

TKS & TKB ACTUATORS

SCREW DRIVE & BELT DRIVE

● **ENDURANCE TECHNOLOGY** SM ●



LINEAR SOLUTIONS MADE EASY

Tolomatic TKS & TKB Electric Rodless Actuators



High Precision Rodless Actuators

The TKS and TKB linear table style actuators are designed for applications carrying moderate load and requiring high precision in parameters such as flatness, straightness and accuracy. Both the TKS and TKB actuators utilize two parallel profiled rails with four recirculating ball linear guides to provide consistent and precise performance. Built-to-order in stroke lengths up to 96 inches.

A Comparison of Screw Drive Actuators

	TKS	B3S	MXE-S	MXE-P
				
Features:	Superior rigidity, high moment load capacities	High load and bending moment capacities	Basic guidance and support	High load and bending moment capacities
Load up to: <i>(with options)</i>	1,500 lbf [6,672 N]	8,000 lbf [35,586 N]	1,040 lbf [4,626 N]	2,584 lbf [11,494 N]
Thrust up to:	3,260 lbf [14,501 N]	2,700 lbf [12,010 N]	4,300 lbf [19,127 N]	4,300 lbf [19,127 N]
Speed up to:	60 in/sec [1,524 mm/sec]	60 in/sec [1,524 mm/sec]	60 in/sec [1,524 mm/sec]	60 in/sec [1,524 mm/sec]
Stroke Length up to:	96 in [2,438 mm]	179 in [4,547 mm]	178 in [4,521 mm]	178 in [4,521 mm]
Screw/Nut Type	Solid & Ball	Solid & Ball	Solid & Ball	Solid & Ball
www.tolomatic.com for complete information, search by literature number:				
Literature Number:	3600-4609	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)

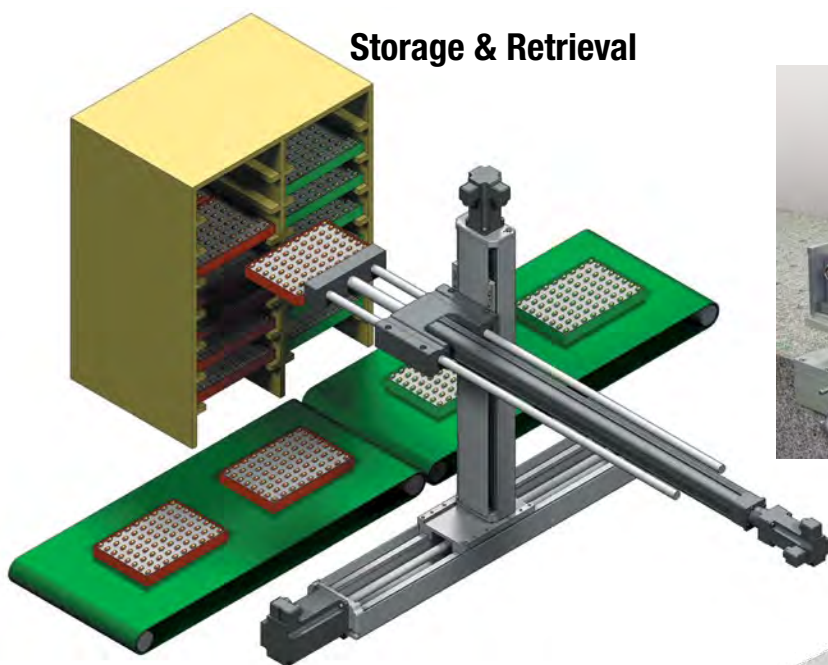
A Comparison of Belt Drive Actuators

	TKB	B3W	MXB-U	MXB-P
				
Features:	Superior rigidity, high moment load capacities	High load and bending moment capacities	Basic thrust, requires external guidance and support	High load and bending moment capacities
Load up to: <i>(with options)</i>	1,500 lbf [6,672 N]	8,000 lbf [35,586 N]	NA	2,584 lbf [11,494 N]
Thrust up to:	245 lbf [1,090 N]	325 lbf [1,446 N]	418 lbf [1,859 N]	418 lbf [1,859 N]
Speed up to:	100 in/sec [2,540 mm/sec]	200 in/sec [5,080 mm/sec]	200 in/sec [5,080 mm/sec]	150 in/sec [3,810 mm/sec]
Stroke Length up to:	96 in [2,438 mm]	207 in [5,258 mm]	230 in [5,842 mm]	230 in [5,842 mm]
www.tolomatic.com for complete information, search by literature number:				
Literature Number:	3600-4609	3600-4176	8500-4000	8500-4000

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

TKS & TKB Applications

Storage & Retrieval



Inspection & Measurement

Custom Two Direction TKS



- Animation
- Assembly machinery
- Automotive
- Cosmetics
- Cycle testing
- Inspection & measurement
- Laser positioning
- Machine tools
- Material handling
- Medical equipment
- Packaging equipment
- Pick & place
- Precision grinders
- Product test simulations
- Semiconductor
- Stage motion control
- Table positioning
- Tension control
- Test stands
- Water jet control
- Wave generation
- and many more

Semiconductor Inspection



CONTENTS

Rodless Comparison	TK_2
Applications.....	TK_3
TKS Features.....	TK_4
TKB Features	TK_6
TKS & TKB Specs.....	TK_8
TKS Specifications	TK_15
TKB Performance.....	TK_21
TKB Specifications	TK_22
Switches	TK_26
Application Data Worksheet.....	TK_28
Selection Guidelines	TK_29
TKS Ordering	TK_30
TKB Ordering	TK_31
Other Tolomatic Products.....	TK_32

TKS

TKB

TKS PRECISION SCREW DRIVE ACTUATOR

ENDURANCE TECHNOLOGYSM

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

The TKS linear table style actuator is designed for applications carrying moderate load and requiring high precision in parameters such as flatness, straightness and accuracy. The TKS actuator utilizes two parallel profiled rails with four recirculating ball linear guides to provide consistent and precise performance. Built-to-order in stroke lengths up to 96 inches with your choice of screw technology.

PRECISION MACHINED TABLE DESIGN

- A low profile design accommodates multiple mounting designs and assures a rigid and secure load



SCREW SUPPORT BEARINGS

- Unique high thrust bearing assembly design eliminates runout and isolates the motor from axial forces

MULTIPLE SCREW TECHNOLOGIES YOU CAN CHOOSE:

- Solid nuts of engineered resins offer quiet performance at the lowest cost; anti-backlash available
- Ball nuts offer positioning accuracy and repeatability with longer life; low-backlash available



TWIN LINEAR RAILS AND BEARINGS

- Industry leading bearing system for consistent tracking, low friction and extended performance
- Superior straightness and flatness is verified at the factory below 0.0002 inches per inch
- Four bearing blocks provide rigid support of the carrier with the lowest possible deflection

INTERNAL SWITCHES

- End of travel and home positioning sensors are integral into the body of the actuator for clean and easy management



TKS

TKB

INTERNAL BUMPERS

- Bumpers protect the screw and nut assembly from damage at end of stroke

INTERNAL COUPLER

- Integral motor coupling for inline mounts provides a more compact package size

LIGHTWEIGHT ALUMINUM DESIGN

- Clear anodized extrusion design is optimized for rigidity and strength
- Mounting holes placed evenly throughout the stroke maintain rigidity



REMOVABLE COVER

- Provides rapid access to internal components and protects mechanisms from incidental damage



MOTOR ORIENTATION • YOU CAN CHOOSE:

- Inline option directly couples the driving shafts and is a one-piece housing construction for optimum alignment and support of the motor
- Reverse-parallel option minimizes the overall length and offers a 1:1 or 2:1 belt ratio

OPTIONS



CARRIER OPTIONS

- **AUXILIARY CARRIER** Doubles the load capacity and increases pitch and yaw bending moment capacities



SEALING OPTIONS

- **BELLOWS** provides additional protection of mechanical components in dirty environments



SWITCHES

Styles include: reed or hall-effect.
15ft potted cable with flying leads

TKS

TKB

TKB PRECISION BELT DRIVE ACTUATOR

ENDURANCE TECHNOLOGYSM

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

The TKB linear table style actuator is designed for high speed applications requiring high precision in parameters such as flatness and straightness. This unique actuator utilizes two parallel profiled rails with four recirculating ball linear guides to provide wide and stable mounting surface with consistent and precise performance. The TKB belt-driven actuator features speeds up to 100 in/sec. and thrusts up to 245 lbf. Built-to-order in stroke lengths up to 96 inches.

REMOVABLE COVER

- Provides rapid access to internal components and protects mechanisms from incidental damage



INTERNAL SWITCHES

- End of travel and home positioning sensors are integral into the body of the actuator for clean and easy management



MULTIPLE BELT TECHNOLOGIES YOU CAN CHOOSE:

- Polyurethane steel-cord reinforced HTD style belt (standard)
- Polyurethane Kevlar reinforced HTD style belt (Contact Tolomatic)

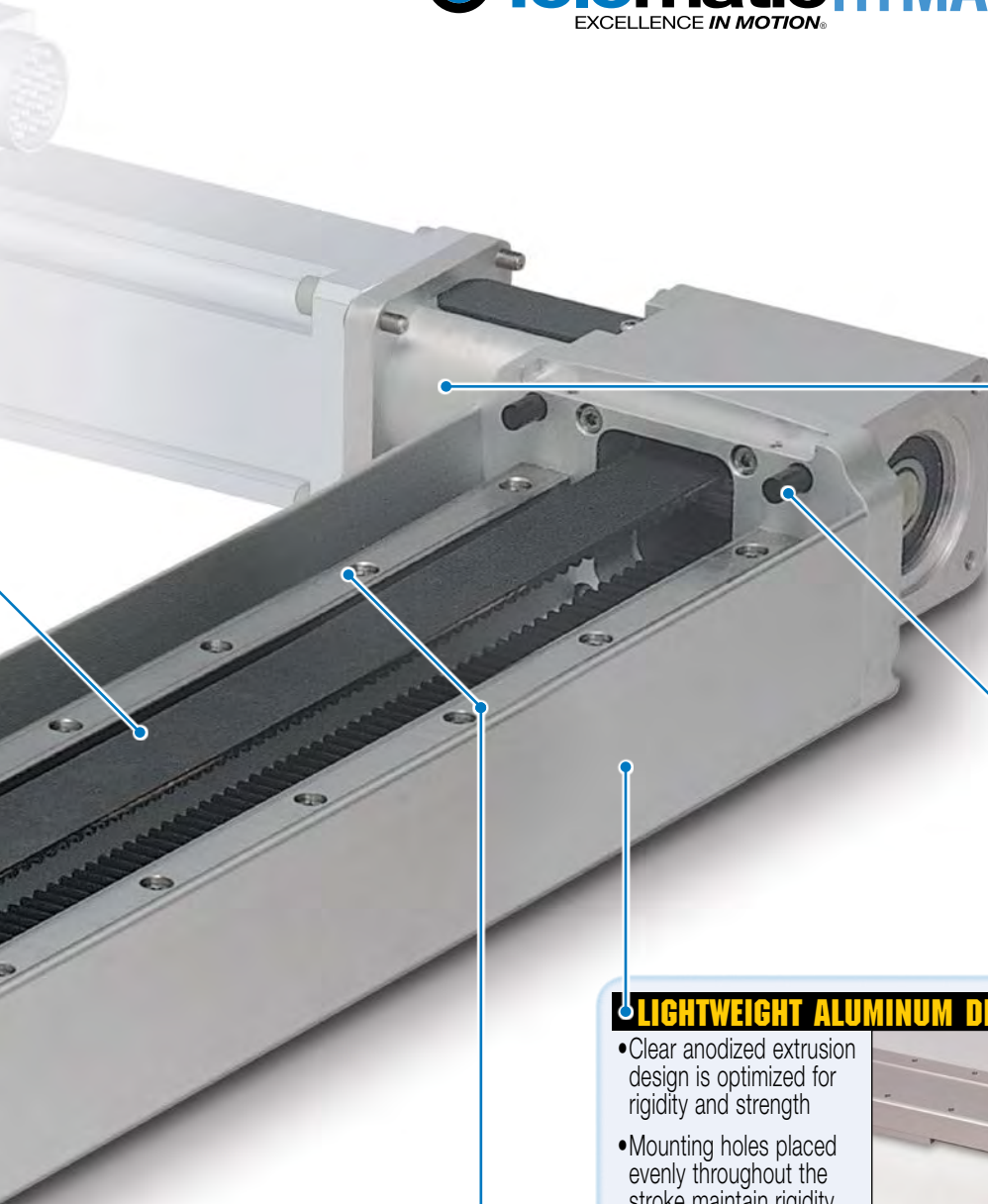
PRECISION MACHINED TABLE DESIGN

- A wide and low profile design accommodates multiple mounting designs and assures a rigid and secure load



TKS

TKB



• MOTOR ORIENTATION • YOU CAN CHOOSE:

- Direct drive option directly couples the driving shafts and is a one-piece housing construction for optimum alignment and support of the motor
- Reduction drive option offers the ability to reduce the reflected inertia and lower the motor torque requirements

• EXTERNAL BUMPERS •

- External bumpers, both ends, are standard
- Protect actuator and load from damage

• LIGHTWEIGHT ALUMINUM DESIGN •

- Clear anodized extrusion design is optimized for rigidity and strength
- Mounting holes placed evenly throughout the stroke maintain rigidity



• TWIN LINEAR RAILS AND BEARINGS •

- Industry leading bearing system for consistent tracking, low friction and extended performance
- Superior straightness and flatness is verified at the factory below 0.0002 inches per inch
- Four bearing blocks provide rigid support of the carrier with the lowest possible deflection

