Tolomatic
EXCELLENCE *IN MOTION*®

# MXB BELT DRIVEN ACTUATORS

ENDURANCE TECHNOLOGY℠

Ⓤ UNGUIDED
Ⓟ PROFILED RAIL


MAXIMUM DURABILITY

# MXB Belt Driven Actuator

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

The MXB belt driven electric actuator is exactly what you would expect from the industry's number one rodless supplier. Designed with our exclusive ENDURANCE TECHNOLOGY℠ 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-[P]: Low profile to fit your application
- MXB-[P]: High precision bearings feature smooth, low breakaway motion
- MXB-[P]: Durable profiled rail design uses THK® Caged Ball® technology to reduce friction and extend actuator life.
- MXB-[P]: High load and bending moment capacities

## Choose from our broad line of MX products:

| ELECTRIC | | | |
|---|---|---|---|
| MXB | | MXE | |
| Belt Driven | | Screw Driven | |
|  |  |  |  |
| [P] Profiled Rail | [U] Unguided | [P] Profiled Rail | [S] Solid Bearing |
| MXB16P | MXB16U | MXE16P | MXE16S |
| MXB25P | MXB25U | MXE25P | MXE25S |
| MXB32P | MXB32U | MXE32P | MXE32S |
| MXB40P | MXB40U | MXE40P | MXE40S |
| MXB50P | MXB50U | MXE50P | MXE50S |
| MXB63P | MXB63U | MXE63P | MXE63S |

| PNEUMATIC | | |
|---|---|---|
| MXP | | |
| Rodless Cylinder | | |
|  |  |  |
| [P] Profiled Rail | [S] Solid Bearing | [N] Internal Bearing |
| MXP16P | MXP16S | MXP16N |
| MXP25P | MXP25S | MXP25N |
| MXP32P | MXP32S | MXP32N |
| MXP40P | MXP40S | MXP40N |
| MXP50P | MXP50S | MXP50N |
| MXP63P | MXP63S | MXP63N |

# A Comparison of Tolomatic Belt Drive Actuators

**All Tolomatic belt drive actuators feature:**

• High linear velocity • High acceleration rate • Long stroke lengths
• Excellent repeatability • High duty cycles • Low profile

**Unique features include:**

| ***MXB-U** Electric Belt Drive* | ***MXB-P** Electric Belt Drive* | ***B3W** Electric Belt Drive* | ***TKB** Electric Belt Drive* |
|---|---|---|---|
|  |  |  |  |
| • Requires external guidance and support | • High load and bending moment capacities | | • Superior rigidity, high moment loads |
| | • High precision bearings feature smooth, low breakaway motion | | • Straightness and flatness within 0.0002 inches per inch of stroke |
| | • Durable profiled rail design uses THK® Caged Ball® technology to reduce friction and extend actuator life | | • Wide stable platform for XY applications |
| | | | • Lowest carrier deflection of any Tolomatic actuator |
| ***www.tolomatic.com** for complete information, search by literature number:* | | | |
| *#8500-4000* | *#8500-4000* | *#3600-4148* | *#3600-4609* |



## CONTENTS

# MXB Belt Driven Actuator

## ADVANTAGES OF BELT SOLUTIONS

The use of synchronous belts, often referred to as timing belts, have become a standard in the automated motion industry as an alternate to screw drive mechanisms for producing linear motion. MXB-[U] and MXB-[P] belt driven actuators are an excellent solution for applications that require:

- High linear velocities
- High acceleration rates
- Long stroke lengths
- Excellent repeatability
- High duty cycles

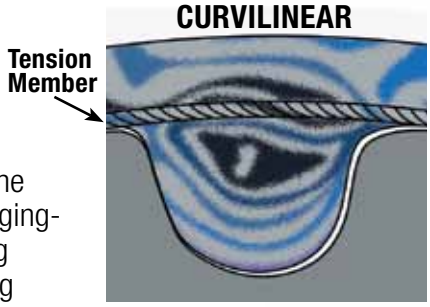
Tolomatic belt driven actuators can achieve linear acceleration up to 1200 in/sec$^2$,
MXB-U velocity of up to 200 in/sec (5 m/sec) and MXB-P velocity of up to 150 in/sec (3.8 m/sec).

## BELT CONSTRUCTION

Tolomatic's standard belt is a polyurethane material reinforced with steel tension members to produce high carrier thrusts without belt stretch.

Tolomatic uses an HTD synchronous belt that features a curvilinear tooth profile. The 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.




***Tolomatic's belt tooth profile distributes thrust force evenly***

## BELT DRIVEN APPLICATIONS

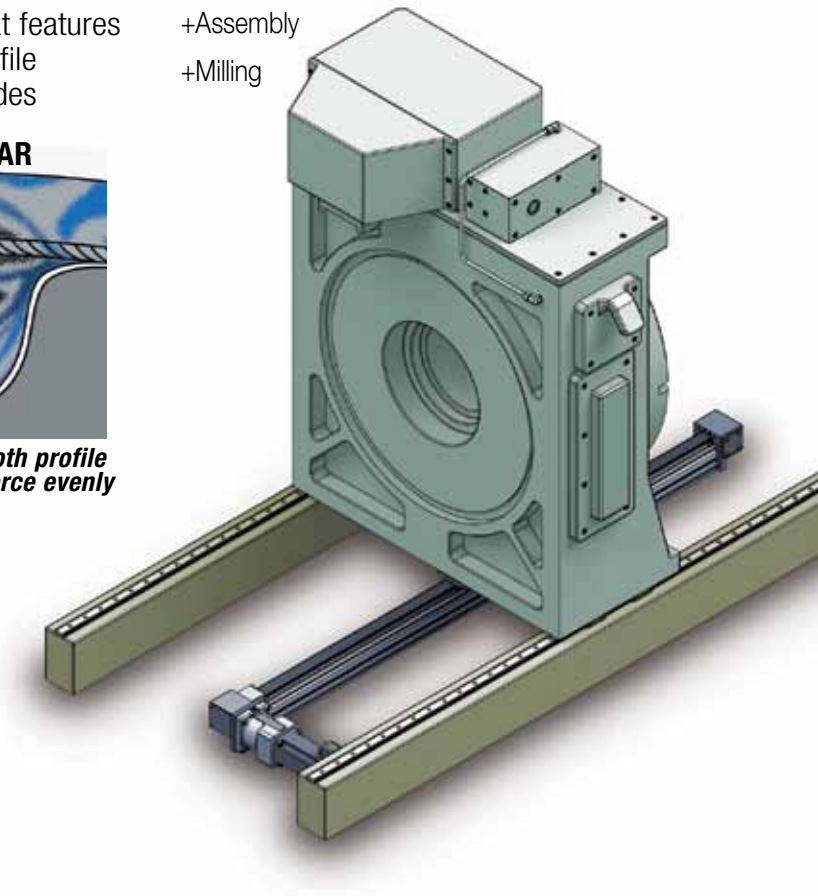
Tolomatic MXB-[U] and MXB-[P] belt driven actuators are:

- Easy to size and order
- Quick to install and maintain
- Simple to integrate and control

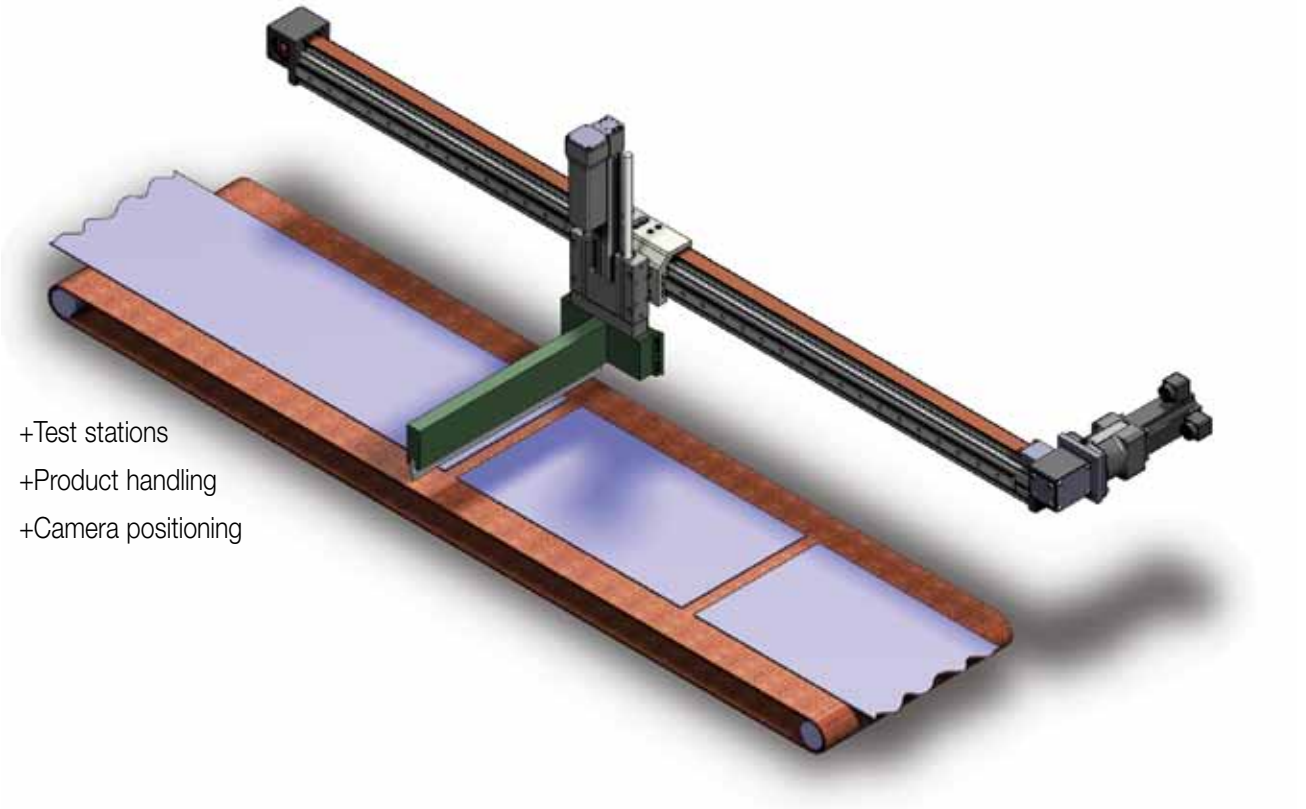
Both MXB-U and MXB-P are available in multiple frame sizes. The MXB-P belt driven actuator integrates the advantages of a linear belt solution with a load support and guidance system. This combination allows you to install a pre-assembled and compact solution, often without the need of external guide rails or load support systems. MXB-P offers options such as dual carriers for twice the load and moment capacity.

