



B3S & B3W ELECTRIC RODLESS ACTUATORS



Tolomatic B3S & B3W Electric Rodless Actuators



The Power to Move Heavy Loads

The B3S and B3W electric rodless actuators have very large moment and load carrying capacities. The sealed recirculating ball bearing design makes it an excellent choice for challenging environments. For even higher capacity (loads up to 3,629 kg.) choose the Dual 180° Carrier and add an auxiliary carrier. Both actuators utilize a patented internal re-circulating ball bearing guidance system that provides extremely long life. These actuators are capable of carrying loads up to 3,629 kg [8,000 lbs].

A COMPARISON OF SCREW DRIVE ACTUATORS

	TRS	B3S	MXE-S	MXE-P	
		G	0 %	940	
Features:	Dual profile rail bearing actuator	High load and bending moment capacities	Basic guidance and support	High load and bending moment capacities	
Load up to: (with options)	6.0 kN [1,356 lbf]	35.6 kN [8,000 lbf]	4.6 kN [1,040 lbf]	11.5 kN [2,584 lbf]	
Thrust up to:	2.5 kN [562 lbf]	12 kN [2,700 lbf]	19.1 kN [4,300 lbf]	19.1 kN [4,300 lbf]	
Speed up to:	0.91 m/sec [36 in/sec]	1.5 m/sec [60 in/sec]	1.5 m/sec [60 in/sec]	1.5 m/sec [60 in/sec]	
Stroke Length up to:	1.1 m [43 in]	4.5 m [179 in]	4.5 m [178 in]	4.5m [178 in]	
Screw/Nut Type	Solid & Ball	Solid & Ball	Solid & Ball	Solid & Ball	
	www.tolor	natic.com for complete inf	ormation, search by literatu	ire number:	
Literature Number:	3600-4222	3600-4176	8300-4000	8300-4000	

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

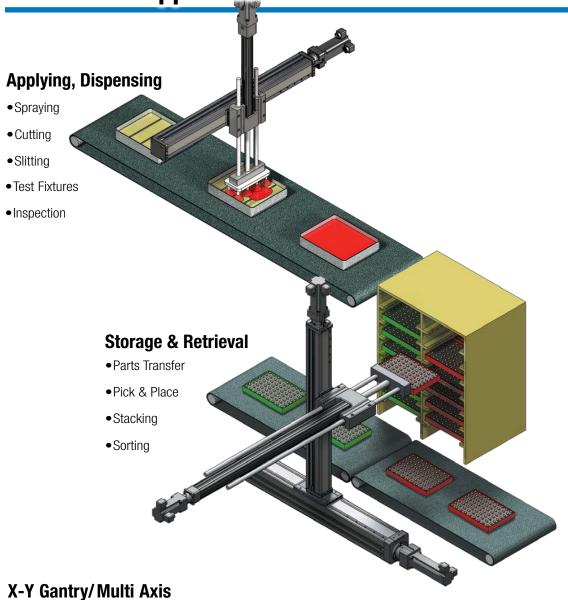
A COMPARISON OF BELT DRIVE ACTUATORS

	B3W	MXB-U	MXB-S	MXB-P					
Features:	High load and bending moment capacities	Basic thrust, requires external guidance and support	Medium load and bending moment capacities	High load and bending moment capacities					
Load up to: (with options)	35.6 kN [8,000 lbf]	NA	4.6 kN [1,040 lbf]	11.5 kN [2,584 lbf]					
Thrust up to:	1.4 kN [325 lbf]	1.9 kN [418 lbf]	1.9 kN [418 lbf]	1.9 kN [418 lbf]					
Speed up to:	5.1 m/sec [200 in/sec]	5.1 m/sec [200 in sec]	2.5 m/sec [100 in sec]	3.9 m/sec [150 in/sec]					
Stroke Length up to:	14.6 m [574 in]	10.5 m [414 in]	10.5 m [414 in]	10.5 m [414 in]					
	www.toloi	www.tolomatic.com for complete information, search by literature number:							
Literature Number:	3600-4176	8500-4000	8500-4000	8500-4000					

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

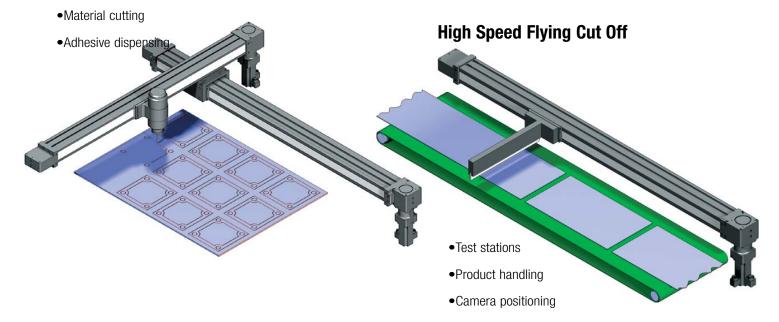


B3S & B3W Applications



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Laser marking



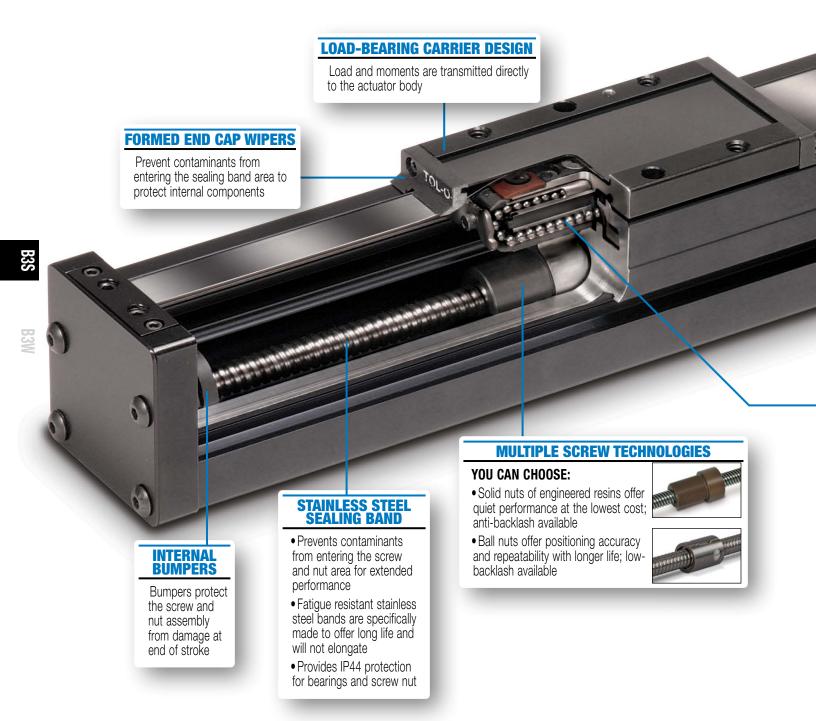
B3S RODLESS SCREW DRIVE ACTUATOR

ENDURANCE TECHNOLOGY designed for maximum durab provide extended service life.

Endurance Technology features are designed for maximum durability to

A Tolomatic Design Principle

The B3S rodless screw-drive electric actuator is designed for carrying moderate to heavy loads with large bending moment capacity. The B3S utilizes an integral recirculating ball bearing guidance system that provides durable performance and extremely long life. Choose from multiple screw technologies for thrust up 12 kN [2,700 lbf]. Built-to-order in stroke lengths up to 10.6 m [416 inches].





Tolomatic...MAXIMUM DURABILITY

SCREW SUPPORT BEARINGS

Unique high thrust bearing assembly design eliminates runout and isolates the linear forces from the drive shaft



LIGHTWEIGHT ALUMINUM DESIGN

- •Black anodized extrusion design is optimized for rigidity and strength
- •External switch channels on both sides allow easy placement and adjustment of position indicating switches

MOTOR ORIENTATION

YOU CAN CHOOSE:

- •Inline option directly couples the driving shaft and is typically a onepiece housing construction for optimum alignment and support of the motor
- Reverse-parallel option minimizes the overall length and offers a belt reduction drive with a 1:1 or 2:1 ratio

YOUR MOTOR HERE

YOU CAN CHOOSE:

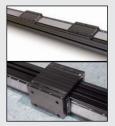
- Specify the device to be installed and actuator ships with proper mounting hardware
- •Specify and ship your device to Tolomatic for factory installation
- Motor or gearbox supplied and installed by Tolomatic

RECIRCULATING BALL **BEARING SYSTEM**



- Unique design incorporates hardened steel raceways integral to the aluminum extrusion
- Bearing surfaces are adjusted at the factory for optimum preload and smooth performance
- Recirculating ball bearing system provides guidance, high efficiency and durability

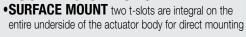
OPTIONS

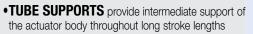


CARRIER OPTIONS

- AUXILIARY CARRIER doubles the load capacity and increases pitch and yaw bending moment
- DUAL 180° CARRIER doubles the load capacity, increases roll and yaw bending moment capacities and offers a wide mounting platform

MOUNTING OPTIONS





• **MOUNTING PLATES** provide intermediate support of the actuator body throughout long stroke lengths



Provides metric tapped holes for mounting of load to carrier and of actuator to mating surfaces



SWITCHES

Styles include: reed, hall-effect or triac. Select either 5 m potted cable with flying leads or 150 mm to quickdisconnect coupler with mating 5 m cable

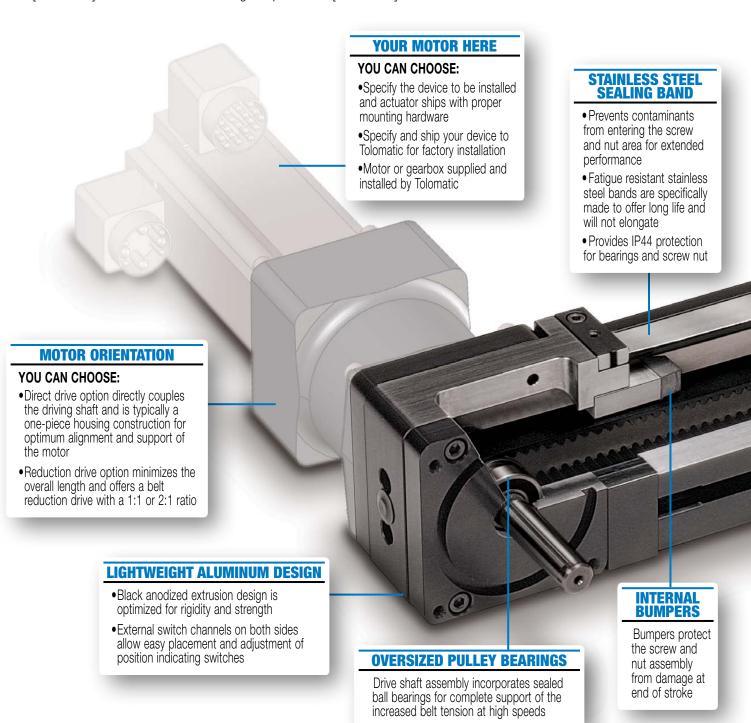


B3W RODLESS BELT-DRIVE ACTUATOR

ENDURANCE TECHNOLOGY A Tolomatic Design Principle

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

The B3W rodless belt-drive electric actuator is designed for carrying moderate to heavy loads at moderate to high speeds with large bending moment capacity. The B3W utilizes an integral recirculating ball bearing guidance system that provides durable performance and extremely long life. The B3W belt-driven actuator features speeds up to 5.1 m/ sec [200 in/sec]. Built-to-order in stroke lengths up to 5.3 m [207 inches].





