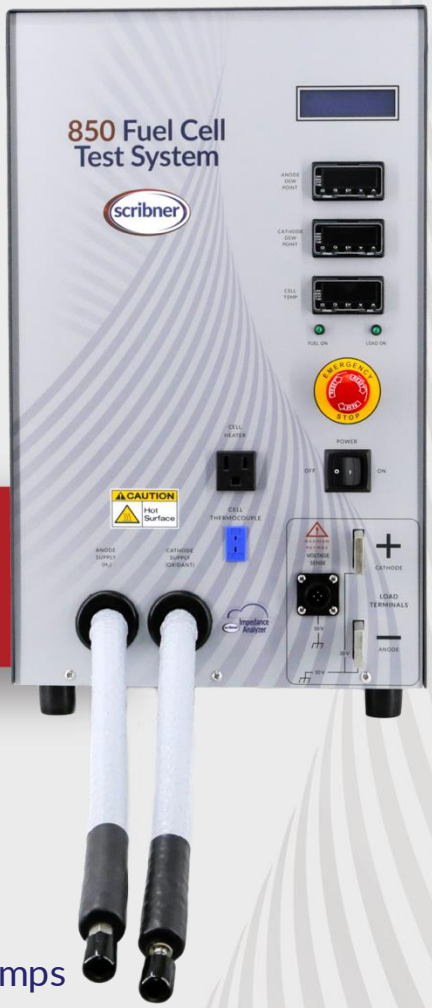
850 MULTI-RANGE FUEL CELL TEST SYSTEM

Fully Automated, Turnkey, Test System for the Operation and Measurement of Single Cell PEM, AEM & DM Fuel Cells



Enhanced Capacity 125 Amp Electronic Load

FEATURES

ADVANCED DIAGNOSTICS

Three Current Range Electronic Load Choices 50, 100, & 125 Amps

Modular Benchtop Design for Complete Diagnostics of Single Cell Testing

- Integrated Frequency Response Analyzer with EIS and HFR
- Integrated Potentiostat for In Situ CV and LSV Experiments
- Auto Multigas Selection for Poisoning and Hydrogen Crossover Experiments
- Auto Back Pressure for Independent Control of Anode / Cathode Pressures

UNATTENDED OPERATION

Smart Fuel Management with Automatic Filling / Draining Humidifiers, Automated Shutdown with Embedded Firmware Level Safety Management & Electronically Controlled Purge Gas

INTUITIVE CONTROLS

FuelCell5® Fully Integrated Software For User Friendly Control, Experimental Sequencing & Analysis

ZView ® World's Leading Impedance Analysis & Equivalent Circuit Modeling

SPECIFICATIONS

ELECTRICAL

Load Current Range Configurations:
5/25/50A, 10/50/100A, 12/62/125A

Maximum Load Power:
100W

Minimum Load Resistance:
<2 mΩ (100mV @ 50A at load terminals)

Current Resolution:
1 mA or 10 mA per software current range selection

Current Accuracy:
0.3% of full-scale current of selected range

Max . Whole Cell Voltage:
20V

Max . Reference Electrode Voltage:
9.999V

Voltage Accuracy:
±3 mV ±0.3% of reading

Voltage & Current Data Update Rate:
100 Hz

Whole Cell Sense Input Resistance:
> 35kΩ

Reference Electrode Input Resistance:
> 10^9 Ω

PROCESS CONTROL

Wetted Materials:
All 316SS

Fittings:
Swagelok® fittings and heated lines

Mass Flow Control:
Software controlled Anode & Cathode
Additional Internal MFCs Available

Purge Control:
Automatic N_2 for Anode & Cathode

Humidifiers:
Dual sparger-type, passivated 316SS, 360 W heaters per bottle

Temperature Control:
(3) Cell, Anode humidifier, Cathode humidifier

Cell Thermocouple:
Type T or Type K

Temperature Range:
Ambient to 99.0°C; Optional: 120°C

Temp Measurement Accuracy:
±0.25% of span, ±1 least significant digit

PHYSICAL

Operating Temperature:
5 – 35 °C

Power Source:
120(10A) or 220–240(5A) VAC 50/60 Hz

Enclosure Type:
Single bench top unit

Size & Weight:
46 x 28 x 48 cm (18 x 11 x 19 in) & 23 kg (50 lbs)

SAFETY

Alarms:
Gas supply pressures(3), Humidifier Water Levels(2), External (1), System Alarm Output (1)

Fail Safe Design:
N_2 Purge On Alarm Condition

Continuous Monitoring:
E-Stop, Voltage, Current, Temperate, Gas Contamination & External Signals

Certification:

INTERNAL OPTIONS

FREQUENCY RESPONSE ANALYZER (FRA)

Adds **Electrochemical Impedance Spectroscopy (EIS) and High-Frequency Resistance (HFR)** measurements for whole cell, or half-cell, diagnostics, monitoring membrane performance over time and under varying operating conditions from **1mHz to 10kHz.**

HUMIDIFIER BY-PASS

Automated delivery between dry and humidified gas to the Fuel Cell to enable **Accelerated Lifetime Durability Testing** and **Predictive Failure Analysis** of the membrane.

