

Motor Acceleration Time Calculator

Calculate acceleration time from total inertia, starting and ending speed, and average net torque. The result supports a transparent timing review before drive or starter selection.

Generated October 10, 2026

<https://www.elecatrix.com/motors-starters/motor-acceleration-time-calculator/>

Inputs

Input	Value	Unit
Motor rotor inertia	1	kg*m^2
Reflected load inertia	4	kg*m^2
Initial speed	N/A	rpm
Final speed	600	rpm
Average net torque	10	N*m

Results

Result	Value	Unit
Total inertia	5	kg*m^2
Speed change	600	rpm
Speed change	62.8319	rad/s
Estimated acceleration time	31.4159	s
Net torque used	10	N*m

Calculation details

Detail	Value	Unit
Calculation basis	Total inertia equals motor rotor inertia plus reflected load inertia. Acceleration time equals total inertia x speed change in rad/s divided by average net torque.	
Torque boundary	Average net torque is user-entered; this page does not derive torque from a curve, current limit, or protection setting.	
Curve boundary	Motor torque-speed curves, load torque, ramp profiles, and thermal limits must be reviewed separately.	

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Selection boundary

This page is an estimate only; do not use it to approve protection, braking, or thermal performance.

Formulas

$$J_{\text{total}} = J_{\text{rotor}} + J_{\text{reflected}}$$

$$\Delta \omega = \frac{2\pi}{60} \times \Delta n_{\text{rpm}}$$

$$t_{\text{accel}} = \frac{J_{\text{total}}}{T_{\text{net}}} \times \Delta \omega$$

Warnings and limitations

This is a timing estimate only. It does not prove startability, torque margin, thermal pass/fail, or protection settings.