Tolomatic...MAXIMUM DURABILITY

RECIRCULATING BALL BEARING SYSTEM



- Unique design incorporates hardened steel raceways integral to the aluminum extrusion
- Bearing surfaces are adjusted at the factory for optimum preload and smooth performance

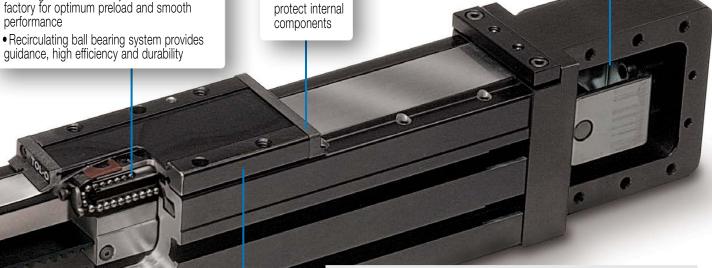
FORMED END CAP WIPERS

Prevent contaminants from entering the sealing band area to

BELT TENSIONING SYSTEM

- Full access to the idle pulley allows ease of adjustment for alignment and tensioning
- Dual adjustment screws and field tensioning kit provide simple maintenance

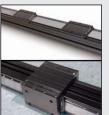




LOAD-BEARING CARRIER DESIGN

Load and moments are transmitted directly to the actuator body

OPTIONS CARRIER OPTIONS



- AUXILIARY CARRIER doubles the load capacity and increases pitch and yaw bending moment
- DUAL 180° CARRIER doubles the load capacity, increases roll and yaw bending moment capacities and offers a wide mounting platform



MOUNTING OPTIONS

- •SURFACE MOUNT two t-slots are integral on the entire underside of the actuator body for direct mounting
- •TUBE SUPPORTS provide intermediate support of the actuator body throughout long stroke lengths
- **MOUNTING PLATES** provide intermediate support of the actuator body throughout long stroke lengths

METRIC OPTION

Provides metric tapped holes for mounting of load to carrier and of actuator to mating surfaces



SWITCHES

Styles include: reed, hall-effect or triac. Select either 5 m potted cable with flying leads or 150 mm to quickdisconnect coupler with mating 5 m cable



MULTIPLE BELT TECHNOLOGIES

Polyurethane steel-cord

reinforced HTD style belt

reinforced HTD style belt

YOU CAN CHOOSE:

Polyurethane Kevlar

(standard)

B3S & B3W Electric Rodless Actuators

SPECIFICATIONS both Screw & Belt Drive

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DYNAMIC BENDING MOMENTS AND LOADS

				METRIC		U.S. CONVENTIONAL		
SINGLE (STANDARD) CARRIER		Size	10	15	20	10	15	20
Fz 1	Mx Moment (Roll)	(N-m : lb-in)	28.2	97	188	250	859	1,662
Fy Mz	My Moment (Pitch)	(N-m : lb-in)	30.4	117	166	269	1,033	1,472
My	Mz Moment (Yaw)	(N-m:lb-in)	17.6	67	96	156	596	850
Mx Z	Fy Load (Radial)	(N : lb)	1,517	3,737	5,155	341	840	1,159
	Fz Load (Lateral)	(N : lb)	2,629	6,468	8,932	591	1454	2008
AUXILIARY CARRIER: Increases rigidity, load-car	rying capacity and m	oments Size	10	15	20	10	15	20
Fz 1	Mx Moment (Roll)	*(N-m : lb-in)	57	194	376	500	1,718	3,324
Fy	My Moment (Pitch)	*(N-m : lb-in)	319	1,326	1,838	2,825	11,734	16,265
My	Mz Moment (Yaw)	*(N-m : lb-in)	184	766	1,061	1,630	6,779	9,388
Mx I	Fy Load (Radial)	(N : lb)	3,034	7,473	10,311	682	1,680	2,318
	Fz Load (Lateral)	(N : Ib)	5,258	12,935	17,864	1,182	2,908	4,016
	Minimum Dimension	1 'D' (mm : in)	124	205	206	4.88	8.07	8.10
DUAL 180° CARRIER: Allows 90° rotation of load,	adds load bearing su	rface Size	10	15	20	10	15	20
Fz ↑	Mx Moment (Roll)	(N-m : lb-in)	74	279	512	657	2,468	4,527
Fy Mz	My Moment (Pitch)	(N-m : lb-in)	35.3	135	192	312	1,192	1,700
My	Mz Moment (Yaw)	(N-m : lb-in)	61	233	333	538	2,066	2,944
MX l	Fy Load (Radial)	(N : lb)	5,258	12,935	17,864	1,182	2,908	4,016
	Fz Load (Lateral)	(N : lb)	3,034	7,473	10,311	682	1,680	2,318
AUXILIARY DUAL 180° CARRIER: Substantially in	creases moment and	loads Size	10	15	20	10	15	20
Fz ‡	Mx Moment (Roll)	* (N-m : lb-in)	149	558	1,023	1,314	4,936	9,054
Fy Mz	My Moment (Pitch)	* (N-m : lb-in)	376	1,532	2,121	3,328	13,558	18,776
,	Mz Moment (Yaw)	* (N-m : lb-in)	652	2,652	3,675	5,768	23,468	32,530
"0"	Fy Load (Radial)	(N : lb)	10,516	25,871	35,728	2,364	5,816	8,032
	Fz Load (Lateral)	(N : lb)	6,067	14,946	20,622	1,364	3,360	4,636
	Minimum Dimension	'D' (mm : in)	124	205	206	4.88	8.07	8.10



The Dual 180° carrier requires its own proprietary tube supports and foot mounts. See dimensional information. Breakaway torque will also increase when using the Auxiliary carrier or the Dual 180° carrier options. When ordering, determine working stroke and enter this value into the configuration string. Overall actuator length will automatically be calculated.

Deflection Considerations: In applications where substantial Mx or My moments come into play, deflection of the cylinder tube, carrier and supports must be considered. The deflection factors shown in the Load Deflection charts on the following page are based on cylinder mounted with tube supports at minimum recommended spacing. If more rigidity is desired, refer to the Auxiliary or Dual Carrier options.

*Loads shown in table are at minimum "D" dimension, for ratings with longer "D" dimension see graphs on page B3_10.

Life of the actuator will vary for each application depending on the combined loads, motion parameters and operating conditions. The load factor (L_r) ratios for each application must not exceed a value of 1.5 (see formula at right). Exceeding a load factor

 $L_F = \frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} \le 1.5$

With combined loads, L must not exceed the



of 1.5 will diminish the actuator's rated life.

B3S & B3W Electric Rodless Actuators

SPECIFICATIONS both Screw & Belt Drive

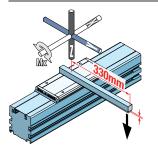
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LOAD DEFLECTION

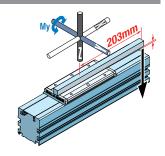
DEFLECTION ABOUT X AXIS

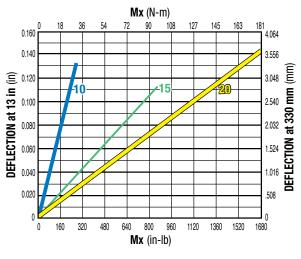
DEFLECTION ABOUT Y AXIS

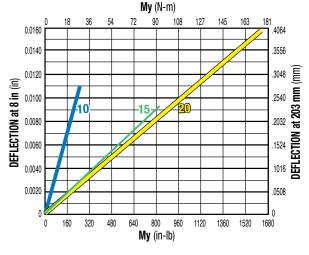


DEFLECTION TESTING WAS DONE UNDER THESE CRITERIA:

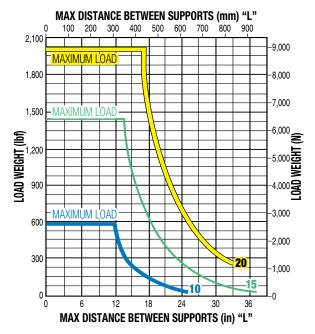
- 1.) Actuator was properly mounted with distance between supports within recommendations (see Support Recommendations below)
- 2.) Deflection was measured from center of carrier as shown (Mx = 330mm, My = 203mm)

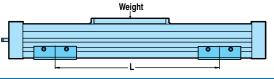




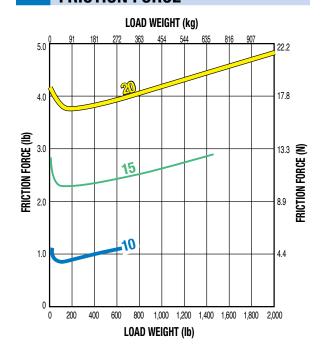


SUPPORT RECOMMENDATIONS





FRICTION FORCE



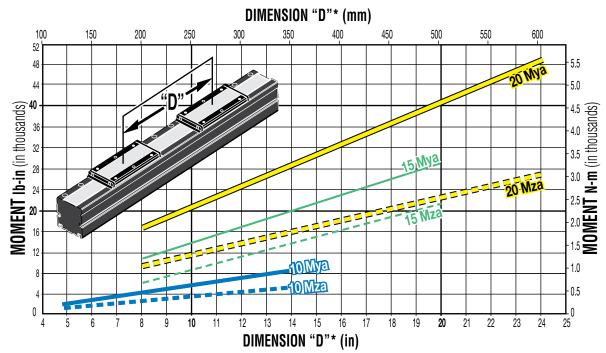


SPECIFICATIONS both Screw & Belt Drive

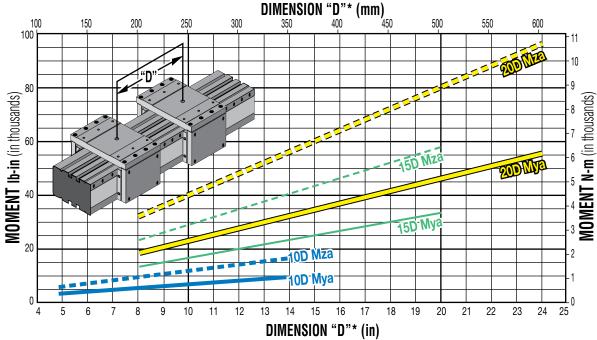
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AUXILIARY CARRIER: BENDING MOMENT AT 'D' DISTANCE



AUXILIARY DUAL 180° CARRIER: BENDING MOMENT AT 'D' DISTANCE



Rates shown on both graphs were calculated with these assumptions: 1.) Coupling between carriers is rigid.

- * Customer must specify Dimension "D" (Distance between carrier center lines) when ordering.
- 2.) Load is equally distributed between carriers.
- 3.) Coupling device applies no misalignment loads to carriers.