Software controlled bypass for **Reformate / Contamination Studies**.

HUMIDIFIER AUTO DRAIN/FILL

Rapid Due Point Reduction to reduce total testing time and automating humidifier water maintenance by draining the system prior to offline operation.

ACCESSORIES

EXPANDED CELL CONTROL
Automatic Back Pressure

Automated cell pressure control to support advanced test protocols.

Provides water trap functions to limit the amount of water in the exhaust stream, including self-draining condensate tanks, to improve user and facility safety.

EXPANDED GAS CONTROL
Gas Mixing Interface

Automated Gas Mixing capability is available as an **Internal Option** (See Part Configurator Page for additional details) and an External Option for expanded customization, with up to (3) number of Mass flow Controllers.

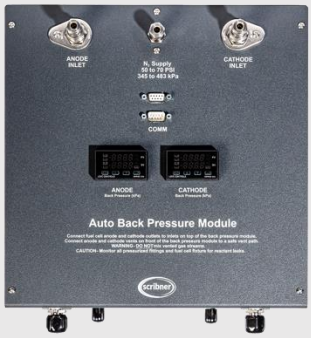
ADVANCED DIAGNOSTICS
Potentiostat

Electrochemical Impedance Spectroscopy (EIS) measurements are used for cell diagnostics to identify performance limitations across multiple frequency regimes.

High-Frequency Resistance (HFR) allows single-frequency measurement to monitor membrane performance over time and under varying operating conditions.

ADDITIONAL INPUTS
Data Expansion Unit

16 Channels of additional inputs to capture temperature or analog measurements, to enable the study of physical or mechanical element affecting cell performance like Heat Distribution, Flow Restrictions, Water Management, etc.



CHARACTERIZATION
Auto-Multi Gas

Electrochemical Surface Area (ECSA) Measurement enabled by computer controlled **Automatic Multi Gas** selector.

Measurement of **Hydrogen Cross Over** and enhanced diagnostics.

ADDITIONAL ACCESSORIES

- Cell Fixtures **Heated Cuffs** to eliminate heat loss
- **DI Water Tank** to provide stable pressurized delivery of existing DI water source
- **Stand-Alone Humidifier** for 3rd channel
- **MEOH Pump** for DMFC Operations.

CELL FIXTURES

PEM & AEM

Our gas-gas fixture **offers superior performance for both PEM & AEM Fuel Cell applications**, making it the ideal choice for a wide range of experimental needs.

DMFC & LIQUID/GAS

All wetted components of the **liquid side are non-metallic and highly chemical resistant**. Interchangeable end plates save money, convert back to PEM/AEM with one part.

Redox Flow Battery

This is specifically designed for use with our **857 Redox Flow Cell Test System**. All non-metallic flow paths are made with non-corrosive, chemically resistant plastics only.

PRODUCT CONFIGURATION

LET'S CONFIGURE YOUR TEST SYTEM

If It Isn't On The Page, Let's Talk Customization

8 5 0 [ ] - A [ ] [ ] X [ ] [ ] C [ ] [ ] X [ ] [ ] - [ ] [ ] [ ]

Optional Mixing[1] — Optional Mixing[1]

Anode[2] — Cathode[2]

Mass Flow Section

LOAD DEFINITION

Code	Description
B	100W 5/25/50A
C	100W 10/50/100A
D	100W 12/62/125A

HYDROGEN		NITROGEN		AIR	
Code	Description	Code	Description	Code	Description
H1	0.1 SLPM H2	N1	0.1 SLPM N2	A1	0.1 SLPM Air
H2	0.2 SLPM H2	N2	0.2 SLPM N2	A2	0.2 SLPM Air
H3	0.5 SLPM H2	N3	0.5 SLPM N2	A3	0.5 SLPM Air
H4	1.0 SLPM H2	N4	1.0 SLPM N2	A4	1.0 SLPM Air
H5	2.0 SLPM H2	N5	2.0 SLPM N2	A5	2.0 SLPM Air
H6	5.0 SLPM H2	N6	5.0 SLPM N2	A6	5.0 SLPM Air

[1] Mixing Mass Flow Controllers are NOT required. Only (1) Internally mounted Mixing Mass Flow Controller per Test-Station for additional mixing capabilities. Externally mounted options are available (850 Reformate Box). Mixing option after the A (Anode) and before the C (Cathode) denotes mixing capabilities on the Anode side. The mixing option after the C (Cathode) denotes mixing capabilities on the Cathode side.

