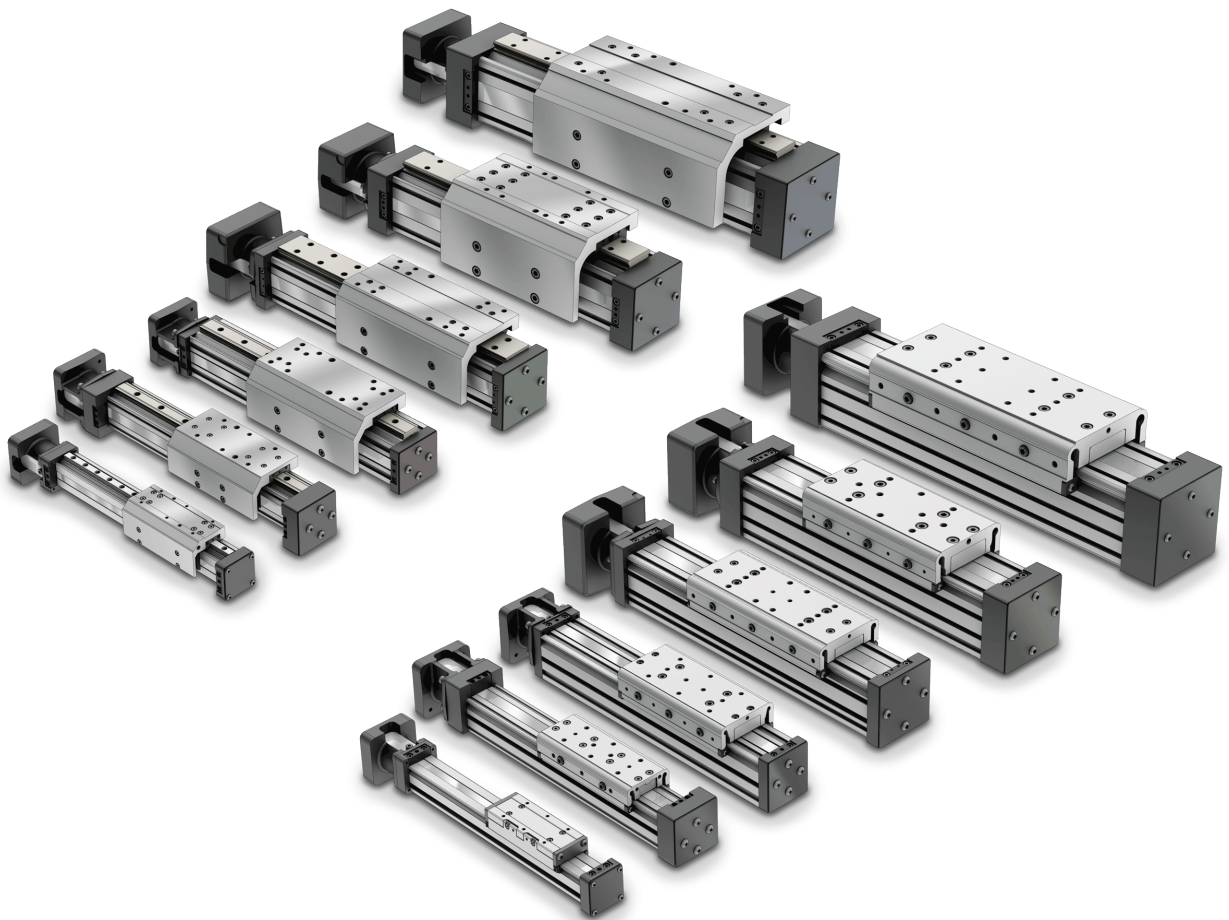


MANUAL

For Installation, Maintenance
and Operation

MXE Series Actuators



Original instructions in English. Translations in community languages supplied as required.

Information furnished is believed to be accurate and reliable. However, Tolomatic assumes no responsibility for its use or for any errors that may appear in this document.

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1: SAFETY

1.1 Safety Symbols

General

Read completely through the applicable sections of the manual before the equipment/unit is unpacked, installed or operated. Pay careful attention to all of the dangers, warnings, cautions and notes stated in the manual. Serious injury to persons or damage to the equipment may result if the information in the manual is not followed.

Safety Symbols

Items that are specifically marked DANGER, WARNING, CAUTION, PROHIBITIVE, MANDATORY ACTION, or NOTE! are arranged in a hierarchical system and have the following meaning:



Indicates a very hazardous situation which, if not avoided, could result in death or serious injury. This signal word is limited to the most extreme situations.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in property damage, minor or moderate injury.



Prohibited – Action

Indicates Prohibited Action



Mandatory Action

Indicates Mandatory Action



NOTE!

Information that requires special attention is stated here.

1.2 Safety Considerations

Proper and Safe Use of Product

Fail-Safe e-Stop Recommendations

After motor has been installed a means for a fail-safe e-stop is highly recommended to ensure equipment and personal safety. The e-stop should be able to remove power from the actuator to stop and/or prevent any undesired motion.

Device Damage Prevention

To prevent permanent damage to the device published speed and load ratings should never be exceeded. In addition, proper mechanical assembly should be verified and safety measures checked before applying power to the complete equipment package.

Personal Safety

During normal operation the motor can become hot. In addition, the case ground of the appropriately marked electric

motor should be tied to an earth ground to prevent the presence of case voltage.

During normal operation the actuator carrier travels back and forth creating a possible point of collision or contact with personnel resulting in physical damage. Proper guarding and signage must be used to prevent entry into zones of possible collisions and contact with hot surfaces.

Handling and Unpacking

When unpacking and handling the actuator, care should be taken not to drop the actuator as this can damage the internal mechanical components, electrical connectors or cause misalignment of feedback device, leading to poor performance or loss of functionality. Since this is an electro-mechanical device, proper ESD (Electro Static Discharge) measures should be taken to avoid static electricity from contacting the signal and power lines of the device.

Packing and Transport



NOTE!

Anchor and secure actuator in such a way as to prevent damage during transportation. Make sure the actuator is clean, dry and protected from moisture. If the actuator needs to be returned to the factory it is recommended that the original packaging is used. If it is not available please follow the recommendations below.

1. Foam in place if possible.
2. Reinforce ends of the box with multiple layers of cardboard or wood to prevent the actuator from breaking through the packaging during shipment.
3. It is recommended to ship one unit per single container. When shipping more than one unit foam in place to prevent damage.
4. Add the RMA number on the outside of the packaging. Failure to do so may delay processing.

Modifications to the Equipment



WARNING! WARNING!

The manufacturer takes no responsibility whatsoever if the equipment is modified or if the equipment is used in any way beyond performance specifications. Unauthorized modifications or changes to the equipment are strictly forbidden and void all warranties.

Requirements Regarding Personnel



NOTE!



All personnel must be completely informed regarding all safety regulations and the function of the equipment.

When installed, pinch points are generated capable of damaging forces and impacts. The risk area surrounding the MXE actuators must either be guarded or clearly marked, including display signage in accordance with all applicable national and international legal requirements. The risk area must be protected by a safety system that stops the equipment if anyone enters the risk area. Personnel who enter the risk area must be authorized, trained and qualified for the different tasks inside the risk area.

2: MXE PRODUCT OVERVIEW

2.1 General Description

The MXE series family of screw driven mechanical linear actuators is manufactured and sold by Tolomatic Inc. to customer specified stroke length and mounting provisions for customer specified motors and intended for general purpose industrial applications.

The product family includes the following models that are available in metric or Imperial carrier interface

6 sizes of MXE actuators with a composite (solid) bearing system (MXE_S)

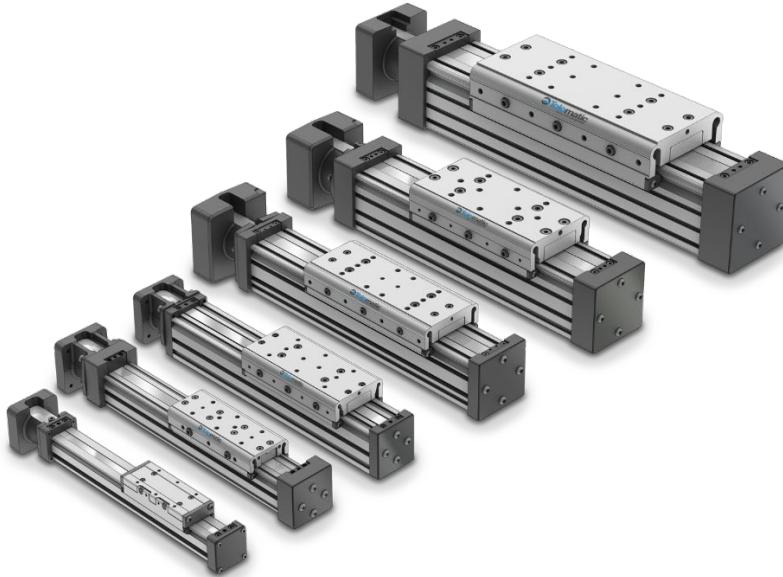


Figure 2.1: Tolomatic MXE_S Rodless Electric Actuators (16, 25, 32, 40, 50, 63 sizes)

6 sizes of MXE actuators with linear guides with recirculating balls running on a profiled rail (MXE_P)

