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PROGRAMMABLE POWER

CASE STUDY

Organization Chooses Water-Cooled Electronic Loads for Hydrogen Fuel-Cell Test

Background

A government-funded research organization based in Asia addresses renewable energy technology, energy efficiency, climate change, and energy policy. Specific areas of focus for the organization include fuel cells and energy storage systems (ESS).

For fuel cells, the organization develops core technologies for mobile (automobiles, heavy-duty vehicles, trains, ships, and drones) and stationary (home and building combined heat and power) applications. Recent accomplishments include the technology transfer of a home fuel-cell system to a manufacturer.

The organization's ESS initiative optimizes electricity use—determining, for example, when electric appliances should connect to the grid and when they should switch over to an ESS. To enable the transition from rechargeable batteries to next-generation fuel batteries, the organization is developing high-density active materials, large-scale storage redox (reduction-oxidation) flow-battery technology, and operational control technology for redox flow batteries.

The Challenge

As the organization works to develop, standardize, test, and verify hydrogen fuel cells for mobile and stationary applications, and as it researches large-capacity secondary cells with the goal of large-scale commercialization of sophisticated energy-storage systems, it requires compact water-cooled programmable electronic loads to perform high-power testing under realistic conditions.

The Solution

The organization has chosen several PLW Series programmable electronic loads in furtherance of its research efforts. Most recently, the organization purchased an 18kW, 50VDC PLW Series water-cooled load that can sink more than 1,250A to perform high-power hydrogen fuel-cell stack test. A key requirement was the ability of the load to draw full rated current at a minimal voltage. Both the PLW Series and its companion air-cooled PLA Series of electronic loads can draw full rated current at voltages less than 1% of full rated voltage. In addition, the organization chose the water-cooled PLW because it is cleaner than an air-cooled unit with respect to dust control. An additional consideration was power density—an 18kW PLW load fits in a compact 2U chassis.

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