Life of the actuator will vary for each application depending on the combined loads, motion parameters and operating conditions. The load factor (L_F) ratios for each application must not exceed a value of 1.5 (see formula at right). Exceeding a load factor of 1.5 will diminish the actuator's rated life. $L_F = \frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} \le 1.5$

With combined loads, L_F must not exceed the value 1.5

SPECIFICATIONS Related to Actuator Size and Screw Selection

METRIC LEAD SCREWS

	SCREW		LEAD	LEAD		MAX	MAX	INERTIA (kg-m² x) BASE ACTUATOR		10 ⁻⁶)	BREAKAWAY
	DIA.	SCREW	(mm/	ACCURACY	BACKLASH					PER/mm OF	TORQUE
	(mm)	ТҮРЕ	turn)	(mm/300)	(mm)	(N)	(mm)	In Line	Rev. Parallel	STROKE	(N-m)
B3S10	10	BNM	10	0.10	0.06	1,832	1,630	1.14	1.43	0.176	0.13
DOOTU	12	SN	12.0	0.13	0.18	800	3,459	3.03	4.50	0.410	0.20
B3S15	15	SN	12.0	0.13	0.18	900	3,388	11.35	12.96	0.966	0.27
DOOLO	16	BN(L)	5.0	0.13	0.38	7,300	3,388	11.93	14.04	1.258	0.16
B3S20	20	BN(L)	5.0	0.13	0.38	11,700	3,337	36.97	39.28	3.102	0.25

⁽L) for low backlash ball screws: backlash = 0.05 mm

INCH (US Conventional) LEAD SCREWS

	SCREW			LEAD		MAX	MAX	INERTIA (Ib-in²) BASE ACTUATOR PER			BREAKAWAY
	DIA.	SCREW	TPI	ACCURACY	BACKLASH	THRUST*	STROKE			PER/in OF	TORQUE
	(in)	TYPE	(turns/in)	(in/ft)	(in)	(lbf)	(in)	In Line	Rev. Parallel	STROKE	(lb-in)
	0.375	BN(L)	08	0.004	0.015	130	64.2	0.0034	0.0042	0.0005	1.125
	0.500	SN	05	0.006	0.007	170	136.2	0.0114	0.0142	0.0017	1.250
B3S10	0.500	SN	02	0.005	0.007	170	134.2	0.0159	0.0187	0.0017	1.750
	0.500	SNA	02	0.005	0.003	170	134.2	0.0193	0.0221	0.0017	1.750
	0.500	SN	01	0.006	0.007	170	100.2	0.0320	0.0348	0.0017	2.500
	0.500	BN(L)	02	0.003	0.015	800	61.4	0.0253	0.0282	0.0017	1.563
	0.625	BN(L)	05	0.003	0.015	800	61.4	0.0397	0.0467	0.0042	1.250
B3S15	0.625	SN	02	0.005	0.007	200	133.4	0.0480	0.0550	0.0042	1.875
	0.625	SNA	02	0.005	0.003	200	133.4	0.0480	0.0550	0.0042	1.875
	0.750	SN	01	0.005	0.007	300	133.4	0.1185	0.1329	0.0087	2.813
Pacau	0.750	BN(L)	02	0.004	0.015	2,700	131.4	0.1159	0.1224	0.0087	3.125
B3S20 -	0.750	BN(L)	05	0.003	0.015	950	131.4	0.1045	0.1110	0.0087	2.188

⁽L) for low backlash ball screws: backlash = 0.0020"

SCREW CODE DESCRIPTION

SN Solid Nut

SNA Anti-backlash Solid Nut

BN Ball Nut

BNL Low-Backlash Ball Nut

Contact Tolomatic for higher accuracy and lower backlash options.

* For Acme screws, maximum thrust is the maximum continuous dynamic thrust subject to Thrust x Velocity limitation.

For ball screws, maximum thrust reflects 90% reliability for 25 million linear millimeters of travel.



SPECIFICATIONS

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METRIC

	WEI	WEIGHT WEIGHT		¹ STRAIGHTNESS &	² TEMPERATURE	
	CARRIER	BASE	UNIT OF STROKE	FLATNESS (supported)	RANGE	
	(kg)	(kg)	(g/mm)	(mm)	(°C)	³ IP RATING
B3S10	0.40	1.00	5.40			
B3S15	0.70	3.96	10.18	0.00067 x L*	4 - 54	44
B3S20	0.97	0.97 6.52 15.73				

INCH (US Conventional)

	WEI	GHT	WEIGHT PER	¹ STRAIGHTNESS &	² TEMPERATURE	
	CARRIER BASE		UNIT OF STROKE		RANGE	
	(lbs)	(lbs)	(lbs/in)	(in)	(°F)	³ IP RATING
B3S10	0.85	2.15	0.30			
B3S15	1.56	8.75	0.57	0.00067 x L*	40 - 130	44
B3S20	2.15	14.38	0.88			



¹The 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 such deviation, so good engineering practices such as measurement, mapping, etc. must be employed in applications with stringent straightness/flatness requirements.

² 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.

³ Protected against ingress of solid particles greater than .039 in (1mm)

and splashing water.

*"L" is maximum distance between supports— See the support recommendation graph on page B3 9.

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.

LEAD SCREW EFFICIENCY

SCREW/NUT	SIZE					
STYLE	10	15	20			
Composite (ACME)		0.60				
Ball		0.90				
Ball Low Backlash		0.85				

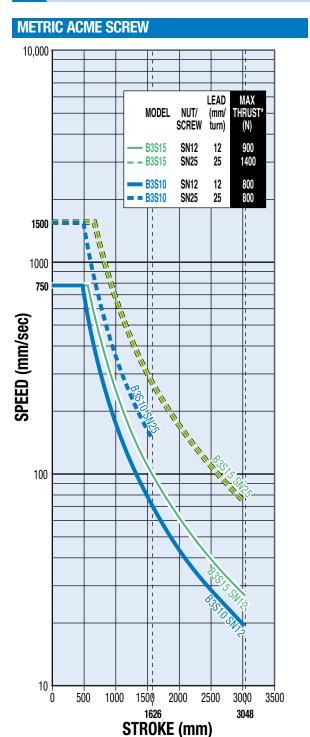


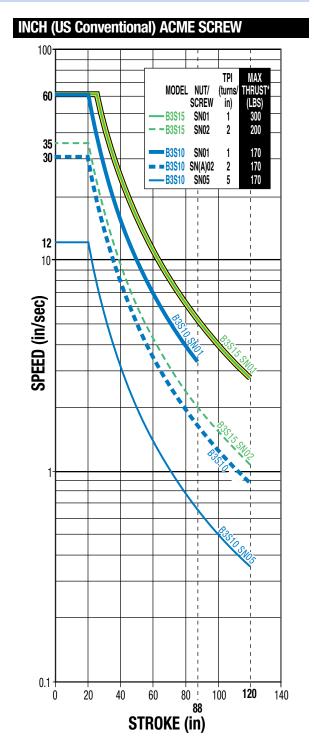
ACME SCREW/NUT COMBINATIONS

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ACME SCREW CRITICAL SPEED CAPACITIES







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

Dotted lines represent maximum stroke for screw selections.

For Screw PV limits, refer to the individual charts located in the technical section for each actuator body size.

SCREW CODE DESCRIPTION SN **Solid Nut SNA Anti-backlash Solid Nut**



ACME SCREW/NUT COMBINATIONS

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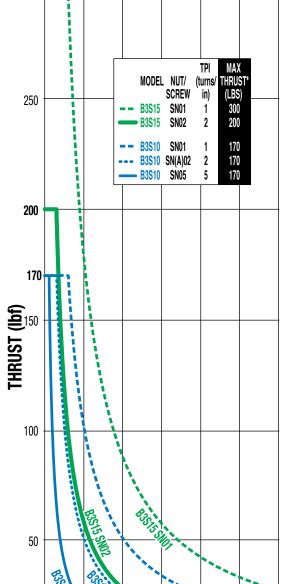


ACME SCREW PV LIMITS

METRIC ACME SCREW

1500 1400 LEAD MAX MODEL NUT/ (mm/ **SCREW** turn) B3S15 SN25 1400 25 1200 12 900 B3S15 SN12 B3S10 SN25 25 800 12 B 3S10 SN12 800







900

800

300

0

300

THRUST (N)



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

1200

1500

600 **750** 900

SPEED (mm/sec)

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

$$\begin{array}{c|c} P & x & V & \leq 0.1 \\ \left(\frac{Thrust}{(Max. Thrust \, Rating)}\right) x & \left(\frac{Speed}{(Max. Speed \, Rating)}\right) \leq 0.1 \end{array}$$

SPEED (in/sec)



50

60

0

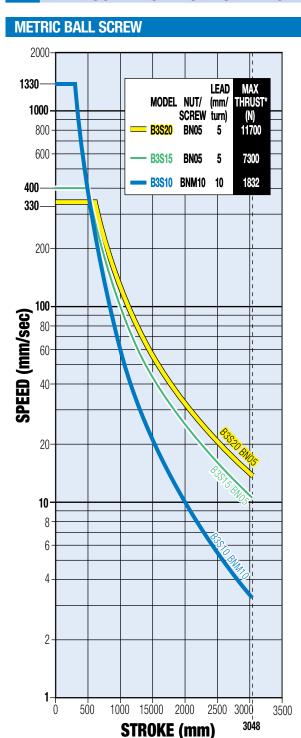
10**12**

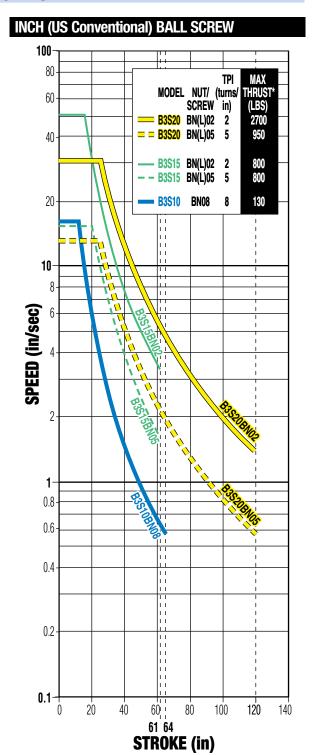
BALL SCREW/NUT COMBINATIONS

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BALL SCREW CRITICAL SPEED CAPACITIES







* Maximum thrust reflects 90% reliability for 25 million linear millimeters of travel.

Dotted lines represent maximum stroke for screw selections.

SCREW CODE DESCRIPTION
BN Ball Nut

BNL Low-Backlash Ball Nut



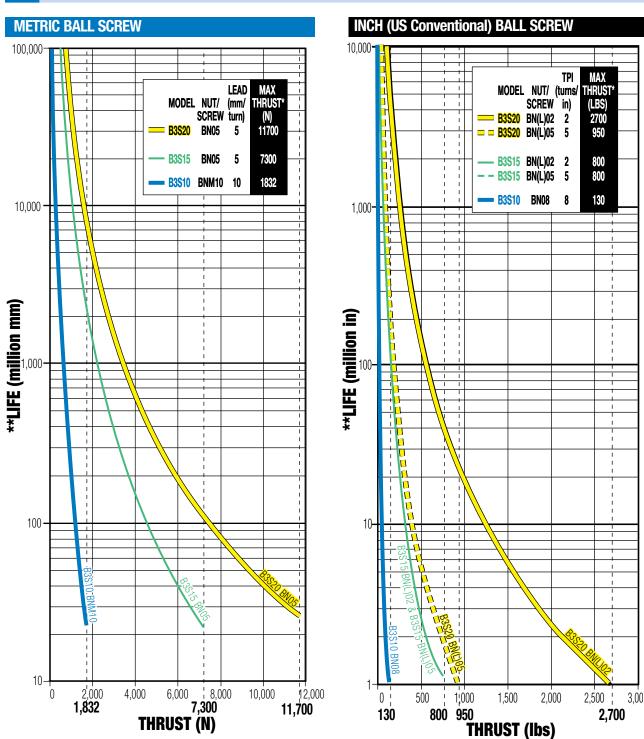
BALL SCREW/NUT COMBINATIONS

sizeit.tolomatic.com for fast. accurate actuator selection



BALL SCREW LIFE CAPACITIES

B3S Electric Screw Drive Rodless Actuators





* Maximum thrust reflects 90% reliability for 25 million linear millimeters of travel.

Dotted lines represent maximum thrust for screw selections.

