

# SENTRY-PRO POWER SYSTEMS

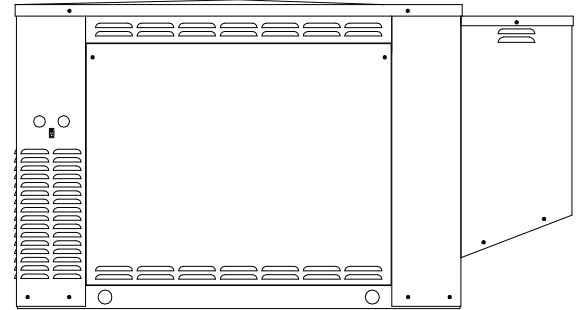
By Gillette Generators, Inc.

MODEL  
**SPP-180**

**LIQUID COOLED LPG/NG ENGINE,  
RESIDENTIAL STANDBY GENERATOR SET**

## KW POWER RATINGS RANGE

Model SERIES	STANDBY 130°C RISE		
	HZ	LPG	N.G.
<b>SPP-180</b>	60	18.0	16.0



## 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 generator sets are UL-1446 certified.
- Liquid cooled engine provides cooler operation and longer service life.
- Solid state, frequency compensated digital voltage regulation for  $\pm 1/2\%$  is standard on all gen-sets.
- Electronic engine governor has a throttle body actuator, which allows precise  $\pm 1/2\%$  isochronous frequency regulation, from no load to full load.
- A brushless rotating field, generator design with shunt wound excitation system and available at a broad range of voltages.
- Solid state, digital microprocessor logic and ultra-bright LED, annunciation display for different engine and generator functions, plus automatic fault shutdowns; high temp., over-crank, over-speed, under-speed, low oil, and low battery.
- The heavy duty, rugged dry fueled engine is capable of delivering rated power at 3600 RPM (60 HZ).
- All generator set control systems components and accessories provide a 2-year limited warranty at time of initial start-up. Optional extended warranties are available. 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. Flexible exhaust hose and muffler is supplied loose for final exhaust installation by others
- "LEVEL 1" All Aluminum Housing: Full weather protection and above average sound attenuation for normal applications.
- "LEVEL 2" Housing: Full weather protection and superior sound attenuation for specific low noise applications. (See "Sound Level" chart).
- Complete Power Plant including automatic transfer switch with "Priority Start" load control technology by temporarily disconnecting "non-essential" loads, to start "essential loads". This allows additional "starting power" equivalent to 22 kW on LPG fuel or 18 kW on natural gas fuel.

## GENERATOR RATINGS

GENERATOR MODEL	VOLTAGE		PH	HZ	LIQUID PROPANE GAS FUEL		NATURAL GAS FUEL	
	L-N	L-L			130°C RISE STANDBY RATING		130°C RISE STANDBY RATING	
					KW/KVA	AMP	KW/KVA	AMP
<b>SPP-180-1-1</b>	120	240	1	60	18/18	75	16/16	67
<b>SPP-180-3-2</b>	120	208	3	60	18/22.5	62	16/20	56
<b>SPP-180-3-3</b>	120	240	3	60	18/22.5	54	16/20	48
<b>SPP-180-3-4</b>	277	480	3	60	18/22.5	27	16/20	24
<b>SPP-180-3-5</b>	127	220	3	60	18/22.5	59	16/20	53

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. 130° "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. 105° "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 130°C (standby), and 105°C (prime) R/R winding temperature, within a maximum 30°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 SPP-180

## GENERATOR SPECIFICATIONS

Type ..... 2 Pole, 3600 RPM, revolving field design  
 Exciter ..... Brushless, shunt excited  
 Voltage Regulator ..... Automatic, solid state  
 Voltage Regulation .....  $\pm 1/2\%$ , No load to full load  
 Frequency ..... 60 HZ (50 HZ available)  
 Frequency Regulation .....  $\pm 1/2\%$  (1/2 cycles, no load to full load)  
 Unbalanced Load Capability ..... 50% of nameplate rating  
 Motor Starting .... 6 HP, Code G w/ 35% Dip on specific voltages  
 Total Stator and Rotor Insulation ..... Class H, 180°C  
 Temperature Rise ..... 130°C R/R, standby rating @ 30°C amb.  
 ..... 105°C R/R, prime rating @ 30°C amb.  
 Bearing ..... 1, Pre-lubed and sealed  
 Power Leads ..... 4 Leads for dedicated single phase  
 ..... or 12 Leads for a broad range of 3 phase voltages  
 Coupling ..... SAE-5 Flywheel housing with flexible disc  
 Total Harmonic Distortion ..... Max 6 1/2% (MIL-STD705B)  
 Telephone Interference Factor ..... Max 250 (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 ..... Not available for prime use

