EMS
ELECTRO MECHANICAL SOLUTIONS

FG WILSON

CATERPILLAR®

Diesel Generator set 2500 series Engine P500-3

455KVA – 500 kVA 50 Hz

Description

This FG Wilson 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

FG Wilson engine - Rugged 4- cycle industrial diesel delivers reliable power, fuel optimized and fast response to load changes.

Permanent Magnet Generator (PMG) - 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-circuit 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 - Standard DSE7410 electronic control provides total system integration including remote start/stop, precise frequency and voltage regulation, alarm and status message display, protection, output metering, auto-shutdown.

Enclosures - Optional weather-protective and sound-attenuated enclosures are available.

Warranty and service - Backed by a comprehensive warranty and worldwide distributor network.

circuit breaker - Optional 3 or 4 pole motorized circuit breaker available.

ISO 8528-5 – Refer to factory for site and configuration specific transient performance classification

Generator set specifications

Output Ratings

	Prime	Standby
400/230V, 50Hz	455 KVA	500 KVA
	364 KW	400 KW

Performance class	Genset models have been tested in accordance with ISO 8528-5.
Voltage regulation, no load to full load	± 1.0 %
Electromagnetic Compatibility Performance	Fuel optimized

Engine specifications

Ratings and Performance Data

Engine Make		Perkins
Engine Model		2506A-E15TAG1
Alternator Make		FG Wilson
Alternator Model		FGL60020
Control Panel		DSE7410
Base Frame		Heavy Duty Fabricated Steel
Circuit Breaker Type		3 Pole MCCB
Frequency		50 HZ
Engine Speed: RPM	rpm	1500
Fuel Tank Capacity:	liters (US gal)	888 (234.58)

Engine Technical Data

No. of Cylinders		6
Alignment		IN LINE
Cycle		4 STROKE
Bore	mm (in)	137 (5.4)
Stroke	mm (in)	171 (6.7)
Induction		TURBOCHARGED AIR TO AIR CHARGE COOLED
Cooling Method		WATER
Governing Type		ELECTRONIC
Governing Class		ISO 8528 G2
Compression Ratio		16.0:1
Displacement	L (cu. in)	15.2 (927.6)
Moment of Inertia:	kg m² (lb/in²)	4.29 (14660)
Voltage		24
Ground		Negative
Battery Charger		70
Engine Weight Dry	kg (lb)	1633 (3600)
Engine Weight Wet	kg (lb)	1714 (3779)

Engine Performance Data

Engine Speed	rpm	1500
Gross Engine Power Prime	kW (hp)	412 (553)
Gross Engine Power Standby	kW (hp)	451 (605)
BMEP Prime	kPa (psi)	2235 (316.1)
BMEP Standby	kPa (psi)	2447 (346)

Fuel system

Type of injection .... MEUI
Injector type .... MEUI
Injector pressure .... 200 MPa

Fuel lift pump
type .... gear driven
Delivery flow:
-1500 rev/min .... 413 litres/hr
-1800 rev/min .... 457 litres/hr
Pressure .... 550 kPa
Maximum suction head at pump inlet .... 3 m
Maximum static pressure head 4m
Fuel inlet temperature to be less than .... 55 °C
Governor type .... electronic
Governing to .... ISO 8528-5 class G3 steady state
Tolerance on fuel consumption .... to ISO 8528-1 1993

Fuel Filter	Replaceable Element			
Recommendation fuel	Class A2 Diesel			
Ful Consumption at	110%	100%	75%	50%
50 Hz Prime l/hr.	100.8	91.9	70.3	49.9
50 Hz standby l/hr.	-	100.8	76.5	53.9

Cooling system

Recommended coolant: 50% inhibited ethylene glycol or 50% inhibited propylene glycol and 50% clean fresh water. Where there is no likelihood of ambient temperatures below 10 °C, clean 'soft' water may be used, treated with 1% by volume of Perkins inhibitor in the cooling system. The inhibitor is available from all Perkins Distributors.

Total system coolant capacity .... 58,0 litres
Maximum pressure:-in crankcase water jacket .... 276 kPa
Maximum top tank temperature .... 107 °C
Maximum static pressure on pump .... 170 kPa
Maximum permissible restriction:-to coolant pump flow .... 30 kPa
Temperature rise across engine with inhibited coolant:
-standby power @1500 and 1800 rev/min .... 10 °C
-prime power @1500 and 1800 rev/min .... 9 °C
Thermostat operation range .... 88 to 98 °C

Radiator
-face area .... 1·238 m²
-weight (dry) .... 132 kg
-rows and materials .... 2 rows, Aluminium
-matrix density and material .... 12 fins per inch, Aluminium
-width of matrix .... 1048 mm
-height of matrix .... 1100 mm
-pressure cap setting (minimum) .... 69 kPa

Charge cooler with integral radiator

-face area .... 1·006 m²
-number of rows and material .... 1 row, Aluminium
-matrix density and material .... 12,5 fins per inch, Aluminium
-width of matrix .... 915 mm
-height of matrix .... 1100 mm