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

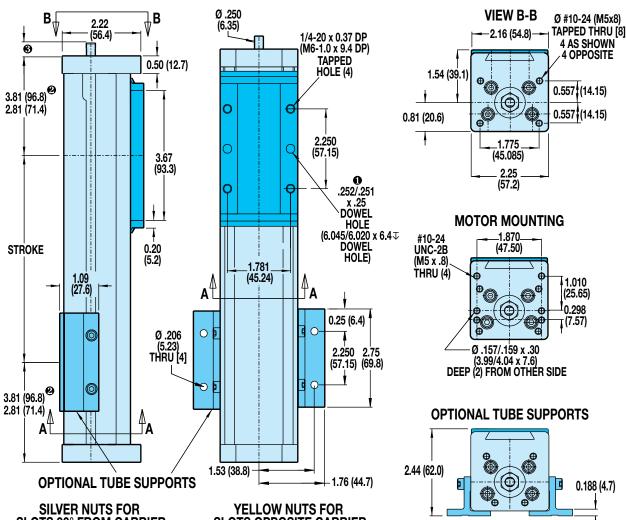


DIMENSIONS Actuator & Options

3D CAD available at www.tolomatic.comAlways use configurated CAD solid model

ways use configurated CAD solid model to determine critical dimensions





SILVER NUTS FOR SLOTS 90° FROM CARRIER #3410-1013 [4410-1013]

Ø#10-24 (M5-0.8)

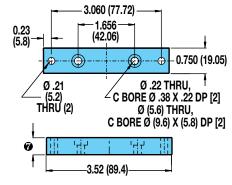
TAPPED HOLE
(CENTERED)

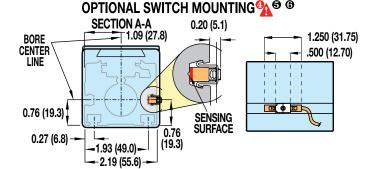
0.66 (16.8)

0.25 (6.4)

YELLOW NUTS FOR SLOTS OPPOSITE CARRIER #3410-1775 [4410-1708]

OPTIONAL MOUNTING PLATES





- DOWEL PINS | .003 (08mm) | M

CAUTION: DO NOT OVERTIGHTEN SWITCH HARDWARE WHEN INSTALLING

- NOTE: The scored face of the switch indicates the sensing surface and must face toward the magnet
- NOTE: Some actuators require switch mounting on a specific side of the actuator. Call Tolomatic 1-800-328-2174 for details
- LMI with MRS is 1" (25.4mm) thick LMI with all others is 1/2" (12.7mm) thick RP, (YMH) all motors is 1/2" (12.7mm) thick

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

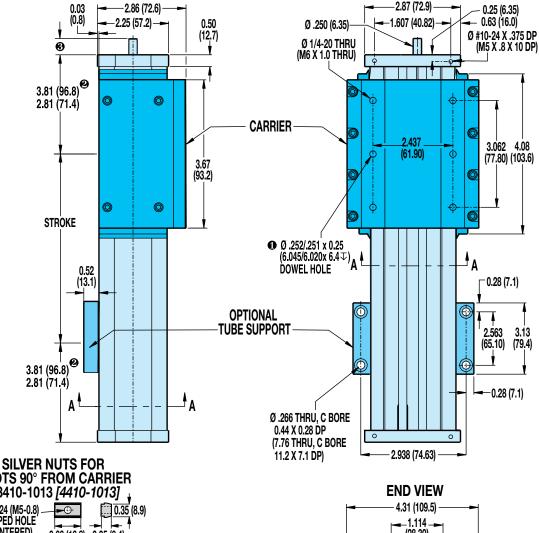


DIMENSIONS Dual 180° Option

3D CAD available at www.tolomatic.com







SLOTS 90° FROM CARRIER #3410-1013 [4410-1013]

Ø#10-24 (M5-0.8) TAPPED HOLE (CENTERED) 0.66 (16.8) 0.25 (6.4)

SECTION A-A 0.20 SENSING SURFACE (5.1)1.250 (31.75) 0.76 (19.3) .500 (12.70) 1.09 (27.8) 0.76 (19.3)

(28.30)0.14 (3.6) 2.83 2.25 (71.8) (57.2) **(** (45.09)0 -o` Ø #10-24 THRU (37.1)(M5 X 0.8 THRU) [8] 2.18 (55.5) 4 AS SHOWN, 4 OPPOSITE

● DOWEL PINS | **←** | .003 (08mm) | **M ❷** FOR SNA02 STYLE ONLY

BORE CENTER LINE

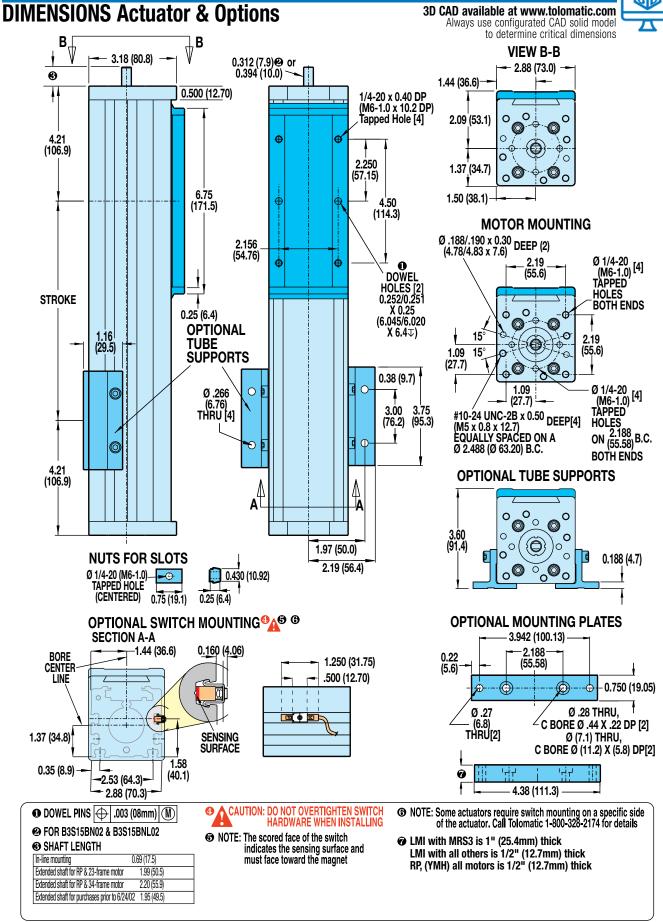
SHAFT LENGTH 0.55 (13.8) In-line mounting Extended shaft for RP & 23-frame motor 1.99 (50.5) Extended shaft for RP & 34-frame motor 2.20 (55.9) Extended shaft for purchases prior to 6/24/02 1.63 (41.4)

CAUTION: DO NOT OVERTIGHTEN SWITCH HARDWARE WHEN INSTALLING

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

NOTE: Some actuators require switch mounting on a specific side of the actuator. Call Tolomatic 1-800-328-2174 for details





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

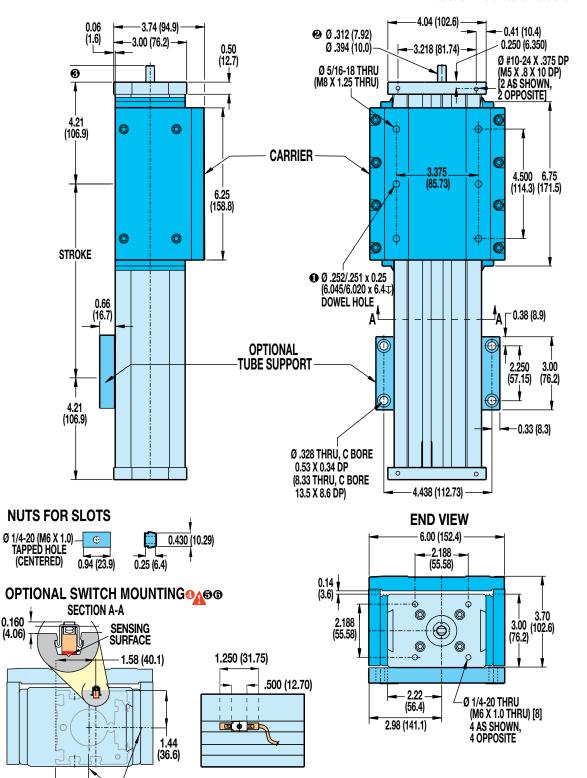


DIMENSIONS Dual 180° Option

3D CAD available at www.tolomatic.com

Always use configurated CAD solid model to determine critical dimensions





DOWEL PINS								
\bigoplus	.003 (08mm)	(M)						
❷ FOR B3S15BN02 &								

1.37 (34.8)

0.160

SHAFT LENGTH 0.69 (17.5) In-line mounting Extended shaft for RP & 23-frame motor 1.99 (50.5) 2.20 (55.9) Extended shaft for RP & 34-frame motor Extended shaft for purchases prior to 6/24/02 1.95 (49.5)

BORE CENTER LINE

CAUTION: DO NOT OVERTIGHTEN SWITCH HARDWARE WHEN INSTALLING

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

ONOTE: Some actuators require switch mounting on a specific side of the actuator. **Call Tolomatic** 1-800-328-2174 for details

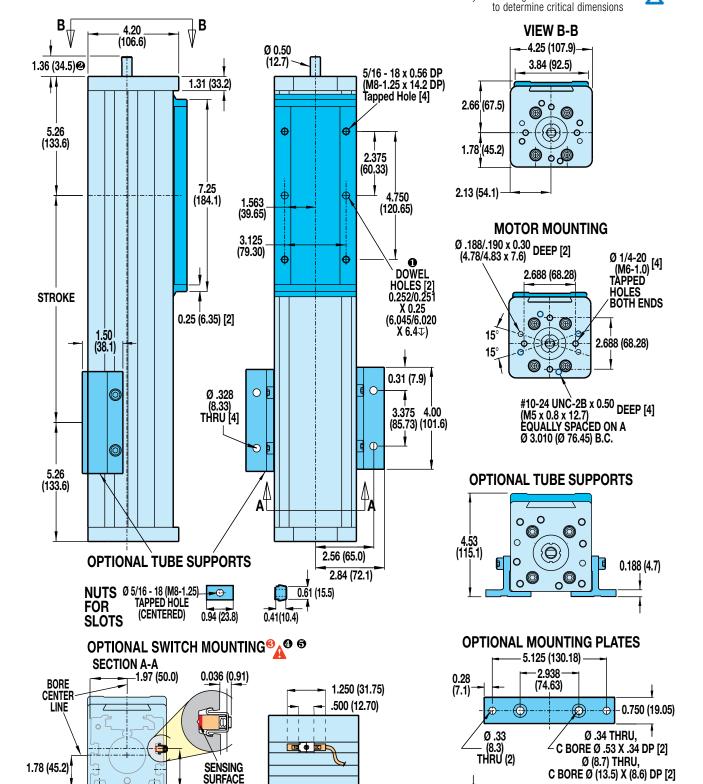


B3S15BNL02

DIMENSIONS Actuator & Options

3D CAD available at www.tolomatic.comAlways use configurated CAD solid model







-3.44 (87.3)-

-3.94 (100.0)

2.14 (54.4)



NOTE: The scored face of the switch indicates the sensing surface and must face toward the magnet NOTE: Some actuators require switch mounting on a specific side of the actuator. Call Tolomatic 1-800-328-2174 for details

5.69 (144.5)

0.50 (12.7)