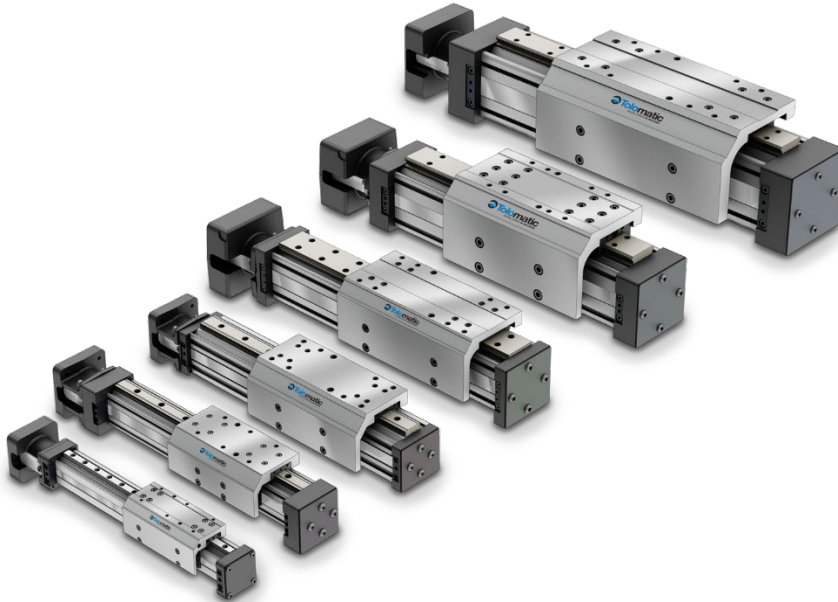


Figure 2.2: Tolomatic MXE_P Rodless Electric Actuators (16, 25, 32, 40, 50, 63 sizes)

2.2 Product Features

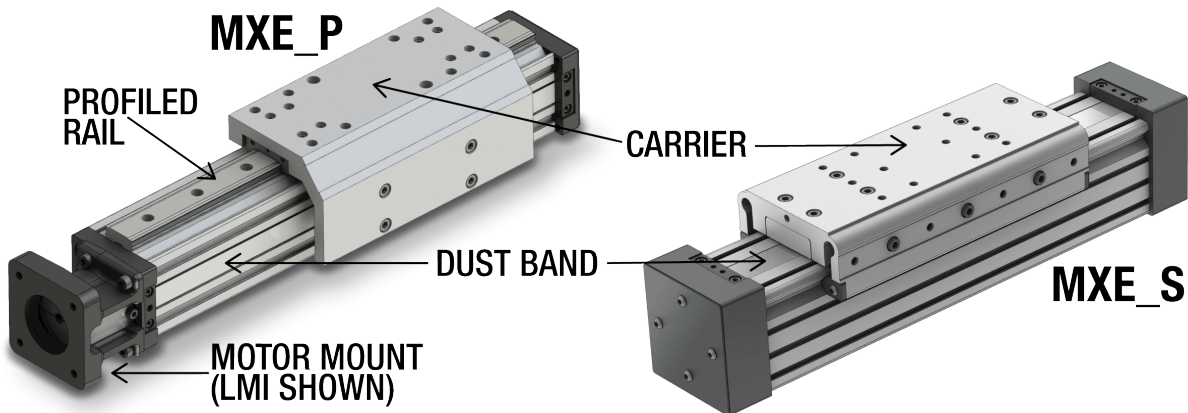


Figure 2.3: MXE major components

2.3 Installation

Tolomatic MXE actuators provide linear travel up to 4539 mm (178.7 in) and are capable of carrying up to 11,490 N (2,583 lbf) of payload. An appropriately marked electric motor or a motor (gearhead) assembly is coupled with the input shaft of the actuator to create linear motion. The motor (gearhead) may be installed by the customer at their facility or by Tolomatic.

⚠ WARNING WARNING!

Before installation and commissioning of the equipment this manual and all accompanying manufacturer's documents and manuals MUST be read by the appropriate personnel. All warnings must be given special attention.

⚠ WARNING WARNING!

MXE series actuators are equipped with ball and lead screws that are not self braking and will not hold position under load. With no current input to the drive motor the carrier can move freely. A motor brake option should be purchased and installed if the actuator is required to hold position when no power is supplied.

2.4 Identification label



Figure 2.4: Typical MXE actuator identification label for actuators made in USA

2.5 Manufacturer

Tolomatic, Inc.
3800 County Road 116, Hamel, MN 55340, USA
Phone: 763-478-8000
sales@tolomatic.com

3: MXE ACTUATOR PRODUCT CONFIGURATION

■ 3.1 MXE Series Standard Configurations and Options

MXE series actuator family includes 12 actuator models: MXE16S, MXE25S, MXE32S, MXE40S, MXE50S, MXE63S and MXE16P, MXE25P, MXE32P, MXE40P, MXE50P, MXE63P



NOTE!

For performance data and specifications please refer to the Tolomatic [MXE Product Brochure 8300-4000](#)



NOTE!

Please see Tolomatic [MXE Product Brochure 8300-4000](#) for complete information on ordering codes. Please use 3D CAD files available at www.tolomatic.com for critical dimensions.

3.2 Standard Configurations and Options

ORDERING

MODEL SELECTION (MUST BE IN THIS ORDER) **MXE40PSN02SM2007.02** OPTIONS (IN ANY ORDER) **LMI DC215.9TC8TK2**

MODEL

MXE MX Rodless Electric Actuator

SERIES

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

BEARING

S Solid Bearing
P Profiled Rail

NUT/SCREW CONFIGURATION

SOLID NUT / PITCH (turn/in)	SERIES
SN01	MXE 25, 32, 40
SN02	MXE 16, 25, 32, 40
SN05	MXE 25, 32
SN04	MXE 16
SN16	MXE 16

BALL NUT / PITCH (turn/in)	SERIES
BN01	MXE 63
BNL01	MXE 63
BN02	MXE 40, 50, 63
BNL02	MXE 40, 50, 63
BN04	MXE 63
BNL04	MXE 63
BN05	MXE 40, 50
BNL05	MXE 40, 50
BN08	MXE 25, 32
BNL08	MXE 25, 32
BNM10	MXE 25, 32

STROKE LENGTH & MOUNTING TYPE

SK _____ Stroke, enter desired stroke length in **inches**

SM† _____ Stroke, enter desired stroke length in **millimeters**

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

MOTOR MOUNTING / REDUCTION

(must choose one)

LMI In-Line mounting
LME23 Ext. shaft for RP & 23 frame motor
LME34 Ext. shaft for RP & 34 frame motor

⚠ A motor size and code must be selected when specifying a reverse-parallel mounting configuration.

RPL1 1:1 Reverse-Parallel mount left
RPR1 1:1 Reverse-Parallel mount right
RPB1 1:1 Reverse-Parallel mount bottom
RPT1 1:1 Reverse-Parallel mount top
RPL2 2:1 Reverse-Parallel mount left
RPR2 2:1 Reverse-Parallel mount right
RPB2 2:1 Reverse-Parallel mount bottom
RPT2 2:1 Reverse-Parallel mount top

MOTOR / DRIVE / CONTROLLER / PLANETARY GEARBOX

⚠ Visit www.tolomatic.com for the most up-to-date information or call Tolomatic 1-800-328-2174

CARRIER OPTIONS

DC _____ Auxiliary Carrier, 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

BIR Bracket in Reverse (see page 7 & 30) (Carrier) (Mirrored)

SWITCHES

RY Reed Switch (Normally Open) with 5-meter lead, & enter quantity desired
RK Reed Switch (Normally Open) with 5-meter lead/QD, & quantity
NY Reed Switch (Normally Closed) with 5-meter lead, & quantity
NK Reed Switch (Normally Closed) with 5-meter lead/QD, & quantity
TY Solid State Switch PNP (Normally Open) with 5-meter lead, & quantity
TK Solid State Switch PNP (Normally Open) with 5-meter lead/QD, & quantity
KY Solid State Switch NPN (Normally Open) with 5-meter lead, & quantity
KK Solid State Switch NPN (Normally Open) with 5-meter lead/QD, & quantity
PY Solid State Switch PNP (Normally Closed) with 5-meter lead, & quantity
PK Solid State Switch PNP (Normally Closed) with 5-meter lead/QD, & quantity
HY Solid State Switch NPN (Normally Closed) with 5-meter lead, & quantity
HK Solid State Switch NPN (Normally Closed) with 5-meter lead/QD, & quantity

FOOD GRADE LUBRICATION


LUB Grease, Food/Drug

MOUNTING


TC Tube Clamps, enter number of pairs
FL Floating Mount
MP Mounting Plates, & quantity

NOTE: Floating Mount is not available with "P" Profiled Rail

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



sizeit.tolomatic.com for fast, accurate actuator selection



tolomatic.com/ask Technical support before and after purchase

sizeit.tolomatic.com for fast, accurate actuator selection or call Tolomatic (1-800-328-2174) with application information. We will provide any assistance needed to determine the proper MXE screw-driven actuator.

⚠ Not all codes listed are compatible with all options.

