Tolomatic™
EXCELLENCE *IN MOTION*

# MXB RODLESS BELT DRIVE ACTUATORS

ENDURANCE TECHNOLOGY℠
A Tolomatic Design Principle

Ⓤ UNGUIDED
Ⓢ SOLID BEARING
Ⓟ PROFILED RAIL


LINEAR SOLUTIONS MADE EASY

# MXB Rodless Belt Drive Actuators

## DESIGNED TO OUTLAST EVERY BELT DRIVE ACTUATOR ON THE MARKET


The MXB belt drive electric actuator is exactly what you would expect from the industry's number one rodless supplier. Designed with our exclusive **ENDURANCE TECHNOLOGY**SM features, the MXB delivers superior performance to meet the most demanding applications. Nobody knows rodless like Tolomatic, and the MXB proves it.

- MXB-[U], MXB-[S] & MXB-[P]: Low profile to fit your application
- MXB-[S]: Engineered bearing material in trapezoidal shape for less wear, low static & dynamic friction
- MXB-[P]: High precision bearings feature smooth, low breakaway motion
- MXB-[P]: Durable profiled rail design uses recirculating ball technology to reduce friction and extend actuator life.
- MXB-[P]: High load and bending moment capacities

## TOLOMATIC'S ELECTRIC RODLESS BELT-DRIVE ACTUATORS

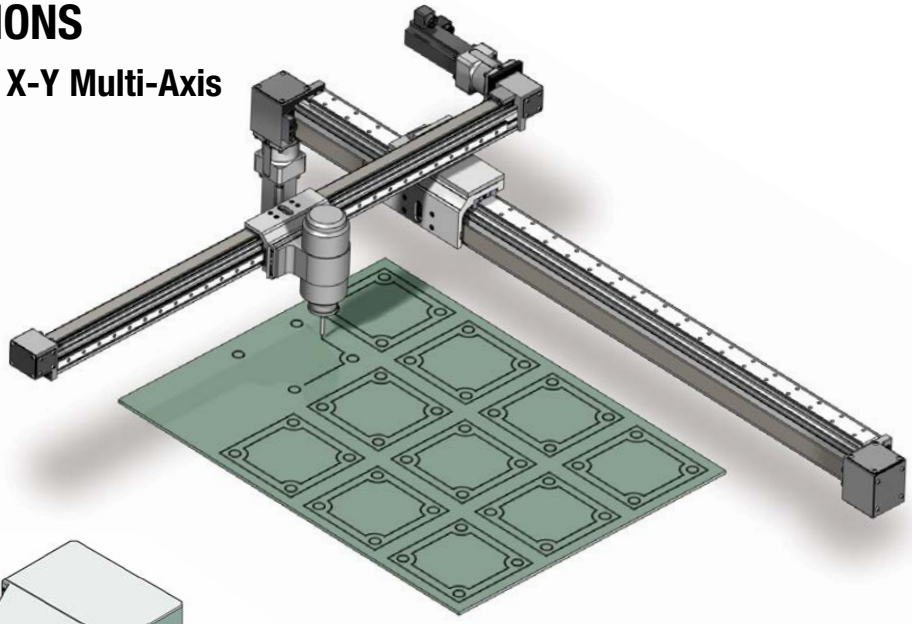
| | *MXB-U* | *MXB-S* | *MXB-P* | *B3W* | *TKB* |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| **Speed** up to: | 5,080 mm/sec *(200 in/sec)* | 2,540 mm/sec *(100 in/sec)* | 3,810 mm/sec *(150 in/sec)* | 5,080 mm/sec *(200 in/sec)* | 2,540 mm/sec *(100 in/sec)* |
| **Stroke Length** up to: | 5,080 mm *(200 in)* | 5,080 mm *(200 in)* | 5,080 mm *(200 in)* | 5,258 mm *(207 in)* | 2,438 mm *(96 in)* |
| **Load** up to: | NA | 236 kg; 2,313 N *(520 lb)* | 586 kg; 5,745 N *1,292 lb* | 911 kg; 8,932 N *(2,008 lb)* | 340 kg; 8,932 N *(750 lb)* |
| **Thrust** up to: | 1,859 N *(418 lbf)* | 1,859 N *(418 lbf)* | 1,859 N *(418 lbf)* | 1,446 N *(325 lbf)* | 1,090 N *(245 lbf)* |
| **Literature Number:** | 8500-4000 | 8500-4000 | 8500-4000 | 3600-4609 | 2700-4000 |

*(Not all models deliver maximum values listed, i.e.: Maximum thrust may not be available with maximum speed)*

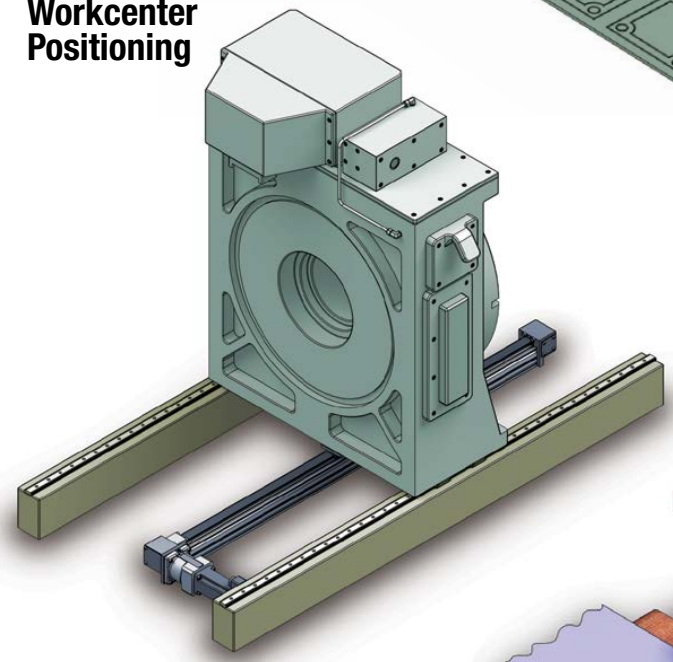
# MXB Rodless Belt Drive Actuators

## APPLICATIONS

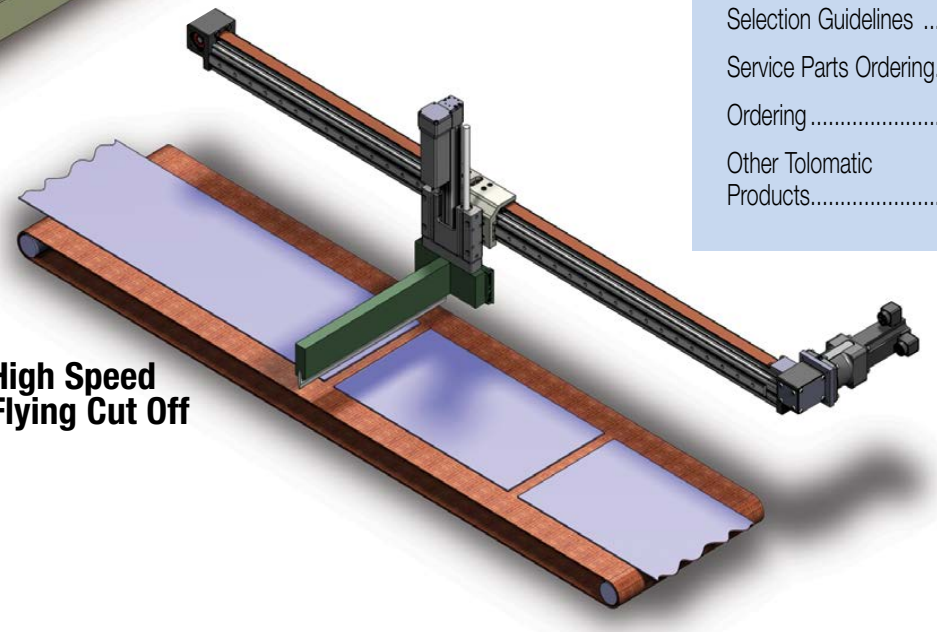
### X-Y Multi-Axis



### Workcenter Positioning



### High Speed Flying Cut Off



**CONTENTS**



- Adhesive dispensing
- Aligning
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- Milling
- Packaging equipment
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- Pulp & Paper
- Slitting
- Sorting
- Spraying
- Stacking
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- Test stations
- Wire winding

# MXB-U UNGUIDED BELT-DRIVE ACTUATOR

## ENDURANCE TECHNOLOGY℠

A Tolomatic Design Principle

*Endurance Technology℠ features are designed for maximum durability to provide extended service life.*

The MXB-U rodless actuator is a pre-assembled compact linear belt solution for use in applications with existing guides & supports. This economical actuator features speeds up to 5080 mm/sec (200 in/sec) and thrusts up to 1859 N (418 lbf). Built-to-order in stroke lengths up to 5842 mm (200 in).

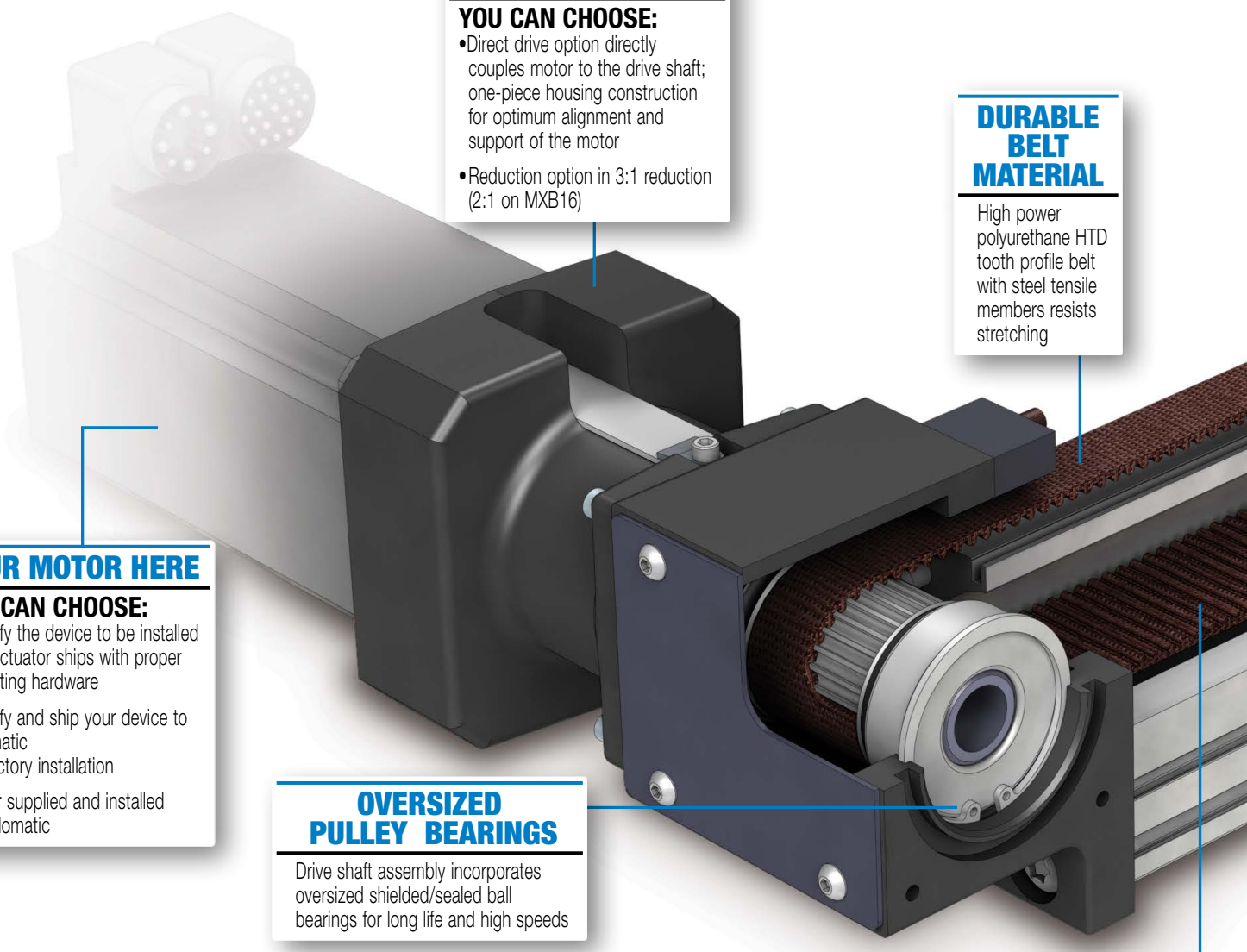
### MOTOR ORIENTATION

**YOU CAN CHOOSE:**

- Direct drive option directly couples motor to the drive shaft; one-piece housing construction for optimum alignment and support of the motor
- Reduction option in 3:1 reduction (2:1 on MXB16)

### DURABLE BELT MATERIAL

High power polyurethane HTD tooth profile belt with steel tensile members resists stretching



### YOUR MOTOR HERE

**YOU CAN CHOOSE:**

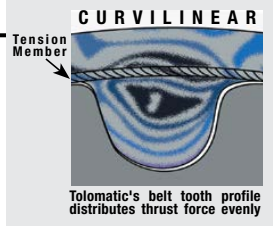
- Specify the device to be installed and actuator ships with proper mounting hardware
- Specify and ship your device to Tolomatic for factory installation
- Motor supplied and installed by Tolomatic

### OVERSIZED PULLEY BEARINGS

Drive shaft assembly incorporates oversized shielded/sealed ball bearings for long life and high speeds

### STEEL REINFORCED/HTD BELT PROFILE

- Belt of polyurethane material reinforced with steel tension members to produce high carrier thrusts without belt stretch.
- HTD tooth profile distributes tooth load more evenly and provides greater tooth shear strength, allowing for higher thrust loading.
- The deep teeth of the HTD profile are cogging-resistant, preventing potentially damaging positioning errors.



# ...MAXIMUM DURABILITY

## INCH OR METRIC MOUNTING

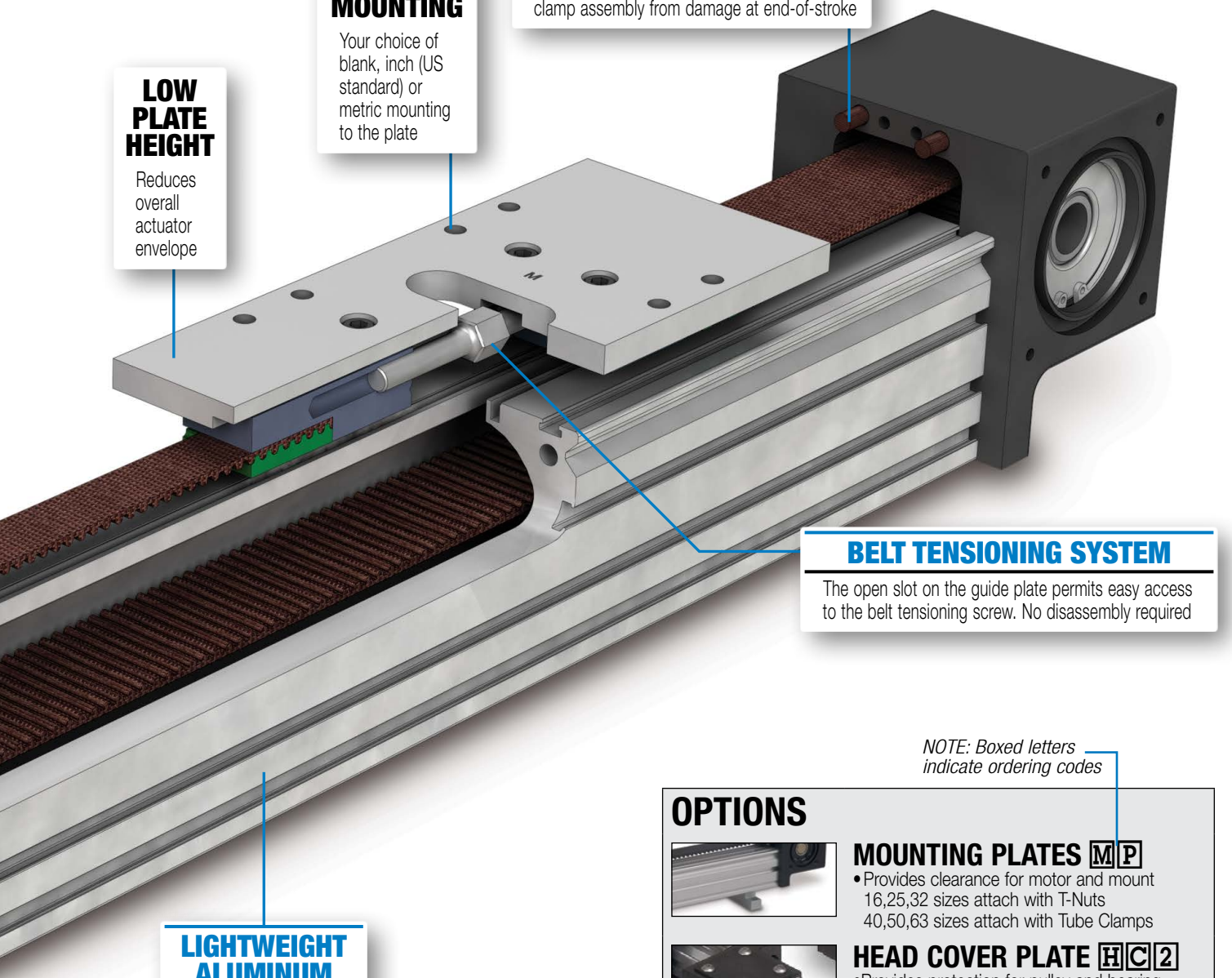
Your choice of blank, inch (US standard) or metric mounting to the plate

## EXTERNAL BUMPERS

Polyurethane bumpers protect the belt and clamp assembly from damage at end-of-stroke

## LOW PLATE HEIGHT

Reduces overall actuator envelope



## BELT TENSIONING SYSTEM

The open slot on the guide plate permits easy access to the belt tensioning screw. No disassembly required

## LIGHTWEIGHT ALUMINUM DESIGN

Clear anodized extrusion design is optimized for rigidity and strength

*NOTE: Boxed letters indicate ordering codes*

## OPTIONS



### MOUNTING PLATES [M][P]

- Provides clearance for motor and mount
  16,25,32 sizes attach with T-Nuts
  40,50,63 sizes attach with Tube Clamps

### HEAD COVER PLATE [H][C][2]

- Provides protection for pulley and bearing

### TUBE CLAMPS [T][C]

- Used for intermediate support
- Flush with bottom of actuator to retain low profile
- Drop-in, adjustable mounting locations (Not available on the MXB16U))

### SWITCHES

- Wide variety of sensing choices: Reed, Solid State PNP or NPN, available normally open or normally closed
- Flush mount, drop-in installation
- Bright LEDs, power & signal indication
- CE rated, RoHS compliant

# MXB-S SOLID BEARING BELT-DRIVE

## ENDURANCE TECHNOLOGY℠

A Tolomatic Design Principle

*Endurance Technology℠ features are designed for maximum durability to provide extended service life.*

The MXB-S rodless style actuator is a compact linear belt solution for use in applications requiring light to moderate load carrying and guidance. The MXB-S actuator utilizes two field replaceable solid bearings that optimize stress distribution for optimal performance, rigidity and life. This economical actuator features speeds up to 2540 mm/sec (100 in/sec) and thrusts up to 1859 N (418 lbf). Built-to-order in stroke lengths up to 5080 mm (200 in).

