



Engineering Excellence in Test Stand Applications

UNICO BATTERY TESTERS

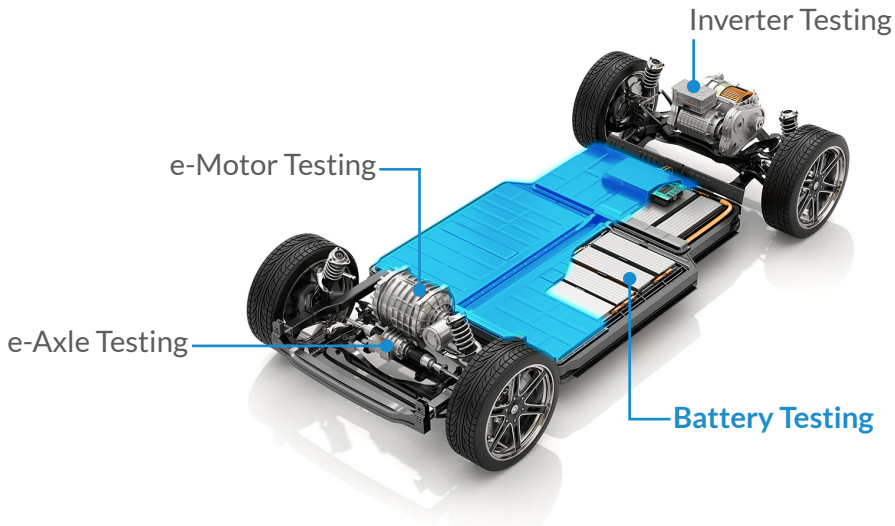
BAT600 SERIES

High Performance SiC Based Solutions



Unico's SiC based battery tester offers high performance, high voltage, and high power in a small package. Systems can be provided as a single or a multi-channel utilizing resonant converters for channel-to-channel isolation significantly reducing the size, cost, and energy needed for multiple battery test channels. An add-on remote filter enables the system to be used also as a battery emulator (see TST600 for battery emulation details).

APPLICATIONS



- Research and Development
- End of Line (EOL) Testing
- Characterization Testing
- Life Cycle & Endurance
- Safety Testing
- Environmental Testing



Performance



Reliability



Accuracy



Flexibility



Efficiency

BENEFITS



HIGH PERFORMANCE TRUE MULTI-CHANNEL

- Unico's SiC technology offers ultra high performance with standard switching frequencies up to 75kHz or more.
- True Multi-Channel capability offers high voltage and power in significantly smaller packages.



REDUCE POWER REQUIREMENTS

- Common DC-Bus Architecture recirculates the energy for multi-channel systems.
- Single AFE connection for multiple test stations reduces installation costs.



STANDARD DESIGN

- Proven durability and reliability.
- Faster commissioning.
- Configurable systems and custom systems also available.
- Single flexible control interface.

