

Electrical Load Calculator

Enter line voltage, phase count, load current, power factor, and utilization percentage to create a transparent U.S. English preliminary electrical-load estimate for motors and related equipment planning. For balanced three-phase input, line voltage means line-to-line voltage. The utilization percentage scales the entered load current before power is estimated.

Generated October 10, 2026

<https://www.elecatrix.com/motors-starters/electrical-load-calculator/>

Inputs

Input	Value	Unit
Line voltage	240	V
Phase count	Single-phase	phase
Load current	20	A
Power factor	0.8	PF
Utilization	80	%
Load-current basis note	N/A	
Power factor basis note	N/A	
Utilization basis note	N/A	

Results

Result	Value	Unit
Real power	3072	W
Apparent power	3840	VA
Phase multiplier	1	x
Utilization ratio	0.8	decimal
Utilized line current	16	A
Reactive power magnitude	2304	VAR

Calculation details

Detail	Value	Unit
--------	-------	------

Electrical Load Calculator

Enter line voltage, phase count, load current, power factor, and utilization percentage to create a transparent U.S. English preliminary electrical-load estimate for motors and related equipment planning. For balanced three-phase input, line voltage means line-to-line voltage. The utilization percentage scales the entered load current before power is estimated.

Generated October 10, 2026

<https://www.elecatrix.com/motors-starters/electrical-load-calculator/>

Calculation basis	Line voltage, entered load current, user-supplied utilization, selected phase model, and user-supplied power factor.
Power factor boundary	Power factor is user-supplied; this calculator does not determine leading/lagging direction, harmonics, correction equipment, or equipment-specific power factor.
Phase model boundary	Balanced equivalent model only; no phase-balance, neutral, harmonics, starting, duty-cycle, or equipment-rating analysis is made by this calculator.
Load model boundary	No NEC load calculation, feeder calculation, service-size decision, breaker selection, conductor selection, motor protection setting, utility approval, or code-compliance result is made by this calculator.

Formulas

$$u = (\text{Utilization percent}/100)$$

$$I_{\text{estimated}} = I_{\text{load}} \times u$$

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

$$S = V \times I_{\text{estimated}} \times \phi$$

$$P = S \times \text{PF}$$

$$Q = S \times \sqrt{1 - \text{PF}^2}$$

phase model boundary = balanced equivalent model only; no phase-balance, neutral, harmonics, starting, duty-cycle, or equipment-rating analysis is made by this calculator

load model boundary = no NEC load calculation, feeder calculation, service-size decision, breaker selection, conductor selection, motor protection setting, utility approval, or code-compliance result is made by this calculator

Electrical Load Calculator

Enter line voltage, phase count, load current, power factor, and utilization percentage to create a transparent U.S. English preliminary electrical-load estimate for motors and related equipment planning. For balanced three-phase input, line voltage means line-to-line voltage. The utilization percentage scales the entered load current before power is estimated.

Generated October 10, 2026

<https://www.elecatrix.com/motors-starters/electrical-load-calculator/>

Warnings and limitations

This is a U.S. English preliminary engineering estimate for motors and related equipment planning, not an NEC load calculation, not service sizing, not a feeder calculation, not circuit design, not breaker selection, not conductor selection, not a motor protection setting, not a utility calculation, and not a code-compliance result. Utilization is a user-entered planning assumption, not an NEC demand factor. Power factor, load current, phase relationship, equipment ratings, load balance, continuous-load treatment, voltage drop, harmonics, and local requirements may change actual conditions. Verify the adopted NEC edition, authority having jurisdiction, utility requirements, equipment data, and project conditions with a qualified electrical professional before design or installation.