

# 12V Sodium-Ion Battery



**12V**

NOMINAL  
VOLTAGE

**30–100Ah**

CAPACITY  
RANGE

**3K+**

CYCLE  
LIFE

**95%**

ROUND-TRIP  
EFF.

**-40/+60°C**

OPERATING  
TEMP

**Zero**

MAINTENANCE

**10yr+**

DESIGN  
LIFE

**IP65**

ENCLOSURE  
RATING

**ENERGY STORAGE YOU CAN BANK ON**

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# Series S 12V Battery

- Sodium-Ion NFPP
- Drop-In Lead-Acid Replacement
- 30 / 60 / 100 Ah Models



The Series S 12V is a direct drop-in replacement for lead-acid batteries across mobility, off-grid, marine, and commercial applications. Built on Coulomb Technology's Sodium-Ion NFPP chemistry, it delivers **10x longer cycle life**, zero maintenance, and a 40% weight reduction — with no thermal runaway risk and no toxic materials.

**Available in three capacity configurations:**

- Series S 12V — 30Ah (360 Wh)
- Series S 12V — 100Ah (1.2 kWh)
- Standard BCI group form factors
- Series S 12V — 60Ah (720 Wh)
- Integrated BMS with cell balancing
- Bluetooth monitoring (optional)

KEY BENEFITS



**Zero Thermal Runaway**

Sodium-Ion NFPP chemistry is inherently non-flammable — no thermal runaway risk, no toxic gas emissions, and no special shipping restrictions.

- ✓ Air-shippable — no hazmat restrictions
- ✓ No hydrogen gas emissions
- ✓ Non-toxic, fully recyclable
- ✓ Simpler installation approvals



**Extreme Temperature Range**

Operates from -40°C to +60°C without derating — outperforming lead-acid in cold climates and high-heat environments alike.

- ✓ -40°C to +60°C discharge range
- ✓ No capacity loss in cold weather
- ✓ 3,000+ cycles at 80% DoD
- ✓ 10+ year design life

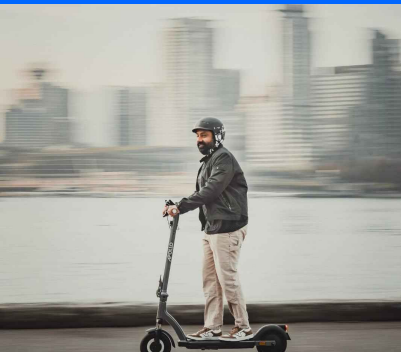


**True Drop-In Replacement**

Standard 12V form factor with BCI-compatible dimensions — replaces lead-acid with no system modifications, no new chargers, no rewiring.

- ✓ BCI group-compatible dimensions
- ✓ Works with existing chargers
- ✓ Zero maintenance — no watering
- ✓ 40% lighter than lead-acid

WHERE THE SERIES S PERFORMS



**GOLF CARTS / SCOOTERS / LIGHT EV**

**Mobility & Light EV**

Direct replacement for lead-acid in golf carts, electric scooters, and light electric vehicles — with 3x the range per charge and zero maintenance.



**MARINE / RV / OFF-GRID Marine & Off-Grid Power**

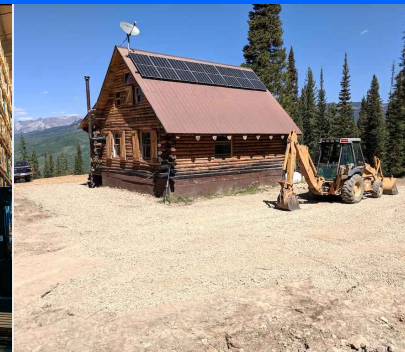
Lightweight, vibration-resistant, and fully sealed for marine, RV, and off-grid solar applications — with no outgassing and no watering required.



**FORKLIFTS / WAREHOUSE / LOGISTICS**

**Material Handling**

Fast charging and extreme temperature tolerance for 24/7 warehouse operations — forklift fleets, pallet jacks, and automated guided vehicles.



**TELECOM / UPS / CRITICAL BACKUP**

**Backup & Telecom Power**

Reliable backup power for telecom towers, UPS systems, and critical infrastructure — with 10+ year design life and zero maintenance overhead.

