# Diesel Generator set 1100 series Engine P50-3

## 45 KVA – 50 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 | 45 KVA | 50 KVA |
| | 36 KW | 40 KW |

| | |
|---|---|
| Performance class | Genset models have been tested in accordance with ISO 8528-5. |
| Voltage regulation, no load to full load | ± 0.5 % |
| Electromagnetic Compatibility Performance | Fuel optimized |

## Engine specifications

### Ratings and Performance Data

| | | |
|---|---|---|
| Engine Make | | Perkins |
| Engine Model | | 1103A-33G1 |
| Alternator Make | | FG Wilson |
| Alternator Model | | FGL20060 |
| Control Panel | | DSE4520 |
| Base Frame | | Heavy Duty Fabricated Steel |
| Circuit Breaker Type | | 80A, 3P MCB/MCCB |
| Frequency | | 50 Hz |
| Engine Speed: RPM | rpm | 1500 |
| Fuel Tank Capacity: | liters (US gal) | 145 (38.3) |

### Engine Technical Data

| | | |
|---|---|---|
| No. of Cylinders | | 3 |
| Alignment | | IN LINE |
| Cycle | | 4 |
| Bore | mm (in) | 105 (4.1) |
| Stroke | mm (in) | 127 (5) |
| Induction | | NATURALLY ASPIRATED |
| Cooling Method | | WATER |
| Governing Type | | MECHANICAL |
| Governing Class | | ISO 8528 G2 |
| Compression Ratio | | 19.25:1 |
| Displacement | L (cu. in) | 3.3 (201.4) |
| Moment of Inertia: | kg m² (lb/in²) | 1.14 (3896) |
| Voltage | | 12 |
| Ground | | Negative |
| Battery Charger | | 65 |
| Engine Weight Dry | kg (lb) | 341 (752) |
| Engine Weight Wet | kg (lb) | 348 (767) |

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## Engine Performance Data

| Engine Speed | rpm | 1500 |
|---|---|---|
| Gross Engine Power Prime | kW (hp) | 42.2 (57) |
| Gross Engine Power Standby | kW (hp) | 46.5 (62) |
| BMEP Prime | kPa (psi) | 1023 (148.4) |
| BMEP Standby | kPa (psi) | 11128 (163.5) |

Fuel system

Type of injection. ... ... ... ... ... ... ... ... ... ... ... ..... ...Direct

Fuel injection pump ... ... ... ... ... ... ... ... ... ... ..... . Rotary

Fuel atomiser.. ... ... ... ... ... ... ... ... ... ... ..... ... ... Multi-hole

Nozzle opening pressure ... ... ... ... ... ... ..... .29,0 MPa (290 bar)

Fuel lift pump

Type ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... . ... . Electrical

-flow/hour ... ... ... ... ... ... ... ... .. .... 120 - 150 l/h (211 - 264 pt/m)

-pressure ... ... ... ... ... ... ... ... ... ... ... ... ... 30 - 75 kPa (4.4 - 10.9 psi)

Maximum suction head:

- 1500 rev/min ... ... ... ... ... ... ..... ... ... ... ... ... ... ... . ... .20 kPa

Governor type

Electronic governor ... ... ... .. ... ..... .. .. Woodward LCS2 Mechanical and electronic governor speed control to. ISO 8528, G2

| Fuel Filter | Replaceable Element | | | |
|---|---|---|---|---|
| Recommendation fuel | Class A2 Diesel | | | |
| Ful Consumption at | 110% | 100% | 75% | 50% |
| 50 Hz Prime l/hr. | 11.7 | 10.5 | 7.8 | 5.6 |
| 50 Hz standby l/hr. | - | 11.7 | 8.7 | 6 |

Cooling system

Radiator

- face area. ... ... ... ... ... ... ... ... ... ... ... ... ... ... 0.276 m² (2.97 ft²)
- rows and materials.. ... ... ... ... ... ... ... ... ... single row aluminum
- matrix density and material. ... ... ... ... .. Aluminum 12.5 fins/inch
- width of matrix. ... ... ... ... ... ... ... ... ... ... ... ... ... .. 526 mm (20.7 in)
- height of matrix ... ... ... ... ... ... ... ... ... ... ... ... ... .. 524 mm (20.6 in)
- pressure cap setting ... ... ... ... ... ... ... ... ... ... ... ... ... ... 107 kPa

Fan

- diameter. ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... . 457 mm (18 in)
- drive ratio ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... .... 0.85 : 1
- number of blades ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... .. ... 7
- material ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... Composite
- type. ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ..Pusher

Coolant

Total system capacity

- with radiator ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... .. 10.2 l (21.5 pt)
- without radiator ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... .. 4.4 l (9.2 pt)

Maximum top tank temperature ... ... ... ... ... ... ... 110 °C (230 °F)

Thermostat operating range.. ... ... ... ... ..82 - 93 °C (180 - 199 °F)

Recommended coolant: 50 % ethylene glycol with corrosion inhibitor (BS 658: 1992 or MOD AL39) and 50% clean fresh water.