OPTIONS



CARRIER OPTIONS

- **AUXILIARY CARRIER** Doubles the load capacity and increases pitch and yaw bending moment capacities



SEALING OPTIONS

- **BELLOWS** provides additional protection of mechanical components in dirty environments



SWITCHES

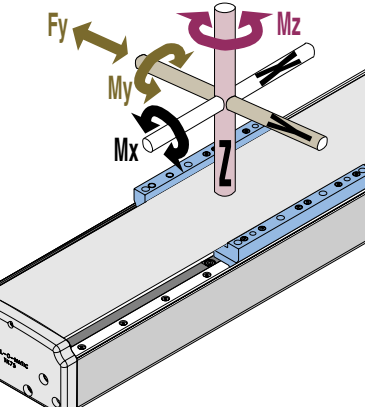
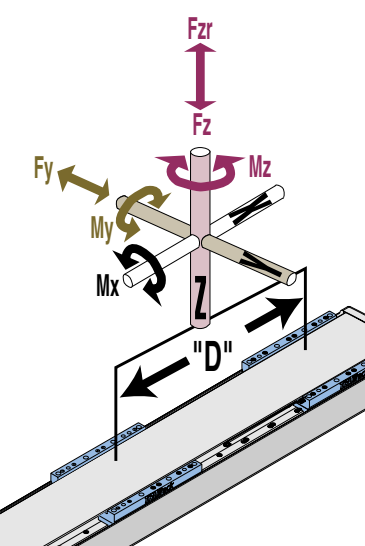
Styles include: reed or hall-effect.
15ft potted cable with flying leads

TKS & TKB Rodless Actuators



TKS & TKB SPECIFICATIONS

BENDING MOMENTS AND LOADS

MAX. BENDING MOMENTS AND LOADS*											
STANDARD CARRIER		U.S. Conventional					Metric				
		10	25	50	75		10	25	50	75	
	Max. Dynamic Bending Moments										
	Mx (Roll)	lb-in	85	721	971	1,151	N-m	9.6	81.5	109.7	130.0
	My (Pitch)	lb-in	234	1,014	1,442	1,477	N-m	26.4	114.6	162.9	166.9
	Mz (Yaw)	lb-in	234	915	1,301	1,332	N-m	26.4	103.4	147.0	150.5
	Max. Dynamic Loads										
	Fy (Radial Load)	lb	100	250	500	750	N	445	1,113	2,225	3,338
	Fz (Lateral Load)	lb	100	250	500	750	N	445	1,113	2,225	2,225
	Fzr (Reverse Lateral Load)	lb	100	250	500	750	N	445	1,113	2,225	2,225
	Max. Static Bending Moments										
	Mx (Roll)	lb-in	170	1,251	1,685	1,997	N-m	19.2	141.3	190.3	225.6
	My (Pitch)	lb-in	468	1,759	2,502	2,563	N-m	52.9	198.8	282.7	289.5
	Mz (Yaw)	lb-in	468	1,588	2,257	2,311	N-m	52.9	179.4	255.0	261.1
	Max. Static Loads										
	Fy (Radial Load)	lb	200	434	868	1,301	N	890	1,931	3,863	5,789
	Fz (Lateral Load)	lb	200	434	868	868	N	890	1,931	3,863	3,863
	Fzr (Reverse Lateral Load)	lb	200	434	868	868	N	890	1,931	3,863	3,863
AUXILIARY CARRIER: Increases rigidity, load-carrying capacity and moments		U.S. Conventional					Metric				
		10DC	25DC	50DC	75DC		10DC	25DC	50DC	75DC	
	Max. Dynamic Bending Moments**		10DC	25DC	50DC	75DC		10DC	25DC	50DC	75DC
	Mx (Roll)	lb-in	170	1,442	1,942	2,302	N-m	19.2	162.9	219.4	260.1
	My (Pitch)	lb-in	563	1,733	3,810	3,875	N-m	63.6	195.7	430.5	437.8
	Mz (Yaw)	lb-in	563	1,733	3,810	3,875	N-m	63.6	195.7	430.5	437.8
	Max. Dynamic Loads										
	Fy (Radial Load)	lb	200	500	1,000	1,500	N	890	2,225	4,450	6,672
	Fz (Lateral Load)	lb	200	500	1,000	1,500	N	890	2,225	4,450	6,672
	Fzr (Reverse Lateral Load)	lb	200	500	1,000	1,500	N	890	2,225	4,450	6,672
	Max. Static Bending Moments**										
	Mx (Roll)	lb-in	340	2,502	3,369	3,994	N-m	38	283	381	451
	My (Pitch)	lb-in	1,126	3,006	6,610	6,723	N-m	127	340	747	760
	Mz (Yaw)	lb-in	1,126	3,006	6,610	6,723	N-m	127	340	747	760
	Max. Static Loads										
	Fy (Radial Load)	lb	400	868	1,735	2,603	N	1,780	3,863	7,721	11,583
	Fz (Lateral Load)	lb	400	868	1,735	1,735	N	1,780	3,863	7,721	7,721
	Fzr (Reverse Lateral Load)	lb	400	868	1,735	1,735	N	1,780	3,863	7,721	7,721
Min. Dimension 'D'	in	5.63	6.93	7.63	7.75	mm	142.9	176	193.8	196.9	



* Bending moments & load specifications are based on 200,000,000 (5,000 KM) linear inches of carrier travel.

Breakaway torque will increase when using the Auxiliary carrier option. When ordering, determine your working stroke and enter this value into the configuration string. Overall actuator length will automatically be calculated.

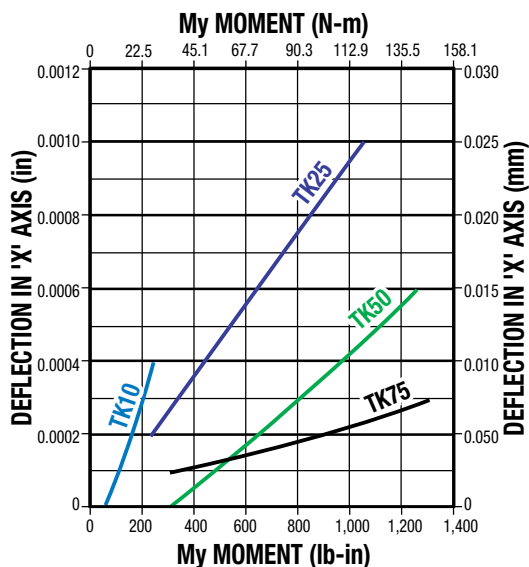
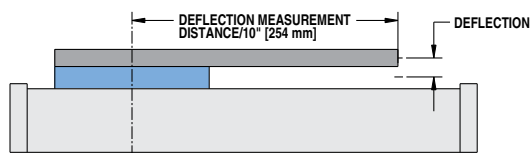
Deflection Considerations: In applications where substantial Mx or My moments come into play, deflection of the cylinder tube, carrier and supports must be considered. The deflection factors shown in the Load Deflection charts, are based on cylinder mounted with tube supports at minimum recommended spacing. 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 graph on page TK_9.

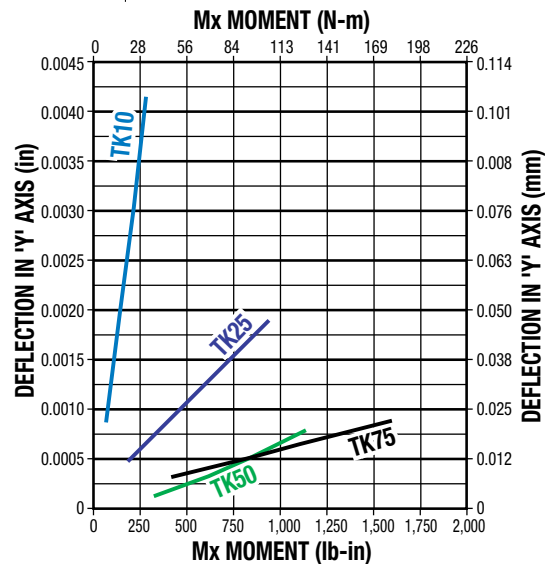
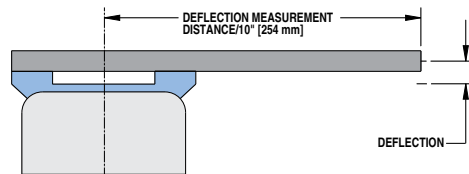
TKS & TKB SPECIFICATIONS

LOAD DEFLECTION

X-AXIS DEFLECTION

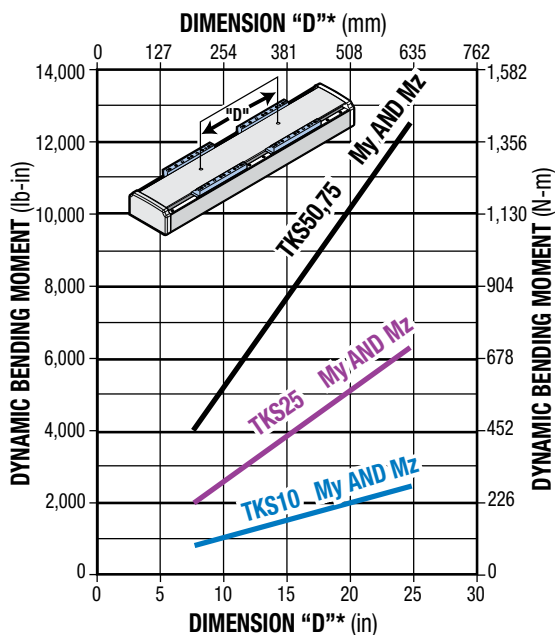


Y-AXIS DEFLECTION

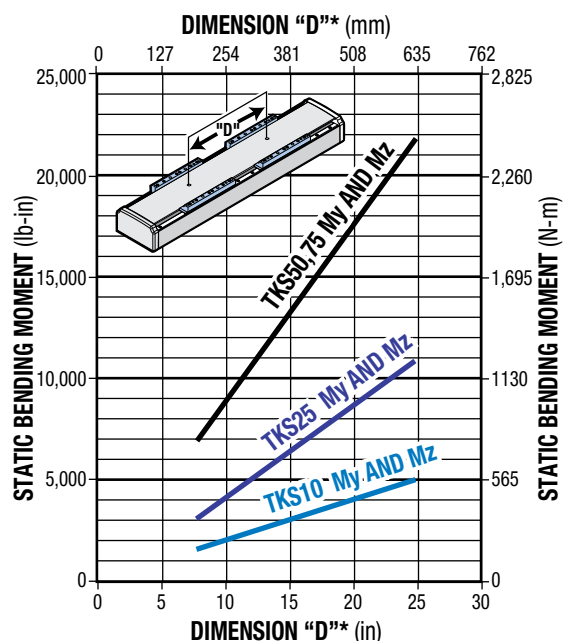


AUXILIARY CARRIER: BENDING MOMENT AT 'D' DISTANCE

DYNAMIC BENDING MOMENT



STATIC BENDING MOMENT



- Rates shown on charts were calculated with these assumptions:
- 1.) Coupling between carriers is rigid.
 - 2.) Load is equally distributed between carriers.
 - 3.) Coupling device applies no misalignment loads to carriers.

* Customer must specify Dimension "D" (Distance between carrier center lines) in configuration string.



See page TK_8 for minimum "D" dimension.

TKS

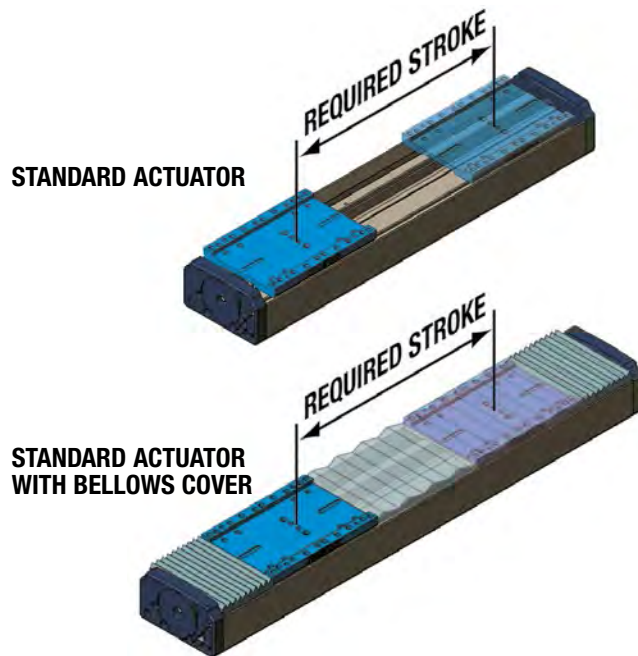
TKB

TKS & TKB Rodless Actuators

TKS & TKB SPECIFICATIONS



BELLOWS STROKE REQUIREMENTS

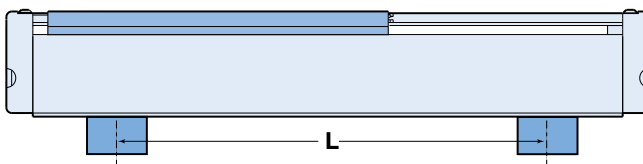
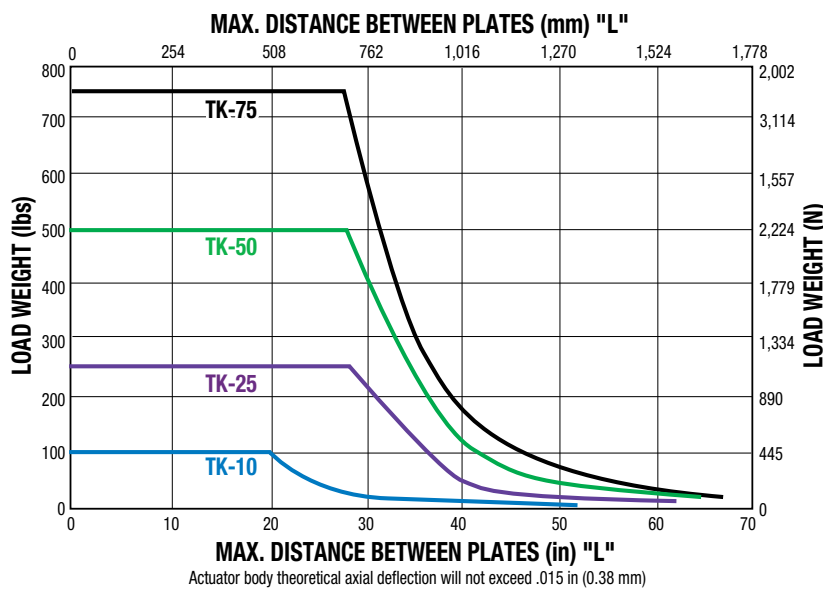


