

Engines redefined

Nuvera® E-Series Fuel Cell Engines

The modern answer to an emissions-free future.



We're at a pivotal moment in the transportation industry.

To expand market share and meet expanding regulatory requirements, vehicle OEMs must offer customers exceptional zero-emission options.

The next generation of medium- and heavy-duty vehicles must perform as well as – or better than – today's best platforms do. And they must be as practical to own and operate as vehicles powered by diesel engines.

Hydrogen fuel cells are the only answer to meet the power, range, and functional requirements that commercial fleet operators require and expect.

That's why the time to move forward with fuel cells is **NOW**.

Nuvera's line of high-performance E-Series power systems simplifies the integration of fuel cells into electric vehicle powertrains.

With controls and interfaces that replicate the design and use of internal combustion engines, **Nuvera® E-Series Fuel Cell Engines** enable the electrification of material handling equipment, buses, trucks, marine vessels, and other medium- and heavy-duty platforms.

As important as technology and performance, Nuvera's fuel cell engines are backed by unparalleled integration support worldwide, both remote and on-site.

Nuvera is defining the next generation of advanced motive power solutions.

Learn more about the most modern engine available at www.nuvera.com

NUVERA®

Nuvera Fuel Cells, LLC

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EU Sales, Engineering, and Service: +49 173 745 8581

- Compact Compressor**
Fully integrated
- Water-Balanced Stack Control**
Optimized engine performance and protection
- Open Flow Field Stack Architecture**
High efficiency and power density
- Uncoated Metal Plates**
Superior resistance to shock and vibration
- 100% Passive Hydrogen Recirculation**



NUVERA® E-Series Fuel Cell Engines For Medium/Heavy-Duty Vehicles

Nuvera® E-60 Fuel Cell Engine



Nuvera® E-Series Fuel Cell Engines Include:

- Fuel cell stack
- Hydrogen management
- Process manifold
- Sensors
- Air compressor
- Cooling pump
- Hydrogen valve
- ECU with patented control algorithms
- Cell voltage monitor

A functioning fuel cell stack is just the beginning.

Advanced controls for Nuvera Fuel Cell Engines enable simpler, faster vehicle integration.

Nuvera's fuel cell Engine Control Unit (ECU) has evolved over decades to ensure that the stack is maintained at conditions needed for long life and optimal performance.

The fuel cell engine communicates with the vehicle control unit using standard CAN 2.0B protocol.

Nuvera's ECU allows integrators to get fuel cell vehicles on the road faster.

	Parameter	Specifications	
Nuvera® Fuel Cell Engine		E-45-HD	E-60-HD
Performance (Beginning of Life)	Gross output power*	53 kW	67 kW
	Net output power*	45 kW	59 kW **
	Operating voltage	170–290 VDC	175–290 VDC
	Maximum operating current	312.5 A	375 A
	Peak efficiency	58%	
Physical	Dimensions (L x W x H)	1000 x 600 x 500 mm	
	Mass	187 kg	190 kg
Operation	Ambient operating temperature	-30°C to 45°C	
	Coolant	De-ionized water or glycol mix	
	Oxidant	Air	
	Fuel quality	SAE J2719 ISO 14687-2	
	Air supply pressure	0.70–1.05 bara	
	Fuel supply pressure	12.5–15.0 bara	
	Input power for balance-of-plant	1.2 kW at 27 VDC 8.0 kW at 375 VDC	1.2 kW at 27 VDC 8.25 kW at 375 VDC

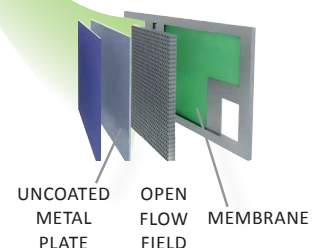
Notes

- * ±5% tolerance on power measurements
- ** 58 kW net system power rating by Shanghai Motor Vehicle Inspection Center, inclusive of test equipment power conversions

At the core: Nuvera's Unique Fuel Cell Stack Architecture



Individual cell assembly from fuel cell stack shown in exploded view



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