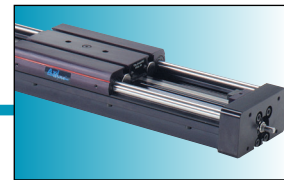


Axi-dyne® SLS/MLS Screw Drives

OVERVIEW



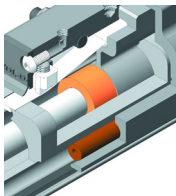
APPLICATION BENEFITS

- Rigid, low-profile design is ideal for space-sensitive applications
- Consistent carrier tracking and long actuator life
- Wide base for ease of mounting.

GUIDANCE SYSTEM

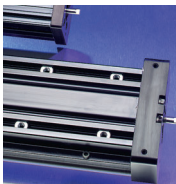


Pre-engineered and fully enclosed the SLS slide guidance system consists of recirculating bearings on ground steel shafts, offering stability and endurance.



Uses the same patented Band Retention system as the BCS—a T-shaped elastomer strip bonded to a stainless steel band, inserted directly into the body housing forming a tight metal-to-metal seal for clean operation.

STANDARD MOUNTING

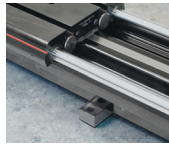


Actuators are provided with T-nuts in the base of the cylinder body. Four T-nuts for the first 24 inches of stroke are standard. Two nuts are provided for each additional 20 inches of stroke. The SLS tube and work table accept 1/4" threaded square nuts (MLS, M6 threaded square nuts).

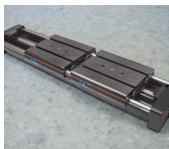
ACTUATOR/MOTOR FACTORS

- Actuator's operating temperature range (40-130° F, 4-54° C) should take into consideration heat generated by the motor and drive, linear velocity and work cycle time.
- For large frame motors or small actuators, cantilevered motors need to be supported, if subjected to continuous rapid reversing duty and/or under dynamic conditions.

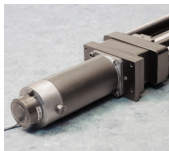
AVAILABLE OPTIONS



Mounting Plates: Provide clearance height for motors and motor mounts when mounting an actuator on a flush surface. Mount to either tapped holes in cylinder heads or to T-nuts, they provide the means for top mounting access. Kits include plates and mounting screws.



Auxiliary Carrier: Increases rigidity, load-carrying capacity and bending moments



Motor Mounting and Gearhead Reduction:

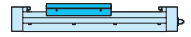
In-line Motor Mounting—This motor mounting option uses a spacer and coupler to join the motor to the actuator shaft.



Gearhead Reduction—Gearheads are available for applications requiring reduction for inertia matching or higher torque at lower speeds. High efficiency, single stage, true planetary gearheads are available in 5.5:1 and 10:1 ratios for reduction solutions with most Tol-O-Matic NEMA 23 and 34 face motors. For gearhead specifications and dimensions, see page F-10.



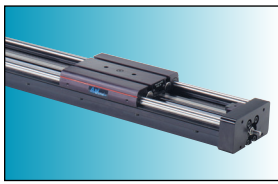
Switches: Reed, dc Hall-effect and ac TRIAC. See section I.



RODLESS

SLS/MLS Series

- Application benefits
- Guidance system
- Standard mounting
- Actuator/motor factors
- Available options

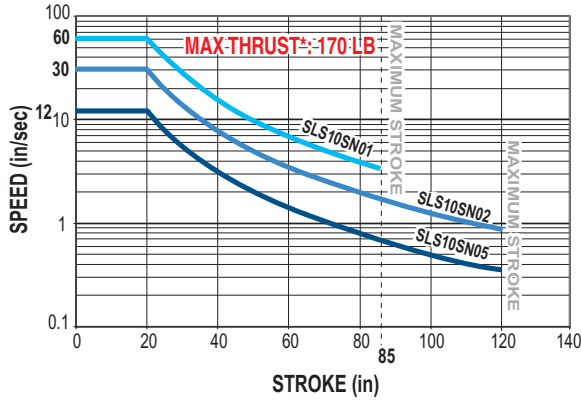


Axi-dyne[®]

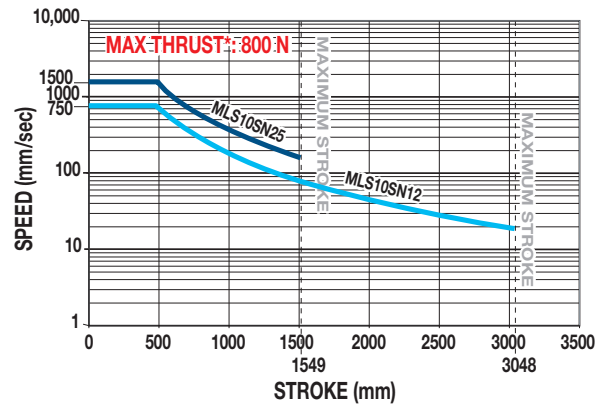
SLS/MLS10 Series ACME SCREW SPECIFICATIONS

