Product Brief

NHR 4800 Battery Cycler

A Highly Versatile and Compact Battery Cycler for Testing and Validation of Batteries, Fuel Cells, Energy Storage Systems, and More!

High Density, Small Footprint, Fully Integrated Battery Cycler and Emulator

The NHR 4800 is a highly versatile and compact battery cycler capable of delivering high-power performance in a 4U chassis. The multifunctional battery cycler can also serve as a DC source, DC load, battery emulator, and amplifier for power-level hardware-in-the-loop (PHIL) testing. The 4800 delivers up to 80VDC and 400A in a single unit while delivering scalable power ranging from 16.5kW up to 165kW. The fully integrated battery cycler includes isolation contactor relays, pre-charge circuitry, and a reverse polarity checker. In addition to battery cycling (sourcing and loading), the 4800 includes a wide range of additional operating modes including a built-in battery cycling profile controller, Arbitrary Profiles (XY and Macros), Sinusoidal on DC, Maximum Power Point Tracking (MPPT) and more. The battery emulation mode allows for accurate emulation of batteries or other bi-directional DC busses for test applications that use batteries such as powertrain and propulsion, EV fast charging, and more. The PHIL feature provides additional testing capability that is especially required in research applications. The versatile system with integrated safety features can replace multiple instruments in research, validation, and production environments. The 4800 can be operated from an integrated touch panel or using SCPI commands in LabVIEW and Python.

An Auto-Ranging Operating Envelope that Delivers

The 4800 provides a very wide operating envelope with higher current and power capability to meet your testing needs. Unlike traditional supplies which have a maximum power at only one voltage/current, the 4800 output automatically adjusts providing more current at lower voltages resulting in a much wider operating envelope with a constant power curve. For example, the 80V model provides up to 400A and 16.5kW of power far exceeding the power capabilities of competitive autoranging models.

Applications

Electric Vehicles, Electric Trucks, Electric Flight, Energy Storage, Marine, Fuel Cells, Industrial, Test Labs

Key Features

- Fully integrated battery cycler: built-in isolation contactor relays, pre-charge circuit, reverse polarity checker
- Voltage models from 80VDC
- Modular and scalable power (Parallel)
- High power density in 4U chassis
- High Performance Source and Regenerative Load
- Regenerative power > 90% (Typical)
- SiC-based technology
- Fast transient speeds: Slew Rate < 1.5mS
- Modes: Charge/Discharge, Load, and Battery Emulation
- Optimize battery connections to minimize hazards
  - Low output capacitance relay isolated from UUT
  - Automatic soft-start re-charge function - Inrush Limiting
- Power Hardware-in-the-Loop (PHIL) Capability
- Air-cooled (no liquid cooling) provides simplified maintenance
- Advanced digital measurements
- Control options: touch panel and SCPI

4800 Compact Battery Cycler Specifications

MODEL NUMBER	80V 4808-16		
Power	16.5kW at 480VAC, reduced power of 13 KW at other input voltages		
Voltage Ranges	80V	Maximum Current	400A
Voltage Regulation Capability			
Accuracy	0.05% Set + 0.05% Range Measurement: 0.05% Reading + 0.05% Range Resolution 0.005% Range		
Programmable Range	0 – 102% Rating	Rise Time (± 90%)	< 4 mS
Line Regulation	0.05% Range		
Current Regulation Capability			
Accuracy	0.1% Set + 0.1% Range	Line Regulation	0.05% Range
Measurement	0.1% Reading + 0.1% Range Resolution 0.005% Range	Rise Time (± 90%)	< 4 mS
Programmable Range	0 – 102% Rating		
Power Regulation Capability			
Accuracy	0.12% Set + 0.12% Range Measurement: 0.12% Reading + 0.12% Range Resolution 0.005% Range		
Range	V Range * I Range	Programmable Range	0 – 100% Rating
Programming Capability			
Operating States Regulation	Charge (Source), Discharge (Load), Standby, Battery Emulation, AC on DC, MPPT (Load), XY, Battery Test, Arbitrary, Analog Control		
Set Point Limits	Constant-Voltage (CV), Current (CC), Power (CP), Series Resistance (CR)		
Trip Point Limits	V Min/Max, I Max (per direction), W Max (per direction)		
Macro Test Profiles			
Development Source Max.	Touch-Panel, Import from Excel, or User's System Controller	Max. Step Delay	1 mS - 7 days
Steps	1 profile up to 1000 or 2 profiles up to 500	Repeat Count	1 – 1000 times (or continuous)
Min.Time Delay	50 µS		
Control			
Local User Int.	Touch-Panel with graphic meters and controls plus Macro screens	Analog Current Monitor	±10 V representing -10 V full range loading and +10 V full range sourcing
Ext. Sys. Comm.	LAN (Ethernet) using SCPI	Analog Voltage Monitor	0 to +10 V full scale voltage
Analog Inputs	Two Analog Inputs also usable as additional DAQ measurement input	External Input	External input Interlock input and power-off (eOff) input
Digital	4 Digital Inputs / 3 Digital Outputs	Software Watchdog	Programmable
Physical (Single 4U Module)			
Connectors	Main power through buss bars	Input Power	3ø, 50 – 60 Hz, 380 VAC to 480 VAC @ 22 A. Output Power reduced below 360 VAC input
Cabinet Dim. (HxWxD)	19" x 6.97" (4U) x 37.35" (incl. rack mount tab)	Internal Mon.	Over-Volt., Over-Current, Over-Power, Over-Temp
Cabinet Weight	115 LBS	Input Isolation UUT Input	500 VDC UUT Output to Chassis
Operating Temp.	0 - 35°C full power	Isolation AC	2500 VDC Mains to Chassis & Mains to UUT Output

** Voltage as measured at input terminals of Power Module. Note: Waveform Measurement up to 64k Samples at up to 1MegSamp/Sec

System Integration on Your Terms

NI offers a variety of solution integration options customized to your application-specific requirements. You can use your own internal integration terms for full system control or leverage the expertise of our worldwide network of partners to obtain a turnkey system.

To learn how you can increase product quality and shorten test timelines, contact your account manager or NI at (888) 280-7645 or info@ni.com.

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