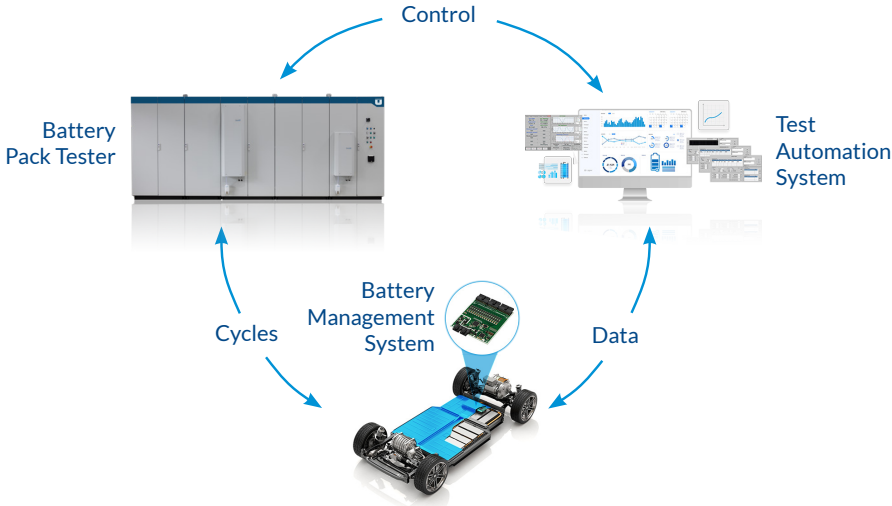


REDUCED DELIVERY TIMES

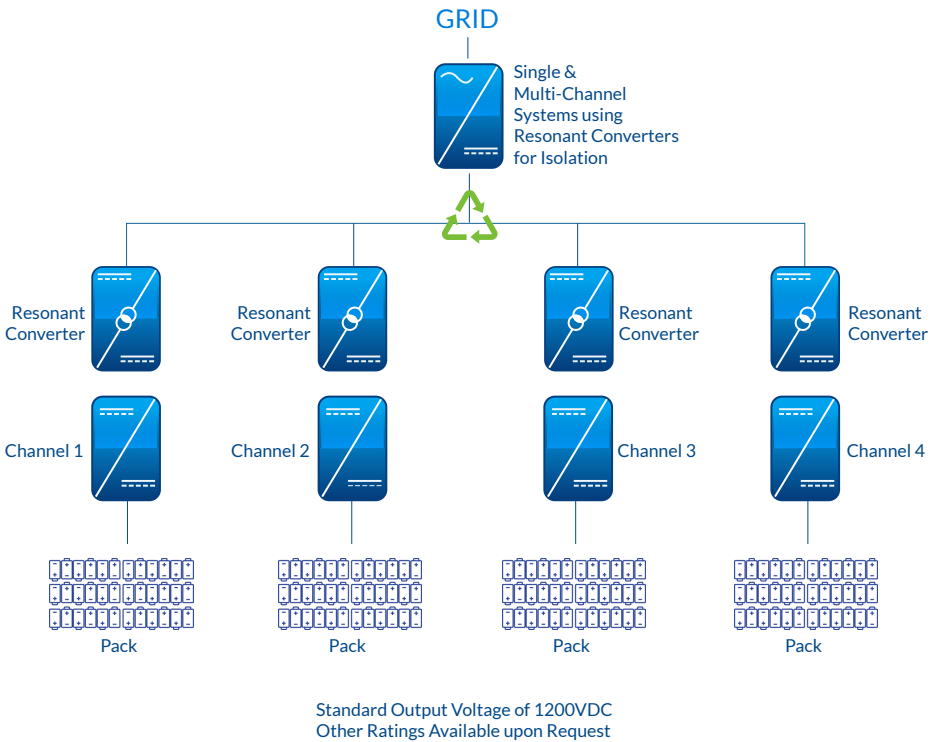
- Both in-stock and ready-to-build standard systems available.
- Configured standard systems have reduced delivery times over custom systems.

BATTERY PACK TESTER - BAT600 SERIES

The BAT600 Series from UNICO, offers a broad range of SiC based DC power solutions. Our solutions offer single channel or true multi-channel solutions for high voltage and high power applications in a wide range of packages from 200kW to 4000kW or more. The BAT600 Series offers a wide range of interfaces to provide simple and robust connections to your Test Automation System (TAS), allowing for optimal utilization and flexibility of your testing schedules.



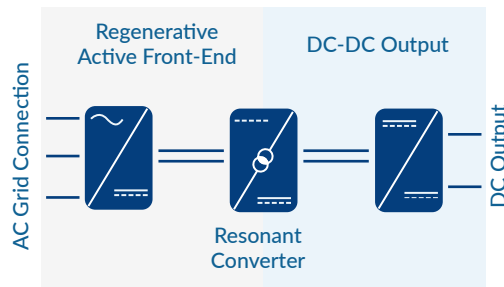
SIC BASED SYSTEMS WITH RESONANT CONVERTER ISOLATION



The SiC based battery testers from Unico are focused high performance, high voltage and high power, in true multi-channel capable solutions for a smaller footprint. The use of resonant converters for channel-to-channel isolation provide options for incredibly high efficiency battery cycling significantly reducing the test lab operating costs and power requirements.

- 200kW up to 1600kW Or More...
- Up to 6400kW With 4 Units in Parallel
- 50-1200VDC Half Bridge
0-1200VDC Full Bridge
- Voltage/Current/Power Control Modes
- Low Current Ripple
0.1% FS rms
- Current Measurement
 $\pm 0.05\%$ FS
- Low Voltage Ripple
0.1% FS rms
- Voltage Measurement
 $\pm 0.05\%$ FS

Battery Pack Testing



- High Speed Control
Up to 16kHz with EtherCAT
- HIL Integration
Real-time Interface
- Dynamic Current Response
10-90% FS in < 1ms
- Current Slew Rate
> 1000A/ms
- Remote Voltage Sense
Voltage Drop Compensation
- Integrated Isolation Monitoring
- Water Cooled
Quiet Operation
- No Isolation Transformer Required

The system is configured by selecting the desired full power of the system with the AFE selection, then picking the number of output channels (1 to 4) and needed output current. A wide selection of configurations are available with higher powers achieved by using systems in parallel and series.

DC OUTPUT CONFIGURATIONS

The SiC based battery testers can be configured with two possible output topologies. The half bridge topology which has a minimum output voltage of 50VDC and a full bridge topology which has a minimum output voltage of 0VDC.

The half bridge configuration of our systems allow for the most flexible and cost effective solution. In addition, if you need additional flexibility in your test facility, our half bridge configurations can be put in parallel for higher currents or in series for high voltages.

If your application needs true zero volt operation, such as fuel cell system testing, the DC output stage can also be provided in a full bridge configuration. This allows our system to operate with full power and performance down to 0VDC. However, due to the nature of the architecture, parallel and serial operation of multiple full-bridge systems is currently not possible.

