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SERIES — M

48V Traction Battery Pack

48V	100–200Ah	3K+	95%	−40/+60°C	Zero	10yr+	IP65
NOMINAL VOLTAGE	CAPACITY RANGE	CYCLE LIFE	ROUND-TRIP EFF.	OPERATING TEMP	MAINTENANCE	DESIGN LIFE	ENCLOSURE RATING

ENERGY STORAGE YOU CAN BANK ON

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PRODUCT OVERVIEW

Series M 48V Traction Battery

- Sodium-Ion NFPP
- Drop-In Lead-Acid Traction Replacement
- 48V / 300Ah / 14.4 kWh

The Series M 48V is a direct drop-in replacement for lead-acid traction batteries in forklifts, golf carts, airport ground support equipment, and industrial vehicles. Built on Coulomb Technology's Sodium-Ion NFPP chemistry, it delivers **6,000+ cycle life**, zero maintenance, and a 30% weight reduction — with no thermal runaway risk and no toxic materials.

Key system features:

- 48V / 300Ah / 14.4 kWh configuration
- Integrated smart BMS with CAN bus
- Standard traction connector interface
- 16S2P prismatic sodium-ion cell stack
- Opportunity charging compatible
- Remote monitoring & diagnostics

KEY BENEFITS

Zero Thermal Runaway

Sodium-Ion NFPP chemistry is inherently non-flammable — no thermal runaway risk, no toxic gas emissions, and no special handling requirements in confined warehouse environments.

- ✓ No hydrogen gas emissions during charging
- ✓ Safe for indoor charging without ventilation
- ✓ Non-toxic, fully recyclable chemistry
- ✓ Simplified fire suppression requirements

Opportunity Charging

Accepts partial charges without memory effect — enabling opportunity charging during breaks to maximize fleet uptime without battery degradation.

- ✓ No memory effect — partial charges safe
- ✓ Fast charge to 80% in under 2 hours
- ✓ 6,000+ cycles at 80% DoD
- ✓ 10+ year design life

Zero Maintenance

Eliminates watering, equalization, and acid spill cleanup — reducing total fleet maintenance costs and freeing technicians for higher-value work.

- ✓ No watering or equalization required
- ✓ No acid spills or corrosion risk
- ✓ 40% reduction in fleet maintenance labor
- ✓ 30% lighter than equivalent lead-acid

WHERE THE SERIES M PERFORMS

FORKLIFTS / PALLET JACKS / AGVS

Warehouse & Logistics

Opportunity charging and zero maintenance for 24/7 warehouse operations — forklift fleets, pallet jacks, and automated guided vehicles.

GOLF CARTS / RESORT / HOSPITALITY

Golf & Resort Fleets

Drop-in replacement for lead-acid in golf cart fleets — with 3× the range per charge, zero watering, and no acid spill risk on turf.

AIRPORT / GROUND SUPPORT / GSE

Airport Ground Support

Reliable power for baggage tugs, belt loaders, and ground support equipment — with fast opportunity charging between flights and zero emissions.

UTILITY VEHICLES / CAMPUS / SECURITY

Utility & Campus Fleets

Zero-emission utility vehicles for campus security, grounds maintenance, and facility operations — with all-day runtime and overnight charging.

TECHNICAL DATA SHEET

Specifications

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SERIES M — 48V BATTERY

NOMINAL VOLTAGE
48V
51.2V nominal (16S NFPP)

