

Solar Battery Runtime Calculator

Estimate usable battery energy and runtime from battery capacity, system voltage, load, depth of discharge, and system efficiency.

Generated October 10, 2026

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

Inputs

Input	Value	Unit
Battery capacity	400	Ah
Battery system voltage	48	V
Load	2400	W
Depth of discharge	80	%
System efficiency	90	%

Results

Result	Value	Unit
Nominal energy	19200	Wh
Usable energy	13824	Wh
Runtime	5.76	h
Usable factor	0.72	x

Calculation details

Detail	Value	Unit
Calculation basis	Runtime equals usable battery energy divided by entered load watts.	
Planning boundary	Merge estimate only; verify chemistry, discharge curve, temperature, inverter, BMS, protection, and project criteria separately.	

Formulas

Nominal energy=Battery capacity x System voltage

Usable energy=Nominal energy x Depth of discharge/100 x Efficiency/100

Runtime=Usable energy/Load

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Warnings and limitations

Battery runtime arithmetic only; the result does not select equipment or determine project requirements.