## GENERATOR FEATURES

- Full generator protection with solid state microprocessor, based controller, for automatic shutdown protection.
- Automatic voltage regulation by automatic solid state, digital design, yielding  $\pm 1/2\%$  from no load to full load.
- 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 3000 V. hi-potential test on main windings, and rotor windings receive a 3000 V. hi-potential test, as per MIL-STD 705B.
- All windings are subjected to “surge” testing to confirm winding integrity and consistency with dielectric voltage withstand test per UL2200.39.
- Full copper windings with UL-1446 listing on all generators.
- All gen-sets are 100% prototyped and production tested.
- Full load testing on all engine-generator sets, before shipping.

## ENGINE SPECIFICATIONS AND APPLICATIONS DATA

### ENGINE

Manufacturer ..... PSI SSI  
 Model and Type ..... 0.97L, 4 cycle, In-Line  
 Aspiration ..... Naturally  
 Liquid Cooled ..... Attached 125°F Radiator  
 Spark Plug (gap) ..... 101722 (1-1.2mm)  
 Cylinder Arrangement ..... 4 cylinder, in line  
 Displacement Cu. In. (cm<sup>3</sup>) ..... 59.38 (974)  
 Bore x Stroke In. (mm.) ..... 2.58 x 2.84 (65.5 x 72.0)  
 Engine Torque (HP) ..... 52lb/ft (39)  
 Main Bearings & Style ..... Ball Bearings  
 Cylinder Head ..... Aluminum  
 Crankshaft ..... Forged Steel  
 Exhaust Valve ..... Sinter powered for dry fuel use  
 Governor ..... Electronic  
 Frequency Reg. (steady state) .....  $\pm 1/4\%$   
 Air Cleaner ..... (1) Replaceable main paper element  
 Oil Filter ..... (1), Replaceable spin-on  
 EPA, CARB, and SORE Emissions ..... Certified  
 Ltd. Standby Warranty ..... 24 Months or 2000 hrs., first to occur  
 Ltd. Prime Warranty ..... not available for prime use  
**Speed ..... 60 HZ**  
 Rated RPM ..... 3600  
 Max Power, bhp Standby / LPG ..... 39  
 Max Power, bhp Prime / LPG ..... 33  
 Max Power, bhp Standby / Nat. Gas ..... 31  
 Max Power, bhp Prime / Nat. Gas ..... 26

### FUEL SYSTEM

Type ..... LPG or NAT. GAS, vapor withdrawal  
 Fuel Pressure (kpa), in. H<sub>2</sub>O\* . (1.74-2.74), 7”-11” Water column  
 Secondary Fuel Regulator ..... NG or LPG vapor system  
 Auto Fuel Lock-Off Solenoid ..... (2) Solenoids on each set  
 \* Measured at gen-set fuel inlet, down stream of all dry fuel accessories

### FUEL CONSUMPTION

		LP GAS: FT <sup>3</sup> /HR (M <sup>3</sup> /HR)	60 HZ
STDBY		100% LOAD	125 (3.5)
		75% LOAD	95 (2.7)
		50% LOAD	60 (1.7)
PRIME		100% LOAD	113 (3.2)
		75% LOAD	86 (2.4)
		50% LOAD	52 (1.5)
		LPG = 2500 BTU X FT <sup>3</sup> /HR = Total BTU/HR LPG CONVERSION: 8.50 FT <sup>3</sup> = 1 LB. ; 36.4 FT <sup>3</sup> = 1 GAL	

		NAT. GAS: FT <sup>3</sup> /HR (M <sup>3</sup> /HR)	60 HZ
STDBY		100% LOAD	280 (7.9)
		75% LOAD	210 (5.9)
		50% LOAD	142 (4.0)
PRIME		100% LOAD	252 (7.1)
		75% LOAD	189 (5.4)
		50% LOAD	126 (3.6)
		NG = 1000 BTU X FT <sup>3</sup> /HR = Total BTU/HR	