0.50 (12.7)-

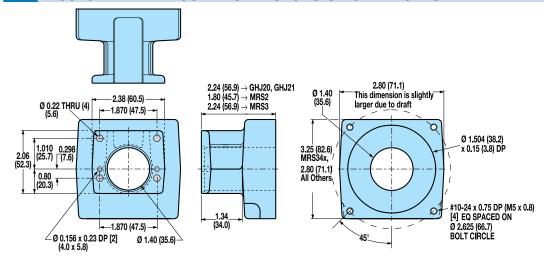
DIMENSIONS Dual 180° Option 3D CAD available at www.tolomatic.com Always use configurated CAD solid model to determine critical dimensions 4.83 (122.7)-5.25 (133.4) (4.1)4.25 (108.0) - Ø .500 (12.70) 0.66 (16.8) 1.31 (33.3) -3.845 (97.66) Ø 1/4-20 X 0.50 DP Ø 3/8-16 THRU 1.36 (34.5) (M6 X 1.0 X 12 DP) (M10 X 1.5 THRU) 5.26 (133.6) 0 **CARRIER** .5.125 6.000 7.25 (152.40) (184.2) (130.18)6.75 (171.5) 0 0 ф **STROKE** ① Ø .252/.251 x 0.25 (6.045/6.020 x 6.4↓ DOWEL HOLE 0.62 -0.38(8.9)(15.9)**OPTIONAL** TUBE SUPPORT 2.250 3.00 (76.2) (57.15) 5.26 (133.6)0.38 (8.9) Ø .391 THRU, C BORE 0.63 X 0.41 DP (9.93 THRU, C BORE 5.25 (133.4) 16.0 X 10.4 DP) **NUTS FOR SLOTS** Ø 5/16-18 (M8 X 1.25)-TAPPED HOLE **END VIEW** 0.61 (15.5) 7.41 (188.2) (CENTERED) 0.94 (23.9) 2.688 (68.28) OPTIONAL SWITCH MOUNTING ® ♠ ⊕ ⊕ .<u>o</u>.<u></u>6. **SECTION A-A** 4.80 4.25 (121.9) (108.0) 0.036 (0.91) 2.688 (68.28) SENSING SURFACE .^{О.}Ф.О 2.14 (54.4) 1.250 (31.75) .500 (12.70) 2.42 (61.5)3.50 (88.9) 1.97 (50.0)1.78 (45.2) **BORE CENTER LINE ❸ A**CAUTION: DO NOT OVERTIGHTEN SWITCH **NOTE:** Some actuators require switch mounting ● DOWEL PINS | .003 (08mm) | M HARDWARE WHEN INSTALLING on a specific side of the actuator. Call **❷ FOR EXTENDED SHAFT 2.11 (53.6)** NOTE: The scored face of the switch Tolomatic 1-800-328-2174 for details indicates the sensing surface and must face toward the magnet

DIMENSIONS Actuator & Options

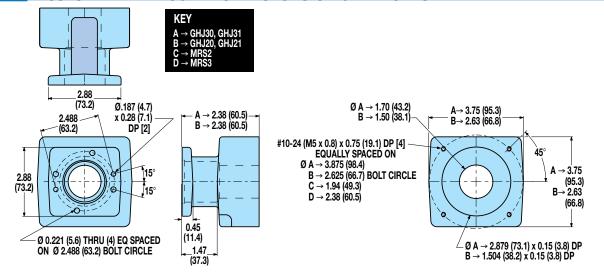
3D CAD available at www.tolomatic.com Always use configurated CAD solid model



B3S10: IN-LINE MOUNT FOR MOTORS OR GEARBOXES

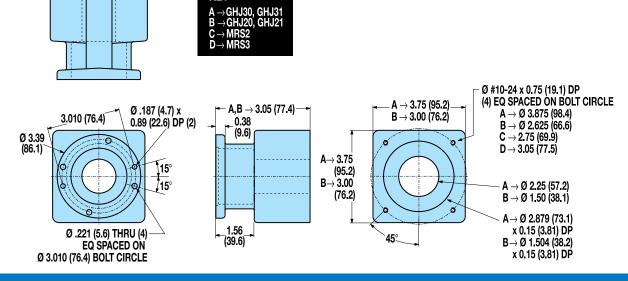


B3S15: IN-LINE MOUNT FOR MOTORS OR GEARBOXES



B3S20: IN-LINE MOUNT FOR MOTORS OR GEARBOXES

KEY



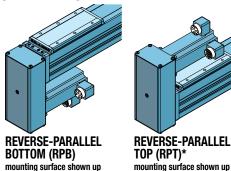


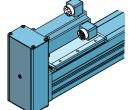
DIMENSIONS Reverse Parallel Mounting

3D CAD available at www.tolomatic.com Always use configurated CAD solid model to determine critical dimensions



STANDARD CARRIER

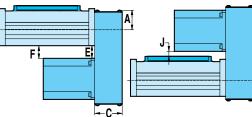




REVERSE-PARALLEL LEFT (RPL) mounting surface shown up

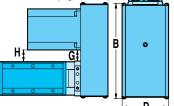
REVERSE-PARALLEL RIGHT (RPR) mounting surface shown up

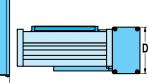
BOTTOM MOUNT



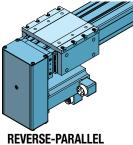
TOP MOUNT

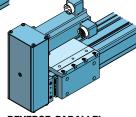
SIDE MOUNT (Right Shown)

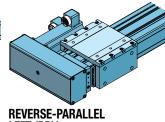


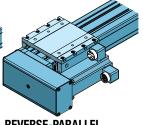


DUAL 180° CARRIER









REVERSE-PARALLEL BOTTOM (RPB) mounting surface shown up

REVERSE-PARALLEL TOP (RPT)* mounting surface shown up

LEFT (RPL) mounting surface shown up

REVERSE-PARALLEL RIGHT (RPR) mounting surface shown up

Reduction Drive Weight

		kg	lb
10	1:1 & 2:1 Ratio	0.93	2.06
15	1:1 Ratio	0.98	2.17
15	2:1 Ratio	1.09	2.40
	1:1 Ratio	1.39	3.07
20	2:1 Ratio	1.47	3.23
20	1:1 Ratio	1.42	3.13
	2:1 Ratio	1.49	3.29

Reduction Inertia at Motor Shaft

		kg-cm ²	lb-in ²
10	1:1 Ratio	0.2559	0.0875
10	2:1 Ratio	0.3291	0.1125
15	1:1 Ratio	0.2043	0.0700
15	2:1 Ratio	0.2767	0.0950
20	1:1 Ratio	0.3447	0.1180
20	2:1 Ratio	0.2928	0.1000

*A NOTE: RPT is generally not recommended because the load may interfere with the motor. Stops or spacers may be required.

Reduction Efficiency: 0.95

	Frame Size	A	В	C	D	E	F	G	Н	J
10	23	42.6	178.6	54.0	82.6	45.6	46.8	37.6	38.4	26.9
15	23	36.6	191.3	54.0	82.6	44.1	44.1	40.8	42.3	25.3
13	34	53.8	208.6	60.3	101.6	27.7	27.7	24.4	25.9	8.9
20	23	63.8	238.4	60.3	101.6	59.5	59.6	50.8	54.7	37.2
	34	63.8	251.5	60.3	101.6	43.2	43.2	34.4	38.4	20.9

	Frame Size	A	В	C	D	E	F	G	Н	J
10	23	1.68	7.03	2.13	3.25	1.80	1.84	1.48	1.51	1.06
15	23	1.44	7.53	2.13	3.25	1.74	1.74	1.61	1.67	1.00
13	34	2.12	8.21	2.38	4.00	1.09	1.09	0.96	1.02	0.35
20	23	2.51	9.38	2.38	4.00	2.34	2.35	2.00	2.16	1.47
20	34	2.51	9.90	2.38	4.00	1.70	1.70	1.36	1.51	0.82

Dimensions in millimeters

Dimensions in inches



33

B3W Electric Belt Drive Rodless Actuators

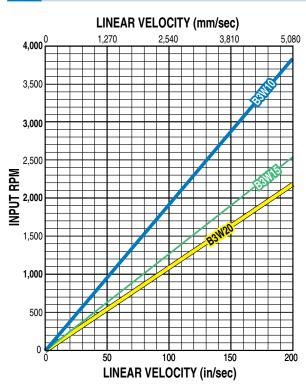
PERFORMANCE

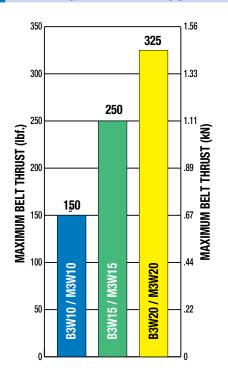
sizeit.tolomatic.com for fast, accurate actuator selection



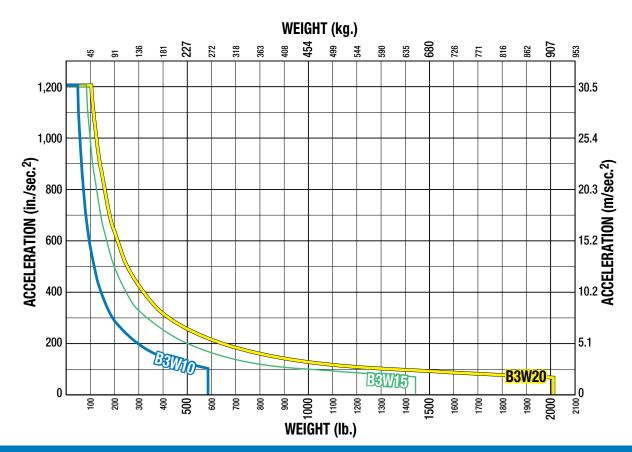


MAXIMUM BELT THRUST





MAXIMUM ACCELERATION AS A FUNCTION OF LOAD WEIGHT





B3W Electric Belt Drive Rodless Actuators

SPECIFICATIONS

sizeit.tolomatic.com for fast, accurate actuator selection



METRIC

INCH (U.S. Conventional)

									iiuij
			B3W10	B3W15	B3W20		B3W10	B3W15	B3W20
	Max. Stroke	mm	14,579	10,566	8,128	in	574	416	320
	Max. Velocity	m/sec	5.08	5.08	5.08	in/sec	200	200	200
	Max. Acceleration	m/sec²	30.48	30.48	30.48	in/sec²	1,200	1,200	1,200
	Max. Input Torque	N-m	8.5	21.2	32.2	lb-in	75.2	188.0	285.0
ray	Standard (single) Carrier	N-m	1.06	1.41	3.18	lb-in	9.38	12.5	28.13
Breakaway Torque	Dual 180° or Aux. Carrier	N-m	1.34	1.69	3.53	lb-in	11.88	15	31.25
Bre	Dual 180 & Aux Carrier	N-m	1.91	2.82	5.37	lb-in	16.88	25	47.5
	Pulley Pitch Dia.	mm	25.48	38.2	44.55	in	1.003	1.504	1.754
	Stroke per Rev.	mm/rev	80.04	120.02	139.95	in/rev	3.151	4.725	5.51
	Repeatability	mm	+/- 0.05	+/- 0.05	+/- 0.05	in	+/- 0.002	+/- 0.002	+/- 0.002
	Straightness & Flatness ¹	mm	0.017 x L*	0.017 x L*	0.017 x L*	in	0.00067 x L*	0.00067 x L*	0.00067 x L*
	Temp. Range ²	°C	4 - 54	4 - 54	4 - 54	°F	40 - 130	40 - 130	40 - 130
	IP Rating ³	IP	44	44	44	IP	44	44	44
	Weight (zero stroke)	kg	3.42	11.39	16.06	lb	7.54	25.12	35.4
	Weight (per unit of stroke)	kg/mm	0.0069	0.0071	0.0128	lb/in	0.389	0.395	0.716
	Weight of pulley	kg	0.0068	0.0244	0.047	lb	0.015	0.054	0.1036
	Weight of carrier	kg	0.39	0.71	0.97	lb	0.85	1.56	2.14
	Inertia (zero stroke)	kg-cm ²	0.833	4.073	7.786	lb-in²	0.2846	1.3917	2.6607
	Inertia (per unit of stroke)	kg-cm²/ mm	0.00018	0.0002	0.00131	lb-in²/in	0.0016	0.0017	0.0114
	Inertia of pulley	kg-cm ²	0.027	0.219	0.422	lb-in²	0.0093	0.0748	0.1441
	Inertia of carrier	kg-cm ²	0.305	1.489	2.847	lb-in²	0.1041	0.5089	0.9728



¹The 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 such deviation, so good engineering practices such as measurement, mapping, etc. must be employed in applications with stringent straightness/flatness requirements.

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.

NOTE: Zero stroke inertia and weight are for an assembled actuator (including carrier, pulley and belt material) that has zero stroke length. To calculate system inertia use the formula below:

System Inertia = Inertia (zero stroke) + [Inertia (per unit of stroke) x number of units] (For weight calculation substitute inertia with weight in the above formula)



² 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.

³ Protected against ingress of solid particles greater than 1 mm (.039 in) and splashing water. *"L" is maximum distance between supports - See Support Recommendations graph pg B3_9.

