CEES™

COMMERCIAL ELECTRICAL ENERGY STORAGE

Non-flammable energy storage built for critical infrastructure.
Operating range -40°C to 55°C. No HVAC. Zero thermal runaway.
15-year daily cycle life warranty.

Advanced Battery Concepts | 8 Consumers Energy Parkway, Clare, MI 48617 | (989) 424-6645 | advancedbatteryconcepts.com

ADVANCED BIPOLAR LEAD TECHNOLOGY

Critical infrastructure energy storage, engineered for the hardest environments on Earth

The CEES™ Advantage

CEES™ is built on Advanced Battery Concepts' proprietary bipolar lead battery architecture, protected by 85+ patents. Unlike conventional lithium-ion systems, CEES™ uses a non-flammable aqueous electrolyte chemistry that eliminates thermal runaway risk entirely. Fire suppression is not needed, no HVAC required, and no specialized fire code compliance to navigate. This is energy storage engineered from the ground up for critical infrastructure deployments where failure is not an option.

Every CEES™ unit is manufactured in Clare, Michigan, using domestically sourced materials. The advanced bipolar lead design delivers constant energy output across the full state of charge, with less than 0.1% annual capacity fade, translating to no measurable fade over the design life. Rated for 15 years of daily cycling, CEES™ operates reliably from -40°C to 55°C without external heating or cooling, and the chemistry is 100% recyclable at end of life through established lead recycling infrastructure.

85+	<0.1%	-40°C to 55°C	15yr	100%
Patents	Fade/Year	Operating Range	Warranty	Recyclable

Why Not Lithium-Ion?

- **Thermal runaway risk**
  Fire suppression, specialized enclosures, and setback requirements add cost and complexity to every lithium-ion installation.
- **HVAC dependency**
  Lithium-ion batteries require climate control to maintain performance, adding ongoing energy and maintenance costs.
- **Capacity degradation**
  Lithium cells lose 2-3% capacity per year, requiring oversizing or early replacement to meet long-term contracts.
- **Recycling challenges**
  End-of-life lithium-ion recycling remains expensive and limited, creating disposal liabilities.

CEES™ Delivers

- **Zero fire risk**
  Non-flammable aqueous chemistry. No thermal runaway. Fire suppression not needed. No setback requirements.
- **No HVAC required**
  Operates from -40°C to 55°C with convection cooling only. Deploy anywhere, no climate control.
- **Near-zero fade**
  Less than 0.1% annual capacity fade. No measurable fade over the design life of the system.
- **100% recyclable**
  Lead-based chemistry recycled through established, profitable infrastructure. Zero disposal liability.

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CEES™ TECHNICAL SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

Parameter	CEES 48 kWh 48V	CEES-R 96 kWh 48V	CEES-R 96 kWh 384V
Nominal Voltage	48 VDC	48 VDC	384 VDC
Maximum Voltage	60 VDC	60 VDC	498 VDC
On-grid Daily Energy	48 kWh	96 kWh	96 kWh
Maximum Current	200 A	400 A	125 A
Maximum Power	9.6 kW	19.2 kW	48.0 kW
Round Trip Efficiency	>88% DC-DC	>88% DC-DC	>90% DC-DC
Discharge Duration	5 - 100 h	5 - 100 h	2 - 100 h
Capacity Fade	<0.1% per year	<0.1% per year	<0.1% per year
Cycles	Unlimited	Unlimited	Unlimited
Energy Throughput Limit	262 MWh	525 MWh	525 MWh
Calendar Life Limit	15 years	15 years	15 years
Battery Type	Advanced bi-polar	Advanced bi-polar	Advanced bi-polar
Battery Chemistry	Aqueous	Aqueous	Aqueous

BATTERY ENCLOSURE SPECIFICATIONS

Parameter	CEES 48 kWh 48V	CEES-R 96 kWh 48V	CEES-R 96 kWh 384V
Dimensions	52.3L x 45.8W x 40H in	52.3L x 45.8W x 80H in	52.3L x 45.8W x 80H in
Shipping Weight	3,550 lbs	3,550 lbs ea / 7,100 lbs	3,550 lbs ea / 7,100 lbs
Enclosure Type	PC Sheet Metal	PC Sheet Metal	PC Sheet Metal
Floor Spacing Req.	58L x 52W in	58L x 52W in	58L x 52W in
DC Disconnect / Breaker	200 A	200 A	75 A
Cooling / Heating	Convection Fans	Convection Fans	Convection Fans

ENVIRONMENTAL SPECIFICATIONS

Parameter	Specification
Operating Temperature	-20°C to +55°C
Derated Energy Capacity	-40°C to -20°C
Noise Level	<47 dB
Storage Temperature	-40°C to +60°C
Operating Humidity	85% RH NC
IP/NEMA Rating	IP55/NEMA3R (CEES) / IP24/NEMA12 (CEES-R)
Installation	Indoor / Outdoor (CEES) / Indoor (CEES-R)

COMPLIANCE INFORMATION

Parameter	Specification
Certifications	UL 1973, UL 94 V-0
Grid Connection	Capable
Inverter Requirements*	Modbus 485 or CAN bus
Installation Requirements	NEC/Local code

* Contact Advanced Battery Concepts for detailed inverter integration specifications.

FEATURES & APPLICATIONS

Key Features

Non-Flammable Chemistry
Aqueous electrolyte eliminates thermal runaway. Fire suppression not needed, no specialized enclosures, no setback distance requirements. Deploy with confidence in occupied buildings, underground facilities, and sensitive environments.

Scalable Architecture
Start with a single 48 kWh CEES™ unit and scale to multi-megawatt Battery Barn™ configurations. Flexible nominal voltage options: 48V, 192V, 288V, 384V. Each system built from forty-eight 48V bipolar lead modules.

Plug and Play Installation
Factory-assembled, tested, and commissioned. Single-point DC connection. No field assembly of cells or modules required. Operational within hours of delivery, not weeks.

Constant Energy Delivery
Bipolar architecture delivers consistent power output across the full state of charge, unlike lithium-ion systems that experience voltage sag under load.

15-Year Daily Cycle Warranty
Warranted for daily cycling over a 15-year period with 262 MWh (48 kWh) or 525 MWh (96 kWh) energy throughput limits. 20-25 year design life with less than 0.1% annual fade.

100% Recyclable
Lead-based chemistry is recycled through established, profitable recycling infrastructure with a 99%+ recovery rate. Zero end-of-life disposal liability.

Applications

Microgrid
Backbone energy storage for isolated or grid-independent microgrids serving military, mining, and remote community installations.

Backup Power
Critical facility backup for hospitals, data centers, telecommunications, and emergency services, no fire risk in occupied spaces.

Peak Shaving / Load Shifting
Reduce demand charges and optimize time-of-use rates with daily cycling designed into the warranty.

Coastal / Island Infrastructure
IP55-rated enclosures withstand saltwater exposure, humidity, and flooding. Purpose-built for coastal and island grid resilience.

Renewable Energy Firming
Smooth intermittent solar and wind output with reliable, long-duration storage that operates in extreme temperatures without derating.

Demand Response
Participate in utility demand response programs with unlimited cycling capability and no degradation penalties.

Off-Grid / Extreme Environments
Full operation from -40°C to 55°C. Ideal for arctic, desert, and high-altitude deployments where HVAC is impractical.

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