Advanced Electrolyzer Technologies for Green Hydrogen

CSIR-CECRI is at the forefront of India's energy transition, supporting the National Green Hydrogen Mission (NGHM) through indigenous electrolyzer technologies, components, and comprehensive systems engineering. Our core platforms span PEM, Alkaline, AEM, and Seawater technologies.

Core Value Proposition

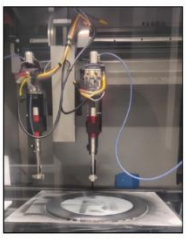
- **Performance & Reliability:** Designed for durable and long operational life.
- **Renewable-Ready:** Operation compatible with intermittent solar and wind energies.
- **Efficiency:** Engineered for low energy consumption.

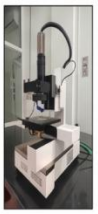
PEM Water Electrolyzer

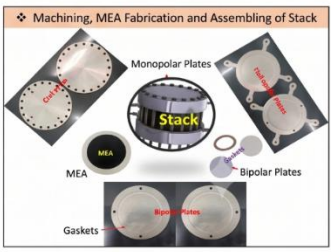
High-efficiency zero-gap PEM electrolyzer technology featuring a compact electrolyzer stack with in-house Membrane Electrode Assembly (MEA) fabrication capability.

- **Key Attributes:** Fast dynamic response, High current-density operation, Zero-gap stack architecture, Modular stack design for industrial scalability.
- **H_2 Output:** 5.0 Nm^3/h
- **O_2 Output:** 2.5 Nm^3/h
- **H_2 Purity:** 99.99%
- **Energy Consumption:** 4.8 - 5.0 kWh/Nm^3

PEM based hydrogen generation







Parameter	CSIR CECRI	10 N Plug Merrimack	C10 Nel
Capacity			
Hydrogen Gas			
Production Rate (Max.)	5 Nm^3/h (0.45 kg/h)	10 Nm^3/h	10 Nm^3/h
Purity	99.0 - 99.999 %	99.999% dry basis	99.999%
Operation temperature	60-70 °C	5-70 °C	5-65 °C
Current Density	0.8 to 1.2 A/cm^2	NA	NA
Stack Current	400 – 600 A	90 – 900 A DC	410 A
Stack voltage	42.5 – 46.0 V	57.7 V	140 V
Hydrogen outlet Pressure	1 bar	1- 40 barg	30 barg
Average Energy consumption (at stack level)	55-56 kWh/kg	NA	69.9 kWh/kg (at system level)
Stack efficiency(at stack level)	74-80%	73.7% - 87.6%	NA