### LARGE FLEXIBLE MOUNTING PATTERN

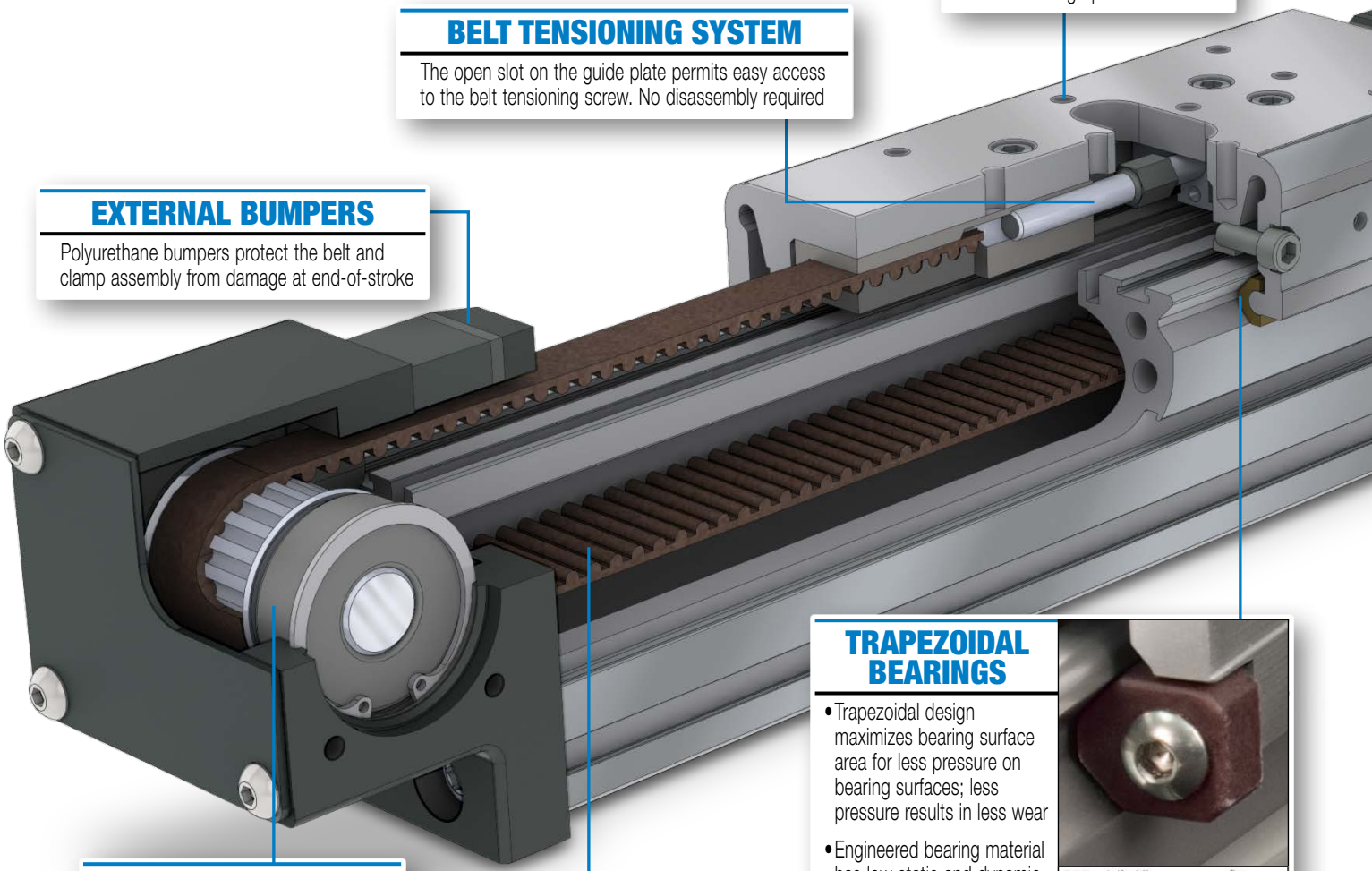
- Carrier gives more load stability
- Directly compatible with existing BCS & BC2 applications
- More fastening options

### BELT TENSIONING SYSTEM

The open slot on the guide plate permits easy access to the belt tensioning screw. No disassembly required

### EXTERNAL BUMPERS

Polyurethane bumpers protect the belt and clamp assembly from damage at end-of-stroke



### TRAPEZOIDAL BEARINGS

- Trapezoidal design maximizes bearing surface area for less pressure on bearing surfaces; less pressure results in less wear
- Engineered bearing material has low static and dynamic friction with low wear properties for long lasting, smooth operation
- Bearings are field replaceable for extended service life



### OVERSIZED PULLEY BEARINGS

Drive shaft assembly incorporates oversized shielded/sealed ball bearings for long life and high speeds

### DURABLE BELT MATERIAL

High power polyurethane HTD tooth profile belt with steel tensile members resists stretching

## INCH OR METRIC MOUNTING

Your choice of blank, inch (US standard) or metric mounting to the plate

## MOTOR ORIENTATION

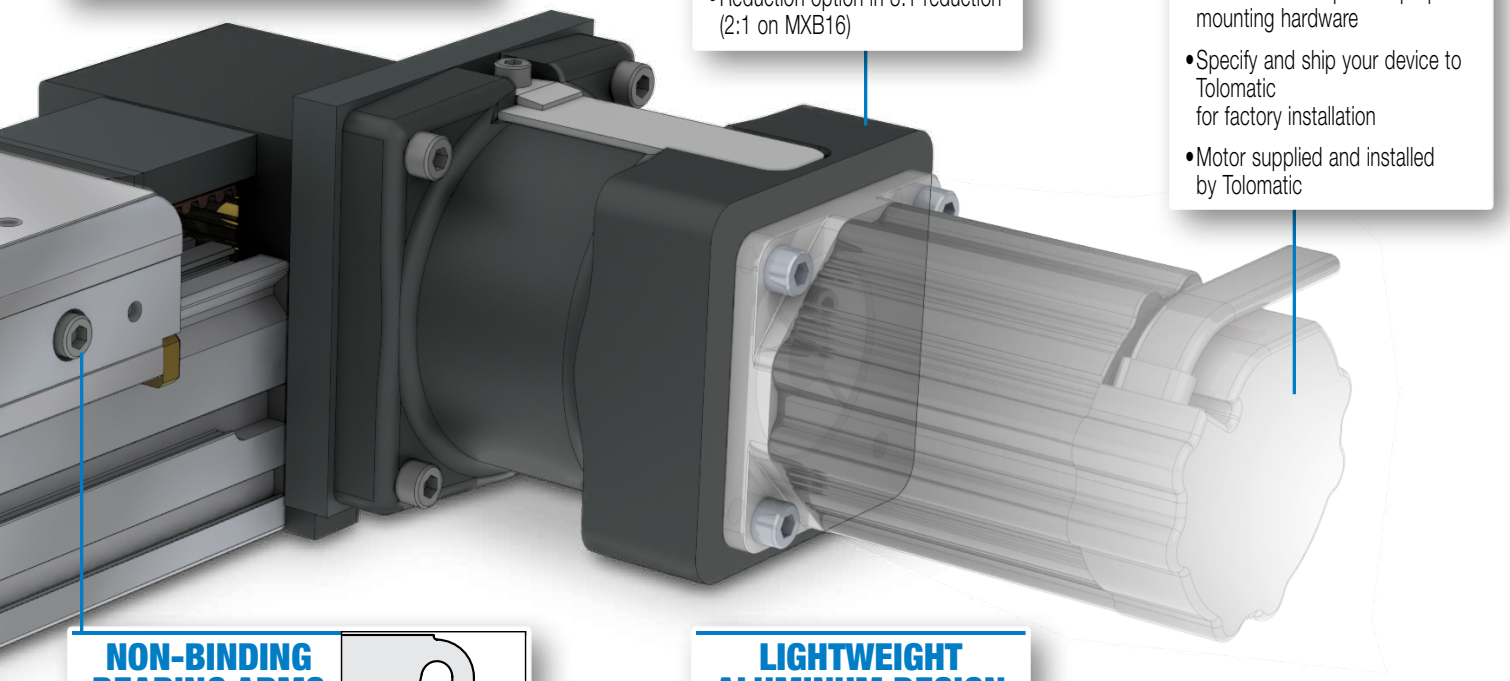
**YOU CAN CHOOSE:**

- Direct drive option directly couples motor to the drive shaft; one-piece housing construction for optimum alignment and support of the motor
- Reduction option in 3:1 reduction (2:1 on MXB16)

## YOUR MOTOR HERE

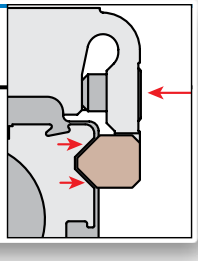
**YOU CAN CHOOSE:**

- Specify the device to be installed and actuator ships with proper mounting hardware
- Specify and ship your device to Tolomatic for factory installation
- Motor supplied and installed by Tolomatic



## NON-BINDING BEARING ARMS

Bearings are tensioned indirectly, providing bind free adjustment



## LIGHTWEIGHT ALUMINUM DESIGN

Clear anodized extrusion design is optimized for rigidity and strength

# OPTIONS

*NOTE: Boxed letters indicate ordering codes*

## AUXILIARY CARRIER [D][C]

- 2X higher Fz (load) capacity
- High bending moment capacity

## MOUNTING PLATES [M][P]

- Provides clearance for motor and mount
  16,25,32 sizes attach with T-Nuts
  40,50,63 sizes attach with Tube Clamps

## FLOATING MOUNT [F][L]

- Compensates for non-parallelism between MX actuator and externally guided load

## HEAD COVER PLATE [H][C][2]

- Provides protection for pulley and bearing

## TUBE CLAMPS [T][C]

- Used for intermediate support
- Flush with bottom of actuator to retain low profile
- Drop-in, adjustable mounting locations (MXB16 uses T-nuts with mounting plates)

## SWITCHES

- Wide variety of sensing choices: Reed, Solid State PNP or NPN, available normally open or normally closed
- Flush mount, drop-in installation
- Bright LEDs, power & signal indication
- CE rated, RoHS compliant

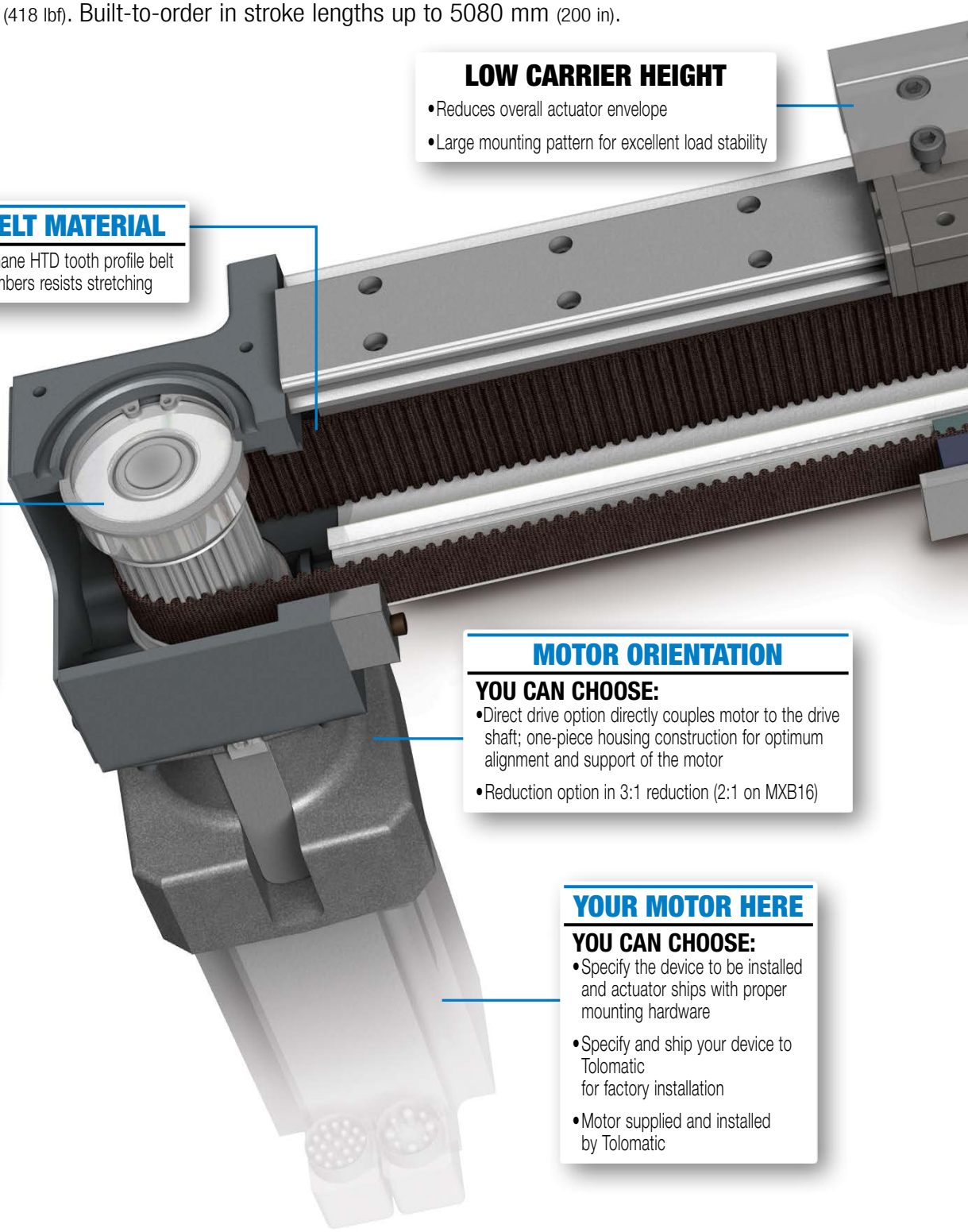
# MXB-P PROFILED RAIL BELT-DRIVE ACTUATOR

## ENDURANCE TECHNOLOGY℠

A Tolomatic Design Principle

*Endurance Technology℠ features are designed for maximum durability to provide extended service life.*

The MXB-P rodless electric belt-drive actuator is designed for applications requiring moderate to heavy load carrying and guidance. The MXB-P actuator features a profiled rail system with recirculating ball linear guides for optimal performance. The MXB-P belt-driven actuator features speeds up to 3810 mm/sec (150 in/sec) and thrusts up to 1859 N (418 lbf). Built-to-order in stroke lengths up to 5080 mm (200 in).



### LOW CARRIER HEIGHT

- Reduces overall actuator envelope
- Large mounting pattern for excellent load stability

### DURABLE BELT MATERIAL

High power polyurethane HTD tooth profile belt with steel tensile members resists stretching

### OVERSIZED PULLEY BEARINGS

Drive shaft assembly incorporates oversized shielded/sealed ball bearings for long life and high speeds

### MOTOR ORIENTATION

**YOU CAN CHOOSE:**

- Direct drive option directly couples motor to the drive shaft; one-piece housing construction for optimum alignment and support of the motor
- Reduction option in 3:1 reduction (2:1 on MXB16)

### YOUR MOTOR HERE

**YOU CAN CHOOSE:**

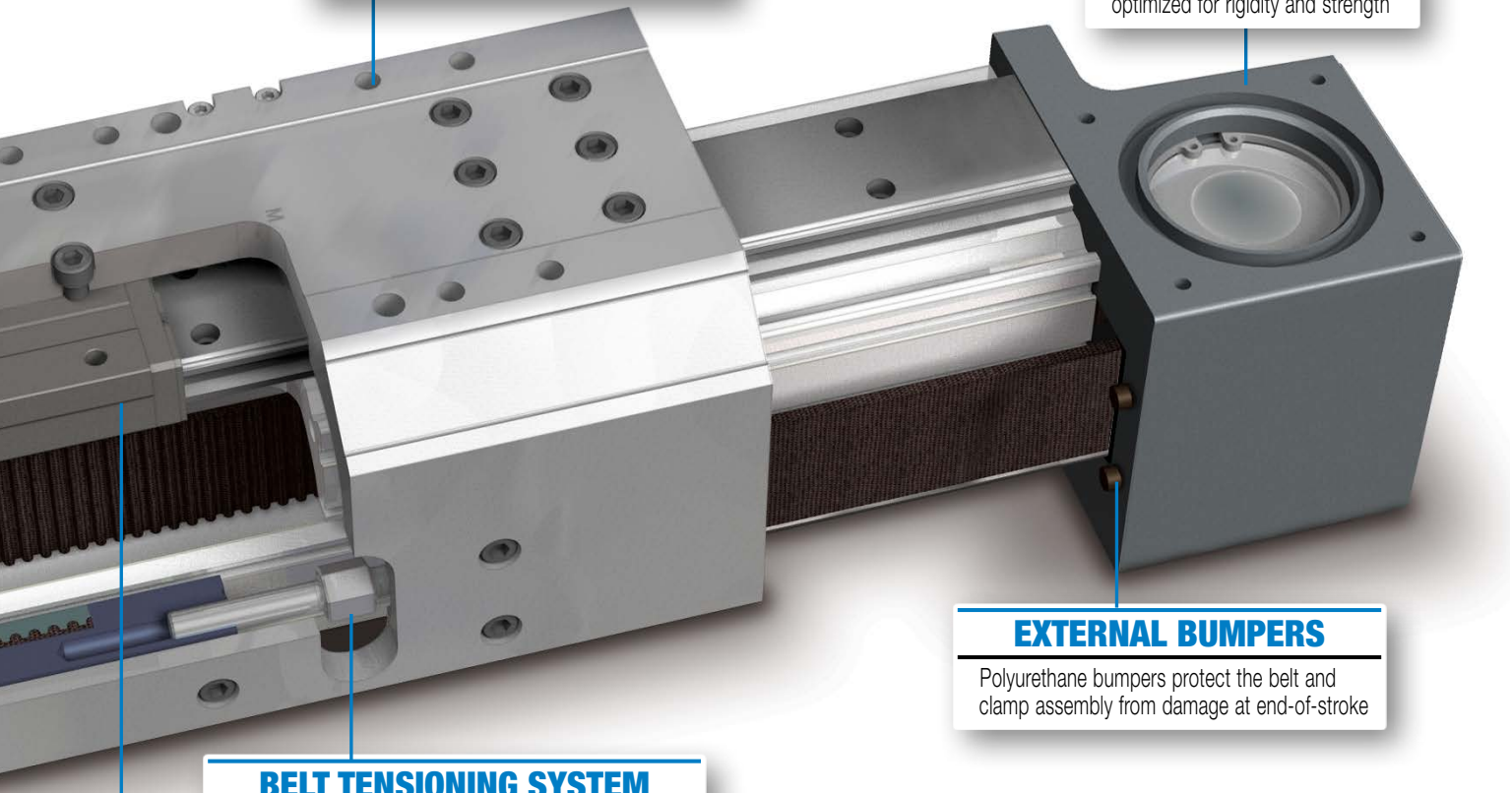
- Specify the device to be installed and actuator ships with proper mounting hardware
- Specify and ship your device to Tolomatic for factory installation
- Motor supplied and installed by Tolomatic

## INCH OR METRIC MOUNTING

Your choice of blank, inch (US standard) or metric mounting to the plate

## LIGHTWEIGHT ALUMINUM DESIGN

Clear anodized extrusion design is optimized for rigidity and strength



## EXTERNAL BUMPERS

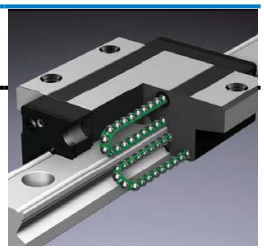
Polyurethane bumpers protect the belt and clamp assembly from damage at end-of-stroke

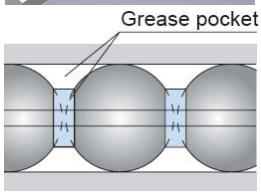
## BELT TENSIONING SYSTEM

The open slot on the guide plate permits easy access to the belt tensioning screw. No disassembly required

## RECIRCULATING BALL BEARINGS

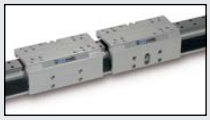
- Recirculating ball bearings are used to reduce friction and extend actuator life
- Designed with a grease pocket between ball elements to reduce friction, noise and maintenance
- Large permissible moment loads
- High speed operation, low heat generation
- High precision, smooth, low friction motion






*NOTE: Boxed letters indicate ordering codes*

## OPTIONS



### AUXILIARY CARRIER [D][C]

- 2X higher Fz & Fy (load) capacity
- High bending moment capacity

### MOUNTING PLATES [M][P]

- Provides clearance for motor and mount
  16,25,32 sizes attach with T-Nuts
  40,50,63 sizes attach with Tube Clamps

