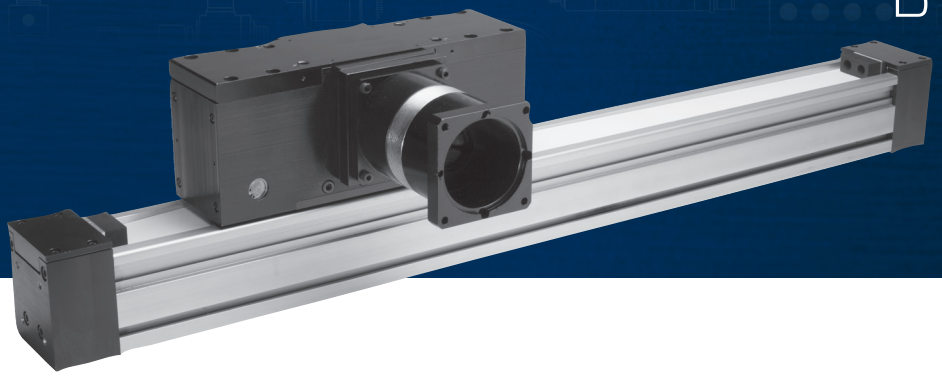
BT80 & BAT80 ACTUATORS

BT80 & BAT80

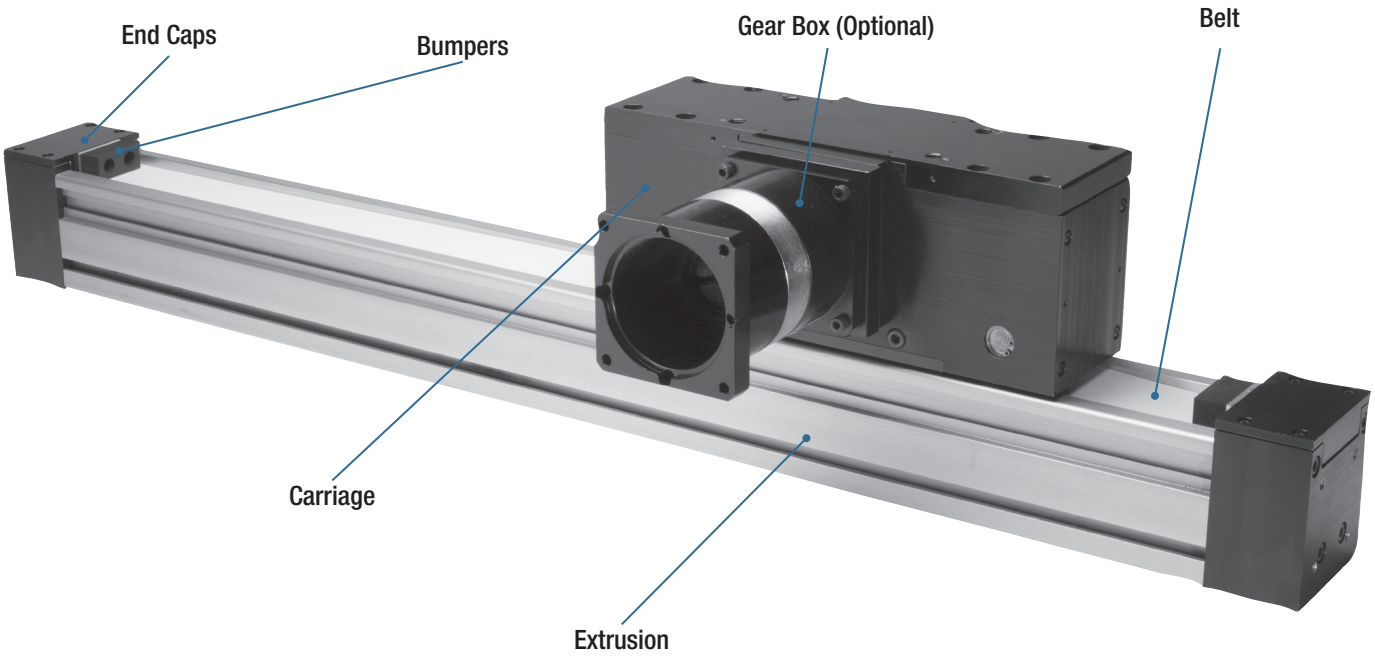


The BT80 is a belt-driven actuator designed for both horizontal and vertical motion applications. Unique within the design, the belt and motor are stationary while the carriage extrusion moves up and down. This reduces the overall moving weight of the load and eliminates associated motor cable flexing.

Since this type of belt design leads to a lighter overall load in the Z-direction, it allows for a faster velocity motion move with same size motor. It is perfect for long Z-axis applications where robustness and speed are needed but where a ballscrew is too heavy, too long, or too slow to meet the needed motion profile. It is also ideal for long stroke horizontal and gantry applications where the carriage and motor move with the load. Designed after the B80/B110 family of actuators, the BT80 offers no backlash, no cogging, self-alignment, smoother motion, and higher precision compared to the average belt drive unit.

For even more rigorous application loads, the BAT80 employs Bimba's unique arc-belt design and offers thrust, loading, and long-life not unlike that of the B80 actuator. It uses the same belt, bearing system, and other durably constructed parts that make the B80 Bimba's premier rodless actuator.

PRODUCT FEATURES