SLS/MLS10 ACME SCREW CRITICAL SPEED AND PV LIMITS

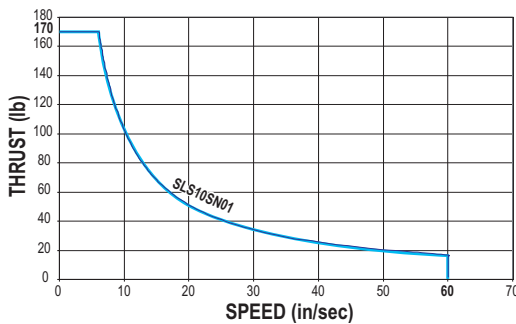
CRITICAL SPEED WITH 1/2" ENGLISH ACME SCREW



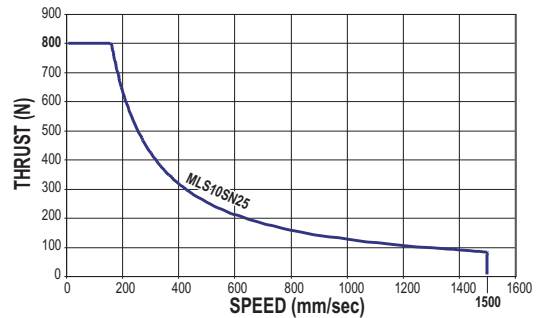
CRITICAL SPEED WITH 12mm METRIC ACME SCREW



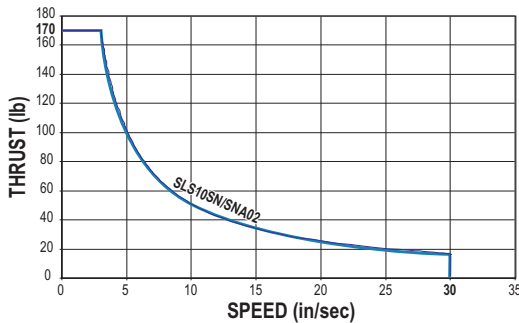
PV LIMITS: 1/2" 1 TPI ENGLISH ACME SCREW



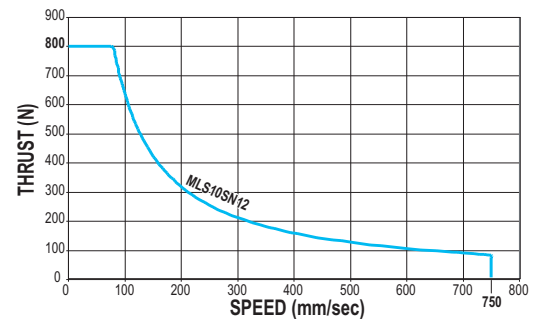
PV LIMITS: 12mm ACME METRIC SCREW w/25mm LEAD



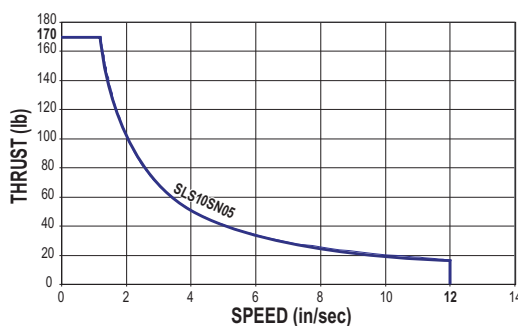
PV LIMITS: 1/2" 2 TPI ENGLISH ACME SCREW



PV LIMITS: 12mm ACME METRIC SCREW w/12mm LEAD



PV LIMITS: 1/2" 5 TPI ENGLISH ACME SCREW



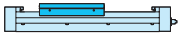
SN = Solid Nut

SNA = Solid Anti-backlash Nut

⚠️ *Maximum thrust is the maximum continuous dynamic thrust subject to Thrust x Velocity limitation.

PV LIMITS: Any material which carries a sliding load is limited by heat buildup. The factors that affect heat generation rate in an application are the pressure on the nut in pounds per square inch and the surface velocity in feet per minute. The product of these factors provides a measure of the severity of an application.

$$P = \frac{\text{Thrust}}{\text{Max. Thrust Rating}} \times V = \frac{\text{Speed}}{\text{Max. Speed Rating}} \leq 0.1$$



RODLESS

SLS/MLS10 Series

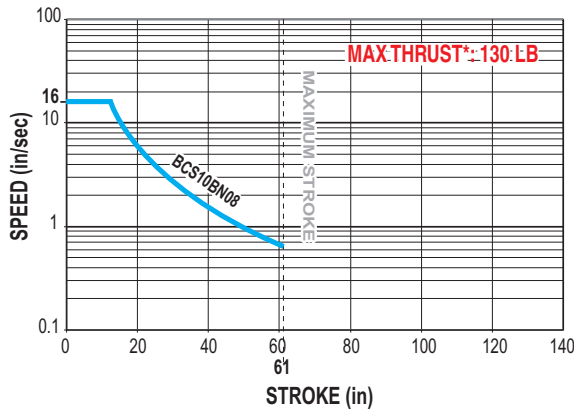
- Acme screw critical speed capacities and PV limits