### TUBE CLAMPS [T][C]

- Used for intermediate support
- Flush with bottom of actuator to retain low profile
- Drop-in adjustable mounting locations

(Not available on the 16, 25 or 32 MXB-P sizes)

### HEAD COVER PLATE [H][C][2]

- Provides protection for pulley and bearing

### SWITCHES

- Wide variety of sensing choices: Reed, Solid State PNP or NPN, available normally open or normally closed
- Flush mount, drop-in installation
- Bright LEDs, power & signal indication
- CE rated, RoHS compliant

# MXB Rodless Belt Drive Actuators

## ACTUATOR SPECIFICATIONS AND BREAKAWAY TORQUE

| MXB [U], [S] & [P] | | | | | | BREAKAWAY TORQUE | |
|---|---|---|---|---|---|---|---|
| MXB SIZE | BELT WIDTH | BELT DEAD LENGTH | PULLEY PITCH DIA. | STROKE PER REV. | *MAX. STROKE | SINGLE CARRIER | AUX. CARRIER OPT. (MXB-P) |
| | mm | mm | mm | mm | m | N-m | N-m |
| 16 | 10 | 363.0 | 19.1 | 60.1 | 5.84 | 0.452 | 0.678 |
| 25 | 18 | 475.5 | 25.5 | 80.0 | 5.19 | 0.565 | 0.791 |
| 32 | 25 | 556.0 | 31.8 | 100.0 | 5.16 | 0.904 | 1.130 |
| 40 | 30 | 633.7 | 38.2 | 120.0 | 5.14 | 1.130 | 1.356 |
| 50 | 40 | 692.2 | 44.6 | 140.0 | 5.13 | 1.695 | 2.034 |
| 63 | 50 | 917.2 | 54.1 | 170.0 | 2.60 | 2.260 | 2.825 |

| MXB [U], [S] & [P] | | | | | | BREAKAWAY TORQUE | |
|---|---|---|---|---|---|---|---|
| MXB SIZE | BELT WIDTH | BELT DEAD LENGTH | PULLEY PITCH DIA. | STROKE PER REV. | *MAX. STROKE | SINGLE CARRIER | AUX. CARRIER OPT. (MXB-P) |
| | in | in | in | in | in | lb-in | lb-in |
| 16 | *0.39* | *14.29* | *0.753* | *2.366* | *230* | *4.0* | *6.0* |
| 25 | *0.71* | *18.72* | *1.003* | *3.151* | *204* | *5.0* | *7.0* |
| 32 | *0.98* | *21.89* | *1.253* | *3.936* | *203* | *8.0* | *10.0* |
| 40 | *1.18* | *24.95* | *1.504* | *4.725* | *202* | *10.0* | *12.0* |
| 50 | *1.57* | *27.25* | *1.754* | *5.510* | *201* | *15.0* | *18.0* |
| 63 | *1.97* | *36.11* | *2.130* | *6.692* | *102* | *20.0* | *25.0* |

*Longer stroke length available, up to 40 feet (12.2m), contact Tolomatic

| [U] MXB-U SIZE | WEIGHT | | | | INERTIA | | |
|---|---|---|---|---|---|---|---|
| | PLATE ASSEMBLY | BELT TENSIONER ASSEMBLY | BASE ACTUATOR | PER cm OF STROKE | DRIVE/IDLE PULLEY ASSEMBLIES | PLATE ASSEMBLY (INCLUDING BELT TENSIONER ASSEMBLY) | PER cm OF STROKE |
| | kg | kg | kg | kg/cm | kg-cm² | kg-cm² | kg-cm² |
| 16 | 0.05 | 0.05 | 0.72 | 0.0150 | 0.0250 | 0.0870 | 0.0006 |
| 25 | 0.12 | 0.07 | 1.17 | 0.0246 | 0.0759 | 0.3073 | 0.0020 |
| 32 | 0.22 | 0.13 | 1.89 | 0.0423 | 0.4143 | 0.8906 | 0.0043 |
| 40 | 0.41 | 0.21 | 3.55 | 0.0629 | 1.0884 | 2.2430 | 0.0075 |
| 50 | 0.47 | 0.33 | 4.50 | 0.0843 | 2.1196 | 3.9449 | 0.0135 |
| 63 | 1.15 | 0.38 | 7.46 | 0.1488 | 5.7101 | 11.1931 | 0.0249 |

| [U] MXB-U SIZE | WEIGHT | | | | INERTIA | | |
|---|---|---|---|---|---|---|---|
| | PLATE ASSEMBLY | BELT TENSIONER ASSEMBLY | BASE ACTUATOR | PER in OF STROKE | DRIVE/IDLE PULLEY ASSEMBLIES | PLATE ASSEMBLY (INCLUDING BELT TENSIONER ASSEMBLY) | PER in OF STROKE |
| | lb | lb | lb | lb/in | lb-in² | lb-in² | lb-in² |
| 16 | *0.11* | *0.10* | *1.59* | *0.084* | *0.0085* | *0.0297* | *0.0005* |
| 25 | *0.27* | *0.15* | *2.59* | *0.138* | *0.0259* | *0.1050* | *0.0017* |
| 32 | *0.48* | *0.30* | *4.17* | *0.237* | *0.1416* | *0.3043* | *0.0037* |
| 40 | *0.90* | *0.46* | *7.83* | *0.352* | *0.3719* | *0.7665* | *0.0065* |
| 50 | *1.03* | *0.72* | *9.93* | *0.472* | *0.7243* | *1.3480* | *0.0117* |
| 63 | *2.54* | *0.83* | *16.44* | *0.833* | *1.9512* | *3.8249* | *0.0216* |

| [S] MXB-S SIZE | WEIGHT | | | | INERTIA | | | |
|---|---|---|---|---|---|---|---|---|
| | CARRIER ASSEMBLY | BELT TENSIONER ASSEMBLY | BASE ACTUATOR | PER cm OF STROKE | DRIVE/IDLE PULLEY ASSEMBLIES | CARRIER ASSEMBLY (INCLUDING BELT TENSIONER ASSEMBLY) | | PER cm OF STROKE |
| | | | | | | SINGLE CARRIER | AUX. CARRIER OPT. | |
| | kg | kg | kg | kg/cm | kg-cm² | kg-cm² | kg-cm² | kg-cm² |
| 16 | 0.15 | 0.05 | 0.84 | 0.0150 | 0.0250 | 0.1782 | 0.3151 | 0.0006 |
| 25 | 0.24 | 0.07 | 1.65 | 0.0246 | 0.0759 | 0.5060 | 0.9035 | 0.0020 |
| 32 | 0.45 | 0.14 | 2.63 | 0.0423 | 0.4143 | 1.4879 | 2.6365 | 0.0043 |
| 40 | 0.80 | 0.21 | 5.06 | 0.0629 | 1.0884 | 3.6828 | 6.6119 | 0.0075 |
| 50 | 1.17 | 0.33 | 7.35 | 0.0843 | 2.1196 | 7.4111 | 13.1956 | 0.0135 |
| 63 | 3.42 | 0.38 | 14.56 | 0.1488 | 5.7101 | 27.7891 | 52.8158 | 0.0249 |

| [S] MXB-S SIZE | WEIGHT | | | | INERTIA | | | |
|---|---|---|---|---|---|---|---|---|
| | CARRIER ASSEMBLY | BELT TENSIONER ASSEMBLY | BASE ACTUATOR | PER in OF STROKE | DRIVE/IDLE PULLEY ASSEMBLIES | CARRIER ASSEMBLY (INCLUDING BELT TENSIONER ASSEMBLY) | | PER in OF STROKE |
| | | | | | | SINGLE CARRIER | AUX. CARRIER OPT. | |
| | lb | lb | lb | lb/in | lb-in² | lb-in² | lb-in² | lb-in² |
| 16 | *0.33* | *0.10* | *1.86* | *0.084* | *0.0085* | *0.0609* | *0.1077* | *0.0005* |
| 25 | *0.54* | *0.15* | *3.64* | *0.138* | *0.0259* | *0.1729* | *0.3087* | *0.0017* |
| 32 | *1.00* | *0.30* | *5.80* | *0.237* | *0.1416* | *0.5084* | *0.9009* | *0.0037* |
| 40 | *1.77* | *0.46* | *11.16* | *0.352* | *0.3719* | *1.2585* | *2.2594* | *0.0065* |
| 50 | *2.57* | *0.72* | *16.20* | *0.472* | *0.7243* | *2.5325* | *4.5092* | *0.0117* |
| 63 | *7.54* | *0.83* | *32.10* | *0.833* | *1.9512* | *9.4960* | *18.0481* | *0.0216* |

| [P] MXB-P SIZE | WEIGHT | | | | INERTIA | | | |
|---|---|---|---|---|---|---|---|---|
| | CARRIER ASSEMBLY | BELT TENSIONER ASSEMBLY | BASE ACTUATOR | PER cm OF STROKE | DRIVE/IDLE PULLEY ASSEMBLIES | CARRIER ASSEMBLY (INCLUDING BELT TENSIONER ASSEMBLY) | | PER cm OF STROKE |
| | | | | | | SINGLE CARRIER | AUX. CARRIER OPT. | |
| | kg | kg | kg | kg/cm | kg-cm² | kg-cm² | kg-cm² | kg-cm² |
| 16 | 0.18 | 0.05 | 1.08 | 0.0183 | 0.0250 | 0.2014 | 0.3615 | 0.0006 |
| 25 | 0.38 | 0.07 | 1.98 | 0.0348 | 0.0759 | 0.7297 | 1.3508 | 0.0020 |
| 32 | 0.74 | 0.13 | 3.55 | 0.0569 | 0.4143 | 2.2232 | 4.1072 | 0.0043 |
| 40 | 1.14 | 0.21 | 6.38 | 0.0959 | 1.0884 | 4.9138 | 9.0740 | 0.0075 |
| 50 | 2.28 | 0.33 | 9.45 | 0.1337 | 2.1196 | 12.9416 | 24.2565 | 0.0135 |
| 63 | 4.25 | 0.38 | 16.89 | 0.1981 | 5.7101 | 33.8324 | 64.9024 | 0.0249 |

| [P] MXB-P SIZE | WEIGHT | | | | INERTIA | | | |
|---|---|---|---|---|---|---|---|---|
| | CARRIER ASSEMBLY | BELT TENSIONER ASSEMBLY | BASE ACTUATOR | PER in OF STROKE | DRIVE/IDLE PULLEY ASSEMBLIES | CARRIER ASSEMBLY (INCLUDING BELT TENSIONER ASSEMBLY) | | PER in OF STROKE |
| | | | | | | SINGLE CARRIER | AUX. CARRIER OPT. | |
| | lb | lb | lb | lb/in | lb-in² | lb-in² | lb-in² | lb-in² |
| 16 | *0.39* | *0.10* | *2.38* | *0.102* | *0.0085* | *0.0688* | *0.1235* | *0.0005* |
| 25 | *0.84* | *0.15* | *4.36* | *0.195* | *0.0259* | *0.2493* | *0.4616* | *0.0017* |
| 32 | *1.64* | *0.30* | *7.83* | *0.318* | *0.1416* | *0.7597* | *1.4035* | *0.0037* |
| 40 | *2.51* | *0.46* | *14.07* | *0.537* | *0.3719* | *1.6791* | *3.1007* | *0.0065* |
| 50 | *5.03* | *0.72* | *20.84* | *0.749* | *0.7243* | *4.4224* | *8.2889* | *0.0117* |
| 63 | *9.36* | *0.83* | *37.24* | *1.110* | *1.9512* | *11.5611* | *22.1783* | *0.0216* |

| | | |
|---|---|---|
| **MAXIMUM VELOCITY [U]** | 5080 mm/sec | *200 in/sec* |
| **MAXIMUM VELOCITY [S]** | 2540 mm/sec | *100 in/sec* |
| **MAXIMUM VELOCITY [P]** | 3810 mm/sec | *150 in/sec* |
| **MAXIMUM ACCELERATION** | 30.48 m/sec² | *1200 in/sec²* |
| **REPEATABILITY** | ± 0.051 mm | *± 0.002 in* |
| **TEMPERATURE RANGE** | -12 to 54 °C | *10 to 130 °F* |

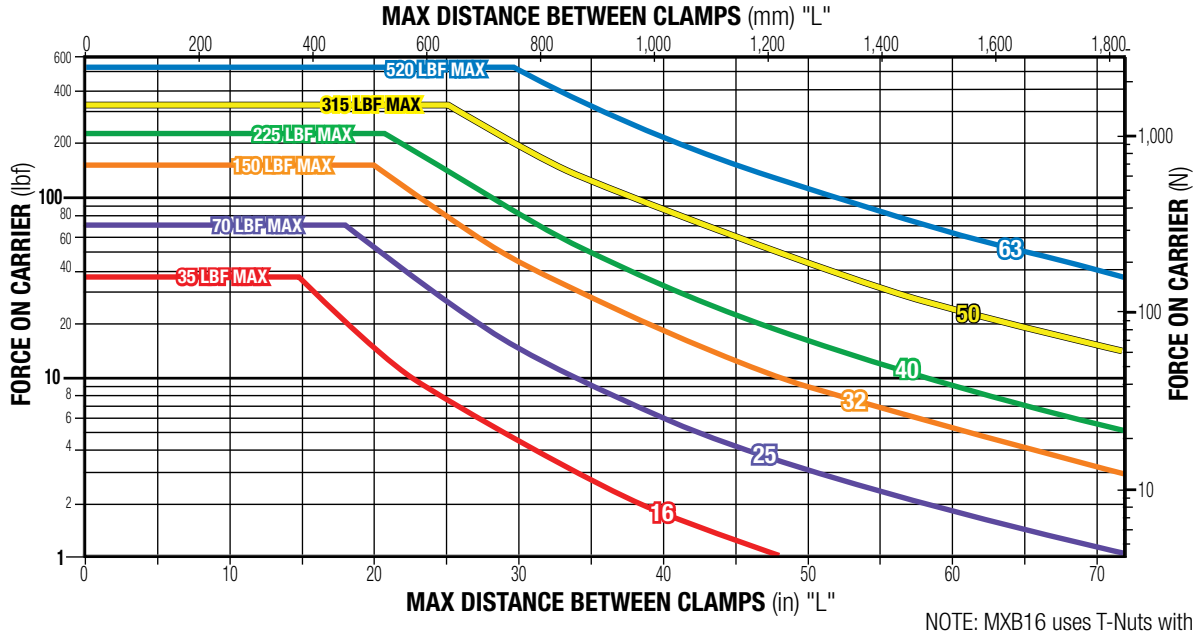
⚠ Heat generated by the motor and drive should be taken into consideration as well as linear velocity and work cycle time. For applications that require operation outside of the recommended temperature range, contact the factory.

**STRAIGHTNESS, FLATNESS** 0.01702 L mm *0.00067 L in*
Actuator mounted on a flat surface and fully restrained (see Mounting Plate Requirements, page MXB_11) L = Maximum distance between supports

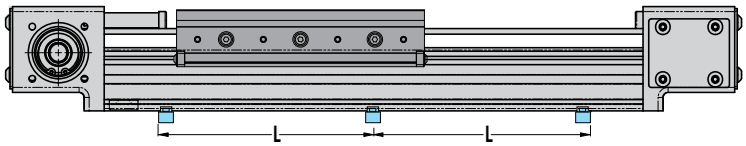
⚠ The listed values relating to straightness/flatness are intended for reference purposes only, and not as an engineering standard of absolute tolerance for a given actuator. Appropriate installation is the single most important factor in reducing variation, so good engineering practices such as measurement, mapping, etc. must be employed in applications with stringent straightness/flatness requirements.

## S & P TUBE CLAMP REQUIREMENTS

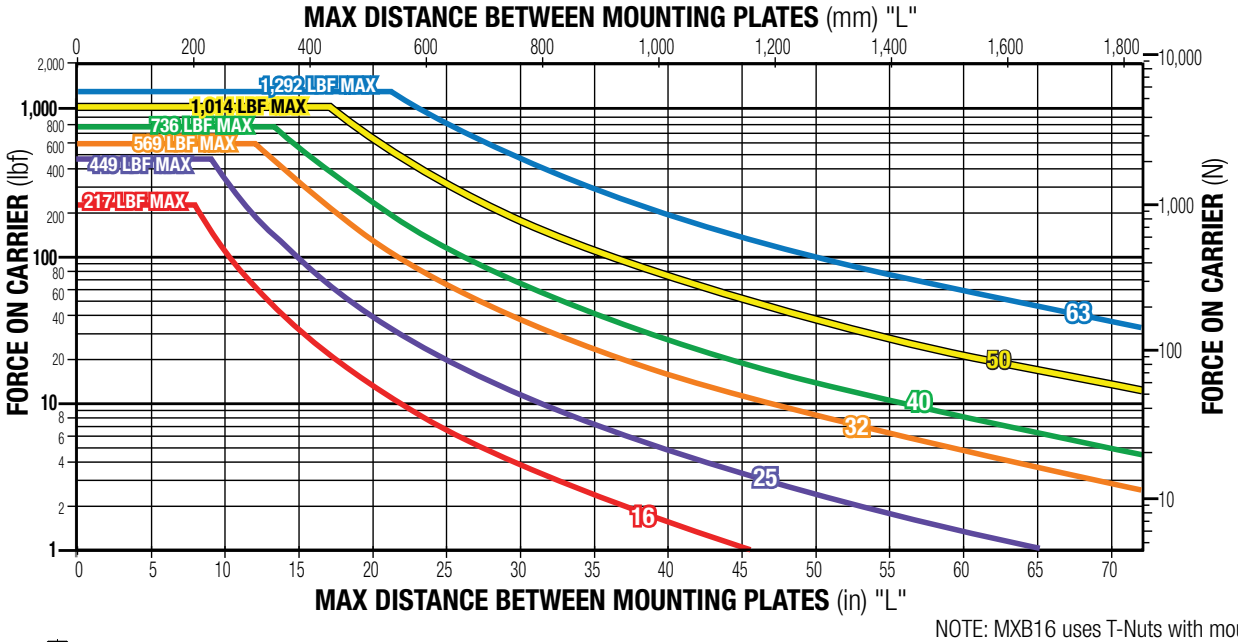
### S SOLID BEARING



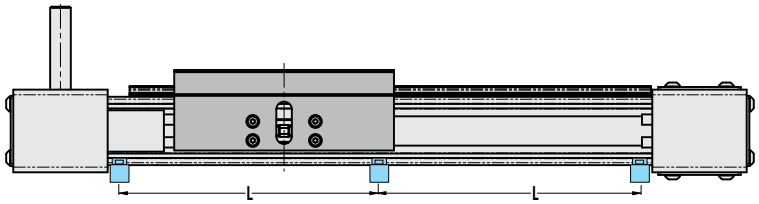

NOTE: MXB16 uses T-Nuts with mounting plates




### P PROFILE RAIL BEARING




NOTE: MXB16 uses T-Nuts with mounting plates

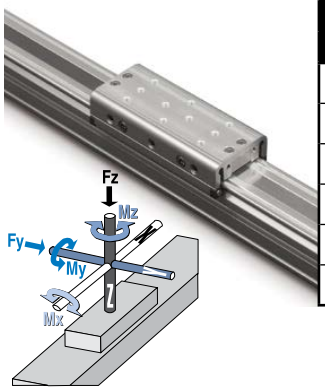


# MXB-S Rodless Belt Drive Actuators

sizeit.tolomatic.com for fast, accurate actuator selection

## S SOLID BEARING MOMENT AND LOAD CAPACITY

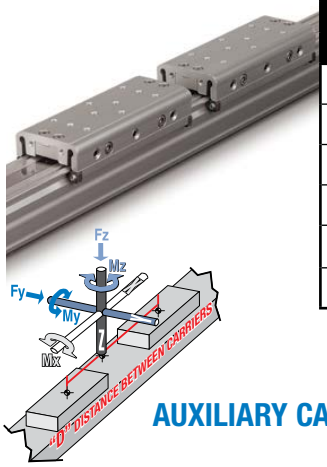
### STANDARD CARRIER




| SIZE | MAX. BENDING MOMENTS | | | MAX. LOAD |
|---|---|---|---|---|
| | Mx | My | Mz | Fz |
| | N-m | N-m | N-m | N |
| 16 | 2.5 | 2.1 | 2.8 | 156 |
| 25 | 6.8 | 12.4 | 3.8 | 311 |
| 32 | 11.3 | 39.5 | 15.8 | 667 |
| 40 | 31.1 | 67.8 | 24.9 | 1,001 |
| 50 | 35.6 | 131.0 | 38.5 | 1,401 |
| 63 | 66.1 | 264.0 | 58.8 | 2,313 |

| SIZE | MAX. BENDING MOMENTS | | | MAX. LOAD |
|---|---|---|---|---|
| | Mx | My | Mz | Fz |
| | in-lbs | in-lbs | in-lbs | lbf |
| 16 | *22* | *19* | *25* | *35* |
| 25 | *60* | *110* | *34* | *70* |
| 32 | *100* | *350* | *140* | *150* |
| 40 | *275* | *600* | *220* | *225* |
| 50 | *315* | *1,155* | *341* | *315* |
| 63 | *585* | *2,340* | *520* | *520* |