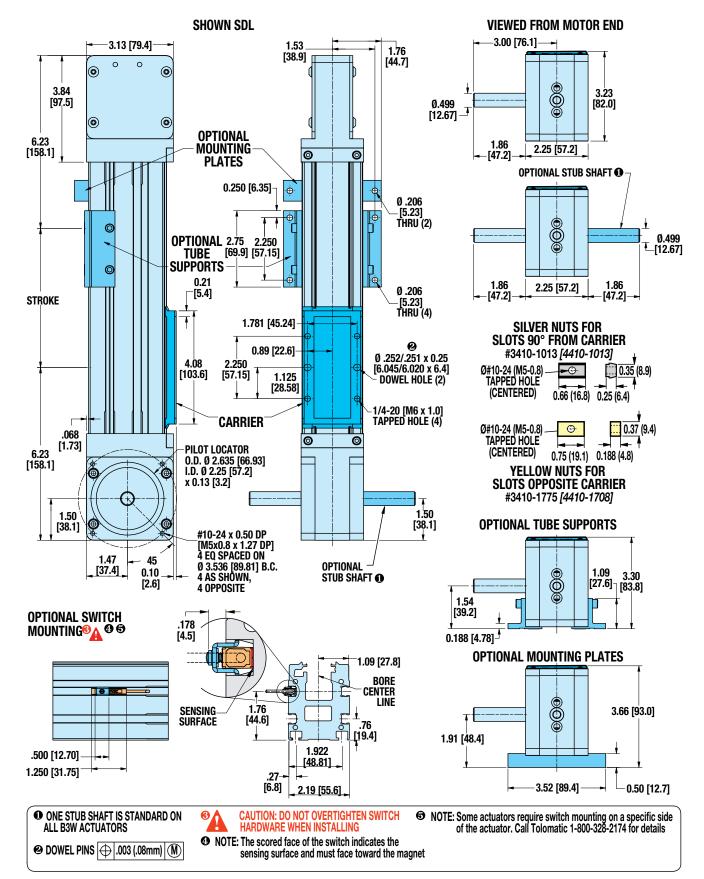
B3W10 Electric Belt Drive Rodless Actuators

DIMENSIONS Actuator & Options

3D CAD available at www.tolomatic.com
Always use configurated CAD solid model

Always use configurated CAD solid model to determine critical dimensions

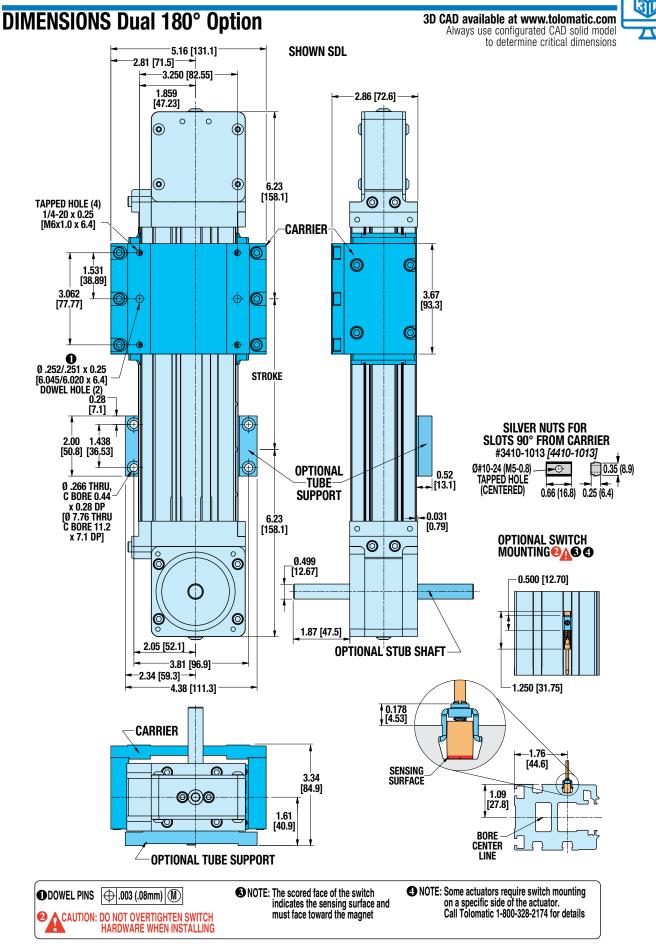




Unless otherwise noted, all dimensions shown are in inches [Dimensions in brackets are in millimeters]



B3W10 Electric Belt Drive Rodless Actuators





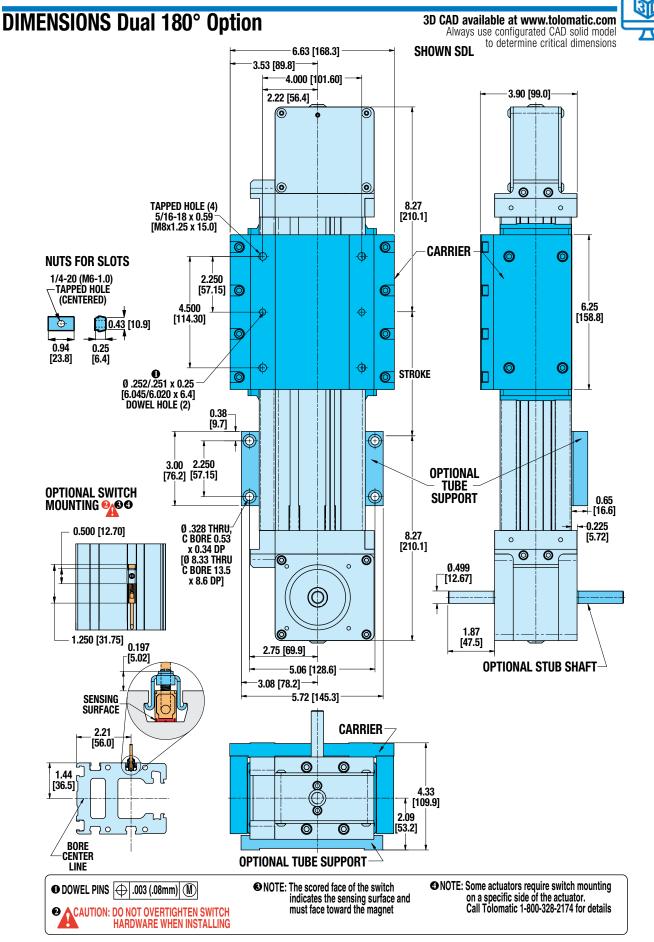
B3W15 Electric Belt Drive Rodless Actuators

DIMENSIONS Actuator & Options 3D CAD available at www.tolomatic.com Always use configurated CAD solid model to determine critical dimensions **VIEWED FROM MOTOR END SHOWN SDL** 2.19 [55.7] 4.00 [101.6] -3.53 [89.7] 1.97 [50.1] 4.45 [113.0] [104.3] **OPTIONAL** MOUNTING 8.27 [210.1] **PLATES** 0 0 • 3.33 [84.5] [9.5] **OPTIONAL STUB SHAFT** ∂ **OPTIONAL** 3.75 TUBE [95.3]SUPPORTS 3.000 [76.20] Ø .499 [12.67] 0.25 1.87 [6.4] Ø .266 --[6.76] THRU (4) [47.5] 2.156 3.33 [84.5] **STROKE** [54.76] 1.078 4.500 [27.38] [114.30] **NUTS FOR SLOTS** 6.75 Ø .252/.251 x 0.25 [171.5] [6.045/6.020 x 6.4] 1/4-20 (M6-1.0) TAPPED HOLE 2.250 DOWEL HOLE (2) [57.15] 0.75 (CENTERED) [19.1] [6.4] 1/4-20 [M6 x 1.0] 0.02 CARRIER PILOT LOCATOR TAPPED HOLE (4) [0.4]ПП 111 O.D. Ø 2.635 [66.93] I.D. Ø 2.25 [57.2] 0 ۰ • ⊚ [210.1] x 0.13 [3.2] **OPTIONAL TUBE SUPPORTS** #10-24 x 0.50 1.75 1.75 [M5 x 0.8 x 12.7] [44.5] [44.5] 4 EQ SPACED ON Ø 3.536 [89.81] B.C. 4 AS SHOWN [107.7] 3.53 [89.7] **⊚** [43.7] 4 OPPOSITE **OPTIONAL** 0.11 1.85 STUB SHAFT **①** [2.7] 1.61 [47.1] [40.9] 0.188 **OPTIONAL SWITCH** [4.78] 0.197 **MOUNTING** [5.02] 1.44 **OPTIONAL MOUNTING PLATES** [36.5] BORE CENTER LINE 4.59 [116.6] 0.76 2.21 SENSING SURFACE [19.4] [56.0] 2.21 [56.1] 2.53 .500 [12.70] [64.3] 0.34 1.250 [31.75] [8.7] 2.88 [73.0] 4.38 [111.3] 0.50 [12.7] CAUTION: DO NOT OVERTIGHTEN SWITCH HARDWARE WHEN INSTALLING NOTE: Some actuators require switch mounting on a specific side of the actuator. Call Tolomatic 1-800-328-2174 for details • ONE STUB SHAFT IS STANDARD ON **ALL B3W ACTUATORS** NOTE: The scored face of the switch indicates the **❷** DOWEL PINS |⊕|.003 (.08mm)| **M**) sensing surface and must face toward the magnet

Unless otherwise noted, all dimensions shown are in inches [Dimensions in brackets are in millimeters]



B3W15 Electric Belt Drive Rodless Actuators





B3W20 Electric Belt Drive Rodless Actuators

DIMENSIONS Actuator & Options 3D CAD available at www.tolomatic.com Always use configurated CAD solid model to determine critical dimensions 2.85 [72.3] **SHOWN SDL** VIEWED FROM MOTOR END 4.50 [114.3] 2.57 [65.2] -3.87 [98.3] → 4.55 4.64 [115.6] **OPTIONAL** [117.9] $\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc$ MOUNTING **PLATES** 0 ۰ 0 8.50 [215.8] 0.31 [7.9]Φ 4.00 [101.6] -Ø.328 —[8.33] Thru (2) 4.00 3.375 **OPTIONAL NUTS FOR SLOTS** [101.6] [85.73] **TUBE** SUPPORTS 5/16 - 18 [M8-1.25] TAPPED HOLE 0 0.61 [15.5] 0.328 (CENTERED) 0.25 0.94 0.41 [10.4] —[8.33] Thru (4) [6.4] [23.8] STROKE 3.125 [79.38] OPTIONAL STUB SHAFT ① 1.563 [39.69] 4.750 0.50 7.25 [120.65] Ø .251/.250 x 0.25 [6.045/6.020 x 6.4] [12.7] [184.2] 2.375 \bigcirc **DOWEL HOLE (2)** [60.33] 5/16-18 [M8 x 1.25] TAPPED HOLE (4) [47.5] 0.01 4.00 [101.6] [0.2]0 ۰ • 0 CARRIER 8.50 [215.8] **OPTIONAL TUBE SUPPORTS** PILOT LOCATOR O.D. Ø 2.635 [66.93] I.D. Ø 2.25 [57.2] 1.80 x 0.13 [3.2] 1.80 4.73 [45.7] [45.7] [120.1] **OPTIONAL** 0.143 1.87 STUB SHAFT 1 1.50 [45.2] [3.63][47.5] [38.1] 0.188 [4.78]-0.034 [0.85] **OPTIONAL SWITCH OPTIONAL MOUNTING PLATES** MOUNTING 449 6 1.97 [50.0] **BORE** CENTER 5.14 [130.4] \bigcirc 1.02 2.39 [25.8]2.27 SENSING SURFACE [60.8][57.7] -0.50.500 [12.70] 5.69 [144.5] 0.50 3.44 [87.3] [12.7] [12.7] 1.250 [31.75] 3.94 [100.0] CAUTION: DO NOT OVERTIGHTEN SWITCH ONE STUB SHAFT IS STANDARD ON **6** NOTE: Some actuators require switch mounting on a specific side HARDWARE WHEN INSTALLING of the actuator. Call Tolomatic 1-800-328-2174 for details **ALL B3W ACTUATORS** NOTE: The scored face of the switch indicates the ② DOWEL PINS ⊕ | .003 (.08mm) (Ŋ) sensing surface and must face toward the magnet