Figure 3.8: MXE_S and MXE_P ordering

3.2.1 Screw Selection

Each of the MXE actuator models is available with a choice of ball and Acme screws of several different leads. Contact Tolomatic for application review and assistance in selecting a screw technology option;



Figure 3.1: Ball nut & solid (Acme) nut

3.2.2 Fastener Choices

Each of the MXE actuator models is available with metric or Imperial (U.S. Conventional) mounting holes on the carrier;

3.2.3 Motor Mounting Options

Each of the MXE actuator models is available with Inline (direct) or Reverse Parallel (timing belt reduction drive) motor (gearhead) mounting configurations;

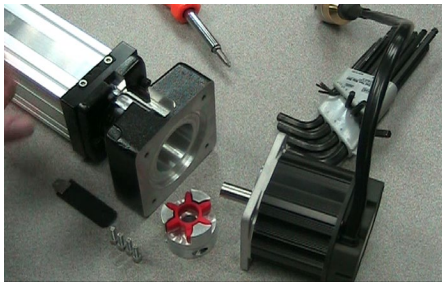


Figure 3.2: MXE Inline (direct, LMI) motor mount

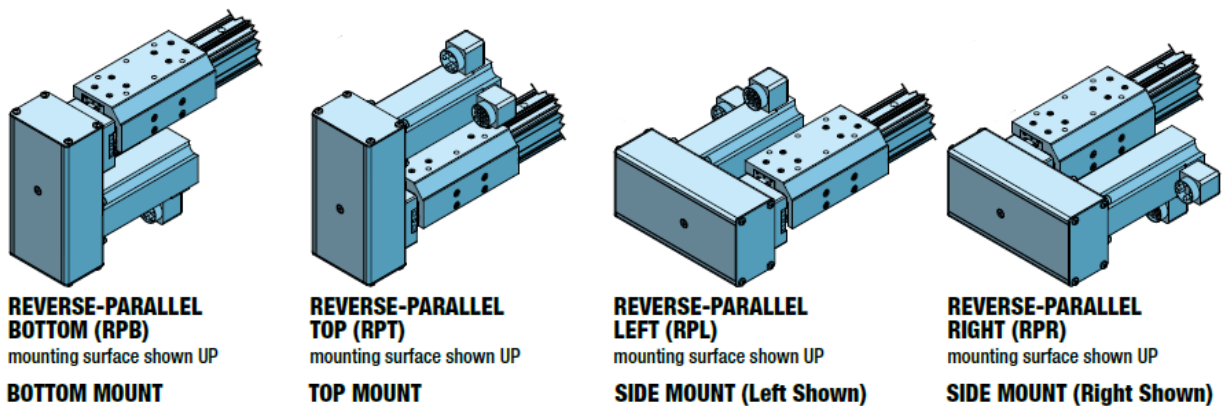


Figure 3.3: MXE Reverse parallel (RP) motor mount

Orientation of the motor (gearhead) with respect to the actuator in a Reverse Parallel motor mounting configuration (“top”, “bottom”, “left” or “right”) is specified by the customer;

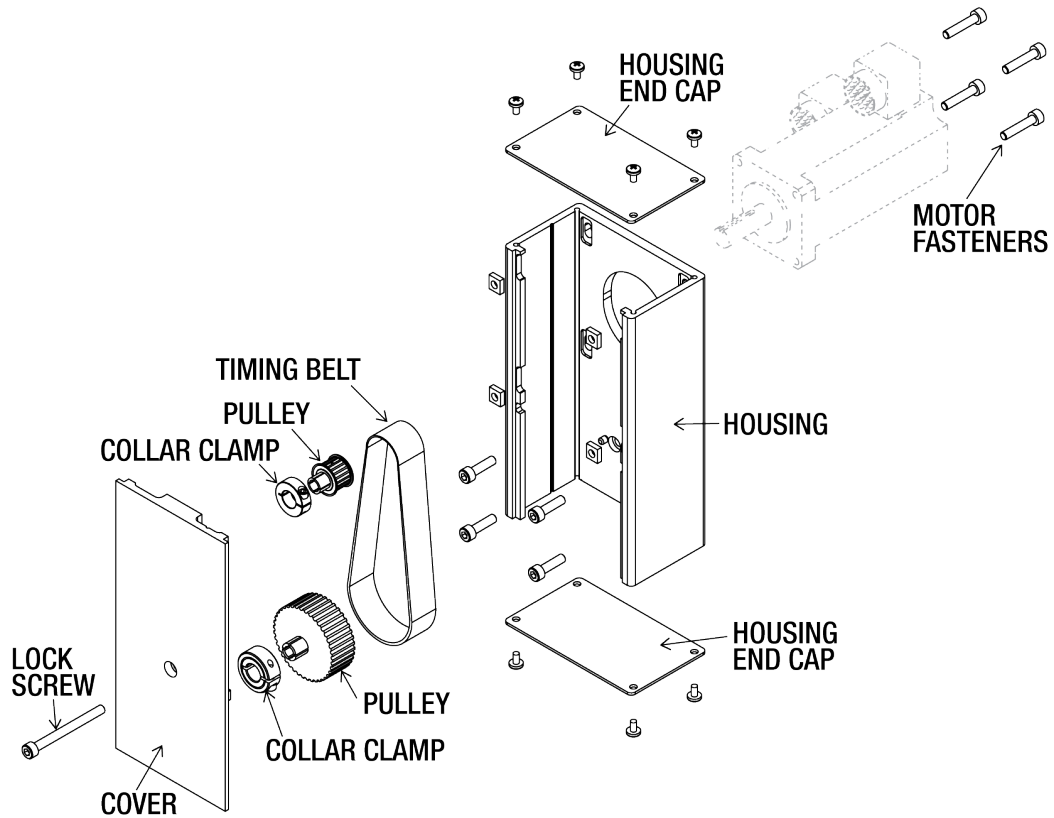


Figure 3.4: Reverse Parallel Motor Mounting Option Parts

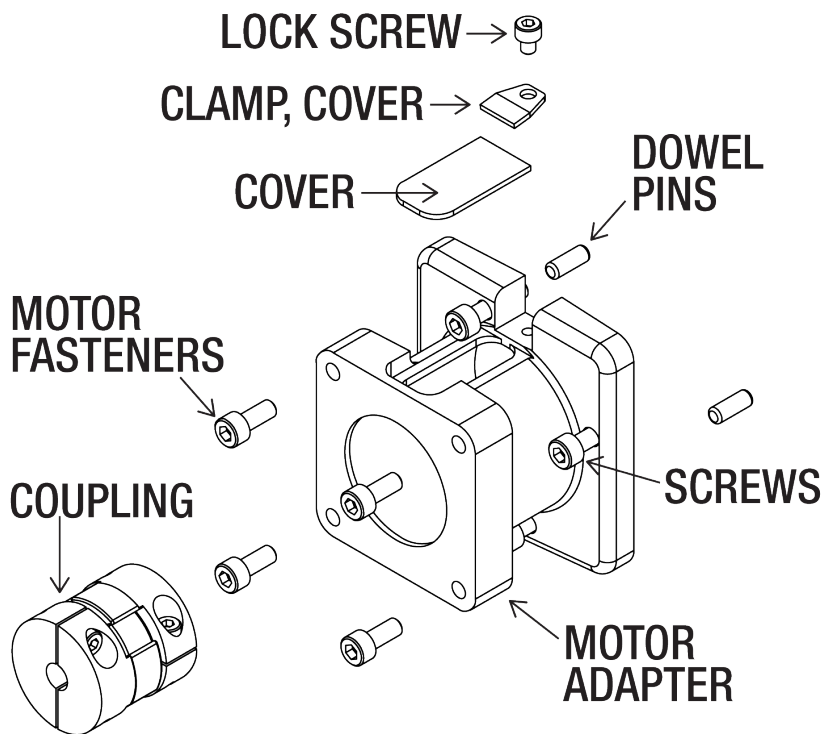


Figure 3.5: Inline Motor Mounting Option Parts

3.2.4 Auxiliary Carrier Option (DC)

Each of the MXE actuator models is available with optional auxiliary carrier (an additional carrier with bearings) increasing load and bending moment capacity;



Figure 3.6: MXE_S and MXE_P with (DC) auxiliary carrier option

3.2.5 Floating Mount Option (FL) (MXE_S only)

Each of the MXE_S actuator models is available with optional floating mount brackets that provide necessary compliance in applications with external load guidance mechanisms;



Figure 3.7: MXE_S with (FL) floating mount option

3.2.6 Actuator Mounting Options (TC) & (MP)

Each of the MXE actuator models is available with Tube Clamp or Mounting Plate mounting configurations;

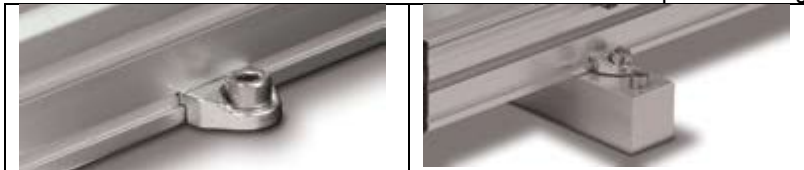


Figure 3.8: MXE with (TC) tube clamps and (MP) mounting plate options

3.2.7 Switch Option

Each of the MXE actuator models is available with a choice of externally mounted positioning sensors (switches) triggered by internal magnets inside the carrier assembly.



Figure 3.9: MXE with optional switch

For the switch types/choices, wiring diagrams and dimensional information please refer to the Tolomatic [MXE Product Brochure 8300-4000](#)

4: MXE MECHANICAL INSTALLATION

WARNING!

Prior to installation and commissioning of this equipment this manual and all accompanying manufacturer documents and manuals MUST be completely read by the appropriate personnel. All warnings must be given special attention.

4.1 General Operation

MXE series linear actuators function by translating the rotary motion of an externally mounted electric motor into a linear motion of the load mounted on the carrier (carriers) using a screw drive mechanism.