Axi dyne® SLS/MLS10 Series

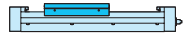
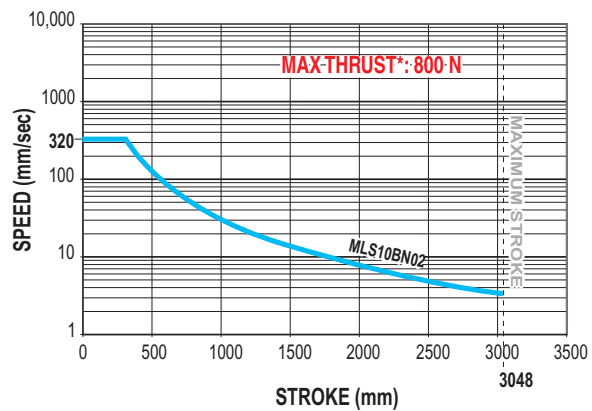
BALL SCREW SPECIFICATIONS

SLS/MLS10 BALL SCREW SPECIFICATIONS

CRITICAL SPEED WITH 3/8" ENGLISH BALL SCREW



CRITICAL SPEED WITH 10mm METRIC BALL SCREW

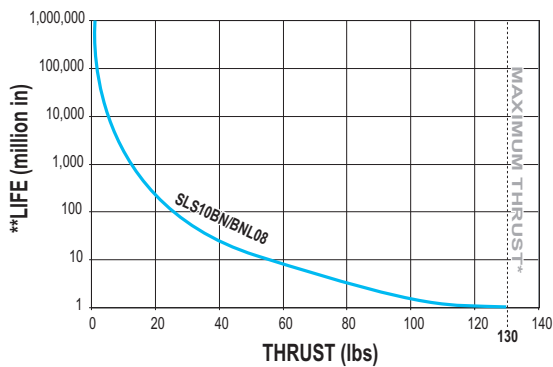


RODLESS

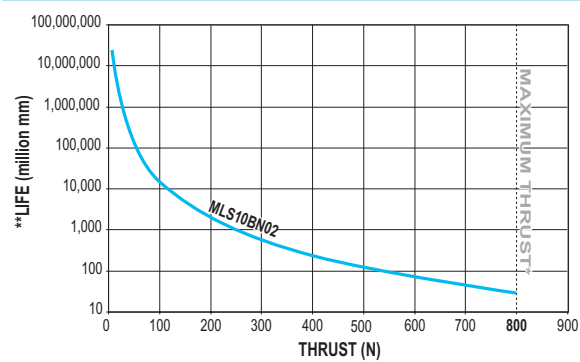
SLS/MLS10 Series

- Ball screw critical speed capacities and life calculations

LIFE CALCULATION: 3/8" 8TPI ENGLISH BALL SCREW



LIFE CALCULATION: 10mm METRIC BALL SCREW w/2.5mm LEAD



BN = Ball Nut



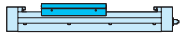
** Maximum thrust reflects 90% reliability for 1 million linear inches of travel.*

***Life indicates theoretical maximum life of screw only, under ideal conditions and does not indicate expected life of actuator.*

SLS/MLS10 Series

SPECIFICATIONS

SPECIFICATIONS RELATED TO ACTUATOR SIZE AND SCREW SELECTION



RODLESS

SLS/MLS10 Series

- Actuator and screw specifications

ENGLISH LEAD SCREWS										
ACTUATOR SERIES	SCREW DIA. (in)	SCREW TYPE	TPI (turns/in)	LEAD ACCURACY (in/ft)	BACKLASH (in)	MAXIMUM THRUST* (lb)	MAXIMUM STROKE (in)	INERTIA (lb-in ²)		BREAKAWAY TORQUE (lb-in)
								BASE ACTUATOR	PER/in	
								In Line	OF STROKE	
SLS10	0.375	BN	08	0.004	0.015	130	61	0.0054	0.0005	1.063
	0.375	BNL	08	0.004	0.002	130	61	0.0054	0.0005	1.063
	0.500	SN	01	0.006	0.007	170	85	0.0554	0.0017	1.875
	0.500	SN	02	0.005	0.007	170	120	0.0262	0.0017	1.438
	0.500	SNA	02	0.005	0.003	170	120	0.0262	0.0017	1.438
	0.500	SN	05	0.006	0.007	170	120	0.0180	0.0017	1.250

