Hydrogen Fueled

Electric Generators & Water Pump Engines

24 hr Continuous Business and Community Operations.

www.securesupplies.biz
Hydrogen Fueled Power Plant

Secure Supplies Fueling Healthy Communities

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.

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.

Electric Generators, Water Pumps. 24 hr Continuous operation
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: 0.25 US 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.

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

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 ºF (0 ºC) Alternator Standard 24 volt internally regulated, 40 Ampere Manually Operable Contactors- Standard Minimum Recommended Battery Capacity 0 ºc = 100 amp – 32 ºc 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
Measured Performance for these New Hydrogen Fueled Engines

<table>
<thead>
<tr>
<th>Engine Model</th>
<th>Size Inch³</th>
<th>Engine Speed RPM</th>
<th>No of Ganged Engines</th>
<th>Power Output</th>
<th>H₂ Gaseous Fuel Scf/Min</th>
<th>Energy Btu/Kw</th>
<th>Use % Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 kw</td>
<td>855</td>
<td>1,700</td>
<td>1</td>
<td>115</td>
<td>28,800</td>
<td>10,330</td>
<td>27.51%</td>
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Lower Heating Value Above was Tested from 990 Btu / Scf Blend

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<tbody>
<tr>
<td>Natural gas</td>
<td>983</td>
<td>20,267</td>
<td>47.141</td>
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<tr>
<td>Hydrogen</td>
<td>290</td>
<td>51,682</td>
<td>120.21</td>
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</tbody>
</table>

Hydrogen Consumption Value: 983 Btu/ft³ 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
H=750L/min 0.1-0.4Mpa

This Healthy Community Fueled Solution Means Emissions are Extremely Small.
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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Value Add your Geo Thermal Hydro Dams, wind and solar Build distributed hydrogen Gas Grid Power systems and Industrial water pumps.

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