MXE actuators use two different bearing systems achieving support and guidance of a load on the carrier: solid composite bearings in sliding motion along the extruded surface of the actuator body in MXE_S models linear guides with recirculating ball bearings running on a profiled rail in MXE_P models

The relationship between the rotary motion of the motor and the linear motion of the actuator corresponds to the following formulas:

Linear distance traveled (mm) = number of screw revolutions * screw lead (mm)

Linear speed (mm/sec) = screw RPM/60 * screw lead (mm)

Linear force (N) = [motor torque (Nm)/1000 * 2 * π * reduction ratio * screw efficiency]/screw lead (mm)

CAUTION!

Care should be taken not to exceed the physical travel limits of the actuator. Exceeding the specified stroke will cause the actuator to reach mechanical end of stroke internally. Although protected by the end of stroke bumpers, reaching internal end of stroke at speeds and torque greater than those used to home (less than 25mm/sec and low torque) may physically damage the screw and the internal components of the actuator.

4.2 Loads and critical speed

Exceeding the specified load limits of the bearing system will lead to reduction of its service life. Exceeding critical speed of the linear motion will lead to increased vibration and heat generation that may cause premature wear and reduced service life of the actuator.

4.3 Mechanical Installation

4.3.0 Installation

1. Remove packaging material;
2. Carefully remove linear actuator from the package;
3. Visually inspect the actuator for damage. Notify the carrier of any shipping damage immediately;
4. Move the actuator to its position
5. If the actuator is mounted in a vertical or inclined position include safety measures to prevent load from falling in the case of screw failure or loss of power
6. Ensure sufficient clearance around the actuator to allow for airflow and cooling
7. Follow installation mounting instructions for each configuration.

4.3.1 Lifting and Moving

⚠ CAUTION CAUTION!

Special care must be taken when lifting the device. Depending on the size and configuration MXE actuators can represent heavy and awkward loads. Lifting equipment with appropriate capacity often should be used, and safe hoisting practices must be employed.

Note the weights in the table below.

SIZE	WEIGHT					
	CARRIER*		BASE ACTUATOR**		PER mm OF STROKE	
	S	P	S	P	S	P
	kg	kg	kg	kg	kg/mm	kg/mm
16	0.21	0.26	0.56	0.65	0.0018	0.0021
25	0.41	0.46	0.96	1.11	0.0034	0.0045
32	0.79	0.96	1.24	1.50	0.0052	0.0066
40	1.43	1.69	2.42	3.12	0.0071	0.0104
50	2.39	3.16	6.76	8.29	0.0114	0.0150
63	5.88	6.77	15.9	17.84	0.0193	0.0243

SIZE	WEIGHT					
	CARRIER*		BASE ACTUATOR**		PER in OF STROKE	
	S	P	S	P	S	P
	lb	lb	lb	lb	lb/in	lb/in
16	0.47	0.58	1.24	1.43	0.10	0.12
25	0.91	1.02	2.11	2.44	0.19	0.25
32	1.74	2.12	2.74	3.30	0.29	0.37
40	3.15	3.72	5.34	6.88	0.40	0.58
50	5.27	6.97	14.91	18.27	0.64	0.84
63	12.96	14.92	35.05	39.34	1.08	1.36

S = Solid Bearing, P = Profiled Rail Bearing

*including nut bracket assembly

**Excluding nut bracket and carrier assembly

Table 4.1: MXE_S and MXE_P weights

4.4 Motor Installation

Refer to the [Technical Note # 3600-4203](#) for motor installation procedures

4.4.1 Reverse Parallel Configuration

For Reverse Parallel (RP) motor configurations refer to the RP belt tensioning procedure and requirements in [Technical Note # 3600-4203](#)

When the motor (gearhead) is installed by the Customer at their facility, MXE actuators are shipped with socket head cap screws securing the RP Cover to the RP Housing “hand tight” and the motor (gearhead) fasteners, the timing belt and pulley and any locking devices (collar clamp or bushing) separate.

4.4.2 To install the motor (gearhead):

(See Figure 3.4) On MXE25 through MXE63 remove the top and bottom housing end caps;

On MXE16 remove the top and the bottom covers

Assemble the motor (gearhead) on the actuator RP housing with fasteners not tight;

Place the motor pulley on the motor shaft;

Verify that the driving and the driven pulleys are aligned and that there is clearance between them and the inside of the RP housing;

Place the belt over the pulleys;

Assemble the motor pulley on the motor shaft using the supplied locking device:

Tighten collar clamp fastener to the torque values provided in the table below

Tighten locking set screws of keyed pulleys to the torque values in the table below.

On MXE25 through MXE63 assemble the back cover to the RP housing;

On MXE16 assemble the bottom cover to the RP housing;

Tension the belt by pulling the motor away from the driven shaft with the appropriate force value found in 3600-4212;

Tighten the motor fasteners to the value provided in the table;

On MXE25 through MXE63 install the top and bottom plastic covers.
 On MXE16 install the top cover to the RP housing.

REVERSE PARALLEL PULLEY COLLAR CLAMP		
Allen Key Size	Torque spec	
	in-lbs.	N-m
7/64	28	3.2
9/64	49	5.5
5/32	76	8.6
3/16	170	19.2
2.5mm	18	2.0
3mm	40	4.5
4mm	84	9.5
5mm	140	15.8
6mm	345	39.0

Table 4.2: RP Pulley collar clamp torque recommendations

MXE63 KEYED PULLEY SET SCREW SIZE	TORQUE	
	(Nm)	(lbf-in)
#6	1.2	11

Table 4.3: Set screw size

4.4.3 Inline Configuration

Refer to the [Technical Note # 3600-4203](#) for motor installation procedures

IN-LINE MOTOR MOUNT COUPLING		
Allen Key Size	Torque spec	
	in-lbs.	N-m
3/32	20	2.3
7/64	25	2.8
9/64	46	5.2
5/32	67	7.6
1/4	135	15.3
5/16	200	22.6
2.5mm	13	1.5
3mm	40	4.5
4mm	67	7.6
5mm	135	15.3

Table 4.4: In-line motor mount coupling torque recommendations

4.5 MXE Mounting Options

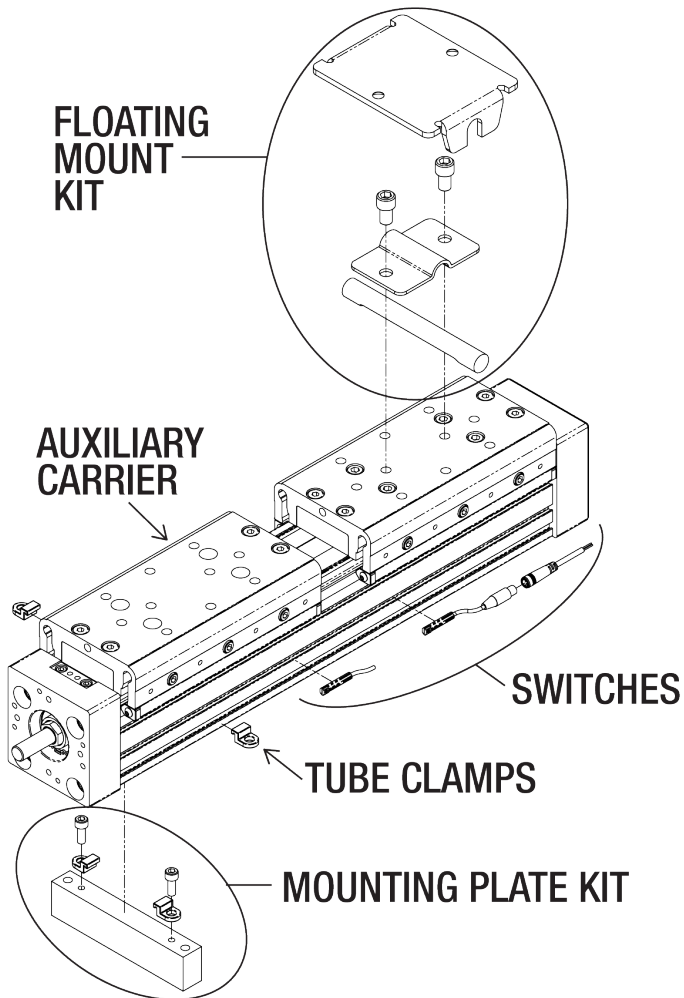


Figure 4.1: MXE rodless electric actuator options

4.5.1 Auxiliary Carrier

Auxiliary carrier option increases load carrying and moment capacity of the linear actuator. The auxiliary carrier is not attached to a ball or a lead nut and is capable of moving freely along the actuator's line of motion. The addition of this option will decrease the effective stroke length by the distance between centers of the two carriers.

For dimensional information please refer to the Tolomatic MXE Product Brochure 83004000_09

Floating Mount Kit

An optional floating mount kit provides necessary compliance for non-parallelism between the actuator's carrier plane of motion and the plane of motion of any externally guided load.

For dimensional information please refer to the Tolomatic MXE Product Brochure 83004000_09

4.5.2 Actuator Mounting

Tube clamps

MXE linear actuators can be mounted to any surface with the help of tube clamps (MXE25 through 63) or mounting plates. Tube clamps allow to directly place the bottom of the actuator body on the mounting surface. In the event a clearance is required between the bottom of the actuator and the mounting surface mounting plates could be used.