The BT80 is a unique rodless electric actuator in which the carriage, and motor attached to the carriage, are stationary; instead, the extrusion moves up and down, providing the motion. This unique motion optimizes vertical motion and is especially tailored for vertical applications, though it may be used in a horizontal configurations as well.

FEATURES AND BENEFITS

High Precision Steel Reinforced Belt

- Arc-belt power design (BAT models)
- Reduced noise and vibration
- Zero backlash
- Self-aligning
- No cogging
- Smooth motion
- Ideal for high speed applications
- High thrust capacity
- High precision to 0.001”
- Long lengths: up to 40ft. (12m)
- Outstanding repeatability

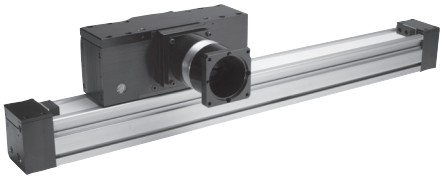
Built-in Linear Ball Rail Guide:

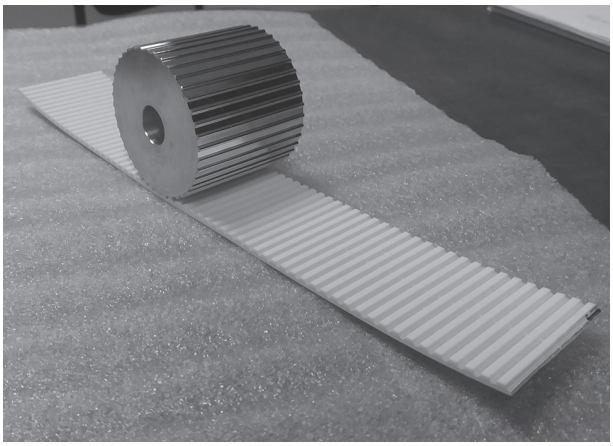
- Maintenance free
- Self-lubricating
- Low friction
- Smooth, quiet operation
- Long life expectancy

80mm Square Aluminum Extrusion:

- Heavy duty 7075 aluminum extrusion
- 25% stronger extrusion
- Supports stops and bearings
- Provides better fit in tight applications
- Promotes long life

BT80/BAT80





BT80 Belt System

The Bimba BT80 belt transfer actuator uses a steel reinforced polyurethane 50mm belt that wraps around a robust, specially designed internal drive carriage assembly that offers two distinct and different types of motion. The first option is motion in which the carriage is stationary and the extrusion travels. The second option is motion in which the extrusion is stationary and the carriage travels. The choice of motion is yours to make and is intended to maximize the overall performance of your motion profile application.