### DC AUXILIARY CARRIER

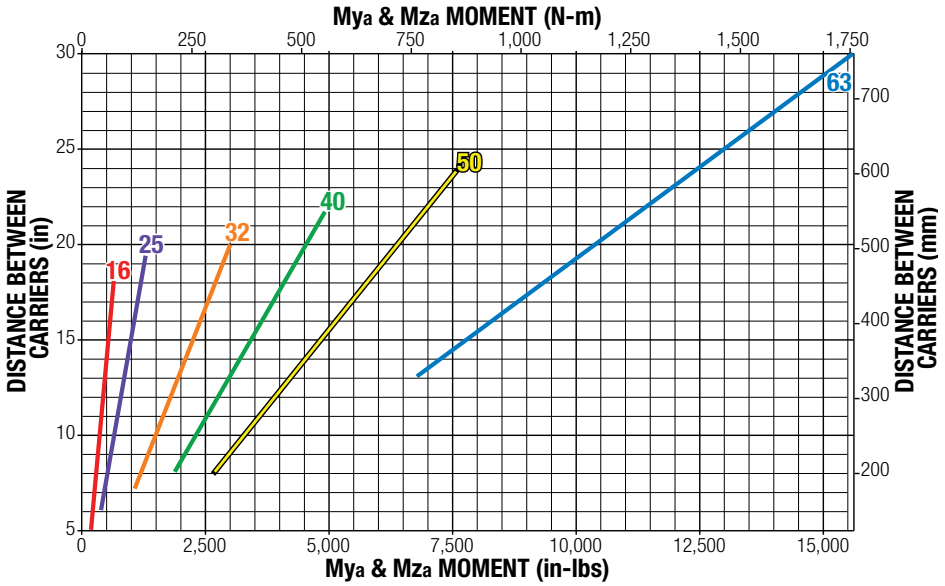



| SIZE | "D" MIN. | MAX. BENDING MOMENTS* | | | MAX. LOAD |
|---|---|---|---|---|---|
| | | Mxa | Mya | Mza | Fza |
| | mm | N-m | N-m | N-m | N |
| 16 | 127 | 5.0 | 19.8 | 19.8 | 311 |
| 25 | 152 | 13.6 | 47.5 | 47.5 | 623 |
| 32 | 178 | 22.6 | 119.0 | 119.0 | 1,334 |
| 40 | 216 | 62.1 | 216.0 | 216.0 | 2,002 |
| 50 | 218 | 71.2 | 306.0 | 306.0 | 2,802 |
| 63 | 330 | 132.0 | 764.0 | 764.0 | 4,626 |

| SIZE | "D" MIN. | MAX. BENDING MOMENTS* | | | MAX. LOAD |
|---|---|---|---|---|---|
| | | Mxa | Mya | Mza | Fza |
| | in | in-lbs | in-lbs | in-lbs | lbf |
| 16 | *5.0* | *44* | *175* | *175* | *70* |
| 25 | *6.0* | *120* | *420* | *420* | *140* |
| 32 | *7.0* | *200* | *1,050* | *1,050* | *300* |
| 40 | *8.5* | *550* | *1,913* | *1,913* | *450* |
| 50 | *8.6* | *630* | *2,709* | *2,709* | *630* |
| 63 | *13.0* | *1,170* | *6,760* | *6,760* | *1,040* |

*At minimum "D" distance see graph below for complete information

### AUXILIARY CARRIER BENDING MOMENTS WITH INCREASED "D" DISTANCE BETWEEN CARRIERS




**Ratings were calculated with the following conditions:**
1.) Coupling between carriers is rigid.
2.) Load is equally distributed between carriers.
3.) Coupling device applies no misalignment loads to carriers.

**The above ratings are the maximum values for shock-free, vibration-free operation in a typical industrial environment, which must not be exceeded even in dynamic operation. Contact Tolomatic for assistance in selecting the most appropriate actuator for your application.**

The moment and load capacity of the actuator bearing system is based on an L10 life of 5,000 linear km ($2x10^8$ in) of travel. Life of the actuator will vary for each application depending on the combined loads, motion parameters and operating conditions. The load factor ($L_F$) for each application must not exceed a value of 1, as calculated below. Exceeding a load factor of 1 will diminish the actuator rated life.

$$L_F = \frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} \leq 1$$

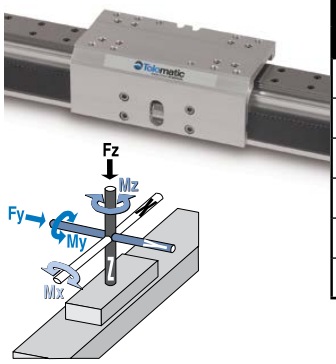
**With combined loads, $L_F$ must not exceed the value 1.**

# MXB-P Rodless Belt Drive Actuators

## P PROFILED RAIL BEARING MOMENT AND LOAD CAPACITY

⚠ Mating surface of mounted component must maintain a flatness of at least 0.040 mm *[0.0015"]*

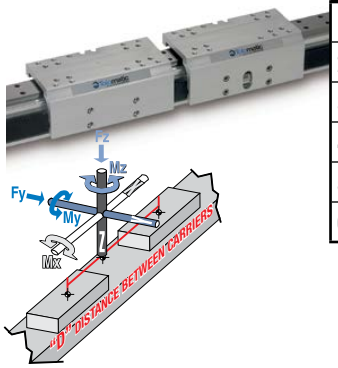
### STANDARD CARRIER




| SIZE | MAX. BENDING MOMENTS Mx | My | Mz | MAX. LOAD Fy & Fz | MAX. THRUST |
|---|---|---|---|---|---|
| | N-m | N-m | N-m | N | N |
| 16 | 4.5 | 38.3 | 38.3 | 966 | 169 |
| 25 | 14.3 | 56.7 | 42.6 | 1,996 | 672 |
| 32 | 25.6 | 152.0 | 152.0 | 2,531 | 930 |
| 40 | 68.2 | 216.0 | 216.0 | 3,274 | 1,112 |
| 50 | 91.7 | 394.0 | 394.0 | 4,510 | 1,446 |
| 63 | 115.0 | 603.0 | 603.0 | 5,745 | 1,859 |

| SIZE | MAX. BENDING MOMENTS Mx | My | Mz | MAX. LOAD Fy & Fz | MAX. THRUST |
|---|---|---|---|---|---|
| | in-lbs | in-lbs | in-lbs | lbf | lbf |
| 16 | 39 | 339 | 339 | 217 | 38 |
| 25 | 126 | 502 | 377 | 449 | 151 |
| 32 | 226 | 1,344 | 1,344 | 569 | 209 |
| 40 | 604 | 1,913 | 1,913 | 736 | 250 |
| 50 | 811 | 3,483 | 3,483 | 1,014 | 325 |
| 63 | 1,019 | 5,339 | 5,339 | 1,292 | 418 |

### DC AUXILIARY CARRIER



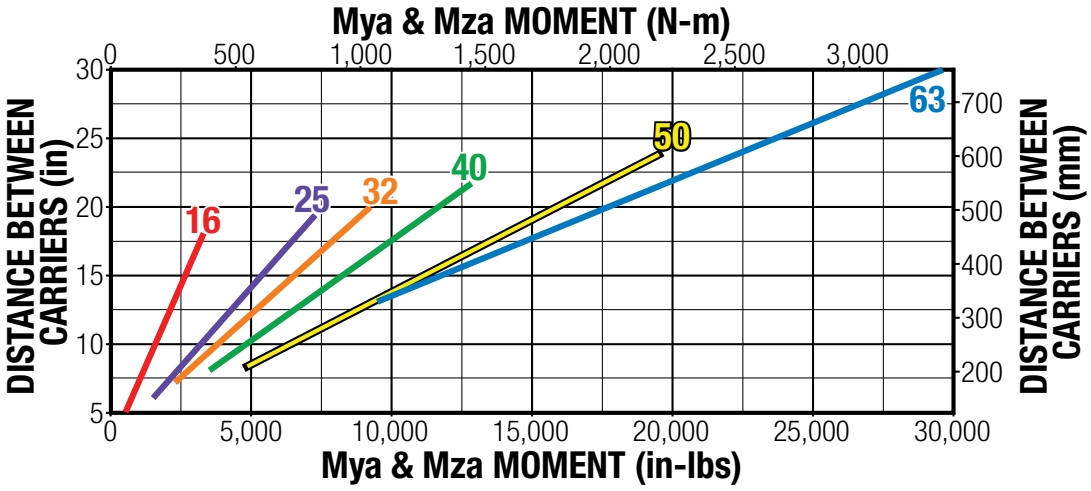

| SIZE | "D" MIN. | MAX. BENDING MOMENTS Mxa | Mya | Mza | MAX. LOAD Fya & Fza |
|---|---|---|---|---|---|
| | mm | N-m | N-m | N-m | N |
| 16 | 127 | 8.9 | 70.0 | 70.0 | 1,932 |
| 25 | 152 | 28.5 | 182 | 182 | 3,993 |
| 32 | 178 | 51.1 | 249 | 249 | 5,063 |
| 40 | 216 | 136.0 | 407 | 407 | 6,549 |
| 50 | 218 | 183.0 | 561 | 561 | 9,020 |
| 63 | 330 | 230.0 | 1,074 | 1,074 | 11,490 |

| SIZE | "D" MIN. | MAX. BENDING MOMENTS Mxa | Mya | Mza | MAX. LOAD Fya & Fza |
|---|---|---|---|---|---|
| | in | in-lbs | in-lbs | in-lbs | lbf |
| 16 | 5.0 | 79 | 620 | 620 | 434 |
| 25 | 6.0 | 252 | 1,610 | 1,610 | 898 |
| 32 | 7.0 | 453 | 2,202 | 2,202 | 1,138 |
| 40 | 8.5 | 1,208 | 3,601 | 3,601 | 1,472 |
| 50 | 8.6 | 1,623 | 4,966 | 4,966 | 2,028 |
| 63 | 13.0 | 2,038 | 9,508 | 9,508 | 2,583 |

*At minimum "D" distance - see graph below for bending moments at greater distances

### AUXILIARY CARRIER BENDING MOMENTS WITH INCREASED "D" DISTANCE BETWEEN CARRIERS

**Ratings were calculated with the following conditions:**
1.) Coupling between carriers is rigid.
2.) Load is equally distributed between carriers.
3.) Coupling device applies no misalignment loads to carriers.




⚠ **The above ratings are the maximum values for shock-free, vibration-free operation in a typical industrial environment, which must not be exceeded even in dynamic operation. Contact Tolomatic for assistance in selecting the most appropriate actuator for your application.**

The moment and load capacity of the actuator bearing system is based on an L10 life of 5,000 linear km ($2x10^8$ in) of travel. Life of the actuator will vary for each application depending on the combined loads, motion parameters and operating conditions. The load factor ($L_F$) for each application must not exceed a value of 1, as calculated below. Exceeding a load factor of 1 will diminish the actuator rated life.

$$L_F = \frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} \leq 1$$

**With combined loads, $L_F$ must not exceed the value 1.**

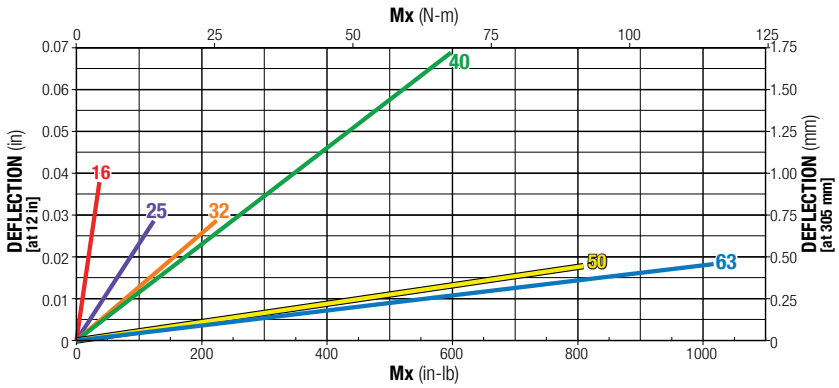
## LOAD DEFLECTION

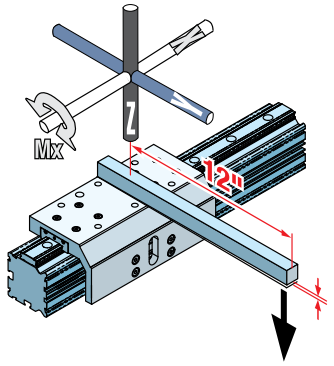
**DEFLECTION TESTING WAS DONE UNDER THESE CRITERIA:**

1.) Actuator was properly mounted with distance between mounting plates within recommendations

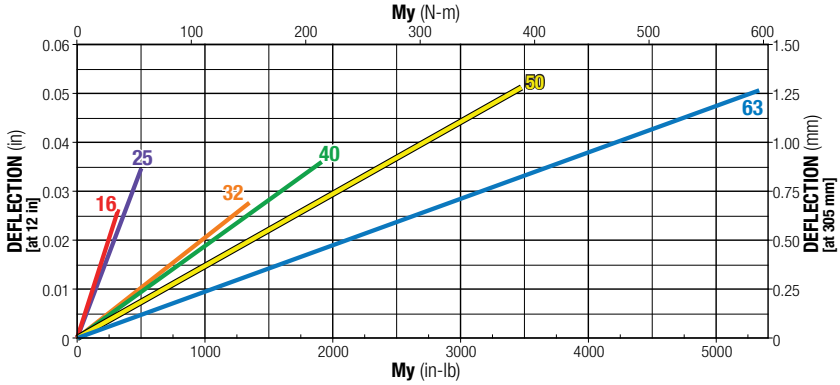
2.) Deflection was measured at 12" from center of carrier as shown *(see Mounting Plate Requirements page MXB_11)*

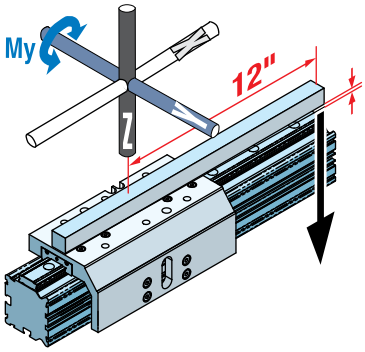
### DEFLECTION ABOUT X AXIS



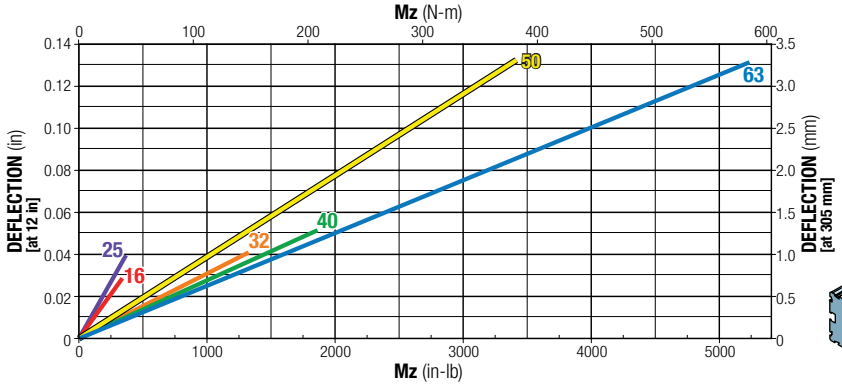



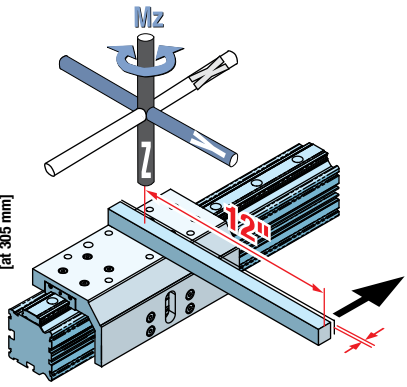

### DEFLECTION ABOUT Y AXIS




### DEFLECTION ABOUT Z AXIS

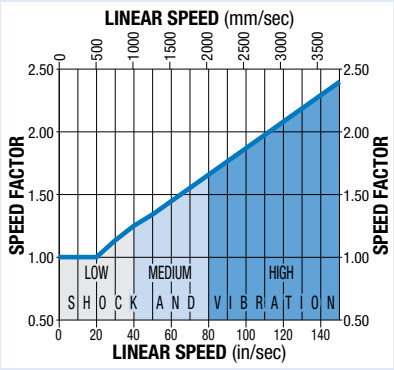



## SPEED FACTOR

*FOR APPLICATIONS WITH HIGH SPEED OR SIGNIFICANT SHOCK AND VIBRATION:*

Calculated values of loads and bending moments must be increased by speed factor from the graph at right to obtain full rated life of profiled rail bearing system.




## PROFILED RAIL LUBRICATION

Proper lubrication of profiled rail bearing system is essential for normal operation and achievement of full rated life of MX--P actuators. Lubrication should be performed at intervals of 101 km ($4x10^6$ in) of travel or once every year, whichever occurs first. **However, operating conditions such as high speed or significant shock and vibration may require more frequent lubrication.** Please consult Tolomatic for recommendations.

**Recommended grease types:**

1. Refined mineral oil-based multi-purpose grease with lithium thickening agent.
2. High-grade synthetic oil-based grease with urea thickening agent.

