NEW PRODUCT ANNOUNCEMENT:

Nanoptek SHG50 Off-Grid Solar Hydrogen Generator™

Carbon-free production of hydrogen anywhere *with just sunlight and water.*

Nanoptek's SHG50 is a portable stand-alone hydrogen generator that uses Nanoptek's patented technology, at the heart of which is our unique photocatalyst, to produce hydrogen at up to 50 standard cubic centimeters per minute (SCCM), consuming only water and sunlight.

And when the sun is not shining, the SHG50 can continue to produce hydrogen with the integral MMO (mixed metal oxide) anode and DC power from an external supply (such as a car lighter socket), for 24/7 operation.

With its enhanced sensitivity to the UV and blue parts of the solar spectrum, the SHG50 absorbs more of the diffuse light that concentrating systems miss. And because these wavelengths penetrate most kinds of cloud cover better than longer wavelengths, the SHG50 can run at up to 1/3 or more of its peak capacity even on overcast days.

Just set it up facing south, switch it on, and H_2 and O_2 are immediately produced, reaching the peak rate for the given conditions within minutes.

Key Advantages:

- Produces zero carbon in solar mode
- No operating costs in solar mode
- True stand-alone operation
- Up to 33% peak capacity on cloudy days
- Integral PV supplies 1VDC bias for photolysis and 2.5 VDC for efficient solar-heated alkaline electrolysis
- Analogue (for virtually no parasitic loss): voltmeter, photocurrent meter, and auto-plumb flow-meters
- Easy transport: folds flat, integral handle
- On-board H_2 storage (20 l @ 1 bar) for 6.7 hours of production (expandable)
- Rapid start-up: H_2 evolves instantly, reaches steady flow in about 10 minutes

MADE IN THE USA.

Performance 820 W/m^2 direct solar (Thorlabs S302C)	KWh_{in} Required per kg of H_2	Electrolysis Efficiency $\frac{39.4KWh/Kg_{H2}}{KWh_{in}/Kg_{H2}}$	DC Volts In	Peak H_2 Vol. Flowrate	Peak H_2 Mass Flowrate	Peak H_2O Req.	H_2 Purity Optional filtration from other sources for higher purity
TiO_2 +MMO	38.3	103%	1.0 / 2.3	0.1 SCFH 50 sccm 3 l/h	0.01 oz./h 0.27 g/h	0.08 oz./h 2.4 ml/h	Raw: 99.95% (Impurities: H_2O, O_2.)
MMO Only	67.9	58%	2.6				

Physical	Weight (empty)	Weight (filled)	Weight/area (filled)	Height	Width	Thickness (folded)	Electrolyte volume	Collecting area
English	43 lbs	56 lbs	9.3 lbs/ft^2	24 in.	36 in.	4 in	1.6 gal.	5.4 ft^2
Metric	19.g kgs	25.4 kgs	42.3kgs/m^2	61 cm	91 cm	10 cm	6 liters	0.5 m^2

Safety and environmental features:

- Dual seal: EPDM gasket and RTV with 316 stainless steel screws to frame
- Dual seal electrode pass-throughs
- Potassium carbonate (potash) electrolyte at pH 11.6 is safer than KOH
- Auto-shutoff connections for leak-proof disconnect
- Shut-off switches
- Low-pressure, low temperature operation
- Non-asbestos gas separation barrier
- Materials are minimal and recyclable

Additional features:

- Integral folding stand for correct angle
- Virtually silent operation
- Operates to -7°C
- Thermal signature less than 35°C above ambient
- No exhaust plume
- Onboard H_2O supply for 1 month continuous operation, equivalent to two 33 lb (15 kg) "BL" cylinders of H_2 at 2000 psi (138 bar)
- Ultra-low light loss rugged S-UVT acrylic™ window
- 316 stainless steel cathode
- MMO (Mixed Metal Oxide) aux. anode
- Nanoptek patented shifted-bandgap UV-Blue titania (TiO_2) photoanode
- Rugged polycarbonate body
- Anodized 6063-T5 Al frame, acrylic overcoated
- Efficient use of diffuse sunlight, no parasitic loss from tracking motor drive

Applications • Supply H_2 for in-field gas chromatography (GC) without carrying cylinders — enough H_2 for one FID (flame ionization detector) • Power a fuel cell during sunless hours with stored H_2 (4W in continuous mode or larger capacity for shorter times) • Education: demonstrate and compare photolysis and electrolysis • Evaluate large site installations

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MADE IN THE USA.