

PRIME POWER SYSTEMS

By Gillette Generators, Inc.

LIQUID COOLED NG ENGINE GENERATOR SET

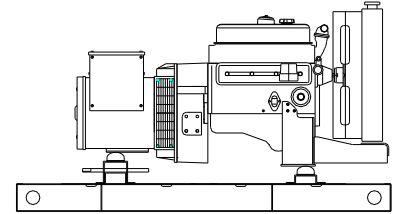
PRIME MODEL
PR-250
60 HERTZ

KW POWER RATINGS RANGE FOR 60 HZ

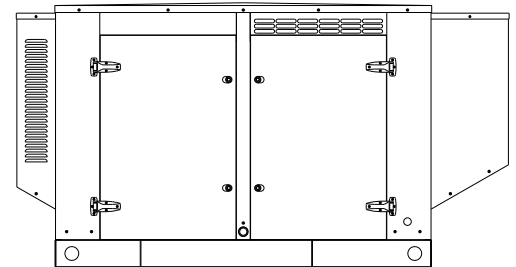
Model	PRIME 105°C RISE	
	HZ	N.G.
PR-250-60 HERTZ	60	25

STANDARD FEATURES

- All generator sets are USA prototype built and thoroughly tested. Production models are USA factory built and 100% load tested.
- Mastertrak telematics remote monitoring equipment with 2 year service subscription. Required for all prime powered generators.
- All generators are UL-1446 certified.
- Solid state, frequency compensated voltage regulation is standard on all gen-sets.
- Electronic engine governor for precise isochronous frequency regulation.
- A brushless rotating field generator design with shunt wound excitation system and connectable at 1 phase or a broad range of 3 phase voltages.
- Deep Sea 7420 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 main line circuit breaker is standard on all gen-sets.
- All generator set specs provide a 2-year limited warranty at time of initial start-up.
- “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. Silencer and flexible exhaust pipe are not supplied, as installation requirements are not known. However, these two items are available as optional equipment.
- “LEVEL 2” Aluminum Housing: Full weather protection and superior sound attenuation for specific low noise applications. Critical grade silencer is standard.



“OPEN” GEN-SET



“LEVEL 2” HOUSED GEN-SET

GENERATOR RATINGS

GENERATOR MODEL	VOLTAGE		PH	HZ	NATURAL GAS FUEL		POWER LEAD CONNECTIONS
	L-N	L-L			105°C RISE PRIME RATING		
					KW/KVA	AMP	
PR-250-1-1	120	240	1	60	25/25	104	4 LEAD DEDICTED 1 PH.
PR-250-3-2	120	208	3	60	25/31	87	12 LEAD LOW WYE
PR-250-3-3	120	240	3	60	25/31	75	12 LEAD HIGH DELTA
PR-250-3-4	277	480	3	60	25/31	38	12 LEAD HIGH WYE
PR-250-3-5	127	220	3	60	25/31	82	12 LEAD LOW WYE
PR-250-3-16	346	600	3	60	25/31	30	4 LEAD DEDICATED 3 PH.

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. 105°C “PRIME RATINGS” are strictly for gen-sets 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 of PRIME RATED systems. 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 105°C (prime) R/R winding temperature, within a maximum 40°C ambient condition. Specifications & ratings are subject to change without prior notice.

APPLICATION AND ENGINEERING DATA FOR MODEL PR-250-60 HZ

GENERATOR SPECIFICATIONS

Manufacturer..... Marathon Electric Generators
 Model & Type..... 283CSL1517, 4 Pole, 4 Lead, Single Phase
 283CSL1707, 4 Pole, 12 Lead re-connectable, Three Phase
 283PSL5250, 4 Pole, 4 lead, 600 VAC, 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 prime amps
 Total Stator and Load Insulation..... Class H, 180°C
 Temperature Rise..... 105°C R/R, prime rating @ 40°C amb.
 1 Ø Motor Starting @ 30% Voltage Dip (240v)..... 62 kVA
 3 Ø Motor Starting @ 30% Voltage Dip (208-240V)..... 92 kVA
 3 Ø Motor Starting @ 30% Voltage Dip (480V)..... 120 kVA
 Bearing..... 1, Pre-lubed and sealed
 Coupling..... Direct flexible disc.
 Total Harmonic Distortion..... Max 3 | % (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 **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..... General Motors
 Model and Type..... Ind. Power Train Vortec, 3.0L, 4 cycle
 Aspiration..... Natural
 Cylinder Arrangement..... 4 Cylinders, In-Line
 Displacement Cu. In. (Liters)..... 181 (3.0)
 Bore & Stroke In. (Cm.)..... 4 x 3.6 (10.2 x 9.1)
 Compression Ratio..... 9.3:1
 Main Bearings & Style..... 4, Babbitt
 Cylinder Head..... Hardened Cast Iron
 Pistons..... 4, 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)..... 1080 (329)
 Max Power, bhp (kwm) Prime/NG..... 40 (30)
 Ltd. Warranty Period..... 12 Months or 2000 hrs., first to occur

FUEL SYSTEM

Type..... NAT. GAS, Vapor Withdrawal
 Fuel Pressure (kpa), in. H₂O*..... (1.74) 7”
 Secondary Fuel Regulator..... NG 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

NAT. GAS: FT ³ /HR (M ³ /HR)	PRIME
100% LOAD	360 (10.2)
75% LOAD	292 (8.3)
50% LOAD	204 (5.7)
NG = 1000 BTU X FT³ = Total BTU/HR	

OIL SYSTEM

Type..... Full Pressure
 Oil Pan Capacity qt. (L)..... 4 (3.8)
 Oil Pan Cap. W/ filter qt. (L)..... 4.3 (4.1)
 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 PR-250-60 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) 18" (46)
 Ambient Capacity of Radiator °F (°C)..... 125 (51.6)
 Engine Jacket Coolant Capacity Gal (L)..... 1.8 (6.8)
 Radiator Coolant Capacity (including engine)Gal. (L)..5.0 (18.9)
 Maximum Restriction of Cooling Air Intake
 and discharge side of radiator in. H₂O (kpa)..... .5 (.125)
 Water Pump Capacity gpm (L/min)..... 18.2 (69)..... 15.5 (59)
 Heat Reject Coolant : Btu/min (kw) 1940 (34)
 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 (m³/min).....64 (1.8)
 Radiator Air Flow cfm (m³/min).....2500 (72)
 Heat Rejected to Ambient:
 Engine: kw (btu/min) 9 (520)
 Alternator: kw (btu/min)4.5 (250)

EXHAUST SYSTEM

Exhaust Outlet Size.....2"
 Max. Back Pressure in. hg (KPA)3.0 (10.2)
 Exhaust Flow, at rated kw: cfm (m³/min)250 (7.1)
 Exhaust Temp., at rated kw: °F (°C) 1056 (569)
 Engines are EPA certified for Natural Gas.

SOUND LEVELS MEASURED IN dB(A)

	Open Set	Level 2 Encl.
Level 2, Critical Silencer	68.....	62

Note: Open sets (no enclosure) has (3) optional silencer system choices due to unknown job-site applications. 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 2 Enclosure
Length in (cm).....	68 (173)	89 (225)
Width in (cm).....	36 (91)	36 (92)
Height in (cm).....	34 (86)	47 (119)
1 Ø Net Weight lbs (kg).....	1070 (485)	1490 (676)
1 Ø Ship Weight lbs (kg).....	1150 (522)	1630 (740)
3 Ø Net Weight lbs (kg).....	1057 (479)	1477 (670)
3 Ø Ship Weight lbs (kg).....	1137 (516)	1617 (734)

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 AND OPTIONAL FEATURES FOR MODEL PR-250-60 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
 - Residential 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 • flexible oil & radiator drain hose.

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:

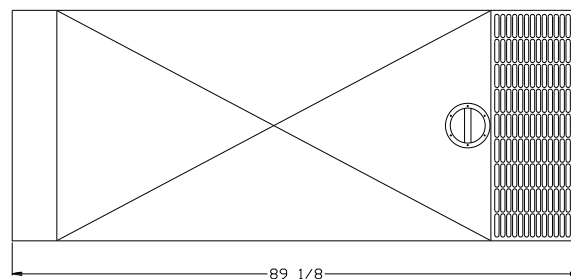
- Battery tray • Battery cables • Battery hold down straps
- 2-stage battery float charger with maintaining & recharging automatic charge stages

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 80°F on, 100°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, with short circuit protection.
- Exhaust Silencer Hospital Grade
- All brushed type 304 stainless steel weather and sound deadening housing for coastal areas.
- DSE WebNet Gateway expansion module will allow communications with a host server via Ethernet and the DSE cloud connection for mapping static locations, real time instrumentation, control event log tables, and automatic system alerts via email.
- Remote Annunciator for up to (8) reporting functions. An additional relay expansion module, plus a second Annunciator adds another (8) reporting functions.



ENGINE END

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

