

# SENTRY-PRO POWER SYSTEMS

By Gillette Generators, Inc.

## LIQUID COOLED DIESEL ENGINE GENERATOR SET

### KW POWER RATINGS RANGE FOR 60 HZ

Model	HZ	STANDBY 130°C RISE
		25/27
<b>SPJD-250-60 HERTZ</b>	60	

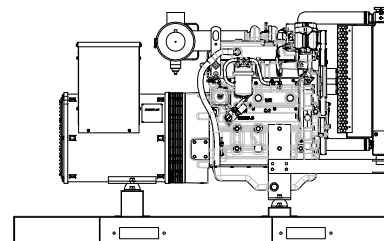
### STANDARD FEATURES

- All generator sets are USA prototype built and thoroughly tested. Production models are USA factory built and 100% load tested.
- All generator sets meet NFPA-110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- All generators are UL-1446 and UL-2200 certified.
- Solid state, frequency compensated voltage regulation is standard on all gen-sets.
- Electronic engine governor for precise isochronous frequency regulation.
- SENTINEL "COMMAND" digital controller allows programming to basic engine functions in the field. Controller has stop-manual-auto mode and engine shutdowns, signaled by full text LCD indicators.
- Heavy Duty 100%-125% rated Circuit Breaker is standard on all gen-sets.
- All generator set control systems components and accessories provide a 1-year limited warranty at time of initial start-up. Generators and engines are governed by separate warranties.
- "OPEN" Generator Sets: There is no enclosure, so gen-set must be placed within a weather protected area, un-inhabited by humans or animals, with proper ventilation. Muffler and flexible exhaust hose are not supplied, as installation requirements are not known. However, these two items are available as optional equipment.
- "LEVEL 1" Aluminum Housing: Full weather protection and above average sound attenuation for normal applications. Residential grade muffler is standard.
- "LEVEL 2" Aluminum Housing: Full weather protection and superior sound attenuation for specific low noise applications. Critical grade muffler is standard.

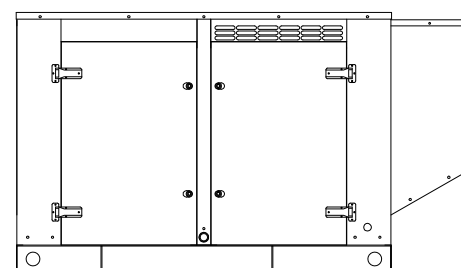
60 HZ MODEL

# SPJD-250

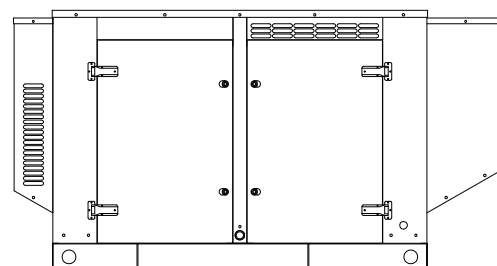
UL-2200 LISTED



"OPEN" GEN-SET



"LEVEL 1" HOUSED GEN- SET



"LEVEL 2" HOUSED GEN-SET

### GENERATOR RATINGS

GENERATOR MODEL	VOLTAGE		PH	HZ	130°C RISE STANDBY RATING		POWER LEAD CONNECTIONS
	L-N	L-L			KW/KVA	AMP	
<b>SPJD-250-1-1</b>	120	240	1	60	25/25	104	4 LEAD DEDICATED 1 PH.
<b>SPJD-250-3-2</b>	120	208	3	60	25/31	87	12 LEAD LOW WYE
<b>SPJD-250-3-3</b>	120	240	3	60	25/31	75	12 LEAD HIGH DELTA
<b>SPJD-250-3-4</b>	277	480	3	60	25/31	38	12 LEAD HIGH WYE
<b>SPJD-250-3-5</b>	127	220	3	60	25/31	82	12 LEAD LOW WYE

RATINGS: All single phase gen-sets are dedicated 4 lead windings, rated at unity (1.0) power factor. All three phase gen-sets are 12 lead windings, rated at .8 power factor. 130° C "STANDBY RATINGS" are strictly for gen-sets that are used for back-up emergency power to a failed normal utility power source. This standby rating allows varying loads, with no overload capability, for the entire duration of utility power outage. All gen-set power ratings are based on temperature rise measured by resistance method as defined by MIL-STD 705C and IEEE STD 115, METHOD 6.4.4. All generators have class H (180°C) insulation system on both rotor and stator windings. All factory tests and KW/KVA charts shown above are based 130°C (standby) R/R winding temperature, within a maximum 40°C ambient condition. Generators operated at standby power ratings must not exceed the temperature rise limitation for class H insulation system, as specified in NEMA MG1-22.40. Specifications & ratings are subject to change without prior notice.

