

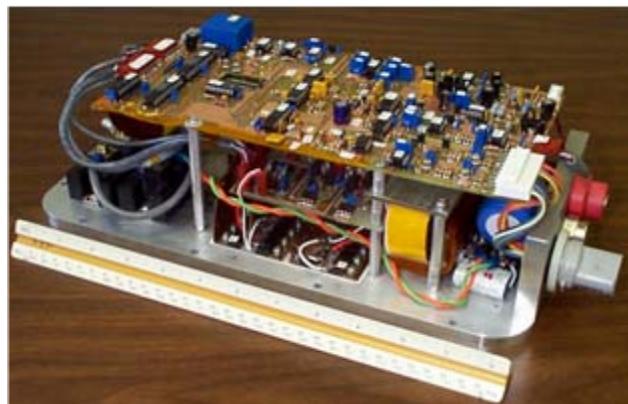
## Isolated Bi-directional DC-to-DC Converter for Fuel Cell Energy Management

### Objective

Create converter technology to assist electric power management for fuel cell vehicles.

### Goal

Evaluate novel topologies of bi-directional isolated DC-to-DC converters for fuel cell systems and build prototype of selected design.



*Developed by Virginia Tech under ORNL subcontract and direction.*

### Converter Specifications

- At fuel cell startup, converter can boost voltage from 12-volt auxiliary battery to power a high voltage (288 volt) DC bus until fuel cell voltage is established.
- Converter can recharge auxiliary battery to store the regenerative power from the motor drive.
- Efficiency during charging and discharging modes greater than 90 percent with a peak efficiency of 94 percent.
- 5 kW peak power (20 seconds) and 1.6 kW continuous power.
- Soft startup for discharge mode operation.
- Active clamp circuit to eliminate voltage spikes and minimize EMI.

### Technology Use

Converter powers compressor motor expanding unit from auxiliary battery for startup operation of fuel cells and recharges battery from drive motor regenerative power.

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