### [U] APPLICATION: Workcenter Positioning

+Positioning
+Assembly
+Milling

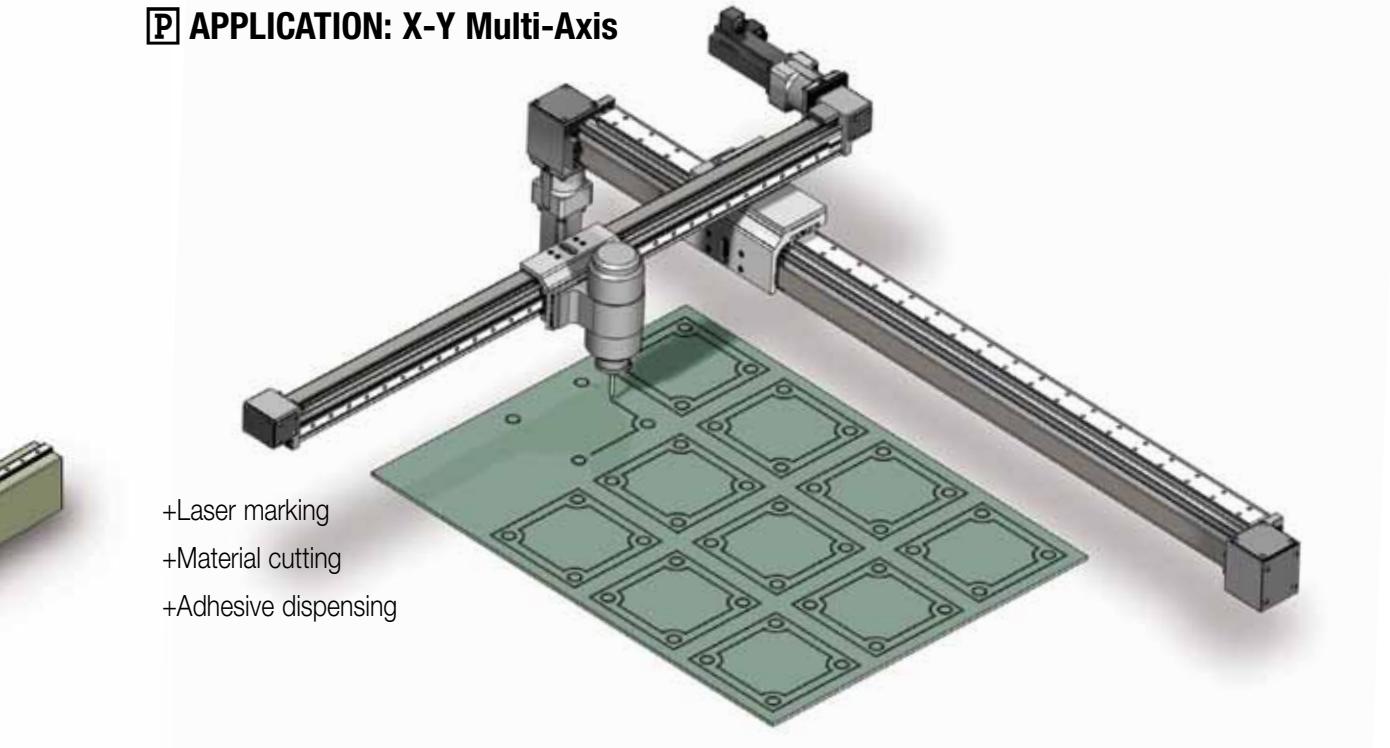


## P APPLICATION: High Speed Flying Cut Off



+Test stations
+Product handling
+Camera positioning

## P APPLICATION: X-Y Multi-Axis

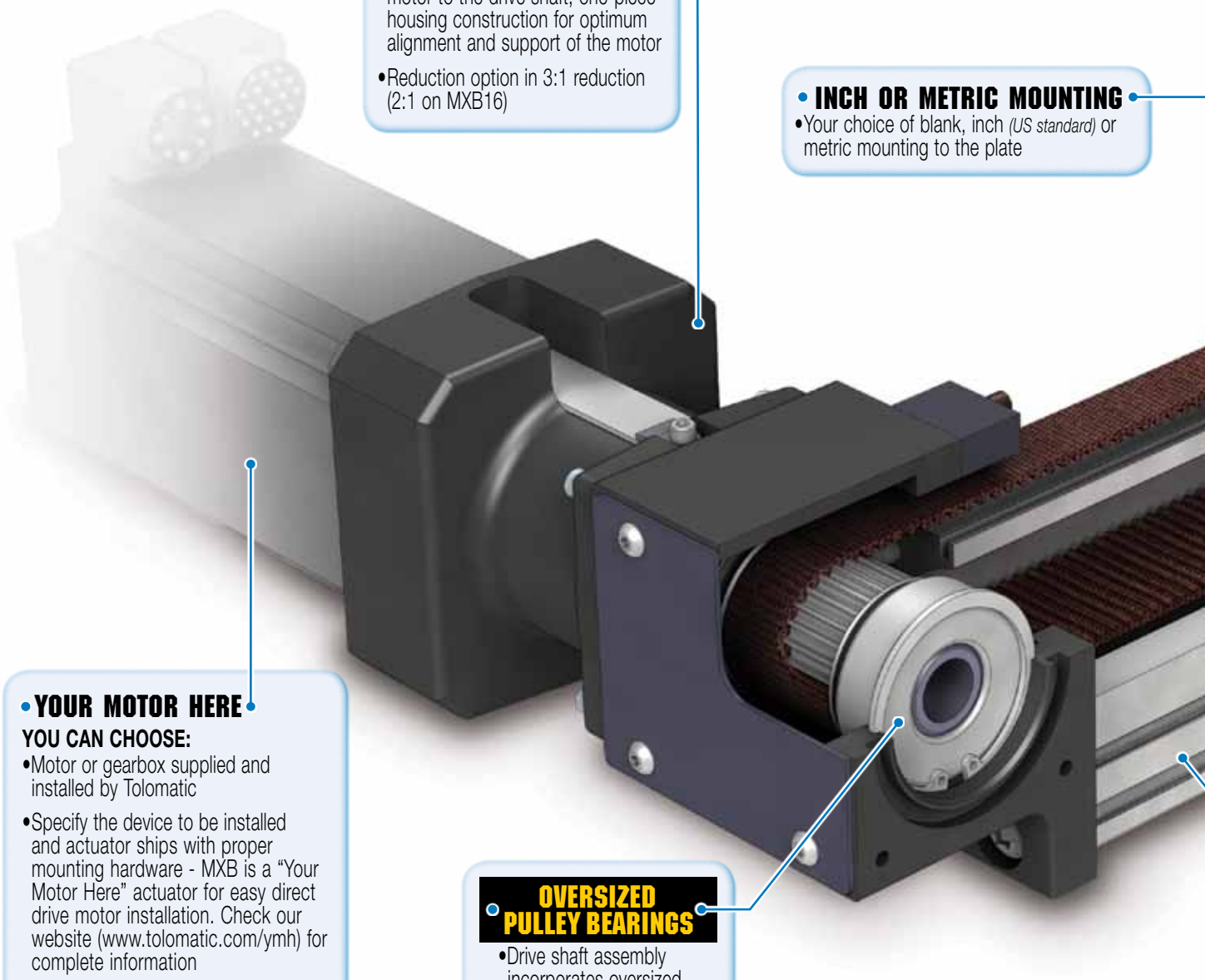


+Laser marking
+Material cutting
+Adhesive dispensing

# MXB-U BELT DRIVE (UNGUIDED)

## ENDURANCE TECHNOLOGY℠

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



### 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)

### INCH OR METRIC MOUNTING

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

### YOUR MOTOR HERE

**YOU CAN CHOOSE:**

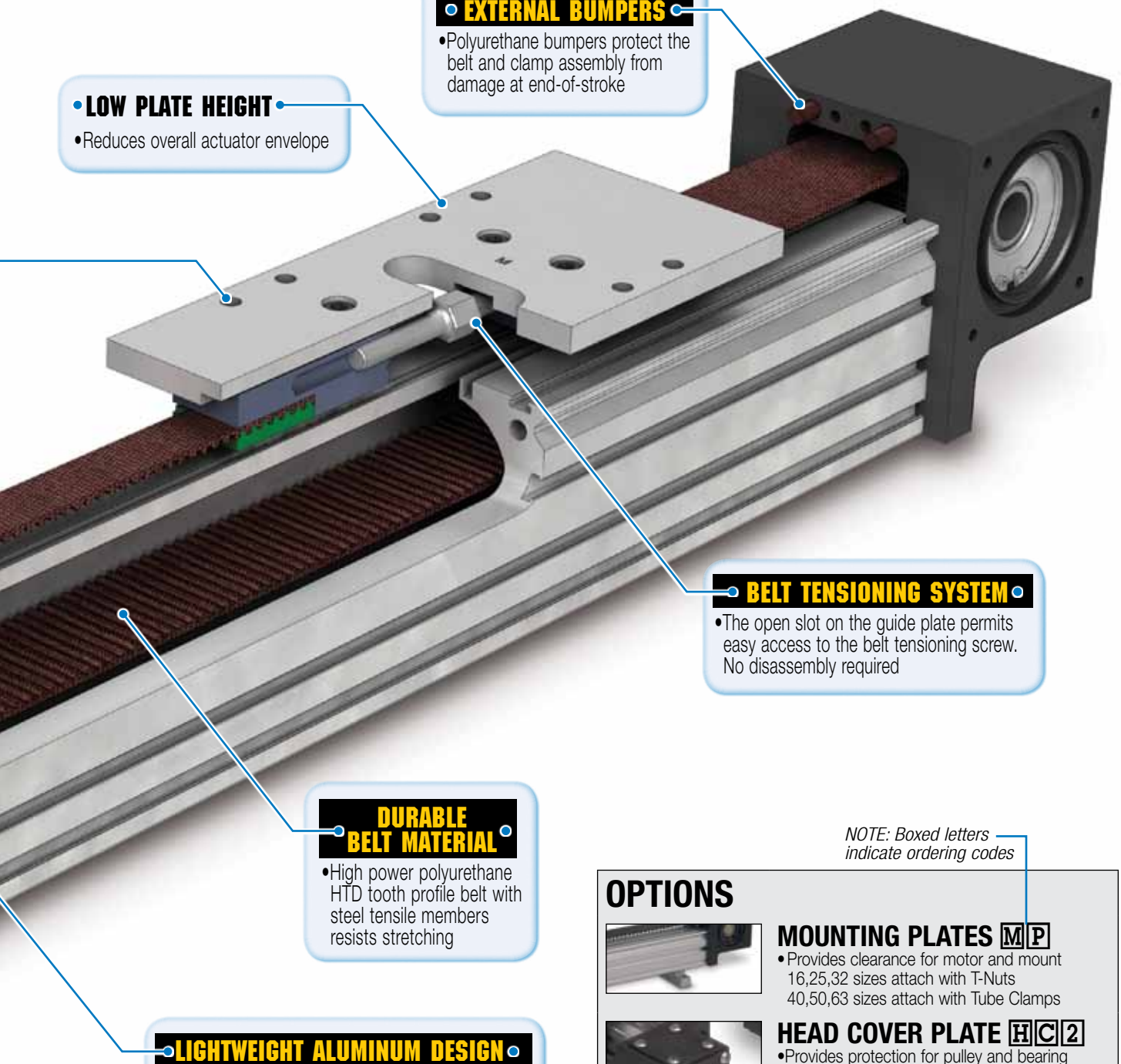
- Motor or gearbox supplied and installed by Tolomatic
- Specify the device to be installed and actuator ships with proper mounting hardware - MXB is a "Your Motor Here" actuator for easy direct drive motor installation. Check our website (www.tolomatic.com/ymh) for complete information
- Specify and ship your device to Tolomatic for factory installation

### OVERSIZED PULLEY BEARINGS

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

**5 DAYS BUILT-TO-ORDER**

# ...MAXIMUM DURABILITY



**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

**DURABLE BELT MATERIAL**
- High power polyurethane HTD tooth profile belt with steel tensile members resists stretching

**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))

# MXB-P BELT DRIVE (PROFILED RAIL)

## ENDURANCE TECHNOLOGY℠

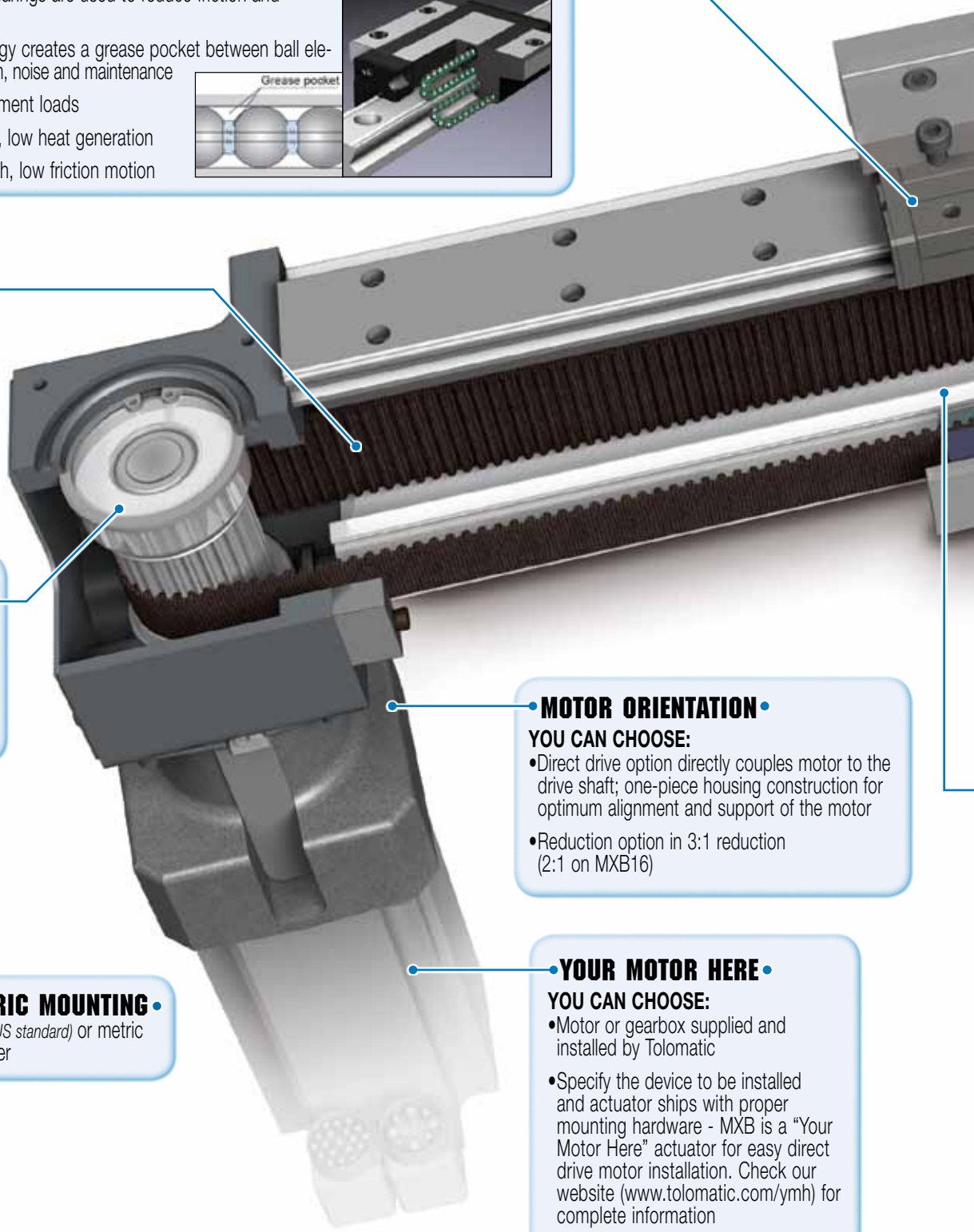
*Endurance Technology℠ features are designed for maximum durability to provide extended service life.*