### OIL SYSTEM

Type ..... Full Pressure  
 Oil Pan Capacity qt. (L) ..... 3.17 (3.0)  
 Oil Pan Capacity W/ filter & oil cooler qt. (L) ..... 3.5 (3.3)  
 Oil Filter ..... 1 Replaceable Spin-On

### ELECTRICAL SYSTEM

Ignition System ..... Electronic with can-bus capability  
 Eng. Alternator:  
     Ground ..... Negative  
     Volts DC ..... 12  
     Max. Amp Battery Charging Output ..... 50  
 Min Battery Req: ..... 12 VDC, 55 Amp/Hr, Size BCI# 21R or 26R (8 1/2”lg X 7”wi X 8 3/4”hi), type “T”, “L”, or “X” terminals.  
 Minimum Cold-Cranking amps at 0°F (-17.8°C) : ..... 390 CCA  
 Eng. Starter Motor ..... 12 VDC

# APPLICATION AND ENGINEERING DATA FOR MODEL SPP-180

## COOLING SYSTEM

Type of System .....	Pressurized, closed recovery
Coolant Pump .....	Pre-lubricated, self-sealing
Cooling Fan Type (no. of blades) .....	Pusher (8)
Fan Diameter inches (cm) .....	12.25" (31)
Ambient Capacity of Radiator °F (°C).....	125 (51.6)
Engine Jacket Coolant Capacity Gal (L).....	0.75 (2.85)
Radiator Coolant Capacity (w/ engine) Gal. (L).....	1.75 (6.62)
Maximum Restriction of Cooling Air Intake and discharge side of radiator in. H <sub>2</sub> O (kpa).....	0.5 (.125)
Water Pump Capacity gpm (L/min).....	13.5 (51.1)
Heat Reject Coolant : Btu/min (kw) .....	2023 (35.5)

## COOLING AIR REQUIREMENTS

Combustion Air, cfm/(m <sup>3</sup> /min) .....	48 (1.4)
Radiator Air Flow cfm (m <sup>3</sup> /min).....	1875 (54)
Heat Rejected to Ambient: Engine: kw (btu/min) .....	6.75 (390)
Alternator: kw (btu/min).....	3.75 (187)

## EXHAUST SYSTEM

Emissions LPG (NG); THC+NOx : .....	0.97 g/km
Emissions LPG (NG); CO : .....	2.72 g/km
Exhaust Outlet Size.....	1-1/2"
Max. Back Pressure in. hg (KPA) .....	3.0 (10.2)
Exhaust Flow, at rated kw: cfm (m <sup>3</sup> /min) .....	250 (7.1)
Exhaust Temp., at rated kw: °F (°C) .....	1375 (746)
Engines are EPA, CARB, & SORE certified.	

## SOUND LEVELS

	Open Set	Level 1 Encl..	Level 2 Encl.
dB(A), Residential Muffler, no load .....	76.....	73 .....	N/A
dB(A), Residential Muffler, full load.....	78.....	74 .....	N/A
dB(A), Critical Muffler, no load .....	74.....	70 .....	68
dB(A), Critical Muffler, full load.....	76.....	73 .....	70

Note: Open sets (no enclosure) has no furnished muffler system due to unknown job-site applications. Level 1 enclosure has installed residential muffler. Level 2 enclosure has installed critical muffler. Level 1 enclosure sets can be upgraded from residential to critical muffler. Sound tests are averaged from several test points and taken at 23 ft. (7 m) from source of noise.

## DERATE GENERATOR FOR ALTITUDE

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

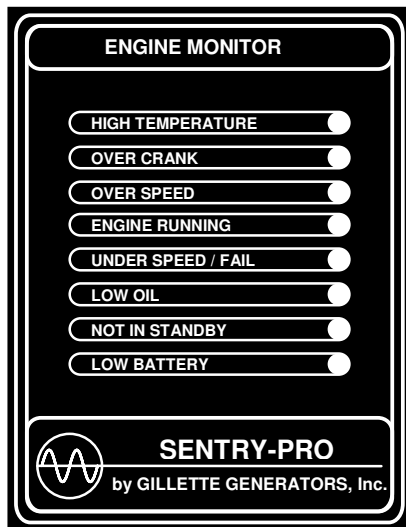
## DERATE GENERATOR FOR TEMPERATURE

2% per 10°F (5.6°C) above 85°F (30°C)

## STANDARD ENCLOSURE FEATURES

- All Aluminum Exterior Housing, ensuring a rust and tarnish free installation.
- Powder coat, backed-on enamel finish, passes UL 1000 hour salt spray test.
- 10 independent metal wash stages, with a final iron phosphate metal etching before powder coat finish.
- Interior "Sound Dampening" preventing metal "ringing".
- Interior sound absorbing foam through out enclosure.
- One locking door for access to controller.
- Hot muffler is concealed away from "touch".
- Access to engine service through bolted access panels.

