82
Engine coolant circuit thermostat fully open temperature:	- °C	94
Maximum coolant temperature - engine out:	- °C	102
Minimum operating block coolant temperature:	- °C	71
Maximum coolant pressure(exclusive of pressure cap; closed thermostat at maximum no load speed):	- kPa	407
Minimum pressure cap rating at sea level:	- kPa	103
Maximum Coolant Friction Head External to Engine:	- kPa	75
Maximum deaeration time:	- min	25
Minimum fill rate (low level alarm required for most engines):	- L/min	19
Maximum coolant expansion space (% total system capacity):	- %	10
Minimum coolant expansion space (% total system capacity):	- %	6

FUEL SYSTEM

*Maximum allowable restriction @ OEM point with maximum fuel flow:	- kPa	20.3
*Maximum fuel drain restriction (total head) before (or without) check valve:.....	- kPa	33.9
Minimum fuel tank venting requirement:	- L/s	0.2
Maximum fuel inlet temperature:	- °C	71
Maximum design fuel flow:	- kg/h	162

ELECTRICAL SYSTEM

System voltage:	- V	24
Minimum battery capacity-cold soak at -18 C (0 F) or above		
Engine only cold cranking amperes:	- CCA	900
Engine only reserve capacity:	- min	270

COLD START CAPABILITY

Minimum ambient temperature for unaided cold start:	- °C	-15
Minimum ambient temperature for aided cold start (Intake Air Heater):	- °C	-35

*At the engine rated power point



Generator Engine Performance Data

Dongfeng Cummins Engine Co., Ltd
Xiangyang, Hubei Province, China

Engine Model

6ZTAA13-G4

Curve Number

FR20692

CPL Code

3715

Performance Data

All data is based on:

Engine operating with fuel system, water pump, lubricating oil pump and air cleaner; not included are alternator, fan, and optional equipment and driven components.

Test Condition:

- GB18297 Engine test code - Performance
- Barometric Pressure : 100 kPa (29.53 in Hg)
- Air Temperature: 25 °C (77 °F)
- Altitude: 80 m (263 ft)
- Relative Humidity: 50%

Steady State Stability Band at any constant load (+/-):

5%

		Standby Power		Prime Power	
Engine Speed	r/min	1500	1800	1500	1800
Gross Engine PowerOutput	kWm	415	415	400	400
Torque:	N.m	2642	2202	2547	2122
Brake Mean EffectivePressure	kPa	2554	2128	2462	2051
Piston Speed	m/s	8.15	9.78	8.15	9.78
Friction Horsepower	kW	31	45	31	45
Coolant Flow	L/min	366	438	366	438
Fuel Consumption	kg/h	80.5	86.7	76.8	82.4
<u>Engine Data</u>					
Intake Air Flow	m3/min	29.2	33.1	28.8	32.7
Exhaust Gas Temp - DryStack	°C	668	646	653	614
Exhaust Gas Flow	kg/min.	30.6	34.5	30.1	34.1
Air to Fuel ratio		24.3	25.1	25.0	26.3
Heat Rejection to Ambient	kW	67	67	65	65
Heat Rejection to JacketCoolant	kW	166	167	162	162
Heat Rejection to Exhaust	kW	359	359	346	346
Heat Rejection to Fuel	kW	5	5	5	5
<u>ATA CAC</u>					
Heat Rejection to Aftercooler	kW	92	107	86	106
TurbochargerCompressor Outlet	kPa	283	271	274	266
Charge Air Flow	kg/min.	34.5	39.0	34.0	38.6
TurbochargerCompressor Outlet	°C	212	214	210	211

TBD = To Be Decided

N/A = Not Applicable

Dongfeng Cummins Engine Co., Ltd.

S4LID-E41 Wdg.311 - Technical Data Sheet

Standards

Stamford industrial alternators meet the requirements of the relevant parts of the BS EN 60034 and the relevant section of other international standards such as BS5000, VDE 0530, NEMA MG1-32, IEC34, CSA C22.2-100 and AS1359. 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	AS440	MX341	MX321		
Voltage Regulation	± 1%	± 1%	± 0.5%		with 4% Engine Governing
Excitation Type	Self-Excited	PMG	PMG		

No Load Excitation Voltage (V)	12 - 9
No Load Excitation Current (A)	0.7 - 0.5
Full Load Excitation Voltage (V)	41 - 39
Full Load Excitation Current (A)	2.3 - 2.2
Exciter Time Constant (seconds)	0.105

