

Table of Contents

Conversion Units	6
Terms and Definitions	7
Basic Engineering Information	9
Drive Mechanisms	11
Lead Screws	11
Ball Screws	12
Selecting and Sizing Screw Drive Systems	13
Travel Rate Vs. Length, Lead Screws	14
Load Vs. Length, Lead Screws	15
Load and Speed Limits, Ball Screws	16
Ball & Acme Screw Assembly Life Expectancy	18
Load Bearing Mechanisms	19
Plain Bearings	19
Rolling Element Bearings	19
Radial Ball Bearings	20
Thrust Ball Bearings	20
Linear Bearings	21
Roller Bearings	23
Selecting and Sizing Bearing Systems	23
Motors and Encoders	25
Stepper Motors	25
Servo Motors	26
Rotary Optical Encoders	27
Sizing Stepper Motors	28
Sizing Servo Motors	33
Control and Electronics	35
Input and Output Devices	35
Stepper Motor Drivers	36
Servo Motor Drivers	36
Stepper Control	37
Servo Control	38
Wiring	39
Grounding	40
Electric Noise	40
Choosing Between Stepper and Servo Motors	41
Selecting a Ball Screw Driven Slide	42
Selecting a Belt Drive Slide	46
Application Examples	49
Fax Your Design Requirements	51