## ENGINE MONITOR & OPERATION MODE FOR RESIDENTIAL STANDBY GENERATOR SETS

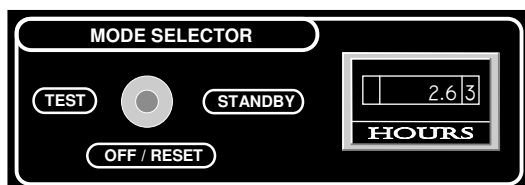


These sets use standard (2) wire start interfacing fully compatible with any dry contact start-stop system that might be installed on ATS, remote start-stop control panels, Trace inverters for controlling solar power battery arrays, etc. The start-stop signal on such equipment is utilized by the gen-set to initialize a (4) second countdown before the gen-set actually begins its first crank cycle.

These standby gen-sets are "stand-alone" units which can work with any type ATS system or any other type sensing device, using (2) wire start-stop interfacing.

## STANDARD FEATURES OF SPP SERIES ARE:

Solid State Digital Microprocessor providing automatic engine start-stop; auto shutdown for low oil, high temperature, over speed, under speed, engine fail, engine crank failure (after 3 failed crank attempts); battery charge fail; a "not in standby mode" warning indicator and a built-in (4) second engine start delay and (2) minute engine cool down delay. Timer cycles can be disabled in the field if application requirements so dictate. The "Mode Selector" switch serves (3) functions: A "Test" position (causing the gen-set to start and run indefinitely, without ATS switching the load); a "Standby" position (the system is ready to start automatically, whenever utility power fails); and an "Off/Reset" position (the engine can not start under any condition, so this is the service position and reset position when any fault is corrected). The "Engine Monitor" has (8) highly visible LED annunciators for all conditions. When mode switch is placed in "Standby" all (8) LED's will flash (3) times serving as a lamp test. The panel also includes a mainline circuit breaker and run time meter.



# STANDARD AND OPTIONAL FEATURES FOR MODEL SPP-180

## CONTROL PANEL:

SPV Series, automatic start-stop engine controller, utilizing solid state digital microprocessor with (8) ultra-bright LED annunciators. Panel also has main line circuit breaker, run time meter, and mode selector switch with "Test", "Standby", or "Off/Reset" positions.

## ENGINE:

Full flow air cleaner and oil filter • full pressure oil system with separate oil cooler • spin-on oil filter • residential muffler • 12 VDC battery charging alternator • vibration isolators • secondary dry fuel regulator with redundant dry fuel lock-off solenoids • 4 in line cylinder, liquid cooled PSI engine • oil drain flex hose

## GENERATOR:

AC generator with digital regulation system • single bearing • brushless design • class H, 180°C insulation system • self ventilated, drip proof construction • UL-1446 certified

## ELECTRICAL:

Battery tray • battery cables • battery straps • 2-stage, float type 3 amp auto battery charger

## SUPPORT:

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

## OPTIONAL FEATURES & ACCESSORIES

- Remote annunciator, showing gen-set conditions
- 3 Phase winding for 208, 240, & 480 volts
- 3 Phase ATS system for complete emergency power system
- 1 Phase ATS system using "Priority Start" load technology by temporarily disconnecting non-essential loads, allowing 30-35% more motor starting power.
- Open (no enclosure) for special in-door applications
- Level 2 housing w/ special sound deadening foam and critical grade muffler.
- All stainless steel weather housing
- Water heater for faster cold weather starts