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| | | 50 Hz |
|---|---|---|
| Cooling System Capacity | L (US gal) | 10.2 (2.7) |
| Water Pump Type: | | Centrifugal |
| Heat Rejected to Water & Lube Oil: Prime | kW (Btu/min) | 26.1 (1484) |
| Heat Rejected to Water & Lube Oil: Standby | kW (Btu/min) | 30 (1706) |
| Heat Radiation to Room*: Prime | kW (Btu/min) | 11.9 (677) |
| Heat Radiation to Room*: Standby | kW (Btu/min) | 13.4 (762) |
| Radiator Fan Load: | kW (hp) | 0.5 (0.7) |
| Radiator Cooling Airflow: | $m^3$/min (cfm) | 86.4 (3051) |
| External Restriction to Cooling Air flow | Pa (in H2O) | 125 (0.5) |

*: Heat radiated from engine and Alternator

Air System (at 50 Hz)

| Air Filter Type | | Replaceable Element |
|---|---|---|
| Combustion Air flow Prime | $m^3$/min | 2.9 |
| Combustion Air Flow Standby | $m^3$/min | 3.1 |
| Max. Combustion Air Intake Restriction | kPa | 8 |

Lubricating System

| | | |
|---|---|---|
| Oil Filter Type: | | Spin-On, Full Flow |
| Total Oil Capacity: | l (US gal) | 8.3 (2.2) |
| Oil Pan Capacity: | l (US gal) | 7.8 (2.1) |
| Oil Type: | | API CG4 / CH4 15W-40 |
| Oil Cooling Method: | | WATER |

| Exhaust system | | |
|---|---|---|
| Maximum Allowable Back Pressure: | kPa (in Hg) | 10 (3) |
| Exhaust Gas Flow: Prime | $m^3$/min (cfm) | 7 (247) |
| Exhaust Gas Flow: Standby | $m^3$/min (cfm) | 7.7 (272) |
| Exhaust Gas Temperature: Prime | °C (°F) | 492 (918) |
| Exhaust Gas Temperature: Standby | °C (°F) | 537 (999) |

Alternator Physical Data

| | |
|---|---|
| No. Of bearings | 1 |
| Insulation Class | H |
| Winding Pitch | 2/3 |
| Winding Code | 6P/6S |
| Wiers | 4 |
| IP | IP23 |
| Excitation System | Shunt |
| AVR Model | R120 |

Alternator Operating Data

| Overseed | rpm | 2250 |
|---|---|---|
| Voltage Regulation (steady State) | % | ±0.5 |
| Wave Form NEMA= TIF | % | 50 |
| Wave form=THF | % | 2 |
| Total Harmonic content LL/LN | % | 2 |
| Radio Interference | | EN61000-6 |
| Radiant Heat | KW | 5.4 |

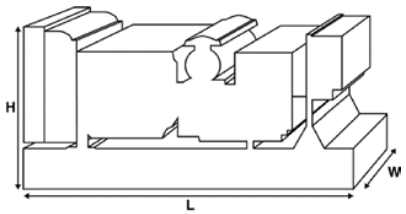
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## Alternator Performance Data

| Voltage Code | | 415/240V | 400/230V | 380/220V |
|---|---|---|---|---|
| Motor Starting capability* | KVA | 74 | 69 | 64 |
| Short Circuit capacity** | % | 270 | 270 | 270 |
| Reactances | Xd | 2.74 | 2.95 | 3.127 |
| | X'd | 0.141 | 0.152 | 0.161 |
| | X''d | 0.076 | 0.076 | 0.08 |

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

## Dimensions (Open Set)




| | |
|---|---|
| Length mm | 1680 |
| Width mm | 760 |
| Height mm | 1330 |

# Control Panel Specification Data

### DSE 4520



**Key Features**

- Load unbalanced alarm
- Configurable for use as an auto start and AMF control module
- J1939-75 support and CAN alarm ignore functon
- Alternator frequency & CAN speed sensing in one variant
- Largest back-lit icon display in its class
- Heated display option
- Real time clock provides accurate event logging
- Fully configurable via the fascia or PC using USB communication
- Extremely efficient power save mode
- 3 phase generator sensing
- 3 phase mains (utility) sensing
- Compatible with 600 V ph to ph nominal systems
- Generator/load power monitoring (kW, kVA, kVAr, pf)
- Accumulated power monitoring (kW h, kVA h, kVAr h)
- Generator overload protection (kW)
- Generator/load current monitoring and protection
- Fuel and start outputs (configurable when using CAN)
- 4 configurable DC outputs

**Key Benefits**

- Automatically transfers between main (utility) and generator
- Hour's counter provides accurate information for monitoring and maintenance periods
- User-friendly set-up and button layout for ease of use
- Multiple parameters are monitored simultaneously which are clearly displayed on the large back-lit icon display.
- The module can be configured to suit a wide range of applications
- Uses DSE Configuration
- Suite PC Software for simplified configuration
- Compatible with a wide range of CAN engines including Tier 4
- License-free PC software
- IP65 rating (with optional gasket) offers increased resistance to water ingress

**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)10A, 5A at continuous supply voltage
- output B (start)10A, 5 A at continuous supply voltage
- output C, D, E & F 2A at supply stage.

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**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 |