For dimensional information please refer to the Tolomatic [MXE Product Brochure 8300-4000](#)

Tube clamps are secured with the fasteners tightened to the torque values given below:

ACTUATOR SIZE	FASTENER SIZE		MIN FASTENER GRADE OR CLASS	TORQUE	
				(Nm)	(lbf-in)
MXE25S AND MXE25P	METRIC	M5	8.8	5.3	47
	IMPERIAL	#10	5	5.0	44
MXE32S AND MXE32P	METRIC	M6	10.9	11.0	97
	IMPERIAL	1/4	8	12.1	107
MXE40S AND MXE40P	METRIC	M6	10.9	11.0	97
	IMPERIAL	1/4	8	12.1	107
MXE50S AND MXE50P	METRIC	M6	10.9	11.0	97
	IMPERIAL	1/4	8	12.1	107
MXE63S AND MXE63P	METRIC	M10	10.9	54.0	478
	IMPERIAL	3/8	8	44.6	395

Table 4.5: Tube clamp torque recommendations

Mounting Plate Kit

Mounting plates used in conjunction with tube clamps provide clearance (for motors/gearheads with a bigger footprint, etc.) between the bottom of the actuator and the mounting surface. For dimensional information and maximum distance between clamps please refer to the Tolomatic [MXE Product Brochure 8300-4000](#)

Mounting plates are secured with the fasteners tightened to the torque values given below:

ACTUATOR SIZE	FASTENER SIZE		MIN FASTENER GRADE OR CLASS	TORQUE	
				(Nm)	(lbf-in)
MXE16S AND MXE16P	METRIC	M5	8.8	5.3	47
	IMPERIAL	#10	5	5.0	44
MXE25S AND MXE25P	METRIC	M5	8.8	5.3	47
	IMPERIAL	#10	5	5.0	45
MXE32S AND MXE32P	METRIC	M6	10.9	11.0	97
	IMPERIAL	1/4	8	12.1	107
MXE40S AND MXE40P	METRIC	M6	10.9	11.0	97
	IMPERIAL	1/4	8	12.1	107
MXE50S AND MXE50P	METRIC	M6	10.9	11.0	97
	IMPERIAL	1/4	8	12.1	107
MXE63S AND MXE63P	METRIC	M10	10.9	54.0	478
	IMPERIAL	3/8	8	44.6	395

Table 4.6: Mounting plate torque recommendations

4.5.3 Switch Mounting

Place switches in the groove on the actuator tube at desired location with *Tolomatic* facing outward. While applying light pressure to the switch rotate the switch into the groove and lock it securely into place by tightening the screw on the switch.

For the switch types/choices, wiring diagrams and dimensional information please refer to the Tolomatic [MXE Product Brochure 8300-4000](#)

4.6 Back Driving

WARNING WARNING!

MXE linear actuators are equipped with ball and lead screws. All ball screws and most of the lead screws that are used in MXE linear actuators are not self-braking and will not hold position under load. When there is no current/torque input to the drive motor, the screw will rotate and the carrier can move freely. A motor brake option should be used if the motion system/axis requires the actuator to hold position when it is not powered, or as a safety measure if the actuator is mounted in a vertical orientation to prevent the payload from free falling in the event of unintended power loss.

5: MXE OPERATION AND START UP CONSIDERATIONS

■ 5.1 Homing

To establish full open and close position of the actuator, set the drive torque limits to the lowest values possible for motion (10-20% to begin with) and use a slow velocity jog command (<1mm/s) to search for the hard limits. If 10-20% of the continuous current is not sufficient to drive both the actuator installed on the equipment, slowly increase the current limit until the unit is able to move to both the fully open and fully closed positions. Proper care must be taken when finding limits after installation of the equipment.

 **WARNING** **WARNING!**

Applying a load in excess of the continuous rated force at the end of travel may cause internal damage and could render the assembly inoperable or cause damage.

Once the full open and closed positions are determined, these values can be stored in the drive/controller as travel limits.

6: MXE REPAIR AND MAINTENANCE

⚠ WARNING WARNING!

Before starting any maintenance activities, make sure that the supply power is shut OFF.

6.1 Lubrication

Proper lubrication of profiled rail bearing system of MXE-P actuators is essential for normal operation and achievement of full rated life. Lubrication is recommended to be performed at intervals of 100 km (4 mln in) of travel or once every year whichever occurs first. Operating conditions such as high speed or significant shock and vibration may require more frequent lubrication.

6.2 Repair kit

MXE repair kit offered by Tolomatic includes the dust band precut to proper length at the factory, nut bracket end caps, and (for MXE-S only) solid bearings and bearing caps. Repair kit allows dust band and solid bearing replacement in the field. Refer to Figure 6.2 for ordering information.

6.3 Dust Band Replacement

6.3.1 MXE_S Dust Band Replacement

Remove the old dust band by following the instructions below.

1. Remove the band clamps from both heads of the actuator by removing screws and backing out set screws 1-2 turns;
2. Carefully lift the dust band from the pocket in each head and remove any shims located under the band. The shims need to be retained for reassembly;
3. On MXE16S remove the end plates from both ends of the carrier; on MXE25S-MXE63S remove aluminum spacer blocks from both ends of the carrier;
4. On the MXE16S remove the screws securing the carrier to the nut bracket and remove the carrier;
5. Remove the acetal end caps from both ends of the nut bracket located underneath the carrier and remove the dust band from the actuator;

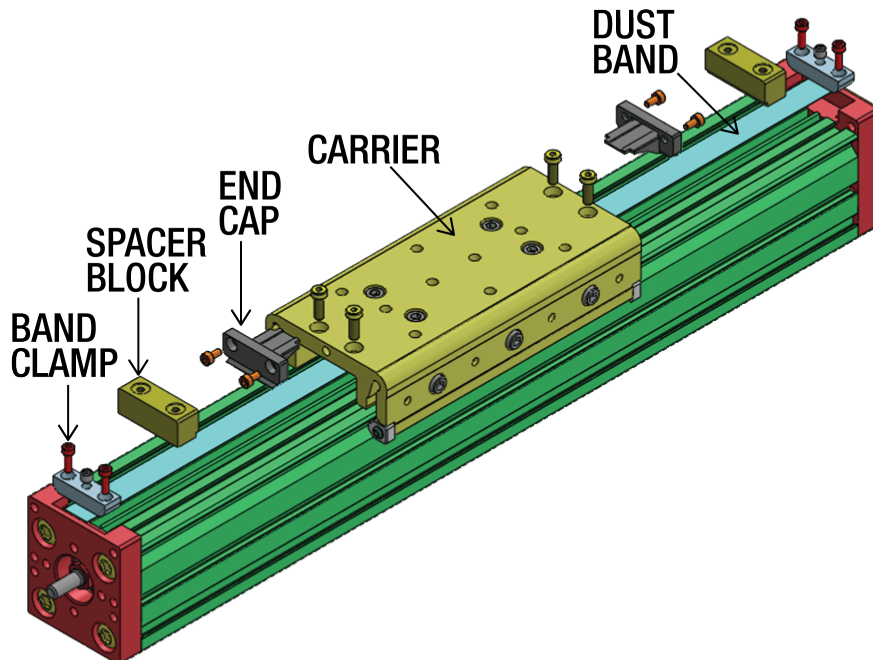


Figure 6.1: MXE_S important parts involved dust band replacement

REPAIR KITS

Repair kit includes: dust band, end caps, [Also for **S** style: bearings and bearing caps]

The part number for a repair kit begins with RK followed by model, actuator size, bearing type, and stroke length (**S****R** = inch/US Standard, **S****M** = metric) (NOTE: If unit has an auxiliary carrier also include DC and distance between carrier centers)

REPAIR KIT	MODEL	ACTUATOR SIZE	BEARING TYPE	STROKE METRIC	STROKE LENGTH	AUXILIARY CARRIER	DISTANCE BETWEEN CARRIERS
RK	MXE	40	S	SM	2007.02	DC	215.9

Figure 6.2 MXE repair kit ordering information

Install the replacement dust band by following the instructions below.

1. Install the new dust band through the nut bracket and reassemble the acetal end caps to both ends using removable strength thread adhesive (Loctite 242 or equivalent);
2. Reinstall the MXE16S carrier using removable strength thread adhesive (Loctite 242 or equivalent) on the fasteners;
3. Reinstall the end plates on MXE16S or aluminum spacer blocks on MXE25S-MXE63S at both ends of the carrier using removable strength thread adhesive (Loctite 242 or equivalent) on the fasteners;
4. Reinstall any shims into the head pockets that were present during disassembly;
5. Position the carrier near the motor end of the actuator;
6. Position the end of the dust band in the pocket over any shims and install the band clamp with the 2 screws using removable strength thread adhesive (Loctite 242 or equivalent), then tighten down the set screws;
7. Position the carrier near the opposite end of the actuator and repeat the steps to install the other end's band clamp.