METRIC LEAD SCREWS										
ACTUATOR SERIES	SCREW DIA. (mm)	SCREW TYPE	LEAD (mm/turn)	LEAD ACCURACY (mm/300)	BACKLASH (mm)	MAXIMUM THRUST (N)	MAXIMUM STROKE (mm)	INERTIA (kg-m ² x 10 ⁻⁶)		BREAKAWAY TORQUE (N-m)
								BASE ACTUATOR	PER/mm	
								In Line	OF STROKE	
MCS10	10	BN	2.5	0.13	0.38	800	1549	1.81	0.18	0.17
	10	BNL	2.5	0.13	0.05	800	1549	1.81	0.18	0.17
	12	SN	12	0.13	0.18	800	3048	6.49	0.41	0.17
	12	SN	25	0.13	0.18	800	1626	15.01	0.41	0.17

SCREW CODE	DESCRIPTION
SN	Solid Nut
SNA	Anti-backlash Solid Nut
BN	Ball Nut
BNL	Low-Backlash Ball Nut



Contact the factory for higher accuracy and lower backlash options.

* For Acme screws, maximum thrust is the maximum continuous dynamic thrust subject to Thrust x Velocity limitation. For ball screws, maximum thrust reflects 90% reliability for 1 million linear inches of travel.

GENERAL ACTUATOR SPECIFICATIONS

SLS ENGLISH ACTUATORS					
ACTUATOR SERIES	CARRIER WEIGHT (lb)	BASE WEIGHT (lb) (Including Carrier)	WEIGHT PER/IN OF STROKE (lb)	TEMPERATURE RANGE* (F°)	IP RATING**
SLS10	1.54	6.05	0.404	40 - 130	44

MLS METRIC ACTUATORS					
ACTUATOR SERIES	CARRIER WEIGHT (kg)	BASE WEIGHT (kg) (Including Carrier)	WEIGHT PER/mm OF STROKE (g)	TEMPERATURE RANGE* (C°)	IP RATING**
MLS10	0.69	2.74	7.23	4 - 54	44



* Heat generated by the motor and drive should be taken into consideration as well as linear velocity and work cycle time. For applications that require operation outside of the recommended temperature range, contact the factory.

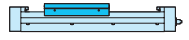
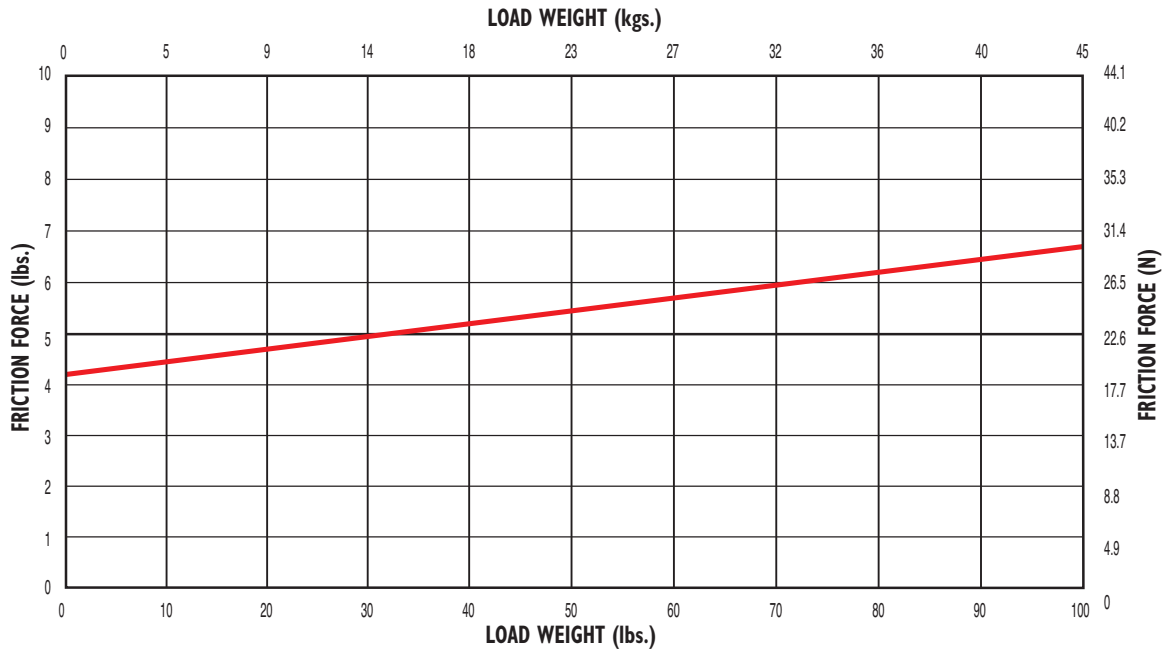
** Protected against ingress of solid particles greater than .039 in (1mm) and splashing water.

LARGE FRAME MOTORS AND SMALLER SIZE ACTUATORS: Cantilevered motors need to be supported, if subjected to continuous rapid reversing duty and/or under dynamic conditions.

