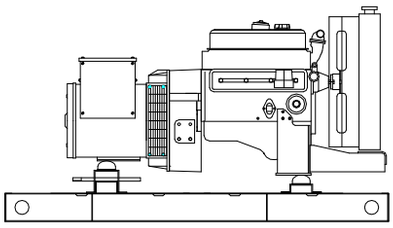
GILLETTE GENERATORS

60 HZ MODEL

SP-410

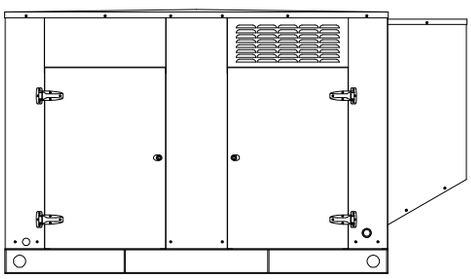
LIQUID COOLED LPG/NG ENGINE GENERATOR SET

Model		STANDBY 120ºC RISE	
	HZ	LPG	N.G.
SP-410-60 HERTZ	60	41	40



"OPEN" GEN-SET

There is no enclosure, so gen-set must be placed within a weather protected area, un-inhabited by humans or animals, with proper ventilation. Silencer not supplied, as installation requirements are not known. However, this item is available as optional equipment.



"LEVEL 2" HOUSED GEN-SET

Full aluminum weather protection and superior sound attenuation for specific low noise applications. Critical grade muffler is standard.

All generator sets are USA prototype built and thoroughly tested. Production models are USA factory built and 100% load tested.

UL2200, UL1446, UL508, UL142, UL498

NFPA 110, 99, 70, 37

All generator sets meet NFPA-110 Level 1, when equipped with the necessary accessories and installed per NFPA standards.

NEC 700, 701, 702, 708

NEMA ICS10, MG1, ICS6, AB1

ANSI C62.41, 27, 59, 32, 480, 40Q, 81U, 360-05

ASCE 7-05 & 7-10

All generator sets meet 180 MPH rating.

40CFR Part 60, 1048, 1054, 1065, 1068

GENERATOR RATINGS					LIQUID PROPANE GAS FUEL		NATURAL GAS FUEL	
GENERATOR MODEL	VOLTAGE		PH	HZ	120ºC RISE STANDBY RATING		120ºC RISE STANDBY RATING	
	L-N	L-L			KW/KVA	AMP	KW/KVA	AMP
SP-410-1-1	120	240	1	60	41/41	171	40/40	167
SP-410-3-2	120	208	3	60	40/50	139	40/50	139
SP-410-3-3	120	240	3	60	40/50	120	40/50	120
SP-410-3-4	277	480	3	60	40/50	60	40/50	60
SP-410-3-5	127	220	3	60	40/50	131	40/50	131
SP-410-3-16	346	600	3	60	40/50	48	40/50	48

RATINGS: All single phase gen-sets are dedicated 4 lead wiring, rated at unity (1.0) power factor. All three phase gen-sets are 12 lead wiring, rated at .8 power factor. 120°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 on 120°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.

WORLDWIDE POWER PRODUCTS

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APPLICATION AND ENGINEERING DATA FOR MODEL SP-410-60 HZ

GENERATOR SPECIFICATIONS

Manufacturer.....Stamford Electric Generators
Model & Type.....UCI224D-06, 4 Pole, 4 Lead, Single Phase
.....UCI224D-311, 4 Pole, 12 Lead re-connectable, Three Phase
..... UCI224C-17, 4 Pole, 6 Lead, 600V, 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).....112 kVA
3 Ø Motor Starting @ 30% Voltage Dip (208-240V).....118 kVA
3 Ø Motor Starting @ 30% Voltage Dip (480V).....190 kVA
3 Ø Motor Starting @ 30% Voltage Dip (600V).....158 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 Stamford Electric Generator having UL-1446 certification.
- Full generator protection with **Deep Sea 7420** 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.
- Self ventilating and drip-proof & revolving field design