[2] Custom Anode and Cathode Mass Flow controllers may be available. Contact ***info@scribner.com*** *for additional details.*

INTERNAL OPTION CODE

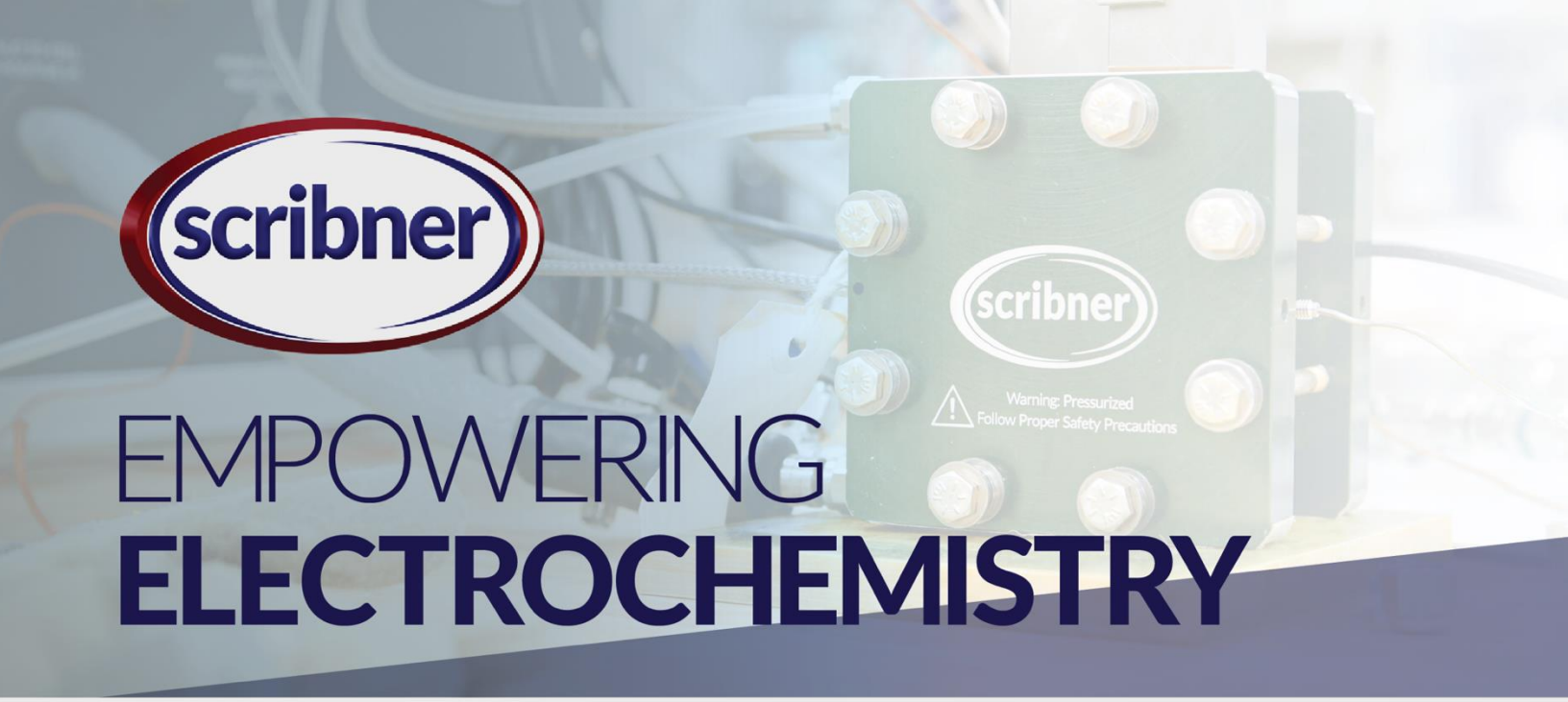
Code	881 FRA	Humidifier By-Pass	Humidifier Auto Drain /Fill
0	N	N	N
1	N	Y	N
2	N	Y	Y
3	N	N	Y
4	Y	N	Y
5	Y	N	N
6	Y	Y	N
Z	Y	Y	Y

THERMOCOUPLE CODE

Code	Cell Thermocouple Type
0	No
J	Type J
K	Type K
R	Type R
S	Type S
T	Type T

PLUG (VOLTAGE) CODE

Code	Plug Type
C	Chinese Plug (230V)
E	European Plug (230V)
N	North American Plug (120V)
U	UK Plug (230V)



EMPOWERING ELECTROCHEMISTRY

ABOUT US

We're the power behind the pioneers—advancing electrochemical research with precision instruments, deep expertise, and unwavering support.

More than a supplier, we're a trusted partner in innovation, removing technical barriers so scientists can focus on breakthroughs that shape the future.

From lab bench to global impact, Scribner makes complex research possible, precise, and scalable.

OUR EXPERTISE

Electrochemistry isn't just what we do—it's who we are. With decades of experience and industry-defining innovation, we deliver cutting-edge electrochemical instrumentation and expert insight that empower scientists to push boundaries.

Whether you're optimizing performance at the molecular level or scaling up for global impact, we provide the precision tools and partnership to turn possibility into progress.

Our product catalog includes:
-Fuel Cell Test Systems
-Electrolyzer Test Systems
-Membrane Conductivity Test Systems
-Redox Flow Cell Test Systems
-Battery Test Systems

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