



# SENTRY-PRO POWER SYSTEMS

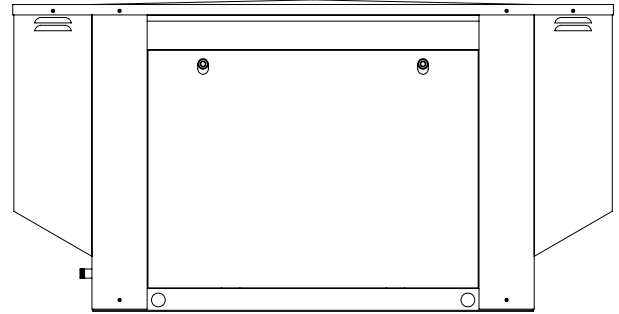
By Gillette Generators, Inc.

MODEL  
**SPV-160**

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

## KW POWER RATINGS RANGE

Model SERIES	HZ	STANDBY 130°C RISE		PRIME 105°C RISE	
		LPG	N.G.	LPG	N.G.
<b>SPV-160</b>	60	15.0	12.5	13.0	11.0



## 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 generators are UL-1446 certified.
- Liquid cooled engine provides cooler operation and longer service life.
- Solid state, digital voltage regulation for  $\pm 1/2\%$  is standard on all gen-sets.
- Mechanical engine governor has a special actuator, which allows precise  $\pm 2 1/2\%$  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 installation by others
- "STANDARD" Housing: Full weather protection and above 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).

## GENERATOR RATINGS

GENERATOR MODEL	VOLTAGE		PH	HZ	LIQUID PROPANE GAS FUEL				NATURAL GAS FUEL			
	L-N	L-L			130°C RISE STANDBY RATING		105°C RISE PRIME RATING		130°C RISE STANDBY RATING		105°C RISE PRIME RATING	
					KW/KVA	AMP	KW/KVA	AMP	KW/KVA	AMP	KW/KVA	AMP
<b>SPV-160-1-1</b>	120	240	1	60	15/15	62	13/13	54	12.5/12.5	52	11/11	45
<b>SPV-160-3-2</b>	120	208	3	60	15/18.8	52	13/16.3	45	12.5/15.6	43	11/13.8	38
<b>SPV-160-3-3</b>	120	240	3	60	15/18.8	45	13/16.3	39	12.5/15.6	37	11/13.8	33
<b>SPV-160-3-4</b>	277	480	3	60	15/18.8	22	13/16.3	19	12.5/15.6	18	11/13.8	16
<b>SPV-160-3-5</b>	127	220	3	60	15/18.8	49	13/16.3	42	12.5/15.6	41	11/13.8	36

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 SPV-160

## 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 .....  $\pm 2 1/2\%$  (3 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 ..... 12 Months or 500 hrs., first to occur

## 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.
- Harmful harmonic distortions over 10% in generator power

## ENGINE SPECIFICATIONS AND APPLICATIONS DATA

### ENGINE

Manufacturer ..... VANGUARD Motors  
 Model and Type ..... DM950G, 4 cycle  
 Aspiration ..... Naturally  
 Liquid Cooled ..... Attached 125°F Radiator  
 Cylinder Arrangement ..... 3 cylinder, in line  
 Displacement Cu. In. (cm<sup>3</sup>) ..... 58.1 (952)  
 Bore x Stroke In. (mm.) ..... 2.83 x 3.07 (72 x 78)  
 Main Bearings & Style ..... Ball Bearings  
 Cylinder Head ..... Aluminum  
 Crankshaft ..... Forged Steel  
 Exhaust Valve ..... Hardened for dry fuel use  
 Governor ..... Mechanical  
 Frequency Reg. (steady state) .....  $\pm 5\%$  (3 cycles)  
 Air Cleaner ..... (1) Replaceable main paper element  
 ..... (1) Replaceable secondary dry-type foam element  
 Oil Filter ..... (1), Replaceable spin-on  
 Ltd. Standby Warranty ..... 24 Months or 1000 hrs., first to occur  
 Ltd. Prime Warranty ..... 12 months or 500 hrs., first to occur