### CAGED BALL® BEARINGS

- THK® Caged Ball® bearings are used to reduce friction and extend actuator life
- Caged Ball® technology creates a grease pocket between ball elements, reducing friction, noise and maintenance
- Large permissible moment loads
- High speed operation, low heat generation
- High precision, smooth, low friction motion





### DURABLE BELT MATERIAL

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

### OVERSIZED PULLEY BEARINGS

- Drive shaft assembly incorporates oversized 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)

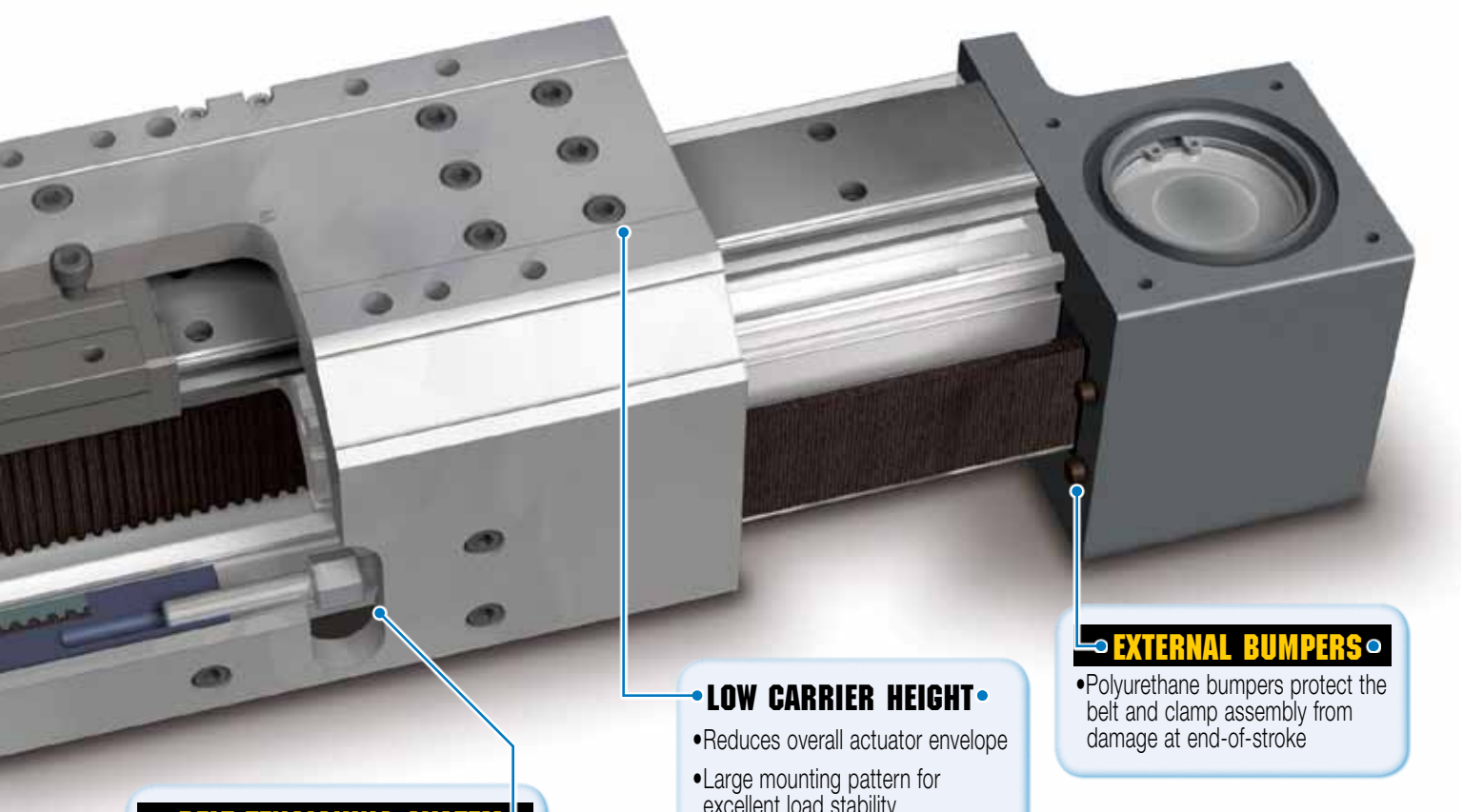
### INCH OR METRIC MOUNTING

- Your choice of inch *(US standard)* or metric mounting to the carrier

### YOUR MOTOR HERE

**YOU CAN CHOOSE:**

- Motor or gearbox supplied and installed by Tolomatic
- Specify the device to be installed and actuator ships with proper mounting hardware - MXB is a "Your Motor Here" actuator for easy direct drive motor installation. Check our website (www.tolomatic.com/ymh) for complete information
- Specify and ship your device to Tolomatic for factory installation



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

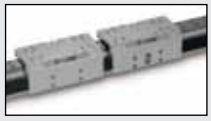
**LOW CARRIER HEIGHT**
- Reduces overall actuator envelope
- Large mounting pattern for excellent load stability

**BELT TENSIONING SYSTEM**
- The open slot on the carrier side permits easy access to the belt tensioning screw. No disassembly required and no need to remove the load from the carrier

**LIGHTWEIGHT ALUMINUM DESIGN**
- Clear anodized extrusion design is optimized for rigidity and strength

*NOTE: Boxed letters indicate ordering codes*

## OPTIONS



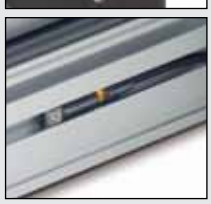
### AUXILIARY CARRIER [D][C]
- 2X higher Fz & Fy (load) capacity
- High bending moment capacity

### 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 Belt Driven Actuator

## ACTUATOR SPECIFICATIONS AND BREAKAWAY TORQUE

SIZING SOFTWARE AVAILABLE AT WWW.TOLOMATIC.COM

| U & P MXB SIZE | BELT WIDTH | | BELT DEAD LENGTH | | PULLEY PITCH DIAMETER | | STROKE PER REVOLUTION | | *MAXIMUM STROKE | | BREAKAWAY TORQUE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | SINGLE CARRIER | | AUXILIARY CARRIER OPT. (MXB-P ONLY) | |
| | in | mm | in | mm | in | mm | in | mm | in | mm | lb-in | N-m | lb-in | N-m |
| 16 | 0.39 | 10 | 14.29 | 363.0 | 0.753 | 19.1 | 2.366 | 60.1 | 200 | 5080 | 4.0 | 0.452 | 6.0 | 0.678 |
| 25 | 0.71 | 18 | 18.72 | 475.5 | 1.003 | 25.5 | 3.151 | 80.0 | 200 | 5080 | 5.0 | 0.565 | 7.0 | 0.791 |
| 32 | 0.98 | 25 | 21.89 | 556.0 | 1.253 | 31.8 | 3.936 | 100.0 | 200 | 5080 | 8.0 | 0.904 | 10.0 | 1.130 |
| 40 | 1.18 | 30 | 24.95 | 633.7 | 1.504 | 38.2 | 4.725 | 120.0 | 200 | 5080 | 10.0 | 1.130 | 12.0 | 1.356 |
| 50 | 1.57 | 40 | 27.25 | 692.2 | 1.754 | 44.6 | 5.510 | 140.0 | 160 | 4064 | 15.0 | 1.695 | 18.0 | 2.034 |
| 63 | 1.97 | 50 | 36.11 | 917.2 | 2.130 | 54.1 | 6.692 | 170.0 | 100 | 2540 | 20.0 | 2.260 | 25.0 | 2.825 |

*Longer lengths may be possible with use of tube couplers - Contact Tolomatic

| U MXB-U SIZE | WEIGHT | | | | | | | | INERTIA | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PLATE ASSEMBLY | | BELT TENSIONER ASSEMBLY | | BASE ACTUATOR | | PER UNIT OF STROKE | | DRIVE/IDLE PULLEY ASSEMBLIES | | PLATE ASSEMBLY (INCLUDING BELT TENSIONER ASSEMBLY) | | PER UNIT OF STROKE | |
| | lb | kg | lb | kg | lb | kg | lb/in | kg/cm | lb-in² | kg-cm² | lb-in² | kg-cm² | lb-in² | kg-cm² |
| 16 | 0.11 | 0.05 | 0.10 | 0.05 | 1.59 | 0.72 | 0.084 | 0.0150 | 0.0085 | 0.0250 | 0.0335 | 0.0980 | 0.0005 | 0.0006 |
| 25 | 0.27 | 0.12 | 0.15 | 0.07 | 2.59 | 1.17 | 0.138 | 0.0246 | 0.0259 | 0.0759 | 0.1201 | 0.3515 | 0.0017 | 0.0020 |
| 32 | 0.48 | 0.22 | 0.30 | 0.13 | 4.17 | 1.89 | 0.237 | 0.0423 | 0.1416 | 0.4143 | 0.3451 | 1.0099 | 0.0037 | 0.0043 |
| 40 | 0.90 | 0.41 | 0.46 | 0.21 | 7.83 | 3.55 | 0.352 | 0.0629 | 0.3719 | 1.0884 | 0.8487 | 2.4836 | 0.0065 | 0.0075 |
| 50 | 1.03 | 0.47 | 0.72 | 0.33 | 9.93 | 4.50 | 0.472 | 0.0843 | 0.7243 | 2.1196 | 1.5103 | 4.4198 | 0.0117 | 0.0135 |
| 63 | 2.54 | 1.15 | 0.83 | 0.38 | 16.44 | 7.46 | 0.833 | 0.1488 | 1.9512 | 5.7101 | 4.2168 | 12.3401 | 0.0216 | 0.0249 |

| P MXB-P SIZE | WEIGHT | | | | | | | | INERTIA | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARRIER ASSEMBLY | | BELT TENSIONER ASSEMBLY | | BASE ACTUATOR | | PER UNIT OF STROKE | | DRIVE/IDLE PULLEY ASSEMBLIES | | CARRIER ASSEMBLY (INCLUDING BELT TENSIONER ASSEMBLY) | | | | PER UNIT OF STROKE | |
| | | | | | | | | | | | SINGLE CARRIER | | AUXILIARY CARRIER OPT. | | | |
| | lb | kg | lb | kg | lb | kg | lb/in | kg/cm | lb-in² | kg-cm² | lb-in² | kg-cm² | lb-in² | kg-cm² | lb-in² | kg-cm² |
| 16 | 0.39 | 0.18 | 0.10 | 0.05 | 2.38 | 1.08 | 0.102 | 0.0183 | 0.0085 | 0.0250 | 0.4856 | 1.4211 | 0.8716 | 2.5506 | 0.0005 | 0.0006 |
| 25 | 0.84 | 0.38 | 0.15 | 0.07 | 4.36 | 1.98 | 0.195 | 0.0348 | 0.0259 | 0.0759 | 0.9914 | 2.9013 | 1.8353 | 5.3708 | 0.0017 | 0.0020 |
| 32 | 1.64 | 0.74 | 0.30 | 0.13 | 7.83 | 3.55 | 0.318 | 0.0569 | 0.1416 | 0.4143 | 1.9356 | 5.6642 | 3.5757 | 10.4641 | 0.0037 | 0.0043 |
| 40 | 2.51 | 1.14 | 0.46 | 0.21 | 14.07 | 6.38 | 0.537 | 0.0959 | 0.3719 | 1.0884 | 2.9693 | 8.6893 | 5.4832 | 16.0460 | 0.0065 | 0.0075 |
| 50 | 5.03 | 2.28 | 0.72 | 0.33 | 20.84 | 9.45 | 0.749 | 0.1337 | 0.7243 | 2.1196 | 5.7498 | 16.8263 | 10.7770 | 31.5378 | 0.0117 | 0.0135 |
| 63 | 9.36 | 4.25 | 0.83 | 0.38 | 37.24 | 16.89 | 1.110 | 0.1981 | 1.9512 | 5.7101 | 10.1930 | 29.8288 | 19.5537 | 57.2221 | 0.0216 | 0.0249 |

**MAXIMUM VELOCITY U** 200 in/sec *5080 mm/sec*

**MAXIMUM VELOCITY P** 150 in/sec *3810 mm/sec*

**MAXIMUM ACCELERATION** 1200 in/sec² *30.48 m/sec²*

**REPEATABILITY** ± 0.002 in *± 0.051 mm*

**TEMPERATURE RANGE** 10 to 130 °F *-12 to 54 °C*

⚠ 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.

