

850e Multi Range Fuel Cell Test System

New!!!

Improved Back Pressure Module! - Featuring SS Fittings and Water Traps

- ✓ Multiple Current Ranges for Accurate Measurement Over Wide Dynamic Range
- ✓ Integrated Turn-Key Test System
- ✓ Low Cost, Quick Delivery
- ✓ FuelCell® Software Included
- ✓ Experimental Methods Manual Included
- ✓ Impedance Spectroscopy & HFR Option
- ✓ SOFC, DMFC & Reformate Options

Features:

- Suitable for up to 50 cm² cells & small stacks
- Electronic load: 5/25/50 A or 10/50/100 A, 100 W, 20 V
- FuelCell® software for user-friendly computer-controlled cell operation & experimentation
- Anode & Cathode stainless steel humidifiers
- Anode & Cathode mass flow controllers
- Flexible heated gas transfer lines
- Constant or stoichiometric-controlled reactant flow rate
- Constant current, voltage or power control modes
- Continuous, real time cell resistance measurement by Current Interrupt
- Automatic hardware shutdown & purge gas for safe, reliable operation
- Multifunction front panel alpha-numeric display
- High impedance whole cell & reference electrode voltage sense inputs
- Simultaneous 3 channel impedance measurement
- Cell main terminals & sense inputs tolerant of non-isolated cell
- Single USB Communications Interface

Available Options:

- **New:** Automated Humidifier By-pass Valves!
- **Improved:** Anode & Cathode Backpressure
- Built-in Impedance Analyzer for EIS & HFR
- Automatic Water Fill (Standard on 10/50/100 A)
- High Temperature Operation to 120 °C
- Anode & Cathode Multi-Gas Selector
- MeOH Pump
- Reformate Simulation



850BP – Back Pressure Module

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Specifications:

Electronic Load:

Maximum Load Current:	5/25/50 A or 10/50/100 A (configuration dependent)
Maximum Load Power:	100 W
Minimum Load Resistance:	< 2 m Ω (100 mV @ 50 A at load terminals)
Current Resolution:	1 mA for 5/25/50 A; 10 mA for 10/50/100 A
Current Accuracy:	$\pm 0.3\%$ of full scale current of selected range

Voltage Measurement and Data Acquisition:

Max. Whole Cell Voltage:	20 V
Max. Reference Electrode Voltage:	9.999 V
Voltage Resolution:	1 mV
Voltage Accuracy:	± 3 mV $\pm 0.3\%$ of reading
Voltage & Current Data Update Rate:	100 Hz
Whole Cell Sense Input Resistance:	> 35 k Ω
Reference Electrode Input Resistance:	> 10 ⁹ Ω

Impedance Analyzer (Optional 880):

Internal Impedance Analyzer Type:	Single sine, one generator and two gain/phase measurement channels
Internal Analyzer Frequency Range:	1 mHz to 10 kHz
Measurement Channels:	Three: whole cell plus two half cell vs. Reference Electrode

Reactant Gas Control System:

All 316 SS construction of humidifiers, flow path, valves and mass flow controllers, with Swagelok® fittings and heated reactant delivery lines

Mass Flow Control:

Anode up to 2 SLPM and Cathode up to 5 SLPM
Software controlled mass flow controllers
Automatic N₂ purge valves on Anode and Cathode

Alarm Inputs:

Gas supply pressures (3), humidifier water levels (2), external (1),
System Alarm Output (1)

Backpressure Control:

Manual, 0 - 30 PSIG, requires Optional 850BP accessory

Temperature Controllers:

Set & Report Accuracy:	$\pm 0.25\%$ of span, ± 1 least significant digit
Sensor Type:	Thermocouple, Type T for cell (Type K optional for high temperature)

Humidifiers:

Temperature Range:	Dual sparger-type, passivated 316L, 360 W heaters per bottle Ambient to 99 °C
Fill Method:	Manual water fill; Optional automatic fill available (requires 30 PSIG min., or 20 PSIG above back pressure water feed)

Environment:

Operating Temperature:	5 – 35 degrees °C
Power Source:	120V 50-60 Hz 10A (Export model 220-240V, 50-60 Hz, 5A)
Enclosure Type:	Single bench top enclosure
Size and Weight:	18" H x 11" W x 19" D (+ 11" for heated gas lines) 46 cm x 28 cm x 48 cm (+ 28 cm); 50 lbs.

Safety Features:

Automatic shutdown and N₂ purge on under-voltage, over-current, over-temperature, loss of reactant or purge gas pressure, low water, communications failure or external alarm. Specifications given for 25 degree C ambient temperature unless otherwise noted.
Emergency Stop switch for manual operator shutdown.

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