The BT80's innovative actuator design can minimize the overall load while maximizing the thrust and speed performance. When a high speed vertical application is called for, the BT80 is the right choice to complete your multi-axis application.

All BT80 units come standard with the EZ Drive. The EZ Drive can easily accommodate a Bimba stepper or servo motor and/or a gear reducer unit. This leads to a wide variety of options for driving the BT80 and allows you to get up and running faster with fewer complications or issues.

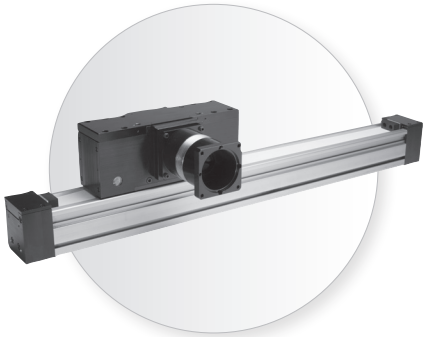
MATERIALS OF CONSTRUCTION

Body Material:	Aluminum
End Caps:	Aluminum
Belt Cover:	Stainless Steel
Carriage:	7075 Aluminum
Belt:	Steel Reinforced Polyurethane

HOW IT'S USED

APPLICATION IDEAS

- Z-Axis Motion
- Pick & Place
- Sorting
- Lifting
- Pressing
- Stacking
- Insertion
- Clamping
- Parts Transfer
- Machine Tool



TARGET APPLICATIONS

The BT80/BAT80 is primarily designed and intended for vertical motion applications. The unique EZ drive carriage is designed to allow the carriage and motor to remain stationary while the extrusion travels up and down along the actuator path. This motion makes it well-suited to be used in 2- or 3-axis motion applications where another Z-axis solution may have limitations that exclude it from your list of options. With performance parameters that mimic the B80 rodless actuator, you can expect all the advantages found in our flagship rodless actuator.

For applications that call for an alternative solution to a traditional pneumatic application, with force and load capability that mimics a large bore pneumatic solution and that offers a more adaptable solution, Bimba electric actuators provide the interchangeable solution. Growing and adapting alongside your business in an easy-to-use, long-lasting, and tough electric actuator that exceeds the competition in performance, value, and life is what makes the BT80/BAT80 the easy choice for vertical and multi-axis solutions.