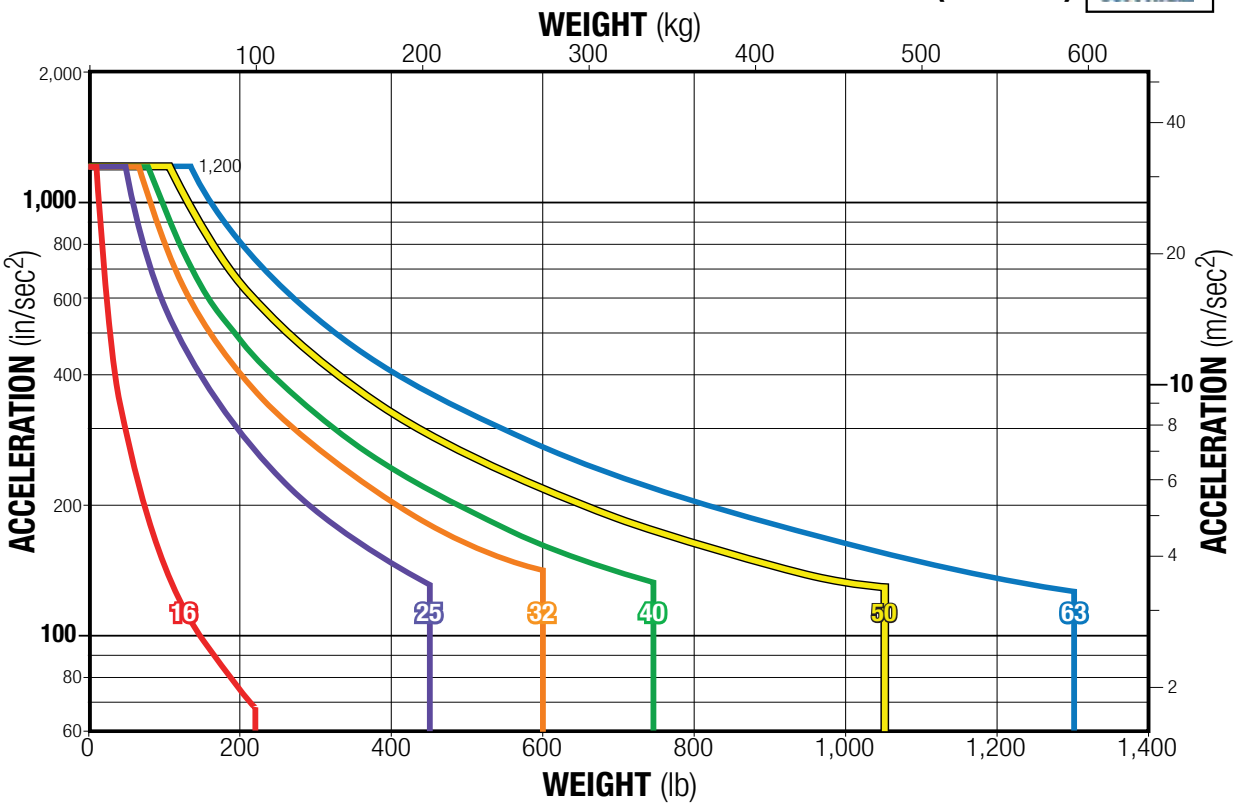
**STRAIGHTNESS, FLATNESS** 0.00067 L in *0.01702 L mm*

Actuator mounted on a flat surface and fully restrained (see Mounting Plate Requirements, page 11) L = Maximum distance between supports

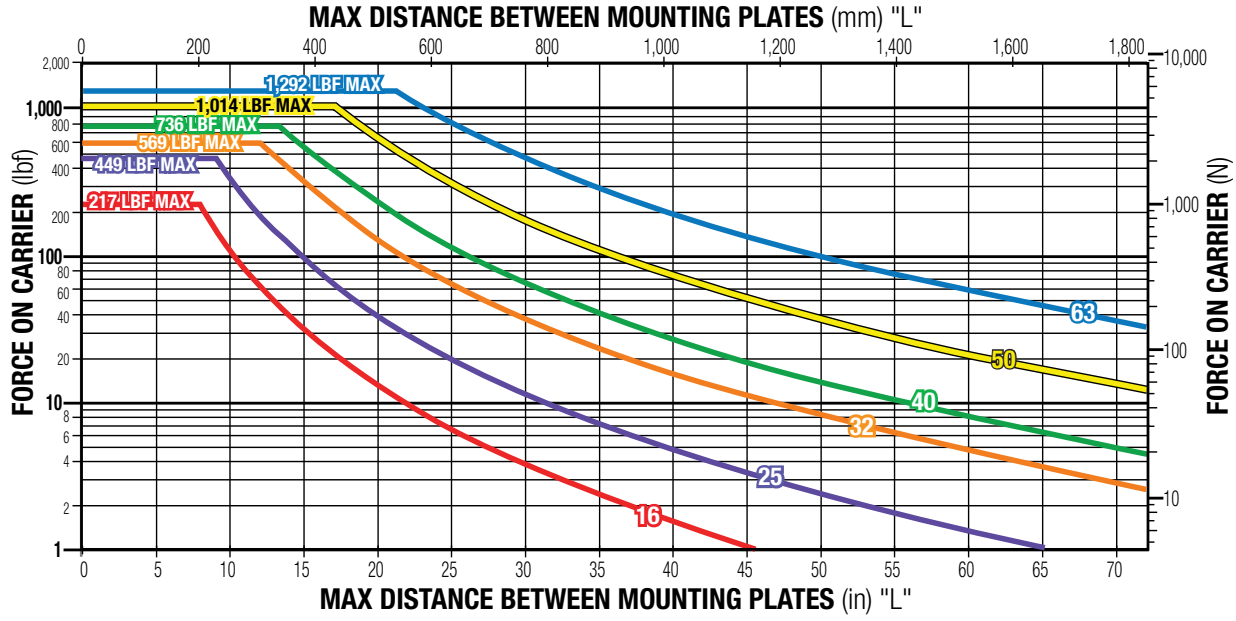
⚠ The listed values relating to straightness/flatness are intended for reference purposes only, and not as an engineering standard of absolute tolerance for a given actuator. Appropriate installation is the single most important factor in reducing variation, so good engineering practices such as measurement,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

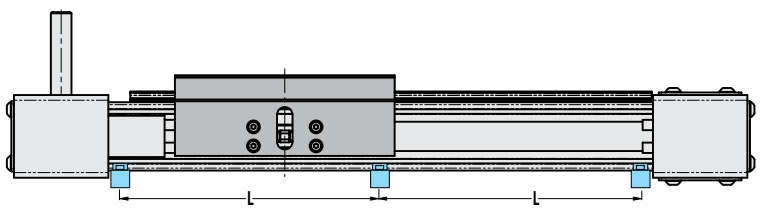
SIZING SOFTWARE AVAILABLE AT WWW.TOLOMATIC.COM

## MAXIMUM ACCELERATION AS A FUNCTION OF LOAD WEIGHT (U & P)




## MOUNTING PLATE REQUIREMENTS (P ONLY)



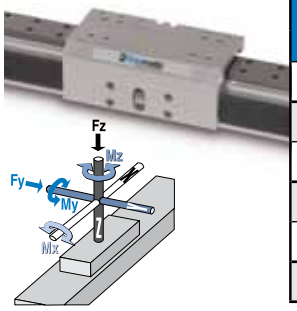
# MXB-P Belt Driven Actuator

## MOMENT AND LOAD CAPACITY

SIZING SOFTWARE AVAILABLE AT WWW.TOLOMATIC.COM

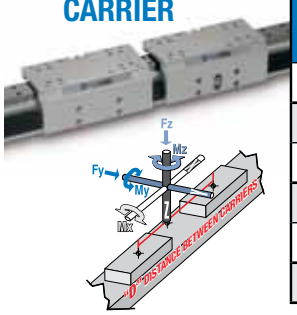
⚠ Mating surface of mounted component must maintain a flatness of at least .0015" [0.040 mm]

### STANDARD CARRIER




| SIZE | MAXIMUM BENDING MOMENTS | | | | | | MAXIMUM LOAD | | | | MAXIMUM THRUST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mx | | My | | Mz | | Fy | | Fz | | | |
| | in-lbs | N-m | in-lbs | N-m | in-lbs | N-m | lbf | N | lbf | N | lbf | N |
| 16 | 39 | 4.5 | 339 | 38.3 | 339 | 38.3 | 217 | 966 | 217 | 966 | 38 | 169 |
| 25 | 126 | 14.3 | 502 | 56.7 | 377 | 42.6 | 449 | 1,996 | 449 | 1,996 | 151 | 672 |
| 32 | 226 | 25.6 | 1,344 | 152 | 1,344 | 152 | 569 | 2,531 | 569 | 2,531 | 209 | 930 |
| 40 | 604 | 68.2 | 1,913 | 216 | 1,913 | 216 | 736 | 3,274 | 736 | 3,274 | 250 | 1,112 |
| 50 | 811 | 91.7 | 3,483 | 394 | 3,483 | 394 | 1,014 | 4,510 | 1,014 | 4,510 | 325 | 1,446 |
| 63 | 1,019 | 115 | 5,339 | 603 | 5,339 | 603 | 1,292 | 5,745 | 1,292 | 5,745 | 418 | 1,859 |

### DC AUXILIARY CARRIER




| SIZE | "D" MINIMUM | | MAXIMUM BENDING MOMENTS* | | | | | | MAXIMUM LOAD | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mxa | | Mya | | Mza | | Fya | | Fza | |
| | in | mm | in-lbs | N-m | in-lbs | N-m | in-lbs | N-m | lbf | N | lbf | N |
| 16 | 5.0 | 127 | 79 | 8.9 | 620 | 70.0 | 620 | 70.0 | 434 | 1,932 | 434 | 1,932 |
| 25 | 6.0 | 152 | 252 | 28.5 | 1,610 | 182 | 1,610 | 182 | 898 | 3,993 | 898 | 3,993 |
| 32 | 7.0 | 178 | 453 | 51.1 | 2,202 | 249 | 2,202 | 249 | 1,138 | 5,063 | 1,138 | 5,063 |
| 40 | 8.5 | 216 | 1,208 | 136 | 3,601 | 407 | 3,601 | 407 | 1,472 | 6,549 | 1,472 | 6,549 |
| 50 | 8.6 | 218 | 1,623 | 183 | 4,966 | 561 | 4,966 | 561 | 2,028 | 9,020 | 2,028 | 9,020 |
| 63 | 13.0 | 330 | 2,038 | 230 | 9,508 | 1,074 | 9,508 | 1,074 | 2,583 | 11,490 | 2,583 | 11,490 |

*At minimum "D" distance - see page 13 for bending moments at greater distances

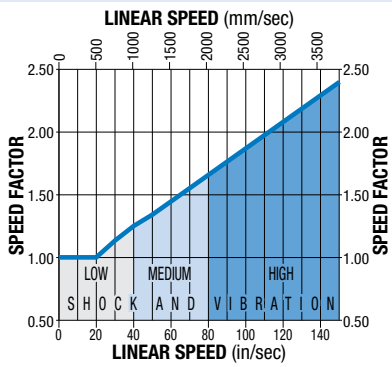
SIZING SOFTWARE

Use sizing software or call Tolomatic (1-800-328-2174) with application information. We will provide any assistance needed to determine the proper MXB belt-driven actuator.

