

Commercial Pump Load Calculator

Calculate pump hydraulic power, shaft power, electrical input, and running current from flow, head, fluid, efficiency, voltage, phase, and power factor.

Generated October 10, 2026

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

Inputs		
Input	Value	Unit
Flow	500	GPM
Head	100	ft
Fluid specific gravity	1	SG
Pump efficiency	0.75	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
Hydraulic horsepower	12.6263	hp
Shaft horsepower	16.835	hp
Estimated electrical input	13.6455	kW
Estimated running current	18.2367	A
Calculation details		
Detail	Value	Unit
Calculation basis	Hydraulic horsepower uses flow, fluid specific gravity, and head. Shaft and electrical input power divide by the entered pump, motor, and drive efficiencies.	

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Equipment boundary

No pump curve, BEP, motor selection, fire-pump compliance, OCPD, conductor, VFD, or code-compliance result is made.

Formulas

$$P_{\text{hydraulic, hp}} = \frac{Q_{\text{GPM}} \times SG \times H_{\text{ft}}}{3960}$$

$$P_{\text{shaft, hp}} = \frac{P_{\text{hydraulic, hp}}}{\eta_{\text{pump}}}$$

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

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

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

Warnings and limitations

This is a pump-duty estimate. Actual pump curves, system effect, BEP, motor nameplate, VFD behavior, fire-pump rules, conductor, protection, and local requirements require separate qualified review.