

Voltage Drop Calculator

Review circuit voltage drop and margin from load current, one-way length, conductor resistance, phase model, system voltage, and an entered drop limit. The result does not select a conductor or establish code compliance.

Generated October 10, 2026

<https://www.elecatrix.com/wire-raceway-ampacity/voltage-drop-calculator/>

Inputs

Input	Value	Unit
Load current	20	A
One-way length	100	ft
System voltage	120	V
Phase model	Single-phase or DC two-wire	
Conductor resistance	1.588	ohm/1000 ft
Entered drop limit	3	%

Results

Result	Value	Unit
Voltage drop	6.352	V
Voltage drop	5.2933	%
Entered limit in volts	3.6	V
Voltage-drop margin	-2.2933	percentage points
Phase multiplier	2	x

Limit check

Above entered voltage-drop limit

Calculation details

Detail	Value	Unit
Calculation basis	Voltage drop uses the entered one-way length, current, conductor resistance per 1000 ft, and the selected single-phase/DC or balanced three-phase multiplier.	

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Selection boundary

Voltage-drop estimate only; no ampacity, conductor-size, insulation, termination-temperature, raceway-fill, protection, equipment-rating, utility, or code-compliance result is made by this calculator.

Formulas

$m = 2$ for single-phase or DC two-wire; $\sqrt{3}$ for balanced three-phase

$\Delta V = \frac{m}{1000} \times I \times L \times R$

$\Delta V_{\%} = \frac{\Delta V}{V_{\text{system}}} \times 100\%$

Voltage-drop margin = Entered drop limit - $\Delta V_{\%}$

Warnings and limitations

This is a voltage-drop estimate using user-supplied resistance. It does not select conductor size, verify ampacity, apply NEC tables, evaluate termination temperature, or approve an installation.