DRIVE OPTIONS

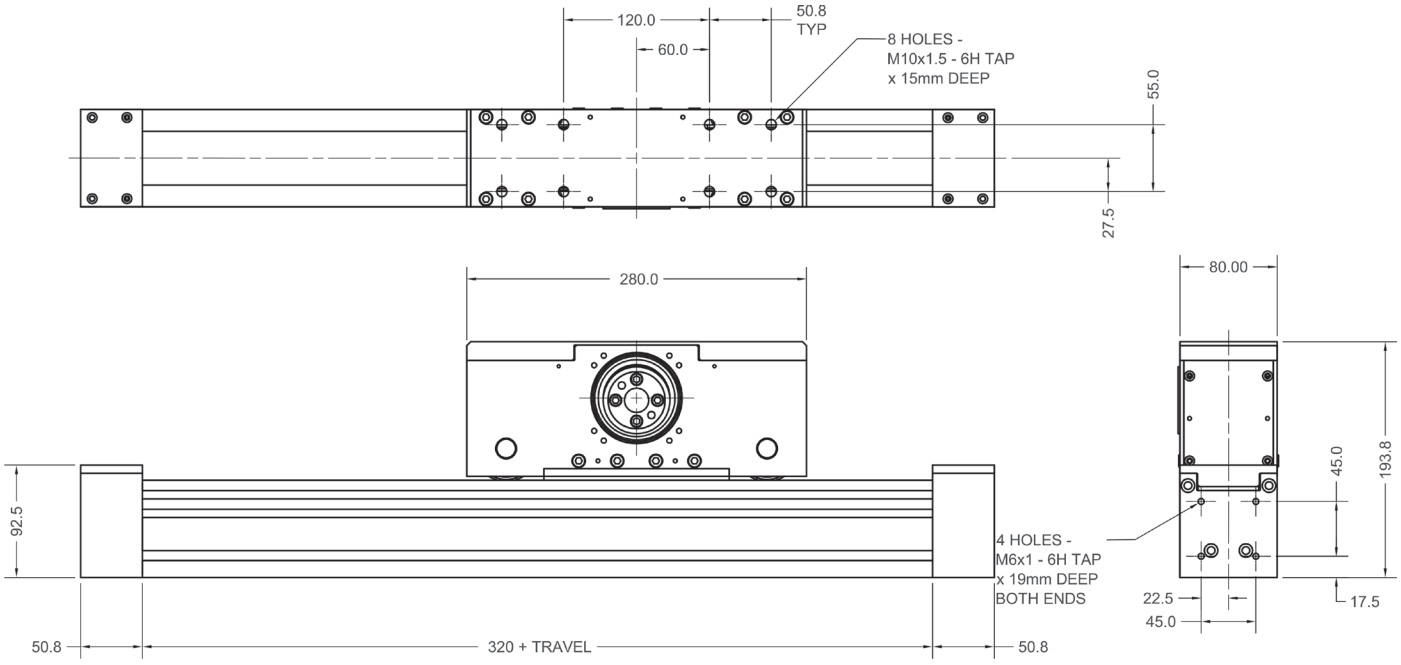
The BT80/BAT80 comes standard with the EZ drive, but a standard input shaft or integrated planetary gear reducer are also available as a selectable option. The choice is yours to select the option that works best for you. With many Bimba stepper and servo motors available to choose from, or using your own familiar motor, configuring an electric actuator that best meets the needs of even your most demanding applications has never been easier.

ADVANTAGES

FEATURE	ADVANTAGE	BENEFIT
Carriage constructed of high-strength 7075 aluminum	Offers enhanced strength and robustness over the competitor	Less deflection and increased load and moment loading capability per carriage size
Self-lubricating linear guides	Minimized maintenance	Worry- and maintenance-free long life, even in applications that require 24/7 motion
Integral Reducer Drive (optional)	Offers increased performance using embedded gear reducer	Move larger loads, improve inertia matching, and complete that using an aesthetically pleasing, cost-effective solution
Extrusion moves; carriage stationary	Less overall weight within that axis	Light weight makes it ideal for Z-axis movement that requires higher speed motion; less torque required to perform motion results in smaller motors and saves on costs
ARC-Power belt (BAT version)	25% higher thrust leads to higher loading capacity	Realize ballscrew-like thrust with belt drive speed ability

DIMENSIONS

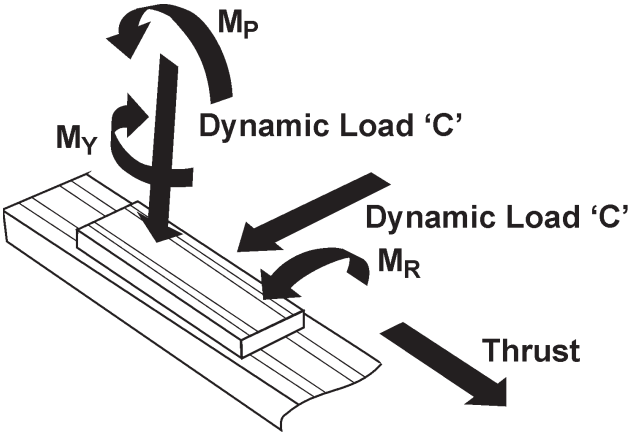
Key specification information for the BT80/BAT80 is given below. For additional specification information, contact Bimba Customer Service at CS@bimba.com or 800.44.BIMBA (800.442.4622).