DETAILED SPECIFICATIONS

Specifications	
Available Power Versions	Systems are available with a wide range of AFE powers from 200kW up to 1600kW, or more.
Output Current	Systems are available with current outputs of 1000A up to 4000A
Overload Current	125% (Other values available as configurable or custom systems)
Output Voltage	Half bridge: 50-1200VDC, Full bridge: 0-1200VDC (Other output voltages available upon request)
Power Device	SiC (See BAT500 for IGBT solutions)
PWM Switch Frequency	75kHz Typical
Control Modes	Voltage, Current, Power
Measuring Ranges	0.05% (+/- 0.01% with Calibration @ 100Hz)
Voltage Measuring Accuracy	Better than 0.05% FS
Current Measuring Accuracy	Better than 0.05% FS
Current Control Accuracy	Better than 0.2%
Voltage Control Accuracy	Better than 0.2%
Voltage Thermal Drift	0.0003% / °C
Performance Dynamics	1000A/ms Typical
Voltage Ramp (10-90% FS)	Not Applicable for Battery Testing
Current Ramp (10-90% FS)	<1.0ms
Current Response (Typical)	±2.0% Typical
Current Ripple	1.5%
DC Voltage Ripple	0.1% rms of full scale
Power Factor	0.99
Efficiency	Better than 95%

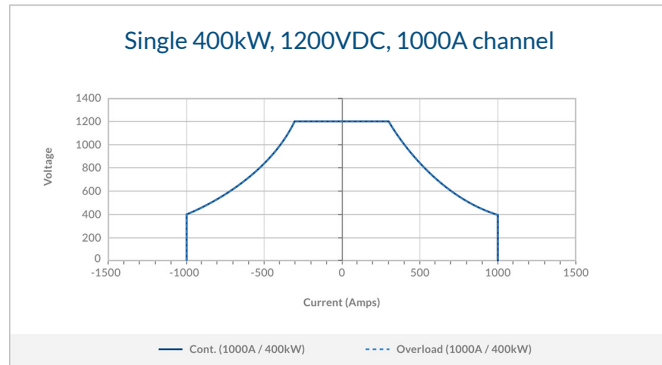
Specifications	
AC Input	Isolation transformer can be selected with your desired input voltage.
Ambient	Up to 40°C, max 1000m above sea level, 95%RH non-condensing
Enclosure	IP54 / NEMA 1 (other options available upon request)
Cooling	Water cooled or air-conditioned racks available
Rack Paint	RAL 7035 rough semi-gloss poly powder finish
Certification Compliance	UL, CE (other certifications available)
Control Modes	Voltage, Current, Power
Control	Local and remote
Built-in Remote Interface Safety and	Analog as well as RS-422, RS-485, two ports (other interface and protocol, see options below)
Control Interlocks	Hardwired, opto-isolated, software configurable
Data Logging	Data sampler through UEdit®
Battery Emulator	Optional. See battery emulator brochure TST600

Options	
Isolation Transformer	Required. UNICO can offer, or you can supply.
Cabinet Paint Finish	Customer specific color cabinets can be ordered as a configurable or custom system
External Communication Interface (2x Interface Per Cycle)	<ul style="list-style-type: none"> • CAN open • Ethernet • Modbus Plus • ControlNet • Interbus • Profibus Master • CC-Link • EtherCAT(async) • Profibus DPV1 • ControlNet • LonWorks • EtherCAT (sync)

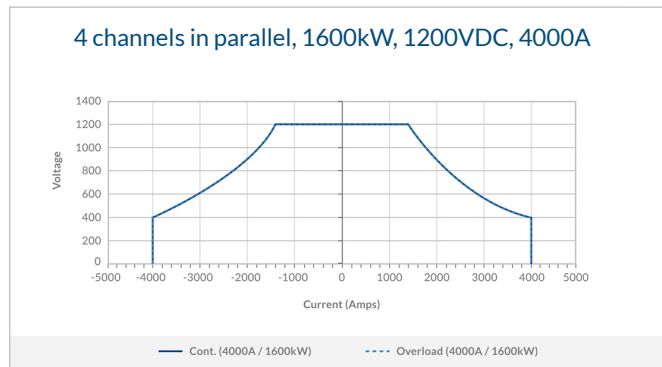
* Performance Specifications are assuming a 600VDC battery with a DCIR=10mΩ and half bridge configuration
 System Full Scale Voltage: 1200VDC
 System Full scale Current: 1000A

The BAT600 Series of Battery Pack Testers from Unico offer an effective and efficient solution for all your battery test requirements. If your exact needs are not met by our range of standard products, please contact Unico to discuss our configurable and custom design options.

SAMPLE POWER CURVES



Example of a single channel with overload



Example of four channels in parallel with overload

Sample power curves are the examples of some system configurations built from our portfolio of different active front ends and DC output sections. Samples are from single systems and from multiple systems in parallel.

Half-bridge versions of our systems can also be put in series for up to 2400VDC with standard configurations. Systems can also be ordered with customer DC output combiners which incorporate DC contactors and a control PLC to automatically put channels in parallel or series.



Specifications are subject to change without notice

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