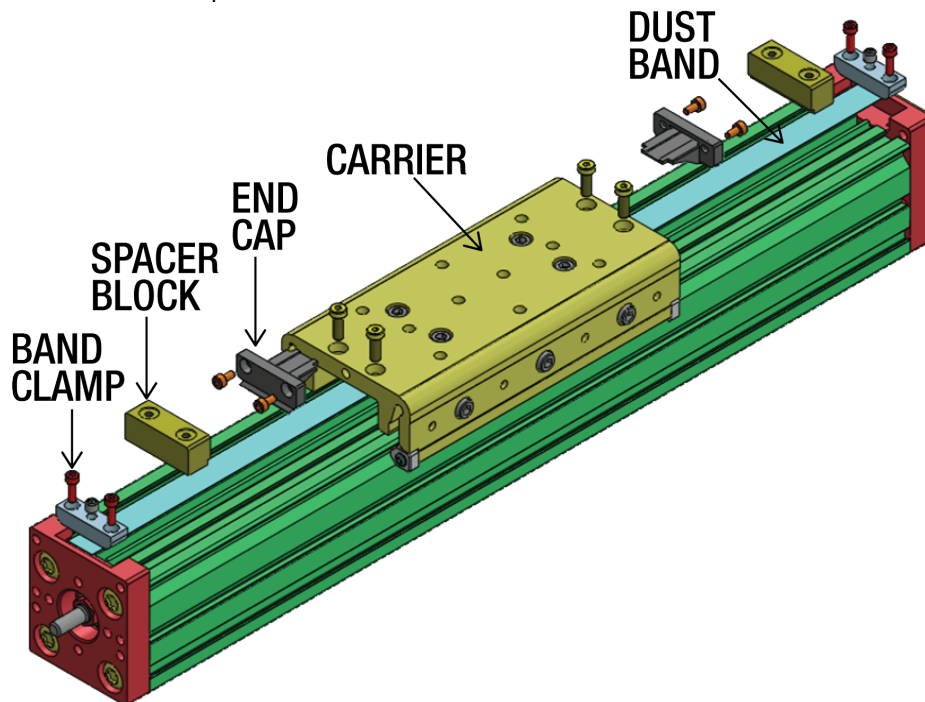


Figure 6.3: MXE_S important parts involved dust band replacement (repeated for reference)

6.3.2 MXE_P Dust Band Replacement

Remove the old dust band by following the instructions below.

1. Remove the band clamps from both heads of the actuator by removing screws and backing out set screws 1-2 turns;
2. Carefully lift the dust band from the pocket in each head and remove any shims located under the band. The shims need to be retained for reassembly;
3. Remove the screws securing the carrier to the nut bracket and slide the carrier clear of the nut bracket;
4. Remove the acetal end caps from both ends of the nut bracket located underneath the carrier and remove the dust band from the actuator.

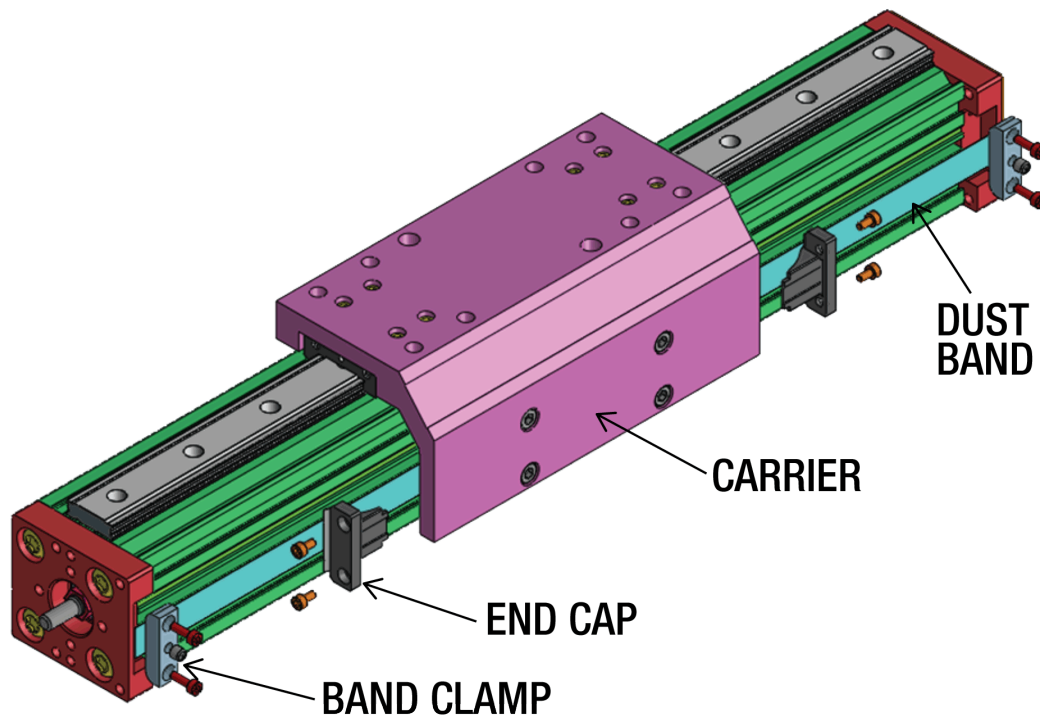


Figure 6.4: MXE_P important parts involved dust band replacement

Install the replacement dust band by following the instructions below.

1. Install the new dust band through the nut bracket and reassemble the acetal end caps to both ends using removable strength thread adhesive (Loctite 242 or equivalent);
2. Position the carrier over the nut bracket and secure with the screws using removable strength thread adhesive (Loctite 242 or equivalent)
3. Reinstall any shims into the head pockets that were present during disassembly;
4. Position the carrier near the motor end of the actuator;
5. Position the end of the dust band in the pocket over any shims and install the band clamp with the 2 screws using removable strength thread adhesive (Loctite 242 or equivalent), then tighten down the set screws;
6. Position the carrier near the opposite end of the actuator and repeat the steps to install the other end's band clamp.

6.4 Replacement and Adjustment of Solid Bearings (MXE_S only)

6.4.1 MXE16S Replacement (25, 32, 40, 50, 63 sizes follow after):

Remove the solid bearings to be replaced by following the instructions below.

1. Slightly loosen the carrier tension screws and locking set screws;
2. Remove the end plates from both ends of the carrier;
3. Remove four fasteners holding the carrier to the nut bracket;
4. Remove 2 lock screws holding together the carrier and the side plate;
5. Remove the bearings out of both parts;

MXE16S:

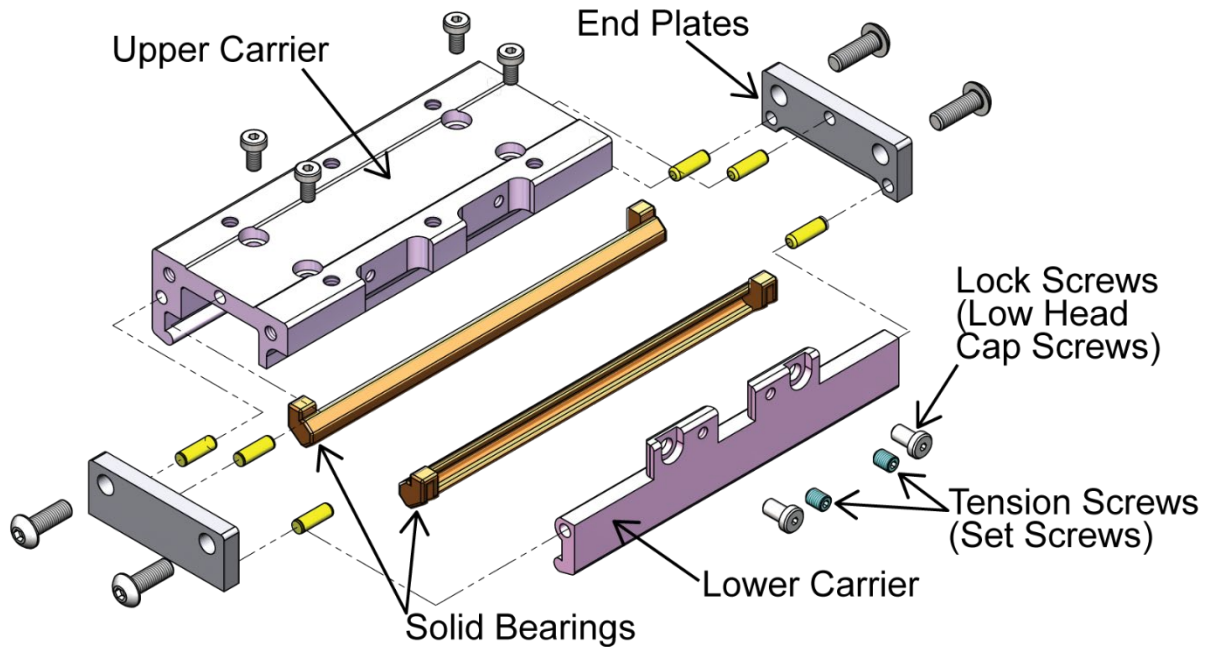


Figure 6.5: MXE16S Carrier Parts

Install and adjust the replacement solid bearings by following the instructions below.

“Snap” the solid bearings into the Upper Carrier and the Lower Carrier;

Position the Upper Carrier over the nut bracket. Reference the picture below for orientation of the carrier;

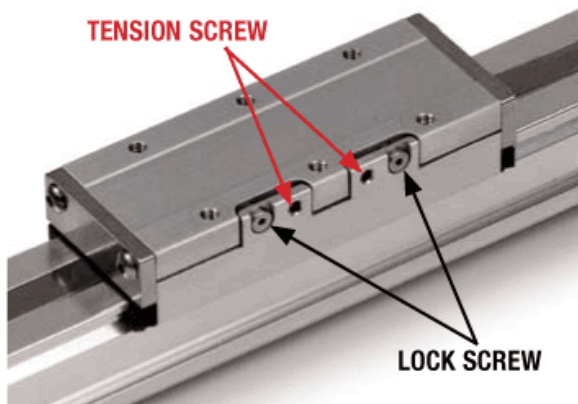


Figure 6.6: MXE16S Carrier Assembly

Loosely secure the Lower Carrier to the Upper Carrier with the low head cap screws

Install the dowel pins into the ends of both carriers and install the end plates securing them with the button head cap screws;

6.4.2 MXE16S Tensioning (25, 32, 40, 50, 63 sizes follow after):

Tension the carrier bearings by tightening the set screws until the Carrier assembly is tight to the tube with no free play; Adjust the torque on the low head cap screws just enough to enable the Carrier assembly to remain tight with no free play but slide freely on the tube.