OPERATING RANGES

Linear Bearings:	-15˚ C to 240˚ C (5˚ F to 464˚ F)
Ball Bearings:	-30˚ C to 250˚ C (-22˚ F to 482˚ F)
Gear Reducers:	-50˚ C to 232˚ C (-58˚ F to 449˚ F)
Belt, Standard:	0˚ C to 80˚ C (32˚ F to 176˚ F)
Belt, Low Temperature:	-25˚ C to 5˚ C (-13˚ F to 41˚ F)
Belt, High Temperature:	20˚ C to 110˚ C (68˚ F to 230˚ F)

SPECIFICATIONS



EXTRUSION		
LINEAR ACTUATOR	MOMENT OF INERTIA	
	Ix (cm^4)	Iy (cm^4)
BT80	146	219

Straightness 0.3175mm per 300mm of length
Twist: 1/4° per 300mm, 3° maximum per 6m length

LINEAR ACTUATOR	LEAD CONSTANT (mm/rev.)	MAXIMUM INPUT TORQUE NM (in-lbs)	BELT	
			MAXIMUM FORCE N (lbs)	ELASTIC LIMIT N (lbs)
BT80	200	19 (168)	875 (197)	1750 (394)
BAT80	200	90 (797)	3750 (843)	7500 (1686)

LINEAR ACTUATOR	CARRIAGE LENGTH (mm)	DYNAMIC LOAD CAPACITY N (lbs)	DYNAMIC MOMENT CAPACITY		
			ROLL M_R NM (in-lbs)	PITCH M_P NM (in-lbs)	YAW M_Y NM (in-lbs)
BT80	280	30410 (6840)	400 (3540)	320 (2832)	320 (2832)
BAT80	280	30410 (6840)	400 (3540)	320 (2832)	320 (2832)

Inertia (lb-in-sec^2):

B Carriage, J = (38 + Stroke mm * 0.01) * 10^{-4} * 8.85

Weight:

BT80 = 11kgs + (0.0114 kgs/mm)

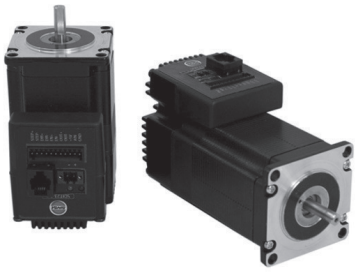
MOTORS AND DRIVES

Bimba motors are available to use as the rotary drive mechanism of the BT80/BAT80 Series. With a complete array of stepper and servo motors available in stock, Bimba has a motor*-drive solution that meets many demanding applications.

Configuring your motor and creating your first motion profile program is easier than ever with Bimba's intuitive and icon based IQ® suite of motion software. With our complete software suite available for free download from the Bimba website, there is no additional cost to your motion project. All Bimba stepper and servo programming software uses the same IQ® programming software, greatly reducing the learning curve. Existing programs can be easily shared or adapted among the two motor technologies.

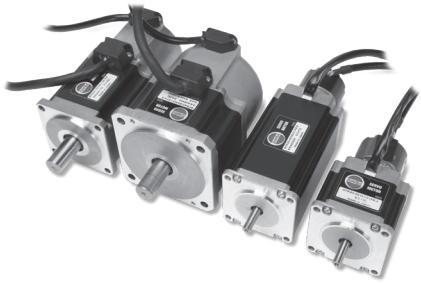
See the Motors and Drives section for Bimba's wide selection of available motors and motor drives.