# APPLICATION AND ENGINEERING DATA FOR MODEL SPJD-250-60 HZ

## GENERATOR SPECIFICATIONS

Manufacturer..... Marathon Electric Generators  
Model & Type..... 283PSL1517 4 Pole, 4 Lead, Single Phase  
..... 283CSL1706 4 Pole, 12 Lead re-connectable, Three Phase  
Exciter..... Brushless, shunt excited  
Voltage Regulator..... Solid State, HZ/Volts  
Voltage Regulation..... ½%, No load to full load  
Frequency..... Field convertible, 60 HZ to 50 HZ  
Frequency Regulation..... ± ½% (½ cycle, no load to full load)  
Unbalanced Load Capability..... 100% of standby amps  
Total Stator and Load Insulation..... Class H, 180°C  
Temperature Rise..... 130°C R/R, standby rating @ 40°C amb.  
1 Ø Motor Starting @ 30% Voltage Dip (240V)..... 60 kVA  
3 Ø Motor Starting @ 30% Voltage Dip (208-240V)..... 55 kVA  
3 Ø Motor Starting @ 30% Voltage Dip (480V)..... 75 kVA  
Bearing..... 1, Pre-lubed and sealed  
Coupling..... Direct flexible disc.  
Total Harmonic Distortion..... Max 3½% (MIL-STD705B)  
Telephone Interference Factor..... Max 50 (NEMA MG1-22)  
Deviation Factor..... Max 5% (MIL-STD 405B)  
Ltd. Warranty Period..... 24 Months from date of start-up or  
..... 1000 hours use, first to occur.

## GENERATOR FEATURES

- World Renown Marathon Electric Generator having UL-1446 certification.
- Full generator protection with **SENTINEL “COMMAND”** controller, having UL-508 certification.
- Automatic voltage regulator with over-excitation, under-frequency compensation, under-speed protection, and EMI filtering. Entire solid-state board is encapsulated for moisture protection.
- Generator power ratings are based on temperature rise, measured by resistance method, as defined in MIL-STD 705C and IEEE STD 115, Method 6.4.4.
- Power ratings will not exceed temperature rise limitation for class H insulation as per NEMA MG1-22.40.
- Insulation resistance to ground, exceeds 1.5 meg-ohm.
- Stator receives 2000 V. hi-potential test on main windings, and rotor windings receive a 1500 V. hi-potential test, as per MIL-STD 705B.
- Full amortisseur windings with UL-1446 certification.
- Complete engine-generator torsional acceptance, confirmed during initial prototype testing.
- Full load testing on all engine-generator sets, before shipping.

## ENGINE SPECIFICATIONS AND APPLICATIONS DATA

- Self ventilating and drip-proof & revolving field design

### ENGINE

Manufacturer..... John Deere  
Model and Type..... 4024TF281, 4 cycle  
Aspiration..... Turbocharged  
Cylinder Arrangement..... 4 Cylinders, In-Line, 4 cycle  
Displacement Cu. In. (Liters)..... 149 (2.4)  
Bore & Stroke In. (Cm.)..... 3.4 x 4.1 (8.6 x 10.5)  
Compression Ratio..... 20.5:1  
Main Bearings & Style..... 4, Cu-Pb Metal, Babbitt  
Cylinder Head..... Cast Iron  
Pistons..... 4, Aluminum Wedge Type  
Crankshaft..... Carbon Steel & Full Balanced  
Exhaust Valve..... Heat Resisting Steel  
Governor..... Electronic  
Frequency Regulation..... ± 1/4% Isochronous  
Air Cleaner..... Dry, Replaceable Cartridge  
Engine Speed..... 1800 rpm  
Max Power, bhp (kwm) Standby..... 48 (36)  
BMEP: psi (kpa) Standby..... 142 (981)  
Ltd. Warranty Period..... 24 months or 1000 hrs, first to occur

### FUEL SYSTEM

Type..... Diesel Fuel Oil (ASTM No. 2-D)  
Combustion System..... Direct Injection  
Fuel Injection Pump..... Stanadyne Rotory Type  
12 VDC Glo-Plugs..... Standard Equipment  
Fuel Filter and Water Separator..... Yes

### FUEL CONSUMPTION

GAL/HR (LITER/HR)	STANDBY
100% LOAD	2.2 (8.3)
75% LOAD	1.7 (6.4)
50% LOAD	1.1 (4.2)

