

SENTRY-PRO POWER SYSTEMS

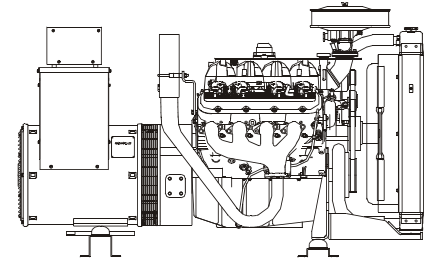
By Gillette Generators, Inc.

MODEL
SP-850

LIQUID COOLED LPG/NG ENGINE GENERATOR SET

KW POWER RATINGS RANGE

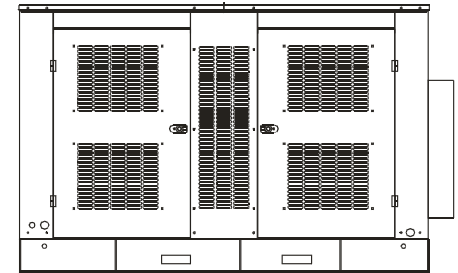
Model	HZ	MAXIMUM 150°C RISE		STANDBY 125°C RISE		PRIME 105°C RISE	
		LPG	N.G.	LPG	N.G.	LPG	N.G.
SP-850	60	79-85	75-80	72-76	72-74	66-70	63-68
	50	68	64	61	59	55	53



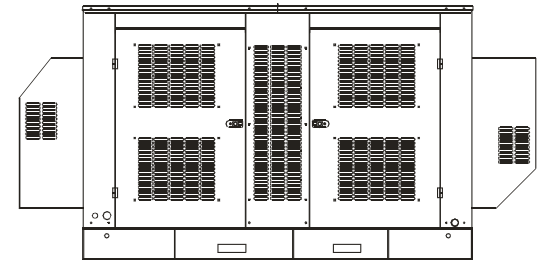
“OPEN” GEN-SET

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 will accept 100% rated load in one step, per NFPA-110.
- All generators are UL-1446 certified.
- Solid state, frequency compensated voltage regulation is standard on all gen-sets.
- Electronic engine governor incorporates a throttle body actuator, which allows precise isochronous frequency regulation.
- A brushless rotating field generator design with shunt wound excitation system and connectable at a broad range of voltages.
- SENTINEL III provides programmable microprocessor logic and digital display for different engine and generator functions, plus automatic fault shutdowns.
- The heavy duty, rugged gas engine is capable of delivering rated power at 1800 RPM (60 HZ) or 1500 RPM (50 HZ).
- 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 supplied loose for final exhaust installation by others.
- “STANDARD” Housing: Full weather protection and average sound attenuation for normal applications.
- “SUPER-SILENT” Housing: Full weather protection and superior sound attenuation for specific low noise applications. (See “Sound Level” chart).



“STANDARD” HOUSED GEN- SET



“SUPER-SILENT” HOUSED GEN-SET

GENERATOR RATINGS

GENERATOR MODEL	VOLTAGE		PH	HZ	LIQUID PROPANE GAS FUEL						NATURAL GAS FUEL					
					150°C RISE MAXIMUM RATING		125°C RISE STANDBY RATING		105°C RISE PRIME RATING		150°C RISE MAXIMUM RATING		125°C RISE STANDBY RATING		105°C RISE PRIME RATING	
	L-N	L-L			KW/KVA	AMP	KW/KVA	AMP	KW/KVA	AMP	KW/KVA	AMP	KW/KVA	AMP	KW/KVA	AMP
SP-850-1-1	120	240	1	60	85/85	354	76/76	317	69/69	288	80/80	333	74/74	308	68/68	283
SP-850-3-2	120	208	3	60	79/98.8	274	72/90	250	66/82.5	229	75/93.8	261	72/90	250	63/78.8	219
SP-850-3-3	120	240	3	60	85/106	256	76/95	229	70/87.5	210	80/100	217	74/92.5	223	67/83.8	202
SP-850-3-4	277	480	3	60	85/106	128	76/95	115	70/87.5	105	80/100	109	74/92.5	111	67/83.8	101
SP-850-3-5	127	220	3	60	85/106	279	76/95	250	70/87.5	230	80/100	243	74/92.5	243	67/83.8	220
SP-850-1-1-5	110	220	1	50	68/68	309	61/61	277	55/55	250	64/64	291	59/59	268	53/53	221
SP-850-3-2-5	110	220	3	50	68/85	224	61/76	200	55/68.8	181	64/75	210	59/73.8	194	53/66	174
SP-850-3-3-5	219	380	3	50	68/85	129	61/76	116	55/68.8	105	64/80	122	59/73.8	112	53/66	101
SP-850-3-4-5	240	415	3	50	68/85	118	61/76	106	55/68.8	96	64/80	111	59/73.8	103	53/66	92
SP-850-3-5-5	231	400	3	50	68/85	123	61/76	110	55/68.8	99	64/80	116	59/73.8	107	53/66	96

