

POWEREDGE™

C Series for Counterbalance Trucks



Nuvera Fuel Cells has developed a motive power product called PowerEdge™ that replaces standard lead acid batteries for lift trucks, based on our field-proven PowerFlow fuel cell system.

PowerEdge can be quickly refueled by PowerTap™, Nuvera's complete hydrogen generation and fast-fueling solution that is designed to provide the lowest cost of fuel possible.

PowerEdge is a hybrid fuel cell/battery pack consisting of a fuel cell power system, sealed, maintenance-free batteries, a compressed hydrogen storage system, all needed counterweight, and a computerized control system with operator interface. Unlike conventional batteries, PowerEdge stays in the truck and is quickly refueled, allowing operators to get back to the floor in less than 2 minutes. PowerEdge is a smart system, and comes equipped with remote monitoring capabilities to better manage your fleet.

Product Features

Increase Productivity Fuel cells offer constant voltage over an entire shift.

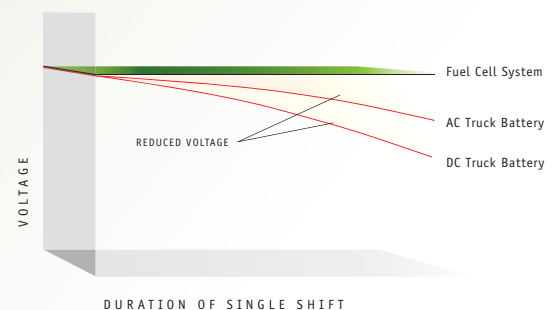
Eliminate Battery Changing Quick refueling gets operators back on the floor, increasing truck uptime.

Lower Carbon Footprint According to Argonne National Laboratory, CO² emissions from fuel cell lift trucks are on average 33% lower than standard batteries recharged with electricity.

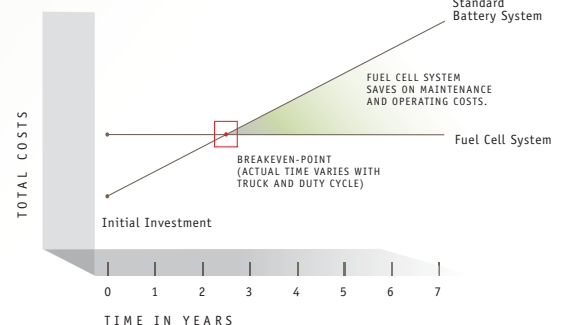
Increased Safety Eliminate acid handling and risky battery changing.

Lower Lifecycle Costs Lower operating and maintenance expenses provide a quick return on investment.

VOLTAGE COMPARISON



LIFE-CYCLE COST COMPARISON



POWEREDGE™

Applications and Specifications

Remote Wireless Monitoring

Streamline operations with fleet optimization, preventative maintenance and remote diagnosis.



Water Neutral

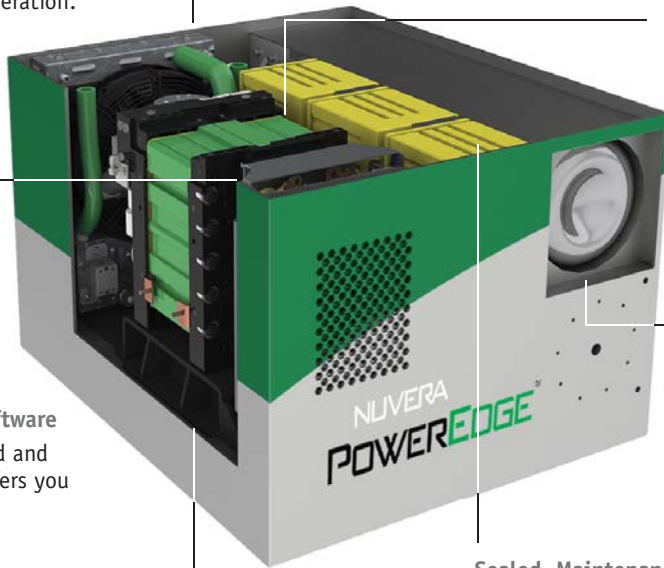
No need to add or remove water during regular operation.

Field Tested Hardware and Software

Extensively tested and proven design offers you peace of mind.

Counterbalance

Lead counterweight. Meets minimum weight requirements in most truck models.



Rugged Metallic Stack Architecture

For industrial duty. Resistant to vibration and shocks up to 20 G's.

Remanufacturable stack maximizes your investment.

Low pressure system for optimum efficiency.

Steel Hydrogen Tanks

Offers quickest refueling option.**

** when used with PowerTap™

Sealed, Maintenance-Free AGM Batteries

Extended high-power performance, full regen capacity and out-of-fuel return to base capability.



What About Hydrogen?

Nuvera has also created the PowerTap Hydrogen Generator and Hydrogen Station, which allow for quick and easy indoor or outdoor refueling. The Total Power Solution, featuring PowerEdge along with the PowerTap Hydrogen Generator and Hydrogen Station, is the first set of hydrogen products designed for material handling. With only one vendor for both power systems and hydrogen infrastructure, TPS offers ease of installation and service.

Product Specifications

	CS25	CM25	CM32
Rated Power (30 sec)	25 kW	25 kW	31 kW
Voltage	36 VDC	36VDC	48 VDC
Operating Current Range ¹	-50A to 1150A	-400A to 1150A	-280A to 1150A
Energy Storage Capacity ²	19.1 kWh	35.7 kWh	36.5 kWh
Size - in. (mm)	35.0 in. x 26.3 in. x 23.7 in. (889 mm x 667 mm x 602 mm)	38.2 in. x 32.7 in. x 23 in. (970 mm x 831 mm x 584 mm)	
Target Weight - lbs (kg)	1850 lbs (839 kg)	3100 lbs (1406 kg)	
Refueling Time	60 sec	120 sec	
Hydrogen Storage ³	0.5 kg	1.0 kg	
Hydrogen Pressure	5075 psig (350 bar)		
Hydrogen Port	SAE J-2600 H35, CE 0036		
Operating Temperature ⁴	25°F to 95°F (-4°C to 35°C)		
Environment	Indoor Use Only		
Emissions	Water Vapor		

¹ Actual lower limit is dependent on truck upper voltage threshold (value shown based on 44V)

² Based on LHV of H₂ at 5075 psi (350 bar), 15°C and 1 hr battery discharge rate

³ At 5075 psig (350 bar), 15°C

⁴ System must be stored and started above freezing conditions (4°C, 39°F minimum)



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