⚠ ***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.***

### 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 4,000,000 inches 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.

The moment and load capacity of the actuator's bearing system is based on an L10 life of 200,000,000 linear inches 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's 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.**

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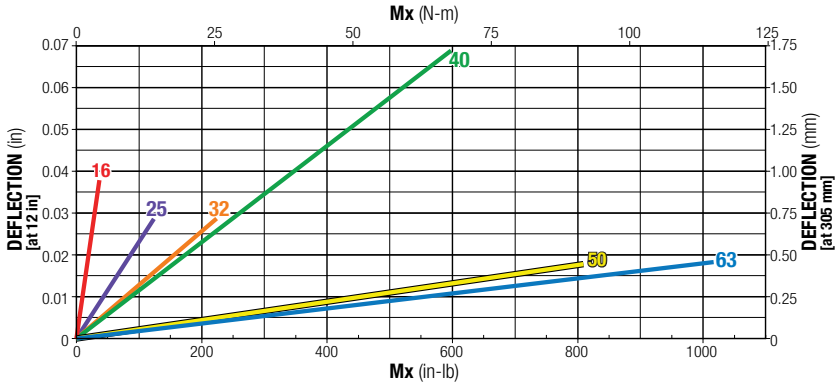
## LOAD DEFLECTION

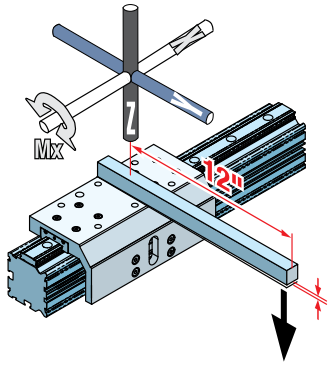
**DEFLECTION TESTING WAS DONE UNDER THESE CRITERIA:**

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

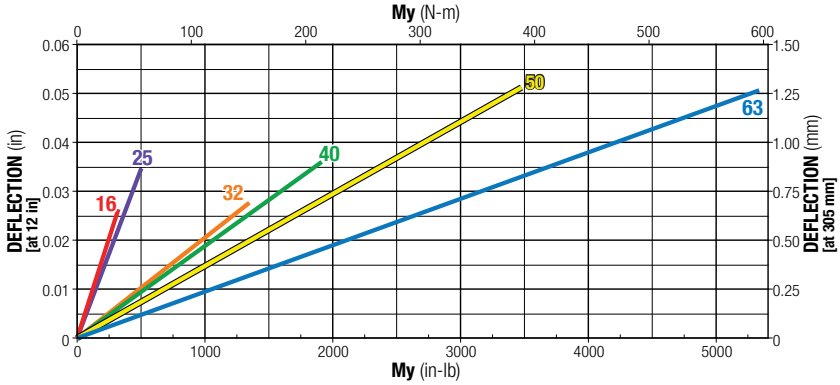
2.) Deflection was measured at 12" from center of carrier as shown *(see Mounting Plate Requirements page 11)*

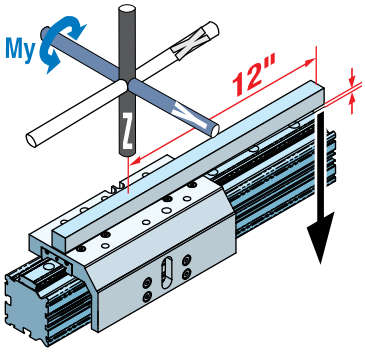
### DEFLECTION ABOUT X AXIS



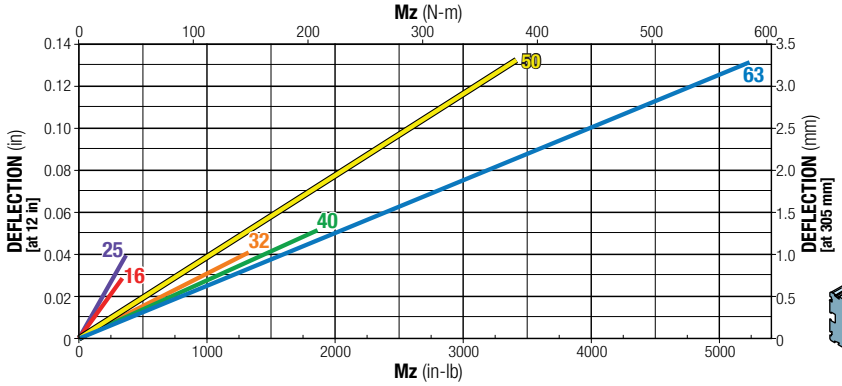



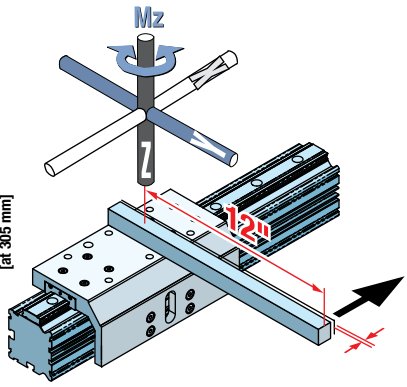

### DEFLECTION ABOUT Y AXIS



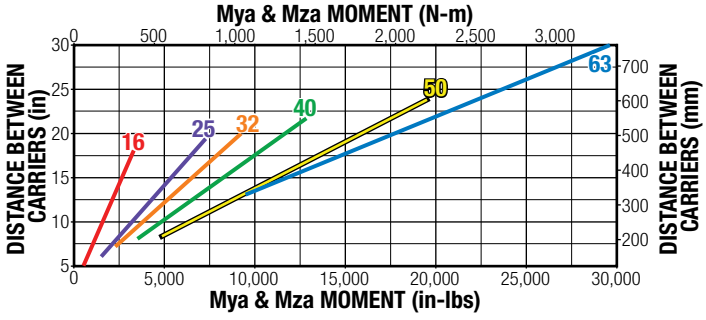




### DEFLECTION ABOUT Z AXIS




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



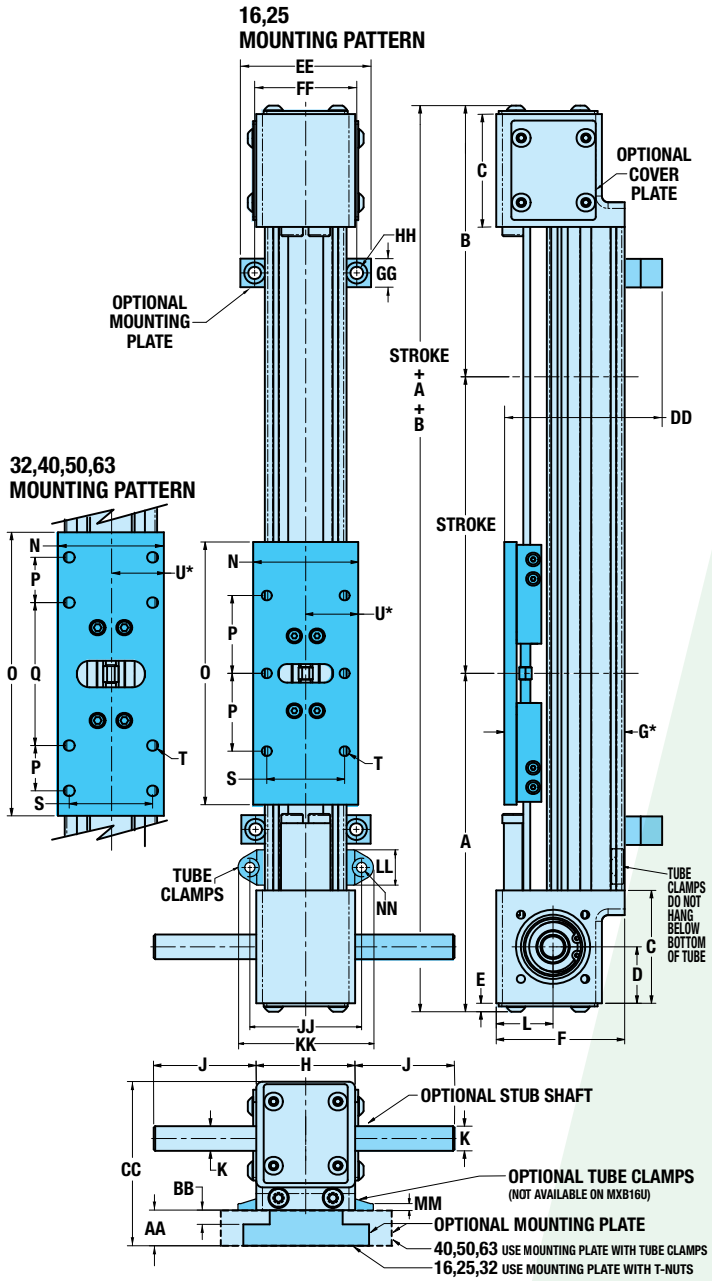

**RATINGS WERE CALCULATED UNDER THESE CRITERIA:**

1.) Coupling between carriers is rigid.

2.) Load is equally distributed between carriers.

3.) Coupling device applies no misalignment loads to carriers.

## ACTUATOR & OPTION DIMENSIONS




| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | 5.33 | 6.85 | 7.39 | 8.53 | 8.85 | 10.83 |
| *mm* | *135.3* | *173.9* | *187.8* | *216.6* | *224.7* | *275.1* |
| B | 4.69 | 5.49 | 6.09 | 7.59 | 8.07 | 10.33 |
| *mm* | *119.0* | *139.3* | *154.7* | *192.7* | *205.0* | *262.1* |
| C | 2.00 | 2.28 | 2.20 | 3.10 | 3.25 | 3.79 |
| *mm* | *50.8* | *58.0* | *55.9* | *78.7* | *82.6* | *96.1* |
| D | 1.00 | 1.14 | 1.00 | 1.55 | 1.58 | 1.79 |
| *mm* | *25.4* | *29.0* | *25.4* | *39.4* | *40.0* | *45.3* |
| E | 0.15 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| *mm* | *3.8* | *4.4* | *4.4* | *4.4* | *4.4* | *4.4* |
| F | 2.08 | 2.60 | 3.05 | 3.69 | 4.35 | 5.48 |
| *mm* | *52.8* | *66.0* | *77.5* | *93.8* | *110.6* | *139.3* |
| G* | 1.77 | 2.44 | 3.05 | 3.48 | 4.31 | 5.34 |
| *mm* | *45.3* | *61.9* | *77.4* | *88.3* | *109.6* | *135.5* |
| H | 1.75 | 2.00 | 2.75 | 3.25 | 3.88 | 4.38 |
| *mm* | *44.5* | *50.8* | *69.9* | *82.6* | *98.4* | *111.1* |
| J | ** | 2.27 | 2.27 | 1.87 | 1.87 | 1.87 |
| *mm* | *** | *57.7* | *57.7* | *47.5* | *47.5* | *47.5* |
| K | Ø.375 | Ø.500 | Ø.500 | Ø.500 | Ø.500 | Ø.500 |
| *mm* | *Ø9.53* | *Ø12.70* | *Ø12.70* | *Ø12.70* | *Ø12.70* | *Ø12.70* |
| L | 1.04 | 1.15 | 1.10 | 1.56 | 1.63 | 2.06 |
| *mm* | *26.4* | *29.2* | *27.9* | *39.7* | *41.5* | *52.2* |
| N | 1.38 | 2.13 | 2.50 | 3.50 | 3.75 | 4.50 |
| *mm* | *34.9* | *54.0* | *63.5* | *88.9* | *95.3* | *114.3* |
| O | 4.33 | 5.31 | 6.69 | 7.87 | 8.50 | 12.00 |
| *mm* | *110.0* | *135.0* | *170.0* | *200.0* | *216.0* | *304.8* |
| P | 1.57 | 1.57 | 1.07 | 1.00 | 1.00 | 1.57 |
| *mm* | *40.0* | *40.0* | *27.1* | *25.4* | *25.4* | *40.0* |
| Q | - | - | 3.37 | 4.50 | 2.75 | 5.12 |
| *mm* | *-* | *-* | *87.7* | *114.3* | *69.8* | *130.0* |
| S | 1.10 | 1.57 | 1.97 | 2.83 | 3.13 | 3.87 |
| *mm* | *28.0* | *40.0* | *50.0* | *72.0* | *79.4* | *98.3* |
| T | #8-32(6) | 1/4-20(6) | 5/16-18(8) | 5/16-18(8) | 5/16-18(8) | 3/8-16(8) |
| *mm* | *M4x0.7* | *M6x1.0* | *M8x1.25* | *M8x1.25* | *M8x1.25* | *M10x1.5* |
| U* | 0.69 | 1.07 | 1.25 | 1.75 | 1.88 | 2.25 |
| *mm* | *17.5* | *27.0* | *31.8* | *44.5* | *47.7* | *57.2* |
| **OPTIONAL MOUNTING PLATES** | | | | | | |
| AA | 0.63 | 0.63 | 0.75 | 1.00 | 1.25 | 1.00 |
| *mm* | *15.9* | *15.9* | *19.1* | *25.4* | *31.8* | *25.4* |
| BB | 0.25 | 0.25 | 0.30 | – | – | – |
| *mm* | *6.4* | *6.4* | *7.6* | – | – | – |
| CC | 2.71 | 3.22 | 3.80 | 4.70 | 5.60 | 6.48 |
| *mm* | *68.7* | *81.9* | *96.5* | *119.4* | *119.4* | *164.6* |
| DD | 2.4 | 3.06 | 3.75 | 4.18 | 5.01 | 6.04 |
| *mm* | *60.9* | *77.7* | *95.2* | *106.1* | *127.4* | *153.3* |
| EE | 2.36 | 2.50 | 3.40 | 5.00 | 5.60 | 8.00 |
| *mm* | *60.0* | *63.5* | *86.4* | *127.0* | *142.2* | *203.2* |
| FF | 1.75 | 2.00 | 2.75 | 4.41 | 5.00 | 7.00 |
| *mm* | *44.5* | *50.8* | *59.9* | *112.0* | *127.0* | *177.8* |
| GG | 1.00 | 1.00 | 1.00 | 0.79 | 0.79 | 1.00 |
| *mm* | *25.4* | *25.4* | *25.4* | *20.1* | *20.1* | *25.4* |
| 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) |
| *mm* | *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)* |

