

Grounding Resistance Calculator

Estimates single-rod and combined grounding resistance from soil resistivity, rod geometry, rod count, and spacing. The result is a model calculation, not a field test.

Generated October 10, 2026

<https://www.elecatrix.com/testing-protection-grounding/grounding-resistance-calculator/>

Inputs

Input	Value	Unit
Soil resistivity	100	ohm-m
Rod length	8	ft
Rod diameter	0.625	in
Rod count	2	count
Rod spacing	16	ft

Results

Result	Value	Unit
Single-rod resistance	39.9049	ohm
Estimated combined resistance	19.9524	ohm
Spacing ratio	2	x rod length
Spacing effectiveness	1	x
Effective rod count	2	count

Calculation details

Detail	Value	Unit
Calculation basis	Single-rod resistance uses a simplified driven-rod approximation. Multiple rods are reduced by an entered-spacing effectiveness factor, capped at one rod-length spacing.	
Selection boundary	Grounding resistance estimate only; no acceptance threshold, electrode design, soil model, test method, bonding, utility, lightning, or code-compliance result is made.	

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Formulas

Rod length (m) = Rod length (ft) x 0.3048

Rod diameter (m) = Rod diameter (in) x 0.0254

$R_{\text{single}} = (\rho / 2\pi L) [\ln((8L/d)) - 1]$

Spacing ratio = (Rod spacing / Rod length)

$S_{\text{eff}} = \min(1, \max(0, \text{Spacing ratio}))$

Effective rod count = $1 + (\text{Rod count} - 1)S_{\text{eff}}$

$R_{\text{combined}} = \frac{R_{\text{single}}}{\text{Effective rod count}}$

Warnings and limitations

This grounding resistance estimate is a simplified engineering approximation. It does not replace fall-of-potential testing, soil modeling, electrode design, bonding review, utility rules, AHJ requirements, or code compliance.