

Motor Reflected Inertia Calculator

Combine direct inertia and mass-radius load rows, then reflect the total to the motor shaft for acceleration, braking, or drive-sizing review.

Generated October 10, 2026

<https://www.elecatrix.com/motors-starters/motor-reflected-inertia-calculator/>

Inputs

Input	Value	Unit
Motor rotor inertia	1	kg*m^2
Speed ratio	2	x
Coupling inertia	N/A	kg*m^2
Load rows	Rows: 2	
Row 1 - Load label	Roller load	
Row 1 - Entered load inertia	4	kg*m^2
Row 1 - Mass	N/A	kg
Row 1 - Radius	N/A	m
Row 2 - Load label	Linear carriage	
Row 2 - Entered load inertia	N/A	kg*m^2
Row 2 - Mass	1	kg
Row 2 - Radius	2	m

Results

Result	Value	Unit
Entered load inertia total	4	kg*m^2
Linear equivalent inertia total	4	kg*m^2
Combined load inertia	8	kg*m^2
Reflected load inertia	2	kg*m^2
Motor-side total inertia	3	kg*m^2
Inertia ratio	3	x

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Speed ratio used	2	x
Counted load rows	2	rows
Calculation details		

Detail	Value	Unit
Calculation basis	Each load row contributes entered inertia or mass x radius^2. Total load inertia is reflected to the motor shaft by speed ratio squared and then added to motor and coupling inertia.	
Ratio boundary	Reflected inertia is a planning metric only; verify direction convention, gearbox ratio, and manufacturer data before using the result for drive sizing.	
Selection boundary	This page does not select a motor, drive, brake, or protection setting and does not prove acceleration or thermal performance.	

Formulas

J_linear = m x r^2

J_load = J_entered + J_linear

J_reflected = fracJ_loadN^2

J_motor side = J_rotor + J_coupling + J_reflected

Inertia ratio = fracJ_motor sideJ_rotor

Warnings and limitations

This page is a reflected-inertia review only. It does not select a motor or drive, and it does not prove acceleration, braking, thermal, or protection performance.