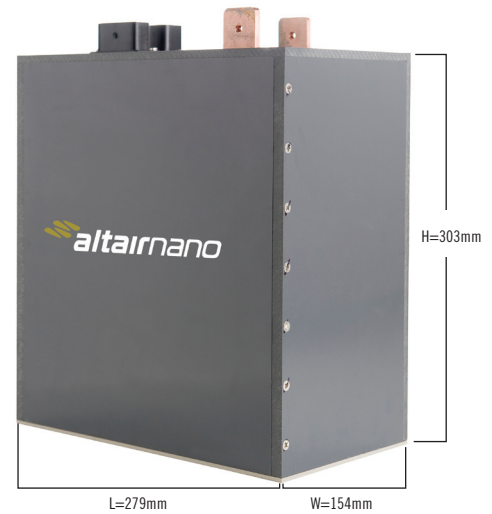


24 V 60 Ah Battery Module

NANO LITHIUM-TITANATE BATTERY MODULE

- High power without sacrificing energy storage
- Ability to recover without capacity loss from a complete discharge
- Higher levels of operational abuse tolerance than existing batteries
- Virtually maintenance free
- Rugged capabilities – duty cycle, safety, long calendar and operational life
- Symmetrical C-rate charge/discharge ideal for regenerative braking applications



Performance Characteristics

Voltage range	17.0 V – 27.5 V
Nominal capacity	60 Ah
Typical discharge energy (60 amp [1C rate] at 25°C, CCCV charge)	1,400 Wh
Peak power (10 sec pulse 50% SOC, at 25°C) (discharge/charge)	21.9 kW/34.3 kW
Energy density	106 Wh/l
Power density ¹	1,673 W/l
Specific energy	51.9 Wh/kg
Specific power ¹	799 W/kg
Internal charge impedance (10 sec DC pulse 50% SOC, at 25°C)	4 mΩ typical
Internal discharge impedance (10 sec DC pulse 50% SOC, at 25°C)	3.8 mΩ typical
Max continuous charge	360 A
Max continuous discharge	360 A
Pulse charge/discharge rate (10 sec pulse)	Up to 600 A max

Life Characteristics

Cycle life at 2C charge and 2C discharge, 100% DOD, 25°C	>16,000 to 80% initial capacity
Cycle life at 2C charge and 2C discharge, 100% DOD, 55°C	>4,000 to 80% initial capacity
Calendar life at 25°C	25 years

Temperature Limits

Operating and Storage temperature range ²	-40°C to +55°C cell temperature
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Voltage Limits³

Discharge cut off voltage at -40°C to +30°C	17.0 V
Discharge cut off voltage at +30°C to +55°C	19.0 V
Charge cut off voltage at +20°C to +55°C	27.0 V
Charge cut off voltage at -40°C to +20°C	27.5 V

Module Dimensions

Length (L) x Width (W) x Height (H)	279 mm x 154 mm x 303 mm
Weight	27.4 kg

Design Standards

Transportation Specifications	UN 3090, UN 3480 compliant
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¹ Power at 25°C for 10 sec pulse.

² Optimal storage temperature is 25°C.

³ In battery systems, the battery management system must enforce the voltage limits at the individual cell level, listed module voltages are estimates.

*Material Safety Data Sheet — Altairnano Document Number 3333272 — is available upon request.

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