



## Press release 08/07/2021

### **EA Elektro-Automatik Offers Bidirectional DC Power Supplies and Regenerative DC Loads for Testing Fuel Cells**

Germany (Viersen), July 8, 2021 - In response to demand for growing hydrogen fuel cell development and test, EA Elektro-Automatik, the global leader in DC power test equipment, offers a series of powerful bidirectional DC power supplies and regenerative DC loads ideal for fuel cell stack testing.

Fuel cell performance requires adherence to a variety of specifications, so test engineers must conduct a series of characterization, performance and durability tests. Fuel cells are characterized by determining their resistance. Fuel cell performance is usually indicated via polarization curves by measuring its voltage and current. A durability test is the test after a fuel cell stack reaches operating conditions, the stack is subjected to a continuous series of charge/discharge cycles to ensure that it will work safely and reliably in the field.

“In response to the demand for clean energy, the market for fuel cells is growing at a compound annual growth rate of 26.4% and is projected to reach \$848 M by 2025. Uses for fuel cells include power generation for commercial vehicles such as buses and forklifts, backup power generation systems, and for other power sources. To ensure the design and manufacturing of quality fuel cells, EA Elektro-Automatik offers its EA-PSB 10000 2-quadrant power supplies and EA-ELR 10000 Series electronic loads. Both the PSB power supplies and the EA-ELR loads sink up to 30 kW and feed back the energy to the grid to enable testing of any size fuel cell stack,” said Markus Schyboll, CEO of EA Elektro-Automatik (EA).

#### **Built-in Function Generator Simulates any Load Condition**

Both the PSB Power Supplies and the ELR Electronic Loads have built-in function generators that include arbitrary waveform generation, which simplifies characterization, performance, and durability testing of fuel cells. Unlike other loads that need a separate AC instrument, the ELR load, with its built-in waveform generator, can perform the perturbation test to determine fuel cell resistance. In addition, both the PSB supplies and the ELR loads, with their built-in waveform generators, can subject the fuel cell-under-test to dynamic load variations for performance and durability testing.



### PSB Series DC Supplies Simulate Fuel Cell Characteristics

The PSB DC Supply also has an internal X-Y generator that allows the supply to simulate the output of a fuel cell. At various voltages, the PSB supply can vary its output resistance to generate a current characteristic of the fuel cell at the programmed voltage. Thus, the PSB supply can emulate the three phases of a fuel cell's characteristic output. The PSB supply can add ripple and noise onto its output to determine how well a fuel-cell powered device can perform under a wide range of conditions.

### Autoranging Maximizes Voltage and Current Curve for Testing Any Type or Size of Fuel Cell

Both the PSB Series supplies and the ELR Loads offer true autoranging performance. The PSB supplies have a constant power characteristic output that allows for a wider range of voltage and current output with one instrument. The supplies can have ranges from 0 – 60 V up to 0 – 2000 V. Current outputs can be up to 1000 A at 30 V with the 30 kW supply. Similarly, the ELR loads can sink up to 2000 V or 1000 A with the 30 kW load. Autoranging power supplies and loads enable users to obtain higher voltages and currents without having to oversize the supply or the load. Thus, one instrument provides a wider range of testing capacity and versatility for use in multiple test applications. The PSB supplies and ELR loads save test costs and test rack space compared with fixed range instruments.

### High Efficiency Regenerative Energy Recovery Saves Costs and Cooling Requirements

The PSB Series power supplies have the added value of being a 2-quadrant instrument. These supplies, therefore, can function as both a source and a load. As a load, both the PSB supplies and the ERL loads are regenerative loads and can return the absorbed power to the grid with more than 96% efficiency. That significantly reduces the cooling requirements on the instrument. Less cooling enables saving space with a smaller instrument for a given power capacity and saves on power consumption costs. Fan noise is also significantly reduced. With high power loads, such as kilowatt loads, regenerative energy recovery offers substantial savings on utilities, smaller-sized instruments, and longer instrument life with less thermally stressed components.

### Complete Portfolio of Interfaces for Automated Test

The PSB Series supplies and the ELR loads have USB and ethernet as standard interfaces. Furthermore, a number of optional interfaces allow control from a PC or a programmable controller. Some of the optional interfaces include RS-232, Profibus, CAN bus, and ModBus. With the CAN interface, the instruments can interface to an automotive control system.



### Simplified Manual Operation

The supplies and the load have a multi-colored touchscreen display that shows all programmed and measured values and only two control knobs. The user has a choice of various languages: English, Spanish, French, German, Chinese and Russian. The learning curve for operating the instrument is short as the user can work in the language in which he or she is most comfortable.

[Learn more](#) fuel cell testing and simulation with the EA-PSB series power supplies and the EA-ELR series electronic loads.

### About EA Elektro-Automatik

The EA Elektro-Automatik Group (EA) is Europe's leading supplier of power electronics for R & D and industrial applications. At the German headquarter in Viersen, North Rhine Westphalia, more than 200 qualified associates research, develop and produce high-tech equipment for laboratory power supplies, high power mains adaptors and electronic loads, with and without mains feedback. Specific to power electronics, *made by EA*, is the wide application spectrum. The units are used across many branches, from batteries, through fuel cell technology, to wind and solar power, from electrochemicals and process technology to telecommunication.

Results and experience from decades of R & D flow continually into new solutions. Automatic test systems with specially developed soft- and hardware assure a consistently high product quality. Flexible production processes support fast reaction to changing customer requirements.

As a mid-size company EA is totally responsible for the production location in Germany but acts globally with branches in China and USA, sales offices in Russia and Spain and a wide network of partners. Value sharing, mutual respect and open communication characterize our association.

The foundation of the company in 1974 was based on innovation, a tradition which is maintained today. What started with the development of simple mains adaptors is continued today in the overall concept of technology leadership. With highly specialized power supply systems for a multitude of applications, EA is driving the future of power electronics – technologically excellent, designed for resource protection and energy saving and conceived for a multitude of applications.



**Elektro-Automatik**

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