MAXIMUM AVAILABLE STROKE FOR BELLOWS OPTION

	TKS		TKB
	Ball Nut	Solid Nut	
10	24	64	64
mm	610	1626	1626
25	44	64	64
mm	1118	1626	1626
50	56	64	64
mm	1422	1626	1626
75	64	64	64
mm	1626	1626	1626

! BELLOWS COVER OPTION INCREASES OVERALL ACTUATOR LENGTH BY 0.508 x STROKE

MOUNTING PLATE RECOMMENDATIONS



FRICTION FORCE

$$lbf = 0.0003 \times \text{LOAD (lb)} + 3.96$$

$$N = 0.003 \times \text{LOAD (kg)} + 17.6$$

LUBRICATION

Proper and adequate lubrication is essential for normal operation of TruTrack actuators. Poor lubrication will cause quicker wear and decrease service life of the actuator. For general use, lubrication should be performed at intervals of 4,000,000 linear inches of travel (100 km) or once every year, whichever occurs first. However, the operating conditions of certain applications may require more frequent lubrication. Please consult Tolomatic for recommendations.

Recommended greases:

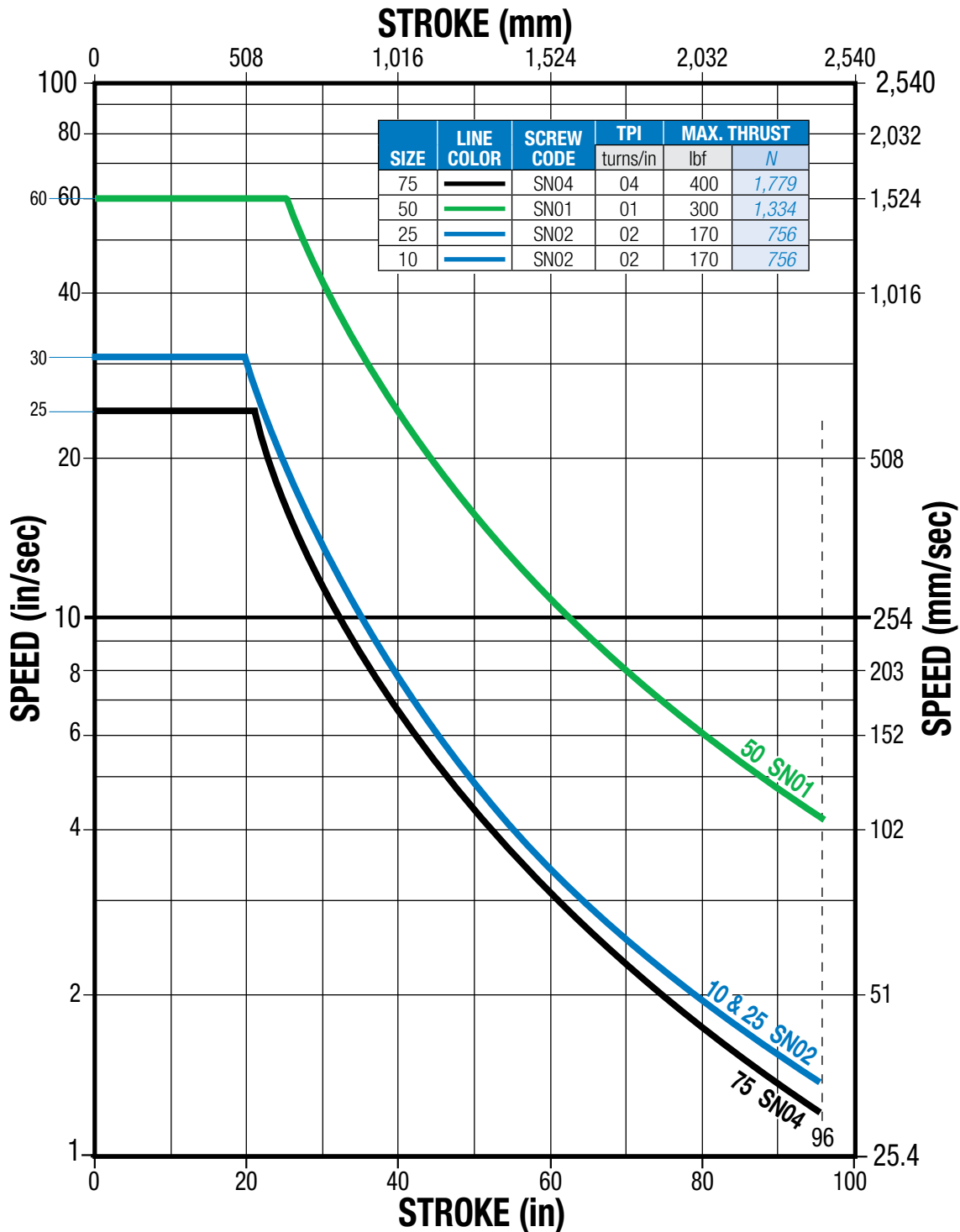
- Multi-purpose grease based on refined mineral oil containing lithium thickening agent (excellent at high pressures, excellent viscosity stability).
- Grease based on a high-grade synthetic oil containing a urea thickening agent (long life, wide temperature range).

TKS Rodless Screw Drive Actuator



ACME SCREW/NUT COMBINATIONS

TKS ACME SCREW CRITICAL SPEED CAPACITIES



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

Dashed line represents maximum stroke for screw selections.

**SCREW TYPE
DESCRIPTION**

SN
BN

Solid Nut
Ball Nut

TKS

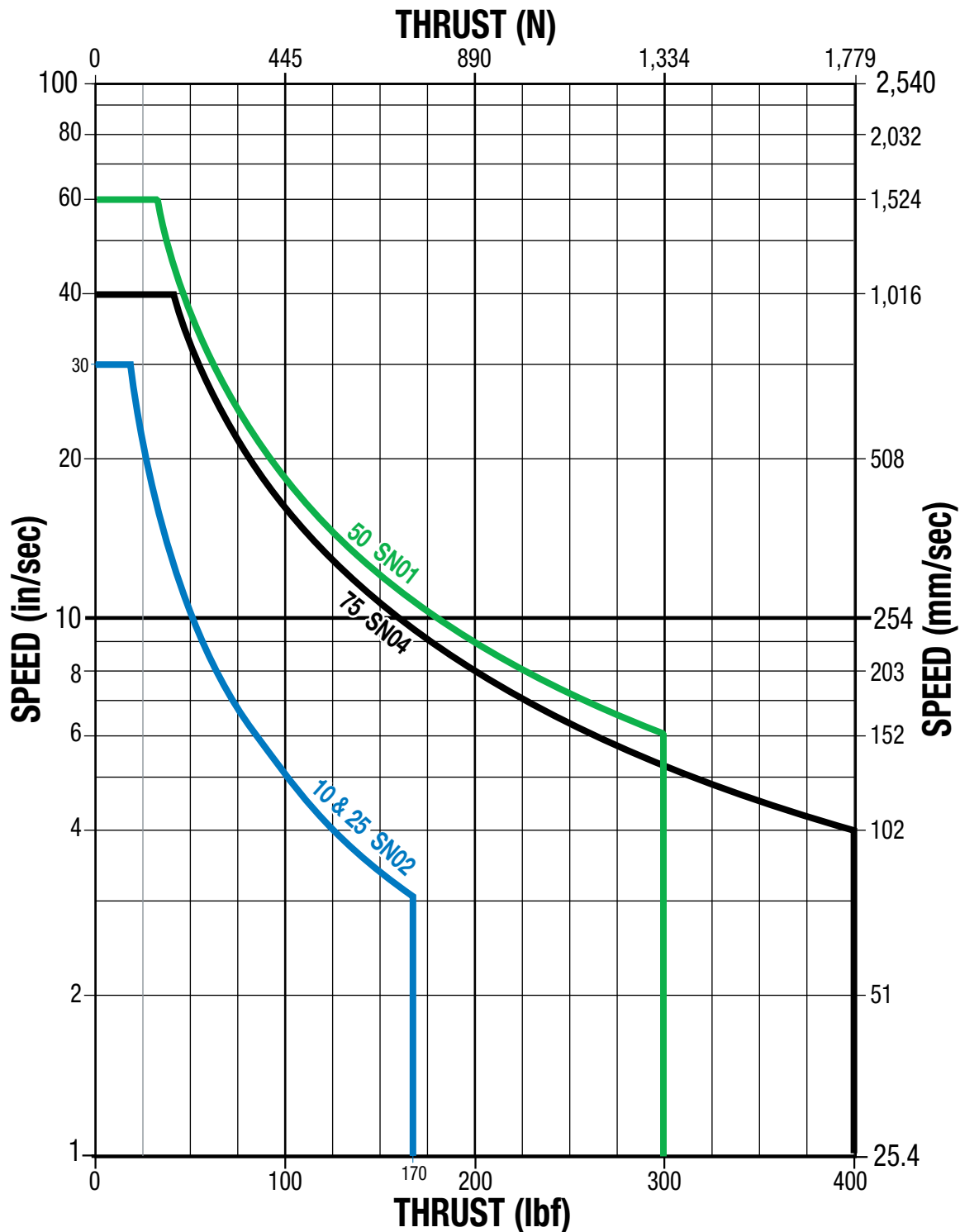
TKB

TKS Rodless Screw Drive Actuator



ACME SCREW/NUT COMBINATIONS

TKS ACME SCREW PV LIMITS



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

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.

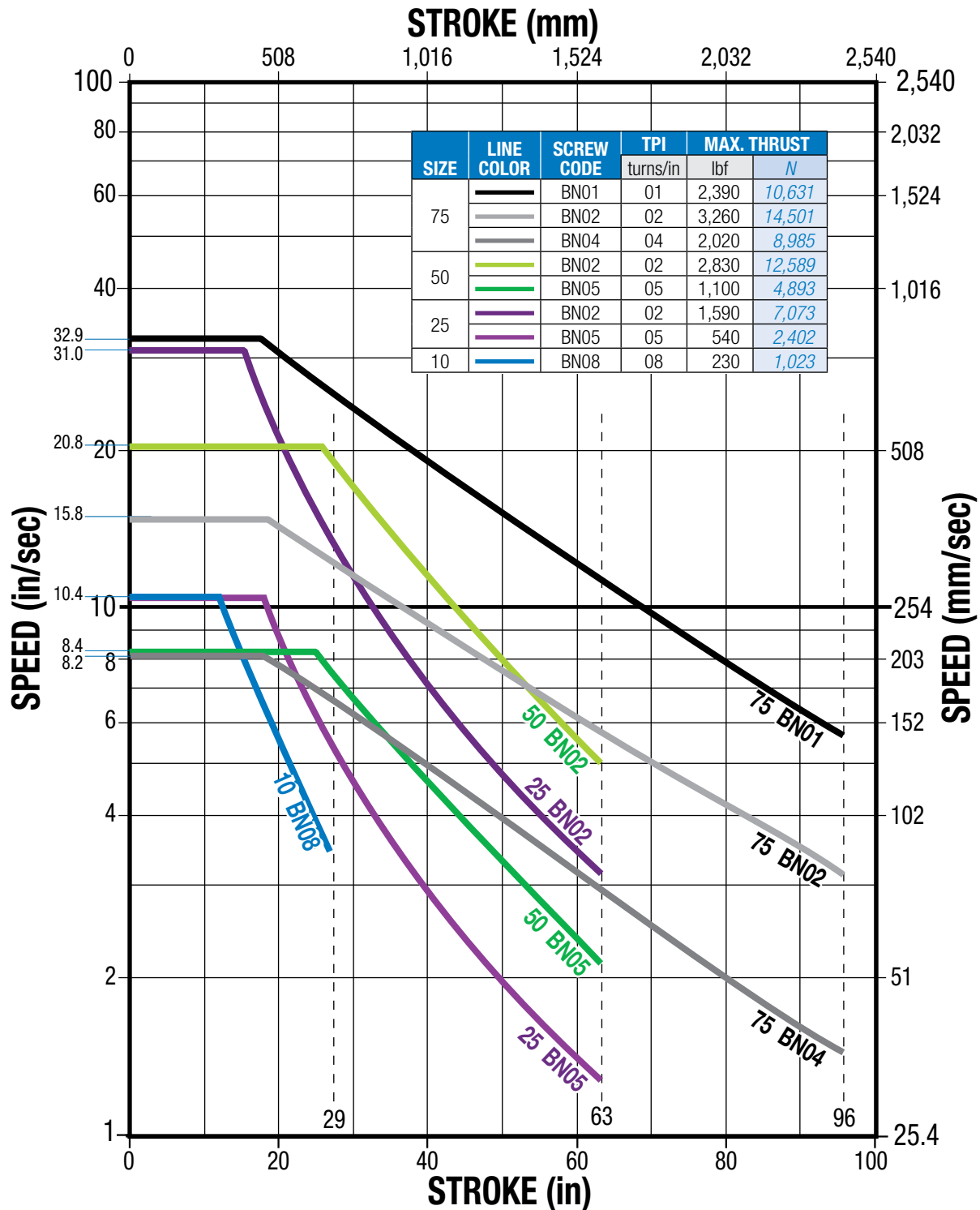
$$\frac{P}{(\text{Max. Thrust Rating})} \times \frac{V}{(\text{Max. Speed Rating})} \leq 0.1$$

TKS Rodless Screw Drive Actuator

BALL SCREW/NUT COMBINATIONS



BALL SCREW CRITICAL SPEED CAPACITIES



* For ball screws, maximum thrust reflects 90% reliability for 1 million linear inches of travel.