RATINGS: All single phase gen-sets are rated at unity (1.0) power factor. All three phase gen-sets are rated at .8 power factor. “MAXIMUM RATINGS” are for short period running, not exceeding 1 hour. “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. “PRIME RATINGS” are strictly for gen-sets that provide the prime source of electric power, where normal utility power is unavailable or unreliable. A 10% overload is allowed for a total of 1 hour, within every 12 hours of operation. 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 on 150°C (maximum), 125°C (standby), and 105°C (prime) R/R winding temperature, within a maximum 35°C ambient condition. Generators operated at maximum power ratings will 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 SP-850

Auto Fuel Lock-Off SolenoidStandard on all sets

GENERATOR SPECIFICATIONS

Type 4 Pole, revolving field design
 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 nameplate rating
 Motor Starting 35% Dip on specific voltages
 Total Stator and Load Insulation Class H, 180°C
 Temperature Rise 150°C R/R, maximum rating @ 35°C amb.
 125°C R/R, standby rating @ 35°C amb.
 100°C R/R, prime rating @ 35°C amb.
 Bearing 1, Pre-lubed and sealed
 Power Leads 12 Leads re-connectable for three phase
 And 4 Leads for dedicated single phase
 Coupling Direct flexible disc.
 Total Harmonic Distortion Max 3.8% (MIL-STD705B)
 Telephone Interference Factor Max 50 (NEMA MG1-22)
 Deviation Factor Max 5% (MIL-STD 405B)
 Alternator Self ventilating and drip-proof
 Ltd. Standby Warranty 24 Months or 1000 hrs., first to occur
 Ltd. Prime Warranty 12 Months or 1000 hrs., first to occur

GENERATOR FEATURES

- Full alternator protection with **SENTINEL III** 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.
- Alternator 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 listing on all alternators.
- Complete engine-alternator torsional acceptance, confirmed during initial prototype testing.
- Full load testing on all engine-alternator sets, before shipping.

ENGINE SPECIFICATIONS AND APPLICATIONS DATA

ENGINE

Manufacturer General Motors
 Model and Type Vortec, 8.1L, 4 cycle
 Aspiration Naturally
 Cylinder Arrangement 8 Cylinders, V-8
 Displacement Cu. In. (Liters) 494 (8.1)
 Bore & Stroke In. (Cm.) 4.25 (10.8) & 4.5 (11.1)
 Compression Ratio 9.1:1
 Main Bearings & Style Aluminum/Lead Silicon Alloy
 Cylinder Head Cast Iron
 Pistons Cast Aluminum
 Crankshaft Nodular Iron
 Exhaust Valve Inconel, A193
 Governor Electronic
 Frequency Reg. (no load-full load) Isochronous
 Frequency Reg. (steady state) ± ½%
 Air Cleaner Dry, Replaceable Cartridge
 Oil Filter 1, Replaceable Spin-On
 Ltd. Warranty 12 Months or 2000 hrs., first to occur
Speed **60 HZ** **50 HZ**
 Rated RPM 1800 1500
 Piston Speed, ft/min (m./min) 1311 (399) 1092 (332)
 Max Power, bhp (kw) Standby /LPG* 150 (112) 123 (92)
 Max Power, bhp (kw) Prime /LPG* 135 (101) 111 (83)
 BMEP: psi (kpa) Standby 146 (1010) 124 (92)
 BMEP: psi (kpa) Prime 131 (909) 111 (83)

*Derate LPG bhp (kw) ratings by 5% for natural gas ratings.

FUEL SYSTEM

Type LPG or NAT. GAS, Vapor Withdrawal
 Fuel Pressure (kpa), in. H₂O (1.74-2.74), 7"-15"
 Secondary Fuel Regulator LPG or NG Vapor System

FUEL CONSUMPTION

		LP GAS: FT ³ /HR (M ³ /HR)	60 HZ	50 HZ
STDBY	100% LOAD		425 (12)	320 (9)
	75% LOAD		350 (10)	250 (7)
	50% LOAD		265 (7.5)	198 (5.5)
PRIME	100% LOAD		390 (11)	300 (8.5)
	75% LOAD		320 (9)	240 (6.8)
	50% LOAD		245 (7)	190 (5.5)
LPG = 2500 BTU X FT³/HR = Total BTU/HR				