## ACTUATOR & OPTION DIMENSIONS

| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | 135.3 | 173.9 | 187.8 | 216.6 | 224.7 | 275.1 |
| B | 119.0 | 139.3 | 154.7 | 192.7 | 205.0 | 262.1 |
| C | 50.8 | 58.0 | 55.9 | 78.7 | 82.6 | 96.1 |
| D | 25.4 | 29.0 | 25.4 | 39.4 | 40.0 | 45.3 |
| E | 3.8 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| F | 52.8 | 66.0 | 77.5 | 93.8 | 110.6 | 139.3 |
| G* | 45.3 | 61.9 | 77.4 | 88.3 | 109.6 | 135.5 |
| H | 44.5 | 50.8 | 69.9 | 82.6 | 98.4 | 111.1 |
| (LMI)J | 15.0 | 57.7 | 57.7 | 47.5 | 47.5 | 47.5 |
| (RP)J | 46.6 | 57.7 | 57.7 | 47.5 | 47.5 | 47.5 |
| K | Ø9.53 | Ø12.70 | Ø12.70 | Ø12.70 | Ø12.70 | Ø12.70 |
| L | 26.4 | 29.2 | 27.9 | 39.7 | 41.5 | 52.2 |
| N | 34.9 | 54.0 | 63.5 | 88.9 | 95.3 | 114.3 |
| O | 110.0 | 135.0 | 170.0 | 200.0 | 216.0 | 304.8 |
| P | 40.0 | 40.0 | 27.1 | 25.4 | 25.4 | 40.0 |
| Q | - | - | 87.7 | 114.3 | 69.8 | 130.0 |
| S | 28.0 | 40.0 | 50.0 | 72.0 | 79.4 | 98.3 |
| T | M4x0.7 | M6x1.0 | M8x1.25 | M8x1.25 | M8x1.25 | M10x1.5 |
| U* | 17.5 | 27.0 | 31.8 | 44.5 | 47.7 | 57.2 |
| V | 30.00 | 42.00 | 55.37 | 64.00 | 78.74 | 100.00 |
| **OPTIONAL MOUNTING PLATES** | | | | | | |
| AA | 15.9 | 15.9 | 19.1 | 25.4 | 31.8 | 25.4 |
| BB | 6.4 | 6.4 | 7.6 | – | – | – |
| CC | 68.7 | 81.9 | 96.5 | 119.4 | 119.4 | 164.6 |
| DD | 60.9 | 77.7 | 95.2 | 106.1 | 127.4 | 161.0 |
| EE | 60.0 | 63.5 | 86.4 | 127.0 | 142.2 | 203.2 |
| FF | 44.5 | 50.8 | 59.9 | 112.0 | 127.0 | 177.8 |
| GG | 25.4 | 25.4 | 25.4 | 20.1 | 20.1 | 25.4 |
| HH | Ø5.6 THRU ⌴ Ø9.4 ↧ 5.6 (2) | Ø5.6 THRU ⌴ Ø9.4 ↧ 5.6 (2) | Ø7.1 THRU ⌴ Ø11.2 ↧ 7.1 (2) | Ø7.1 THRU (2) | Ø7.1 THRU (2) | Ø7.1 THRU (2) |

Dimensions in millimeters

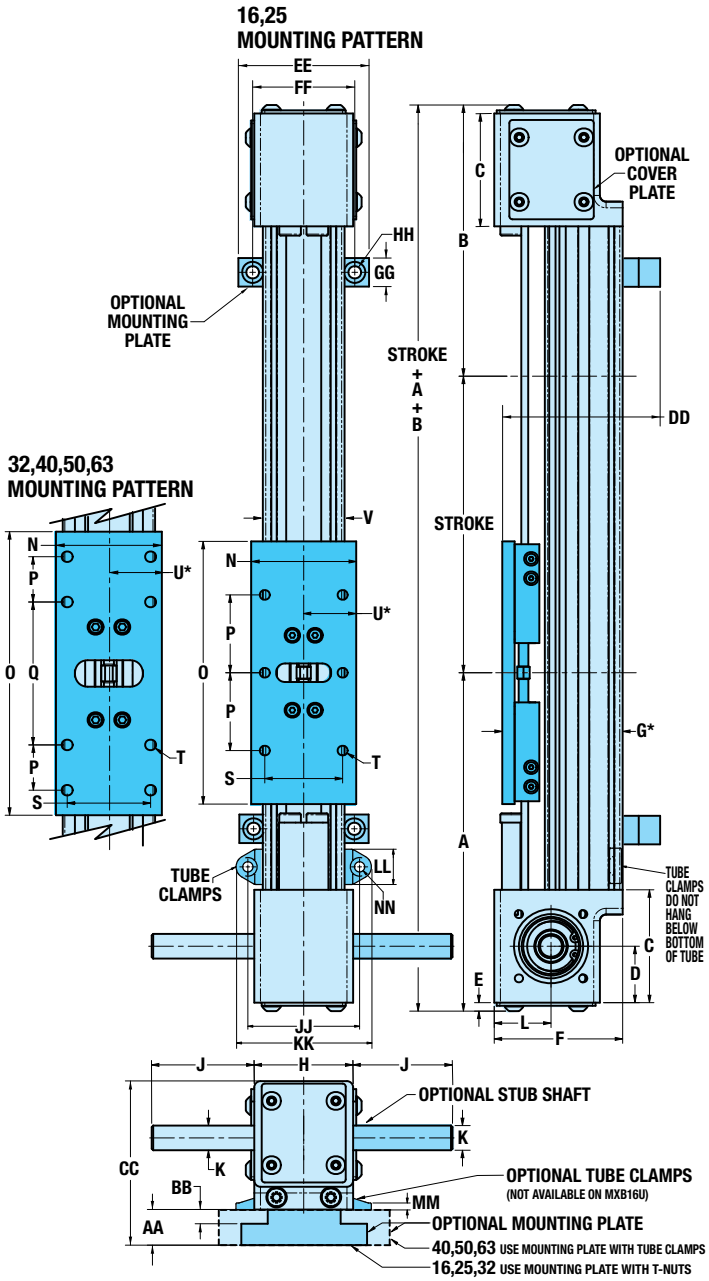
| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | 5.33 | 6.85 | 7.39 | 8.53 | 8.85 | 10.83 |
| B | 4.69 | 5.49 | 6.09 | 7.59 | 8.07 | 10.33 |
| C | 2.00 | 2.28 | 2.20 | 3.10 | 3.25 | 3.79 |
| D | 1.00 | 1.14 | 1.00 | 1.55 | 1.58 | 1.79 |
| E | 0.15 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| F | 2.08 | 2.60 | 3.05 | 3.69 | 4.35 | 5.48 |
| G* | 1.77 | 2.44 | 3.05 | 3.48 | 4.31 | 5.34 |
| H | 1.75 | 2.00 | 2.75 | 3.25 | 3.88 | 4.38 |
| (LMI)J | 0.59 | 2.27 | 2.27 | 1.87 | 1.87 | 1.87 |
| (RP)J | 1.83 | 2.27 | 2.27 | 1.87 | 1.87 | 1.87 |
| K | Ø.375 | Ø.500 | Ø.500 | Ø.500 | Ø.500 | Ø.500 |
| L | 1.04 | 1.15 | 1.10 | 1.56 | 1.63 | 2.06 |
| N | 1.38 | 2.13 | 2.50 | 3.50 | 3.75 | 4.50 |
| O | 4.33 | 5.31 | 6.69 | 7.87 | 8.50 | 12.00 |
| P | 1.57 | 1.57 | 1.07 | 1.00 | 1.00 | 1.57 |
| Q | - | - | 3.37 | 4.50 | 2.75 | 5.12 |
| S | 1.10 | 1.57 | 1.97 | 2.83 | 3.13 | 3.87 |
| T | #8-32(6) | 1/4-20(6) | 5/16-18(8) | 5/16-18(8) | 5/16-18(8) | 3/8-16(8) |
| U* | 0.69 | 1.07 | 1.25 | 1.75 | 1.88 | 2.25 |
| V | 1.18 | 1.65 | 2.18 | 2.52 | 3.10 | 3.94 |
| **OPTIONAL MOUNTING PLATES** | | | | | | |
| AA | 0.63 | 0.63 | 0.75 | 1.00 | 1.25 | 1.00 |
| BB | 0.25 | 0.25 | 0.30 | – | – | – |
| CC | 2.71 | 3.22 | 3.80 | 4.70 | 5.60 | 6.48 |
| DD | 2.4 | 3.06 | 3.75 | 4.18 | 5.01 | 6.34 |
| EE | 2.36 | 2.50 | 3.40 | 5.00 | 5.60 | 8.00 |
| FF | 1.75 | 2.00 | 2.75 | 4.41 | 5.00 | 7.00 |
| GG | 1.00 | 1.00 | 1.00 | 0.79 | 0.79 | 1.00 |
| HH | Ø.22 THRU ⌴ Ø.37 ↧ .22 (2) | Ø.22 THRU ⌴ Ø.37 ↧ .22 (2) | Ø.28 THRU ⌴ Ø.44 ↧ .28 (2) | Ø.28 THRU (2) | Ø.28 THRU (2) | Ø.28 THRU (2) |

*Dimensions in inches*

**OPTIONAL TUBE CLAMPS**

| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| JJ | - | 57.0 | 74.1 | 82.7 | 97.5 | 131.7 |
| KK | - | 69.0 | 87.4 | 96.7 | 111.5 | 150.7 |
| LL | - | 18.0 | 16.0 | 14.0 | 14.0 | 19.0 |
| MM | - | 3.6 | 4.3 | 3.8 | 3.8 | 6.1 |
| NN | - | 5.2 | 7.1 | 7.1 | 7.1 | 10.7 |

Dimensions in millimeters



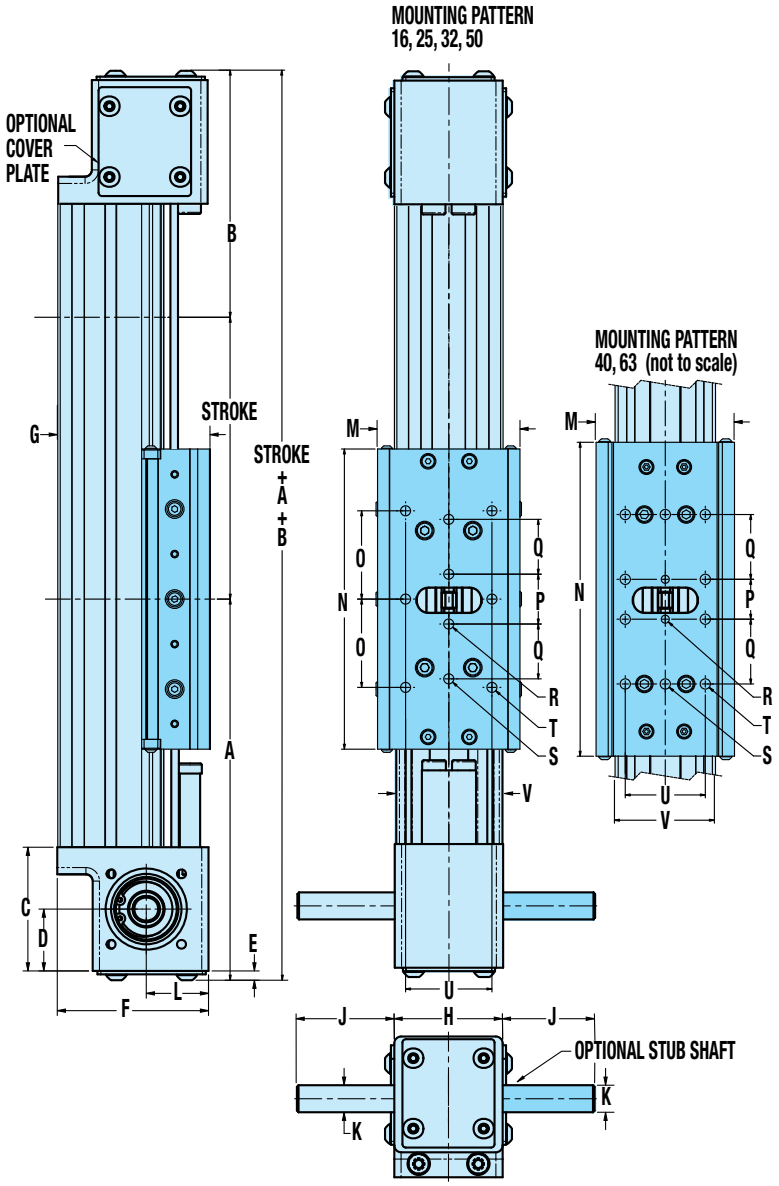

⚠ *In order for the actuator to operate properly, dimensions "G" and "U" must not vary more than 0.51mm *[±0.020 in]* over the entire length of the stroke.

| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| JJ | - | 2.24 | 2.92 | 3.26 | 3.84 | 5.19 |
| KK | - | 2.72 | 3.44 | 3.81 | 4.39 | 5.93 |
| LL | - | 0.71 | 0.63 | 0.55 | 0.55 | 0.75 |
| MM | - | 0.14 | 0.17 | 0.15 | 0.15 | 0.24 |
| NN | - | 0.20 | 0.28 | 0.28 | 0.28 | 0.42 |

*Dimensions in inches*

# MXB-S Rodless Belt Drive Actuator

## SOLID BEARING DIMENSIONS



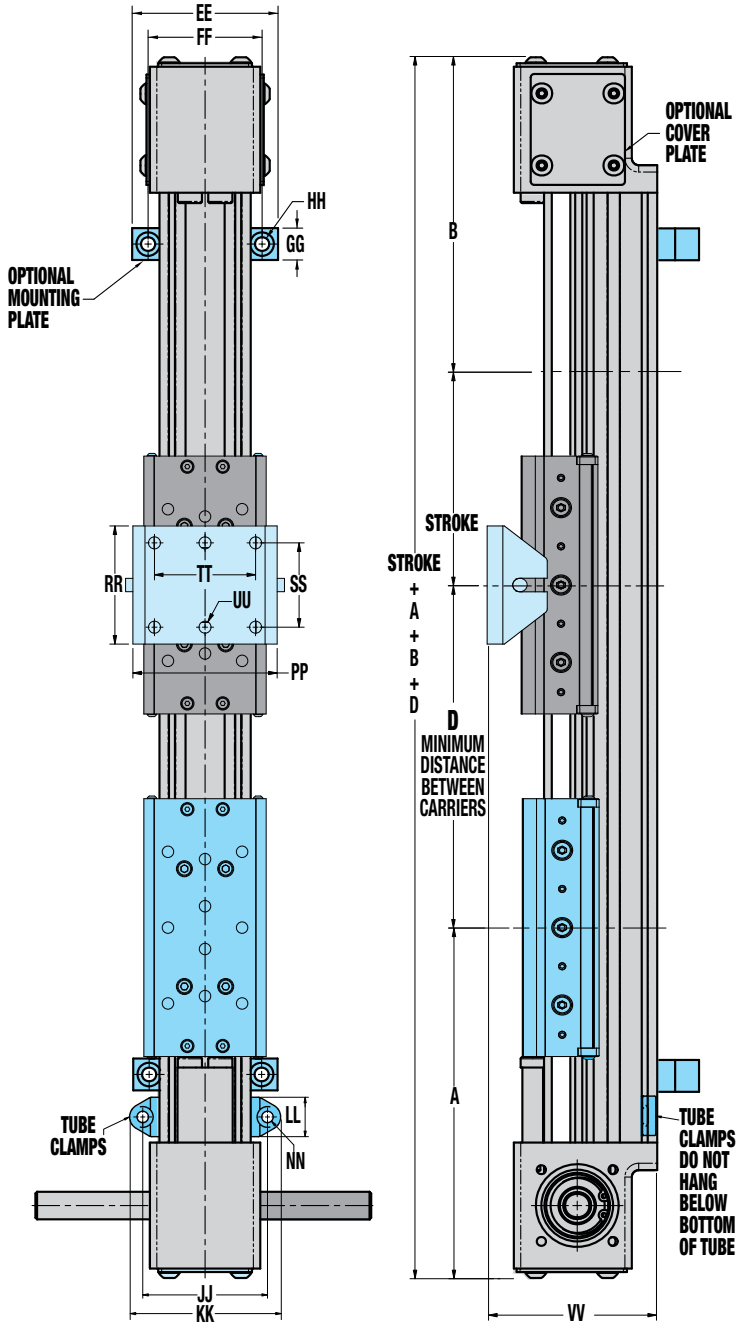

| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | 135.3 | 173.9 | 179.3 | 216.6 | 217.8 | 275.1 |
| B | 119.0 | 139.3 | 163.2 | 192.7 | 212.0 | 262.1 |
| C | 50.8 | 58.0 | 55.9 | 78.7 | 82.6 | 96.1 |
| D | 25.4 | 29.0 | 25.4 | 39.4 | 40.0 | 45.3 |
| E | 3.8 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| F | 52.8 | 66.0 | 77.5 | 93.8 | 110.6 | 139.3 |
| G* | 45.8 | 58.4 | 77.8 | 89.2 | 112.8 | 139.7 |
| H | 44.5 | 50.8 | 69.9 | 82.6 | 98.4 | 111.1 |
| (LMI) J | 15.0 | 57.7 | 57.7 | 47.5 | 47.5 | 47.5 |
| (RP) J | 46.6 | 57.7 | 57.7 | 47.5 | 47.5 | 47.5 |
| K | Ø9.53 | Ø12.70 | Ø12.70 | Ø12.70 | Ø12.70 | Ø12.70 |
| L | 26.4 | 29.2 | 27.9 | 39.7 | 41.5 | 52.2 |
| M | 40.1 | 55.4 | 72.6 | 88.2 | 104.1 | 142 |
| N | 110.0 | 134.9 | 153 | 200 | 200.9 | 307.6 |
| O | 30 | 39.9 | 45 | - | 47.8 | - |
| P | - | 25.4 | 25.4 | 25.4 | 63.5 | 76.2 |
| Q | - | 27.2 | 28 | 41.3 | 31.8 | 38.1 |
| R | - | M6x1.0 (2) | M8x1.25 (2) | M8x1.25 (2) | M10x1.5 (2) | M10x1.5 (2) |
| S | - | M6x1.0 (2) | M8x1.25 (2) | M8x1.25 (2) | M10x1.5 (2) | M10x1.5 (2) |
| T | M4x0.7 (6) | M6x1.0 (6) | M8x1.25 (6) | M8x1.25 (8) | M10x1.5 (6) | M10x1.5 (8) |
| U* | 30.0 | 30.0 | 44.0 | 51.0 | 65.8 | 82.6 |
| V | 30.00 | 42.00 | 55.37 | 64.00 | 78.74 | 100.00 |

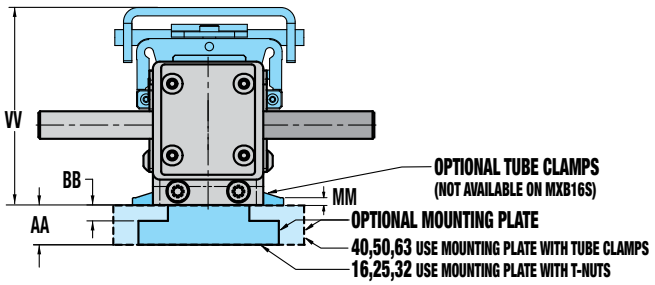
Dimensions in millimeters

| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | *5.33* | *6.85* | *7.06* | *8.53* | *8.57* | *10.83* |
| B | *4.69* | *5.49* | *6.43* | *7.59* | *8.34* | *10.33* |
| C | *2.00* | *2.28* | *2.20* | *3.10* | *3.25* | *3.79* |
| D | *1.00* | *1.14* | *1.00* | *1.55* | *1.58* | *1.79* |
| E | *0.15* | *0.17* | *0.17* | *0.17* | *0.17* | *0.17* |
| F | *2.08* | *2.60* | *3.05* | *3.69* | *4.35* | *5.48* |
| G* | *1.80* | *2.30* | *3.06* | *3.51* | *4.44* | *5.50* |
| H | *1.75* | *2.00* | *2.75* | *3.25* | *3.88* | *4.38* |
| (LMI) J | *0.59* | *2.27* | *2.27* | *1.87* | *1.87* | *1.87* |
| (RP) J | *1.83* | *2.27* | *2.27* | *1.87* | *1.87* | *1.87* |
| K | *Ø.375* | *Ø.500* | *Ø.500* | *Ø.500* | *Ø.500* | *Ø.500* |
| L | *1.04* | *1.15* | *1.10* | *1.56* | *1.63* | *2.06* |
| M | *1.58* | *2.18* | *2.86* | *3.47* | *4.1* | *5.59* |
| N | *4.33* | *5.31* | *6.02* | *7.87* | *7.91* | *12.11* |
| O | *1.18* | *1.57* | *1.77* | - | *1.88* | - |
| P | - | *1.00* | *1.00* | *1.00* | *2.50* | *3.00* |
| Q | - | *1.07* | *1.10* | *1.63* | *1.25* | *1.50* |
| R | - | *1/4-20 (2)* | *1/4-20 (2)* | *1/4-20 (2)* | *3/8-16 (2)* | *3/8-16 (2)* |
| S | - | *#10-32 (2)* | *1/4-20 (2)* | *5/16-18 (2)* | *3/8-16 (2)* | *3/8-16 (2)* |
| T | *#8-32 (6)* | *1/4-20 (6)* | *1/4-20 (6)* | *5/16-18 (8)* | *3/8-16 (6)* | *3/8-16 (8)* |
| U* | *1.18* | *1.18* | *1.73* | *2.00* | *2.59* | *3.25* |
| V | *1.18* | *1.65* | *2.18* | *2.52* | *3.10* | *3.94* |