Dashed lines represent maximum stroke for screw selections.

SCREW TYPE BN
DESCRIPTION Ball Nut

TKS

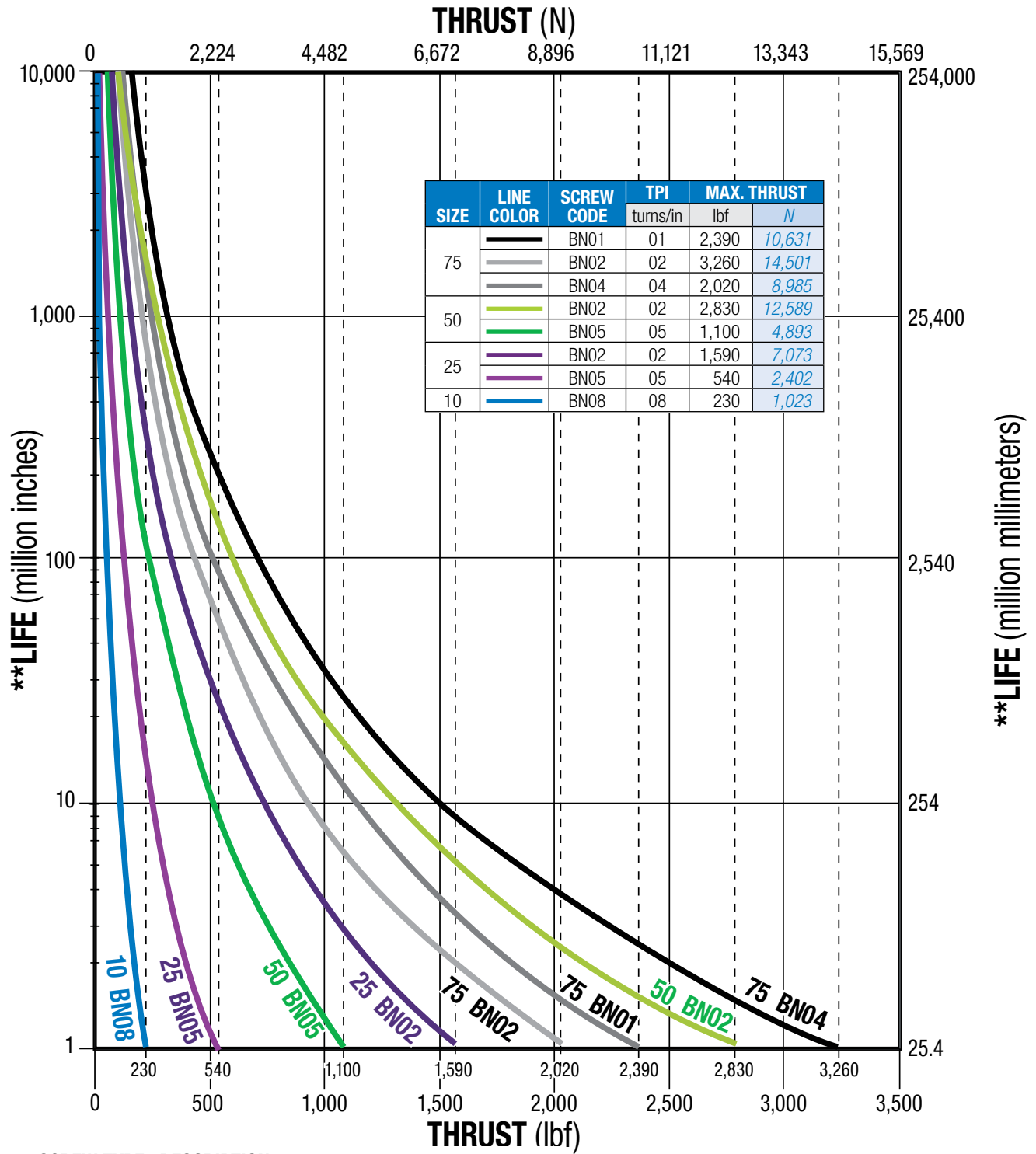
TKB

TKS Rodless Screw Drive Actuator

BALL SCREW SPECIFICATIONS



BALL SCREW LIFE CALCULATION



SCREW TYPE DESCRIPTION
BN Ball Nut

▲ * Maximum thrust reflects 90% reliability for 1 million linear inches of travel

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

TKS Rodless Screw Drive Actuator

TKS SPECIFICATIONS



SPECIFICATIONS RELATED TO ACTUATOR SIZE AND SCREW SELECTION

TKS LEAD SCREWS U.S. CONVENTIONAL											
ACTUATOR	SCREW DIA.	SCREW CODE	TPI (turns/in)	LEAD ACCURACY	BACKLASH	MAXIMUM THRUST*	MAXIMUM STROKE	INERTIA (lb-in ²)			BREAKAWAY TORQUE
								BASE ACTUATOR		PER/in OF STROKE	
	(in)			(in/ft)	(in)	(lb)	(in)	In Line	Rev. Parallel		(lb-in)
TKS10	0.500	SN	2	0.003	0.007	170	96	0.0126	0.0159	0.0017	0.938
	0.375	BN	8	0.004	0.002	230	29	0.0029	0.0038	0.0005	0.813
TKS25	0.500	SN	2	0.003	0.007	170	96	0.0263	0.0291	0.0017	1.750
	0.500	BN	2	0.004	0.002	1,590	63	0.0263	0.0291	0.0017	1.438
	0.625	BN	5	0.004	0.002	540	63	0.0311	0.0380	0.0042	1.063
TKS50	0.750	SN	1	0.003	0.007	300	96	0.1472	0.1577	0.0087	3.750
	0.750	BN	2	0.004	0.002	2,830	63	0.0867	0.0972	0.0087	1.875
	0.750	BN	5	0.004	0.002	1,100	63	0.0698	0.0803	0.0087	1.500
TKS75	1.000	SN	4	0.003	0.007	400	96	0.2196	0.2737	0.0275	2.813
	1.000	BN	1	0.004	0.002	2,390	96	0.3037	0.3578	0.0275	3.438
	1.000	BN	2	0.004	0.002	3,260	96	0.2364	0.2905	0.0275	2.813
	1.000	BN	4	0.004	0.002	2,020	96	0.2196	0.2737	0.0275	2.500

TKS LEAD SCREWS METRIC											
ACTUATOR	SCREW DIA.	SCREW CODE	TPI (turns/in)	LEAD ACCURACY	BACKLASH	MAXIMUM THRUST*	MAXIMUM STROKE	INERTIA (kg-m ² x 10 ⁻⁶)			BREAKAWAY TORQUE
	(in)			(mm/300)	(mm)	(N)	(mm)	BASE ACTUATOR		PER/in OF STROKE	
								In Line	Rev. Parallel		
TKS10	0.500	SN	2	0.0762	0.1778	756	2,438	3.69	4.65	0.50	0.11
	0.375	BN	8	0.1016	0.0508	1,023	737	0.85	1.11	0.15	0.09
TKS25	0.500	SN	2	0.0762	0.1778	756	2,438	7.69	8.51	0.49	0.20
	0.500	BN	2	0.1016	0.0508	7,073	1,600	7.69	8.51	0.49	0.16
	0.625	BN	5	0.1016	0.0508	2,402	1,600	9.10	11.12	2.17	0.12
TKS50	0.750	SN	1	0.0762	0.1778	1,334	2,438	43.06	46.13	2.54	0.42
	0.750	BN	2	0.1016	0.0508	12,588	1,600	25.36	28.43	2.54	0.21
	0.750	BN	5	0.1016	0.0508	4,893	1,600	20.42	23.49	2.54	0.17
TKS75	1.000	SN	4	0.0762	0.1778	1,779	2,438	64.23	80.06	8.04	0.31
	1.000	BN	1	0.1016	0.0508	10,631	2,438	88.83	104.66	8.04	0.39
	1.000	BN	2	0.1016	0.0508	14,234	2,438	69.15	84.97	8.04	0.31
	1.000	BN	4	0.1016	0.0508	8,985	2,438	64.23	80.06	8.04	0.28

 **Contact the factory 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 1 million linear inches of travel.**

SCREW TYPE DESCRIPTION

SN
BN

Solid Nut
Ball Nut

TKS Rodless Screw Drive Actuator

TKS SPECIFICATIONS

ACTUATOR SPECIFICATIONS

SPECIFICATIONS	U.S. CONVENTIONAL					METRIC				
		TKS10	TKS25	TKS50	TKS75		TKS10	TKS25	TKS50	TKS75
Carrier weight	lb	0.56	2.31	3.18	3.54	kg	0.25	1.05	1.44	1.61
Base weight (in-line model, including carrier • motor not included)	lb	3.22	9.46	14.56	17.95	kg	1.46	4.29	6.6	8.14
Weight per/in (mm) of stroke	lb	0.229	0.527	0.728	0.932	kg	0.10	0.24	0.33	0.42
Straightness (YX Plane) (unconstrained ¹)	in/in	0.0004				mm/mm	0.0004			
Straightness (YX Plane) (constrained ²)	in/in	0.0002				mm/mm	0.0002			
Flatness (ZX Plane) (unconstrained ¹)	in/in	0.0008				mm/mm	0.0008			
Flatness (ZX Plane) (constrained ²)	in/in	0.0002				mm/mm	0.0002			
Screw uni-directional repeatability ³	in	±0.0004				mm	±0.010			
Temperature Range ⁴	°F	40-130				°C	4-54			



¹ Listed values are intended for reference purposes only, and not as an engineering standard of absolute tolerance for a given actuator. Values were derived from testing of characteristic samples of appropriate products, and indicate an expected range of deviation from a theoretical straight line in the indicated plane of carrier motion. 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. For more information on how these values were obtained, please read the white paper on this subject available at www.tolomatic.com.

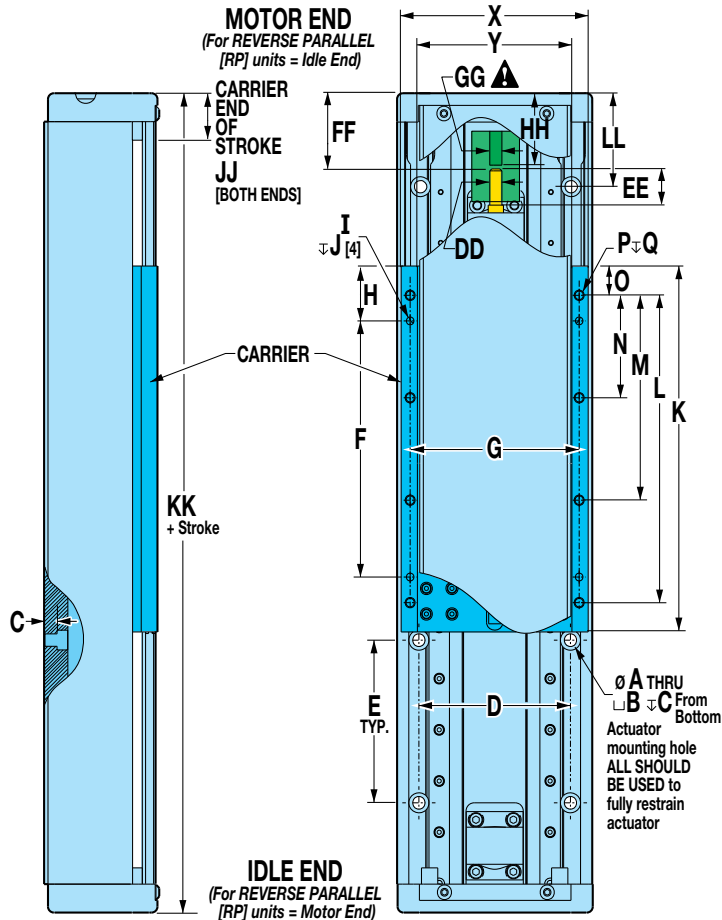
² Actuator mounted on a flat surface and fully restrained.

³ Ball screw; not including backlash

⁴ 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.

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.

