WHOLESALE DIESEL GENERATORS
A DIVISION OF NORTH STAR LOGISTICS LLC
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1350KW Perkins Diesel Generator

Perkins Engine | Customizable Options | EPA Tier 3

General

Model	WDG-1350-PER
Fuel Type	Diesel
Prime Rating	1350 kW / 1690 kVA
Standby Rating	1480 kW / 1850 kVA
Frequency	60 Hz
Voltage	Any voltage can be customized
Phase	Single Phase or Three Phase
Enclosure Type	Silent, Weatherproof
Engine Brand	Perkins
Alternator Brand	Stamford
Controller Model	Deep Sea DSE 7320/7310

Engine Data

Engine Model	4012-46TAG3A
Configuration	V12 (12 cylinder)
Aspiration	Turbocharged & Air-to-air charge cooled
Bore x Stroke (in.)	6.3 x 7.4 (in.)
Rated Speed (RPM)	1800
Displacement (L)	45.8
Compression Ratio	13.1/13.6:1
Cooling Method	Water cooled
Governor	Electronic

Alternator Data

Alternator Model	Stamford S6L1D-H4
Type	Self-excited, Brushless
Power Factor	0.8
Voltage Regulation	AVR
Insulation System	Class H
Protection Level	IP23

Size & Dimensions

Dimensions (L x W x H)	228 x 78 x 91 (in.)
Net Weight (lbs.)	26,000

Other Customization

- ☐ Open type without enclosure
- ☐ Silent type with enclosure
  - Options for:
    - Painted
    - Stainless Steel
    - Aluminum (MOQ required)

Product Specifications for 4012-46TAG

Total Power Range

Gross Mechanical Output	906-1643 kWm
Typical Electrical Output	1000-1880 kVA (800-1504 kWe)
Rated Speed	1500/1800 rpm

Emission Standards

Emissions	Fuel Optimised

50 Hz Typical Electrical Output

Prime	1250-1710 kVA
Standby	1375-1880 kVA
Baseload	1000-1425 kVA

60 Hz Typical Electrical Output

Prime	1095-1368 kWe
Standby	1204-1504 kWe
Baseload	868-1140 kWe

General

Number of Cylinders	12 Vee
Bore	160 mm
Stroke	190 mm
Displacement	45.8 l

Compression Ratio	13:1/13.6:1
Aspiration	Turbocharged and air-to-air charge cooled
Combustion System	Direct injection
Rotation from Flywheel End	Anti-clockwise
Cooling System	Liquid
Aftertreatment	-
Typical Alternator Efficiency	95%
Switchable	Available for some power nodes

ElectropaK Dimensions

Length	3915 mm
Width	2198 mm
Height	2259 mm
Dry Weight	4400 kg

Disclaimer

Note 1	*Final dimensions dependent on selected options

Definitions

Prime Power	Unlimited hours usage with an average load factor of 80% of the published prime power over each 24 hours period. A 10% overload is available for 1 hour in every 12 hours operation.
Standby Power	Limited to 500 hours annual usage with an average load factor of 80% of the published standby power rating over each 24 hour period. Up to 300 hours of annual usage may be run continuously. No overload is permitted on standby power.

Baseload	Unlimited hours usage with an average load factor of 100% of the published baseload power. No overload is permitted on baseload power.

4012-46TAG Standard Equipment

Air inlet system

Mounted air filter and turbochargers

Cooling system

Powder coated radiator comprising: water radiator; air charge cooled radiator; fuel oil cooling (optional); all pipes, hoses and clips; fan; pulleys; fan belts and safety guards
System designed for ambients up to 50ºC (122ºF)
Two twin thermostats

Electrical equipment

24 volt starter motor and 24 volt alternator with integral regulator and DC output
Overspeed switch and magnetic pickup
Turbine inlet temperature shutdown switch
Twin high coolant temperate shutdown switches
Twin low oil pressure shutdown switches

Flywheels and flywheel housing

SAE00 flywheel housing
SAE J620 size 18 flywheel

Fuel system

Direct fuel injection system, fuel lift pump
Full flow spin-on fuel oil filters

Governing

Governing to ISO 8528-5 class G2 with isochronous capability

Oil system

Engine jacket water/lubricating oil temperature stabiliser
Full flow spin-on oil filters
Wet sump with filler and dipstick

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S6L1D-H4 Wdg.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)	14.2 - 15.6
No Load Excitation Current (A)	0.71 - 0.76
Full Load Excitation Voltage (V)	66
Full Load Excitation Current (A)	2.9
Exciter Time Constant (seconds)	0.16