STAMFORD

S4LID-E41 Wdg.311

Electrical Data								
Insulation System	Class H							
Stator Winding	Double Layer Lap							
Winding Pitch	Two Thirds							
Winding Leads	12							
Winding Number	311							
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	13.56							
	50 Hz				60 Hz			
Telephone Interference	THF<2%				TIF<50			
Cooling Air	0.8 m³/sec				0.96 m³/sec			
Voltage Star	380	400	415	440	416	440	460	480
Voltage Parallel Star	190	200	208	220	208	220	230	240
Voltage Series Delta	220	230	240	254	240	254	266	277
kVA Base Rating (Class H) for Reactance Values	350	360	360	350	400	435	440	455
Saturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	3.01	2.79	2.59	2.24	3.47	3.38	3.12	2.97
X'd Dir. Axis Transient	0.20	0.19	0.17	0.15	0.21	0.20	0.19	0.18
X''d Dir. Axis Subtransient	0.14	0.13	0.12	0.11	0.15	0.14	0.13	0.12
Xq Quad. Axis Reactance	2.57	2.39	2.22	1.92	2.92	2.84	2.62	2.49
X''q Quad. Axis Subtransient	0.36	0.33	0.31	0.27	0.41	0.40	0.37	0.35
XL Stator Leakage Reactance	0.07	0.06	0.06	0.05	0.08	0.08	0.08	0.07
X2 Negative Sequence Reactance	0.24	0.23	0.21	0.18	0.28	0.27	0.25	0.24
X0 Zero Sequence Reactance	0.10	0.09	0.09	0.07	0.10	0.09	0.09	0.08
Unsaturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	3.61	3.35	3.11	2.69	4.17	4.05	3.75	3.56
X'd Dir. Axis Transient	0.23	0.21	0.20	0.17	0.24	0.23	0.21	0.20
X''d Dir. Axis Subtransient	0.17	0.16	0.15	0.13	0.17	0.17	0.15	0.15
Xq Quad. Axis Reactance	2.65	2.46	2.29	1.98	3.00	2.92	2.70	2.57
X''q Quad. Axis Subtransient	0.43	0.40	0.37	0.32	0.49	0.48	0.44	0.42
XL Stator Leakage Reactance	0.08	0.07	0.07	0.06	0.10	0.09	0.09	0.08
Xlr Rotor Leakage Reactance	0.12	0.11	0.10	0.09	0.13	0.13	0.12	0.11
X2 Negative Sequence Reactance	0.29	0.27	0.25	0.22	0.33	0.32	0.30	0.29
X0 Zero Sequence Reactance	0.12	0.11	0.10	0.09	0.11	0.11	0.10	0.10

STAMFORD®

S4LID-E41 Wdg.311

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	Series 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
	Series Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
	kVA	380	415	400	380	370	385	385	370	350	360	360	350	320	325	325	320
	kW	304	332	320	304	296	308	308	296	280	288	288	280	256	260	260	256
	Efficiency (%)	92.7	92.5	93.0	93.5	92.9	93.0	93.2	93.6	93.2	93.3	93.5	93.8	93.6	93.8	93.9	94.1
	kW Input	328	359	344	325	319	331	331	316	300	309	308	298	274	277	277	272

60 Hz	Series 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
	Series Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	435	470	475	490	420	460	460	475	400	435	440	455	365	395	400	410
	kW	348	376	380	392	336	368	368	380	320	348	352	364	292	316	320	328
	Efficiency (%)	92.9	92.9	93.1	93.2	93.1	93.0	93.3	93.3	93.4	93.3	93.5	93.5	93.7	93.7	93.9	93.9
	kW Input	374	405	408	421	361	396	395	407	343	373	377	389	312	337	341	349

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
- 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 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.