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

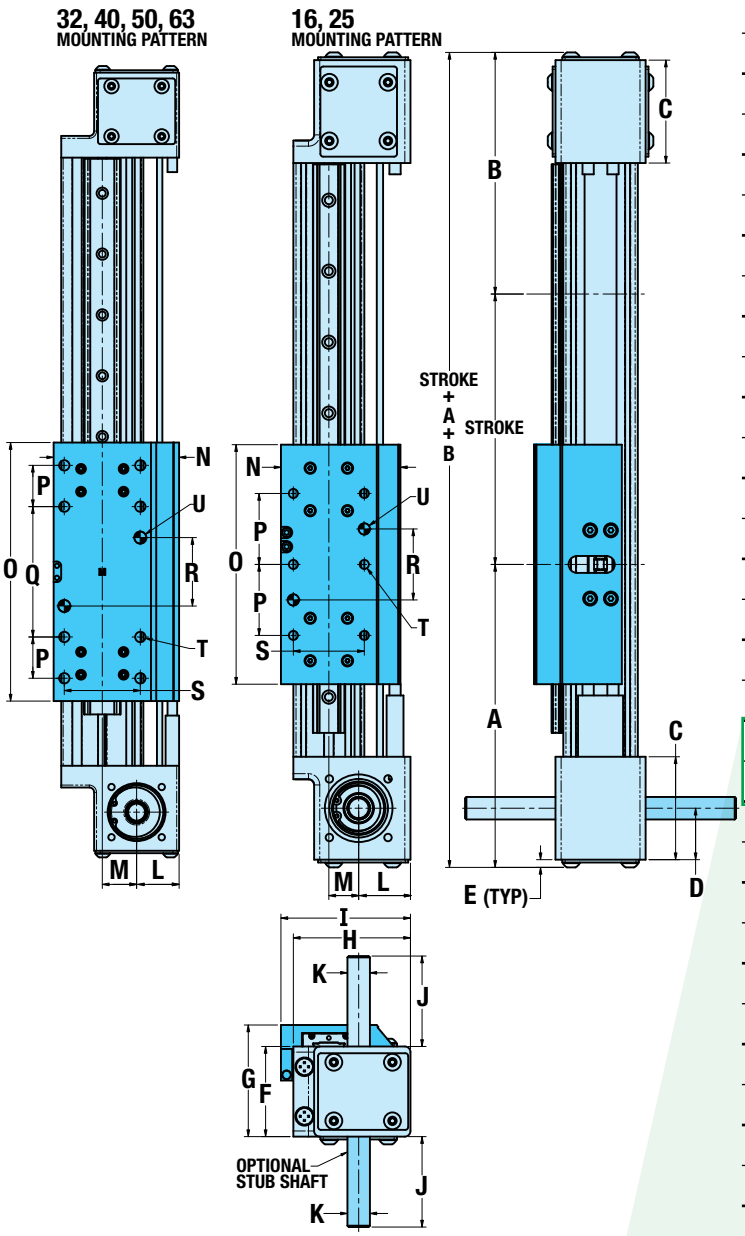
| ** | MXB16 |
|---|---|
| (LMI) J | 0.59 |
| *mm* | *15.0* |
| (RP) J | 1.83 |
| *mm* | *46.6* |

### OPTIONAL TUBE CLAMPS

| | | | | | | |
|---|---|---|---|---|---|---|
| JJ | - | 2.24 | 2.92 | 3.26 | 3.84 | 5.19 |
| *mm* | *-* | *57.0* | *74.1* | *82.7* | *97.5* | *131.7* |
| KK | - | 2.72 | 3.44 | 3.81 | 4.39 | 5.93 |
| *mm* | *-* | *69.0* | *87.4* | *96.7* | *111.5* | *150.7* |
| LL | - | 0.71 | 0.63 | 0.55 | 0.55 | 0.75 |
| *mm* | *-* | *18.0* | *16.0* | *14.0* | *14.0* | *19.0* |
| MM | - | 0.14 | 0.17 | 0.15 | 0.15 | 0.24 |
| *mm* | *-* | *3.6* | *4.3* | *3.8* | *3.8* | *6.1* |
| NN | - | 0.20 | 0.28 | 0.28 | 0.28 | 0.42 |
| *mm* | *-* | *5.2* | *7.1* | *7.1* | *7.1* | *10.7* |

# MXB-P Belt Driven Actuator

## ACTUATOR DIMENSIONS




| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | 5.33 | 6.85 | 7.39 | 8.53 | 8.85 | 10.83 |
| *mm* | *135.3* | *173.9* | *187.8* | *216.6* | *224.7* | *275.1* |
| B | 4.69 | 5.49 | 6.09 | 7.59 | 8.07 | 10.33 |
| *mm* | *119.0* | *139.3* | *154.7* | *192.7* | *205.0* | *262.1* |
| C | 2.00 | 2.28 | 2.20 | 3.10 | 3.25 | 3.79 |
| *mm* | *50.8* | *58.0* | *55.9* | *78.7* | *82.6* | *96.1* |
| D | 1.00 | 1.14 | 1.00 | 1.55 | 1.58 | 1.79 |
| *mm* | *25.4* | *29.0* | *25.4* | *39.4* | *40.0* | *45.3* |
| E | 0.15 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| *mm* | *3.8* | *4.4* | *4.4* | *4.4* | *4.4* | *4.4* |
| F | 1.75 | 2.00 | 2.75 | 3.25 | 3.88 | 4.38 |
| *mm* | *44.5* | *50.8* | *69.9* | *82.6* | *98.4* | *111.1* |
| G | 2.10 | 2.48 | 3.33 | 3.88 | 5.10 | 5.73 |
| *mm* | *53.2* | *62.9* | *84.6* | *98.7* | *129.6* | *145.6* |
| H | 2.08 | 2.60 | 3.05 | 3.69 | 4.35 | 5.48 |
| *mm* | *52.8* | *66.0* | *77.5* | *93.8* | *110.6* | *139.3* |
| I | 2.16 | 2.87 | 3.25 | 4.09 | 4.64 | 5.79 |
| *mm* | *54.8* | *73.0* | *82.5* | *103.9* | *117.9* | *147.1* |
| J | ** | 2.27 | 2.27 | 1.87 | 1.87 | 1.87 |
| *mm* | *** | *57.7* | *57.7* | *47.5* | *47.5* | *47.5* |
| K | Ø.375 | Ø.500 | Ø.500 | Ø.500 | Ø.500 | Ø.500 |
| *mm* | *Ø9.53* | *Ø12.70* | *Ø12.70* | *Ø12.70* | *Ø12.70* | *Ø12.70* |
| L | 1.04 | 1.15 | 1.10 | 1.56 | 1.63 | 2.06 |
| *mm* | *26.4* | *29.2* | *27.9* | *39.7* | *41.5* | *52.2* |
| M | 0.45 | 0.66 | 0.89 | 0.87 | 1.17 | 1.46 |
| *mm* | *11.4* | *16.8* | *22.6* | *22.2* | *29.8* | *37.1* |
| N | 1.78 | 2.65 | 3.25 | 3.85 | 4.62 | 5.93 |
| *mm* | *45.3* | *67.4* | *82.5* | *97.8* | *117.4* | *150.6* |
| O | 4.33 | 5.31 | 6.69 | 7.87 | 8.50 | 12.00 |
| *mm* | *110.0* | *135.0* | *170.0* | *200.0* | *216.0* | *304.8* |
| P | 1.57 | 1.57 | 1.07 | 1.00 | 1.00 | 1.57 |
| *mm* | *40.0* | *40.0* | *27.1* | *25.4* | *25.4* | *40.0* |
| Q | — | — | 3.37 | 4.50 | 2.75 | 5.12 |
| *mm* | *—* | *—* | *87.7* | *114.3* | *69.8* | *130.0* |
| R | 1.57 | 1.57 | 1.77 | 2.50 | 1.50 | 2.56 |
| *mm* | *40.0* | *40.0* | *45.0* | *63.5* | *38.1* | *65.0* |
| S | 1.10 | 1.57 | 1.97 | 2.83 | 3.13 | 3.87 |
| *mm* | *28.0* | *40.0* | *50.0* | *72.0* | *79.4* | *98.3* |
| T | #8-32(6) | 1/4-20(6) | 5/16-18(8) | 5/16-18(8) | 5/16-18(8) | 3/8-16(8) |
| *mm* | *M4x0.7* | *M6x1.0* | *M8x1.25* | *M8x1.25* | *M8x1.25* | *M10x1.5* |
| 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 |
| *mm* | *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* |

| ** | MXB16 |
|---|---|
| (LMI) J | 0.59 |
| *mm* | *15.0* |
| (RP) J | 1.83 |
| *mm* | *46.6* |

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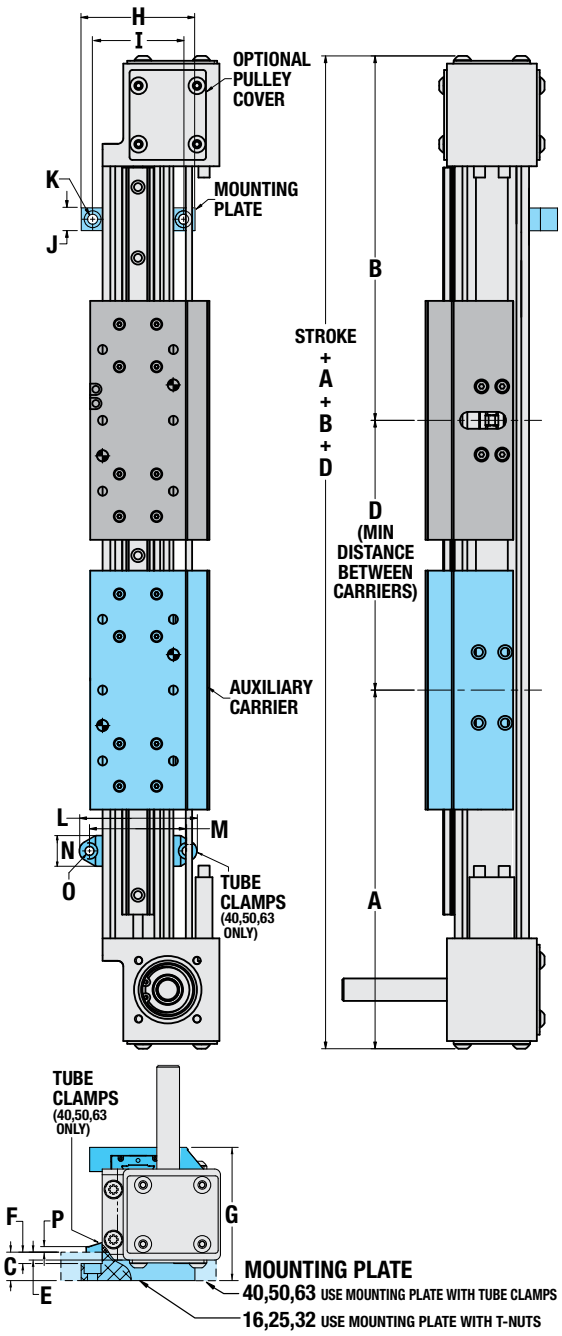
## OPTION DIMENSIONS