DIMENSIONS



SIZE	10			25					50				75	
Frame	17	23		23			34		23		34		34	
		MRS	Brushless	MRS	Brushless	Gearbox	Motor	Gearbox	Motor	Gearbox	Motor	Gearbox	Motor	Gearbox
AA	#6-32	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5
mm														
BB Ø	1.810	2.625	2.625	2.625	2.625	2.625	3.875	3.875	2.625	2.625	3.875	3.875	3.875	3.875
mm	45.97	66.68	66.68	66.68	66.68	66.68	98.43	98.43	66.68	66.68	98.43	98.43	98.43	98.43
CC Ø	1.182	1.501	1.501	1.501	1.501	1.501	2.875	2.875	1.501	1.501	2.875	2.875	2.875	2.875
mm	30.02	38.13	38.13	38.13	38.13	38.13	73.03	73.03	38.13	38.13	73.03	73.03	73.03	73.03
DD	Ø188		Ø315						Ø500				Ø500	
mm	4.78		8.00						12.70				12.70	
EE	0.70	0.78	0.58	1.38	0.75	1.00	1.31	1.06	0.91	1.16	0.85	0.60	0.71	
mm	17.6	19.7	14.6	35.1	19.1	25.4	33.3	26.9	23.2	29.5	21.6	15.2	18.0	
FF	1.16	1.15	1.35	1.49	1.92	1.67	1.36	1.61	1.61	1.36	1.67	1.92	1.92	
mm	29.5	29.1	34.2	37.8	48.8	42.4	34.5	40.9	40.9	34.5	42.4	48.8	48.8	
GG	0.315	0.250	0.500	0.250	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
mm	8.00	6.35	12.70	6.35	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
HH	1.00	0.79	1.50	0.83	1.42	1.18	1.17	1.43	1.45	1.20	1.20	1.33	1.21	1.33
mm	25.4	20.0	38.1	21.0	36.0	30.0	29.6	36.3	36.9	30.5	30.5	33.7	30.7	33.8
JJ	0.69	motor = 0.75 idle = 0.69		1.00					1.13				1.12	
mm	17.5	19.1	17.5	25.4					28.7				28.4	
KK	7.00	7.06		8.92					9.87				10.31	
mm	177.8	179.4		226.6					250.7				261.9	
LL	1.44	1.50		1.63					1.75				1.67	
mm	36.5	38.1		41.3					44.5				42.4	

SIZE	10	25	50	75
A	0.19	0.26	0.26	0.34
mm	4.8	6.6	6.6	8.6
B	0.31	0.53	0.44	0.53
mm	7.9	13.5	11.2	13.5
C	0.24	0.31	0.28	0.28
mm	6.1	7.9	7.1	7.1
D	2.330	3.580	2.270	2.939
mm	59.18	90.93	57.66	74.65
E	2.500	2.500	5.000	5.000
mm	63.50	63.50	127.00	127.00
F	3.937	3.937	5.118	5.512
mm	100.00	100.00	130.00	140.00
G	2.599	3.937	4.724	5.315
mm	66.00	100.00	120.00	135.00
H	0.84	1.49	1.25	1.12
mm	21.4	38.0	31.8	28.4
I	0.12	0.24	0.24	0.24
mm	3.0	6.0	6.0	6.0
J	Thru	Thru	Thru	Thru
mm				
K	5.63	6.93	7.62	7.75
mm	142.9	175.9	193.5	196.9
L	4.725	5.512	7.086	7.244
mm	120.02	140.00	180.00	184.00
M	3.150	3.543	4.724	4.882
mm	80.00	90.00	120.00	124.00
N	1.575	1.968	2.362	2.362
mm	40.00	50.00	60.00	60.00
O	0.45	0.71	0.27	0.25
mm	11.4	18.0	6.8	6.4
P	M4	M6	M8	M8
mm				
Q	0.31	Thru	Thru	Thru
mm	7.9			
R	0.75	1.00	1.75	1.75
mm	19.1	25.4	44.5	44.5
S	0.85	1.22	2.00	2.00
mm	21.6	31.0	50.8	50.8
T	2.15	3.28	3.50	4.13
mm	54.6	83.3	88.9	104.9
U	3.00	4.50	5.50	6.13
mm	76.2	114.3	139.7	155.6
V	1.74	2.72	3.14	3.42
mm	44.2	69.1	79.8	86.9
W	0.06	0.06	0.06	0.06
mm	1.5	1.5	1.5	1.5
X	2.88	4.35	5.35	5.97
mm	73.0	110.6	135.9	151.7
Y	2.38	3.35	4.10	4.72
mm	60.3	85.2	104.1	119.9
Z	0.75	1.25	1.53	1.62
mm	19.1	31.6	38.9	41.2

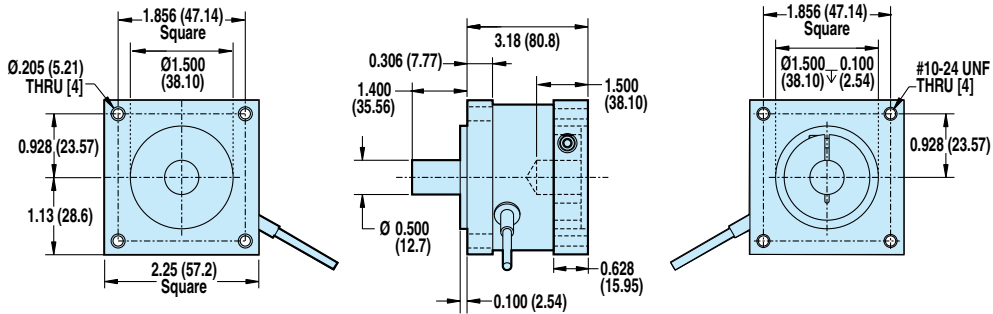
TKS Rodless Screw Drive Actuator

DIMENSIONS

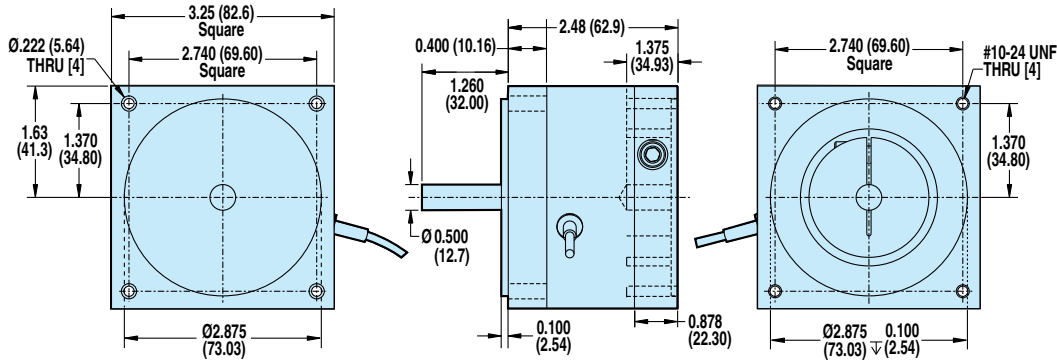


TKS: DOUBLE C-FACE BRAKE OPTION

BRAKE FOR 23-FRAME MOTOR



BRAKE FOR 34-FRAME MOTOR



MOTOR TYPE	FRAME	BRAKE PART NO.	STATIC TORQUE		REFLECTED INERTIA		WEIGHT		VOLTAGE	CURRENT	RESISTANCE	CABLE LENGTH	
			lb-in	N-m	lb-in ²	kg-m ² x 10 ⁻⁶	lbs	kg				in	mm
BRUSHLESS	23	3600-6286	10	1.130	0.0125	3.66	1.49	0.68	24	0.286	83.6	16.75	425
	34	3600-6288	25	2.825	0.1087	31.79	2.88	1.31	24	0.369	65.1	18.0	457

MAXIMUM BRAKE HOLDING LOADS

LEADSCREW/NUT REDUCTION	23-FRAME BRAKE						34-FRAME BRAKE					
	INLINE		5:1 GEARBOX		10:1 GEARBOX		INLINE		5:1 GEARBOX		10:1 GEARBOX	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
TKS10 with SN02	180	81.6	180	81.6	180	81.6						
TKS10 with BN08	559	253.5	1874	850	1874	850						
TKS25 with SN02	180	81.6	180	81.6	180	81.6	180	81.6	180	81.6	180	81.6
TKS25 with BN02	140	63.5	903	409.5	1643	745.2	349	158.3	2259	1024.6	4107	1862.8
TKS25 with BN05	349	158.3	2259	1024.6	4008	1817.9	873	395.9	4008	1817.9	4008	1817.9
TKS50 with SN01	105	47.6	300	136.0	300	136.0	262	118.8	300	136.0	300	136.0
TKS50 with BN02	140	63.5	903	409.5	1643	745.2	349	158.3	2259	1024.6	4107	1862.8
TKS50 with BN05	349	158.3	2259	1024.6	4107	1862.8	873	395.9	5647	2561.4	10055	4560.8
TKS75 with SN04							419	190	419	190	419	190
TKS75 with BN01							175	79.3	1129	512.1	2053	931.2
TKS75 with BN02							349	158.3	2259	1024.6	4107	1862.8
TKS75 with BN04							698	316.6	4517	2048.8	8213	3725.3

Double C-face brakes are used for static holding (back driving prevention) and are not designed for dynamic stopping. Please contact Tolomatic if your application requires dynamic stopping. This brake can be used with other Tolomatic systems. Consult Tolomatic for availability.

NOTE: MRB & MRV motors are discontinued contact Tolomatic for information

TKS Rodless Screw Drive Actuator

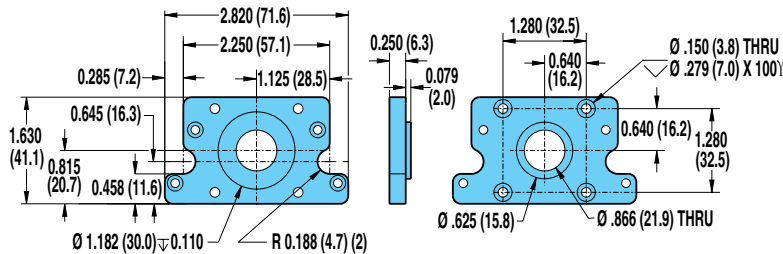


DIMENSIONS



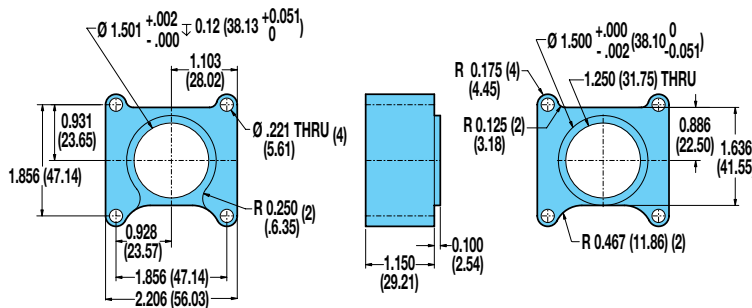
NOTE: MRB & MRV motors are discontinued contact Tolomatic for information

TKS10: IN-LINE MOUNT FOR 17-FRAME BRUSHLESS MOTORS



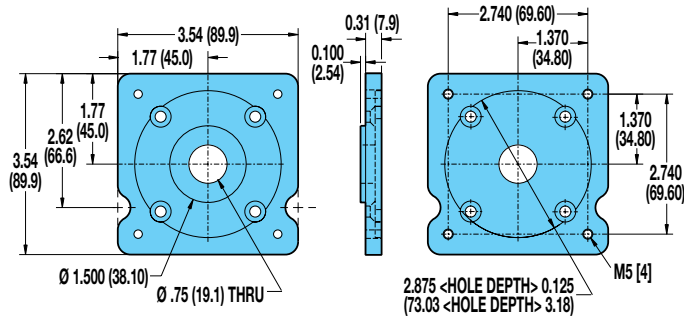
17-frame motors cannot be mounted directly to the actuator head and require the use of the motor adapter plate shown. Gearbox option is not available with 17-frame motors.

TKS10: IN-LINE MOUNT FOR 23-FRAME BRUSHLESS MOTORS OR GEARBOX



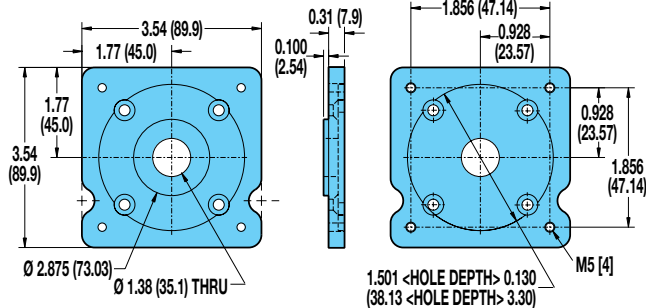
23-frame motors cannot be mounted directly to the actuator head and requires the use of the motor adapter plate shown.

TKS25: IN-LINE MOUNT FOR 34-FRAME BRUSHLESS MOTORS OR GEARBOX



23-frame motors are mounted directly to the actuator head and require no motor adapter plates. 34-frame motors cannot be mounted directly to the actuator head and require the use of the motor adapter plate shown.

TKS50: IN-LINE MOUNT FOR 23-FRAME BRUSHLESS MOTORS OR GEARBOX



34-frame motors are mounted directly to the actuator head and require no motor adapter plates. 23-frame motors cannot be mounted directly to the actuator head and require the use of the motor adapter plate shown.

TKS75: IN-LINE MOUNT FOR 34-FRAME MOTORS OR GEARBOX

All brushless servo and gearheads may be mounted directly to the actuator head and do not require the use of motor adapter plates.