		NAT. GAS: FT ³ /HR (M ³ /HR)	60 HZ	50 HZ
STDBY	100% LOAD		1020 (29)	880 (25)
	75% LOAD		830 (23.5)	685 (19.5)
	50% LOAD		670 (19)	495 (14)
PRIME	100% LOAD		950 (27)	800 (22.5)
	75% LOAD		790 (22.5)	635 (18)
	50% LOAD		620 (17.5)	470 (13.3)
NG = 1000 BTU X FT³/HR = Total BTU/HR				

OIL SYSTEM

Type Full Pressure
 Oil Pan Capacity qt. (L) 8.0 (7.6)
 Oil Pan Cap. W/ filter qt. (L) 8.5 (8.0)

ELECTRICAL SYSTEM

Ignition System Electronic
 Eng. Alternator:
 Ground Negative
 Volts DC 12
 Max. Amp Output 70
 Recommended Battery: 12 VDC, 70 Amp/Hr, Size BCI# 29h,
 13"lg X 6"wi X 9"hi, with round posts & neg. ground
 Cold-Cranking amps at 0°F (-17.8°C) : 840 CCA

Eng. Starter Motor 12 VDC

COOLING SYSTEM

Type of System..... Pressurized, closed recovery
 Coolant Pump Pre-lubricated, self-sealing
 Cooling Fan Type (no. of blades).....Pusher (12)
 Fan Diameter inches (cm).....23.6" (599)
 Ambient Capacity of Radiator °F (°C) 125 (51.6)
 Engine Jacket Coolant Capacity Gal (L) 3.6 (13.7)
 Radiator Coolant Capacity Gal. (L)..... 4.3 (16.2)
 Maximum Restriction of Cooling Air Intake
 and discharge side of radiator in. H₂O (kpa)5 (.125)
Speed 60 HZ.....50 HZ
 Water Pump Capacity gpm (L/min) 37 (140) 34 (119)
 Heat Rejection Coolant : Btun (kw) 3540 (62) 3010 (53)
 Note: Coolant temp. shut-down switch setting at 212°F (100°C) with 50/50
 (water/antifreeze) mix.

AIR REQUIREMENTS

Speed 60 HZ.....50 HZ
 Radiator Air Flow cfm (m³/min) 6500 (187) 5200 (153)
 Combustion Air cfm (m³/min)..... 250 (7.1) 212 (6)
 Heat Rejected to Ambient:
 Engine: kw (btu/min)..... 40 (2300) 32 (1820)
 Alternator: kw (btu/min)..... 11.5 (665) 13 (745)

EXHAUST SYSTEM

Emissions; HC : g/hp-hr 156-240*
 Emissions; CO : g/hp-hr 3600-10000*
 Emissions; NoX : g/hp-hr 228-624*
 Muffler Inlet – Outlet Size..... 3"
 Max. Back Pressure hg 2"
Speed 60 HZ.....50 HZ
 Exhaust Flow, stby kw: cfm (m³/min) .. 774 (21.9) 619 (17.5)
 Exhaust Temp., stby kw: °F (°C) 1200 (648) 1100 (543)
 *Engine manufacturer’s estimated range.

Start • Fail to Come to Rest • Loss of Speed Sensing Signal. All alarms are indicated by an LCD icon and LED light.

SOUND LEVELS

	Open Set	Std. Encl.	Super-Silent Encl.
dB(A), Industrial Muffler, no load.....	85	81	78
dB(A), Industrial Muffler, full load.....	88	83	80
dB(A), Residential Muffler, no load.....	83	79	75
dB(A), Residential Muffler, full load.....	86	81	77
dB(A), Critical Muffler, no load.....	80	76	72
dB(A), Critical Muffler, full load.....	83	79	75

Note: Open sets (no enclosure) has loose flexible exhaust hose and loose industrial muffler, ready for installation by others. Standard enclosure has installed industrial muffler. Super-Silent enclosure has installed residential muffler. All gen-sets are available with optional residential or critical grade mufflers. Reduce all sound levels by 5% for 50 HZ, 1500 RPM operation. Sound tests are taken at 21 ft. (3 m) from source of noise.