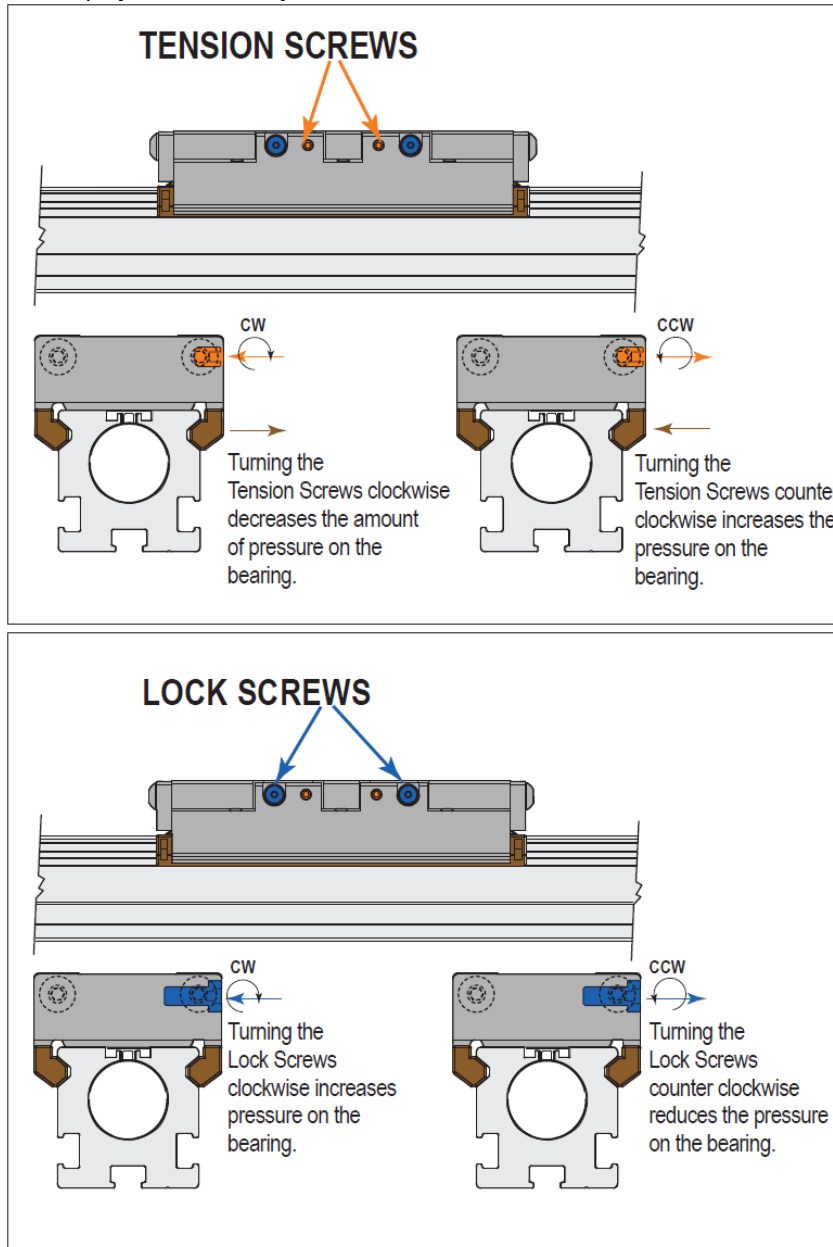


Figure 6.7: MXE16S Solid Bearing Adjustment

Consult the MXE_S online carrier adjustment video: <https://youtu.be/LVWPg2gfy0A>

6.4.3 MXE_S Replacement (25, 32, 40, 50, 63 sizes):

Remove the solid bearings to be replaced by following the instructions below.

MXE25S-MXE63S

1. Slightly loosen the carrier tension screws and locking set screws;
2. Remove bearing end caps from the bearings and slide the bearings out.

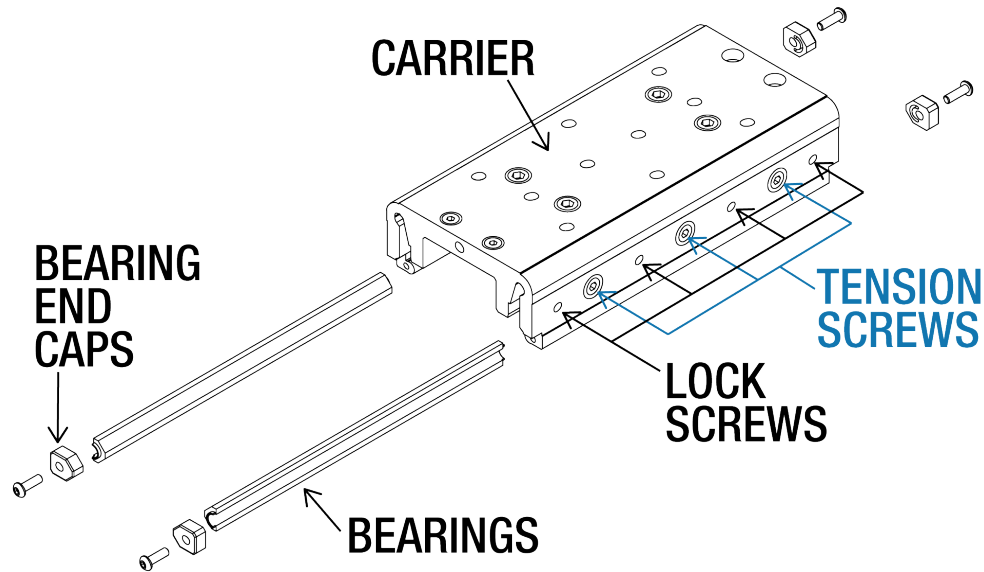


Figure 6.8: MXE_S important parts involved in bearing replacement (25, 32, 40, 50, 63 sizes)

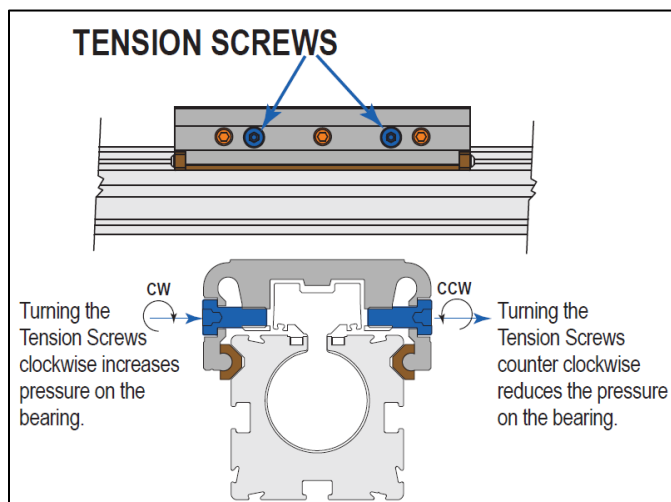
Install and adjust the replacement solid bearings by following the instructions below.

1. Position the plastic bearings on each side of the Carrier and install the four bearing end caps;
2. Snug the fasteners but do not tighten them;

6.4.4 MXE_S Tensioning (25, 32, 40, 50, 63 sizes):

Tension the carrier bearings by tightening all socket head cap screws on both sides while trying to apply equal amount of torque to each screw until the Carrier is tight to the tube with no free play;

Adjust the torque on the set screws on both sides of the carrier just enough to enable the carrier to remain tight with no free play but slide freely on the tube.



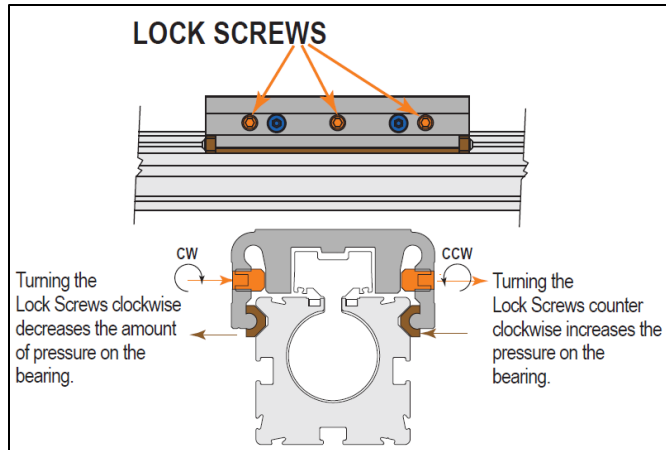


Figure 6.9: MXE25-MXE63 Solid Bearing Adjustment

Consult the MXE_S online carrier adjustment video: <https://youtu.be/LVWPq2gfy0A>

6.5 Storage

1. Perform repairs, maintenance and inspections prior to storing the equipment to ensure it is in good working order.
2. Store in clean and dry environment
3. It is recommended after every 6 months of storage and before placing in service to cycle actuators for 2 complete stroke lengths in order to redistribute the internal lubricants.
4. If stored for a period longer than 2 years without use it may be necessary to return the actuator to Tolomatic in order to replace the lubricant.
5. Recommended storage temperature -25°C to +60°C (-13°F to +140°F)

APPENDIX A: PERFORMANCE & MECHANICAL SPECIFICATIONS

A1: Performance & Mechanical Specifications



NOTE!

