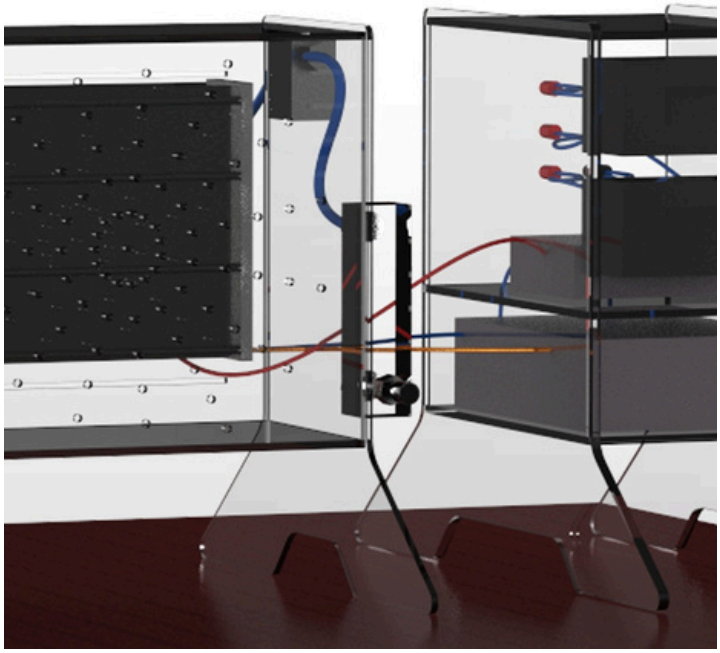


HYDROGENERGY


ALKALINE ELECTROLYZER
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Green Hydrogen Generation & Storage System

The Green Hydrogen Generation & Storage System is a complete, hands-on platform for understanding and experimenting with the production, storage, and utilization of hydrogen as a clean energy carrier. Designed for research and academic training, it integrates hydrogen generation via electrolysis, safe high-pressure storage, and power generation through fuel cells — enabling end-to-end study of the hydrogen value chain.

Key Features

1. Hydrogen Generation – Electrolyzer

Water Electrolysis Technology – Produces pure hydrogen using renewable-powered electrolysis for zero-carbon emissions.
PEM or Alkaline Electrolyzer Options – Supports modern Proton Exchange Membrane (PEM) technology for high efficiency and fast response, or alkaline electrolyzers for cost-effective training.
Real-time Monitoring – Displays voltage, current, temperature, and gas production rates.
Safety Features – Integrated pressure relief valves, flashback arrestors, and leak detection systems.

2. Hydrogen Storage – Type 1 Cylinder

High-Pressure Storage – Cylinders designed to store hydrogen safely at rated pressures (commonly 150–200 bar).
Type 1 Construction – All-metal (steel or aluminum) body offering durability and long service life.
Certified & Compliant – Meets international hydrogen storage standards for safety and performance.
Easy Integration – Secure mounting and quick-connect fittings for laboratory or pilot-scale setups.

3. Hydrogen Utilization – Fuel Cell

Proton Exchange Membrane Fuel Cell (PEMFC) – Converts stored hydrogen into clean electricity with only water as the by-product.
Load Integration – Supports powering small DC loads or interfacing with inverters for AC output.
Performance Measurement – Enables characterization of efficiency, voltage-current curves, and power output under different loads.

Green Hydrogen Generation and Storage System

Technical Specifications:

1. Energy Source

Parameter	Specifications
Solar PV Array	Grid Connected Solar PV Array-3kW Solar Panel-3kWp Grid Tied Inverter-3kW

2. Water Distiller

Parameter	Specifications
Input Water	Tap or Rain Water
Output Water	<20 µS/cm (at 25 degree Celsius)
Power Consumption	100 W
Standard Power Supply	AC Supply 200-240 V, 50 Hz
Clean Water Production Rate	Up to 1L per hour
Filtering System	Distillation

3. Water Tank

Parameter	Specifications
Capacity	25L

4. PEM Electrolyzer

Parameter	Specifications
Hydrogen Output Volume	0-3000 ml/min
Hydrogen Output Pressure	0.4 MPa
Hydrogen Purity	>99.99%
Overpressure Protection	0.46 MPa
Input Supply	220V, 50 Hz Supply
Water Purity	<1µS/cm
Power Consumption	<1500 W
Weight	<50kg.

5. AEM Electrolyzer

Parameter	Specifications
Hydrogen Production Rate	500 NL/hr

Hydrogen Output Purity	35bar, 99.9% pure
Output Pressure	Up to 35 bar
Power Consumption	2400 W
Power Supply	AC 220V, 50 Hz
IP Rating	IP 20
Control and Monitoring	Fully Automatic
Water input conductivity	<20 µS/cm (at 25 degree Celsius)
Weight	55 kg.

6. Alkaline electrolyzer

Parameter	Specifications
Hydrogen output Volume	0-3000 ml/min
Hydrogen output pressure	0.4 MPa
Hydrogen Purity	>99.99%
Overpressure Protection	0.5MPa
Input Supply	220V, 50 Hz supply
Water Purity	<4µS/cm
Power Consumption	<2200 W
Alkaline Medium	18% KOH
Lye Tank Capacity	15L

7. PEM Fuel Cell

Parameter	Specifications
No. of Cells	48
Rated Power	1000 W
Performance	28.8V @ 35A
H2 Supply Valve Voltage	12V
Purging Valve Voltage	12V
Blower Voltage	12V
Reactants	Hydrogen and Air
External Temperature	5 to 30 deg. C
Max. Stack Temperature	65 deg. C
H2 Pressure	0.45-0.55 bar
Hydrogen Purity	>99.995% dry H2
Humidification	Self- humidified
Cooling	Air
Flow Rate at max output	13L/min
Startup time	<30 s at ambient temperature
Efficiency of Stack	40% @ 28.8V
Low Voltage Shut down	12V
Over current shut down	42 A
Over Temperature shut down	65 deg. C
External Power Supply	13V, 8A

8. PEM Fuel Cell Control Unit

Parameter	Specifications
Charge Controller	1kW PWM Charge Controller
Battery	24V, 42 Ah
Inverter	1300 VA
Rotameter	0-15LPM
Pressure Guage	0-10 bar

9. Manifold

Parameter	Specifications
Dual Pressure Gauge	Cylinder Tank Pressure: 0-50 bar Fuel Cell Pressure: 0-10 bar

10. Hydrogen Storage

Parameter	Specifications
Hydrogen Dryer	Desiccant based dryer
Hydrogen Cylinder	47 L water capacity

11. Pump

Parameter	Specifications
Type	Peristaltic Pump

12. Accessories

Parameter	Specifications
User Manual Hydrogen Leak Detector	