**Speed ..... 60 HZ**  
 Rated RPM ..... 3600  
 Max Power, bhp Standby / LPG ..... 28  
 Max Power, bhp Prime / LPG ..... 26  
 Max Power, bhp Standby / Nat. Gas ..... 25  
 Max Power, bhp Prime / Nat. Gas ..... 23

### FUEL SYSTEM

Type ..... LPG or NAT. GAS, vapor withdrawal  
 Fuel Pressure (kpa), in. H<sub>2</sub>O\* (1.74-2.74), 7”-15” Water column  
 Secondary Fuel Regulator ..... LPG or NG vapor system  
 Auto Fuel Lock-Off Solenoid ..... (1) Solenoid on each set  
 And redundant fuel shutoff for safety precautions.  
 \* Measured at gen-set fuel inlet, down stream of all dry fuel accessories

will harm digital loads. Our distortions are only 6 1/2%.

### 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) ..... 2.75 (2.6)  
 Oil Pan Capacity W/ filter & oil cooler qt. (L) ..... 3.5 (3.3)

### ELECTRICAL SYSTEM

Ignition System ..... Electronic  
 Eng. Alternator:  
 Ground ..... Negative  
 Volts DC ..... 12  
 Max. Amp Battery Charging Output ..... 15  
 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

## COOLING SYSTEM

Liquid cooled by generator and engine pusher fans. A maximum radiator air flow of 3000 CFM is required for proper cooling.

## EXHAUST SYSTEM

Residential type muffler with 200 CFM exhaust flow and an exhaust back pressure at 3600 RPM full load, of 1½" hg water column.

## ENGINE CLASS AND EMISSION LIMITS

If an engine is not handheld (trimmer, blower, etc.) and is greater than or equal to 225cc displacement, it is a Class II engine. Following are maximum emission levels for CARB & EPA Class II engines.

### CALIFORNIA TIER 1 (GRAMS / HP-HOUR)

CLASS	DISPLACEMENT	HC+NO <sub>x</sub>	CO
II	27 HP = 952 CC	10	350

### USA EPA PHASE 1 (GRAMS / KILOWATT HOUR)

CLASS	DISPLACEMENT	HC+NO <sub>x</sub>	CO
II	27 HP = 952 CC	13.4	519

1 HORSEPOWER = .746 KW

1 KW = 1.341 HORSEPOWER

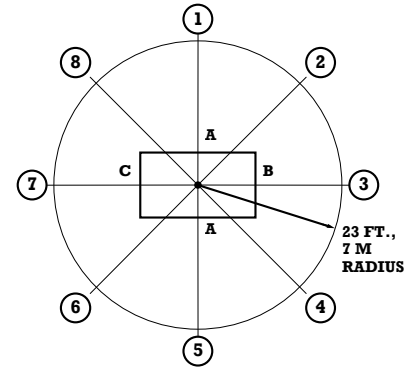
## DERATING FACTORS

Engine horse power ratings meet SAE J1349 test codes. Reduce 3.5% for each 1000 feet, over 328 feet above seal level and 1% for every 10°F (5.65°C) rise, above 77°F (25°C). Generator specifications are in accordance with ASA, NEMA, and IEEE standards.

## ACOUSTIC DATA

A= Access Doors,  
B= Engine Radiator End  
C= Generator End

Note: All tests are full load operation in standard weather with Open (no enclosure), Standard Enclosure, or Super-Silent Enclosure, and in open field with no obstacles.



