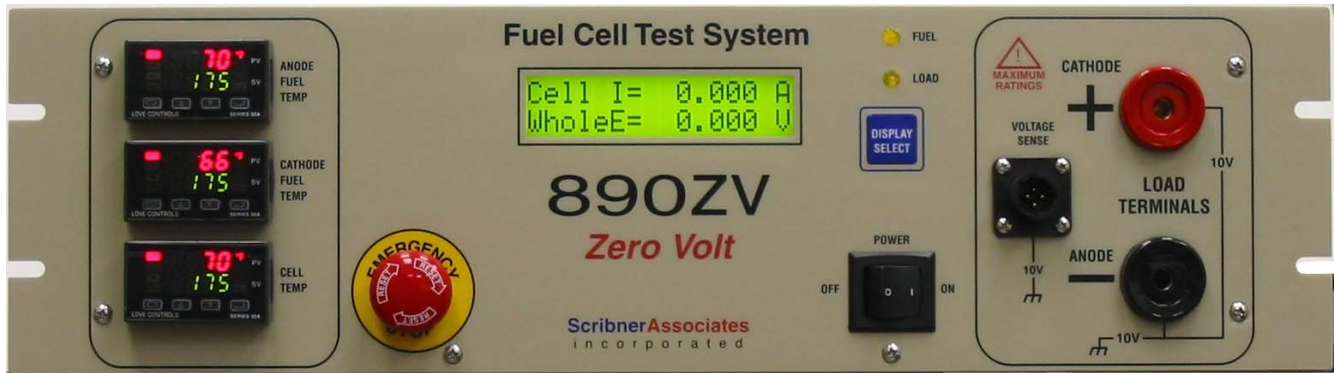


# 890ZV Advanced Fuel Cell Test Load



## **NEW – SOFC Zero Volt Operation Includes Two Current Ranges 5A/25A**

The Model **890ZV** is the latest fuel cell test system produced by Scribner Associates, Inc. The instrument consists of a programmable electronic load, fuel and temperature controls, and data acquisition functions in an integrated bench top unit. A built-in power source makes the **890ZV** particularly well suited for small single cell SOFC work for research, laboratory and educational use. Such cells often have high resistance electrical interconnects that require use of a power source in order to apply current to the fuel cell.

The **890ZV**, like earlier models, is optimized for cost and size, and offers extra hardware features and Scribner Associates' FuelCell® software.

The **890ZV** is typically for use with a SOFC fuel cell, a suitable furnace and a fuel management unit. It is available with the optional internal **Model 880 Frequency Response Analyzer (FRA)**. An interface box may be purchased for non-integrated fuel system designs.

### **Features:**

- Remote operation from USB-GPIB interface with SAI FuelCell® software
- Load system with bucking power source for SOFC high resistance cell leads
- Electronic load with two current ranges: 5 / 25 Amps
- Constant current, voltage, or power control mode
- Current Interrupt (iR) cell resistance measurement
- Whole cell sense voltage input and two high-impedance reference electrode inputs
- Optional internal impedance analyzer with real-time high frequency resistance (HFR) capability
- Impedance measurement using whole cell or either reference electrode input
- Automatic shutdown in hardware for over-current, under-voltage, over-power, load temperature and cell / furnace temperature conditions
- Ramping cell/furnace temperature control
- Cell main terminals and sense inputs tolerant of non-isolated cell
- Internal temperature controllers for anode humidifier and cell / furnace temperatures
- Multifunction front panel text display with function select button
- Connections for Solartron impedance analyzer (for models without internal impedance analyzer)
- Connector for optional interface box or direct gas management unit connection
- Analog input/output ports for two main gas mass flow controllers and up to five additional mass flow controllers including anode forming gas mixtures
- Low voltage output signal to control purge gas valves
- Contact inputs for three supply pressure sensors and three auxiliary alarms
- Low voltage alarm output signal to indicate fault condition
- RS485 digital interface for external temperature controllers

## Specifications:

### Electronic Load:

Maximum Load Current (2 ranges):	5A, 25A
Maximum Load Voltage	10 V
Maximum Load Power:	50 W
Minimum Load Resistance:	3.3V power supply used to allow zero load voltage at full current with up to 3.2V drop in cell wiring
Current Resolution:	1mA
Current Accuracy:	0.3% of full scale current of selected range

### Voltage Measurement and Data Acquisition:

Maximum Whole Cell Voltage:	10.000V
Maximum Reference Electrode Voltage:	9.999V
Whole Cell Sense Voltage Input Resistance:	> 35 k $\Omega$
Reference Electrode Input Resistance	> 10 <sup>9</sup> $\Omega$
Voltage Resolution:	1 mV
Voltage Accuracy:	$\pm 3$ mV $\pm 0.3\%$ of reading
Voltage and Current Data Update Rate:	100 Hz

### Fuel Interface:

Outputs for anode, cathode flow controllers:	Two, Analog (0-5 V)
Outputs for reformat flow controllers:	Five, Analog (0-5 V) (optional)
Alarm Inputs:	Six: Three for gas pressures, three auxiliary
Alarm Outputs:	One, 5 V logic
Fuel Solenoid Control:	One, 5 V output (external relay needed, included with interface box)

### Temperature Controllers:

Quantity:	Three (Anode, Cathode and Cell / Furnace)
Type:	On/off 5V output (external SSR required)
Set and Report Accuracy:	$\pm 0.25\%$ of span, $\pm 1$ least significant digit
Sensor Type:	Thermocouple, Type K Standard, T or S optional

### Impedance Measurement:

Interface for internal or external analyzers:	Voltage and current output channels with variable DC bias rejection, generator input channel with selectable attenuation
Internal Impedance Analyzer Type:	Single sine, two gain/phase measurement channels, one generator output channel
Internal Analyzer Frequency Range:	1 mHz to 10 kHz
Measurement Channels:	Three: whole cell plus two half cell vs. reference electrode

### Environment:

Operating Temperature:	0-40 °C ambient; all specs given for 25 °C ambient
Power Source:	100-240 VAC, 50/60 Hz (auto select)
Size:	3U std rack mount, 19" W x 5.25" H x 21" D

### Safety Features:

Automatic shutdown and N<sub>2</sub> purge with under voltage, over-current, over-temperature, loss of supply pressures, low water, furnace over-temperature, communications failure or external alarm. Manual Emergency Stop switch for manual operator shutdown.

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