WHOLESALE DIESEL GENERATORS
A DIVISION OF NORTH STAR LOGISTICS LLC
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675KW Perkins Diesel Generator

Perkins Engine | Customizable Options | EPA Tier 3

General

Model	WDG-675-PER
Fuel Type	Diesel
Prime Rating	679 kW / 849 kVA
Standby Rating	750 kW / 940 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	4006-23TAG3A
Configuration	6 cylinder, in-line
Aspiration	Turbocharged & Air-to-air charge cooled
Bore x Stroke (in.)	6.3 x 7.4 (in.)
Rated Speed (RPM)	1800
Displacement (L)	23
Compression Ratio	13.6:1
Cooling Method	Water cooled
Governor	Electronic

Alternator Data

Alternator Model	Stamford S5L1D-G4
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)	187 x 82 x 94 (in.)
Net Weight (lbs.)	12,500

Other Customization

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

Product Specifications for 4006-23TAG

Total Power Range

Gross Mechanical Output	531-886 kWm
Typical Electrical Output	595-1000 kVA (476-800 kWe)
Rated Speed	1500/1800 rpm

Emission Standards

Emissions	Fuel Optimised

50 Hz Typical Electrical Output

Prime	746-802 KVA
Standby	820-898 KVA
Baseload	595-637 kVA

60 Hz Typical Electrical Output

Prime	600-722 kWe
Standby	660-800 kWe
Baseload	480-572 kWe

General

Number of Cylinders	6 inline
Bore	160 mm
Stroke	190 mm
Displacement	23 l

Compression Ratio	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	90-95%
Switchable	Yes

ElectropaK Dimensions

Length	2927 mm
Width	1690 mm
Height	2125 mm
Dry Weight	2524 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
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.

4006-23TAG Standard Equipment

Air inlet system

Mounted air filter and turbocharger

Cooling system

Radiator supplied loose incorporating air-to-air charge cooler
System designed for ambients up to 50ºC (122ºF)
Twin thermostats, water pump

Electrical equipment

24V starter motor, 24V alternator with integral voltage regulator and DC output
High coolant temperature protection switch
Low oil pressure protection switch
Turbine inlet temperature protection

Flywheel and housing

SAE ‘0' flywheel housing
SAE J620 size 18 flywheel

Fuel system

Digital governing to ISO 8528-5 Class G2 with isochronous capability
Direct fuel injection system with fuel lift pump
Full flow spin-on filters

Lubrication system

Full flow spin-on oil filters
Wet full aluminium sump with filler and dipstick

Optional equipment

4 meter wiring harness
Exhaust counter flanges
Immersion heater
Secondary electric start
Single exhaust outlet pipe
Temperate radiator kit

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S5L1D-G4 Wdg.311 - 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	AS440	MX341	MX321	MX322	
Voltage Regulation	± 1%	± 1%	± 0.5%	± 0.5%	with 4% Engine Governing
AVR Power	Self-Excited	PMG	PMG	PMG	

No Load Excitation Voltage (V)	11.4 - 10.7
No Load Excitation Current (A)	0.66 - 0.56
Full Load Excitation Voltage (V)	44
Full Load Excitation Current (A)	2.6
Exciter Time Constant (seconds)	0.099

