

Battery Charge Time Calculator

Estimates battery charging time from nominal capacity, starting state of charge, effective charge current, and charging efficiency.

Generated October 10, 2026

<https://www.elecatrix.com/solar-backup-power/battery-charge-time-calculator/>

Inputs

Input	Value	Unit
Battery capacity	200	Ah
Starting state of charge	50	%
Charge current	25	A
Charging efficiency	80	%

Results

Result	Value	Unit
Amp-hours to replace	100	Ah
Effective charging current	20	A
Estimated charge time	5	h
Capacity used	200	Ah

Calculation details

Detail	Value	Unit
Calculation basis	Available amp-hours equal capacity times the unfilled state-of-charge fraction. Effective charging current applies the entered charging efficiency.	
Selection boundary	Estimate only; actual charge time depends on chemistry, charger profile, taper, temperature, BMS limits, battery age, and manufacturer instructions.	

Formulas

$$Q_{\text{available}} = C_{\text{Ah}} \times (1 - \frac{\text{SoC}_{\text{start}}}{100})$$

$$I_{\text{effective}} = I_{\text{charge}} \times \frac{\text{eff}_{\text{charge}}}{100}$$

$$t_{\text{charge}} = \frac{Q_{\text{available}}}{I_{\text{effective}}}$$

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Warnings and limitations

Actual charging can take longer because of taper, chemistry, temperature, charger settings, BMS limits, battery age, and manufacturer charge-current limits.