

Electrical Service Size Calculator

Use service voltage, phase count, a user-supplied real-power demand basis, power factor, and a target utilization percentage to create a transparent U.S. English preliminary service-size estimate. This calculator does not perform an NEC service calculation, service sizing, or code-compliant service-rating selection.

Generated October 10, 2026

<https://www.elecatrrix.com/residential-load-service/electrical-service-size-calculator/>

Inputs

Input	Value	Unit
Service voltage	240	V
Phase count	Single-phase	phase
Estimated real-power demand	24000	W
Power factor	0.8	PF
Target utilization	80	%
Demand basis note	N/A	
Power factor basis note	N/A	

Results

Result	Value	Unit
Estimated service current	125	A
Phase multiplier	1	x
Apparent service VA	30000	VA
Target utilization ratio	0.8	decimal
Planning VA at target utilization	37500	VA
Planning headroom	7500	VA

Calculation details

Detail	Value	Unit
Calculation basis	User-supplied real-power demand divided by power factor, then evaluated with the selected phase model and target utilization ratio.	

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Service-rating boundary	No NEC service calculation, service rating selection, conductor selection, breaker selection, equipment approval, utility approval, or code-compliance result is made by this calculator.
Phase model boundary	Balanced equivalent phase model only; no phase-balance, load-by-leg, neutral, power-factor verification, utility, or equipment-duty analysis is made by this calculator.

Formulas

$\text{phase multiplier} = 1 \text{ for single-phase; } \sqrt{3} \text{ for three-phase}$

$\text{utilization ratio} = \text{target utilization percent} / 100$

$\text{apparent service VA} = \text{estimated real-power demand W} / \text{power factor}$

$\text{estimated service current amps} = \text{apparent service VA} / (\text{service voltage} \times \text{phase multiplier})$

$\text{planning VA} = \text{apparent service VA} / \text{utilization ratio}$

$\text{planning headroom VA} = \text{planning VA} - \text{apparent service VA}$

service-rating boundary = no NEC service calculation, service rating selection, conductor selection, breaker selection, equipment approval, utility approval, or code-compliance result is made by this calculator

Warnings and limitations

This is a U.S. English preliminary engineering estimate, not an NEC service calculation, not service sizing, and not code-compliance approval. It does not apply NEC load classifications, demand factors, continuous-load rules, conductor ampacity, overcurrent protection, voltage-drop limits, equipment ratings, load balancing, utility requirements, or local amendments. Verify the adopted NEC edition, AHJ direction, utility requirements, equipment data, and project conditions with a qualified electrical professional before design or installation.