Unless otherwise noted, all dimensions shown are in inches [Dimensions in brackets are in millimeters]

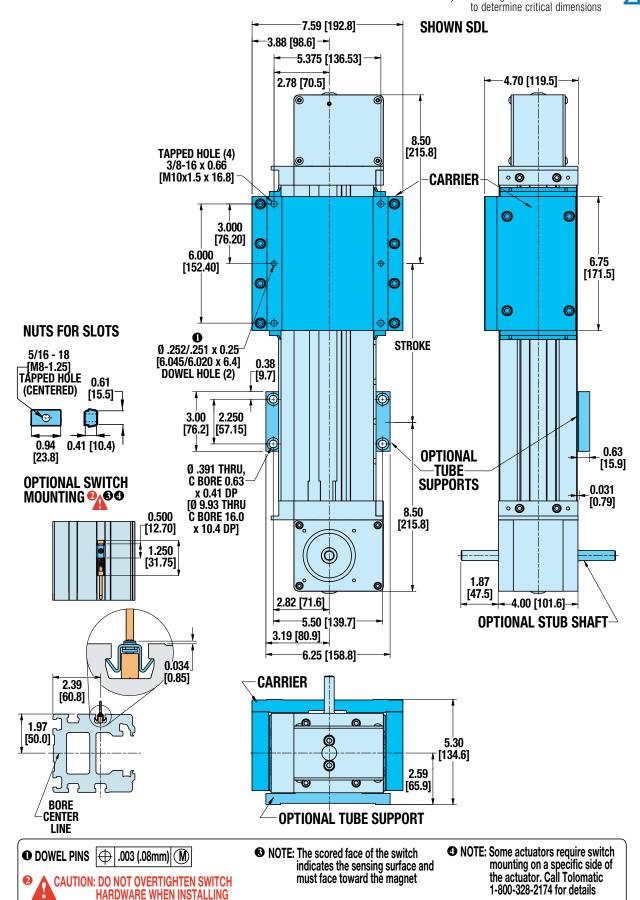


B3W20 Electric Belt Drive Rodless Actuators

DIMENSIONS Dual 180° Option

3D CAD available at www.tolomatic.comAlways use configurated CAD solid model







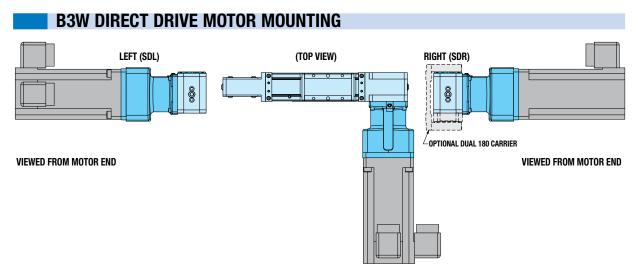
B3W Electric Belt Drive Rodless Actuators

MOTOR MOUNTING

3D CAD available at www.tolomatic.com

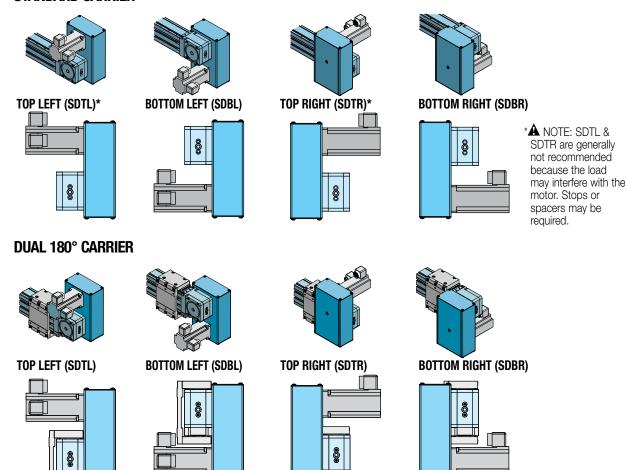


Always use configurated CAD solid model to determine critical dimensions



B3W(D) REDUCTION DRIVE MOTOR MOUNTING

STANDARD CARRIER





B3S & B3W Electric Rodless Actuators

SWITCHES



There are 10 sensing choices: DC reed, form A (open) or form C (open or closed); AC reed (Triac, open); Hall-effect, sourcing, PNP (open); Hall-effect, sinking, NPN (open); each with either flying leads or QD (quick disconnect). Commonly used to send analog signals to PLC (programmable logic controllers), TLL, CMOS circuit or other controller device. These switches are activated by the actuator's magnet.

Switches contain reverse polarity protection. QD cables are shielded; shield should be terminated at flying lead end.

If necessary to remove factory installed switches, be sure to reinstall on the same of side of actuator with scored face of switch toward internal magnet.

SPECIFICATIONS

or con loanons										
		REE	D DC		REE	D AC	HALL-EFFECT DC			
ORDER CODE	RT	RM	BT	BM	CI	CM	TT	TM	KT	KM
LEAD	5m	QD*	5m	QD*	5m	QD*	5m	QD*	5m	QD*
CABLE SHIELDING	Unshielded	Shielded†	Unshielded	Shielded†	Unshielded	Shielded†	Unshielded	Shielded†	Unshielded	Shielded†
SWITCHING LOGIC	"A" Norm	a ll y Open	"C" Normally (Open or Closed	Triac Norr	nally Open	,	PNP (Sourcing) Normally Open NPN (Sinking) Normally		Norma ll y Open
MECHANICAL CONTACTS	Single-Pole Single-Throw		Single-Pole [Oouble-Throw	Single-Pole	Single-Throw	NO,	These Are Soli	d State Compon	ents
COIL DIRECT	Ye	es	Ye	es	Y	es		-	_	
POWER LED	None		No	ne	Nc	one	None		None	_
SIGNAL LED	Red 🖭	TOL-O-MATIC	INC		INC	л I С	Red • TOL-O-MANG		Red •1	OL-O-MATIC
OPERATING VOLTAGE	200 Vo	c max.	120 Vo	dc max.	120 Va	ac max.	5 - 25 Vdc			
OUTPUT RATING	RATING -		_		_		25 Vdc, 200mA dc			
OPERATING TIME	OPERATING TIME 0.6 msec max. (including bounce)			ec max. g bounce)	_		< 10 micro sec.			
OPERATING TEMPERATURE			-40°F [-40°C] 1	o 158°F [70°C]			0°F [-18°C] to 150°F [66°C]			
RELEASE TIME		1.0 mse	ec. max.		_	_	_			
ON TRIP POINT			_		-	_	150 Gauss maximum			
OFF TRIP POINT		_	_		_	_	40 Gauss minimum			
**POWER RATING (WATTS)	10.	-) § §	10	0.0		5	.0	
VOLTAGE DROP	2.6 V typica			Α	_			-		
RESISTANCE 0.1 Ω In		tial (Max.)		_		-				
CURRENT CONSUMPTION		=	_		1 Amp at 86°F [30°C]	0.5 Amp at 140°F [60°C]		200 mA	at 25 Vdc	
FREQUENCY		_	_		47 - 63 Hz —					
CABLE MIN. STATIC					0,630"	[16mm]				
RADIUS DYNAMIC					Not Reco	mmended				

A CAUTION: DO NOT OVER TIGHTEN SWITCH HARDWARE WHEN INSTALLING!



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

*QD = Quick Disconnect; Male coupler is located 6" [152mm] from sensor,

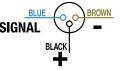
Female coupler to flying lead distance is 197" [5m] also see Cable Shielding specification above REPLACEMENT OF QD SWITCHES MANUFACTURED BEFORE JULY 1, 1997: It will be necessary to replace or rewire the female end coupler.



Quick disconnect Wiring



Quick disconnect SIGNAL Wiring



Reed Switch Life Expectancy: Up to 200,000,000 cycles (depending on load current, duty cycle and environmental conditions)

†Shielded from the female quick disconnect coupler to the flying leads. Shield should be terminated at flying lead end.

[§] Maximum current 500mA (not to exceed 10VA) Refer to Temperature vs. Current graph and Voltage Derating graph

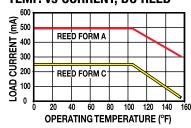


B3S & B3W Electric Rodless Actuators

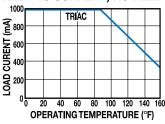
SWITCH PERFORMANCE

PERFORMANCE

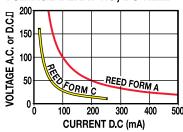
TEMP. vs CURRENT, DC REED



TEMP. vs CURRENT, AC REED

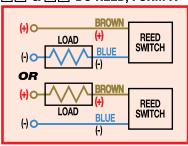


VOLTAGE DERATING, DC REED

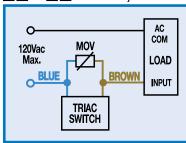


WIRING DIAGRAMS

RT & RM DC REED, FORM A



CIT & CM AC REED, TRIAC

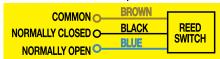


INSTALLATION INFORMATION

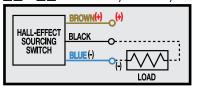


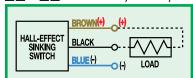
THE NOTCHED FACE OF THE SWITCH INDICATES THE SENSING SURFACE AND MUST FACE TOWARD THE MAGNET.

BT & BM DC REED, FORM C



TT & TM HALL-EFFECT, SOURCING, PNP KT & KM HALL-EFFECT, SINKING, NPN



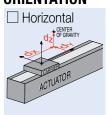


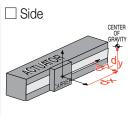


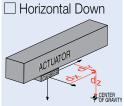
THE NOTCHED
GROOVE IN THE
ACTUATOR
INDICATES THE
GROOVE TO
INSTALL THE
SWITCH. CONTACT
TOLOMATIC IF
SWITCHES ARE
REQUIRED ON
ANOTHER SIDE OF
ACTUATOR.

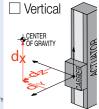
APPLICATION DATA WORKSHEET

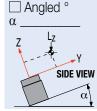
Fill in known data. Not all information is required for all applications

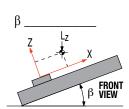










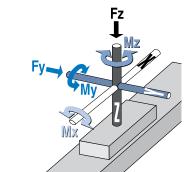


□ Load attached to carrier OR □ Load supported by other mechanism

DISTANCE FROM
CENTER OF CARRIER
TO LOAD CENTER
OF GRAVITY

☐ inch (U.S. Standard)

millimeter (Metric)



BENDING MOMENTS **APPLIED TO CARRIER** My \square N-m M_7 ☐ in.-lbs. (U.S. Standard) (Metric)

STROKE LENGTH

inch (SK) (U.S. Standard)

☐ millimeters

PRE	CIS	ION
		999

Repeatability \square inch

☐ millimeters

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

LOAD ☐ kg. \square lb.

THRUST REQUIRED

☐ lbf. (U.S. Standard)

OPERATING ENVIRONMENT

Temperature, Contamination, etc.

(U.S. Standard) (Metric)

MOVE PROFILE Move Distance

millimeters

☐ mm/sec

per hour

Dwell Time After Move Max. Speed _

☐ in/sec

□ sec

MOVE TIME

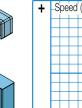
per minute

NO. OF CYCLES

MOTION PROFILE

 \square N

(Metric)

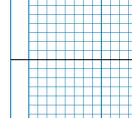


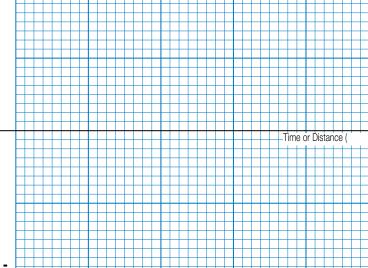


BELT DRIVE



Reduction Drive SCREW DRIVE







sizeit.tolomatic.com for fast, accurate actuator selection

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

USE THE TOLOMATIC SIZING AND SELECTION SOFTWARE AVAILABLE ON-LINE AT www.tolomatic.com OR... CALL TOLOMATIC AT 1-800-328-2174.

