Raytheon Ktech’s 30kW energy storage system (ESS), the RK30 shown above, is an advanced energy storage solution that provides improved flexibility for diverse energy management and storage needs. The RK30 supports power inputs from a variety of generation sources and improves overall energy reliability, reduces life-cycle and generator fuel costs, and supports integration of renewable technologies.

The RK30 consists of RedFlow® ZBM batteries, bidirectional inverters, high performance power electronics and the Raytheon Energy Storage System Controller. The 30kW/120kWh ESS is designed to optimize power and energy and efficiently distribute uninterrupted power.

Our control system is based on smart, innovative algorithms that intelligently select the most efficient power source available to meet the current power demands. These algorithms provide accelerated response to power fluctuations and advanced system management methods to deliver reliable power even when impacted by short-term (milliseconds to hours) to long-term (days) fluctuations and intermittencies.

The RK30 is configurable to support numerous applications including:

• Load following in microgrid configuration to significantly reduce generator fuel consumption and allowing diesel generation sets to run at optimum power and then shut down for sustained periods.

• Storing renewable energy for optimal use including peak and evening, and managing renewable ramp rates.

Benefits

- Optimization of generators and microgrids
- Enhanced management and control of renewables
- Versatile application support
- Scalable to meet specific power and energy needs
- Reliable source of power
RK30 Energy Storage System

- Powering remote sites including off-grid locations, mobile systems, and disaster recovery.
- Power for stationary energy storage including back-up power.
- Peak shaving to avoid time of day and demand charges.
- Voltage and frequency regulation.

**Technical Specifications**

- **Enclosure**
  - Tricon container
  - Rated NEMA 4X
- **Output**
  - 208 VAC, 60 Hz three-phase
  - Power: 30 kW continuous
  - Energy: 120 kWhr (max)
  - Operating temperature range: +14°F to +122°F (-15°C to 50°C)
- **Zinc Bromide Module (ZBM)**
  - Output: 120 V nominal
  - Efficiency: 70-75% (dc)
  - Capacity: nominal 2400 Ahr
- **Safety**
  - Hazard class 8 (electrolyte)
  - Safety Data Sheet available
- **Communications and Interfaces**
  - Ethernet 10/100
  - 3G modem
- **Inverter Certification**
  - Utility compatibility rated UL 1741 complaint
  - Power factor rated IEEE 1547 compliant

**Battery**

The RK30 uses 12 RedFlow® zinc bromide battery modules (ZBM). The ZBM is a Generation 2.5, 5kW/10kWh battery that is reliable and robust having been used in remote sites in the Australian outback for more than three years. The batteries are designed to handle both 100 percent discharge and partial discharge without significant degradation. With target life of 2,000-plus cycles, these batteries are most cost effective during hard-working, heavy cycling applications with charge/discharge times of several hours.

**System Controller**

The system controller, designed by Raytheon, monitors the AC and DC buses and MPPT renewable energy output voltage levels to optimally manage the overall ESS operations. It manages power and energy, system status and safety, data acquisition, errors and faults, communications and reporting, and interfaces with the grid or microgrid.

The system controller is configurable, supporting parallel applications and optimizing system operation.

**Power Electronics**

All RK30 power electronics are commercial off-the-shelf components. The breakers, contactors, and inverter hardware meet standard CE and UL certifications providing a minimum 10-year life span with daily cycling. A number of sensor locations provide immediate feedback of voltage, current, and temperatures. These readings along with chemical sensing, enclosure interlocks, and surge protection, provide a safe, reliable, autonomous turnkey system.

Raytheon
P.O. Box 11337
Tucson, Arizona
85734-1337 USA
rmspr@raytheon.com
www.raytheon.com