### Model SPV-160 O-Open (no enclosure)

Position	1	2	3	4	5	6	7	8
dB(A)	80	80	82	80	82	81	80	81

### Model SPV-160 E-Standard Enclosure

Position	1	2	3	4	5	6	7	8
dB(A)	74	74	76	74	72	73	74	73

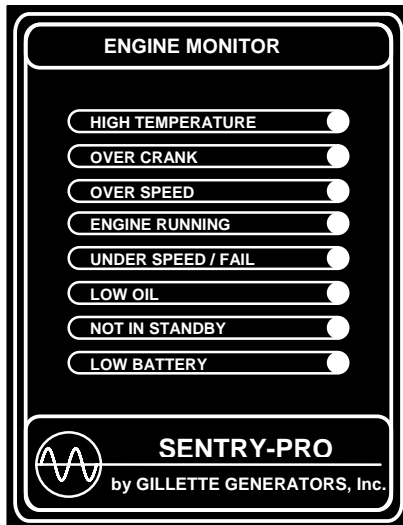
### Model SPV-160 S-Super-Silent Enclosure

Position	1	2	3	4	5	6	7	8
dB(A)	71	71	73	71	69	70	71	70

## STANDARD ENCLOSURE FEATURES

- Coating Protection: (10) Independent Wash Stages for a completely clean metal base. • (1) Zinc Phosphate Metal Etching Stage. • (1) Complete Immersion into E-Coat with Baked Finish. • (1) Final Powder Coat baked on Enamel Finish. This provides UV Protection, passes UL 1000 Hour Salt Spray Tests, and gives the best protection for your investment.
- Interior sound damping preventing metal "ringing".
- Interior sound absorbing foam throughout enclosure.
- (3) Full service locking access doors.
- Hot muffler is concealed inside enclosure.

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

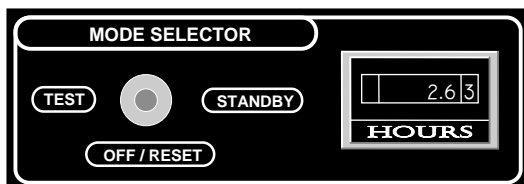


These sets use standard (2) wire start interfacing fully compatible with any dry contact start-stop system that might be installed on ATS, remote start-stop control panels, Trace inverters for controlling solar power battery arrays, etc. The start-stop signal on such equipment is utilized by the gen-set 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 SPV 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 SPV-160