CAPACITY
300Ah
14.4 kWh usable energy

CYCLE LIFE
6K+
At 80% DoD, 25°C

WEIGHT
125kg
30% lighter than lead-acid

OPERATING TEMP
−30/+55°C
Discharge range

EFFICIENCY
95%
Round-trip efficiency

PARAMETER	VALUE / DESCRIPTION	UNIT
NOMINAL VOLTAGE	51.2 (16S configuration)	VDC
CAPACITY	300 (14,400 Wh)	Ah
CELL CONFIGURATION	16S2P prismatic sodium-ion pouch cells	—
USABLE CAPACITY	80–100% DoD (vs. 50% lead-acid)	—
CYCLE LIFE	6,000+ @ 80% DoD, 25°C	—
CELL TYPE	Sodium-Ion NFPP (Non-Flammable Polymer Pouch)	—
DISCHARGE TEMP RANGE	−30°C to +55°C	—
CHARGE TEMP RANGE	−10°C to +45°C	—
SELF-DISCHARGE RATE	<3% per month	—
ROUND-TRIP EFFICIENCY	~95%	—
BMS COMMUNICATION	Integrated smart BMS; CAN bus / RS-485	—
CONNECTOR INTERFACE	Standard traction connector (SB350 / custom)	—
ENCLOSURE RATING	IP54 — dust and splash 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
- ✓ BMS Protections & CAN Bus Communication Tests
- ✓ Functional & Conditioning Cycles
- ✓ 3 × 0.2C Capacity Verification (80% DoD)
- ✓ Baseline OCV & Self-Discharge Measurement
- ✓ Vibration & IP54 Seal Verification

TECHNOLOGY COMPARISON

Sodium-Ion NFPP vs. Lead-Acid Traction

- Performance
- Safety
- Total Cost of Ownership

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

A Clear Advantage Across Every Performance Dimension

Coulomb Technology's Sodium-Ion NFPP chemistry delivers superior cycle life, opportunity charging capability, zero maintenance, and a safer operating profile — making it the definitive upgrade for lead-acid traction battery fleets.

FEATURE	SODIUM-ION NFPP	LEAD-ACID TRACTION
Cycle Life	**6,000+ cycles @ 80% DoD**	1,000–1,500 cycles @ 50% DoD
Weight (300Ah / 48V)	**125 kg**	~180 kg
Usable Capacity	**80–100% DoD**	50% DoD (to preserve life)
Discharge Temp Range	**−30°C to +55°C**	−20°C to +45°C
Opportunity Charging	**Full support — no degradation**	Not recommended — reduces life
Maintenance	**Zero maintenance**	Weekly watering & equalization
Hydrogen Gas Emissions	**None**	Emitted during charging
Charging Efficiency	**~95%**	~75%
Thermal Runaway Risk	**Zero risk**	Low risk
Memory Effect	**None**	Sulfation if undercharged
Lifespan	**10+ years**	3–5 years
Environmental Impact	**Non-toxic, recyclable**	Lead & acid hazardous waste

30%
Safer chemistry vs. LFP lithium-ion

50%
More extreme temp tolerant vs. LFP

20%
Less degradation vs. LFP lithium-ion

Zero
Thermal runaway risk

TOTAL COST OF OWNERSHIP

Bankable Economics

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SYSTEM ADVANTAGE OVER LEAD-ACID TRACTION

Lower Total Cost of Ownership Over the Product Lifetime

Sodium-Ion NFPP eliminates replacement costs, maintenance overhead, and hazardous disposal — delivering measurable savings vs. lead-acid traction through zero maintenance, longer design life, and higher efficiency.

CYCLE LIFE

3,000+

3,000+ cycles at 80% DoD vs. 300–500 cycles for lead-acid traction — dramatically fewer replacements over the fleet lifetime.

DESIGN LIFE

10+ Years

Sodium-Ion NFPP chemistry delivers a 10+ year design life vs. 3–5 years for lead-acid — reducing replacement and disposal costs.

ROUND-TRIP EFFICIENCY

≥95%

~95% round-trip efficiency vs. ~75% for lead-acid — more usable energy from every charge cycle.

ZERO MAINTENANCE

Zero

No watering, equalization, or scheduled maintenance — eliminating 100% of lead-acid O&M overhead.

WEIGHT SAVINGS

30%

30% lighter per 300Ah vs. lead-acid traction — reducing vehicle load, freight, and handling costs.

HAZARDOUS DISPOSAL

None

Non-toxic, fully recyclable chemistry eliminates hazardous lead & acid disposal fees and regulatory burden.

RESEARCH & DEVELOPMENT PARTNERS

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