*Dimensions in inches*

## SOLID BEARING OPTION DIMENSIONS



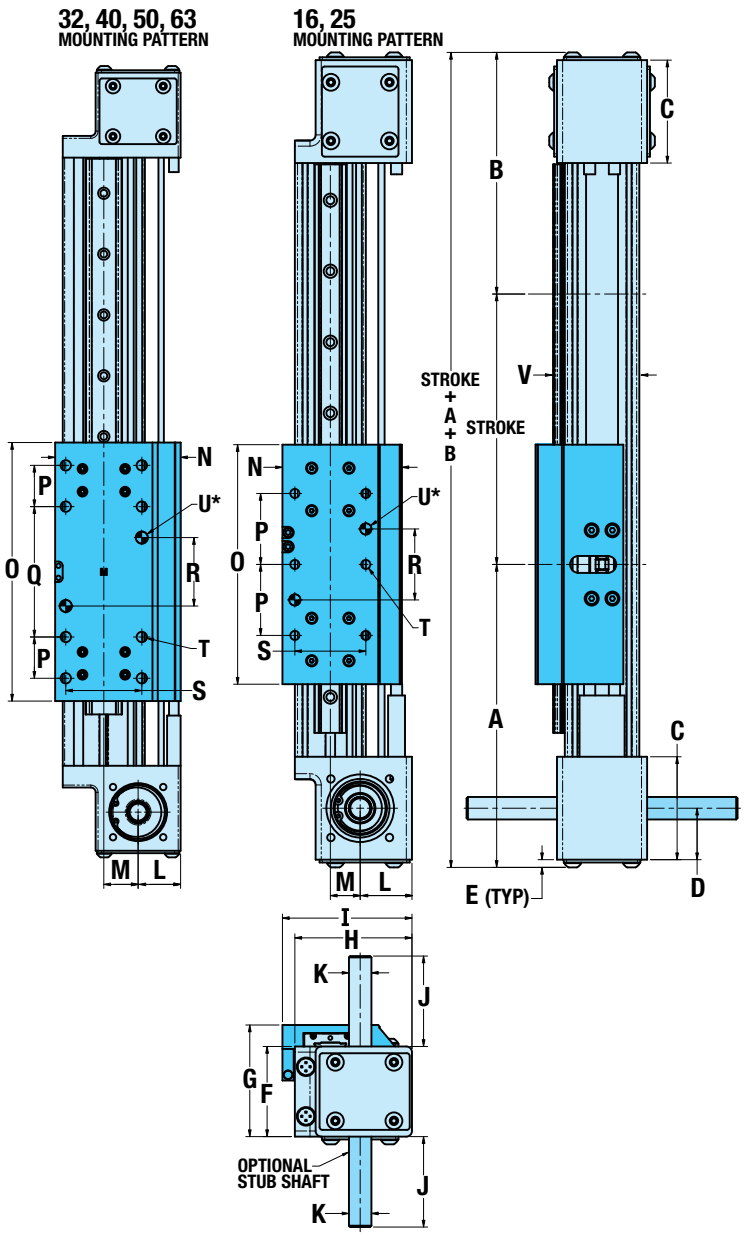

| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | 135.3 | 173.9 | 179.3 | 216.6 | 217.8 | 275.1 |
| B | 119.0 | 139.3 | 163.2 | 192.7 | 212.0 | 262.1 |
| D | 127.0 | 152.4 | 177.0 | 215.9 | 216.4 | 330.2 |
| **OPTIONAL MOUNTING PLATES** | | | | | | |
| AA | 15.9 | 15.9 | 19.1 | 25.4 | 31.8 | 25.4 |
| BB | 6.4 | 6.4 | 7.6 | – | – | – |
| DD | 60.9 | 77.7 | 95.2 | 106.1 | 127.4 | 153.3 |
| EE | 60.0 | 63.5 | 86.4 | 127.0 | 142.2 | 203.2 |
| FF | 44.5 | 50.8 | 59.9 | 112.0 | 127.0 | 177.8 |
| GG | 25.4 | 25.4 | 25.4 | 20.1 | 20.1 | 25.4 |
| HH | Ø5.6 THRU ⌴ Ø9.4 ↧ 5.6 (2) | Ø5.6 THRU ⌴ Ø9.4 ↧ 5.6 (2) | Ø7.1 THRU ⌴ Ø11.2 ↧ 7.1 (2) | Ø7.1 THRU (2) | Ø7.1 THRU (2) | Ø7.1 THRU (2) |
| **OPTIONAL TUBE CLAMPS** | | | | | | |
| JJ | - | 57.0 | 74.1 | 82.7 | 97.5 | 131.7 |
| KK | - | 69.0 | 87.4 | 96.7 | 111.5 | 150.7 |
| LL | - | 18.0 | 16.0 | 14.0 | 14.0 | 19.0 |
| MM | - | 3.6 | 4.3 | 3.8 | 3.8 | 6.1 |
| NN | - | 5.2 | 7.1 | 7.1 | 7.1 | 10.7 |
| **OPTIONAL FLOATING MOUNT** | | | | | | |
| PP | 47.2 | 64.1 | 93.3 | 109.7 | 128.0 | 154.9 |
| RR | 24.9 | 31.8 | 70.1 | 100.0 | 100.0 | 127.0 |
| SS | 11.9 | 15.9 | 50.0 | 74.9 | 80.0 | 100.1 |
| TT | - | - | - | 55.1 | - | 70.1 |
| UU | Ø4.6 (2) | Ø6.1 (2) | Ø7.1 (2) | Ø7.1 (4) | Ø9.1 (2) | Ø8.6 (4) |
| VV | 58.5 | 70.9 | 93.3 | 108.2 | 133.1 | 156.8 |

Dimensions in millimeters

| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | *5.33* | *6.85* | *7.06* | *8.53* | *8.57* | *10.83* |
| B | *4.69* | *5.49* | *6.43* | *7.59* | *8.34* | *10.33* |
| D | *5.00* | *6.00* | *7.00* | *8.50* | *8.60* | *13.00* |
| **OPTIONAL MOUNTING PLATES** | | | | | | |
| AA | *0.63* | *0.63* | *0.75* | *1.00* | *1.25* | *1.00* |
| BB | *0.25* | *0.25* | *0.30* | – | – | – |
| DD | *2.4* | *3.06* | *3.75* | *4.18* | *5.01* | *6.04* |
| EE | *2.36* | *2.50* | *3.40* | *5.00* | *5.60* | *8.00* |
| FF | *1.75* | *2.00* | *2.75* | *4.41* | *5.00* | *7.00* |
| GG | *1.00* | *1.00* | *1.00* | *0.79* | *0.79* | *1.00* |
| HH | *Ø.22 THRU ⌴ Ø.37 ↧ .22 (2)* | *Ø.22 THRU ⌴ Ø.37 ↧ .22 (2)* | *Ø.28 THRU ⌴ Ø.44 ↧ .28 (2)* | *Ø.28 THRU (2)* | *Ø.28 THRU (2)* | *Ø.28 THRU (2)* |
| **OPTIONAL TUBE CLAMPS** | | | | | | |
| JJ | - | *2.24* | *2.92* | *3.26* | *3.84* | *5.19* |
| KK | - | *2.72* | *3.44* | *3.81* | *4.39* | *5.93* |
| LL | - | *0.71* | *0.63* | *0.55* | *0.55* | *0.75* |
| MM | - | *0.14* | *0.17* | *0.15* | *0.15* | *0.24* |
| NN | - | *0.20* | *0.28* | *0.28* | *0.28* | *0.42* |
| **OPTIONAL FLOATING MOUNT** | | | | | | |
| PP | *1.86* | *2.52* | *3.37* | *4.32* | *5.04* | *6.10* |
| RR | *0.98* | *1.25* | *2.76* | *3.94* | *3.94* | *5.00* |
| SS | *0.47* | *0.63* | *1.97* | *2.95* | *3.15* | *3.94* |
| TT | - | - | - | *2.17* | - | *2.76* |
| UU | *Ø.18 (2)* | *Ø.24 (2)* | *Ø.28 (2)* | *Ø.28 (4)* | *Ø.36 (2)* | *Ø.34 (4)* |
| VV | *2.30* | *2.79* | *3.67* | *4.26* | *5.24* | *6.18* |

*Dimensions in inches*

## PROFILED RAIL BEARING DIMENSIONS




| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | 135.3 | 173.9 | 187.8 | 216.6 | 224.7 | 275.1 |
| B | 119.0 | 139.3 | 154.7 | 192.7 | 205.0 | 262.1 |
| C | 50.8 | 58.0 | 55.9 | 78.7 | 82.6 | 96.1 |
| D | 25.4 | 29.0 | 25.4 | 39.4 | 40.0 | 45.3 |
| E | 3.8 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| F | 44.5 | 50.8 | 69.9 | 82.6 | 98.4 | 111.1 |
| G | 53.2 | 62.9 | 84.6 | 98.7 | 129.6 | 145.6 |
| H | 52.8 | 66.0 | 77.5 | 93.8 | 110.6 | 139.3 |
| I | 54.8 | 73.0 | 82.5 | 103.9 | 117.9 | 147.1 |
| (LMI)J | 15.0 | 57.7 | 57.7 | 47.5 | 47.5 | 47.5 |
| (RP)J | 46.6 | 57.7 | 57.7 | 47.5 | 47.5 | 47.5 |
| K | Ø9.53 | Ø12.70 | Ø12.70 | Ø12.70 | Ø12.70 | Ø12.70 |
| L | 26.4 | 29.2 | 27.9 | 39.7 | 41.5 | 52.2 |
| M | 11.4 | 16.8 | 22.6 | 22.2 | 29.8 | 37.1 |
| N | 45.3 | 67.4 | 82.5 | 97.8 | 117.4 | 150.6 |
| O | 110.0 | 135.0 | 170.0 | 200.0 | 216.0 | 304.8 |
| P | 40.0 | 40.0 | 27.1 | 25.4 | 25.4 | 40.0 |
| Q | — | — | 85.7 | 114.3 | 69.8 | 130.0 |
| R | 40.00 | 40.00 | 45.00 | 63.50 | 38.10 | 65.00 |
| S | 28.00 | 40.00 | 50.00 | 72.00 | 79.38 | 98.30 |
| T | M4x0.7 | M6x1.0 | M8x1.25 | M8x1.25 | M8x1.25 | M10x1.5 |
| U* | Ø4.045 / 4.020 ↧6.35 | Ø6.045 / 6.020 ↧6.35 | Ø8.045 /8.020 ↧9.53 | Ø8.045 /8.020 ↧12.70 | Ø8.045 /8.020 ↧12.70 | Ø10.045 /10.020 ↧12.70 |
| V | 35.50 | 48.60 | 62.87 | 73.50 | 93.74 | 115.00 |

Dimensions in millimeters

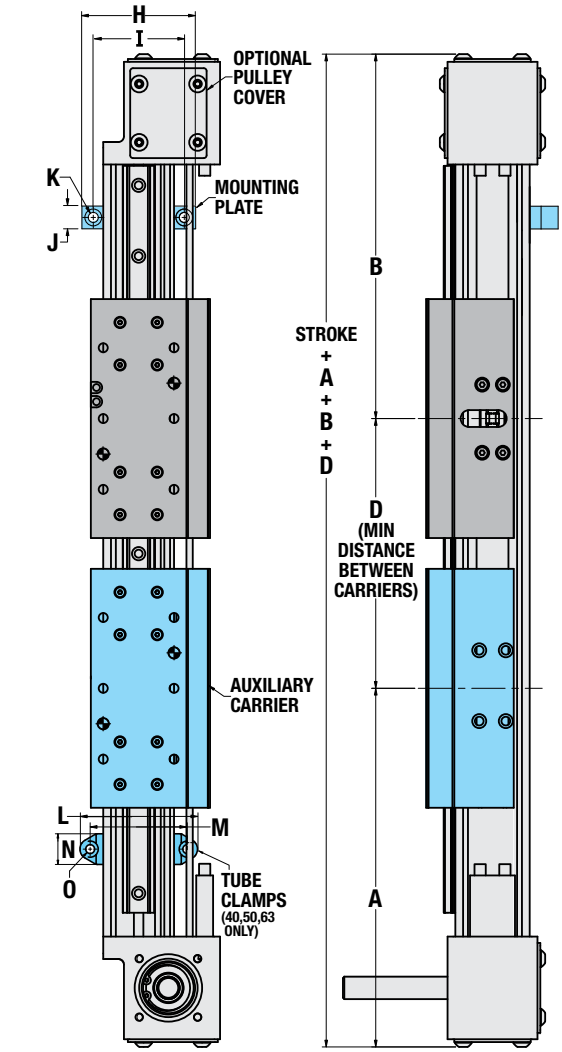
| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | *5.33* | *6.85* | *7.39* | *8.53* | *8.85* | *10.83* |
| B | *4.69* | *5.49* | *6.09* | *7.59* | *8.07* | *10.33* |
| C | *2.00* | *2.28* | *2.20* | *3.10* | *3.25* | *3.79* |
| D | *1.00* | *1.14* | *1.00* | *1.55* | *1.58* | *1.79* |
| E | *0.15* | *0.17* | *0.17* | *0.17* | *0.17* | *0.17* |
| F | *1.75* | *2.00* | *2.75* | *3.25* | *3.88* | *4.38* |
| G | *2.10* | *2.48* | *3.33* | *3.88* | *5.10* | *5.73* |
| H | *2.08* | *2.60* | *3.05* | *3.69* | *4.35* | *5.48* |
| I | *2.16* | *2.87* | *3.25* | *4.09* | *4.64* | *5.79* |
| (LMI)J | *0.59* | *2.27* | *2.27* | *1.87* | *1.87* | *1.87* |
| (RP)J | *1.83* | *2.27* | *2.27* | *1.87* | *1.87* | *1.87* |
| K | *Ø.375* | *Ø.500* | *Ø.500* | *Ø.500* | *Ø.500* | *Ø.500* |
| L | *1.04* | *1.15* | *1.10* | *1.56* | *1.63* | *2.06* |
| M | *0.45* | *0.66* | *0.89* | *0.87* | *1.17* | *1.46* |
| N | *1.78* | *2.65* | *3.25* | *3.85* | *4.62* | *5.93* |
| O | *4.33* | *5.31* | *6.69* | *7.87* | *8.50* | *12.00* |
| P | *1.57* | *1.57* | *1.07* | *1.00* | *1.00* | *1.57* |
| Q | — | — | *3.37* | *4.50* | *2.75* | *5.12* |
| R | *1.575* | *1.575* | *1.772* | *2.500* | *1.500* | *2.559* |
| S | *1.102* | *1.575* | *1.969* | *2.835* | *3.125* | *3.870* |
| T | *#8-32(6)* | *1/4-20(6)* | *5/16-18(8)* | *5/16-18(8)* | *5/16-18(8)* | *3/8-16(8)* |
| U* | *Ø.1583 / .1573 (2) ↧.250* | *Ø.2520 / .2510 (2) ↧.250* | *Ø.3145 / .3135 (2) ↧.375* | *Ø.3145 / .3135 (2) ↧.500* | *Ø.3145 / .3135 (2) ↧.500* | *Ø.3770 / .3760 (2) ↧.500* |
| V | *1.40* | *1.91* | *2.48* | *2.89* | *3.69* | *4.53* |

*Dimensions in inches*

*DOWEL HOLES

| | |
|---|---|
| ⌖ | 0.08 mm Ⓜ |
| ⌖ | 0.003 in Ⓜ |

## PROFILED RAIL BEARING OPTION DIMENSIONS




| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | 135.3 | 173.9 | 187.8 | 216.6 | 224.7 | 275.1 |
| B | 119.0 | 139.3 | 154.7 | 192.7 | 205.0 | 262.1 |
| **AUXILIARY CARRIER** | | | | | | |
| D | 127.0 | 152.4 | 177.0 | 215.9 | 216.4 | 330.2 |
| **MOUNTING PLATE** | | | | | | |
| C | 15.9 | 15.9 | 19.1 | 25.4 | 31.8 | 25.4 |
| E | 7.2 | 4.4 | 7.2 | 9.3 | 9.8 | 5.6 |
| F | 6.4 | 6.4 | 7.6 | – | – | – |
| G | 61.9 | 74.4 | 96.5 | 114.8 | 151.4 | 165.4 |
| H | 60.0 | 63.5 | 86.4 | 127.0 | 142.2 | 203.2 |
| I | 44.5 | 50.8 | 69.9 | 112.0 | 127.0 | 177.8 |
| J | 25.4 | 25.4 | 25.4 | 20.1 | 20.1 | 25.4 |
| K | Ø5.6 THRU ⌴ Ø9.4 ↧ 5.6 (2) | Ø5.6 THRU ⌴ Ø9.4 ↧ 5.6 (2) | Ø7.1 THRU ⌴ Ø11.2 ↧ 7.1 (2) | Ø7.1 THRU (2) | Ø7.1 THRU (2) | Ø7.1 THRU (2) |
| **TUBE CLAMPS** | | | | | | |
| L | – | – | – | 96.8 | 111.5 | 150.6 |
| M | – | – | – | 82.8 | 97.5 | 131.8 |
| N | – | – | – | 14.0 | 14.0 | 19.1 |
| O | – | – | – | 7.1 | 7.1 | 10.7 |
| P | – | – | – | 3.8 | 3.8 | 6.1 |

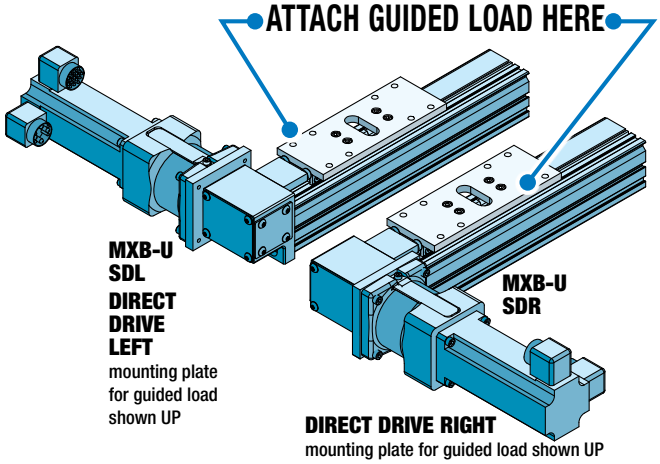
Dimensions in millimeters

| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | *5.33* | *6.85* | *7.39* | *8.53* | *8.85* | *10.83* |
| B | *4.69* | *5.49* | *6.09* | *7.59* | *8.07* | *10.33* |
| **AUXILIARY CARRIER** | | | | | | |
| D | *5.00* | *6.00* | *7.00* | *8.50* | *8.60* | *13.00* |
| **MOUNTING PLATE** | | | | | | |
| C | *0.63* | *0.63* | *0.75* | *1.00* | *1.25* | *1.00* |
| E | *0.28* | *0.17* | *0.29* | *0.37* | *0.39* | *0.22* |
| F | *0.25* | *0.25* | *0.30* | – | – | – |
| G | *2.44* | *2.93* | *3.80* | *4.52* | *5.96* | *6.51* |
| H | *2.36* | *2.50* | *3.40* | *5.00* | *5.60* | *8.00* |
| I | *1.75* | *2.00* | *2.75* | *4.41* | *5.00* | *7.00* |
| J | *1.00* | *1.00* | *1.00* | *0.79* | *0.79* | *1.00* |
| K | *Ø.22 THRU ⌴ Ø.37 ↧ .22 (2)* | *Ø.22 THRU ⌴ Ø.37↧ .22 (2)* | *Ø.28 THRU ⌴ Ø.44↧ .28 (2)* | *Ø.28 THRU (2)* | *Ø.28 THRU (2)* | *Ø.28 THRU (2)* |
| **TUBE CLAMPS** | | | | | | |
| L | – | – | – | *3.81* | *4.39* | *5.93* |
| M | – | – | – | *3.26* | *3.84* | *5.19* |
| N | – | – | – | *0.55* | *0.55* | *0.75* |
| O | – | – | – | *0.28* | *0.28* | *0.42* |
| P | – | – | – | *0.15* | *0.15* | *0.24* |

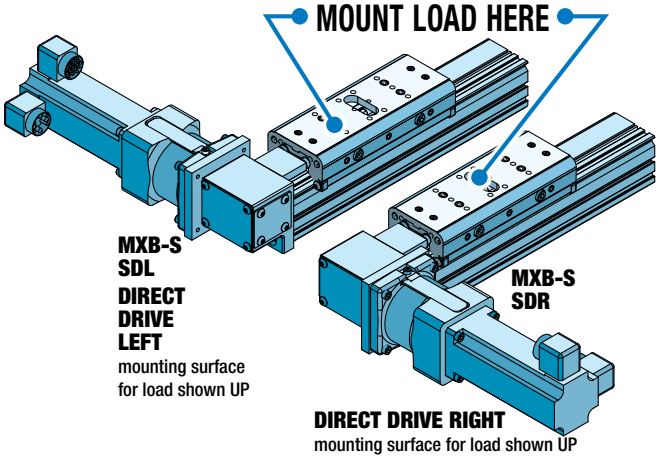
*Dimensions in inches*

## DIRECT DRIVE MOTOR MOUNTING

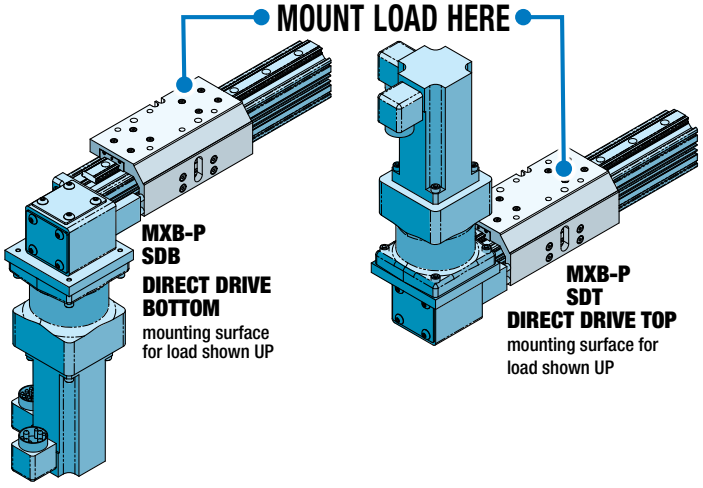
### MXB-U




### MXB-S




### MXB-P



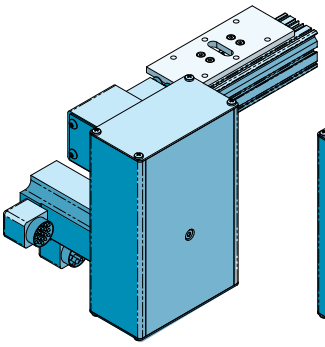

### MOTOR MOUNTING

The MXB-P is unique among Tolomatic belt drive actuators. The mounting surface of the carrier is located 90° from the motion of the belt. The side opposite the belt is reserved for switch placement. The bottom of the actuator is reserved for mounting. If the motor is mounted in the SDT (direct drive top orientation), be sure the load mounted to the carrier does not interfere with the motor.