## DIMENSIONAL OVERVIEW PRINT FOR MODEL SPP-180

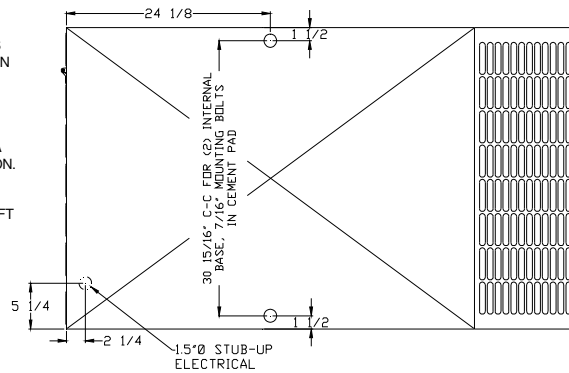
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**(A) (4) LIFTING HOLES IN BASE:**  
 1-1/2" DIA. HOLES ARE INSTALLED IN BASE, FOR LIFTING EQUIPMENT. REMOVE PLASTIC COVERS IN THESE HOLES, AND RE-INSTALL COVERS WHEN GEN-SET IS IN PLACE.

**(B) DRY FUEL CONNECTION:**  
 LPG OR NAT. GAS CONNECTION IS LOCATED ON THE ENGINE END PANEL AS SHOWN. THERE IS A 3/4" THREADED PIPE COUPLING FOR CONNECTION.

**(C) ELECTRICAL & GROUND CONNECTION:**  
 THERE ARE TWO KNOCK-OUT HOLES ON THE LEFT HAND SIDE OF GENERATOR END. BOTH HOLES ARE FOR 3/4" CONDUIT. (1) 1.5"Ø HOLE IN BASE FOR STUB-UP

TOP VIEW



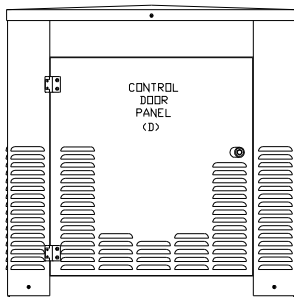
**(D) CONTROL DOOR PANEL:**

THIS PANEL IS HERE TO HELP WITH INITIAL WIRING INSTALLATION AND QUICK ACCESS TO GENERATOR CONTROLS. QUALIFIED PERSONEL ONLY: UN-LOCK AND OPEN, CONTROL DOOR. REMOVE ROOF SCREW AND SLIDE BLANK PANEL DOWN AND OFF, FOR FULL WIRING ACCESS

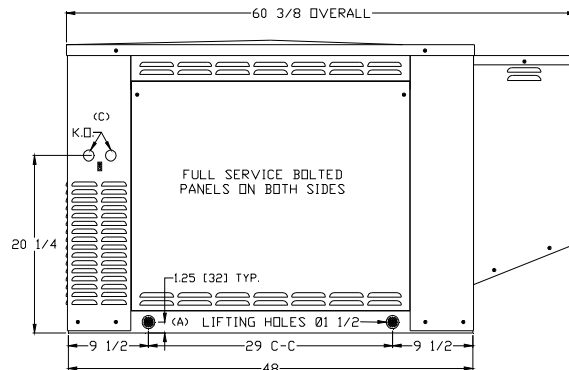
**(E) EXHAUST CHUTE:**

LOCATED IN THIS CHUTE, IS WHERE THE EXHAUST PIPE & MUFFLER RESIDES, PLEASE KEEP CLEAR WHILE UNIT IS RUNNING OR HOT. DO NOT INSTALL UNIT WHERE THE EXHAUST MAY COME INTO CONTACT WITH FLAMMABLE OBJECTS.

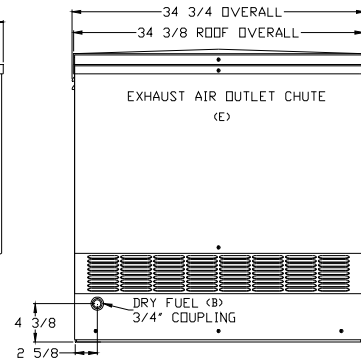
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GENERATOR END VIEW



SIDE VIEW



ENGINE END VIEW

## DIMENSIONS AND WEIGHTS

FOR ALUMINUM AND STAINLESS STEEL HOUSINGS	Open Set	Level 1 Enclosure	Level 2 Enclosure
Length in .....	48	60	60
Width in .....	34	34	34
Height in .....	33	33	33
Net Weight lbs.....	730	820	855
Ship Weight lbs.....	770	860	895
<b>INCREASE IN WEIGHT FOR STAINLESS STEEL HOUSING</b> .....	N/A	80 lbs	96 lbs

## DISTRIBUTED BY:



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