

EPOCH BATTERIES

Technical Bulletin

C12460A-A Performance Ratings

Audience: Customers, Dealers, and Authorized Installers

Overview

The Epoch C12460A-A is a 12V 460Ah LiFePO₄ battery designed for high-capacity applications including marine, RV, solar energy storage, and industrial power systems. This bulletin presents the verified continuous charge and discharge performance ratings established through extended thermal-equilibrium testing.

These ratings represent the sustained current levels the battery can safely deliver or accept on a continuous basis under normal operating conditions. They are not theoretical maximums or brief peak values — they reflect real-world, steady-state capability.

In the event of any discrepancy between the information in this technical bulletin and the C12460A-A User Manual, the specifications and ratings presented in this bulletin shall take precedence.

Published Continuous Ratings

Parameter	Current (A)	C-Rate
Continuous Discharge	230 A	0.50C
Continuous Charge	210 A	0.45C

Battery capacity: 460 Ah nominal. C-rate values are rounded to the nearest 0.05C for simplicity.

What These Ratings Mean in Practice

A continuous rating describes the maximum current the battery can sustain indefinitely during repeated charge and discharge cycles without exceeding safe thermal limits. This is different from a peak or burst rating, which only applies for a short duration.

At the published continuous discharge rate of 230A (0.50C), the C12460A-A will reach and maintain a stable internal temperature of 55°C in a 25°C ambient environment. The battery's BMS and cell chemistry are designed to operate safely and efficiently at this temperature. Similarly, the continuous charge rate of 210A (0.45C) maintains the same thermal equilibrium.*

For most real-world installations, actual loads cycle on and off and rarely approach continuous maximum draw. This means the battery will typically run well below its thermal ceiling, resulting in even longer service life and additional headroom for occasional higher-demand events.

** Epoch has not yet tested the extent to which continuous cycling at these sustained current levels may affect the total number of rated charge/discharge cycles under the battery's standard cycle life specification. Cycle life ratings published for the C12460A-A are based on normal operating conditions. Customers operating consistently at or near continuous maximum ratings should contact Epoch Technical Support for application-specific guidance.*

How These Ratings Were Determined

The continuous ratings for the C12460A-A are based on extended thermal-equilibrium testing, not short-duration benchmarks or theoretical calculations. The methodology is summarized below.

Test Parameter	Detail
Ambient Temperature	25°C (77°F)
Starting Condition	Battery fully acclimated to ambient temperature before testing begins
Thermal Target	55°C average battery temperature, sustained over full charge/discharge cycles
Test Duration	Multiple days of continuous cycling (4+ days confirmed)
Adaptive Method	Test system automatically adjusts current after each cycle: increases current if battery runs below 55°C, decreases if above
Measurement Basis	Average temperature across the entire charge and discharge cycle, not instantaneous peak

This adaptive cycling approach converges on the true continuous current that maintains long-term thermal equilibrium, providing a highly reliable and repeatable rating.

Understanding C-Rate

C-rate is a standardized way to express charge or discharge current relative to a battery's capacity. For the C12460A-A with its 460Ah capacity:

C-Rate	Current (A)	Approx. Duration	Context
0.10C	46 A	~10 hours	Light / overnight use
0.25C	115 A	~4 hours	Moderate sustained load
0.45C	210 A	~2.2 hours	Continuous charge rating
0.50C	230 A	~2 hours	Continuous discharge rating
1.00C	460 A	~1 hour	Reference only (1C)

Coming Soon: Single-Event High-Current Ratings

In addition to the continuous ratings above, Epoch is currently testing single-event performance — the maximum C-rate the battery can sustain for a single, uninterrupted discharge or charge event starting from a fully acclimated state at 25°C ambient.

Because the battery starts at ambient temperature and only needs to remain within safe thermal limits for one cycle (rather than reaching steady-state equilibrium), the single-event rating is expected to exceed 1C for discharge. A corresponding single-event charge rating will also be published.

These values will be published once testing is complete and will provide additional guidance for applications that experience intermittent high-demand events rather than sustained continuous loading.

Why This Matters for Your Application

Transparent, test-verified ratings allow customers and system designers to size their battery banks with confidence. When Epoch publishes a continuous rating, it means the battery has been proven to sustain that level of performance through rigorous, multi-day thermal testing — not a brief bench test or a calculation from a datasheet.

A 0.50C continuous discharge rate is a strong result for a battery of this capacity class, and the 0.45C continuous charge rate supports rapid recharging for systems that need fast turnaround between cycles, such as solar installations maximizing midday harvest or marine vessels on short layovers.

As always, if you have questions about how these ratings apply to your specific installation, please reach out to Epoch Technical Support.

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