Battery Emulator vs. Bi-directional Power Supplies for Battery Simulation: Top 8 Considerations

01 SERIES RESISTANCE

Does it Ensure Accurate Simulation of Real World Conditions?

A key feature of battery simulation is having a built-in programmable series resistance with low-capacitance. NHR Battery Emulators have a programmable series resistance that is built into the hardware vs. only the software. This ensures accurate testing of real world conditions. As in a real battery, NHR Battery Emulators adjust the output voltage depending on the direction and amplitude of current flow.

02 CAPACITANCE

Is Capacitance Good or Bad?

Battery emulators with low output capacitance provide accurate simulation of series resistance effects, allowing the output voltage to adjust proportionally to changes in current. By comparison, many regenerative power supplies have high output capacitance to reduce noise output, but this negates the series resistance functionality and can lead to inaccurate battery simulation.

03 SAFETY

Is Safety Designed into the Product?

Power supplies generally require add-ons for safety contactors and do not have additional safety features such as interlocks, e-stops, etc. Adding these components is time intensive and significantly complicates the test set up, adding time delays and additional labor costs. NHR Battery Emulators have all of these, as well as multiple layers of safety, built-in.

04 SUPPORT

Who do I Contact for Support?

There is no single point of contact when building your own system with bidirectional power supplies. Software, additional safety features, or integration challenges fall on the user to resolve, adding time and cost. NHR is an expert in battery simulation and your partner in test.

05 SET ACCURACY

How Accurate is the System?

Power supplies generally only specify load/line regulation (how much an output can change under various line/load conditions), but does not account for the set accuracy or requested output. NHR clearly documents empirical control accuracy for all conditions including load/line and error from your requested value.

06 MEASUREMENT ACCURACY

What is the Measurement Accuracy?

Power supplies are general purpose products, and battery specific measurements such as Ahr or kWhr are often left to the user's software to track and determine. NHR Battery Emulators take precision battery test measurements directly in the hardware, making programming simpler and more effective.

07 SET METHODS & CONTROL

How Easy is it to Use and Control?

Power supplies involve significant software program development before testing can begin. NHR Battery Emulators have operating modes designed to support battery emulation, and our software solutions provide ready to go control solutions to eliminate integration time and effort.

08 CONTROL SPEED

Will the Control Speed Meet Real-World Conditions?

Power supplies generally have high output capacitance, providing much slower response rates. NHR Battery Emulators are designed with low output capacitance for very fast change of set points to accurately emulate real world conditions.