DERATE GENERATOR FOR ALTITUDE

3% per 1000 ft. above 3000 ft. from sea level
 3% per 305 meters above 914 meters from sea level

DERATE GENERATOR FOR TEMPERATURE

2% per 10°F above 85°F
 2% per 12°C above 30°C

DIMENSIONS AND WEIGHTS

	Open Set	Standard Enclosure	Super-Silent Enclosure
Length in (cm)	76 (193)	104 (264)	130 (330)
Width in (cm).....	44 (112)	48 (122)	48 (122)
Height in (cm).....	40 (102)	62 (156)	62 (156)
Net Weight lbs (kg).....	2075 (941)	2675 (1213)	2925 (1327)

SENTINEL III & IV® DIGITAL MICROPROCESSOR CONTROLLERS

Ship Weight lbs (kg)..... 2300 (1043) .2900 (1315).. 3150 (1429)



SENTINEL III®*

A field programmable microprocessor controller as standard equipment on all 4-pole gen-sets. This solid-state module automatically starts and stops the engine, indicates operational status and fault conditions, by means of a graphical LCD display and flashing LED. This controller provides: Generator Volts (L1-N, L2-N, L3-N) and (L1-L2, L2-L3, L3-L1) • Generator Amps (L1, L2, L3) • Generator Frequency (HZ) • Engine Speed (RPM) • Engine Oil Pressure (PSI or BAR) • Engine Temperature (C and F) • Starting Battery Volts • Engine Run Time (Hours) • Scroll Button • Push Buttons for Manual On – Manual Off – Manual Operation – Auto Operation – Programming. These displays are supplemented further by LCD icon displays for various engine alarms. *New for the fall of 2003.

Multiple alarm channels are provided to monitor the following: Under and Over Speed • Charge Alternator Failure • Emergency Stop • Low Oil Pressure • High Engine Temperature • Fail to

CONTROLLER FEATURES

- Microprocessor Based Design
- Programmable Operations
- Auto Engine Starting and Stopping
- Custom Graphical Icon Display
- Provides Engine and Generator Instrumentation
- Provides Engine Alarms and Status Information
- Configurable Inputs, Outputs, Alarms, and Timers
- LED and LCD alarm Indications
- Compatible with SENTINEL IV for easy upgrade



SENTINEL IV®

This is an upgrade to SENTINEL III, having the same features, plus the following: Monitors utility power supply • Remote communication via optional RS232 port (RS485 porting available

– consult factory) • This module can also signal cell phones

STANDARD AND OPTIONAL FEATURES FOR MODEL SP-850

STANDARD FEATURES

using GSM SMS message system, to report faults • Use this controller in conjunction with remote annunciators (see optional part # S-19)

CONTROL PANEL:

- SENTINEL III® programmable microprocessor with logic and digital LCD display features:
 - AC volts, amps, frequency, oil pressure, engine temperature, DC volts, engine run hours, and additional display symbols for a wide variety of

protective shutdowns.

- Automatic shutdowns include: under and over speed, under and over volts, high engine temperature, low oil pressure, and engine over-crank.

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 • silencer • 12 VDC battery charging alternator • flexible exhaust connector • "Isochronous" duty, electronic governor • secondary dry fuel regulator • dry fuel lock-off solenoid • vibration isolators • closed coolant recovery system with 50/50 water to anti-freeze mixture

- 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
- Starting Battery (size BCI# 27f, 660 CCA, 12 VDC)
- Battery Charger, float type, 12 VDC at max. charge, with ammeter.
- Battery Charger, float type, 12 VDC at max. charge, with ammeter and voltmeter, meeting NFPA-110 requirements.
- Radiator for dirty environment
- Flexible Oil Drain hose with on-off valve
- Flexible Radiator Drain hose with on-off valve
- External Permanent Magnet Generator (PMG) for increased induction motor starting capacity.
- Exhaust Silencer (Residential Grade) installed inside or outside (underline one) weather housing. Note: This muffler style (mounted outside housing) is standard equipment on Super-Silent housings.

GENERATOR:

AC generator • shunt excited • brushless design • single bearing • direct connection to engine with flex disc • class H, 180°C insulation • self ventilated • drip proof construction

VOLTAGE REGULATOR:

½% Voltage regulation • EMI filter • under-speed protection • over-excitation protection • total encapsulation

ELECTRICAL:

Battery tray • battery cables • battery hold down straps

SUPPORT:

Operation, maintenance, and installation literature.
Call 1-800-777-9639 or Fax 1-574-262-1840
E-mail : engineering@gillettegenerators.com
Web : www.gillettegenerators.com

- Exhaust Silencer (Critical Grade) installed inside or outside (underline one) weather housing.
- Circuit Breaker. (Choice of mounted or loose)

Exhaust system mounted on roof, not shown. Design & specifications subject to change without prior notice. Dimensions shown are approximate. Contact Gillette for certified drawings. DO NOT USE DIMENSIONS FOR INSTALLATION PURPOSES.

- Circuit Breaker with NEMA-3R Enclosure. Note: These breakers are shipped loose for installation in remote outside area by others.
- Single or Three Phase Windings, 50 or 60 Hertz.
- SENTINEL IV Controller with all features of Sentinel III, 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 IV must be selected, to achieve remote annunciation.

- All aluminum weather and sound deadening housing for coastal areas. (allow 8-10 weeks for special order)