### OIL SYSTEM

Type..... Full Pressure  
Oil Pan Capacity qt. (L)..... 8.5 (8.0)  
Oil Pan Cap. W/ filter qt. (L)..... 9.0 (8.5)  
Oil Filter..... 1, Replaceable Spin-On

### ELECTRICAL SYSTEM

Ignition System..... Electronic  
Eng. Alternator and Starter:

Ground..... Negative  
Volts DC..... 12  
Max. Amp Output of Alternator..... 55

Recommended Battery to -18°C (0°F):.. 12 VDC, Size BCI# 24F  
Max Dimensions: ..10 3/4" lg X 6 3/4" wi X 9" hi, with standard round posts. Min. output at 600 CCA. Battery tray (max. dim. at 12"lg x 7"wi), hold down straps, battery cables, and battery charger, is furnished. Installation of (1) starting battery is required, with possible higher AMP/HR rating, as described above, if normal environment averages -13°F (-25°C) or cooler.

### CERTIFICATIONS

All engines are CARB and EPA emissions certified. All stationary diesel engines are Interim Tier IV compliant.

# APPLICATION AND ENGINEERING DATA FOR MODEL SPJD-250-60 HZ

## COOLING SYSTEM

Type of System .....	Pressurized, closed recovery
Coolant Pump .....	Pre-lubricated, self-sealing
Cooling Fan Type (no. of blades) .....	Pusher (6)
Fan Diameter inches (cm) .....	18" (46)
Ambient Capacity of Radiator °F (°C) .....	125 (52)
Engine Jacket Coolant Capacity Qt. (L) .....	2.7 (2.6)
Radiator Coolant Capacity Qt. (L) .....	6.46 (6.12)
Engine Heat Reject. Btu/min (kw) .....	1412 (25)
Water Pump Capacity gpm (L/min) .....	24 (91)
Heat Reject Coolant: Btu/min (kw) .....	1412 (25)
Low Radiator Coolant Level Shutdown .....	Standard
Note: Coolant temp. Shutdown switch setting at 212°F (100°C) with 50/50 (water/antifreeze) mix.	

## COOLING AIR REQUIREMENTS

Combustion Air cfm (m <sup>3</sup> /min) .....	123 (3.5)
Max. Air Intake Restrictions :	
Clean Air Cleaner, H <sub>2</sub> O (KPA) .....	12 (3)
Intake Manifold Pressure, Psi (kpa) .....	11 (75)
Max. Allowable Temp. Rise, Amb:	
Air to Engine Inlet, °F (°C) .....	15 (8)
Radiator Cooling Air, SCFM (m <sup>3</sup> /min) .....	3200 (91)

## EXHAUST SYSTEM

Exhaust Outlet Size .....	2"
Max. Back Pressure in H <sub>2</sub> O (kpa) .....	30 (7.5)
Exhaust Flow, at rated KW, cfm (m <sup>3</sup> /min) ...	283 (8.0)
Exhaust Temp, at rated KW, °F (°C) .....	1026 (552)

## SOUND LEVELS MEASURED IN dB(A)

	Open Set	Level 1 Encl.	Level 2 Encl.
Level 1, Residential Silencer .....	71	67	n/a
Level 2, Critical Silencer .....	68	64	62
Level 3, Hospital Silencer .....	66	62	60

Note: Open sets (no enclosure) has (3) optional silencer system choices due to unknown job-site applications. Level 1 enclosure has installed residential silencer with upgrade to critical or hospital grade silencer. Level 2 enclosure has installed critical silencer with upgrade to hospital silencer. Sound tests are averaged from several test points and taken at 23 ft. (7 m) from source of noise at normal operation.

## DERATE GENERATOR FOR ALTITUDE

3% per 1000 ft.(305m) above 3000 ft. (914m) from sea level

## DERATE GENERATOR FOR TEMPERATURE

2% per 10°F (5.6°C) above 85°F (29.4°C)

## DIMENSIONS AND WEIGHTS

	Open Set	Level 1 Enclosure	Level 2 Enclosure
Length in (cm) .....	68 (173)	82 (208)	89 (226)
Width in (cm) .....	36 (91)	36 (91)	36 (91)
Height in (cm) .....	40 (102)	47 (119)	47 (119)
1 Ø Net Weight lbs (kg) ..	1244 (564)	1599 (725)	1779 (807)
1 Ø Ship Weight lbs (kg) ..	1344 (610)	1709 (775)	1880 (853)
3 Ø Net Weight lbs (kg) ..	1294 (587)	1574 (714)	1754 (796)
3 Ø Ship Weight lbs (kg) ..	1399 (635)	1682 (763)	1848 (838)

# SENTINEL COMMAND DIGITAL MICROPROCESSOR CONTROLLER



### SENTINEL COMMAND

The “**Command**” controller is an auto start control module and the upgrade “**Command Elite**” controller is an auto mains (utility) failure, module, for single gen-set applications.

