

Motor Synchronous Speed Calculator

Calculate rotating-field speed as a reference for induction-motor slip. The result does not predict loaded rotor speed or select equipment.

Generated October 10, 2026

<https://www.elecatrrix.com/motors-starters/motor-synchronous-speed-calculator/>

Inputs

Input	Value	Unit
Frequency	60	Hz
Motor poles	4 poles	poles

Results

Result	Value	Unit
Synchronous speed	1800	rpm
Frequency used	60	Hz
Pole count used	4	poles

Calculation details

Detail	Value	Unit
Calculation basis	Synchronous speed uses frequency and the entered number of motor poles.	
Equipment boundary	Ideal synchronous-speed estimate only; actual induction-motor speed includes slip and may vary with load, frequency, drive settings, and equipment condition.	

Formulas

$$n_s = (120 \times f / P)$$

$$n_{\text{actual}} < n_s \text{ when induction motor slip is present}$$

Warnings and limitations

This is an ideal rotating-field speed calculation. Verify frequency, pole count, drive settings, and measured speed before using it for field decisions.