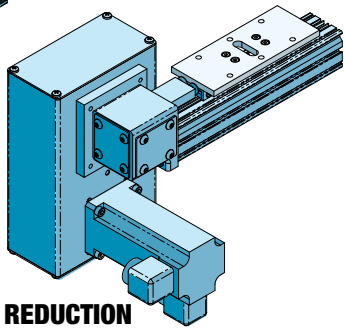
LARGE FRAME MOTORS AND SMALLER SIZE ACTUATORS: Cantilevered motors need to be supported if subjected to continuous rapid reversing duty and/or under dynamic conditions.

## REDUCTION DRIVE MOTOR MOUNTING

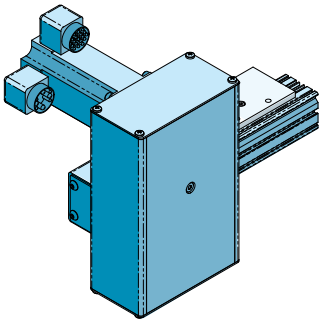
### MXB-U



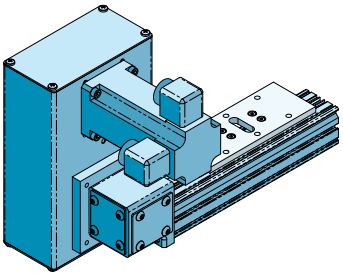
**REDUCTION DRIVE BOTTOM LEFT (SDBL)**
mounting plate for guided load shown UP



**REDUCTION DRIVE BOTTOM RIGHT (SDBR)**
mounting plate for guided load shown UP

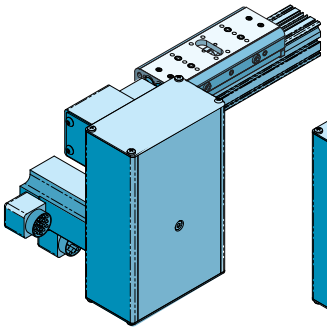


**REDUCTION DRIVE TOP LEFT (SDTL)**
mounting plate for guided load shown UP

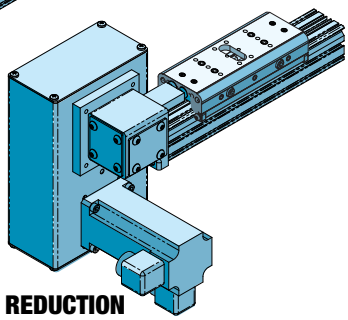


**REDUCTION DRIVE TOP RIGHT (SDTR)**
mounting plate for guided load shown UP

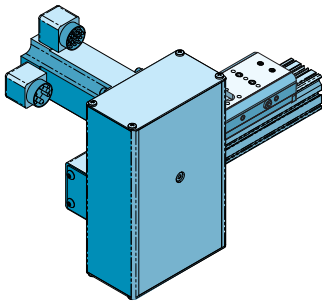
### MXB-S



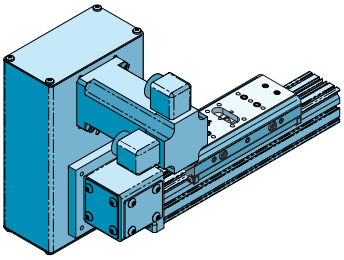
**REDUCTION DRIVE BOTTOM LEFT (SDBL)**
mounting surface for load shown UP



**REDUCTION DRIVE BOTTOM RIGHT (SDBR)**
mounting surface for load shown UP

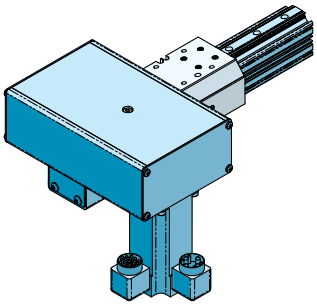


**REDUCTION DRIVE TOP LEFT (SDTL)**
mounting surface for load shown UP

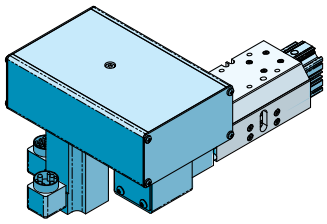


**REDUCTION DRIVE TOP RIGHT (SDTR)**
mounting surface for load shown UP

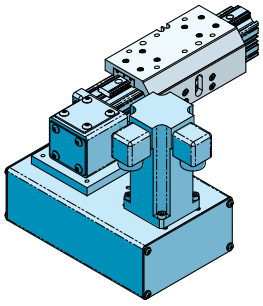
### MXB-P



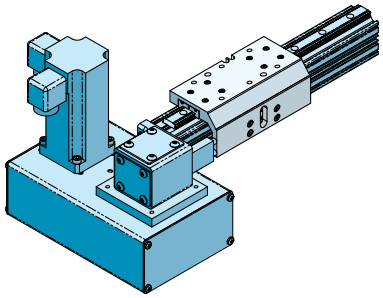
**REDUCTION DRIVE RIGHT BOTTOM (SDRB)**
mounting surface for load shown UP



**REDUCTION DRIVE LEFT BOTTOM (SDLB)**
mounting surface for load shown UP



**REDUCTION DRIVE RIGHT TOP (SDRT)**
mounting surface for load shown UP



**REDUCTION DRIVE LEFT TOP (SDLT)**
mounting surface for load shown UP

See tolomatic.com for 3D solid model(s) with motor mounting dimensions

# SWITCHES

## SPECIFICATIONS


RoHS COMPLIANT CE

MX products offer a wide range of sensing choices. There are 12 switch choices: reed, solid state PNP (sourcing) or solid state NPN (sinking); in normally open or normally closed; with flying leads or quick-disconnect.

Commonly used for end-of-stroke positioning, these switches allow drop-in installation anywhere along the entire actuator length. The one-piece design includes the retained fastening hardware. The magnet and magnet hardware are located on the carrier. See the dimensional drawings on page MXB_23 for details of magnet and switch locations. Switches and magnets can be installed in the field at any time.

Switches are used to send digital signals to PLC (programmable logic controller), TTL, CMOS circuit or other controller device. Switches contain reverse polarity protection. Solid state QD cables are shielded; shield should be terminated at flying lead end.

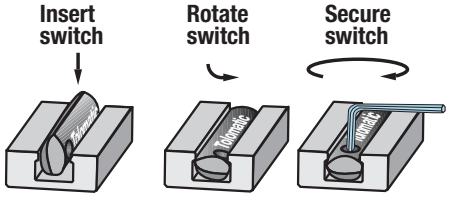
All switches are CE rated and are RoHS compliant. Switches feature bright red or yellow LED signal indicators; solid state switches also have green LED power indicators.

| | Order Code | Lead | Switching Logic | Power LED | Signal LED | Operating Voltage | **Power Rating (Watts) | Switching Current (mA max.) | Current Consumption | Voltage Drop | Leakage Current | Temp. Range | Shock / Vibration |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REED | RY | 5m | SPST Normally Open | — | Red | 5 - 240 AC/DC | **10.0 | 100mA | — | 3.0 V max. | — | 14 to 158°F [-10 to 70°C] | 50 G / 9 G |
| | RK | QD* | | Tolomatic 81009082 | | | | | | | | | |
| | NY | 5m | SPST Normally Closed | — | Yellow | 5 - 110 AC/DC | | | | | | | |
| | NK | QD* | | Tolomatic 81009084 | | | | | | | | | |
| SOLID STATE | TY | 5m | PNP (Sourcing) Normally Open | Green | Yellow | 10 - 30 VDC | **3.0 | 100mA | 20 mA @ 24V | 2.0 V max. | 0.05 mA max. | | |
| | TK | QD* | | Tolomatic 81009088 | | | | | | | | | |
| | KY | 5m | NPN (Sinking) Normally Open | Green | Red | | | | | | | | |
| | KK | QD* | | Tolomatic 81009090 | | | | | | | | | |
| | PY | 5m | PNP (Sourcing) Normally Closed | Green | Yellow | | | | | | | | |
| | PK | QD* | | Tolomatic 81009092 | | | | | | | | | |
| | HY | 5m | NPN (Sinking) Normally Closed | Green | Red | | | | | | | | |
| | HK | QD* | | Tolomatic 81009094 | | | | | | | | | |

*QD = Quick-disconnect  Enclosure classification IEC 529 IP67 (NEMA 6)  CABLES: Robotic grade, oil resistant polyurethane jacket, PVC insulation

⚠**WARNING: Do not exceed power rating (Watt = Voltage x Amperage). Permanent damage to sensor will occur.

## SWITCH INSTALLATION AND REPLACEMENT

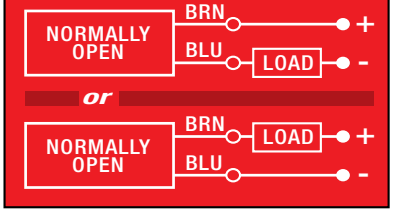



Place switch in side groove on tube at desired location with "Tolomatic" facing outward. While applying light pressure to the switch, rotate the switch halfway into the groove. Maintaining light pressure, rotate the switch in the opposite direction until it is fully inside the groove with "Tolomatic" visible. Re-position the switch to the exact location and lock the switch securely into place by tightening the screw on the switch.

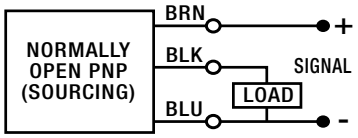
# SWITCHES

## WIRING DIAGRAMS

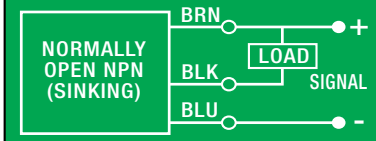
**RY • RK**
REED • NORMALLY OPEN



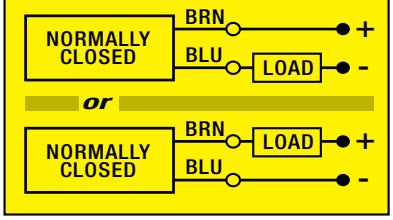

**TY • TK**
SOLID STATE • NORMALLY OPEN • PNP



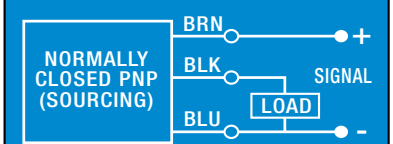

**KY • KK**
SOLID STATE • NORMALLY OPEN • NPN



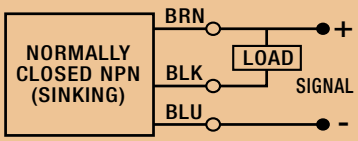

**NY • NK**
REED • NORMALLY CLOSED



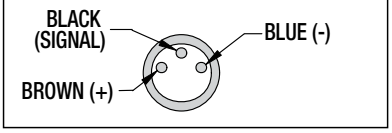

**PY • PK**
SOLID STATE • NORMALLY CLOSED • PNP



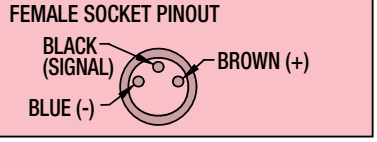

**HY • HK**
SOLID STATE • NORMALLY CLOSED • NPN




QUICK DISCONNECT MALE PLUG PINOUT

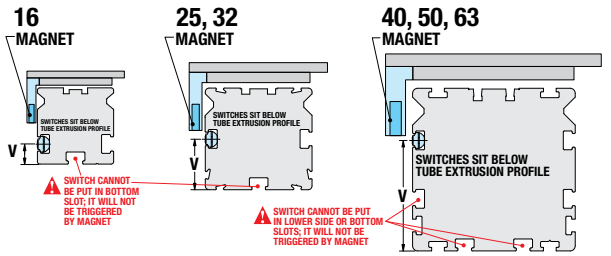



QUICK DISCONNECT FEMALE SOCKET PINOUT

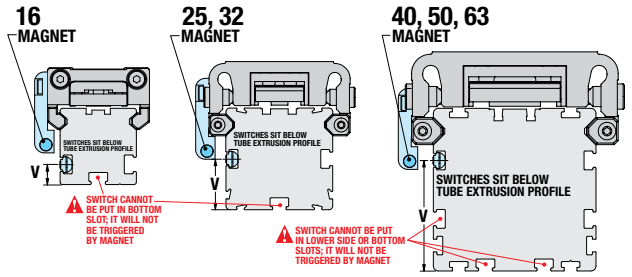



## MOUNTING DIMENSIONS

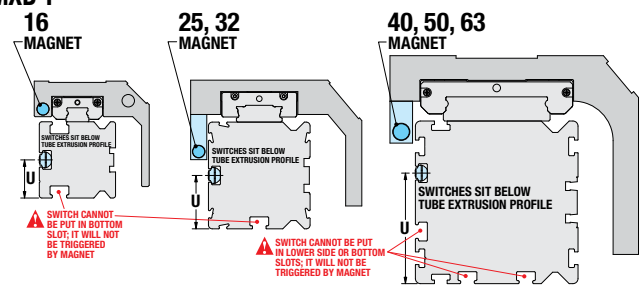
### MXB-U




### MXB-S

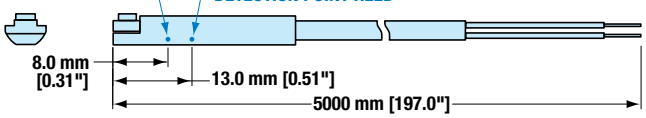



### MXB-P

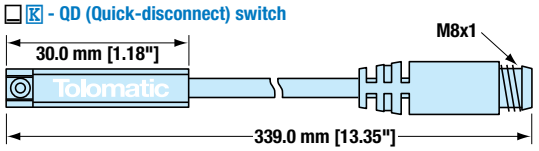


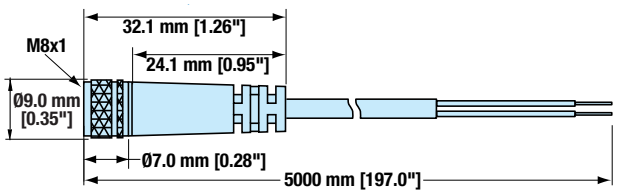

## SWITCH DIMENSIONS

Y - direct connect




K - QD (Quick-disconnect) switch




## SWITCH MOUNTING

| mm | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| U | 15.0 | 21.0 | 27.7 | 43.5 | 51.4 | 62.0 |
| V | 7.9 | 20.0 | 27.0 | 43.5 | 51.4 | 62.0 |
| *in* | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
| U | *0.59* | *0.83* | *1.09* | *1.71* | *2.02* | *2.44* |
| V | *0.31* | *0.79* | *1.06* | *1.71* | *2.02* | *2.44* |

⚠ NOTE: When ordering switches as a service part, Magnet Housing Kit (light blue in drawings) is required if actuator was not originally ordered with switches.

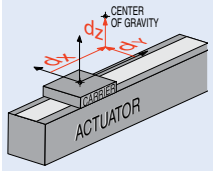
# COMPILE APPLICATION REQUIREMENTS

## APPLICATION DATA WORKSHEET

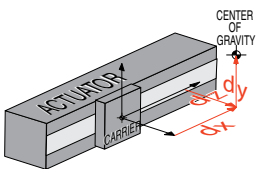
*Fill in known data. Not all information is required for all applications*

## ORIENTATION

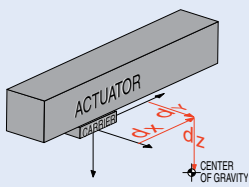
☐ Horizontal



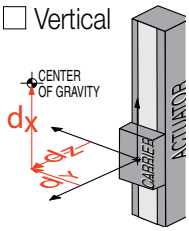

☐ Side




☐ Horizontal Down

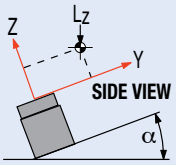



☐ Vertical

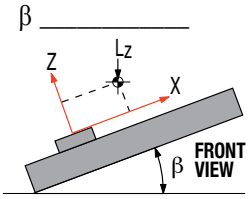



☐ Angled °

α _____




β _____




☐ Load attached to carrier OR ☐ Load supported by other mechanism

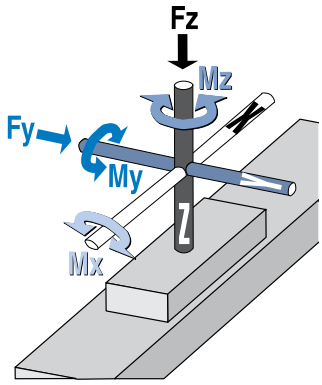
## DISTANCE FROM CENTER OF CARRIER TO LOAD CENTER OF GRAVITY

$d_x$ _____
$d_y$ _____
$d_z$ _____

☐ inch (U.S. Standard) ☐ millimeter (Metric)

## STROKE LENGTH _____

☐ inch (S K) (U.S. Standard) ☐ millimeters (Metric)




## BENDING MOMENTS APPLIED TO CARRIER

$M_x$ _____
$M_y$ _____
$M_z$ _____

☐ in.-lbs. (U.S. Standard) ☐ N-m (Metric)

## PRECISION

Repeatability _____

☐ inch ☐ millimeters

## OPERATING ENVIRONMENT

Temperature, Contamination, etc.