Both controllers include a backlit LCD display which continuously displays the status of engine and generator at all times. Both will also monitor speed, frequency, voltage, current, oil pressure, coolant temp., and fuel levels. These modules have been designed to display warning and shut down status. They also include: (6) digital inputs • (3) analog inputs • (6) outputs • voltage monitoring (utility mains included on “**Command Elite**”) • (10) event logs • configurable timers • automatic shutdown or warning during fault detection via red LED indicators • remote start (on or off load) • engine preheat • advanced metering capability • hour meter • text LCD displays • protected solid state outputs • test buttons for: stop/reset • manual mode • auto mode • lamp test • start button.

This controller (installed on all generator models as standard equipment) can be accessed via PC laptop using any standard USB cable and downloadable software.

## COMMAND ELITE CONTROLLER UPGRADE



### SENTINEL COMMAND ELITE CONTROLLERS :

The “**Command Elite**” controller is an auto-mains (utility) failure control module that has almost all the Sentinel “**Command**” controller features, plus the additional capability of

being able to monitor a mains (utility) power supply. It is also used where remote annunciation is required.

All controllers are simple to operate and feature a user friendly menu layout for improved clarity. Enhanced features include a real time clock, better event, and performance monitoring, plus Ethernet communications for lower cost monitoring.

# STANDARD AND OPTIONAL FEATURES FOR MODEL SPJD-250-60 HZ

## STANDARD FEATURES

### CONTROL PANEL:

SENTINEL "COMMAND" digital microprocessor with logic allows programming in the field. Controller has:

- STOP-MANUAL-AUTO modes and automatic engine shutdowns, signaled by full text LCD indicators:
- Low oil pressure
- High engine temp
- Low Radiator Level
- Three auxiliary alarms
- Battery fail alarm
- Engine fail to start
- Engine over speed
- Engine under speed
- Over & under voltage

Also included is tamper-proof engine hour meter

### ENGINE:

Full flow oil filter • Air filter • Oil pump • Solenoid type starter motor • Hi-temp radiator • Jacket water pump • Thermostat • Pusher fan and guard • Exhaust manifold • Residential Silencer • 12 VDC battery charging alternator • Flexible exhaust connector • "Isochronous" duty, electronic governor • Vibration isolators • Closed coolant recovery system with 50/50 water to anti-freeze mixture

### AC GENERATOR SYSTEM:

AC generator • Shunt excited • Brushless design • Circuit Breaker installed and wired to gen-set • Direct connection to engine with flex disc • Class H, 180°C insulation • Self ventilated • Drip proof construction • UL Certified

### VOLTAGE REGULATOR:

½% Voltage regulation • EMI filter • Under-speed protection • Over-excitation protection • total encapsulation

### DC ELECTRICAL SYSTEM:

Battery tray • Battery cables • Battery hold down straps • 2-stage battery float charger with maintaining & recharging automatic charge stages.

### WEATHER/SOUND PROOF ALUMINUM HOUSING CORROSION RESISTANT PROTECTION CONSISTING OF:

- 9 Heated And Agitated Wash Stages.
- Zinc Phosphate Etching-coating Stage
- Final Baked On Enamel Powder Coat
- 18/8 Stainless Steel Hardware

## ACCESSORY ITEMS

- ☐ Engine Coolant Heater with automatic 60°F on, 80°F off, thermostat
- ☐ Starting Battery Heater Blanket with automatic 60°F on, 80°F off, thermostat
- ☐ Battery Charger Upgrade, float type, 12 VDC at max. charge, with ammeter on charger.
- ☐ External Permanent Magnet Generator (PMG) for increased induction motor starting capacity on 1Ø or 3 Ø sets, and to meet NFPA-110 requirements.
- ☐ Exhaust Silencer Critical Grade or Hospital Grade (Replacing standard Residential Grade).

- ☐ All brushed type 304 stainless steel weather and sound deadening housing for coastal areas.
- ☐ SENTINEL COMMAND ELITE Controller with all features of Sentinel COMMAND, plus allowing full telemetry remote control annunciation, and utility power monitoring.
- ☐ Remote Annunciator for up to (10) reporting functions. An additional relay expansion module, plus a second Annunciator adds another (10) reporting functions. Note: SENTINEL COMMAND ELITE must be selected, to achieve remote annunciation.

