



Air • Gas • Liquid Oil-Free Diaphragm Pumps for Fuel Cells

Fuel Cell Types: PEMFC, HTPEMFC, DMFC, SOFC, PAFC, AFC, MCFC

Markets Served:

- Automotive
- Auxiliary Power Units (APU)
- Buses
- Consumer Electronics
- Educational
- Electrolyzers
- Hydrogen Generators
- Heavy Duty Vehicles
- Light Duty Vehicles
- Material Handling Vehicles
- Micro CHP (mCHP)
- Power to Gas
- Primary Power
- Reformers
- Scooters
- Test Stands
- Underwater Vehicles
- Unmanned Aviation Vehicles (UAV)
- Uninterruptable Power Supplies (UPS)



Pumps for Fuel Cells

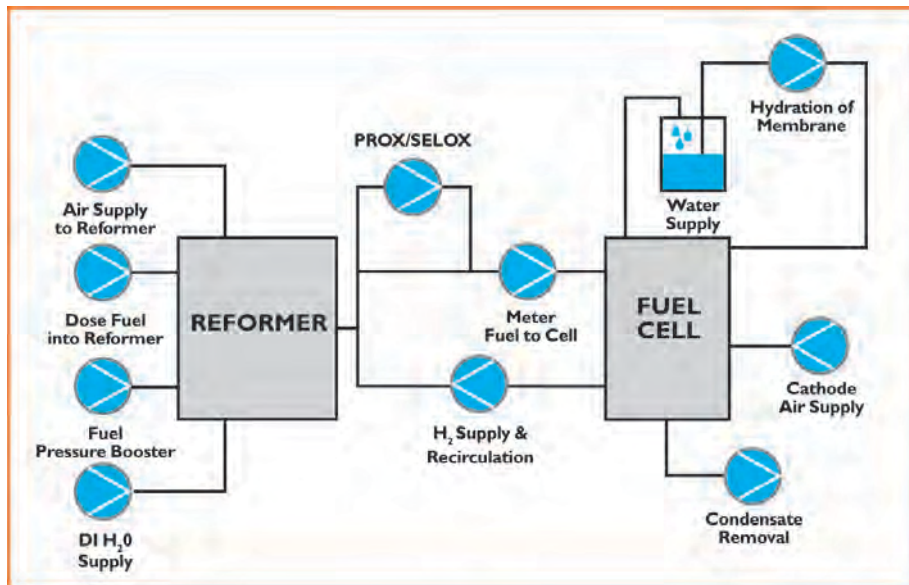
The clean, oil-free pump for developing technologies

Diaphragm pumps are ideal for fuel cells because they are 100% oil-free. Unlike other pumps, they do not contaminate the media. KNF pumps are specifically designed to pump either liquids or air and gases. We offer a variety of wetted materials, motor types, and performance ranges. Our pumps are ideal for fuel cell systems because of the following qualities:

- **Energy Efficiency** – We understand that pumps are power parasitic to fuel cells. Our designs operate with minimum power requirements, and many feature adjustable speed.
- **Smallest Size** – We make some of the smallest liquid and gas pumps in the world for metering, dosing, or high-speed pumping.
- **Quiet** – Because pumps are typically the most significant generators of noise in a fuel cell system, we focus our efforts to minimize the noise signature.
- **High Reliability** – The lifetime of any diaphragm pump was once considerably longer than a fuel cell could last. The newer cells and systems, however, are being designed for much longer service lives. Tell us what lifetime specification you need.
- **RunWet or Dry** – Our gas-handling pumps handle slugs of liquid, and our liquid pumps operate dry continuously. They do, however, operate most efficiently while pumping their intended media.
- **KNF Experience** – We will meet or exceed your challenges with our 50+ years of designing high-quality, rugged pumps.
- **Motor Selection** – We offer a variety of high-quality motors to fit your needs. Everything from economical carbon-brush types and ironless core versions with precious metal brushes, to the highest-quality, longest-life, brushless DC motors featuring available logic speed controls.

- high efficiency, low power consumption
- tolerates wet vapors without damage
- premium, corrosion-resistant wetted parts
- clean, oil-free, compact performance
- reliable, maintenance-free design
- liquid models available to 235 psig continuous or higher
- **We Start with Your Specs** – KNF’s modular design concept and corporate philosophy of “optimize...not compromise” has enabled us to efficiently design over 30,000 unique pumping solutions for our customers.
- **CE and DVGW Approved** – All KNF pumps are CE marked. In addition, we have DVGW approval for our secondary safety diaphragm (.12) design, frequently used to boost the pressure of methane, propane, or natural gas going into a reformer and to recirculate hydrogen or other gas through the cell.
- **Worldwide Support** – 14 KNF subsidiaries around the globe assure you that we can fully support system manufacturers and your customers.
- **High Pressure Liquids** – Our liquid line of pumps is available with three pressure ranges: 14 psig continuous, 80 psig continuous, and 235 psig continuous – making them ideal for use in dosing, injecting, and reforming applications.

Applications for KNF Pumps in Fuel Cell Systems



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