NOVA Module

Hydrogren Production System

Quantum Pulsed Eletrolysis Techology | Modular Architecture | Utility Scale Capable

NOVA™ OVERVIEW



The NAER H2 NOVA™ Module is the next-generation hydrogen production platform using Quantum Pulsed Electrolysis (QPE), a fundamentally different approach to green H_2 generation. By deploying dual plasma envelopes submerged in a low-concentration KOH electrolyte, NOVA™ achieves energy efficiencies that were impossible under conventional Faradaic electrolysis constraints.

Unlike alkaline, PEM, or SOEC electrolyzers requiring 50–55 kWh per kilogram, NOVA™ produces green hydrogen at a fraction of the energy input enabling cost-competitive, large-scale production from significantly smaller renewable energy infrastructure.

- Modular container-based architecture — rapidly deployable
- Fully integrated water treatment and desalination
- Scalable from 50 kg/hr
- Turnkey EPC delivery: engineering through commissioning
- O&M structure with performance milestones

2.0	~6	15x	99.99%
kWh / kg H2	kWh / kg H2	More Efficient	Membrane/PSA
Module Performance	*Integrated System*	*Vs. Conventional Electrolysis*	*Hydrogen Output Purity*

PERFORMANCE COMPARISON: NOVA™ vs. CONVENTIONAL ELECTROLYSIS

Metric	Conventional (PEM/AEL/SOEC)	NOVA™ System
Core energy input / kg H_2	50–55 kWh	**2.0 kWh**
Integrated system power / kg H_2	55–60 kWh	**~6.0 kWh**
Market efficiency	Baseline	**15× more efficient**
Hydrogen purity	99.5 – 99.9%	**99.99% (Membrane/PSA)**
Operating pressure	Up to 30+ bar	**11" Hg vacuum**
Raw electricity cost / kg*	$4.50	**$0.12 – $0.36**
Water source	Pre-treated DI water req.	**Seawater → demineralized**
Scalable	Yes	**Yes**
Deployment model	Custom construction	**Containerized modules**

** Based on $0.09/kWh U.S. industrial electricity rate.*

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NAER H2



TECHNICAL SPECIFICATIONS

Module output	50 kg/hr
Power consumption	100 kWh
Power per kg	2 kWh
Primary voltage	480 VAC 60Hz / 400 VAC 50Hz
Module dims (OD)	40'L × 8'W × 9.5'H
Module material	Epoxy painted steel
Dry weight	12,000 kg
Water usage	150 gph (demineralized)
Max gas flow	375 CFM
H_2 purity (output)	99.99% (Membrane / PSA)
Stacking capability	2-high (with walkways & access)

LARGE SCALE DESIGN, ENGINEERING & INTEGRATION CAPABILITIES

Engineering

- Full feed & detailed engineering
- Electrical, civil & structural design
- P&ID and process simulation
- 3D plant modeling & BIM integration
- Hazardous area classification (ATEX/NEC)
- Grid-tie and off-grid PV interface design

Procurement & Construction

- Global equipment procurement & QA/QC
- Factory acceptance testing
- Module fabrication & containerization
- Site preparation & civil works
- Mechanical, piping & electrical installation
- Coastal / remote site experience

System Integration & O&M

- Commissioning, startup & performance testing
- SCADA / DCS integration
- Ammonia synthesis & downstream process tie-in
- Seawater desalination system interface
- O&M with KPI-based reporting
- Technology licensing for OEM scale-up

ABOUT

NAER H2 INC.

NAER H2 is a U.S.-based clean energy company headquartered in Southern California, dedicated to commercializing the NOVA™ Quantum Pulsed Electrolysis hydrogen production technology. NAER H2 delivers full turnkey engineering, procurement, construction, and commissioning of hydrogen production facilities from single production units to utility-scale multi-module installations.

NAER H2 has conducted rigorous independent performance testing under its formal System Test Protocol, validating efficiencies that are transformative relative to the industry standard. The company's modular design philosophy enables rapid deployment globally including remote, coastal, and off-grid environments with integrated seawater desalination, gas purification, and downstream process coupling.

NAER H2's mission is to make green hydrogen the lowest-cost, most scalable energy carrier on the planet without subsidies and without compromise.

NAER H2 INC.

256 Witherspoon Way
Suite I
El Cajon, CA 92020
United States

www.naer-inc.com

sales@naer-inc.com

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