

Watts Amps Volts Calculator

Solve single-phase or balanced three-phase current and apparent power from real power, voltage, phase model, and power factor.

Generated October 10, 2026

<https://www.elecatrix.com/voltage-current-resistance/watts-amps-volts-calculator/>

Inputs		
Input	Value	Unit
Real power	1500	W
Voltage	120	V
Phase count	Single-phase	phase
Power factor	1	PF
Results		
Result	Value	Unit
Current estimate	12.5	A
Apparent power	1500	VA
Apparent power	1.5	kVA
Phase multiplier	1	x
Power factor used	1	PF
Calculation details		
Detail	Value	Unit
Calculation basis	Real power is divided by power factor to estimate apparent power, then divided by voltage and the selected phase multiplier to estimate current.	
Boundary	Preliminary estimate only; no load study, conductor sizing, breaker selection, motor starting, harmonic, demand, utility-billing, or code-compliance result is made by this calculator.	

Formulas		
S	= (P / PF)	

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$k_{\text{phase}} = 1$ for single-phase; $\sqrt{3}$ for balanced three-phase

$I = \frac{P}{V \times k_{\text{phase}}}$

Warnings and limitations

This is a preliminary power formula estimate. Verify voltage basis, measured load, duty cycle, nameplate data, conductor sizing, protection, and local requirements before final design or installation decisions.