

PRODUCT SHEET 1.1 | JUNE 2024



nyobolt

INDUSTRIAL

Robotics - AMR



The Nyobolt battery is the material handling industry's first extreme fast charging lithium-ion battery.

The battery incorporates Niobium Tungsten Oxide (NWO), a next generation Li-ion battery technology, for a safe, reliable, high-power performance over many cycles.

This performance is possible in the most challenging of environments from freezing cold to intense heat.

Combined with innovative low impedance pack design and advanced thermal engineering, this module delivers an extreme fast-charge in < 5 minutes.



extreme fast-charge in
< 5 minutes



high performance from
freezing cold to intense heat



high-power performance



many cycles

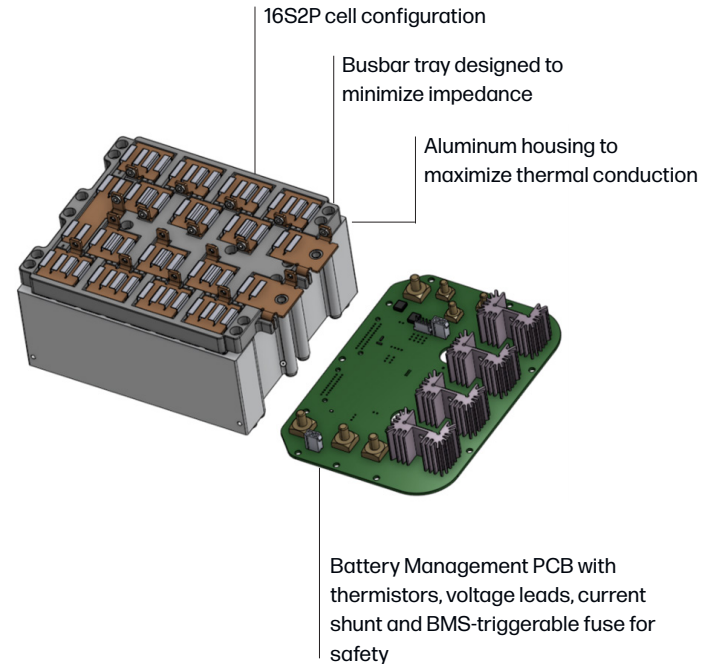
Key Features	Battery Performance Attribute	Benefits for Material Handling
Extreme Fast Charging	0-100% full charge in < 5 minutes	Maximize picks per hour by reducing time spent out of service on a charger Eliminate the need for dedicated charging bays, freeing up warehouse floor space
Remarkable Power Density	>10 kW/L delivered in a compact and lightweight design	Faster lift and navigation speed with a lighter battery increases payload capacity
Advanced Thermal Design	Low impedance, high roundtrip efficiency cell technology designed into thermally optimized pack design	Operate continuously without the risk of overheating at high ambient temperatures
Extended Cycle Life	15,000 to 20,000 full SoC charge-discharge cycles	Lower total cost and the need for replacement batteries with a NWO battery that has 10x the life standard Li-ion
Wide Temperature Operability	Charge and discharge from -20°C to 60°C	Operate in all warehouse environments, including ambient, refrigerated and freezer
Advanced Battery Management System	Accurate State of Charge, State of Power, and State of Health data monitoring with predictive estimation and early fault detection capability stored on-board or communicated via wireless or CAN	Track and optimize AMR tasking based on battery and system performance Schedule preventative maintenance
Modular Design	Multiple modules can be interfaced to communicate centrally	Easily integrated as a retrofit with the option to size the battery to match AMR route and operation requirements
Protection Features	Dedicated protection chip with configurable levels for voltage, current and temperature	Enhance operational safety with active and passive protection features
Enhanced Safety	Certified to UL2271 and UN38.3	Reassured safety during operation, transportation, and storage

Battery Specifications

Description	Value
Nominal Voltage	35.2V
Voltage Range	16V - 48V
Rated Capacity / Energy	6 Ah / 211 Wh
Max Continuous Charge / Discharge Current	90A (15C)
Max Pulse Charge / Discharge Current	180A (30C)
Operating Temperature	-20 to 60 °C
Cooling	Passive (Customizable to Bot)
Full Depth-of-Discharge Cycle Life to 80%	15,000 to 20,000 cycles
Partial Depth-of-Discharge (Micro) Cycle Life*	3,000,000 cycles*
Dimensions	Retrofit to AMR
BMS Functions	SoC, SoP, and SoH Estimation Accuracy >97%, Passive Cell Balancing, Passive and Active Warnings and Faults

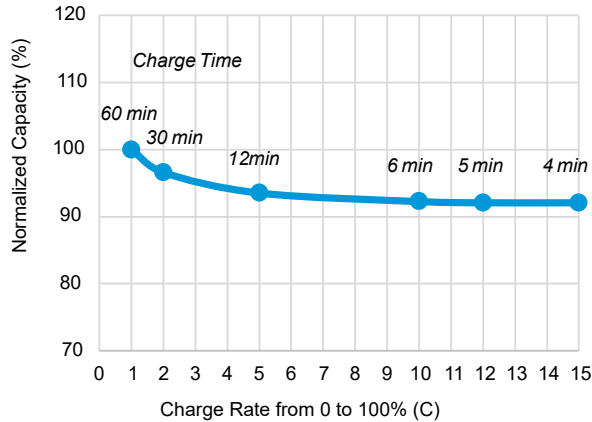
* Dependent on robot duty cycle

Battery Pack Components



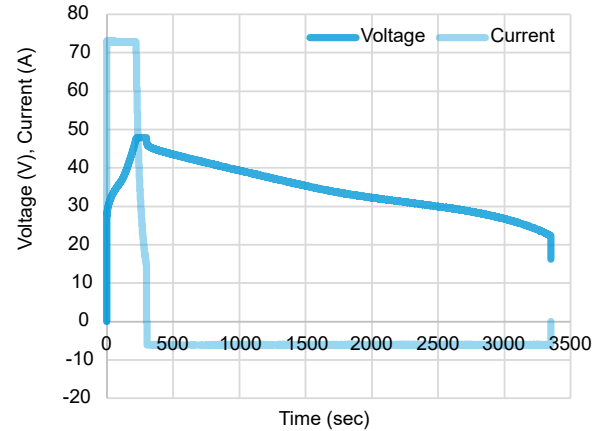
Performance Data

Capacity retention as a function of charge rate and time



Discharge capacity retention reported after a time limited constant current constant voltage (CCCV) fast charge at the indicated c-rate.

5-minute Fast Charge Polarization Curve



Current and voltage reported after a 5-min, 12C CCCV Charge, 5-sec rest, and then 1C discharge.

Nyobolt builds high performance battery packs ranging from 18V to 800V using cells sized from 3Ah to 65Ah. Please reach out to learn how this AMR battery pack can be customized to match your requirements.



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More power in less time

To find out more visit
www.nyobolt.com

Or contact us at
product@nyobolt.com

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