**Contact Bimba's Customer Service team for help in crossing your motor to a Bimba motor.*



IntelliMotor®
ITM-23Q-2-EIP-E-M12

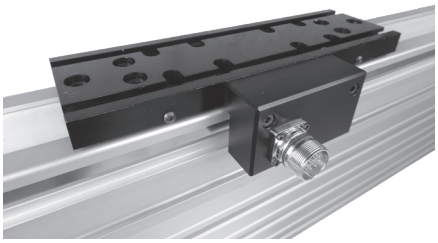
AC Stepper Motor
MTR-AC23T-753-S



AC Servo Motor

LINEAR SCALE

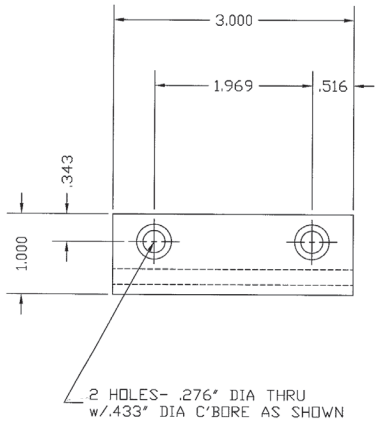
In extreme cases where precision beyond the normal tight accuracy of the BT80/BAT80 is desired, Bimba offers external linear scales. They are capable of providing extended position precision to as tight as 10µm. These scales are composed of a reading head and external scale. Linear scales are available in incremental or absolute versions which can be added to your actuator as an additional component when included in the final part number.



External Linear Scale

MOUNTING CLAMPS

To secure an actuator to the machine frame, hold-down clamps are available. They are designed to fit perfectly in the extruded body actuator T-channel. Appropriate sized clamps are available for the BT80/BAT80 actuator, as well as all of Bimba's electric actuators.



Bimba BT80 Clamp Drawing
CL-80-39

The model number of the BT80/BAT80 Series rodless actuator consists of an alphanumeric cluster designating product type, carriage type, stroke length, drive type, drive location, gear ratio (optional), external scale (optional), and other optional components that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number.

An example of a basic BT80 unit with length 500mm, EZ drive, no scale, and additional options is shown below.