ENGINE SPECIFICATIONS AND APPLICATIONS DATA

ENGINE

Manufacturer.....Power Solutions Inc. (PSI)
Model and Type .....Ind. Power Train, 4.3L, 4 cycle
Aspiration..... Natural
Cylinder Arrangement.....6 Cylinders, V-6
Displacement Cu. In. (Liters).....262 (4.3)
Bore & Stroke In. (Cm.).....4 x 3.48 (10.2 x 8.4)
Compression Ratio..... 9.05:1
Main Bearings & Style.....4, Babbitt
Cylinder Head .....Cast Iron
Pistons .....6, Silicon Aluminum
Crankshaft .....Nodular Iron
Exhaust Valve .....Forged Steel
Governor .....Electronic
Frequency Reg. (no load-full load) .....Isochronous
Frequency Reg. (steady state) .....± 1/4%
Air Cleaner.....Dry, Replaceable Cartridge
Engine Speed…….. 1800 rpm
Piston Speed, ft/min (m./min 1044 (318)
Max Power, bhp (kwm) Standby /LPG..... ..... 67 (50)
Max Power, bhp (kwm)Standby /NG..... ..... 62 (46)
Ltd. Warranty Period.....12 Months or 2000 hrs., first to occur

FUEL SYSTEM

Type .....LPG or NAT. GAS, Vapor Withdrawal
Fuel Pressure (kpa), in. H_2O* .....(1.74-2.74), 7"-11"
Secondary Fuel Regulator..... NG or LPG Vapor System
Auto Fuel Lock-Off Solenoid ..... Standard on all sets
Fuel Supply Inlet Line.....1" NPTF
* Measured at gen-set fuel inlet, downstream of any dry fuel accessories.

FUEL CONSUMPTION

LP GAS: FT^3/HR (M^3/HR)	STANDBY
100% LOAD	240 (6.9)
75% LOAD	200 (5.6)
50% LOAD	145 (4.0)
LPG = 2500 BTU X FT^3/HR = Total BTU/HR LPG Conversion: 8.50 FT^3 = 1 LB. : 36.4 FT^3 = 1 GAL.	

NAT. GAS: FT^3/HR (M^3/HR)	STANDBY
100% LOAD	584 (17)
75% LOAD	485 (140
50% LOAD	375 (10)
NG = 1000 BTU X FT^3/HR = Total BTU/HR	

OIL SYSTEM

Type ..... Full Pressure
Oil Pan Capacity qt. (L) 5.0 (4.7)
Oil Pan Cap. W/ filter qt. (L) 6.5 (6.2)
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..... 70
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.

APPLICATION AND ENGINEERING DATA FOR MODEL SP-410-60 HZ

COOLING SYSTEM

Type of System ..... Pressurized, closed recovery
Coolant Pump ..... Pre-lubricated, self-sealing
Cooling Fan Type (no. of blades) ..... Pusher (10)
Fan Diameter inches (cm) ..... 21" (533)
Ambient Capacity of Radiator °F (°C) 125 (51.6)
Engine Jacket Coolant Capacity Gal (L) 1.8 (6.8)
Radiator Coolant Capacity (with engine) Gal. (L) 5.2 (19.7)
Maximum Restriction of Cooling Air Intake
and discharge side of radiator in. H_20 (kpa) ..... 0.5 (.125)
Water Pump Capacity gpm (L/min) 28 (106)
Heat Reject Coolant: Btu/min (kw) 2320 (40.8)
Low Radiator Coolant Level Shutdown……...Standard
Note: Coolant temp. shut-down switch setting at 220°F (104°C) with 50/50 (water/antifreeze) mix.

COOLING AIR REQUIREMENTS

Combustion Air, cfm (m^3/min) 98 (2.78)
Radiator Air Flow cfm (m^3/min) 5000 (142)
Heat Rejected to Ambient:
Engine: kw (btu/min) 19.2 (1100)
Alternator: kw (btu/min) 7.5 (422)

EXHAUST SYSTEM

Exhaust Outlet Size ..... 2.5"
Max. Back Pressure in. hg (KPA) ..... 3" (10.2)
Exhaust Flow, at rated kw: cfm (m^3/min) 330 (9.4)
Exhaust Temp., at rated kw: °F (°C) 1206 (652)
Engines are EPA certified for LPG and Natural Gas.