Axi dyne® SLS/MLS10 Series

SPECIFICATIONS

FRICITION FORCE

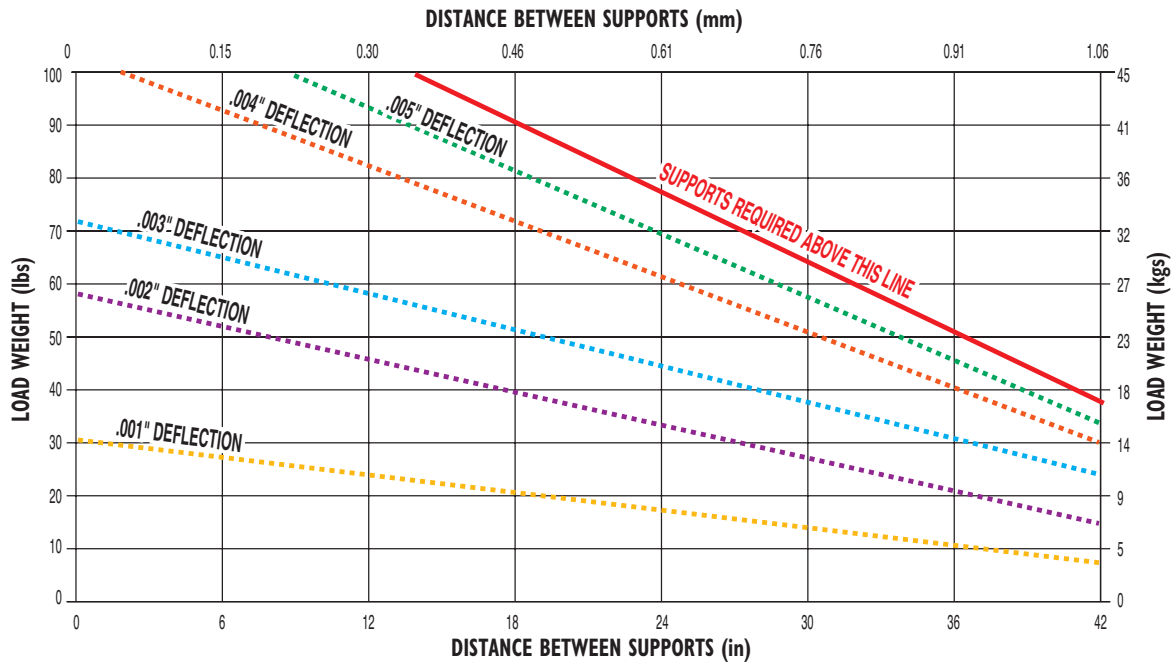


RODLESS

SLS/MLS10 Series

- Friction Force
- Support recommendations
- Bending moments and loads

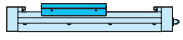
SUPPORT RECOMMENDATIONS



Axi dyne® SLS/MLS10 Series

SPECIFICATIONS

DYNAMIC BENDING MOMENTS AND LOADS



RODLESS

SLS/MLS10 Series

- Bending moments and loads

		MAXIMUM BENDING MOMENTS AND LOADS		ENGLISH	METRIC
STANDARD CARRIER				SLS10	MLS10
	Mx Moment (Roll)	(lb-in : N-m)	80	9.0	
	My Moment (Pitch)	(lb-in : N-m)	80	9.0	
	Mz Moment (Yaw)	(lb-in : N-m)	125	14.1	
	Fz Load (Lateral)	(lb : N)	100	445	
AUXILIARY CARRIER: Increases rigidity, load-carrying capacity and moments				SLS10	MLS10
	Mx Moment (Roll)	*(lb-in : N-m)	160	18.1	
	My Moment (Pitch)	*(lb-in : N-m)	178	20.1	
	Mz Moment (Yaw)	*(lb-in : N-m)	278	31.3	
	Fz Load (Lateral)	(lb : N)	200	890	
	Minimum Dimension 'D'	(in : mm)	5.5	169.7	

! Breakaway torque will increase when using the Auxiliary carrier option. When ordering, determine your working stroke and enter this value into the configuration string. Overall actuator length will automatically be calculated.

*Loads shown in table are at minimum "D" dimension, for ratings with longer "D" dimension see graph on page C-131.