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S5L1D-G4 Wdg.311

Electrical Data								
Insulation System	H							
Stator Winding	Double Layer Lap							
Winding Pitch	2/3							
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	19.28							
	50 Hz				60 Hz			
Telephone Interference	THF<2%				TIF<50			
Cooling Air Flow	1.25 m³/sec				1.5 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 Series Delta (V)	220	230	240	254	240	254	266	277
kVA Base Rating (Class H) for Reactance Values (kVA)	680	700	700	680	750	794	831	875
Saturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	2.95	2.74	2.55	2.20	3.26	3.08	2.95	2.85
X'd Dir. Axis Transient	0.16	0.15	0.14	0.12	0.18	0.17	0.16	0.16
X"d Dir. Axis Subtransient	0.11	0.10	0.10	0.08	0.12	0.12	0.11	0.11
Xq Quad. Axis Reactance	2.46	2.29	2.13	1.84	2.72	2.58	2.47	2.39
X"q Quad. Axis Subtransient	0.26	0.24	0.22	0.19	0.29	0.27	0.26	0.25
XL Stator Leakage Reactance	0.05	0.04	0.04	0.03	0.05	0.05	0.05	0.04
X2 Negative Sequence Reactance	0.16	0.15	0.14	0.12	0.18	0.17	0.16	0.16
X0 Zero Sequence Reactance	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Unsaturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	3.54	3.29	3.05	2.64	3.91	3.70	3.54	3.43
X'd Dir. Axis Transient	0.19	0.17	0.16	0.14	0.21	0.19	0.19	0.18
X"d Dir. Axis Subtransient	0.13	0.12	0.11	0.10	0.14	0.14	0.13	0.13
Xq Quad. Axis Reactance	2.54	2.36	2.19	1.89	2.80	2.65	2.54	2.46
X"q Quad. Axis Subtransient	0.31	0.29	0.27	0.23	0.34	0.32	0.31	0.30
XL Stator Leakage Reactance	0.05	0.05	0.04	0.04	0.06	0.05	0.05	0.05
Xlr Rotor Leakage Reactance	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
X2 Negative Sequence Reactance	0.19	0.18	0.17	0.14	0.21	0.20	0.19	0.19
X0 Zero Sequence Reactance	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02

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S5L1D-G4 Wdg.311

Time Constants (Seconds)		
T'd Transient Time Const.	0.080	
T''d Sub-Transient Time Const.	0.012	
T'do O.C. Field Time Const.	2.500	
Ta Armature Time Const.	0.019	
T''q Sub-Transient Time Const.	0.0120	
Resistances in Ohms (Ω) at 22^{0}C		
Stator Winding Resistance (Ra), per phase for series connected	0.00302	
Rotor Winding Resistance (Rf)	1.88	
Exciter Stator Winding Resistance	17	
Exciter Rotor Winding Resistance per phase	0.092	
PMG Phase Resistance (Rpmg) per phase	1.91	
Positive Sequence Resistance (R1)	0.0038	
Negative Sequence Resistance (R2)	0.0043	
Zero Sequence Resistance (R0)	0.0038	
Saturation Factors	400V	480V
SG1.0	0.324	0.309
SG1.2	1.253	1.064
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	SAE 1, 0, 0.5	
Moment of Inertia	11.0201 kgm²	-
Weight Wound Stator	860kg	-
Weight Wound Rotor	670kg	-
Weight Complete Alternator	1750kg	-
Shipping weight in a Crate	1790kg	-
Packing Crate Size	160 x 90 x 115(cm)	-
Maximum Over Speed	2250 RPM for two minutes	
Bearing Drive End	-	-
Bearing Non-Drive End	Ball 6314	-

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S5L1D-G4 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	750	770	770	750	720	740	740	720	680	700	700	680	625	640	640	625
	kW	600	616	616	600	576	592	592	576	544	560	560	544	500	512	512	500
	Efficiency (%)	94.4	94.5	94.6	94.9	94.5	94.6	94.7	95.0	94.7	94.8	94.9	95.1	95.0	95.0	95.1	95.3
	kW Input	636	652	651	632	609	626	625	606	574	591	590	572	527	539	538	525

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	825	869	912	944	794	837	881	913	750	794	831	875	694	725	762	794
	kW	660	695	730	755	635	670	705	730	600	635	665	700	555	580	610	635
	Efficiency (%)	94.5	94.6	94.6	94.7	94.7	94.7	94.8	94.8	94.8	94.9	94.9	94.9	94.9	95.0	95.1	95.1
	kW Input	698	735	771	797	671	707	744	770	633	670	701	738	585	610	641	668

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®

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