| | MXB16 | MXB25 | MXB32 | MXB40 | MXB50 | MXB63 |
|---|---|---|---|---|---|---|
| A | 5.33 | 6.85 | 7.39 | 8.53 | 8.85 | 10.83 |
| *mm* | *135.3* | *173.9* | *187.8* | *216.6* | *224.7* | *275.1* |
| B | 4.69 | 5.49 | 6.09 | 7.59 | 8.07 | 10.33 |
| *mm* | *119.0* | *139.3* | *154.7* | *192.7* | *205.0* | *262.1* |
| **AUXILIARY CARRIER** | | | | | | |
| D | 5.00 | 6.00 | 7.00 | 8.50 | 8.60 | 13.00 |
| *mm* | *127.0* | *152.4* | *177.0* | *215.9* | *216.4* | *330.2* |
| **MOUNTING PLATE** | | | | | | |
| C | 0.63 | 0.63 | 0.75 | 1.00 | 1.25 | 1.00 |
| *mm* | *15.9* | *15.9* | *19.1* | *25.4* | *31.8* | *25.4* |
| E | 0.28 | 0.17 | 0.29 | 0.37 | 0.39 | 0.22 |
| *mm* | *7.2* | *4.4* | *7.2* | *9.3* | *9.8* | *5.6* |
| F | 0.25 | 0.25 | 0.30 | – | – | – |
| *mm* | *6.4* | *6.4* | *7.6* | – | – | – |
| G | 2.44 | 2.93 | 3.80 | 4.52 | 5.96 | 6.51 |
| *mm* | *61.9* | *74.4* | *96.5* | *114.8* | *151.4* | *165.4* |
| H | 2.36 | 2.50 | 3.40 | 5.00 | 5.60 | 8.00 |
| *mm* | *60.0* | *63.5* | *86.4* | *127.0* | *142.2* | *203.2* |
| I | 1.75 | 2.00 | 2.75 | 4.41 | 5.00 | 7.00 |
| *mm* | *44.5* | *50.8* | *69.9* | *112.0* | *127.0* | *177.8* |
| J | 1.00 | 1.00 | 1.00 | 0.79 | 0.79 | 1.00 |
| *mm* | *25.4* | *25.4* | *25.4* | *20.1* | *20.1* | *25.4* |
| 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) |
| *mm* | *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 | – | – | – | 3.81 | 4.39 | 5.93 |
| *mm* | – | – | – | *96.8* | *111.5* | *150.6* |
| M | – | – | – | 3.26 | 3.84 | 5.19 |
| *mm* | – | – | – | *82.8* | *97.5* | *131.8* |
| N | – | – | – | 0.55 | 0.55 | 0.75 |
| *mm* | – | – | – | *14.0* | *14.0* | *19.1* |
| O | – | – | – | 0.28 | 0.28 | 0.42 |
| *mm* | – | – | – | *7.1* | *7.1* | *10.7* |
| P | – | – | – | 0.15 | 0.15 | 0.24 |
| *mm* | – | – | – | *3.8* | *3.8* | *6.1* |

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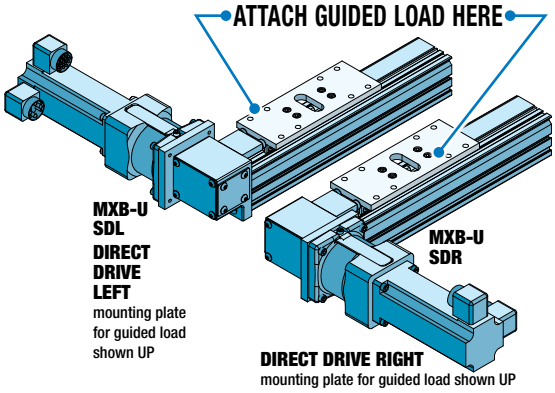
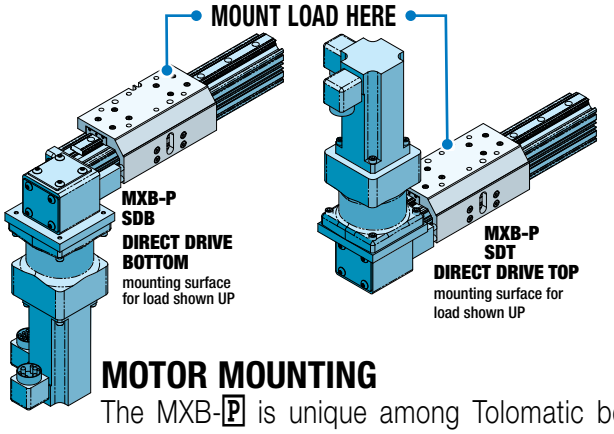
## DIRECT DRIVE MOTOR MOUNTING

### MXB-U




### MXB-P



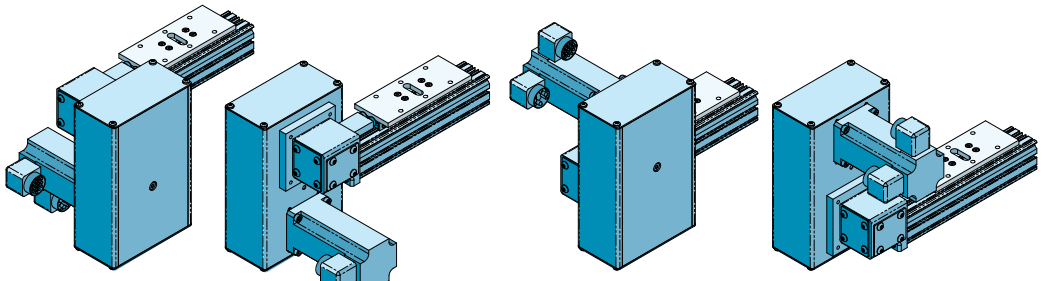

LARGE FRAME MOTORS AND SMALLER SIZE ACTUATORS: Cantilevered motors need to be supported if subjected to continuous rapid reversing duty and/or under dynamic conditions.

### MOTOR MOUNTING

The MXB-P is unique among Tolomatic belt driven 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.

## REDUCTION DRIVE MOTOR MOUNTING

### MXB-U



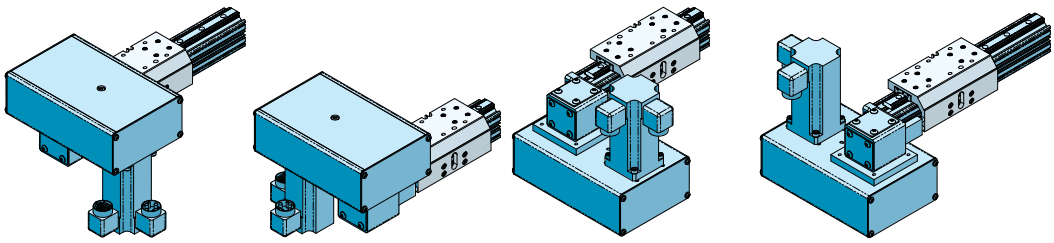
**REDUCTION DRIVE BOTTOM LEFT (SDBL)**
mounting surface for load shown UP

**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

**NOTE: Switches NOT available for MXB-U**


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 and is designed for the slot opposite the belt on the MXB (upper slot on 40, 50, 63 sizes). The magnet is located in a slot on the carrier. See the dimensional drawings on page 19 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.

RoHS COMPLIANT CE

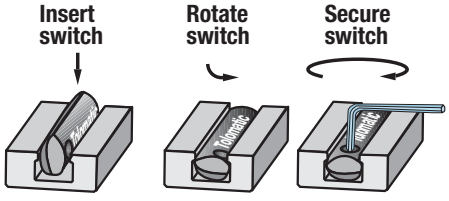
All switches are CE rated and are RoHS compliant. Switches feature bright red or yellow LED signal indicators; solid state switches also have green LED power indicators.

| | Order Code | Part Number | 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 | 8100-9082 | 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 | 8100-9083 | QD* | | Tolomatic 81009082 | | | | | | | | | |
| | NY | 8100-9084 | 5m | SPST Normally Closed | — | Yellow | 5 - 110 AC/DC | | | | | | | |
| | NK | 8100-9085 | QD* | | Tolomatic 81009084 | | | | | | | | | |
| SOLID STATE | TY | 8100-9088 | 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 | 8100-9089 | QD* | | Tolomatic 81009088 | | | | | | | | | |
| | KY | 8100-9090 | 5m | NPN (Sinking) Normally Open | Green | Red | | | | | | | | |
| | KK | 8100-9091 | QD* | | Tolomatic 81009090 | | | | | | | | | |
| | PY | 8100-9092 | 5m | PNP (Sourcing) Normally Closed | Green | Yellow | | | | | | | | |
| | PK | 8100-9093 | QD* | | Tolomatic 81009092 | | | | | | | | | |
| | HY | 8100-9094 | 5m | NPN (Sinking) Normally Closed | Green | Red | | | | | | | | |
| | HK | 8100-9095 | 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

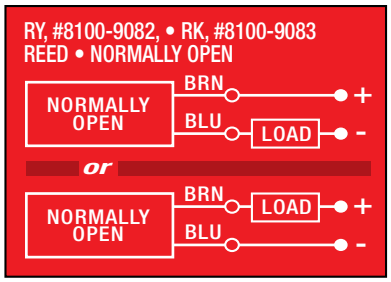


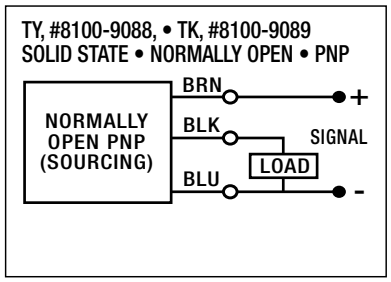

Place switch in side groove on tube at desired location with "Tolomatic" facing outward. While applying light pressure to the switch, rotate the switch halfway into the groove. Maintaining light pressure, rotate the switch in the opposite direction until it is fully inside the groove with "Tolomatic"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