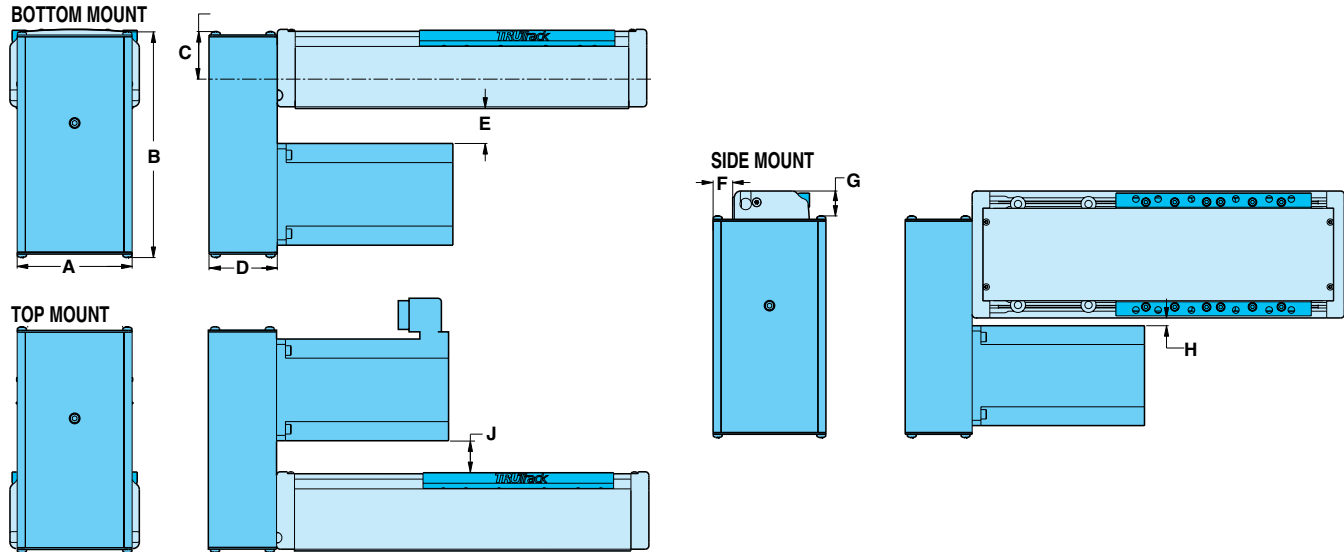
INTERCHANGING MOTORS: Leadscrews on TruTrack actuators are specific to the motor type specified. Motor mounting plates do not provide for interchanging servo or stepper motors. For gearhead dimensions and specifications, refer to literature #3600-4161

TKS Rodless Screw Drive Actuator

DIMENSIONS



TKS: REVERSE PARALLEL MOUNTING



			A		B		C		D		E		F		G		H		J	
			in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm		
BRUSHLESS	TKS10	11, 21, 22, 23, 24 Frame Motor	3.25	82.6	5.70	144.8	1.27	32.3	2.13	54.1	0.98	24.9	0.82	20.8	0.38	9.7	0.29	7.4	0.86	21.8
											23 Frame						23 Frame			
	TKS25	21, 22, 23, 24 Frame	3.25	82.6	7.02	178.4	1.33	33.8	2.13	54.1	1.74	44.2	0.32	8.1	1.07	27.2	0.8	20.3	1.78	45.2
		31, 32, 33 Frame	4.00	101.6	7.79	197.9	1.33	33.8	2.38	60.5	0.97	24.6	0.69	17.5	1.07	27.2	0.15	3.8	1.01	25.7
	TKS50	21, 22, 23, 24 Frame	3.25	82.6	7.02	178.4	1.33	33.8	2.13	54.1	1.74	44.2	0.32	8.1	1.07	27.2	0.80	20.3	1.78	45.2
		31, 32, 33 Frame	4.00	101.6	7.79	197.9	1.33	33.8	2.38	60.5	0.97	24.6	0.69	17.5	1.07	27.2	0.15	3.8	1.01	25.7
TKS75	31, 32, 33 Frame Motor	4.00	101.6	8.98	228.1	1.77	45.0	4.00	101.6	1.35	34.3	0.32	8.1	1.45	36.8	0.08	2.0	1.29	32.8	
										34 Frame						34 Frame				

SPECIFICATIONS

			WEIGHT OF REDUCTION DRIVE				REDUCTION INERTIA AT MOTOR SHAFT			
			1:1		2:1		1:1		2:1	
			lbs	kg	lbs	kg	lb-in ²	kg-cm ²	lb-in ²	kg-cm ²
BRUSHLESS	TKS10	11, 21, 22, 23, 24 Frame Motor	1.80	0.82	1.80	0.82	0.039	0.1141	0.047	0.1368
	TKS25	21, 22, 23, 24 Frame	2.51	1.14	2.74	1.24	0.038	0.1112	0.103	0.3014
		31, 32, 33 Frame Motor	2.75	1.25	2.98	1.35	0.038	0.1112	0.103	0.3014
	TKS50	21, 22, 23, 24 Frame	2.85	1.29	3.08	1.40	0.036	0.1054	0.227	0.6628
		31, 32, 33 Frame Motor	3.40	1.54	3.56	1.62	0.036	0.1054	0.227	0.6628
TKS75	31, 32, 33 Frame Motor		3.40	1.54	3.56	1.62	0.036	0.1054	0.227	0.6628

REDUCTION EFFICIENCY: 0.95

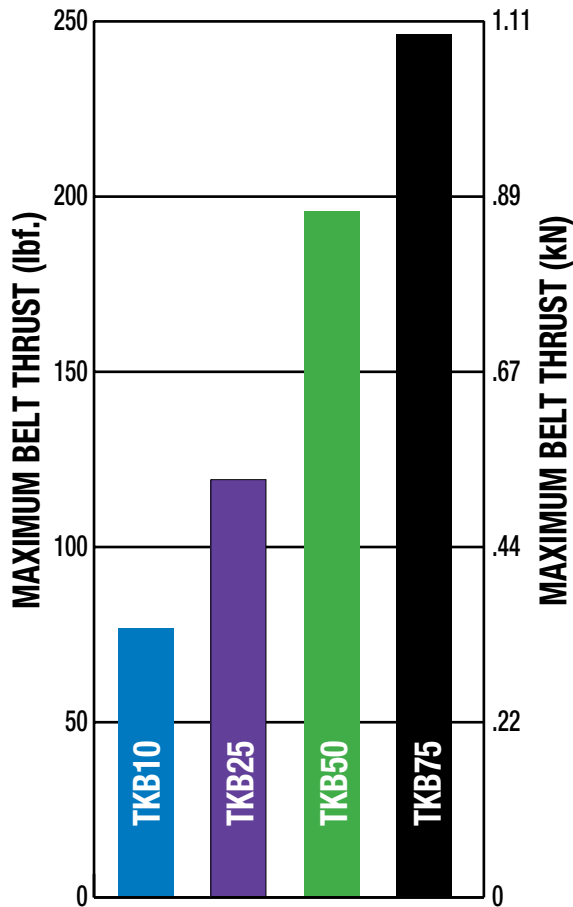
TKB Rodless Belt Drive Actuator

BELT PERFORMANCE

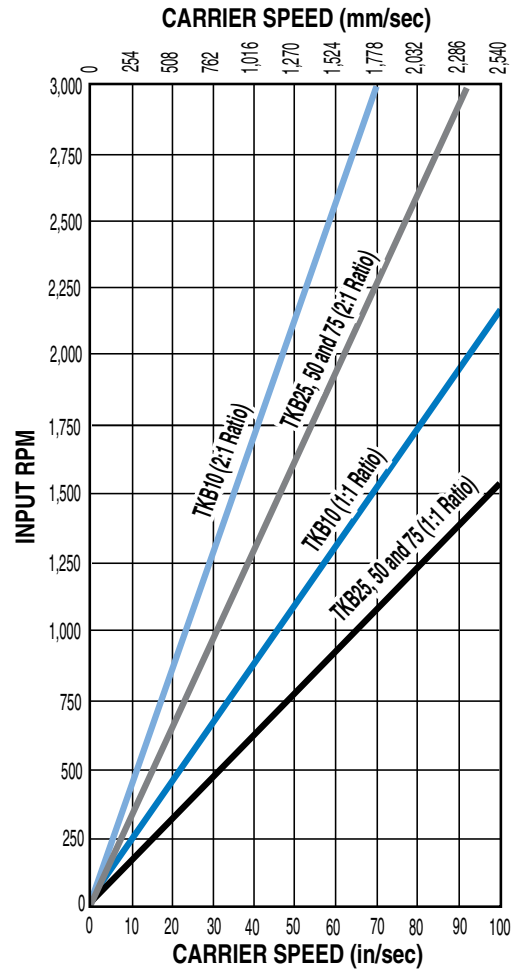


BELT FORCE AND SPEED CAPACITIES

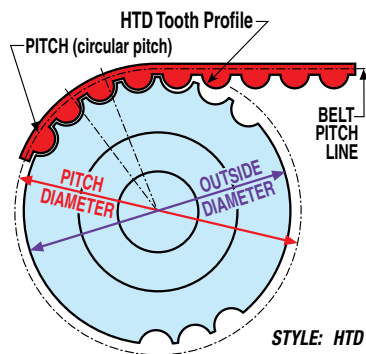
BELT FORCE FOR TKB ACTUATORS



MAXIMUM BELT SPEED FOR TKB ACTUATORS



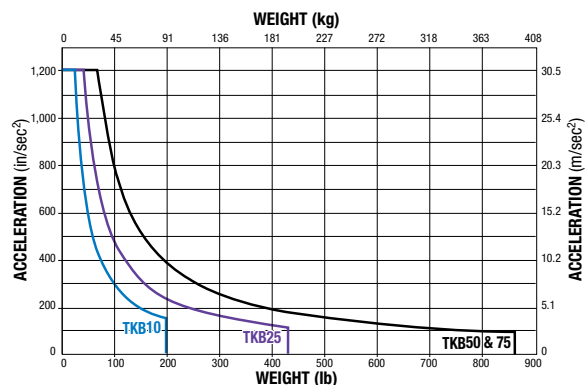
BELT SPECIFICATIONS



- STYLE: HTD Tooth
TOOTH PITCH: 5mm
BELT MATERIAL: Polyurethane body with steel tension members
CHARACTERISTICS: • For higher speed, higher load applications
• Heavy duty drive and idler pulley bearings

MAX ACCELERATION

AS A FUNCTION OF CARRIER LOAD WEIGHT



TKB Rodless Belt Drive Actuator

TKB SPECIFICATIONS



TKB BELT, INERTIA AND BREAKAWAY TORQUE SPECIFICATIONS

TKB ACTUATORS (US STANDARD MEASUREMENTS)								
	MAXIMUM STROKE	BELT WIDTH	BELT DEAD LENGTH	WHEEL PITCH DIA.	MOTION RATIO	STRAIGHTNESS & FLATNESS (in) ¹	TEMP. RANGE ²	BREAKAWAY TORQUE
	(in)	(in)	(in)	(in)	(in/rev)	(Constrained)	(F°)	(lb-in)
TKB10	96	0.59	15.88	0.89	2.787	0.0002	40 - 130	3.5
TKB25	96	1.00	23.12	1.19	3.742	0.0002	40 - 130	10.0
TKB50	96	1.57	26.23	1.19	3.742	0.0002	40 - 130	10.0
TKB75	96	1.97	25.68	1.19	3.742	0.0002	40 - 130	10.0

TKB ACTUATORS (METRIC MEASUREMENTS)								
	MAXIMUM STROKE	BELT WIDTH	BELT DEAD LENGTH	WHEEL PITCH DIA.	MOTION RATIO	STRAIGHTNESS & FLATNESS (mm) ¹	TEMP. RANGE ²	BREAKAWAY TORQUE
	(mm)	(mm)	(mm)	(mm)	(mm/rev)	(Constrained)	(C°)	(N-m)
TKB10	2438	15.0	333.6	22.5	70.78	0.005	4 - 54	0.35
TKB25	2438	25.4	533.8	30.3	95.05	0.005	4 - 54	1.06
TKB50	2438	40.0	867.4	30.3	95.05	0.005	4 - 54	1.06
TKB75	2438	50.0	1089.8	30.3	95.05	0.005	4 - 54	1.06

GENERAL ACTUATOR SPECIFICATIONS

TKB ACTUATORS (US STANDARD MEASUREMENTS)						
	CARRIER WEIGHT	BASE WEIGHT (inc. carrier)	WEIGHT PER (in) OF STROKE	INERTIA (lb-in ²) BASE ACTUATOR (inc. carrier assy.)	INERTIA (lb-in ²) PER (in) OF STROKE	REPEATABILITY
	(lbs)	(lbs)	(lbs)			(in)
TKB10	0.64	3.23	0.20	0.165	0.0012	±0.002
TKB25	2.41	10.69	0.46	1.100	0.0046	±0.002
TKB50	3.38	14.99	0.61	1.576	0.0072	±0.002
TKB75	4.42	18.34	0.72	2.039	0.0090	±0.002

TKB ACTUATORS (METRIC MEASUREMENTS)						
	CARRIER WEIGHT	BASE WEIGHT (inc. carrier)	WEIGHT PER (in) OF STROKE	INERTIA (kg-cm ²) BASE ACTUATOR (inc. carrier assy.)	INERTIA (kg-cm ²) PER (in) OF STROKE	REPEATABILITY
	(kg)	(kg)	(kg)			(mm)
TKB10	0.3	1.5	0.09	0.48	0.41	±0.05
TKB25	1.1	4.8	0.21	3.22	1.29	±0.05
TKB50	1.5	6.8	0.28	4.61	2.05	±0.05
TKB75	1.5	8.3	0.32	5.97	2.54	±0.05



