

Lighting Circuit Load Calculator

Estimates lighting branch-circuit load, current, and fixture capacity from fixture wattage, quantity, continuous-load factor, voltage, phase, and an entered breaker value.

Generated October 10, 2026

<https://www.elecatrix.com/lighting/lighting-circuit-load-calculator/>

Inputs

Input	Value	Unit
Fixture watts	60	W
Fixture count	24	count
Continuous multiplier	125	%
System voltage	120	V
Phase	Single-phase	
Entered breaker	20	A

Results

Result	Value	Unit
Total fixture watts	1440	W
Adjusted circuit load	1800	VA
Circuit current	15	A
Adjusted VA per fixture	75	VA
Max fixtures by entered breaker	32	fixtures
Entered breaker margin	5	A

Status

Status	Value	Unit
Capacity comparison	Entered breaker meets calculated load	

Calculation details

Detail	Value	Unit
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Calculation basis

Total lighting watts are multiplied by the entered continuous-load factor, converted to current, and compared with the entered breaker value.

Selection boundary

Lighting circuit load estimate only; no breaker, conductor, lighting controls, energy-code, fixture listing, or code-compliance result is made.

Formulas

Total fixture watts = fixture watts x fixture count

Adjusted circuit VA = total fixture watts x (continuous multiplier (%)/100)

Phase multiplier = 1 for single-phase, sqrt(3) for balanced three-phase

Circuit current = (adjusted circuit VA/phase multiplier x voltage)

Adjusted VA per fixture = fixture watts x (continuous multiplier (%)/100)

Maximum fixtures = $\text{lfloor}(\text{breaker (A)} \times \text{voltage} \times \text{phase multiplier} / \text{adjusted VA per fixture})\text{rfloor}$

Entered breaker margin = entered breaker (A) - circuit current (A)

Warnings and limitations

This lighting circuit load estimate uses entered fixture and breaker values. It does not select breakers, conductors, controls, fixtures, or prove code compliance.