Axi-dyne® SLS/MLS10 Series

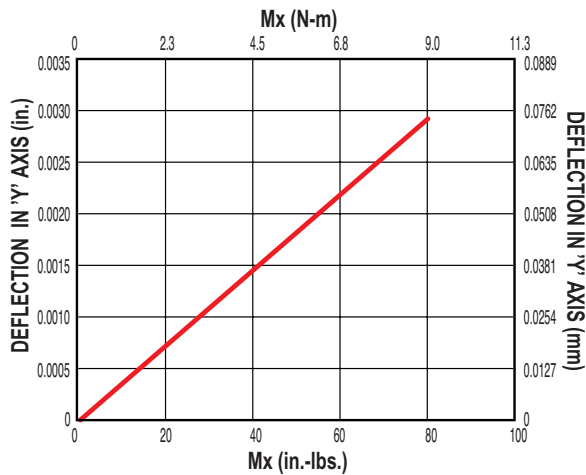
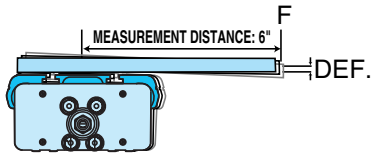
SPECIFICATIONS

LOAD DEFLECTION

Y-AXIS DEFLECTION

Figures calculated with the following considerations:

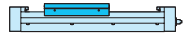
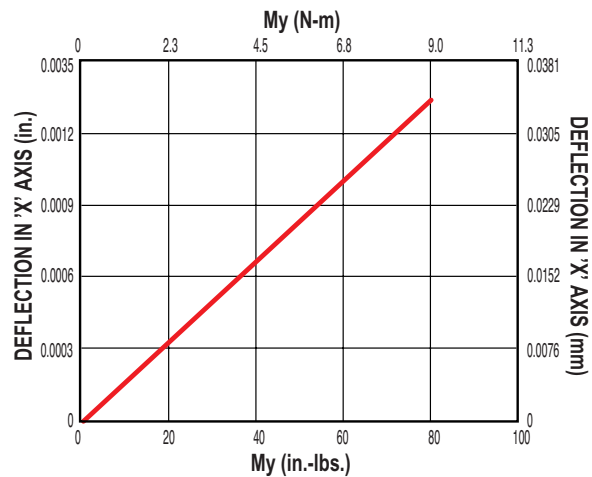
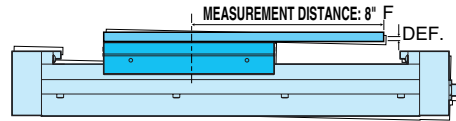
- 1.) Tube supports spaced at minimum distances for each bore size
- 2.) Measurement distance from F to center of carrier is 6 inches



X-AXIS DEFLECTION

Figures calculated with the following considerations:

- 1.) Tube supports spaced at minimum distances for each bore size
- 2.) Measurement distance from F to center of carrier is 8 inches

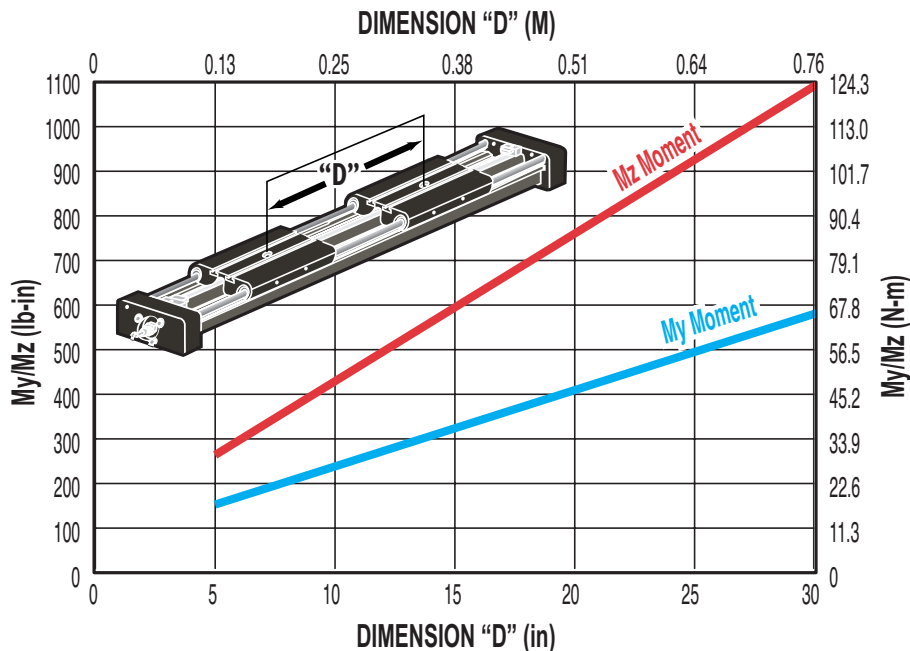


RODLESS

SLS/MLS10 Series

- Load deflection
- Auxiliary carrier

AUXILIARY CARRIER: BENDING MOMENT AT 'D' DISTANCE



Rates shown on charts were calculated with these assumptions:

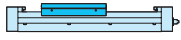
- 1.) Coupling between carriers is rigid.
- 2.) Load is equally distributed between carriers.
- 3.) Coupling device applies no misalignment loads to carriers.

* Customer must specify Dimension "D" (Distance between carrier center lines) in configuration string.

