Key Features

- Single output up to 40V/3,600A/72kW per system
- Parallel expansion up to 7,200A
- Built-in digital measurements including Ah & kWh
- Multiple safety layers to protect battery/DUT
- SCPI, VXI-11, & LabVIEW control via LAN interface
- NI-Compliant LabVIEW Drivers
- 87% efficiency returning discharge power to facility
- Crane/hoist lifting hangers & robust casters

High Current Battery Testing

The 9220 Dual Bay Series Test System is designed for testing all battery chemistries including lead-acid, lead-cadmium, and other low voltage, high current, large format batteries (LFB) typically used in energy storage systems (ESS). The system is bi-directional requiring no additional equipment to charge or discharge the unit-under-test (UUT). Additionally, the built-in measurement system eliminates external measurement devices by providing time-stamped digital readings for voltage, current, power as well as Ah and kWh.

Recycle Discharge Power Back to the Facility

Unlike typical high-current systems which convert battery discharge power into waste heat, the 9220 Dual Bay converts up to 87% of the battery discharge power into usable electrical power that precisely matches the facility’s AC line. This process, called regeneration, results in lower operating costs, reduces air-conditioning usage, eliminates expensive water cooling systems, and often provides enough savings to payback the entire system within a few years.

System Cabinet Features for Easy Installation

The 9220 Dual Bay has been designed with vertical lifting hangers at each corner allowing the entire system to be lifted using a 4-point hoist or crane. Each hanger has been designed to safely support up to 3000 lbs. when the system is lifted with ½” grade 8 bolts.

The system has been equipped with robust casters (Fig.1) permitting easy movement for final placement within or reconfiguration of the laboratory.

Output connections are solid 4” x ¾” (102mm x 19mm) buss bars which have been staggered to minimize the risk of accidental shorting. Each buss bar provides four 5/8” (15.88mm) mounting holes on 2” (50.8mm) centers allowing for easy connection of additional buss bars or heavy duty power cables.
## 9220 Series Dual Bay Specifications

<table>
<thead>
<tr>
<th>Programming Capability</th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating States</strong></td>
<td>Charge (Source), Discharge (Load), Standby, Battery Emulation</td>
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<td><strong>Charge/Discharge Modes</strong></td>
<td>Constant-Voltage(CV), Current (CC), Power (CP), Series Resistance (CR)</td>
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<tr>
<td><strong>Charging Envelope</strong></td>
<td>0-40V, 32kW, 2400A</td>
<td>0-40V, 40kW, 3000A</td>
<td>0-40V, 48kW, 3600A</td>
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<tr>
<td><strong>Discharging Envelope</strong></td>
<td>1-40V, 4kW, 2400A</td>
<td>1-40V, 60kW, 3000A</td>
<td>1-40V, 72kW, 3600A</td>
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<tr>
<td><strong>Slew Rate</strong></td>
<td>Voltage: 0.012V/s – 80V/ms</td>
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<td><strong>Current</strong></td>
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<td>0.85A/s – 15kA/ms</td>
<td>1.02A/s – 18kA/ms</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>8kW/s – 32kWs</td>
<td>10kW/s – 40kW/ms</td>
<td>12kW/s – 48kW/ms</td>
</tr>
<tr>
<td><strong>Resistance</strong></td>
<td>2.5mΩ/s – 8.4Ω/ms</td>
<td>2.0mΩ/s – 6.7Ω/ms</td>
<td>1.7mΩ/s – 5.6Ω/ms</td>
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**Macro Test Profiles**
- **Development Source**: LabVIEW or PowerPanel
- **Maximum Steps**: 1000
- **Minimum Time Delay**: 50μS
- **Maximum Step Delay**: 1mS – 7 Days

**Programming**
- **Range**: 0-40V
- **Accuracy**: ±0.1% + 0.1%
- **Resolution**: ±0.005%

**Measurement (4-Wire)**
- **Range**: 0-40V
- **Accuracy**: ±0.05% + 0.05%
- **Resolution**: ±0.005%

**Control**
- **Communications**: LAN (Ethernet)
- **Drivers**: SCPI, VXI-11, LabVIEW (Non-OS Specific)
- **Software Tools**: Windows based applications including Power Panel, Firmware Update & Calibration

**Safety**
- **Isolation AC Input**: 1000V AC Input to DC Output/1000V AC Input to chassis
- **Isolation UUT Input**: 600V UUT to chassis
- **Programmable Limits**: Over-Voltage (OV), Under-Voltage (UV), Over-Power (OP), Internal Over Temperature
- **Interlocks**: External user input, emergency stop, and rear service doors
- **Watchdog Timer**: Continuously monitors control communications

**Physical**
- **Operating Temperature**: 0-35°C full power
- **Output Connections**: Buss Bars
- **Cabinet Dimensions (HxWxD)**: 83.25 x 56.56 x 34.5"/2115 x 1436 x 876mm including lift tabs and casters
- **Facility Input**: 3Φ, 50-60Hz 380VAC, 400VAC, 480VAC (input voltage to be specified at time of order)

**Input Power**
- **3Φ 380VAC**: 64 A, 80 A, 96 A
- **3Φ 400VAC**: 62 A, 77 A, 92 A
- **3Φ 480VAC**: 51 A, 64 A, 76 A
- **Cabinet Weight**: 2150lbs/975kg, 2450lbs/1111kg, 2750lbs/1247kg

**Calibration**
- Semi-Automatic, closed cover with standard lab equipment

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### Ordering Information

<table>
<thead>
<tr>
<th>Model Number Construction</th>
<th>Series</th>
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<th>Power Level (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9220-4904-48</td>
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<td>-4904</td>
<td>-48</td>
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</table>

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¹ Accuracies are % of Set + % of Range,
² Resolutions are % of Range unless otherwise indicated
³ Measurement Accuracies are % of Reading + % of Range

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