CARRIAGE		
Carriage Type	Number of Bearing Blocks	Carriage Length
B	2	280

DRIVE	
SD	Single Shaft
RD	Reducer Drive
EZ	EZ Drive

RATIO
XX

EXTRA CARRIAGE	
N	None
1	1 Extra

PROTECTION	
00	Standard
Z1	Corrosion-Resistant
SS	Stainless Steel

PURGE PORT*	
P0	None
PL	Left
PR	Right
PB	Both

BT80 B 00500 EZ 01 N 1 0190 00 N P0

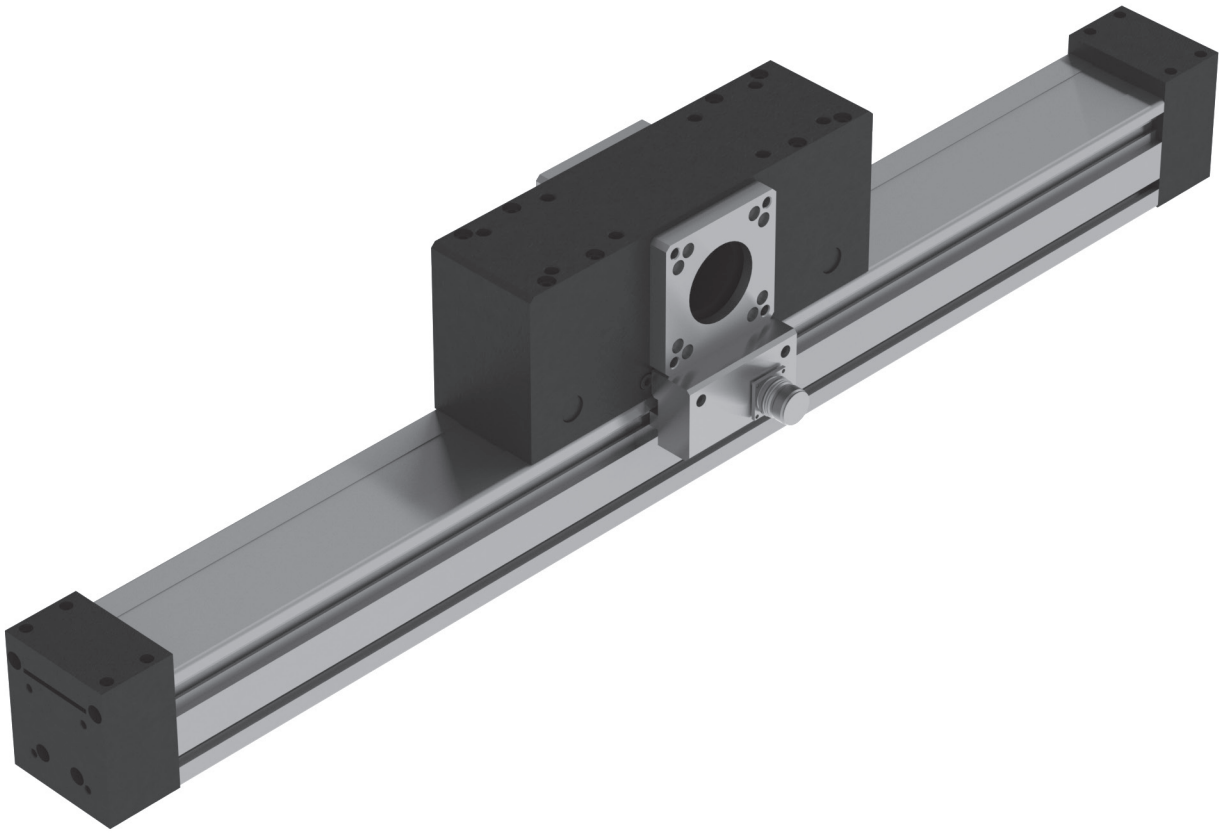
ACTUATOR
BT80
BAT80

STROKE
XXXXX (mm)

SCALE	
Y	Yes
N	No

DISTANCE
XXXX (mm)
280-1000mm

KEYWAY	
Y	Yes
N	No



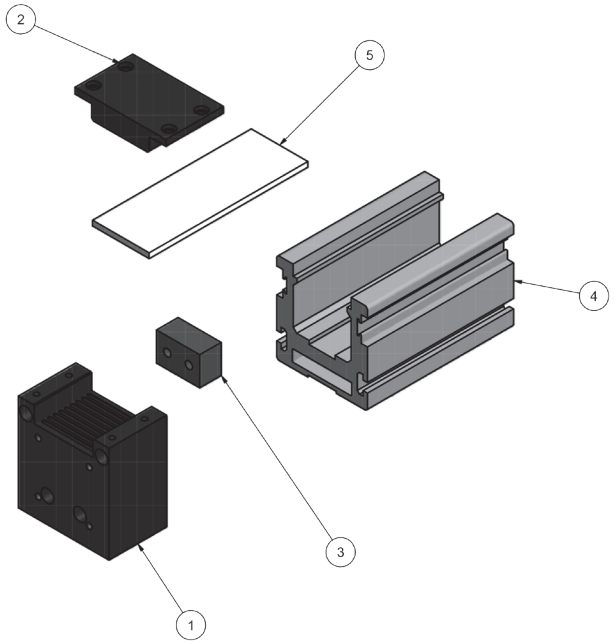
NOTE: If a motor or gearbox adapter is required, please refer to the Adapters section of the Accessories chapter in this catalog.

Bimba BT80/BAT80 Series electric actuators are repairable. A list of the individual components is given below that together make up the BT80/BAT80 electric actuator.

Please use the linear actuator serial number located at the drive end for all inquiries, along with the original purchase order number (if available). Describe the part required along with part number below. Contact Bimba Customer Service at 800-442-4622 (800-44-BIMBA) or e-mail cs@bimba.com.

