

Neutral Load Calculator

Estimates neutral current and phase-current imbalance for split-phase three-wire or linear three-phase wye models.

Generated October 10, 2026

<https://www.elecatrrix.com/commercial-industrial-loads/neutral-load-calculator/>

Inputs		
Input	Value	Unit
System model	Three-phase wye linear load	
Phase A current	100	A
Phase B current	90	A
Phase C current	80	A
Results		
Result	Value	Unit
Estimated neutral current	17.3205	A
Average phase current	90	A
Maximum phase deviation	10	A
Phase-current unbalance	11.1111	%
Calculation details		
Detail	Value	Unit
Model note	Three-phase wye neutral estimate uses the vector sum for balanced 120-degree phase displacement and linear load current.	
Calculation basis	Neutral current is estimated from entered phase currents and the selected system model. The result assumes linear current and does not add harmonic neutral current.	
Selection boundary	Screening estimate only; verify nonlinear loads, harmonics, shared-neutral rules, conductor sizing, protection, and local code requirements before design use.	

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Formulas

$$I_N = |I_A - I_B| \text{ for split-phase three-wire}$$

$$I_N = \sqrt{I_A^2 + I_B^2 + I_C^2 - I_A \times I_B - I_B \times I_C - I_C \times I_A} \text{ for linear three-phase wye}$$

$$I_{avg} = \frac{\sum I_{modeled}}{N_{modeled}}$$

$$I_{deviation} = \max |I_{phase} - I_{avg}|$$

$$\text{Unbalance (\%)} = \frac{I_{deviation}}{I_{avg}} \times 100$$

Warnings and limitations

This neutral-load estimate uses entered current values. It does not evaluate harmonic neutral current, nonlinear loads, conductor ampacity, shared-neutral rules, or code compliance.