MODULAR, MULTI-OUTPUT ENERGY MAGAZINE

The Energy Magazine is a power and energy storage system designed to master many of the challenges associated with the increasing demand for available shipboard electrical power. The types of technology being incorporated into a range of ship systems today is not only driving up the need for more power but also for higher power quality, more efficient use of power and intermittent power for the high-bursts of energy required by pulse power weapons and sensor systems.

The key to managing all this power is the Energy Magazine which employs state-of-the-art lithium iron phosphate batteries for energy storage and advanced controls for energy management. The system is capable of supplying energy to either the ship’s electrical distribution system or directly to the pulse weapon/sensor accommodating spiked power demands that the ship’s generators cannot provide. During times of lower demand the Energy Magazine is “recharged” from the ship’s electrical system. The technology also provides ship back-up power in the event the generator(s) go offline.

Leonardo DRS has demonstrated Energy Magazine technology and multi-application hardware for the pulsed power and stable back up power required to help sustain multiple mission systems. This technology is suitable for DDG 51 back fit and other ship class applications.

SELECTED FEATURES
• Modular architecture and adaptable software
• Latest technology lithium iron phosphate batteries
• “Hatch-able” modules for ease of installation
• Design compliant to multiple MIL-STDs (see back for details)
**ENERGY MAGAZINE**

**DESIGN EVOLUTION**

**EM-Laser**
Lithium Iron Phosphate Batteries  
- 1000 VDC internal output in dual stacks  
- 71 kW-hr (256MJ)

**EM-MKII**
Lithium Iron Phosphate Batteries  
- 1000 VDC internal output in dual stacks  
- 71 kW-hr (256MJ)

**EM-Stable Backup Power**
Lithium Iron Phosphate Batteries  
- Separate storage media section  
- 1000 VDC in each stack: cascadeable  
- 71 kW-hr (256MJ)

**DIMENSIONS**

- Each module fits through a standard ship hatch
- 26 inches
- 66 inches

**CONFIGURATIONS**

<table>
<thead>
<tr>
<th></th>
<th>Power / Duration</th>
<th>Duty Cycle</th>
<th>Recharge Time</th>
<th>Output Voltage</th>
<th>Discharge Cycles</th>
<th>Galvanic Isolation</th>
<th>Cabinet Size</th>
<th>Cabinet Weight (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EM-Laser</strong></td>
<td>660kW / 4 Minutes</td>
<td>Notional 50%</td>
<td>&lt; 16 min</td>
<td>650VDC Galvanic Isolation</td>
<td>&gt;1000</td>
<td>AC-DC; DC-AC</td>
<td>48&quot; D x 66&quot; H x 100&quot; W</td>
<td>-9,200</td>
</tr>
<tr>
<td><strong>EM-MKII</strong></td>
<td>900kW / Continuous</td>
<td>Stochastic</td>
<td>Continuous</td>
<td>650VDC Non-isolated</td>
<td>N/A</td>
<td>AC-DC; DC-AC</td>
<td>48&quot; D x 66&quot; H x 150&quot; W</td>
<td>-14,500</td>
</tr>
<tr>
<td><strong>EM-Stable Backup Power</strong></td>
<td>750kW / 3 Min.</td>
<td>100% Continuous</td>
<td>&lt; 16 min.</td>
<td>450/690 VAC, 60 Hz</td>
<td>&gt; 250</td>
<td>AC-DC; DC-AC</td>
<td>48&quot; D x 66&quot; H x 100&quot; W</td>
<td>-9,200</td>
</tr>
</tbody>
</table>

**INPUT/CONTROL**

- Input/Control 650VDC
- Isolated 300-650VDC
- Non-Isolated 450/690 VAC AFE Bi-directional
- Battery System - 1KVDC Internal Output

**MILITARY SPECIFICATIONS**

- MIL-STD-1399, Section 300B, Input Power Quality
- MIL-STD-167-1, Type I, Vibration
- MIL-STD-741-1 Airborne Noise
- MIL-STD-741-2 Structure-borne Noise, Type III
- MIL-STD-461F, EMI
- DDS-072-1/-5, Grade A Shock
- DOD-STD-1399-70-1 Magnetic DC Field
- NEMA IEC 60529, IP54 Enclosure
- NAVSEA S9310-AQ-SAF-010/ SG270-BV-SAF-010
- DOD Directive 8500.01/02 Information Assurance

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