_____
_____
_____

⚠ NOTE: If load or force on carrier changes during cycle use the highest numbers for calculations

## LOAD _____

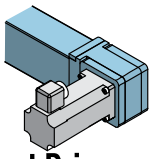
☐ lb. (U.S. Standard) ☐ kg. (Metric)

## THRUST REQUIRED

$F_z$ _____
$F_y$ _____

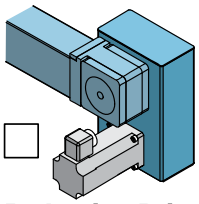
☐ lbf. (U.S. Standard) ☐ N (Metric)

☐



**Direct Drive**

☐



**Reduction Drive**

## MOVE PROFILE

Move Distance _____
☐ inch ☐ millimeters

Dwell Time After Move_____

Max. Speed _____
☐ in/sec ☐ mm/sec

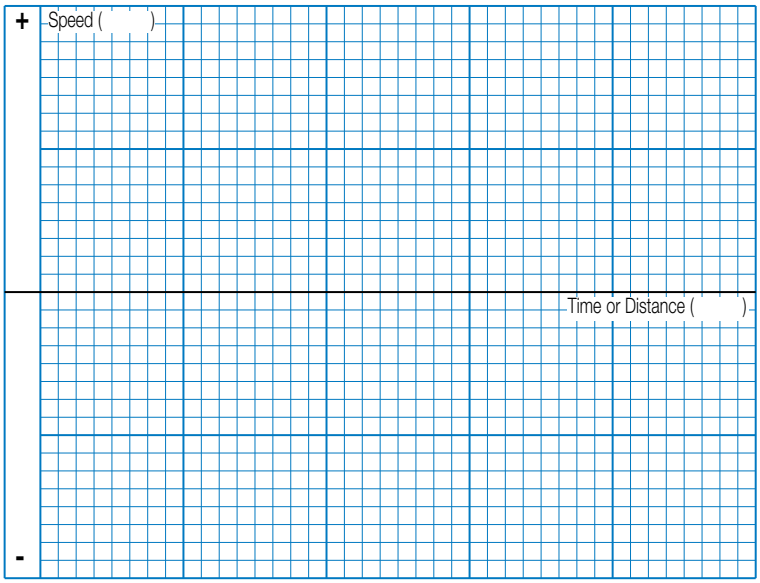
## MOVE TIME _____

☐ sec

## NO. OF CYCLES _____

☐ per minute ☐ per hour

## MOTION PROFILE




Graph your most demanding cycle, including accel/decel, velocity and dwell times. You may also want to indicate load variations and I/O changes during the cycle. Label axes with proper scale and units.

**USE THE TOLOMATIC SIZING AND SELECTION SOFTWARE AVAILABLE ON-LINE AT www.tolomatic.com OR... CALL TOLOMATIC 1-800-328-2174** with the above information. We will provide any assistance needed to determine the proper MX actuator for the job. **FAX 1-763-478-8080**

## CONTACT INFORMATION

Name, Phone, Email
Co. Name, Etc.

_____
_____
_____

# SELECTION GUIDELINES

**The process of selecting a belt drive actuator for a given application can be complex. It is highly recommended that you contact Tolomatic or a Tolomatic distributor for assistance in selecting the best actuator for your application. The following overview of the selection guidelines are for educational purposes only.**

## 1 CHOOSE ACTUATOR SIZE

Choose an actuator that has the thrust, speed and moment load capacity to move the load.

**A)** For maximum thrust use the table below.

**B)** Max. speed of MXB-U 200 in/sec (5 m/sec); Max. speed of MXB-S 100 in/sec (2.5 m/sec) Max. speed of MXB-P 150 in/sec (3.8 m/sec).

**C)** For MXB-S moment and load capacities see tables on page MXB_12.
For MXB-P moment and load capacities see tables on page MXB_13.

| SIZE | MAXIMUM THRUST | |
|---|---|---|
| | lbf | N |
| 16 | 38 | *169* |
| 25 | 151 | *672* |
| 32 | 209 | *930* |
| 40 | 250 | *1112* |
| 50 | 325 | *1446* |
| 63 | 418 | *1859* |

## 2 COMPARE LOAD TO MAXIMUM LOAD CAPACITIES

Calculate the application load (combination of load mass and forces applied to the carrier) and application bending moments (sum of all moments Mx, My, and Mz applied to the carrier). Be sure to evaluate the magnitude of dynamic inertia moments. When a rigidly attached load mass is accelerated or decelerated, its inertia induces bending moments on the carrier. Careful attention to how the load is decelerated at the end of the stroke is required for improved actuator performance and application safety. If either load or any of the moments exceed figures indicated in the Moment and Load Capacity tables (page MXB_12 & 13) for the actuator consider:

**1) A higher capacity carrier (ie. S to P)**

**2) A larger actuator size**

**3) Auxiliary carrier**

**4) External guide system (if the load is externally supported and guided, consider using MXB-U)**

## 3 CALCULATE LOAD FACTOR (LF)

For loads with a center of gravity offset from the carrier account for both applied (static) and dynamic loads. The load factor (LF) must not exceed the value of 1.

$$L_F = \frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} \leq 1$$

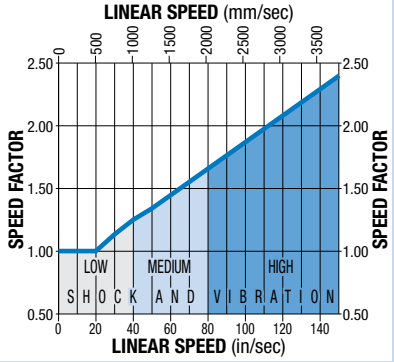
If LF does exceed the value of 1, consider the four choices listed in step #2.

## 4 ESTABLISH YOUR MOTION PROFILE AND CALCULATE ACCELERATION RATE

Using the application stroke length and maximum carrier velocity (or time to complete the linear motion), establish the motion profile. Select either triangular (accel-decel) or trapezoidal (accel-constant speed-decel) profile. Now calculate the maximum acceleration and deceleration rates of the move. Acceleration/deceleration should not exceed 1200 in/sec$^2$ (30.48 m/sec$^2$). Also, do not exceed safe rates of dynamic inertia moments determined in step #3.

### SPEED FACTOR

*FOR APPLICATIONS WITH HIGH SPEED OR SIGNIFICANT SHOCK AND VIBRATION:* Calculated values of loads and bending moments must be increased by speed factor from the graph below to obtain full rated life of profiled rail bearing system.




## 5 SELECT MOTOR (GEARHEAD IF NECESSARY) AND DRIVE

To help select a motor and drive, use the sizing equations located in the Engineering Resources section of the Tolomatic Electric Products Catalog (#3600-4609) to calculate the application thrust and torque requirements. Refer to Motor sections to determine the motor and drive.

**USE THE TOLOMATIC SIZING AND SELECTION SOFTWARE AVAILABLE ON-LINE AT www.tolomatic.com OR... CALL TOLOMATIC AT 1-800-328-2174.** We will provide any assistance needed to determine the proper MX actuator for the job.

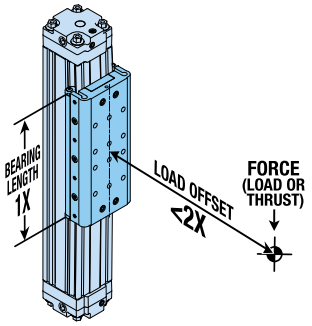
## 6 DETERMINE MOUNTING PLATE REQUIREMENTS

- **Consult the Mounting Plate Requirements graph for the model selected (page MXB_11)**
- **Cross reference the application load and maximum distance between supports**
- **Select the appropriate number of mounting plates**

## 7 CONSIDER OPTIONS

- **Choose metric or inch (U.S. standard) load mounting. When ordering use S K for inch and S M for metric.**
- **Switches - Reed, Solid State PNP or NPN, all available normally open or normally closed**
- **F L Floating mount bracket - used when lack of parallelism occurs between the actuator and an externally guided and supported load (available for S Solid bearing style MXB actuators)**

### S SOLID BEARING 2:1 RULE




**For applications using S solid bearings, binding or interrupted motion may occur if the load offset is equal to or greater than twice the bearing length (1X).** *LOAD OFFSET is defined as: the distance from the applied force (or the load center of gravity) to the centerline of the carrier.*

**If the load offset cannot be changed consider:**

**1.) Higher capacity bearing style, i.e. S to P**

**2.) Larger actuator size**

**3.) Auxiliary carrier**

**4.) Add external guides**

# SERVICE PARTS ORDERING

## SWITCHES

Switches for MXB include retained mounting hardware and are the same for all actuator sizes and bearing styles

| Code | | Lead | Normally | Sensor Type |
|---|---|---|---|---|
| R Y | | 5m (197 in) | Open | Reed |
| R K | | Quick-disconnect | | |
| N Y | | 5m (197 in) | Closed | Reed |
| N K | | Quick-disconnect | | |
| T Y | | 5m (197 in) | Open | Solid State PNP |
| T K | | Quick-disconnect | | |
| K Y | | 5m (197 in) | Open | Solid State NPN |
| K K | | Quick-disconnect | | |
| P Y | | 5m (197 in) | Closed | Solid State PNP |
| P K | | Quick-disconnect | | |
| H Y | | 5m (197 in) | Closed | Solid State NPN |
| H K | | Quick-disconnect | | |

NOTE: All switch kits include retained hardware. Quick-disconnect kits include female connector

⚠ NOTE: When ordering switches as service part, Magnet Housing Kit is required if actuator was not originally ordered with switches

To order switch kit use configuration code for switch preceded by SW and actuator code.

EXAMPLE: S W M X B 2 5 K K

KIT | ACTUATOR | SIZE | SWITCH CODE

The example is for Solid State NPN, Normally Open Switch with Quick-disconnect couplers. Each switch kit is complete with Bracket, Set Screw, Switch and mating QD cable. Note that the bracket/switch size is common and may be used on any size MXB.

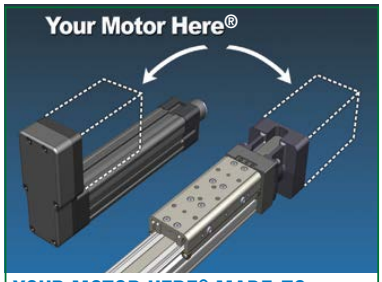
## OPTIONS

| MXB SIZE | Mounting Plate Kit | S (inch) Floating Mount Kit | S (metric) Floating Mount Kit | **MXB-U Magnet Housing Kit | **MXB-S Magnet Housing Kit | **MXB-P Magnet Housing Kit |
|---|---|---|---|---|---|---|
| 16 | 8516-9030 | 8116-9536 | *8116-9036* | 8516-9024 | 8516-9074 | 8340-1008 |
| 25 | 8525-9030 | 8525-9536 | *8525-9136* | 8525-9024 | 8525-9074 | 8525-9009 |
| 32 | 8532-9030 | 8132-9536 | *8132-9036* | 8525-9024 | 8532-9074 | 8532-9009 |
| 40 | 8540-9030 | 8140-9536 | *8140-9036* | 8525-9024 | 8540-9074 | 8540-9009 |
| 50 | 8550-9030 | 8550-9536 | *8550-9036* | 8550-9024 | 8550-9074 | 8550-9009 |
| 63 | 8563-9030 | 8163-9536 | *8163-9036* | 8550-9024 | 8563-9074 | 8563-9009 |

***Magnet Housing Kit is required if actuator was not originally ordered with switches

**Check out our MX--S carrier adjustment video on the web**
*https://youtu.be/LVWPg2gfy0A*


**Select a complete system from tolomatic or add any motion system to Tolomatic's actuators**

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Nidec CONTROL TECHNIQUES

# MXB Rodless Belt Drive Actuators

## ORDERING

MODEL SELECTION (MUST BE IN THIS ORDER)

OPTIONS (IN ANY ORDER)

MXB 40 P BWS30 SM2007.02 SDB DC215.9 MP8 HC2 TK2

### MODEL
**MXB** MX Rodless Belt Drive Actuators

### SERIES
**16** Series actuator
**25** Series actuator
**32** Series actuator
**40** Series actuator
**50** Series actuator
**63** Series actuator

### BEARING
**U** Unguided Carrier
**S** Solid Bearing Carrier
**P** Profiled Rail Bearing Carrier

### BELT MATERIAL AND WIDTH
**BWS10** 10 mm Urethane Steel (MXB16)
**BWS18** 18 mm Urethane Steel (MXB25)
**BWS25** 25 mm Urethane Steel (MXB32)
**BWS30** 30 mm Urethane Steel (MXB40)
**BWS40** 40 mm Urethane Steel (MXB50)
**BWS50** 50 mm Urethane Steel (MXB63)

### STROKE LENGTH & MOUNTING TYPE
**SK**____.___ Stroke, enter desired stroke length in **inches**

**SM†**____.___ Stroke, enter desired stroke length in **millimeters**

**GPB** Blank Plate (MXB-U only)
NO MOUNTING HOLES allowing user to drill and tap as needed

**NOTE: Actuator mounting threads and mounting fasteners will be either inch or metric, depending on how stroke length is indicated**

**SK=inch mounting**

**SM= metric mounting**

† The metric version provides metric tapped holes for mounting of the load to the carrier and of the actuator to mounting surfaces

### U & S MOTOR MOUNTING/REDUCTION
*(must choose one)*

**SDL, SDLD*** Direct Drive on Left
**SDR, SDRD*** Direct Drive on Right

⚠ A motor size and code must be selected when specifying a 3:1 reduction. (2:1 reduction on MXB16)

**SDTL, SDTLD*** 3:1 Reduction on Top Left
**SDTR, SDTRD*** 3:1 Reduction on Top Right
**SDBL, SDBLD*** 3:1 Reduction on Left Bottom
**SDBR, SDBRD*** 3:1 Reduction on Right Bottom

***For Dual Stub Shaft Option**

### P MOTOR MOUNTING / REDUCTION
*(must choose one)*

**SDT, SDTD*** Direct Drive on Top
**SDB, SDBD*** Direct Drive on Bottom

⚠ A motor size and code must be selected when specifying a 3:1 reduction. (2:1 reduction on MXB16)

**SDLT, SDLTD*** 3:1 Reduction on Left Top
**SDRT, SDRTD*** 3:1 Reduction on Right Top
**SDLB, SDLBD*** 3:1 Reduction on Left Bottom
**SDRB, SDRBD*** 3:1 Reduction on Right Bottom

***For Dual Stub Shaft Option**

### AUXILIARY CARRIER
**DC**___.___ Auxiliary Carrier, (MXB-P only) enter center-to-center spacing desired in **inches** (SK) or **millimeters** (SM)

(Same unit of measure as stroke length is required)

▲ **Center-to-center spacing between carriers adds to overall length of the actuator,** this distance will not be subtracted from stroke length specified in the previous step

### HEAD COVER PLATES
**HC2** Head Cover Plates

### MOUNTING
**MP_** Mounting Plates, & quantity
**TC_** Tube Clamps, & quantity
*NOTE: The MXB requires Mounting Plates to allow clearance for motor when mounted flush to surface.*
**16,25,32** *sizes use T-Nuts with Mounting Plates.*
**40,50,63** *sizes use Tube Clamps with Mounting Plates.*

### P CARRIER ORIENTATION
**BIR** Mirrored Carrier Design

### MOTOR / DRIVE / CONTROLLER / PLANETARY GEARBOX
⚠ Reference the ordering pages in Tolomatic Electric Product Brochures Stepper Products Brochure #3600-4160 & Planetary Gearbox Doc. #3600-4161

### SWITCHES

| TYPE | LOGIC | NORMALLY | QUICK-DISCONNECT | CODE | QUANTITY | LEAD LENGTH |
|---|---|---|---|---|---|---|
| REED | SPST | Open | no | RY | After code enter quantity desired | 5 meters (16.4 feet) |
| | | | QD | RK | | |
| | | Closed | no | NY | | |
| | | | QD | NK | | |
| SOLID STATE | PNP | Open | no | TY | | |
| | | | QD | TK | | |
| | NPN | Open | no | KY | | |
| | | | QD | KK | | |
| | PNP | Closed | no | PY | | |
| | | | QD | PK | | |
| | NPN | Closed | no | HY | | |
| | | | QD | HK | | |

⚠ **Not all codes listed are compatible with all options.**

**Call Tolomatic 1-800-328-2174 to determine available options and accessories based on your application requirements.**

**VISIT www.tolomatic.com FOR COMPLETE, UP-TO-DATE INFORMATION**

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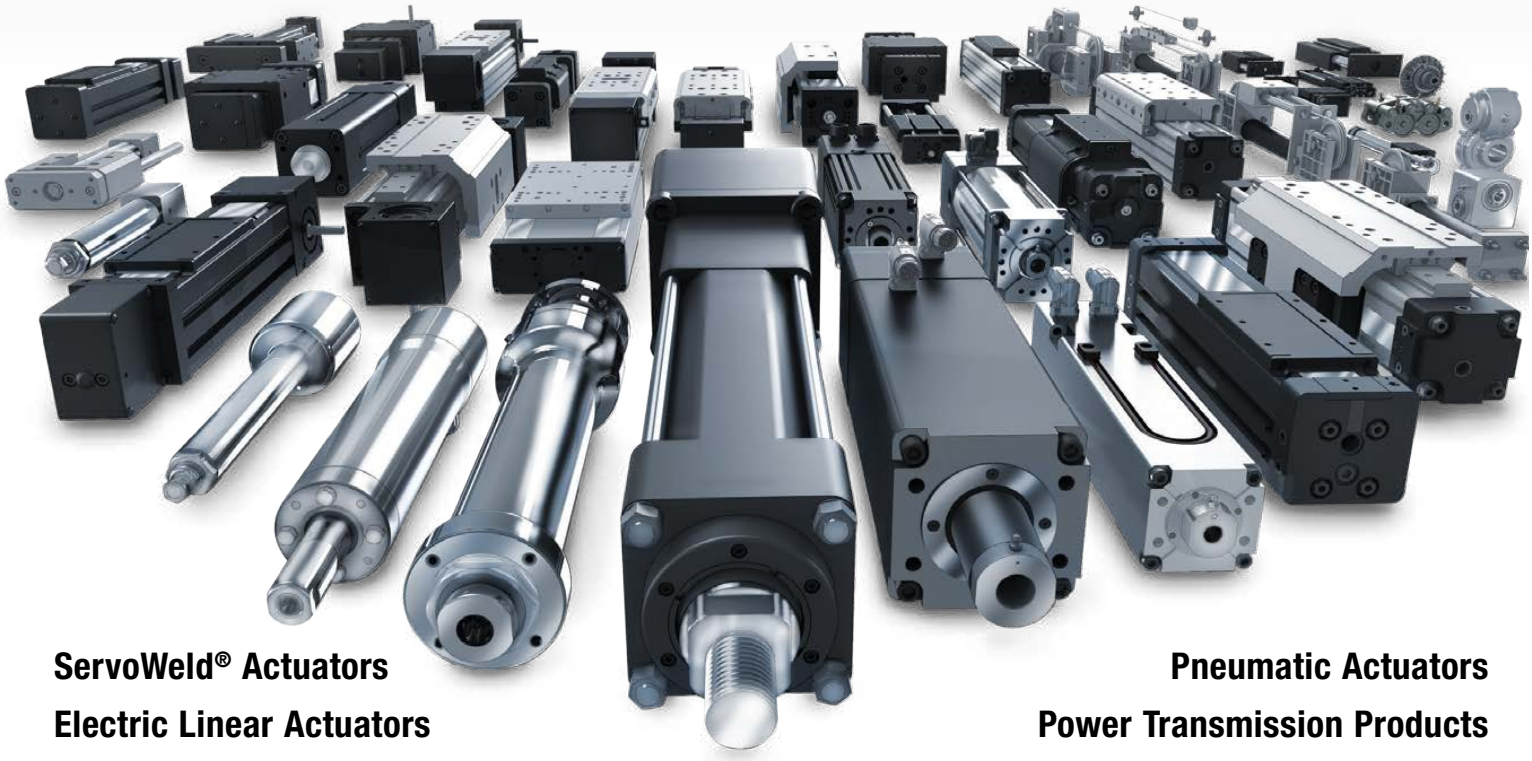

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