# Specifications

SERIES S — 12V BATTERY



NOMINAL VOLTAGE

**12v**

12.8V nominal (4S NFPP)

CAPACITY RANGE

**30-100Ah**

Three models available

CYCLE LIFE

**3K+**

At 80% DoD, 25°C

WEIGHT (100AH)

**13kg**

40% lighter than lead-acid

OPERATING TEMP

**-40/+60°C**

Discharge range

EFFICIENCY

**95%**

Round-trip efficiency

PARAMETER	VALUE / DESCRIPTION	UNIT
NOMINAL VOLTAGE	12.8 (4S configuration)	VDC
CAPACITY — 30AH MODEL	30 (360 Wh)	Ah
CAPACITY — 60AH MODEL	60 (720 Wh)	Ah
CAPACITY — 100AH MODEL	100 (1,200 Wh)	Ah
USABLE CAPACITY	80-100% DoD (vs. 50% lead-acid)	—
CYCLE LIFE	3,000+ @ 80% DoD, 25°C	—
CELL TYPE	Sodium-Ion NFPP (Non-Flammable Polymer Pouch)	—
DISCHARGE TEMP RANGE	-40°C to +60°C	—
CHARGE TEMP RANGE	-10°C to +45°C	—
SELF-DISCHARGE RATE	<3% per month	—
ROUND-TRIP EFFICIENCY	~95%	—
BMS COMMUNICATION	Integrated BMS; optional Bluetooth monitoring	—
ENCLOSURE RATING	IP65 — sealed, vibration-resistant	—

CERTIFICATIONS

UL 1973

UL 9540

UN 38.3

Cell & Module Level

UL 9540A TESTING

Cell: Tested & Passed

Module/System: In Progress

WARRANTY

Cell: 3 Years

System: 5 Years

Extended warranty available

QUALITY ASSURANCE & TEST SCOPE

- ✓ Visual, Mechanical & Dimensional Inspection
- ✓ 3 × 0.2C Capacity Verification (80% DoD)

- ✓ BMS Protections & Isolation Tests
- ✓ Baseline OCV & Self-Discharge Measurement

- ✓ Functional & Conditioning Cycles
- ✓ Vibration & IP65 Seal Verification

- Performance
- Safety
- Total Cost of Ownership

## WHY SODIUM-ION NFPP OUTPERFORMS LEGACY LEAD-ACID TECHNOLOGY

### A Clear Advantage Across Every Performance Dimension

Coulomb Technology's Sodium-Ion NFPP chemistry delivers superior cycle life, wider operating temperature range, zero maintenance, and a fundamentally safer chemistry — making it the ideal replacement for lead-acid in critical commercial and industrial applications.

FEATURE	SODIUM-ION NFPP	LEAD-ACID
Cycle Life	<b>3,000+ cycles @ 80% DoD</b>	300–500 cycles @ 50% DoD
Weight (100Ah)	<b>13 kg (28.7 lb)</b>	~22 kg (48.5 lb)
Usable Capacity	<b>80–100% DoD</b>	50% DoD (to preserve life)
Discharge Temp Range	<b>–40°C to +60°C</b>	–20°C to +50°C
Charge Temp Range	<b>–10°C to +45°C</b>	0°C to +40°C
Maintenance	<b>Zero maintenance</b>	Regular watering & equalization
Self-Discharge	<b>&lt;3% per month</b>	5–15% per month
Charging Efficiency	<b>~95%</b>	~75%
Thermal Runaway Risk	<b>Zero risk</b>	Low risk
Toxic Gas Emissions	<b>None</b>	Hydrogen gas during charging
Memory Effect	<b>None</b>	Sulfation if undercharged
Lifespan	<b>10+ years</b>	3–5 years
Environmental Impact	<b>Non-toxic, recyclable</b>	Lead & acid hazardous