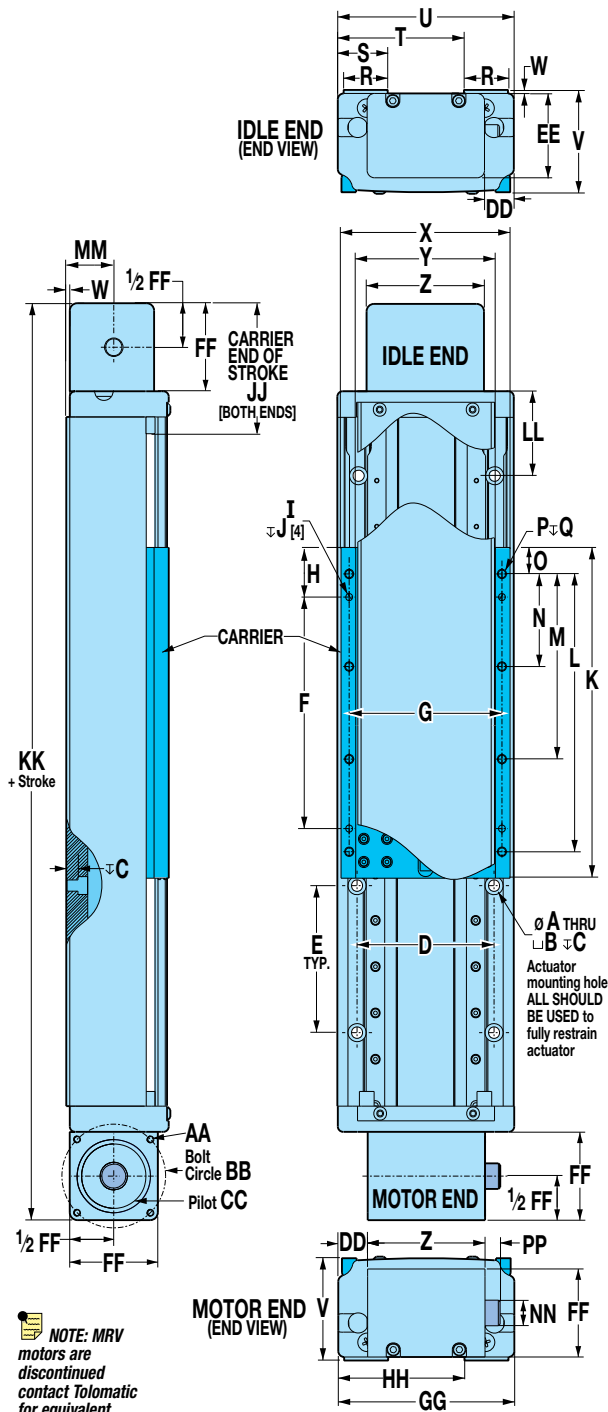
¹ The listed values relating to straightness/flatness are intended for reference purposes only, and not as an engineering standard of absolute tolerance for a given actuator. Appropriate installation is the single most important factor in reducing such deviation, so good engineering practices such as 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.

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.

TKB Rodless Belt Drive Actuator

DIMENSIONS



NOTE: MRV motors are discontinued contact Tolomatic for equivalent replacement

SIZE	10	25	50	75
A Ø	0.19	0.26	0.26	0.34
mm	4.8	6.6	6.6	8.6
B Ø	0.31	0.53	0.44	0.53
mm	7.9	13.5	11.2	13.5
C	0.17	0.92	0.28	0.34
mm	4.3	23.4	7.1	8.6
D	2.330	3.580	2.270	2.939
mm	59.18	90.93	57.66	74.65
E	2.500	2.500	5.000	5.000
mm	63.50	63.50	127.00	127.00
F	3.937	3.937	5.118	5.512
mm	100.00	100.00	130.00	140.00
G	2.599	3.937	4.724	5.315
mm	66.00	100.00	120.00	135.00
H	0.84	1.49	1.25	1.12
mm	21.4	38.0	31.8	28.4
I	Ø.12	Ø.24	Ø.24	Ø.24
mm	3.0	6.0	6.0	6.0
J	Thru	Thru	Thru	Thru
mm				
K	5.63	6.93	7.62	7.75
mm	142.9	175.9	193.5	196.9
L	4.725	5.512	7.086	7.244
mm	120.02	140.00	180.00	184.00
M	3.150	3.543	4.724	4.882
mm	80.00	90.00	120.00	124.00
N	1.575	1.968	2.362	2.362
mm	40.00	50.00	60.00	60.00
O	0.45	0.71	0.27	0.25
mm	11.4	18.0	6.8	6.4
P	M4	M6	M8	M8
mm				
Q	0.31	Thru	Thru	Thru
mm	7.9			
R	0.75	1.00	1.75	1.75
mm	19.1	25.4	44.5	44.5
S	0.85	1.22	2.00	2.00
mm	21.6	31.0	50.8	50.8
T	2.15	3.28	3.50	4.13
mm	54.6	83.3	88.9	104.9

SIZE	10	25	50	75
U	3.00	4.50	5.50	6.13
mm	76.2	114.3	139.7	155.6
V	1.74	2.72	3.14	3.42
mm	44.2	69.1	79.8	86.9
W	0.06	0.06	0.06	0.06
mm	1.5	1.5	1.5	1.5
X	2.88	4.35	5.35	5.97
mm	73.0	110.6	135.9	151.7
Y	2.38	3.35	4.10	4.72
mm	60.3	85.2	104.1	119.9
Z	2.00	2.88	3.71	3.94
mm	50.8	73.0	94.3	100.0
AA	M5	M5	M5	M5
mm				
BB	1.768	2.475	2.475	2.475
mm	44.90	62.86	62.86	62.86
CC	1.251	1.751	1.751	1.751
mm	31.78	44.48	44.48	44.48
DD	0.50	0.81	0.90	1.10
mm	12.7	20.7	22.9	27.9
EE	1.44	2.25	2.25	2.25
mm	36.5	57.2	57.2	57.2
FF	1.50	2.25	2.25	2.25
mm	38.1	57.2	57.2	57.2
GG	3.00	4.50	5.50	6.13
mm	76.2	114.3	139.7	155.6
HH	2.15	3.28	3.50	4.13
mm	54.6	83.3	88.9	104.9
JJ	2.19	3.25	3.37	3.37
mm	55.6	82.4	85.6	85.6
KK	10.00	13.42	14.37	14.81
mm	254.0	340.9	365.0	376.1
LL	1.43	1.63	1.75	1.75
mm	37.0	41.3	44.5	44.5
MM	0.81	1.44	1.83	1.86
mm	20.6	36.5	46.5	47.2
NN	Ø.436	Ø.500	Ø.500	Ø.500
mm	11.07	12.70	12.70	12.70

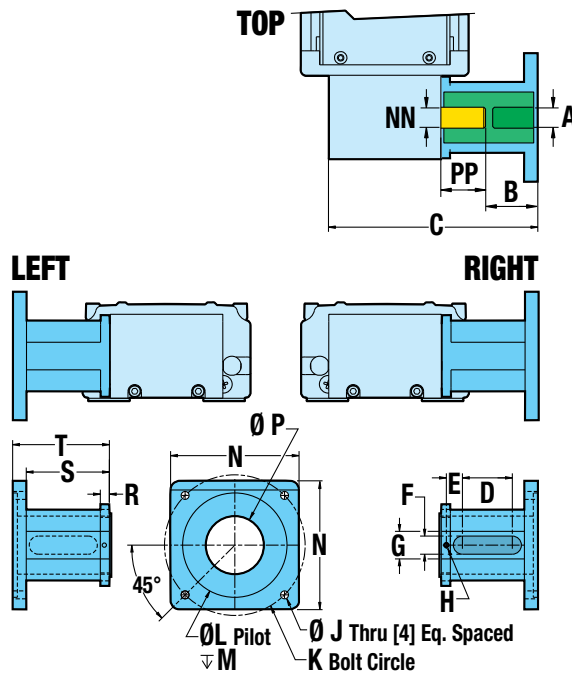
SIZE	10		25			50		75
FRAME	23		23		34	23	34	34
MOTOR	MRS	"MRV"	MRS	"MRV"				
PP	1.40	0.71	1.46	0.79	0.79	0.81	0.81	0.82
mm	35.6	18.1	37.0	20.1	20.1	20.5	20.5	20.8

TKB Rodless Belt Drive Actuator



DIMENSIONS

TKB DIRECT DRIVE MOTOR MOUNTING

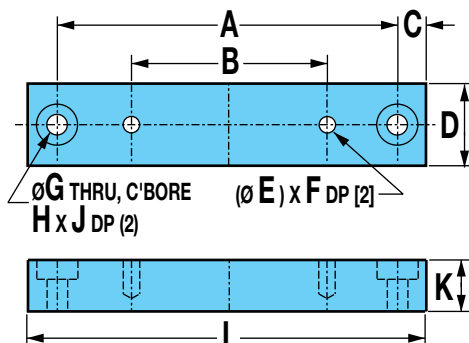


If a Tolomatic motor is not specified in the configuration string, customer's motor must conform to the shaft dimensions shown for mounting compatibility. Please specify your motor type and frame size when ordering.

NOTE: MRB & MRV motors are discontinued contact Tolomatic for information

SIZE	10	25		50		75
FRAME	23	23	34	23	34	34
A						
mm						
B	1.667	1.936	1.686	1.920	1.670	1.661
mm	42.34	49.17	42.82	48.77	42.42	42.19
C	4.63	5.85	5.85	5.85	5.85	6.19
mm	117.6	1.486	1.486	1.486	1.486	157.2
D	1.45	1.38	1.60	1.38	1.60	1.60
mm	36.8	34.9	40.6	34.9	40.6	40.6
E	0.34	0.47	0.36	0.47	0.36	0.36
mm	8.6	11.9	9.1	11.9	9.1	9.1
F	0.38	0.50	0.50	0.50	0.50	0.50
mm	9.5	12.7	12.7	12.7	12.7	12.7
G	0.77	0.76	0.76	0.76	0.76	0.76
mm	19.6	19.3	19.3	19.3	19.3	19.3
H	Ø M3	Ø M3	Ø M3	Ø M3	Ø M3	Ø M3
J	M5	M5	M5	M5	M5	M5
K	2.625	2.625	3.875	2.625	3.875	3.875
mm	66.68	66.68	98.43	66.68	98.43	98.43
L	1.503	1.503	2.877	1.503	2.877	2.877
mm	38.2	38.2	73.1	38.2	73.1	73.1
M	0.13	0.13	0.13	0.13	0.13	0.13
mm	3.3	3.3	3.3	3.3	3.3	3.3
N	2.25	2.25	3.54	2.25	3.54	3.54
mm	57.2	57.2	89.9	57.2	89.9	89.9
P	0.75	1.35	1.60	1.35	1.60	1.60
mm	19.1	34.3	40.6	34.3	40.6	40.6
R	0.25	0.25	0.25	0.25	0.25	0.25
mm	6.4	6.4	6.4	6.4	6.4	6.4
S	2.26	2.35	2.10	2.35	2.10	2.10
mm	57.3	59.8	53.4	59.8	53.4	53.4
T	2.63	2.73	2.48	2.73	2.48	2.48
mm	66.9	69.3	62.9	69.3	62.9	62.9
NN	Ø.375	Ø.500	Ø.500	Ø.500	Ø.500	Ø.500
mm	9.53	12.70	12.70	12.70	12.70	12.70
PP	0.965	0.793	0.793	0.808	0.808	0.817
mm	24.51	20.14	20.14	20.52	20.52	20.75

TKS & TKB: MOUNTING PLATE OPTION



SIZE	10	25	50	75
A	3.500	5.125	6.250	7.000
mm	88.90	130.18	158.75	177.80
B	2.330	3.580	2.270	2.939
mm	59.10	90.93	57.66	74.65
C	0.25	0.31	0.38	0.50
mm	6.4	8.0	9.5	12.7
D	0.75	1.00	1.00	1.00
mm	19.1	25.4	25.4	25.4
E	M4x0.7	M6x1.0	M6x1.0	M6x1.0
mm				
F	0.31	0.50	0.50	0.31
mm	7.8	12.7	12.7	7.8

SIZE	10	25	50	75
G	Ø 0.19	Ø 0.26	Ø 0.26	Ø 0.34
mm	Ø 4.8	Ø 6.6	Ø 6.6	Ø 8.6
H	Ø 0.31	Ø 0.44	Ø 0.44	Ø 0.53
mm	Ø 7.8	Ø 11.1	Ø 11.1	Ø 13.4
J	0.17	0.28	0.28	0.31
mm	4.3	7.1	7.1	7.8
K	0.75	0.88	0.63	0.63
mm	19.1	22.3	16.0	16.0
L	4.00	5.75	7.00	8.00
mm	101.6	146.0	177.8	203.2

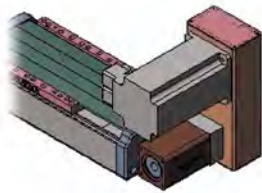
TKB Rodless Belt Drive Actuator



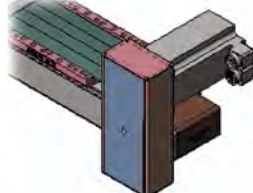
DIMENSIONS

TKB REDUCTION DRIVE MOTOR MOUNTING

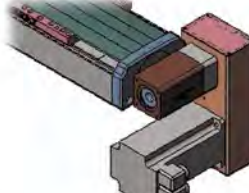
TOP LEFT (SDTL)