Axi dyne[®] SLS/MLS10 Series

DIMENSIONS

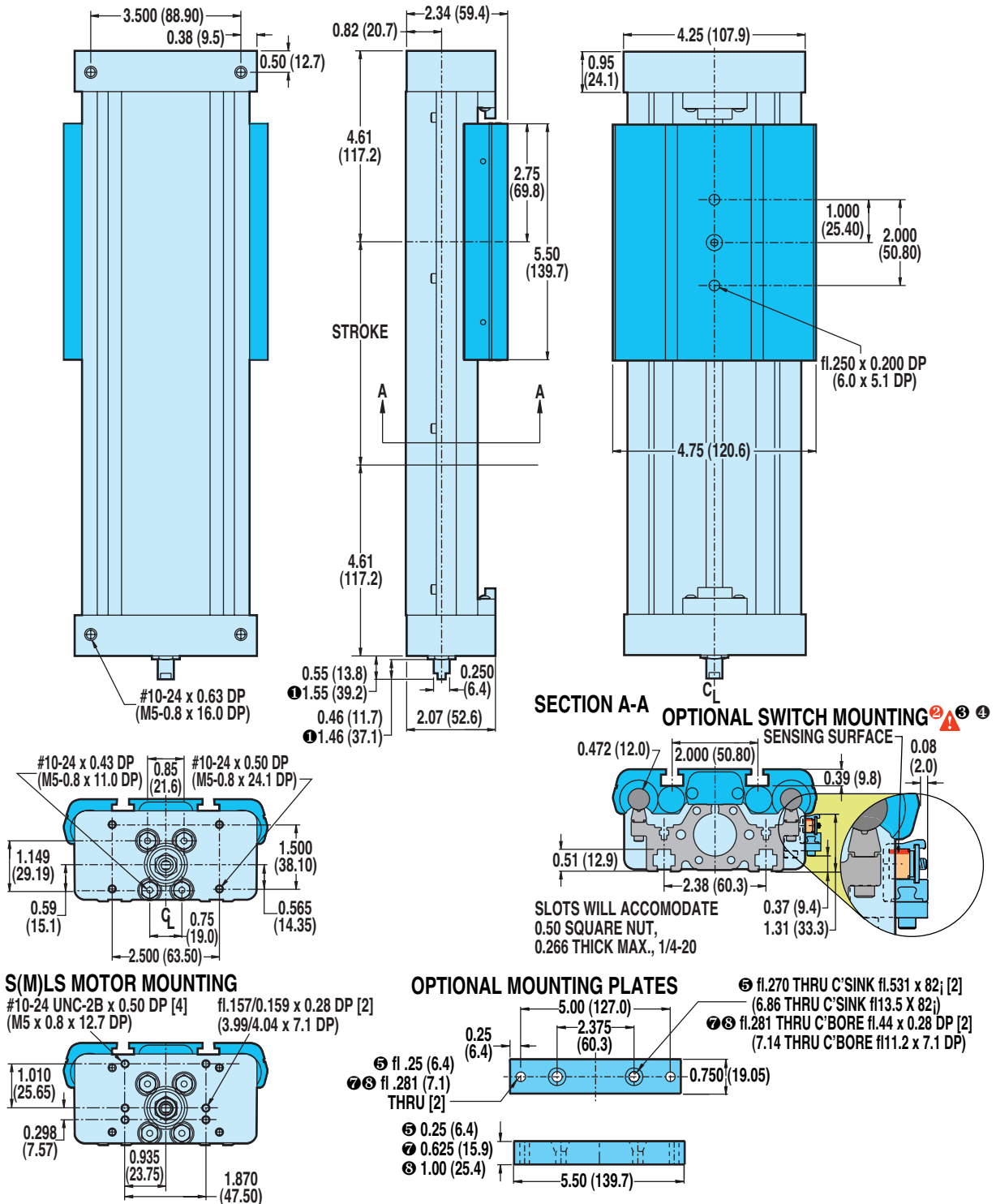
SLS10/MLS10 ACTUATOR AND OPTIONS DIMENSIONS



RODLESS

SLS/MLS10 Series

- Actuator and options dimensions



① FOR EXTENDED SHAFT

⚠ CAUTION: DO NOT OVERTIGHTEN SWITCH HARDWARE WHEN INSTALLING

② NOTE: The scored face of the switch indicates the sensing surface and must face toward the magnet

④ NOTE: Some actuators require switch mounting on a specific side of the actuator. Call Tol-O-Matic 1-800-328-2174

