

Commercial Fan Load Calculator

Calculate fan shaft power, electrical input, and running current from airflow, pressure, efficiency, voltage, phase, and power factor.

Generated October 10, 2026

<https://www.elecatrix.com/commercial-industrial-loads/commercial-fan-load-calculator/>

Inputs		
Input	Value	Unit
Airflow	10000	CFM
Total pressure	2	in. w.g.
Air density	0.075	lb/ft3
Fan efficiency	0.65	x
Motor efficiency	0.92	x
Drive efficiency	1	x
System voltage	480	V
Power factor	0.9	PF
Phase	Balanced three-phase	
Results		
Result	Value	Unit
Air power	3.1488	hp
Shaft horsepower	4.8443	hp
Estimated electrical input	3.9265	kW
Estimated running current	5.2476	A
Calculation details		
Detail	Value	Unit
Calculation basis	Air power uses CFM, inches of water gauge, and a standard conversion constant. Shaft and electrical input power divide by the entered fan, motor, and drive efficiencies.	

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Equipment boundary

No fan curve, system effect, FEI, duct design, motor selection, OCPD, conductor, or code-compliance result is made.

Formulas

$$P_{\text{air, hp}} = Q_{\text{CFM}} \times \Delta p_{\text{in.w.g.}} \times 0.00015744 \times (\rho/0.075)$$

$$P_{\text{shaft, hp}} = \frac{P_{\text{air, hp}}}{\eta_{\text{fan}}}$$

$$P_{\text{input, hp}} = \frac{P_{\text{shaft, hp}}}{\eta_{\text{motor}} \eta_{\text{drive}}}$$

$$P_{\text{input, kW}} = 0.745699872 P_{\text{input, hp}}$$

$$I = \frac{1000 P_{\text{input, kW}}}{\phi V \text{PF}}$$

Warnings and limitations

This is a fan-duty estimate. Actual fan curves, system effect, air density, FEI/ASHRAE/energy-code scope, motor nameplate, conductor, protection, and local requirements require separate review.