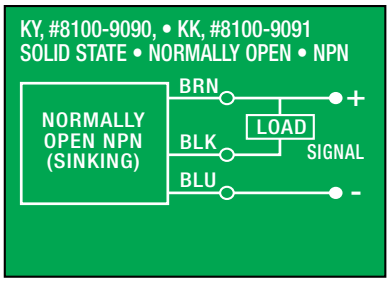
## SWITCHES

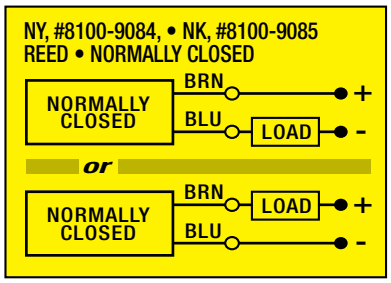
### WIRING DIAGRAMS

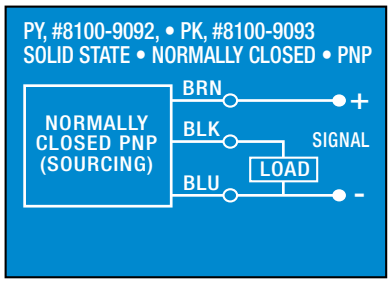
NOTE: Switches NOT available for MXB-U

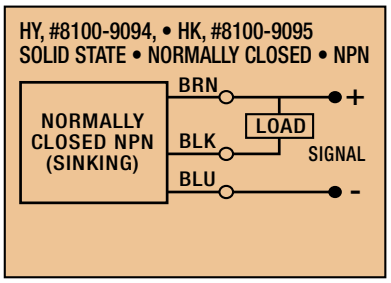


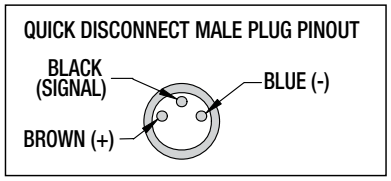



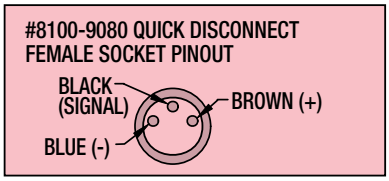



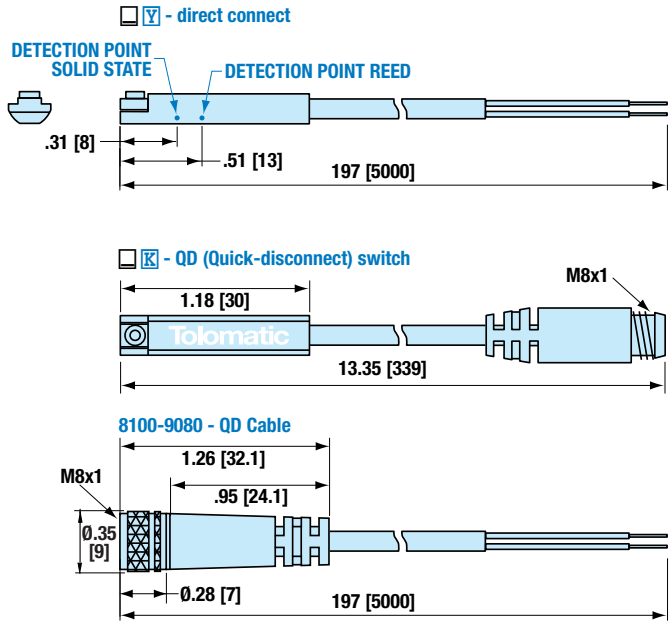



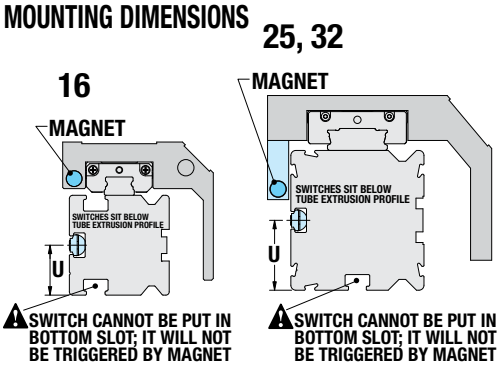



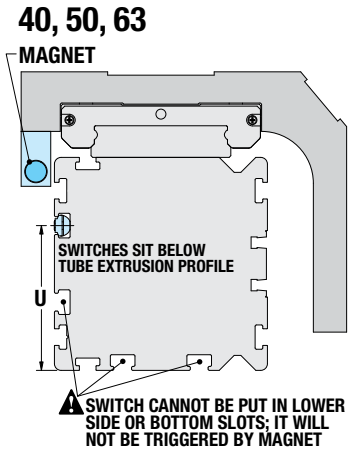

### SWITCH DIMENSIONS




Dimensions in inches [brackets indicate dimensions in millimeters]

### MOUNTING DIMENSIONS




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.

### SWITCH MOUNTING

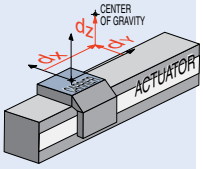
| | 16 | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|---|
| U | 0.31 | 0.79 | 1.06 | 0.81 | 1.08 | 1.50 |
| *mm* | *7.9* | *20.0* | *27.0* | *20.5* | *27.4* | *38.0* |

# APPLICATION DATA WORKSHEET

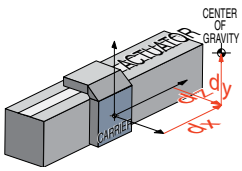
*Fill in known data. Not all information is required for all applications*

## ORIENTATION

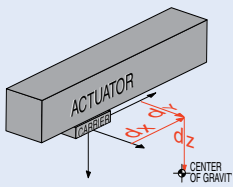
☐ Horizontal



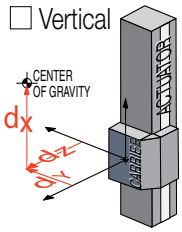

☐ Side




☐ Horizontal Down

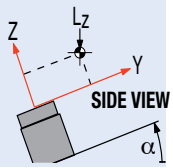



☐ Vertical

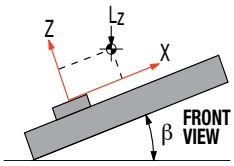



☐ Angled °

α _____




β _____




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

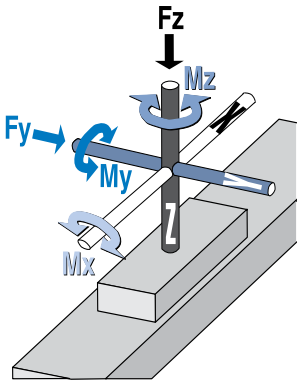
## DISTANCE FROM CENTER OF CARRIER TO LOAD CENTER OF GRAVITY

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

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

## STROKE LENGTH _____

☐ inch (SK) (U.S. Standard) ☐ millimeters (SM) (Metric)




## BENDING MOMENTS APPLIED TO CARRIER

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

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

## PRECISION

Repeatability _____

☐ inch ☐ millimeters

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

## LOAD _____

☐ lb. (U.S. Standard) ☐ kg. (Metric)

## FORCES APPLIED TO CARRIER

$F_z$ _____
$F_y$ _____

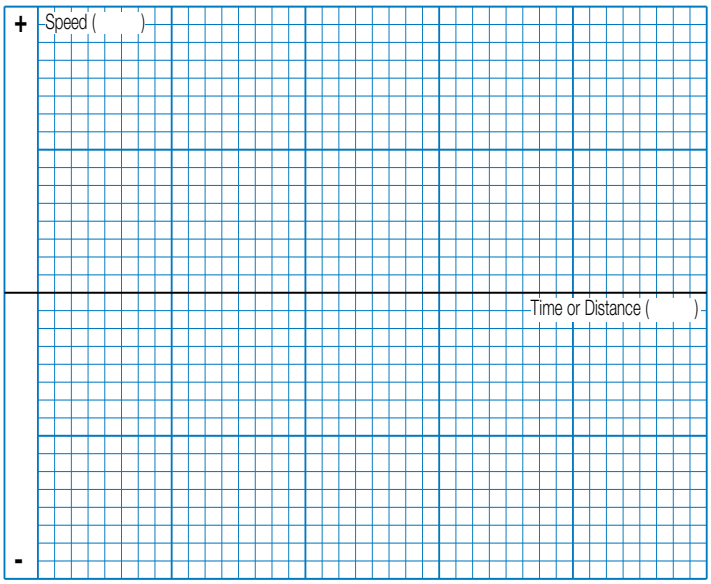
☐ lbf. (U.S. Standard) ☐ N (Metric)

## OPERATING ENVIRONMENT

Temperature, Contamination, etc.

_____
_____
_____

## 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.

## 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

## CONTACT INFORMATION

Name, Phone, Email
Co. Name, Etc.

_____
_____
_____

**STOP** **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.

**FAX 1-763-478-8080** **EMAIL help@tolomatic.com**

# SELECTION GUIDELINES

**The process of selecting a belt driven 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)** Maximum speed of MXB-U 200 in/sec (5 m/sec); Maximum speed of MXB-P 150 in/sec (3.8 m/sec).

**C)** For MXB-P moment and load capacities see tables on page 12.

| 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 12) for the actuator consider:

1) A larger actuator size

2) Auxiliary carrier

3) 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 ($L_F$) must not exceed the value of 1.

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

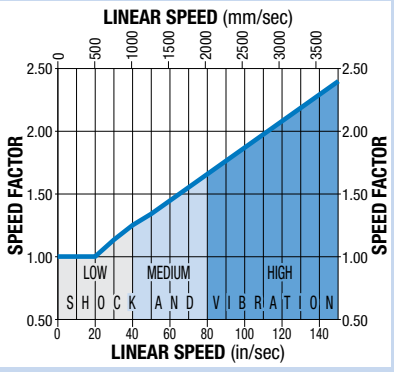
If $L_F$ does exceed the value of 1, consider the three choices listed in step #2.

## 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.

## 6 DETERMINE MOUNTING PLATE REQUIREMENTS

- Consult the Mounting Plate Requirements graph for the model selected (page 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


**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.

# SERVICE PARTS ORDERING

## SWITCHES

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

| Code | Part Number | Lead | Normally | Sensor Type |
|---|---|---|---|---|
| R Y | 8100-9082 | 5m (197 in) | Open | Reed |
| R K | 8100-9083* | Quick-disconnect | | |
| N Y | 8100-9084 | 5m (197 in) | Closed | Reed |
| N K | 8100-9085* | Quick-disconnect | | |
| T Y | 8100-9088 | 5m (197 in) | Open | Solid State PNP |
| T K | 8100-9089* | Quick-disconnect | | |
| K Y | 8100-9090 | 5m (197 in) | Open | Solid State NPN |
| K K | 8100-9091* | Quick-disconnect | | |
| P Y | 8100-9092 | 5m (197 in) | Closed | Solid State PNP |
| P K | 8100-9093* | Quick-disconnect | | |
| H Y | 8100-9094 | 5m (197 in) | Closed | Solid State NPN |
| H K | 8100-9095* | Quick-disconnect | | |

*Also order mating QD cable #8100-9080

| | | |
|---|---|---|
| | 8100-9080 | Mating QD (Quick-disconnect) cable 197 in. (5m) |

⚠ NOTE: Switches NOT available for MXB-U

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

## OPTIONS

| ACTUATOR SIZE | Mounting Plate Kit | **Magnet Housing Kit |
|---|---|---|
| 16 | 8316-9016 | 8340-1008 |
| 25 | 8525-9030 | 8525-9009 |
| 32 | 8532-9030 | 8532-9009 |
| 40 | 8340-9017 | 8540-9009 |
| 50 | 8350-9016 | 8550-9009 |
| 63 | 8363-9016 | 8563-9009 |

***Magnet Housing Kit is required if actuator was not originally ordered with switches (MXB-P only)

# MXB Belt Driven Actuator

## ORDERING

5 DAYS BUILT-TO-ORDER

MODEL SELECTION (MUST BE IN THIS ORDER)

MXB 40 P BWS30 SM2007.02 SDB

OPTIONS (IN ANY ORDER)

DC215.9 MP8 HC2 TK2

### MODEL

**MXB** MX Belt Driven Actuator

### SERIES

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

### BEARING

**U** Unguided Carrier
**P** Profiled Rail

### 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**

### U 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. Reference the motor ordering pages in Electric Products Catalog #3600-4609.*

**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. Reference the motor ordering pages in Electric Products Catalog #3600-4609.*

**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.*

### MOTOR / DRIVE / CONTROLLER / PLANETARY GEARBOX

⚠ *Reference the ordering pages in Electric Products Catalog #3600-4609 Stepper Products Brochure #3600-4160 & Planetary Gearbox Doc. #3600-4161*

### SWITCHES *("P" bearing only)*

| 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 | | |

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

⚠ ***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.***

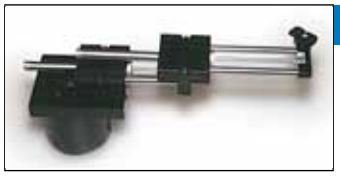
# THE TOLOMATIC DIFFERENCE What you expect from the industry leader:

## EXCELLENT CUSTOMER SERVICE & TECHNICAL SUPPORT

Our people make the difference! Expect prompt, courteous replies to all of your application and product questions.


## INDUSTRY LEADING DELIVERIES

Standard catalog products are built to order and ready-to-ship in 5 days or less. Modified and custom products ship weeks ahead of the competition.



## INNOVATIVE PRODUCTS

From standard catalog products... to modified products... to completely unique custom products, Tolomatic designs and builds the best solutions for your challenging applications.


## SIZING & SELECTION SOFTWARE

Windows® compatible, downloadable from our website – FREE – the best tool of its kind on the market! Product selection has never been easier.


## 3D MODELS & 2D DRAWINGS AVAILABLE ON THE WEB

Easy to access CAD files are available in many popular formats.

## ALSO CONSIDER THESE OTHER TOLOMATIC PRODUCTS:

### PNEUMATIC PRODUCTS


*RODLESS CYLINDERS: Band Cylinders, Cable Cylinders, MAGNETICALLY COUPLED CYLINDERS/SLIDES; GUIDED ROD CYLINDER SLIDES*
"FOLDOUT" BROCHURE #9900-9075 PRODUCTS BROCHURE #9900-4028 www.tolomatic.com/pneumatic

### ELECTRIC PRODUCTS


*ROD & GUIDED ROD STYLE ACTUATORS, HIGH THRUST ACTUATORS, SCREW & BELT DRIVE RODLESS ACTUATORS, MOTORS, DRIVES AND CONTROLLERS*
"FOLDOUT" BROCHURE #9900-9074 PRODUCTS BROCHURE #9900-4016 www.tolomatic.com/electric

### POWER TRANSMISSION PRODUCTS


*GEARBOXES: Float-A-Shaft®, Slide-Rite®; DISC CONE CLUTCH; CALIPER DISC BRAKES*
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