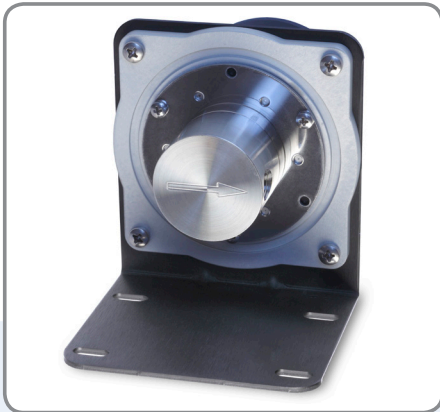


# Enabling Technology for Fuel Cell Applications

Micropump gear pumps provide enabling technology for new fuel cell designs while:

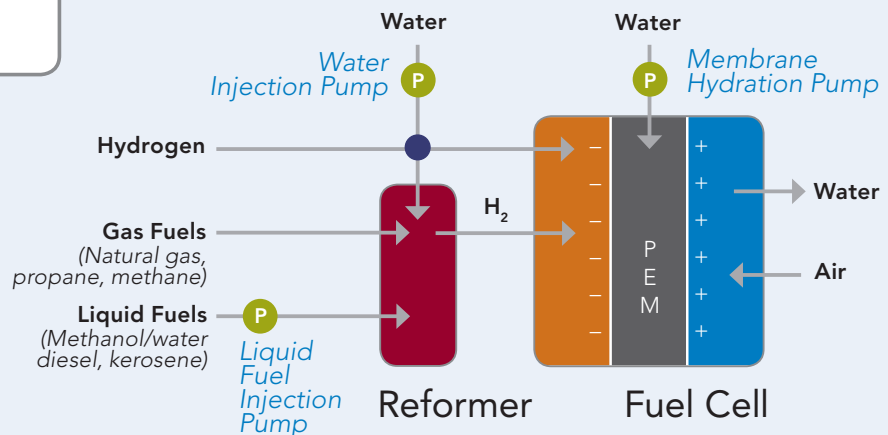
- ▶ Lowering manufacturing costs
- ▶ Reducing fuel cell operation costs
- ▶ Increasing fuel cell system life
- ▶ Reducing parasitic loads



Uniform, pulseless flow, over a wide range of pressures and temperatures, provide the advantage required for successful fuel cell design. Micropump pump technology serves fuel cell applications from test stands through high volume production. With over fifty years of system development expertise to help optimize your fuel cell design.

## Micropump Gear Pump Advantages for Fuel Cell Applications

- ▶ System simplification — pulseless flow eliminates need for pulse dampeners; reduces system part count
- ▶ High pressure — differential pressures up to 250 psi continuously for greater reformer efficiency
- ▶ Long life — life expectancies of 10,000 hours in typical fuel cell 'balance of plant' applications
- ▶ Fast response to control inputs — low inertia rotating parts
- ▶ Reduced parasitic load
  - ▶ Hydraulic efficiency from advanced gear pump technology
  - ▶ Electrical efficiency from brushless electromagnetic pump drives with no moving parts
- ▶ Consistent performance — wear compensation by design
- ▶ Freeze Resistant — well suited for real world environments
- ▶ Compact size — ease of design integration
- ▶ Isolated fluid path — magnetic drive with no leak-prone dynamic seals



## OEM Specific Solutions

Micropump's engineering team focuses on total system requirements while helping you determine the specific pump, drive, and control design that best meets your application needs. The resulting solution will be configured to meet your specific manufacturability and serviceability needs while providing a superior total cost solution.

Micropump products are designed and manufactured to ISO 9001 and ISO/TS 16949 quality standards, and to ISO 14001 environmental management standards.

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