DSE7310/20 MKII

AUTO START & AUTO MAINS FAILURE CONTROL MODULES



KEY FEATURES

- Configurable power-up mode
- MPU fail delay
- Enhanced graphical user interface
- Drag & drop advanced PLC editor
- MSC ID within PLC GenComm override
- 4-Line back-lit LCD text display
- Multiple Display Languages
- Five key menu navigation
- LCD alarm indication
- Heated display option available
- Customisable power-up text and images
- DSENet expansion compatibility
- Data logging facility
- Internal PLC editor
- Protections disable feature
- Fully configurable via PC using USB, RS232 & RS485 communication
- Front panel configuration with PIN protection
- Power save mode
- 3 phase generator sensing and protection
- 3 phase mains (utility) sensing and protection (DSE7320 MKII only)
- Automatic load transfer control (DSE7320 MKII only)
- Generator current and power monitoring (kW, kvar, kVA, pf)
- Mains current and power monitoring (kW, kvar, kVA, pf) (DSE7320 MKII only)
- kW and kvar overload and reverse power alarms
- Over current protection
- Unbalanced load protection
- Independent earth fault protection
- Breaker control via fascia buttons
- Fuel and start outputs configurable when using CAN
- 6 configurable DC outputs
- 2 configurable volt-free relay outputs
- 6 configurable analogue/digital inputs
- Support for 0 V to 10 V & 4 mA to 20 mA sensors
- 8 configurable digital inputs
- Configurable 5 stage dummy load and load shedding outputs
- CAN, MPU and alternator frequency speed sensing in one variant
- Real time clock
- Manual and automatic fuel pump control
- Engine pre-heat and post-heat functions
- Engine run-time scheduler
- Engine idle control for starting & stopping
- Fuel usage monitor and low fuel level alarms
- Simultaneous use of RS232 and RS485 communication ports
- True dual mutual standby using RS232 or RS485 for accurate engine hours balancing.
- MODBUS RTU support with configurable MODBUS pages.
- Advanced SMS messaging (additional external modem required)
- Start & stop capability via SMS messaging
- 3 configurable maintenance alarms
- Compatible with a wide range of CAN engines, including tier 4 engine support
- Uses DSE Configuration Suite PC Software for simplified configuration
- Licence-free PC software
- IP65 rating (with supplied gasket) offers increased resistance to water ingress
- Modules can be integrated into building management systems (BMS) using MODBUS RTU

KEY BENEFITS

- Automatically transfers between mains (utility) and generator (DSE7320 MKII only) for convenience.
- Hours counter provides accurate information for monitoring and maintenance periods
- User-friendly set-up and button layout for ease of use
- Multiple parameters are monitored & displayed simultaneously for full visibility
- The module can be configured to suit a wide range of applications for user flexibility
- PLC editor allows user configurable functions to meet user specific application requirements.

SPECIFICATIONS

DC SUPPLY

CONTINUOUS VOLTAGE RATING

8 V to 35 V Continuous
5 V for up to 1 minute

CRANKING DROPOUTS

Able to survive 0 V for 100 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

510 mA at 12 V, 240 mA at 24 V

MAXIMUM STANDBY CURRENT

330 mA at 12 V, 160 mA at 24 V

CHARGE FAIL/EXCITATION RANGE

0 V to 35 V

GENERATOR & MAINS (UTILITY)

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 PICKUP

VOLTAGE RANGE

+/- 0.5 V to 70 V

FREQUENCY RANGE

10,000 Hz (max)

INPUTS

DIGITAL INPUTS A TO H

Negative switching

ANALOGUE INPUTS A & F

Configurable as:
Negative switching digital input
0 V to 10 V sensor
4 mA to 20 mA sensor
Resistive sensor

ANALOGUE INPUTS B, C, D & E

Configurable as:
Negative switching digital input
Resistive sensor

OUTPUTS

OUTPUT A & B (FUEL & START)

15 A DC at supply voltage

OUTPUTS C & D

8 A AC at 250 V AC (Volt-free)

AUXILIARY OUTPUTS E, F, G, H, I & J

2 A DC at supply voltage

DIMENSIONS

OVERALL

245 mm x 184 mm x 51 mm
9.6" x 7.2" x 2.0"

PANEL CUT-OUT

220 mm x 160 mm
8.7" x 6.3"

MAXIMUM PANEL THICKNESS

8 mm
0.3"

STORAGE TEMPERATURE RANGE

-40°C to +85°C
-40 °F to +185 °F

OPERATING TEMPERATURE RANGE

-30°C to +70°C
-22 °F to +158 °F

HEATED DISPLAY VARIANT

-40 °C to +70 °C
-40 °F to +158 °F

RELATED MATERIALS

TITLE

DSE7310 MKII & DSE7320 MKII Installation Instructions
DSE7310 MKII & DSE7320 MKII Operator Manual
DSE7310 MKII & DSE7320 MKII Configuration Suite PC Manual

PART NO.

053-181
057-253
057-243

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DSE7310/20 MKII

AUTO START & AUTO MAINS FAILURE CONTROL MODULES

The DSE7310 MKII is an Auto Start Control Module and the DSE7320 MKII 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 MKII 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. Dual mutual standby is now available on both the DSE7310 MKII & DSE7320 MKII using RS232 or RS485 communications. This provides for a simpler and more convenient installation with more advanced features such as true engine hours balancing.

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 at +/-7.5 mm,
8 Hz to 500 Hz at 2 gn

HUMIDITY

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