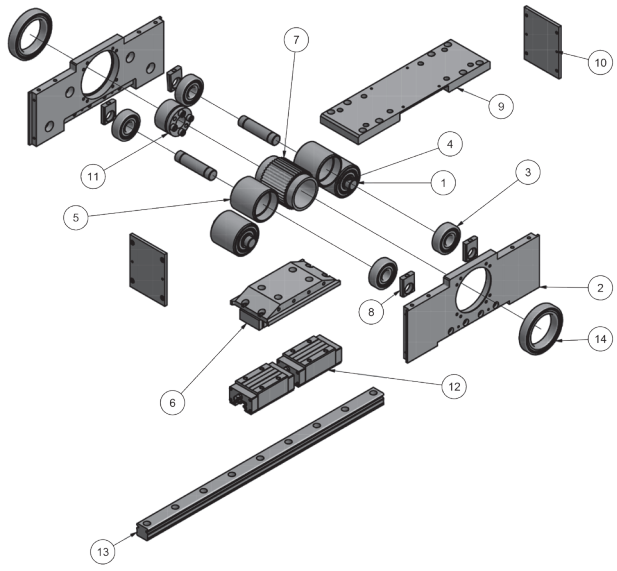
REPAIR PARTS

BT80 Belt Clamp End View



PART	QUANTITY	PART NO.	PART DESCRIPTION
1	1	BT80-20	End Plate
2	1	BT80-21	Clamp Plate
3	1	BT110-42	Bumper
4	1	B80-01 Machined	Extrusion
5	1	LP20B-15	Belt ATS
5A	1	B110-03	Belt BAT10
5B	1	H8XZ-52	Belt AT10

BT80 EZ Drive Carriage View



PART	QUANTITY	PART NO.	PART DESCRIPTION
1	4	B80-26	Idler Shaft
2	2	BT80-127	Side Plates
3	8	B80-44	Bearings
4	4	B80-128	Spacer
5	4	BT80-133	Pulley
6	1	BT80-31	Carriage
7	1	BT80-19 for AT5 Belt	Drive Pulley
7A	1	B80-19 for BAT10 Belt	Drive Pulley
7B	1	BT8010-19 for AT10 Belt	Drive Pulley
8	4	BT80-27	Take-up Slides
9	1	BT80-126	Idler Shaft
10	2	BT80-22	Carriage End Plate
11	1	BT80-41	Locking Mechanism
12	2	B80-05	Linear Bearings
13	1	B80-02	Linear Rail
14	2	BT80-40	Bearings

SWITCHES

Switches add versatility to your electric motion application. They can be used to provide end of stroke limits, count strokes, or communicate positioning to an outside source. Switches can provide safety to applications as well, preventing undesirable situations like runaways to prevent damage.

To learn more about Bimba's available switch selection, refer to the Switches section in this catalog.

AIR/PURGE PORTS

Air and purge ports are essential for actuators that operate in dirty applications. In both belt- and screw-driven actuators, ports keep dust and grime from egressing, protecting the internals of the actuator. Air and purge ports are recommended for use with Bimba's air preparation products.

When using purge ports, supply dry filtered air to the actuators in order to achieve optimal protection.

PROTECTION

Bimba offers several protection options for our actuators. Our primary options are Armoloy® and stainless steel. **Armoloy®** offers additional protection against moisture and dirt. It is used to coat the steel linear rail and bearings in a Bimba actuator. Armoloy® coating can also be applied to the aluminum extrusion upon request. **Stainless steel** works in conjunction with Armoloy® coatings, providing additional protection to the end caps and carriage.

Additional coatings are available upon request.

MOTOR MOUNTING

Motor mounts allow you to mount any motor to any actuator (within the actuator's rating). They give end users the ability to use Bimba electric actuators with the motor of their choosing. Careful considerations regarding torque limitations must be made when mounting a motor the actuator is not rated for.

To request custom motor mounting options, please supply Bimba with the following information: shaft diameter, shaft length, pilot diameter, pilot depth, bolt circle, and hole size.

CUSTOMER-REQUESTED HOLES AND DOWEL PINS

Bimba can provide custom holes and dowel pins to accommodate the customer's specific tooling and mounting holes.

For further customization, contact the factory.

NOTES