

Commercial Feeder Voltage Drop Calculator

Calculate commercial feeder voltage drop and resistive loss from current, one-way length, resistance per 1,000 feet, voltage, and phase model.

Generated October 10, 2026

<https://www.elecatrrix.com/commercial-industrial-loads/commercial-feeder-voltage-drop-calculator/>

Inputs

Input	Value	Unit
Feeder current	100	A
One-way length	250	ft
Conductor resistance	0.25	ohm/1000 ft
System voltage	480	V
Phase model	Balanced three-phase	

Results

Result	Value	Unit
Voltage drop	10.8253	V
Voltage drop	2.2553	%
End voltage	469.1747	V
One-way resistance used	0.0625	ohm
Resistive loss	1875	W
Current used	100	A
Length used	250	ft
System voltage used	480	V
Phase multiplier	1.7321	x

Calculation details

Detail	Value	Unit
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Calculation basis	Resistance is scaled from the entered ohms per 1,000 feet. Single-phase voltage drop uses twice the one-way resistance; balanced three-phase voltage drop uses square root of 3 times one-way resistance.
Review boundary	Screening conductor-resistance arithmetic only. No conductor product, temperature, installation method, ampacity, protection, utility, equipment, or code-compliance result is made.

Formulas

$$R_{\text{one-way}} = R_{1000\text{ft}} \times \frac{L_{\text{one-way}}}{1000}$$

$$\Delta V_{1\text{phi}} = 2IR_{\text{one-way}}$$

$$\Delta V_{3\text{phi}} = \sqrt{3}IR_{\text{one-way}}$$

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

$$k_{\text{loss}} = 2 \text{ for single-phase}$$

$$k_{\text{loss}} = 3 \text{ for balanced three-phase}$$

$$P_{\text{loss}} = k_{\text{loss}}I^2R_{\text{one-way}}$$

Warnings and limitations

This conductor-resistance worksheet does not select conductor size, account for reactance or temperature, or establish ampacity, protection, equipment, utility, or code compliance.