

Effects of Change in Parameter on Ball Screw Characteristics

When selecting ball screws and nuts for a given application it is important to understand the relationship between various ball screw and nut parameters. A change to a single parameter can affect the whole system. For example, increasing the length of the ball screw may decrease the allowable critical speed of operation. Thus, a longer screw length may require slower operation (critical speed). Refer to the chart below as you consider the requirements of your specific application.

Increasing this Parameter	Affects this Parameter	Causing it to
Screw Length	Critical Speed	Decrease
	Column Load	Decrease
Screw Diameter	Critical Speed	Increase
	Inertia	Increase
	Stiffness	Increase
	Spring Rate	Increase
	Load Capacity	Increase
	Column Load	Increase
Lead	Torque Input	Increase
	Load Capacity	Increase
	Positioning Accuracy	Decrease
	Angular Velocity	Decrease
	Ball Diameter	Increase
Angular Velocity	Critical Speed	Decrease
Mounting Rigidity	Critical Speed	Increase
	System Stiffness	Increase
Load	Life	Decrease
Nut length (7.5 turns max)	Load Capacity	Increase
	Stiffness	Increase
Number of Ball Bearings	System Stiffness	Increase
	Load Capacity	Increase
Preload	Positioning Accuracy	Increase
	System Stiffness	Increase
	Drag-Torque	Increase
Ball Diameter	Life	increase
	System Stiffness	Increase
	Load Capacity	Increase

Contact Joyce/Dayton with your specific application requirements.

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