DBA EDGE
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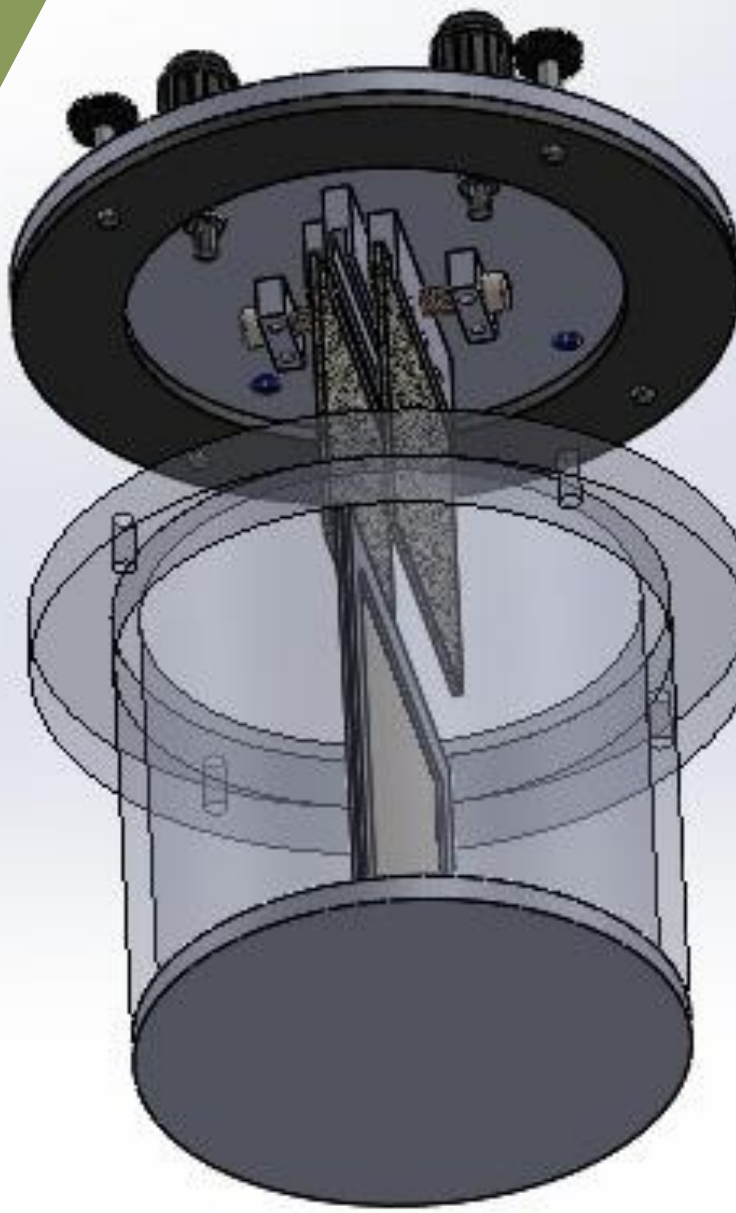

HydroCell

Alkaline Water Electrolyzer

Low-Cost Hydrogen Electrolyzer for Labs

Introducing HydroCell

Clean Hydrogen, Engineered Compact

Welcome to the HydroCell Project — a compact, transparent, and modular hydrogen generation system designed specifically for the needs of modern laboratories, educational institutions, and forward-thinking research innovators. As the world transitions toward cleaner energy solutions, HydroCell provides a tangible, hands-on platform to explore the science and engineering behind hydrogen production.

Developed using precision-engineered components and a robust electrochemical architecture, HydroCell ensures safe, consistent, and visible hydrogen/oxygen generation using alkaline electrolysis. Its transparent casing allows real-time observation of gas evolution, making it not only a powerful functional tool but also an exceptional teaching and demonstration aid.

With integrated control features, including digital voltage and current monitoring and adjustable power tuning, users can explore how variables like electrode configuration, membrane separation, and current density affect gas output and efficiency. The modular and scalable design makes it ideal for structured experimentation, rapid prototyping, and pilot-scale innovation in green energy systems.

Whether you're an educator showcasing sustainable energy, a researcher experimenting with gas flow rates, or an innovator exploring fuel cell technologies — HydroCell delivers clean hydrogen, when and where you need it.

Designed for

- Performance
- Portability
- Visibility

Ideal for

- Educational outreach
- Technical demonstrations
- MSMEs and Clean-tech Pilots

Key Features

- ### Transparent Acrylic based Cell

  Visualize gas formation and reaction zones in real time.

- ### Nickel-Based Mesh Electrodes

  Efficient and durable electrochemical performance.

- ### KOH Electrolyte Compatible

  High ionic conductivity, safe for controlled use.

- ### Adjustable Power Control

  Integrated display with knobs for voltage & current tuning.

- ### Separate Control Enclosure

  Power supply for power unit and digital indicators.

- ### Optional Gas Separation (perforated acrylic separator)

  For demonstration of separation of gas output.

- ### Gas Bubbling bottle

  Separate gas bubbling bottle is provided to visualize gas formation in real-time.

What's Included

- 1× HydroCell unit (assembled)
- 1× Power/control module
- 1× Instruction & safety manual
- 1× Pair of Ni Mesh electrodes
- 1× Power cable, along with banana connector cables
- 1x extra rubber gasket, two thumb screws and washers.

HydroCell In Action

- Voltage vs. hydrogen output rate graphs
- Performance testing across electrolyte concentrations and electrode types
- Demonstrations of diaphragm separation and safety valves

Why HydroCell Matters

Hydrogen is a cornerstone of clean energy strategies worldwide. The global electrolyzer capacity has surged to over 1.4 GW by end-2023, with many megawatt-scale projects underway in Europe, North America, and India. However, most systems remain in early stages due to high capital costs and infrastructure gaps.

In this evolving ecosystem, HydroCell fills a crucial gap: a compact, lab-grade alkaline electrolyzer that accelerates education, prototyping, and research in hydrogen generation—right from the bench.

HydroCell Advantages

1. ## Compact & portable module

   Ideal for universities, labs, and training facilities

2. ## Integrated control unit

   Smooth experimentation without needing separate power supply units

3. ## Separate power/control housing

   Enhances safety and modular maintenance in teaching environments

4. ## Optional membrane interface (demonstration)

   Shows H_2/O_2 separate chambers—useful for analytical and demo setups

5. ## Batch production potential

   Supports customization and startups in early hydrogen tech ecosystems

Applications

- Academic and research demonstrations
- Renewable energy labs and workshops
- Fuel cell prototyping and H_2/O_2 studies
- Science exhibitions and clean energy education
- Controlled electrolysis experiments

Technical Specifications

Cell Volume	~400 mL
Electrode Type	Nickel mesh (1 pair)
Electrolyte	25% KOH aqueous solution
Operating Voltage	2V–10V DC (adjustable)
Hydrogen Output	~55–60 mL/min (~5A)
Control Interface	Voltage & current display, tuning knobs
Power Source	220 V AC
Casing Material	Acrylic based

Notes

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