⑤ KIT #0610-9010 Mounting Plate

⑦ KIT #0610-9066 Mounting Plate for use with MRV23

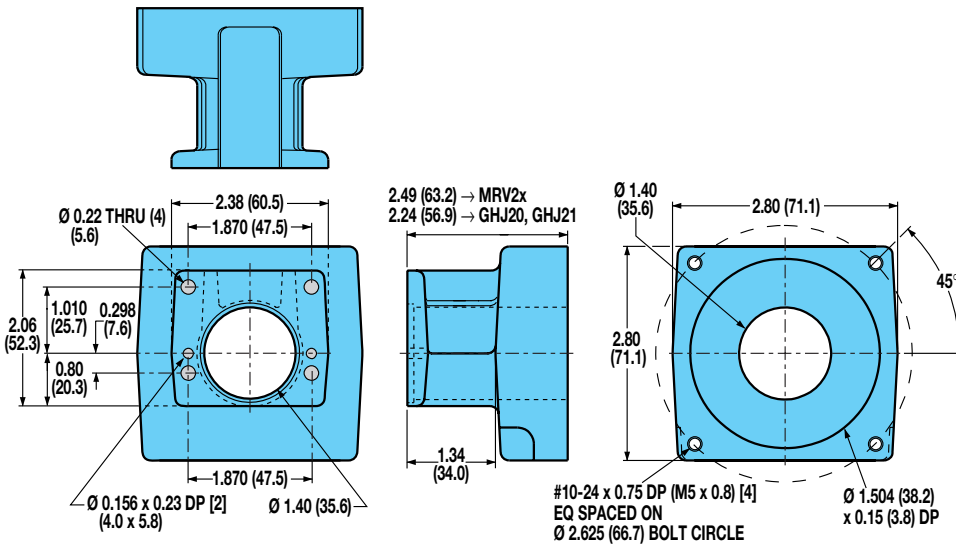
⑧ KIT #0610-9067 Mounting Plate for use with MRV34

Unless otherwise noted, all dimensions shown are in inches (Dimensions in parenthesis are in millimeters)

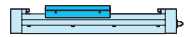
Axi dyne® SLS/MLS10 Series

DIMENSIONS

SLS/MLS10: IN-LINE MOUNT FOR BRUSHLESS MOTORS (MRV) AND GEARHEADS



! For gearhead dimensions and specifications, refer to page F-10.



RODLESS

SLS/MLS10 Series

- In-line mounting dimensions

Axi dyne® SLS/MLS10 Series

ORDERING

BASE MODEL SPECIFICATIONS

SLS 10 SN02 SK25 LMI

OPTIONS SPECIFICATIONS

DC18 KT2 TN4 MP2

MODEL TYPE

SLS SLS Series English Screw Drive
MLS MLS Series Metric Screw Drive

TUBE BORE DIAMETER

10 1-inch (25 mm) bore

NUT/SCREW CONFIGURATION

ENGLISH MODELS

SOLID NUT / PITCH (turn/in)	SERIES
SN01	SLS10
SN02	SLS10
SNA02	SLS10
SN05	SLS10

BALL NUT / PITCH (turn/in)	SERIES
BN08	SLS10
BNL08	SLS10

METRIC MODELS

SOLID NUT / LEAD (mm/turn)	SERIES
SN12	MLS10
SN25	MLS10

BALL NUT / LEAD (mm/turn)	SERIES
BN02	MLS10
BNL02	MLS10

STROKE LENGTH

SK Stroke, then enter desired stroke length in decimal inches

MOTOR MOUNTING / REDUCTIONS

(must choose one)

LMI In-Line mounting
****LMX** Extended shaft - old style (see note)

**** For replacement actuators with extended motor shafts purchased prior to 6/24/02 use LMX**

AUXILIARY CARRIER

DC_ Auxiliary Carrier, then center-to-center spacing desired in decimal inches. (Center-to-Center spacing will add to overall dead length and will not subtract from the stroke length)

SWITCHES

RM_ Reed Switch (Form A) with 5-meter lead/QD, and quantity desired
RT_ Reed Switch (Form A) with 5-meter lead, and quantity desired
BM_ Reed Switch (Form C) with 5-meter lead/QD, and quantity desired
BT_ Reed Switch (Form C) with 5-meter lead, and quantity desired
KM_ Hall-effect Sinking Switch with 5-meter lead/QD, and quantity desired
KT_ Hall-effect Sinking Switch with 5-meter lead, and quantity desired
TM_ Hall-effect Sourcing Switch with 5-meter lead/QD, and quantity desired
TT_ Hall-effect Sourcing Switch with 5-meter lead, and quantity desired
CM_ TRIAC Switch with 5-meter lead/QD, and quantity desired
CT_ TRIAC Switch with 5-meter lead, and quantity desired

T-NUT OPTION

TN_ Additional T-nuts and quantity

MOUNTING PLATES

MP_ Mounting Plates plus quantity desired

TO ORDER MOTORS/CONTROLS/INTERFACES

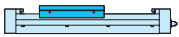
 **BRUSHLESS SERVO (SEE PAGE F-33)**

⚠ Not all codes listed are compatible with all options.

Use the Tol-O-Motion™ Sizing Software to determine available options and accessories based on your application requirements.

FIELD RETROFIT KITS

ITEM	SLS10	MLS10
1/4" Mounting Plates	0610-9010	0610-9010
1/2" Mounting Plates	0610-9045	0610-9045



RODLESS

SLS/MLS10 Series

• Ordering