

Generator Size Calculator

Estimates planning running and surge ratings, plus an apparent-power basis, from running watts, starting loads, power factor, and margin.

Generated October 10, 2026

<https://www.elecatrix.com/power-quality-transformers/generator-size-calculator/>

Inputs		
Input	Value	Unit
Running load	5000	W
Largest starting load	3000	W
Other simultaneous starting load	1000	W
Power factor	0.8	PF
Planning margin	20	%
Results		
Result	Value	Unit
Minimum running rating	6000	W
Minimum surge rating	10800	W
Minimum running rating (kW)	6	kW
Estimated kVA basis	13.5	kVA
Margin multiplier	1.2	x
Calculation details		
Detail	Value	Unit
Calculation basis	Running rating applies the entered margin to running watts. Surge rating applies the same margin to running watts plus entered starting watts.	
Selection boundary	Generator estimate only; no fuel, altitude, temperature, motor-starting, transfer equipment, neutral bonding, grounding, emissions, utility, or code-compliance result is made.	

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Formulas

Margin multiplier = $1 + (\text{Planning margin (\%)} / 100)$

Running rating (W) = Running watts x Margin multiplier

Surge rating (W) = (Running watts + Largest starting watts + Other simultaneous starting watts) x Margin multiplier

Required kVA = $(\text{Surge rating (W)} / 1000 \times \text{Power factor})$

Warnings and limitations

This generator size estimate uses entered load assumptions only. It does not approve generator selection, transfer equipment, fuel, grounding, utility interconnection, or code compliance.