		50
Cooling System Capacity	L (US gal)	58.1 (15.3)
Water Pump Type:		Centrifugal
Heat Rejected to Water & Lube Oil: Prime	kW (Btu/min)	134 (7620)
Heat Rejected to Water & Lube Oil: Standby	kW (Btu/min)	147 (8360)
Heat Radiation to Room*: Prime	kW (Btu/min)	48.4 (2752)
Heat Radiation to Room*: Standby	kW (Btu/min)	54.5 (3099)
Radiator Fan Load:	kW (hp)	13.7 (18.4)
Radiator Cooling Airflow:	m^3/min (cfm)	476.4 (16824)
External Restriction to Cooling Air flow	Pa (in H2O)	125 (0.5)

*: Heat radiated from engine and Alternator
Designed to operate in ambient conditions up to 50°C (122°F).

Air System (at 50 Hz)

Air Filter Type		Non Canister
Combustion Air flow Prime	m^3/min	25.8
Combustion Air Flow Standby	m^3/min	30.5
Max. Combustion Air Intake Restriction	kPa	6.2

Lubricating System

Oil Filter Type:		Eco, Full Flow
Total Oil Capacity:	l (US gal)	62 (16.4)
Oil Pan Capacity:	l (US gal)	53 (14)
Oil Type:		API CI4 15W-40
Oil Cooling Method:		WATER

Exhaust system		
Maximum Allowable Back Pressure:	kPa (in Hg)	6.8 (2)
Exhaust Gas Flow: Prime	m^3/min (cfm)	71.4 (2521)
Exhaust Gas Flow: Standby	m^3/min (cfm)	81 (2860)
Exhaust Gas Temperature: Prime	°C (°F)	500 (932)
Exhaust Gas Temperature: Standby	°C (°F)	550 (1022)

Alternator Physical Data

No. Of bearings	1
Insulation Class	H
Winding Pitch	2/3
Winding Code	6S
Wiers	6
IP	IP23
Excitation System	Shunt
AVR Model	R150

Alternator Operating Data

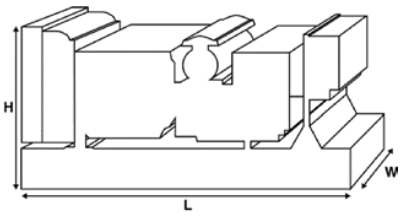
Overseed	rpm	2250
Voltage Regulation (steady State)	%	± 1.0
Wave Form NEMA= TIF	%	50
Wave form=THF	%	2
Total Harmonic content LL/LN	%	1.5
Radio Interference		EN61000-6
Radiant Heat	KW	23.3

Alternator Performance Data

Voltage Code		415/240V	400/230V	380/220V
Motor Starting capability*	KVA	270	270	270
Short Circuit capacity**	%	2.81	3.02	3.348
Reactances	Xd	0.142	0.152	0.169
	X'd	0.107	0.107	0.118
	X''d	270	270	270

*Based on 30% voltage dip at 0.4 power factor
** With optional independent excitation system (PMG / AUX winding)

Dimensions (Open Set)



Length mm	3800
Width mm	1131
Height mm	2215

Control Panel Specification Data

DSE 7410

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
- Five key menu navigation
- Front panel editing with PIN protection
- 11 configurable inputs
- 8 configurable outputs
- Flexible sensor inputs
- 3 Configurable timers and alarms
- Configurable event log (250)
- Integral PLC editor
- CAN and Magnetic Pick-up/Alt. sensing
- Fuel usage monitor and low fuel alarms
- kW protection
- Reverse power (kW) protection
- Power monitoring (kW.h, kV Ar, kV A h, kV Ar h)
- Fully configurable via DSE Configuration Suite PC software

Key Benefits

- 132 x 64-pixel ratio display for clarity
- Real-time clock provides accurate event logging
- Set maintenance periods can be configured to maintain optimum engine performance
- Built-in-in-ethernet communications provides advanced remote monitoring
- Modules can be integrated into building management systems (BMS) using MODBUS
- increased input and output expansion capability via DSENet
- IP65 rating (with supplied gasket) offers increased resistance to water ingress
- Data logging to assist with fault finding
- PLC editor allows user configurable functions to meet specific application requirements
- License-free PC software

Specifications

- continuous voltage rating 8V to 35V continuous
- 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
- Maximum operating current260 mA at 12 V, 130 mA at 24
- charge fail 0 V to 35 V
- output A (fuel)15A DC at supply voltage
- output B (start)15A DC at supply voltage
- output C&D 8A DC at supply voltage
- Output E to J 2 A DC at supply voltage
- BUS 15V to 333V AC L-N
- MPU ±0.5 to 70V

Codes or

standards compliance may not be available with all model configurations – consult factory for availability.

ISO 8528	This generator set has been designed to comply with ISO 8528 standards.
ISO 3046	This generator set performance and test methods comply with ISO 3046
BS 5000	This generator set comply with the British standards used for engine and generators
IEC 60034	This generator performance complies with the international standard for rotating electrical machines