NOTE Please see Tolomatic [MXE Product Brochure 8300-4000](#) for complete information on performance data. Use 3D CAD files (available at www.tolomatic.com) for critical dimensions.

APPENDIX B: TROUBLESHOOTING PROCEDURE

B1: Troubleshooting

SYMPTOM	POTENTIAL CAUSE	SOLUTION
Carrier is not moving	Motor has insufficient torque capacity	Verify the motor selection
	Drive has insufficient current capacity	Verify the drive's setting
	The RP pulley or the inline coupling is slipping on the motor shaft	Verify that the pulley locking device/coupling fasteners are tightened to the proper torque value
	Misalignment of the load guidance system and the actuator's line of motion	Ensure proper alignment or use a floating mount plate
	Actuator had an end of stroke collision of excessive force	Remove the tooling and manually jog away from the end of the actuator. If problem persists contact Tolomatic for service
Actuator body vibrates during operation	Loose mounting	Check the actuator mounting
	Drive is improperly tuned	Tune drive
	Ball/roller screw rotational speed exceeds the critical level	Verify the application speed

APPENDIX C: WARRANTY

■ C:1 Warranty and Limitation of Liability

Tolomatic's complete terms and conditions can be found here <https://www.tolomatic.com/info-center/resource-details/terms-and-conditions>

Limited Warranty

Tolomatic warrants that at the time of delivery, Products shall be in good condition, free from defects in material and workmanship and that Products made to order shall conform to applicable drawings or specifications as referenced in the quotation or accepted purchase order ("Product Warranty"). The Product Warranty shall expire one year from date of shipment (the "Warranty Period"). Tolomatic warrants that Buyer shall acquire good title to the Products free from third party rights. These warranties are given only to Buyer and not to any third party.

The Product Warranty excludes any defects or non-conformance resulting (wholly or in part) from: (i) accidental damage, mishandling, incorrect installation, negligence or other circumstances arising after delivery; (ii) the repair or alteration of the Product by any party other than Tolomatic or its authorized representative; (iii) the failure by Buyer to provide a suitable storage, use, or operating environment for the Products; (iv) Buyer's use of the Products for a purpose or in a manner other than that for which they were designed; and (v) other abuse, misuse or neglect of the Products by Buyer or any third party.

The Product Warranty excludes any Products not manufactured by Tolomatic. Insofar as any Products are manufactured by third parties, Tolomatic shall, insofar as it can, pass to the Buyer the benefit of all warranties given by the supplier of such Products.

The Product Warranty shall be limited to defects of which Tolomatic is notified within twenty-one (21) days from the date of shipment to Buyer or, in the event of latent defects, within twenty-one (21) days of the defect being discovered and provided that such notice is received within the Warranty Period. As sole remedy for the breach of the warranty in paragraph (a) above, provided that (if required by Tolomatic) all non-conforming Products are returned to Tolomatic at Buyer's cost, and provided that Tolomatic confirms the defect or non-conformance, Tolomatic shall at its option (i) replace or repair the defective or non-conforming items, or correct any defective work or non-conformance, or (ii) refund to Buyer the original purchase price of the defective or non-conforming item and reimburse to Buyer any transportation and insurance charges incurred by Buyer.

Any claim by Buyer against Tolomatic alleging the breach of the Product Warranty must be commenced within twelve (12) months following the date of the alleged breach.

In the event the parties disagree whether or not a breach of the Product Warranty has occurred, Tolomatic may (but shall not be obliged to) undertake any repairs or replacement requested by Buyer pending final settlement of the matter. If it is determined that no such breach has occurred, Buyer shall pay Tolomatic upon demand the reasonable price of the repairs, corrections, or replacements made by Tolomatic including allowances for overheads and a reasonable profit margin.

THE WARRANTIES EXPRESSLY MADE UNDER THESE TERMS ARE EXCLUSIVE AND GIVEN IN LIEU OF ALL OTHER REPRESENTATIONS, WARRANTIES AND COVENANTS THAT MAY BE IMPLIED BY LAW, BY CUSTOM OF TRADE, BY THESE TERMS, BY THE PURCHASE ORDER OR OTHERWISE WITH RESPECT TO THE PRODUCTS. TO THE FULL EXTENT PERMITTED BY LAW, TOLOMATIC DISCLAIMS AND BUYER WAIVES ALL SUCH REPRESENTATIONS, WARRANTIES AND COVENANTS INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS. BUYER'S SOLE REMEDY FOR BREACH OF WARRANTY IS STATED IN PARAGRAPH (d) ABOVE.

No Products shall be returned without Tolomatic's prior written consent. Products which Tolomatic consents to have returned shall be shipped by Buyer at Buyer's risk and expense, freight prepaid, to such location as Tolomatic designates.

Limitation of Liability

Tolomatic shall in no event be liable to Buyer or any third party, whether in contract, tort (including negligence), misrepresentation, strict liability or otherwise, for any incidental, punitive, consequential, indirect or special damages, including any loss of profits or savings or anticipated profits or savings, loss of data, loss of opportunity, loss of reputation, loss of goodwill or business or potential business, however caused, even if Tolomatic has been advised of the possibility of such damages in advance.

Under no circumstances shall Tolomatic's liability to Buyer in connection with any purchase order or Products supplied to Buyer exceed an amount equal to the amount paid by Buyer for such Products.

Buyer agrees and understands that it is solely Buyer's responsibility to ensure that Products are suitable for Buyer's requirements and for the environment, facilities or machinery for which they are intended by Buyer or by its end-customer to be fitted or used. Even if Tolomatic is advised of Buyer's intended use, Tolomatic makes no representation or warranty that the Product will be suitable for that purpose. Any technical advice furnished by Tolomatic relating to the intended use of the Products is given for information only and Tolomatic assumes no obligation or liability for the advice given or the results obtained. Except insofar as specifications or drawings form part of a purchase order and the Product Warranty, to the full extent permitted by law, Tolomatic disclaims and Buyer waives all representations, warranties and covenants that may be implied from the provision by Tolomatic of technical advice or information about Product. All such advice and information are accepted by Buyer at its risk. Insofar as any liability or warranty of Tolomatic cannot be limited or excluded under applicable law, including any laws that do not permit limitations on liability relating to death or personal injury, the provisions of these terms and conditions shall be construed as being subject to such legal limitations, but only if those legal provisions have effect in relation to Tolomatic's liability notwithstanding the governing law provision in Section Error! Reference source not found.

Product Return Procedure

1. Please contact Tolomatic Technical Support for RMA (Return Material Authorization) process and possible in the field repair.
2. If an RMA is needed your Tolomatic Technical Support team will initiate the RMA process and set up an RMA number.

USA - Headquarters

Tolomatic Inc.

3800 County Road 116
Hamel, MN 55340, USA

Phone: (763) 478-8000

Toll-Free: **1-800-328-2174**

sales@tolomatic.com

www.tolomatic.com

MEXICO

Centro de Servicio

Parque Tecnológico Innovación
Int. 23, Lateral Estatal 431,
Santiago de Querétaro,
El Marqués, México, C.P. 76246

Phone: +1 (763) 478-8000

help@tolomatic.com

EUROPE

Tolomatic Europe GmbH

Elisabethenstr. 20
65428 Rüsselsheim
Germany

Phone: +49 6142 17604-0

help@tolomatic.eu

CHINA

Tolomatic Automation Products (Suzhou) Co. Ltd.

No. 60 Chuangye Street, Building 2
Huqiu District, SND Suzhou
Jiangsu 215011 - P.R. China

Phone: +86 (512) 6750-8506

TolomaticChina@tolomatic.com

APPENDIX D: DECLARATION OF CONFORMITY

■ D1: Declaration of Conformity



EU Declaration of Incorporation

No: 36004717_00

We the manufacturer,

Tolomatic
3800 County Road 116
Hamel, MN 55340
USA

Declare under our sole responsibility that the product(s),

MXE Actuators

All Models

Fulfills the essential requirements of partly completed machinery in the following directives:

EC Machinery Directive 2006/42/EC

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive.

RoHS Directive (2011/65/EU, as amended by (EU) 2015/863)

REACH (Regulation (EC) No 1907/2006)

Assumption of conformity is based on the application of the harmonized or applicable technical standards and, when applicable or required, a European community notified body certification.

Brad Schulz
Director of Engineering & Technology

04.18.2022
Date (dd.mm.yyyy)

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QUALITY SYSTEM
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Certified site: Hamel, MN

USA - Headquarters Tolomatic Inc. 3800 County Road 116 Hamel, MN 55340, USA Phone: (763) 478-8000 Toll-Free: 1-800-328-2174 sales@tolomatic.com www.tolomatic.com	MEXICO Centro de Servicio Parque Tecnológico Innovación Int. 23, Lateral Estatal 431, Santiago de Querétaro, El Marqués, México, C.P. 76246 Phone: +1 (763) 478-8000 help@tolomatic.com	EUROPE Tolomatic Europe GmbH Elisabethenstr. 20 65428 Rüsselsheim Germany Phone: +49 6142 17604-0 help@tolomatic.eu	CHINA Tolomatic Automation Products (Suzhou) Co. Ltd. No. 60 Chuangye Street, Building 2 Huqiu District, SND Suzhou Jiangsu 215011 - P.R. China Phone: +86 (512) 6750-8506 TolomaticChina@tolomatic.com
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