# 10×

Longer cycle life  
vs. lead-acid

# 40%

Lighter weight  
per 100Ah

# Zero

Maintenance  
required

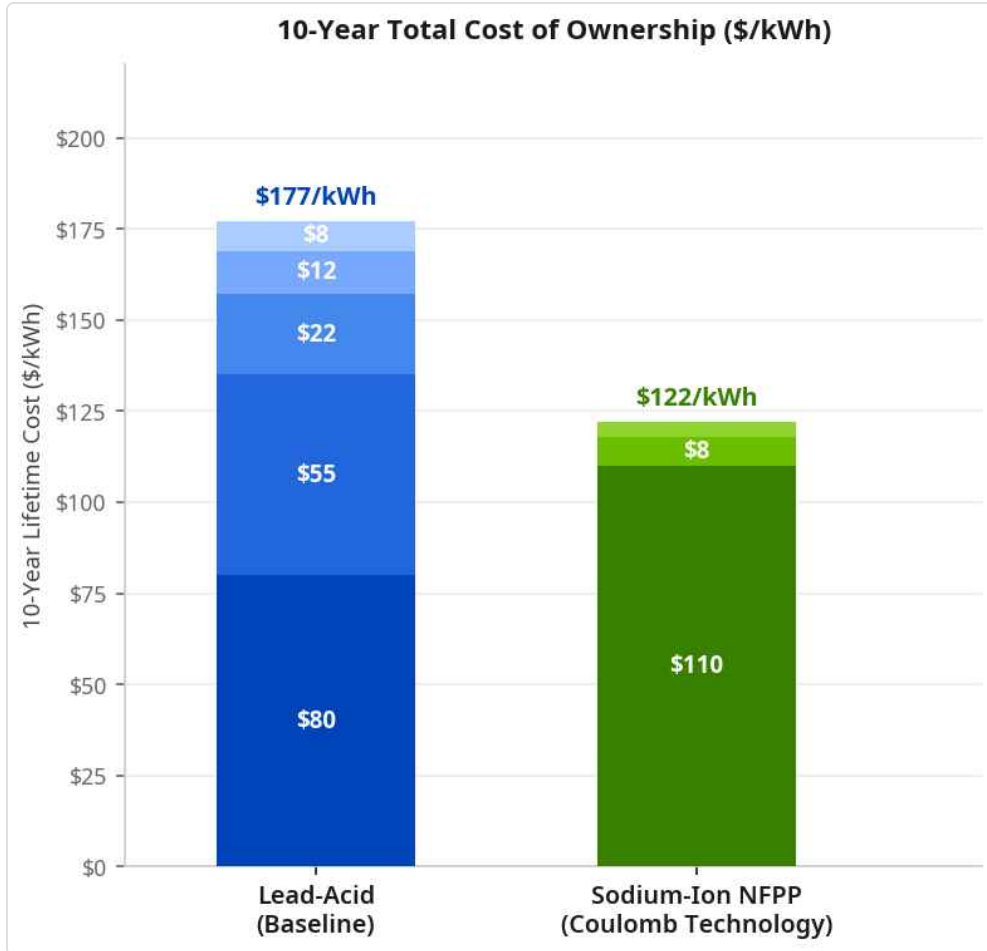
# 95%

Round-trip  
efficiency

SYSTEM ADVANTAGE OVER LEAD-ACID

## 31% Lower Total Cost of Ownership Over 10 Years

Sodium-Ion NFPP eliminates replacement costs, maintenance overhead, and hazardous disposal — delivering a 31% lower 10-year TCO vs. lead-acid, validated by real-world deployments.



MODEL ASSUMPTIONS

Lead-acid replacement cycle	3-5 yr
NFPP design life	10+ yr
Analysis period	10 yr
Lead-acid replacements	2x
Maintenance cost delta	100%
Weight savings (100Ah)	40%
Charging efficiency delta	20%
Discount rate / NPV calc	8%

COST COMPONENTS

- Lead-Acid — CapEx
- Lead-Acid — Replacement
- Lead-Acid — O&M
- Lead-Acid — Disposal
- NFPP — CapEx
- NFPP — O&M
- NFPP — Disposal
- Lead-Acid — Downtime

**31% Lower TCO** — \$122/kWh (NFPP) vs. \$177/kWh (Lead-Acid) over 10 years. Savings driven by eliminated replacements, zero maintenance, and lower disposal costs.

**31%** — Lower 10-year TCO vs. lead-acid (\$122 vs. \$177/kWh)

**Zero** — Maintenance cost — no watering, no equalization

**10yr+** — Design life vs. 3-5 years for lead-acid

RESEARCH & DEVELOPMENT PARTNERS

