

855 SOFC/SOEC Test System

The complete test station for operation and measurement of solid oxide fuel cells with electrolysis option

The 855 is designed for SOFC testing and diagnostics in a research lab environment.

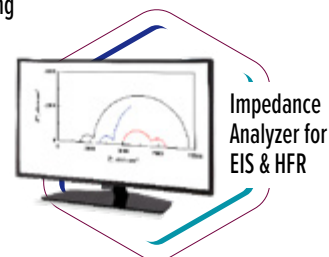
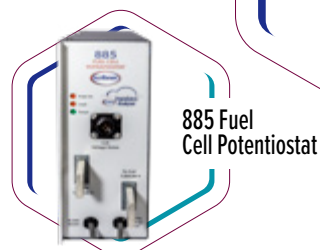
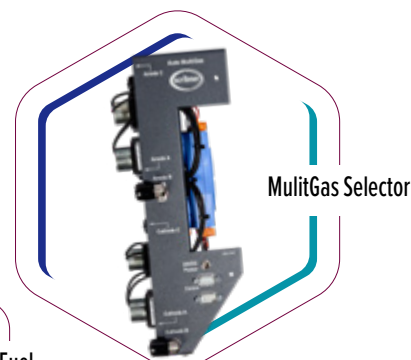
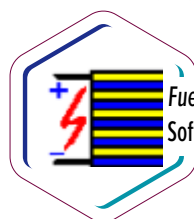
The 855 features

- Suitable for Button Cells and Planar Cells
- Multi Range, Zero Volt, Electronic load 5/25/50 A, 100 W, 20 V
- FuelCell® software for user-friendly computer controlled cell operation & experimentation
- Stainless Steel Anode humidifier with Bypass Valve and auto waterfill
- Up to five mass flow controllers available
- Includes Furnace Control hardware with redundant over-temperature protection
- Constant or stoichiometric-controlled reactant flow rate
- Current, voltage or power control mode
- Continuous real time cell resistance and IR-free voltage measurement by Current Interrupt
- Whole cell voltage plus two high-impedance reference inputs for half-cell data
- Safety features include detection of alarm conditions and automatic hardware shutdown for safe, reliable operation

The 855 with power supply add-on for SOEC testing

- 100 A / 5 V Programmable Power Supply to drive the electrolysis reaction
- Voltage and current-controlled fixed, scanning and stair-step experiments
- Humidified H₂ for water electrolysis, CO₂ + H₂O for SynGas production

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SPECIFICATIONS: 855 SOFC Fuel Cell Test System

Electronic Load:

Maximum Load Current	5/25/50 A or 10/50/100 A (maximum 25 A with boost power supply in zero-volt mode)
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	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
Sense Lead Input Resistance	>35 k Ω
Voltage Resolution	1 mV
Voltage Accuracy	± 3 mV $\pm 0.3\%$ of reading
Voltage & Current Data Update Rate	100 Hz

Reactant Gas Control System:

All 316 SS construction of humidifiers, flow path, valves & mass flow controllers, with Swagelok® fittings	
Mass Flow Control	Anode up to 1 SLPM and cathode up to 5 SLPM*, software controlled mass flow controllers Automatic N ₂ purge valves on anode and cathode
Alarm Inputs	Gas supply pressures (3), humidifier water level (1) Furnace over temperature (1), and external (1)

Temperature Controllers:

Quantity	(3) Furnace, Anode Humidifier, Cell Temp
Set and Report Accuracy	$\pm 0.25\%$ of span, ± 1 least significant digit
Sensor Type	Thermocouple, Type K (R/S also Available)

Temperature Limit Controller:

	(1) Furnace Over-Temp
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Humidifier:

Type	Single bottle-type Passivated 316L
	Auto Water fill
	Automated Humidifier Bypass

Environment:

Operating Temperature	5 to 35 °C
Power Source	220-240 V, 50-60 Hz, 20 A
Enclosure Type	Single bench top enclosure
Size and Weight	91 cm H x 61 cm W x 61 cm D (+ 41 cm for heated gas lines), 55 kg 36" H x 24" W x 24" D (+ 16" for heated gas lines), 120 lb.
Safety Features	Automatic shutdown and N ₂ purge on under-voltage, over-current, over-temperature, loss of reactant or purge gas pressure, low water, communications failure or external alarm, Emergency Stop switch for manual operator shutdown