## 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 solenoid • 3 in line cylinder, liquid cooled Vanguard engine

## GENERATOR:

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

## ELECTRICAL:

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

## SUPPORT:

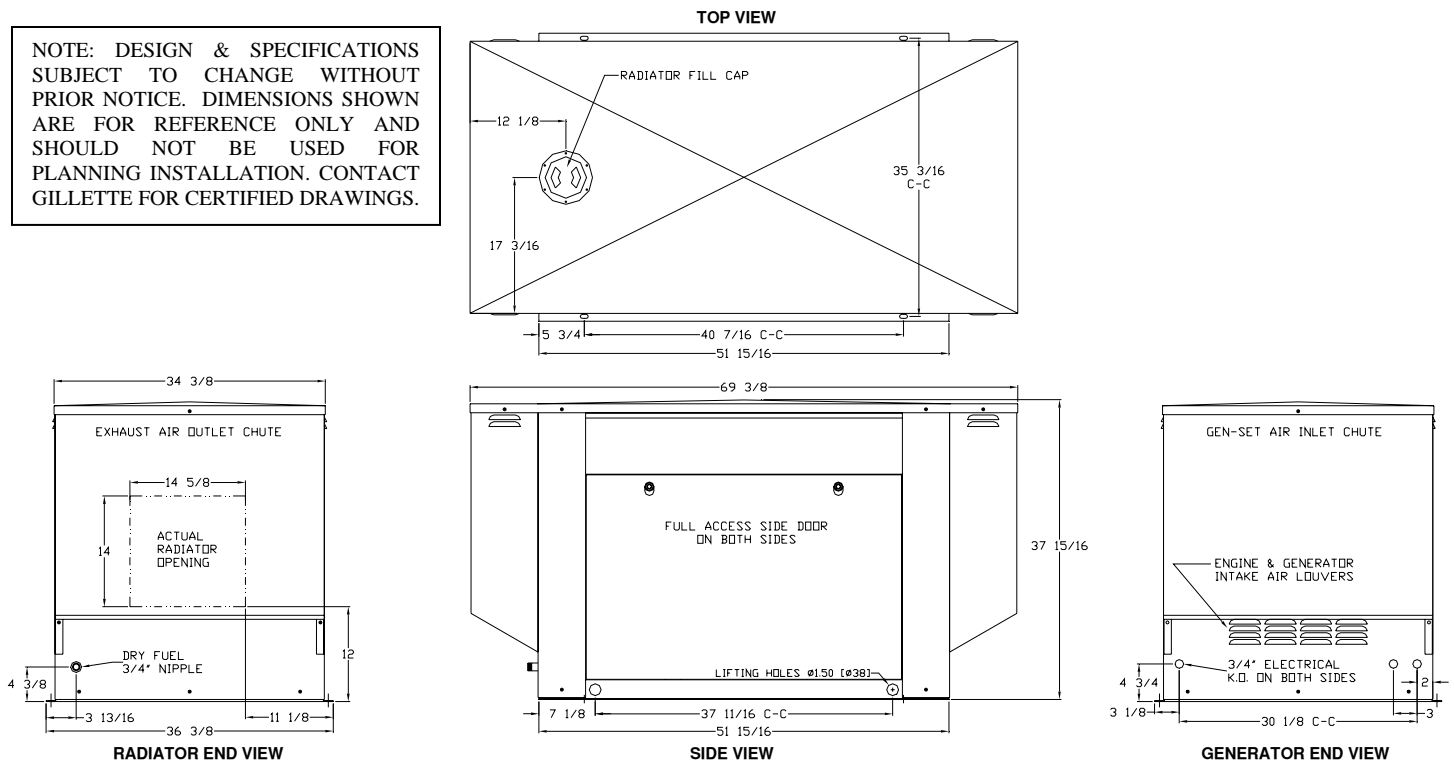
Operation, maintenance, and installation instructions  
 Call 1-800-777-9639 or Fax 1-574-262-1840  
 E-mail : sales@gillettegenerators.com  
 Web : www.gillettegenerators.com

## OPTIONAL FEATURES & ACCESSORIES

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li><input type="checkbox"/> Remote annunciator, showing gen-set conditions</li> <li><input type="checkbox"/> 3 Phase winding</li> <li><input type="checkbox"/> 3 Phase ATS system</li> <li><input type="checkbox"/> 1 Phase ATS system</li> <li><input type="checkbox"/> Oil drain flex hose with on-off valve</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Open (no enclosure) for special applications</li> <li><input type="checkbox"/> Super-Silent housing w/ special sound deadening foam and spark arrestor residential muffler.</li> <li><input type="checkbox"/> All aluminum or stainless steel weather housing</li> <li><input type="checkbox"/> In hose water heater for faster cold weather starts</li> </ul> |
|---|--|

## DIMENSIONAL OVERVIEW PRINT FOR MODEL SPV-160

NOTE: DESIGN & SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR PLANNING INSTALLATION. CONTACT GILLETTE FOR CERTIFIED DRAWINGS.



## DIMENSIONS AND WEIGHTS

FOR STAINLESS STEEL AND STAINLESS STEEL HOUSINGS	Open Set	Standard Enclosure	Super-Silent Enclosure
Length in (cm) .....	52 (132) .....	70 (178) .....	70 (178)
Width in (cm) .....	37 (94) .....	37 (94) .....	37 (94)
Height in (cm) .....	35.5 (90) .....	38 (97) .....	38 (97)
Net Weight lbs (kg) .....	950 (431) .....	1250 (567) .....	1350 (612)
Ship Weight lbs (kg) .....	1050 (477) .....	1350 (612) .....	1450 (658)
<b>REDUCTION IN WEIGHT FOR ALUMINUM HOUSING</b> .....	N/A .....	-120(54) .....	-120(54)

## DISTRIBUTED BY: