

Hydrogen Fueled Power Plant

Secure Supplies

HYDROGEN
Electric Generator



engines
fueling healthy communities

**Hydrogen Fueled
Electric Generators & Water Pump Engines
24 hr Continuous Business and Community Operations.**



**HEALTHY COMMUNITY
FUELING
& POWER SECURITY**

- LESS HARMFUL EMISSIONS
- LESS FUELING COSTS
- LESS FUEL CONSUMPTION

SERVICE ADVANTAGES

- LESS OIL CHANGES
- NO SERVICING TO INJECTION VALVE SYSTEM FOR LIFE OF THE ENGINE

FUEL TYPES

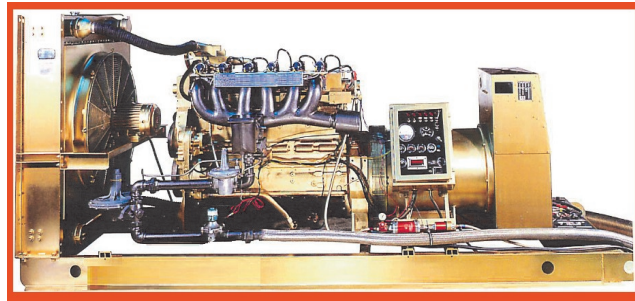
- HYDROGEN STANDARD
- LPG OPTION
- FLARE GAS OPTION
- METHANE OPTION
- BIO GAS OPTION
- CNG OPTION

LOW REACTANCE

A Advanced Low Reactance Hydrogen Generator Design, offers a low wave form distortion with non linear loads, and provides excellent motor starting capabilities in all conditions.

Hydrogen Fueled Power Plant

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Sound Proof Enclosure Optional
Containerized Enclosure Optional

Base Model

- Continuous Power Plant 150 KWE
- Standby Power Plant 150 KWE

Range

- 200KWE
- 250 KWE
- 500KWE
- 800 KWE
- 1 MW

There is No Better Prime Power Hydrogen Fueled Engine, Premium Industrial and Community Engineering with prime power load warranty for continuous operation..

Hydrogen Fuel Consumption Rate

6 Cylinder 14 ltr 150 kw
75X 0.3 Nm³/H=22.5CBM/H (Normal Meter Cubed per Hour)=22500L/H=375L/min
0.1-0.4Mpa .

All Hydrogen Based Gases are able to be tuned for on order Including PURE H₂ Hydrogen 80% H₂ Blends. Field Gas, Digester Gas, Sewerage Gas, Bio Gas LPG, CNG, Propane HD5, Gas will require a basic analysis of the specific gas if it is not pure h₂ Hydrogen so we tune for you prior to delivery.

Control Panel

Vibration isolated control with analog instrumentation for industrial continuous use.

Generator Performance

Voltage regulation under load from no load to 100% load will be with +0.5%.

Random Voltage Variation

Hydrogen Fueled Engine 2015
14 L Power Plant Generator Set

- 150 KW
KW KVA @ 0.8 P.F
Compression 60 HZ– 1800 RPM 50 HZ—
1500 RPM
- Ratio
11.88 to 1 Prime 150 (200) Prime 130 (185)
8.5 to 1 143 (190) 125 (150)

PRIME POWER PLANT

From Secure Supplies Fueled By Hydrogen Runs 24 hrs Continuous with Load Warranty. Applications: Hydrogen Gas Grids ,Community Power and Water, Farms, Mines, Maritime, Trains. Secure Supplies Primary Focus is Fixed engine applications.



Electric Generators, Water Pumps. 24 hr Continuous operation



TECHNICAL SUPPORT

Notes : 21 ° C (90°F) or lower water temperature to the after cooler or use of air to air after cooler of 130° F or lower temperature to the radiator.

ZERO DOWNTIME

Comprehensive Warranty

TURNKEY SOLUTIONS

For more information on any of our products or services please visit us on the Web at: www.yourwebsitehere.com

SERVICES AVAILABLE

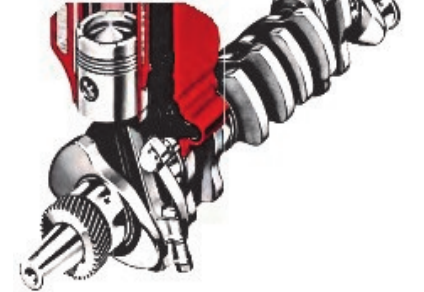
- Survey
- Design
- Supply & Technical Support
- Installation and Setup
- Maintenance
- Health Engine Checkups
- Application Support
- Hardware Support
- Guaranteed Warranty
- Community Powering
- Community Water Provision

Specification Features and Benefits

Engine Data Sheet

Type : Hydrogen Fueled 4 Cycle Line 6 Cylinder
 Aspiration : Cooled Turbo Charged
 Bore –in (mm) : 5.5 (140MM)
 Stroke –in (mm) : 6 (152MM)
 Displacement in inch³/ Liter 855 (14 Ltr)
 Compression Ratio 11:88:1
 Crank Shaft :Forged Steel Integral Counter weight type
 Connecting Rods Advanced 1 Beam Design Forged Steel
Lube Oil: 38 US Quarts (36 Liters)
Lube Oil Required : API CD 15W-40
Lube Oil Filter : Single full Flow / bypass
Maximum Lube Oil Consumption at full load
 0.25US Quarts / 240 ml per hour
Valves Per Cylinder H2 Over Head Cam
 Intake Advanced High Compression Hydrogen Valve 1
 Exhaust Advanced High Compression Hydrogen Valve 1
Engine Weight and Centre of Gravity (With Standard Kit)
 Reference Install Diagram : Available
 Dry Weight Lb (Kg) : 3150 (1429 kg)
 Wet Weight Lb (Kg) : 3234 (1467 kg)
 Maximum Amount of allowable Bending Movement at rear face of block :lb (n'm) : 1000 (1350 Nn'm)
Air Induction System
 High Altitude and Low Pressure H2 Gas Injection System
 Dry Element Air Cleaner
 Option for Nitrogen Membrane Filter
Cooling System
 High Ambient Cooling 100°F (38°C) Radiator
 Cast Iron Cylinder Block with replaceable wet liners.
 For Constant Loads from non load 100% will not exceed 0.5% of its mean Value.

Hydrogen Fueled



Electrical Systems

Battery Voltage 24 volt Battery Cable Size Minimum Cable Length not exceed 10 ft (3m)AWG 00 Wiring for Automatic Starting Negative Ground Cranks Amps 550Amp at ambient temperature 32 °F (0 °C) Alternator Standard 24 volt internally regulated, 40 Ampere Manually Operable Contactors-Standard Minimum Recommended Battery Capacity 0 °c –100 amp –32 °c 150amp Wiring Diagram Available.

Voltage Regulator : Electronic voltage regulator with 3 phase RMS Sensing.

Frequency Regulator -

Isochronous under varying loads from no load to 100% load with electric governor. Random Frequency Variation will not exceed 0.5% of its mean value of constant loads , from no load to full load with Isochronous governor.

Power Generation Alternator

Brushless AC Alternator Provides Broad range reconnect output design for service in severe environments. Also see page 2

Optional Equipment

- **Heat Exchanger** - Copper Nickel tube Bundle, for salt water or corrosive cooling water cooling system environments.
- **Oil Heater**- Mounted on Side of Unit
- **Sound Proof Case**
- **Shipping Container Case**- External Radiators
- **Water Jacket Heater**– Mounts under Oil Pan
- 115 Volt , 2550 Watt
- **Water Temperature Switch**– Provide Signal to Activate Alarm. Not included for High water Temperature remote monitoring.
- **Oil Temperature Switch**– Provide Signal to Activate Alarm. Not included for High OIL

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Exhaust

Exhaust Pipe Normally
Acceptable 5 inch 125 mm

ZERO DOWNTIME

Premier Machinery
Industry leader in High performance prime power units.

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For more information on any of our products or services please visit us on the Web at:
www.yourwebsitehere.com

SERVICES AVAILABLE

- Technical Support
- Installation and Setup
- Maintenance
- Application Support
- Hardware Support
- Guaranteed Warranty

Measured Performance for these New Hydrogen Fueled Engines

Engine Model	Size Inch3	Engine Speed RPM	No of Ganged Engines	Power Output	H2 Gaseous Fuel Scfpd	Energy Btu/Kw	Use % Improvement
150 kw	855	1,700	1	115	28,800	10,330	27.51%

Lower Heating Value Above was Tested from 990 Btu / Scf Blend

Gaseous Fuels @ 32 F and 1 atm	Btu/ft3 [2]	Btu/lb [3]	MJ/kg [4]
Natural gas	983	20,267	47.141
Hydrogen	290	51,682	120.21

Hydrogen Consumption Value 983 divided by 290 = 3.389 x More cuft required. Of h2
439 litre per minute= 23390 litre per hr

Hydrogen
15.23290 cu ft. per minute = 931.9743 (cubic ft) per hr = 439 litre per minute= 23390 litre per hr

At 1440 minutes per day (24 hrs) , fuel consumed over 24 hours is
22,367 standard cubic feet ("scf") to produce 2.4 mega watts.(in 1 day 24 hrs)
633,374 Liters (L) to produce 2.4 mega watts.(in 1 day 24 hrs)
Each Mega Watt uses 9319 scf of Hydrogen Gas.

Altitude can affect the result as it was done at sea level above so please use these numbers best and worst case consumptions. As we ship globally. All are based on fixed rpm fixed engines.

**6 Cylinder 14 ltr 150 kw 150 X 0.3 Nm³/H=45 CBM/H (Normal Meter Cubed per Hour)=45000L/
H=750L/min 0.1-0.4Mpa**

This Healthy Community Fueled Solution Means Emissions are Extremely Small.



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Special Applications for these New Hydrogen Fueled Engines

Alternator Temperature

Rise At Rated load is less than 105°C at Prime power rating and less than 125°C At Stand by Rating. Per NEMA, MGI-22.40, I EEE115 and AEC 34.1

Noise and Interference

These Engines are quiet 60 db and Also AC Harmonic distortion is less than 5% total load to full load. Less than 3% any single harmonic. Telephone influence factor, less than 50 per NEMA less than 3. Radio Interference, Alternator and regulator meet provisions of BS800 and VDE Class G and N.

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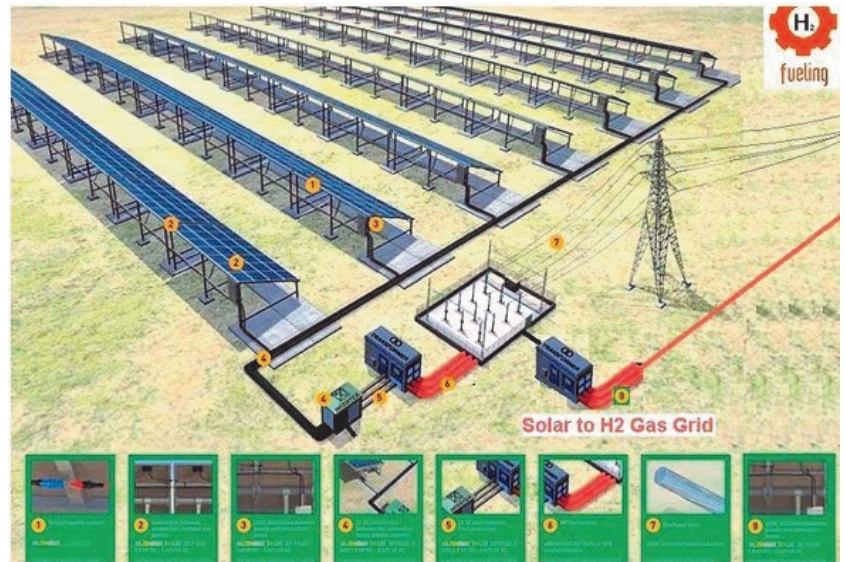
SERVICES AVAILABLE

- Technical Support
- Installation and Setup
- Maintenance
- Application Support
- Hardware Support

- Guaranteed Warranty
- 5 Years Standby power
- 2 years Prime Power

Value Add your
Geo Thermal
Hydro Dams,
wind and solar
Build distributed
hydrogen Gas
Grid Power
systems and
Industrial water
pumps.

Solar / Power to Gas Pipeline Gas Grids



Community Power Hub Fueled By Hydrogen Grids to the engines also works



Secure Supplies Fueling Healthy Communities



Porting Ships
No Longer have to Continuously Operate when in port
Emission Levels Emission Levels can now be cut back
They Can Turn off Engines
and Connect to the Renewable Port Power
From Solar , Solar to Hydrogen Gas Grids
Fueling Fuel Cells 1 mw
Hydrogen Fuel Power Plants
www.securesupplies.biz
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Secure Supplies Fueling Healthy Ports MARSOL STANDARDS

Hydrogen Fueling Ports low emissions
Hydrogen Fueling Ports low emissions,
turn off idling ships, fuel engines and power plants, fuel fuel cells



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