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S6L1D-H4 Wdg.312

Electrical Data								
Insulation System	H							
Stator Winding	Double Layer Concentric							
Winding Pitch	2/3							
Winding Leads	6							
Winding Number	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	25.38							
	50 Hz				60 Hz			
Telephone Interference	THF<2%				TIF<50			
Cooling Air Flow	1.89 m³/sec				2.27 m³/sec			
Voltage Star (V)	380	400	415	440	416	440	460	480
Voltage Parallel Star (V)	-	-	-	-	-	-	-	-
Voltage Delta (V)	-	-	-	-	-	-	-	-
kVA Base Rating (Class H) for Reactance Values (kVA)	1335	1400	1400	1340	1481	1569	1638	1694
Saturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	2.145	2.030	1.886	1.606	2.383	2.256	2.155	2.047
X'd Dir. Axis Transient	0.134	0.127	0.118	0.100	0.149	0.141	0.135	0.128
X"d Dir. Axis Subtransient	0.113	0.107	0.099	0.085	0.126	0.119	0.114	0.108
Xq Quad. Axis Reactance	1.855	1.756	1.631	1.389	2.061	1.952	1.864	1.771
X"q Quad. Axis Subtransient	0.276	0.261	0.242	0.206	0.306	0.290	0.277	0.263
XL Stator Leakage Reactance	0.061	0.058	0.054	0.046	0.068	0.064	0.061	0.058
X2 Negative Sequence Reactance	0.171	0.162	0.151	0.128	0.190	0.180	0.172	0.163
X0 Zero Sequence Reactance	0.018	0.017	0.016	0.013	0.020	0.019	0.018	0.017
Unsaturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	2.574	2.436	2.263	1.927	2.859	2.707	2.586	2.456
X'd Dir. Axis Transient	0.154	0.146	0.136	0.116	0.171	0.162	0.155	0.147
X"d Dir. Axis Subtransient	0.132	0.125	0.116	0.099	0.147	0.139	0.133	0.126
Xq Quad. Axis Reactance	1.911	1.809	1.680	1.431	2.123	2.010	1.920	1.824
X"q Quad. Axis Subtransient	0.331	0.313	0.291	0.248	0.368	0.348	0.333	0.316
XL Stator Leakage Reactance	0.069	0.065	0.060	0.051	0.076	0.072	0.069	0.066
Xlr Rotor Leakage Reactance	0.079	0.075	0.069	0.059	0.088	0.083	0.079	0.075
X2 Negative Sequence Reactance	0.205	0.194	0.181	0.154	0.228	0.216	0.206	0.196
X0 Zero Sequence Reactance	0.021	0.020	0.018	0.016	0.023	0.022	0.021	0.020

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S6L1D-H4 Wdg.312

Time Constants (Seconds)		
T'd Transient Time Const.	0.085	
T''d Sub-Transient Time Const.	0.015	
T'do O.C. Field Time Const.	4.15	
Ta Armature Time Const.	0.019	
T''q Sub-Transient Time Const.	0.01	
Resistances in Ohms (Ω) at 22^{0}C		
Stator Winding Resistance (Ra), per phase for series connected	0.00134	
Rotor Winding Resistance (Rf)	2.42	
Exciter Stator Winding Resistance	19.56	
Exciter Rotor Winding Resistance per phase	0.095	
PMG Phase Resistance (Rpmg) per phase	1.91	
Positive Sequence Resistance (R1)	0.00168	
Negative Sequence Resistance (R2)	0.00193	
Zero Sequence Resistance (R0)	0.00168	
Saturation Factors	400V	480V
SG1.0	0.427	0.445
SG1.2	1.808	1.566
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	SAE0,00	SAE0,00
Moment of Inertia	28.2 kgm²	28 kgm²
Weight Wound Stator	1361kg	1361kg
Weight Wound Rotor	1116kg	1073kg
Weight Complete Alternator	2836kg	2962kg
Shipping weight in a Crate	2881kg	3007kg
Packing Crate Size	180x105x153(cm)	180x105x153(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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S6L1D-H4 Wdg.312

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)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Delta (V)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	kVA	1430	1500	1500	1435	1390	1460	1460	1400	1335	1400	1400	1340	1240	1305	1305	1250
	kW	1144	1200	1200	1148	1112	1168	1168	1120	1068	1120	1120	1072	992	1044	1044	1000
	Efficiency (%)	94.8	94.8	94.9	95.1	94.9	94.9	95.0	95.1	95.0	95.0	95.0	95.2	95.1	95.1	95.2	95.3
	kW Input	1207	1266	1265	1207	1172	1231	1230	1177	1125	1179	1178	1126	1043	1098	1097	1050

60 Hz	Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Delta (V)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	kVA	1588	1681	1756	1812	1544	1637	1706	1762	1481	1569	1638	1694	1375	1456	1525	1575
	kW	1270	1345	1405	1450	1235	1310	1365	1410	1185	1255	1310	1355	1100	1165	1220	1260
	Efficiency (%)	94.8	94.9	94.9	94.9	94.9	94.9	95.0	95.0	94.9	95.0	95.0	95.1	95.0	95.1	95.1	95.2
	kW Input	1340	1418	1480	1527	1302	1380	1437	1484	1248	1321	1379	1426	1157	1225	1283	1324

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 marine alternators, 3% for every 5°C by which the operational ambient temperature exceeds 50°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 (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®

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 upto 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	PART NO.
DSE7310 MKII & DSE7320 MKII Installation Instructions	053-181
DSE7310 MKII & DSE7320 MKII Operator Manual	057-253
DSE7310 MKII & DSE7320 MKII Configuration Suite PC Manual	057-243

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DSEGenset®

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