SOUND LEVELS MEASURED IN dB(A)

	Open Set	Level 2 Encl.
Level 2, Critical Silencer	70	64
Level 3, Hospital Silencer		59

Note: Open sets (no enclosure) have silencer system choices due to unknown job-site applications. Level 2 enclosure has installed critical silencer with upgrade to Level 3 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 104°F (40s°C)

DIMENSIONS AND WEIGHTS

	Open Set	Level 2 Enclosure
Length in (cm)	78 (198)	94 (238)
Width in (cm)	42 (107)	42 (107)
Height in (cm)	36 (91)	53 (134)
1 Ø Net Weight lbs (kg)	1326 (601)	1851 (839)
1 Ø Ship Weight lbs (kg)	1406 (638)	2011 (912)
3 Ø Net Weight lbs (kg)	1316 (597)	1771 (803)
3 Ø Ship Weight lbs (kg)	1396 (633)	1931 (875)

DEEP SEA 7420 DIGITAL MICROPROCESSOR CONTROLLER

Deep Sea 7420

The "**7420**" controller is an auto start mains (utility) failure module for single gen-set applications. This controller includes a backlit LCD display which continuously displays the status of the engine and generator at all times.

The "**7420**" controller 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. It also includes: (11) configurable inputs • (8) configurable outputs • voltage monitoring • mains (utility) failure detection • (250) event logs • configurable timers • automatic shutdown or warning during fault detection • remote start (on 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 • power monitoring (kWh, kVAr, kVAh, kVArh)

This controller includes expansion features including RS232, RS484 (using MODBUS-RTU/TCP), direct USB connection with PC, expansion optioned using DSENet for remote annunciation and remote relay interfacing for a distance of up to 3300FT. The controller software is freely downloadable from the internet and allows monitoring with direct USB cable, LAN, or by internet via the built in web interface.

Further expansion is available by adding the optional "WebNet" gateway interface module. This device will allow comprehensive monitoring of the generator via the cloud including identification, location, and status. Some advantages of this module include: reduced site visits and maintenance costs • remote fuel management • fault analysis • asset tracking • automatic system alerts • maximized system up-time.

STANDARD FEATURES FOR MODEL SP-410-60 HZ

STANDARD FEATURES

CONTROL PANEL:

Deep Sea 7420 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 • 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

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

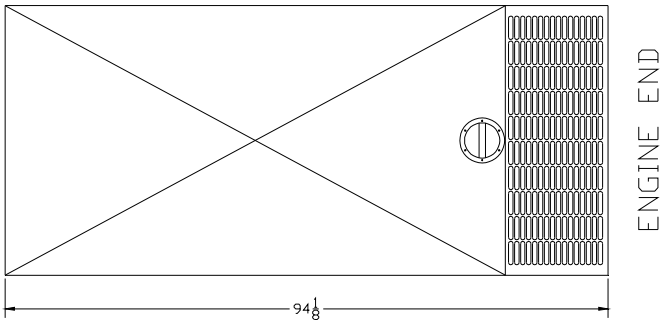
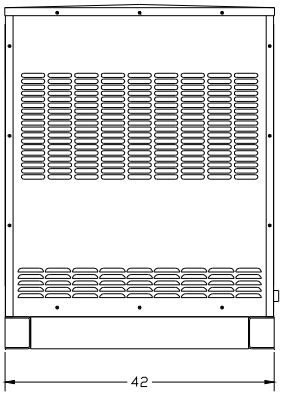
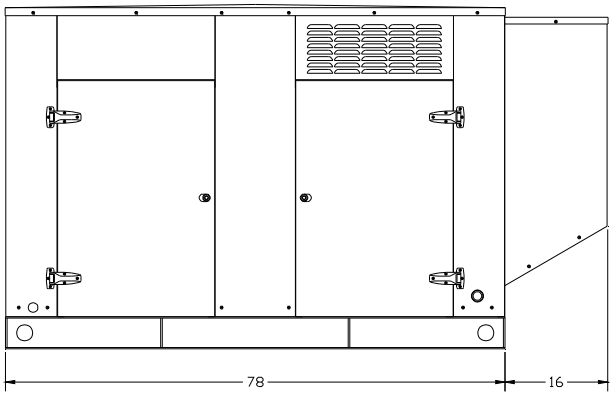
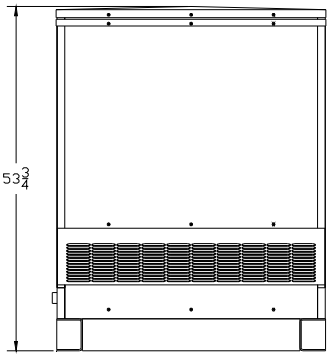
VOLTAGE REGULATOR:

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

Design & specifications subject to change without prior notice. Dimensions shown are approximate. Contact Gillette for certified drawings.
DO NOT USE DIMENSIONS FOR INSTALLATION PURPOSES.