We will provide any assistance needed to determine the proper actuator for the job.

FAX 1-763-478-8080

Inline

EMAIL help@tolomatic.com

CONTACT INFORMATION

Name, Phone, Email Co. Name, Etc.



SELECTION GUIDELINES

The process of selecting a load bearing 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 quidelines are for educational purposes only.

Choose an actuator that has

the (A) thrust, (B) speed and

(C) moment load capac-

ity to move the load. A.

B3W see page B3_25

B3_13 to B3_15; All

B3W see page B3 8

B. Max. Speed: B3S see

critical speed graphs page

sizes = 200 in/sec (5m/sec).

MAXIMUM LOAD

Calculate the application

load (combination of load

mass and forces applied

to the carrier) and appli-

cation bending moments

(sum of all moments Mx,

C. Moment & Load B3S &

CAPACITIES

B3 11;

B3W

Max Thrust: B3S see page

tuator performance and application safety. If either load or any of your moments exceed figures indicated in the Moment and Load Capacity table (page B3 8) for the actuator consider:

- 1) Higher capacity bearing style
- 2) A larger actuator size
- 3) Auxiliary carrier
- 4) External guide system

CALCULATE LOAD **CHOOSE ACTUATOR** FACTOR LF

For loads with a center of gravity offset from the carrier account for both applied (static) and dynamic loads. The load factor (LF) must not exceed the value of 1.5.

$$L_F = \frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} \le 1.5$$

If LF does exceed the value of 1.5. consider the four choices listed in step #2.

ESTABLISH YOUR MOTION PROFILE "AND CALCULATE ACCELERATION RATE **COMPARE LOAD TO**

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 speeddecel) profile. Now calculate the maximum acceleration and deceleration rates of the move. For the B3S Acceleration/deceleration should not exceed critical speed (page B3_13) for the screw/nut combination • Select the appropriate numchosen. For the B3W acceleration/deceleration should not exceed 1200 in/sec² (30.48 m/ sec²). Also, do not exceed safe rates of dynamic inertia moments determined in step #3.

SELECT THE LEAD SCREW (B3S ONLY)

Based on the application requirements for accuracy, backlash, quiet operation, life, etc. select the appropriate lead screw type (Acme screw with a solid nut or ball screw with a standard or antibacklash nut) and the pitch (lead). For additional information on screw selection, consult "Which Screw? Picking the Right Technology" (#9900-4644) available at www.tolomatic.com.

→ SELECT MOTOR GEARHEAD IF **NECESSARY) AND** DRIVE

To help select a motor and drive, use the sizing equations located in the Engineering Resources section [ENGR_] 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.

DETERMINE TUBE SUPPPORT/ MOUNTING PLATE/ T-NUT REQUIREMENTS

- Consult the Tube Support graph Requirements the model selected (page B3 9)
- Cross reference the application load and maximum distance between supports
- ber of tube supports, T-nuts or mounting plates and requirements for motor and adapter clearance.

CONSIDER OPTIONS

- Choose metric or inch (US) Conventional) load mounting. (When ordering use **SK** for inch or **SM** for metric)
- Switches Reed, Solid State PNP or NPN, all available normally open or normally closed.

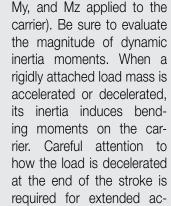
CONSIDER IORIENTATION (B3W ONLY)

Belt drives used in vertical applications will not prevent a load falling in the event of a timing belt failure. A secondary safety measure is recommended if a B3W is used in a safety critical vertical applica-

Use the Tolomatic Sizing & Selection Software or call Tolomatic at 1-800-328-2174









ORDERING

BASE MODEL

OPTIONS



B3S 20 D BNL02 SK36 LMI

DC18 TS2 BM2 TN8

MODEL TYPE

B3S B3S Screw Drive Rodless Actuator

SIZE

10,

15, 20

DUAL 180° CARRIER

Dual 180° Carrier

NUT/SCREW CONFIGURATION

INCH MODELS	METRIC
(US Conventional)	Models†
SOLID NUT /	SOLID NUT /
PITCH (turn/in)	LEAD (mm/turn)
♦\$N01 ♦\$N02, \$NA02 \$N05	♦\$N25 ♦\$N12
♦SN (Solid Nut) not ava	ailable for 20 Size
Ball Nut /	Ball Nut /
Pitch (turn/in)	Lead (turn/in)
BN02, BNL02	BNM10
BN05, BNL05	BN05, BNL05
BN08, BNL08	BN08, BNL08

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

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 / REDUCTIONS

(must choose one)

LMI In-Line mounting

LME23 Ext. shaft for RP & 23 frame motor

LME34 Ext. shaft for RP & 34 frame motor

*LMX Extended shaft - old style (see note) *For replacement actuators with extended motor shafts purchased prior to 6/24/02,

use the LMX configuration code.

A motor size and code must be A selected when specifying a reverseparallel 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

AUXILIARY CARRIER

DC Auxiliary Carrier, then 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.

SUPPORTS AND MOUNTING PLATES

(both may be selected)

TS _ Tube Supports plus quantity desired **MP_Mounting Plates plus quantity desired

**Mounting plates are not available on B3SD Dual 180° models.

SWITCHES

(Quantity desired follows product code)

RM Reed Switch (Form A) with 5-meter lead/QD (Quick-disconnect)

Reed Switch (Form A) with 5-m lead

BM_ Reed Switch (Form C) with 5-meter lead/QD

Reed Switch (Form C) with 5-m lead

KM Hall-effect Sinking Switch with 5-meter lead/QD

Hall-effect Sinking Switch w/ 5-m lead

TM_ Hall-effect Sourcing Switch with 5-meter lead/QD

TT_ Hall-effect Sourcing Switch with 5-meter lead

CM TRIAC Switch with 5-meter lead/QD

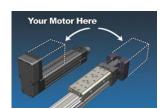
CT TRIAC Switch with 5-meter lead

T-NUTS

TN Additional T-Nuts and quantity

FOOD GRADE LUBRICATION

LUB Grease, Food/Drug



"YOUR MOTOR HERE." MADE-TO-ORDER MOTOR MOUNTS. FAST DELIVERY.

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Visit www.tolomatic.com/ymh to find your motor/actuator match!

Not all codes listed are compatible with all options.

Use Tolomatic Sizing Software to determine available options and accessories based on your application requirements.

NOTE: Brakes mounted on reduction drives (especially in vertically positioned actuators) will not prevent back driving of the screw and the load falling under gravity in the event of a timing belt failure. An inline motor mount with a fail-safe brake mounted directly to the actuator shaft or a special geared or thru-shaft reduction drive construction should be considered if a brake is required in a safety critical application. Contact Tolomatic for alternative reduction drive brake mounting options.

Gearheads may be used with reduction drives. However, the torque on the belt and internal reduction drive components must remain below the capabilities of the assembly to prevent belt slipping or premature failure. Contact Tolomatic for additional information if required.

FIELD RETROFIT KITS									
ITEM	B3S10_SM	B3S15_SM	B3S20_SM	B3S10_SK	B3S15_SK	B3S20_SK			
Tube Supports	4410-9006	4415-9006	4420-9006	3410-9006	3415-9006	3420-9006			
Tube Supports (B3SD Dual 180° models)	4410-9026	4415-9026	4420-9026	3410-9026	3415-9026	3420-9026			
1/2" Mounting Plates	4410-9030	4415-9030	4420-9030	3410-9142	3415-9056	3420-9056			
1" Mounting Plates	4410-9031	4415-9031	_	3410-9057	3415-9057	-			



B3W Electric Belt Drive Rodless Actuators

ORDERING



BASE MODEL BASE MODEL DC18 TS2 BM2 TN16

MODEL TYPE

B3W Series Belt Drive

SIZE

20

10, 15,

DUAL 180° CARRIER

D Dual 180° Carrier

BELT MATERIAL AND WIDTH

BWS18 18mm Polyurethane Steel belt (B3W10)

BWS30 30mm Polyurethane Steel belt (B3W15)

BWS40 40mm Polyurethane Steel belt (B3W20)

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

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

Not all codes listed are compatible with all options.

Use Tolomatic Sizing Software to determine available options and accessories based on your application requirements.

MOTOR MOUNTING / REDUCTIONS

(must choose one)

SDL, SDLB* Direct Drive on left SDR, SDRB* Direct Drive on right

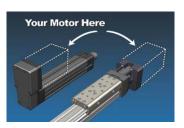
A motor size and code must be selected when specifying a 3:1 reduction.

SDTL, SDTLB* 3:1 Reduction on top left SDTR, SDTRB* 3:1 Reduction on top right SDBL, SDBLB* 3:1 Reduction on bottom left SDBR, SDBRB*3:1 Reduction on bottom right *For Dual Stub Shaft option

AUXILIARY CARRIER

DC_ _Auxiliary Carrier, then 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.



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Visit **www.tolomatic.com/ymh** to find your motor/actuator match!

SUPPORTS AND MOUNTING PLATES

(both may be selected)

TS _ Tube Supports, enter quantity desired

MP_ Mounting Plates, enter quantity
desired

SWITCHES										
CODE		ТҮРЕ	QUICK- Disconnect	LEAD LENGTH	QUANTITY					
RM		Form A	QD							
RT	REED		TOITITA	no		eq				
BM		뿚	Form C	QD		desir				
BT		TOITILO	no	5 meters	ıtity					
KM	C	Sinking	QD		quai					
KT	H H	Silikiliy	no		enter					
TM	HALL-EFFECT	Sourcing	QD		After code enter quantity desired					
TT	/H	Sourchig	no		ter co					
CM		TRIAC	QD		Af					
CT		INIAU	no							

T-NUTS

TN _ Additional T-Nuts, enter quantity

NOTE: Brakes mounted on reduction drives (especially in vertically positioned actuators) will not prevent back driving of the screw and the load falling under gravity in the event of a timing belt failure. An inline motor mount with a fail-safe brake mounted directly to the actuator shaft or a special geared or thru-shaft reduction drive construction should be considered if a brake is required in a safety critical application. Contact Tolomatic for alternative reduction drive brake mounting options.

Gearheads may be used with reduction drives. However, the torque on the belt and internal reduction drive components must remain below the capabilities of the assembly to prevent belt slipping or premature failure. Contact Tolomatic for additional information if required.

FIELD RETROFIT KITS									
ITEM									
Tube Supports	4410-9006	4415-9006	4420-9006	3410-9006	3415-9006	3420-9006			
Tube Supports (B3WD Dual 180° models)	4410-9170	4415-9170	4420-9170	3410-9170	3415-9170	3420-9170			
1/2" Mounting Plates (MRV 23-frame motors)	4410-9030	4415-9030	1	3410-9056	3415-9056	ı			
1/2" Mounting Plates (MRV all frame motors)	ı	_	4420-9030	ı	-	3420-9056			
1" Mounting Plates (MRV all frame motors)	4410-9031	_	_	3410-9057	_	_			
1" Mounting Plates (MRV 34-frame motors)	-	4415-9031	_	_	3415-9057	_			



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INNOVATIVE PRODUCTS

Solutions with Endurance TechnologySM for challenging applications.



Built-to-order with configurable stroke lengths and flexible mounting options.



ACTUATOR SIZING

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YOUR MOTOR HERE®

Match your motor to compatible mounting plates with Tolomatic actuators.



CAD LIBRARY

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