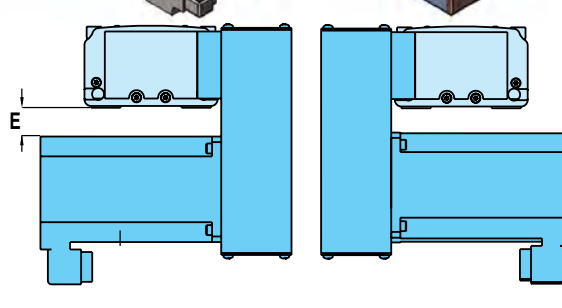
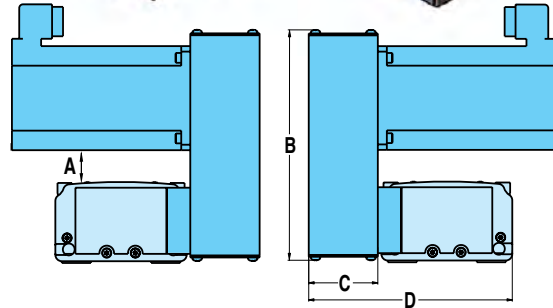
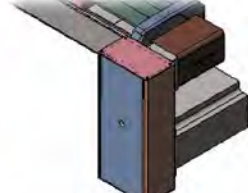
TOP RIGHT (SDTR)



BOTTOM LEFT (SDBL)



BOTTOM RIGHT (SDBR)



DIMENSIONS

		A		B		C		D		E	
		in	mm	in	mm	in	mm	in	mm	in	mm
10	11 Frame Motor	1.21	30.7	5.70	144.8	2.13	54.1	4.50	114.3	1.33	33.7
	21, 22, 23, 24 Frame Motor	0.86	21.9	5.70	144.8	2.13	54.1	4.50	114.3	0.98	24.9
25	21, 22, 23, 24 Frame Motor	1.77	44.9	7.02	178.3	2.13	54.1	5.67	144.1	1.61	40.8
	31, 32, 33 Frame Motor	1.12	28.5	7.79	197.9	2.38	60.5	5.92	150.4	0.96	24.4
50	21, 22, 23, 24 Frame Motor	2.50	63.4	8.34	211.8	2.13	54.1	6.48	164.6	1.96	49.7
	31, 32, 33 Frame Motor	1.85	47.0	8.98	228.1	2.38	60.5	6.73	170.9	1.31	33.3
75	31, 32, 33 Frame Motor	1.60	40.7	8.98	228.1	2.38	60.5	7.00	177.9	1.28	32.5

SPECIFICATIONS

		WEIGHT OF REDUCTION DRIVE				REDUCTION INERTIA AT MOTOR SHAFT			
		1:1		2:1		1:1		2:1	
		lbs	kg	lbs	kg	lb-in ²	kg-cm ²	lb-in ²	kg-cm ²
10	11, 21, 22, 23, 24 Frame Motor	1.80	0.82	1.80	0.82	0.039	0.1141	0.047	0.1368
25	21, 22, 23, 24 Frame Motor	2.55	1.16	2.78	1.26	0.036	0.1054	0.227	0.6628
	31, 32, 33 Frame Motor	2.80	1.27	3.03	1.37	0.036	0.1054	0.227	0.6628
50	21, 22, 23, 24 Frame Motor	2.87	1.30	3.10	1.40	0.036	0.1054	0.227	0.6628
	31, 32, 33 Frame Motor	3.44	1.56	3.60	1.63	0.036	0.1054	0.227	0.6628
75	31, 32, 33 Frame Motor	3.44	1.56	3.60	1.63	0.036	0.1054	0.227	0.6628

REDUCTION EFFICIENCY: 0.95



NOTE: MRB & MRV motors are discontinued
contact Tolomatic for information

TKS

TKB

TKS & TKB Rodless Actuators

SWITCHES



There are 4 sensing choices: DC reed, form A (open) or form C (open or closed); Hall-effect, sourcing, PNP (open); Hall-effect, sinking, NPN (open); each with either flying leads. 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.

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

SPECIFICATIONS

		REED DC		HALL-EFFECT DC	
ORDER CODE		RT	BT	TT	KT
PART NUMBER		3600-9082	3600-9084	3600-9088	3600-9090
LEAD		5M	5M	5M	5M
CABLE SHIELDING		UNSHIELDED	UNSHIELDED	UNSHIELDED	UNSHIELDED
SWITCHING LOGIC		"A" NORMALLY OPEN	"C" NORMALLY OPEN OR CLOSED	PNP (SOURCING) NORMALLY OPEN	NPN (SINKING) NORMALLY OPEN
MECHANICAL CONTACTS		SINGLE-POLE SINGLE-THROW	SINGLE-POLE DOUBLE-THROW	NO, THESE ARE SOLID STATE COMPONENTS	
COIL DIRECT		YES	YES	—	
POWER LED		NONE	NONE	NONE	NONE
SIGNAL LED		RED		RED	RED
OPERATING VOLTAGE		200 VDC MAX.	120 VDC MAX.	5 - 25 VDC	
OUTPUT RATING		—		25 VDC, 200MA DC	
OPERATING TIME		0.6 MSEC MAX. (INCLUDING BOUNCE)	0.7 MSEC MAX. (INCLUDING BOUNCE)	< 10 MICRO SEC.	
OPERATING TEMPERATURE		-40°F [-40°C] TO 158°F [70°C]		0°F [-18°C] TO 150°F [66°C]	
RELEASE TIME		1.0 MSEC. MAX.		—	
ON TRIP POINT		—		150 GAUSS MAXIMUM	
OFF TRIP POINT		—		40 GAUSS MINIMUM	
**POWER RATING (WATTS)		10.0 §	3.0 § §	5.0	
VOLTAGE DROP		2.6 V TYPICAL AT 100 MA	NA	—	
RESISTANCE		0.1 Ω INITIAL (MAX.)		—	
CURRENT CONSUMPTION		—		200 MA AT 25 VDC	
CABLE MIN. BEND RADIUS	STATIC	0.630" [16MM]			
	DYNAMIC	NOT RECOMMENDED			

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.

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

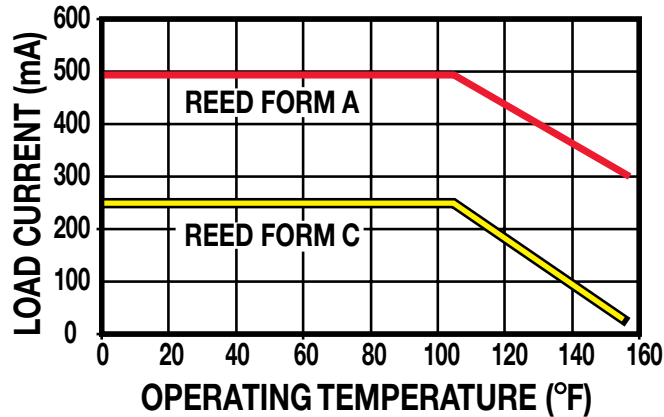
§§ Maximum current 250mA (not to exceed 3VA) Refer to Temperature vs. Current graph and Voltage Derating graph

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

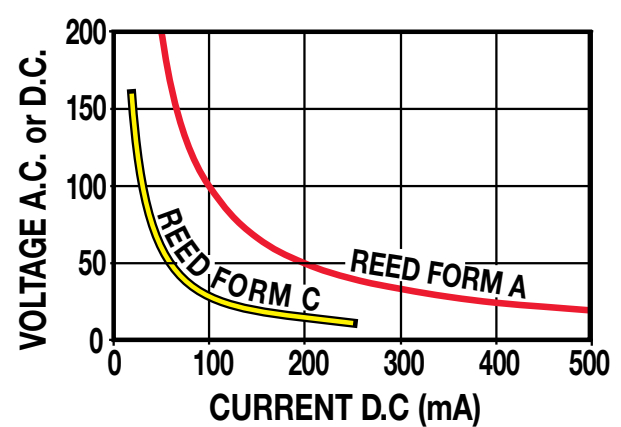
TKS & TKB Rodless Actuators

SWITCH PERFORMANCE

TEMP. vs CURRENT, DC REED

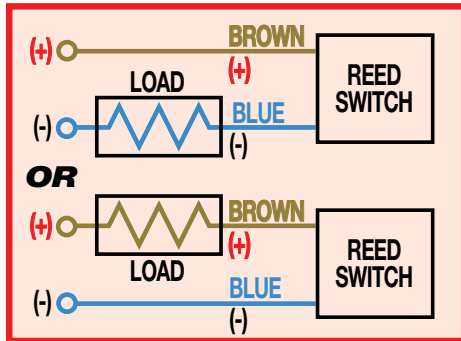


VOLTAGE DERATING, DC REED

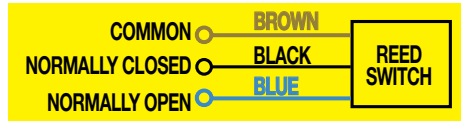


WIRING DIAGRAMS

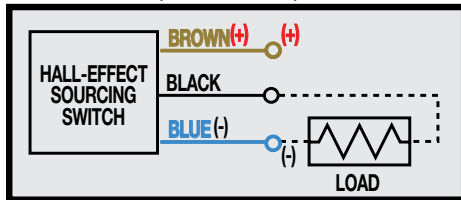
DC REED, FORM A



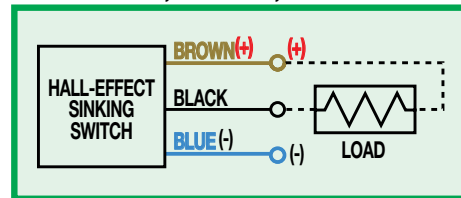
DC REED, FORM C



HALL-EFFECT, SOURCING, PNP



HALL-EFFECT, SINKING, NPN



INSTALLATION INFORMATION



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

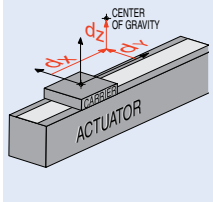
TKS

TKB

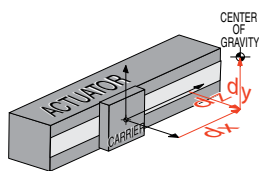
COMPILE APPLICATION REQUIREMENTS

ORIENTATION

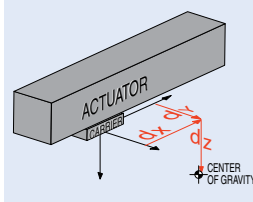
☐ Horizontal



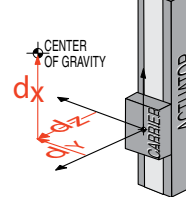
☐ Side



☐ Horizontal Down



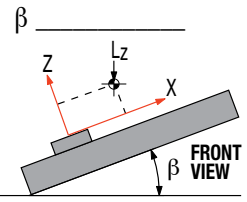
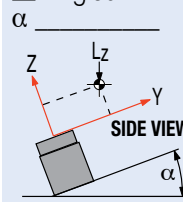
☐ Vertical



APPLICATION DATA WORKSHEET

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

☐ Angled °



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

DISTANCE FROM CENTER OF CARRIER TO LOAD CENTER OF GRAVITY

dx _____
dy _____
dz _____

☐ inch
(U.S. Standard)

☐ millimeter
(Metric)

STROKE LENGTH

☐ inch (S I K)
(U.S. Standard)

☐ millimeters
(Metric)

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

LOAD

☐ lb.
(U.S. Standard)

☐ kg.
(Metric)

THRUST REQUIRED

☐ lbf.

(U.S. Standard)

☐ N

(Metric)

Fz _____
Fy _____

BENDING MOMENTS APPLIED TO CARRIER

☐ in.-lbs.
(U.S. Standard)

☐ N-m
(Metric)

Mx _____
My _____
Mz _____

PRECISION

Repeatability _____

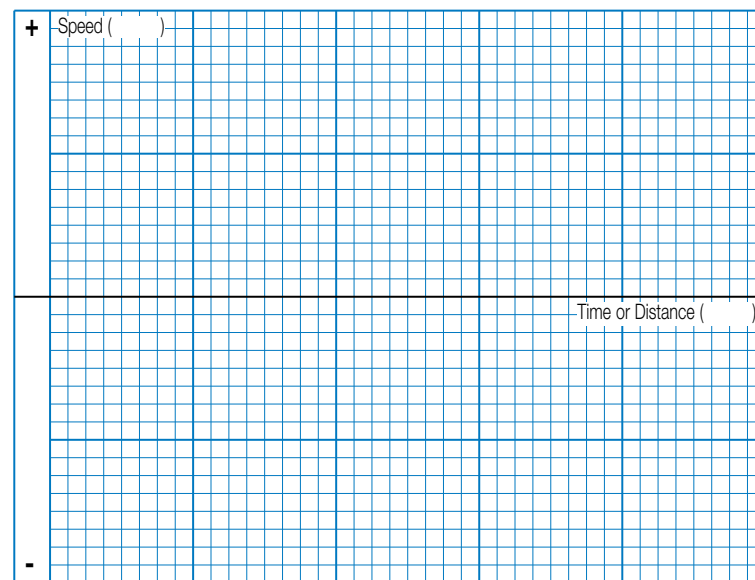
☐ inch

☐ millimeters

OPERATING ENVIRONMENT

Temperature, Contamination, etc.

MOTION PROFILE



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

MOVE PROFILE

Move Distance _____

☐ inch

☐ millimeters

Dwell Time After Move _____

Max. Speed _____

☐ in/sec

☐ mm/sec

MOVE TIME

☐ sec

NO. OF CYCLES

☐ per minute

☐ per hour

CONTACT INFORMATION

Name, Phone, Email
Co. Name, Etc.



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

FAX 1-763-478-8080

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 guidelines are for educational purposes only.

1 CHOOSE ACTUATOR SIZE

Choose an actuator that has the thrust, speed and moment load capacity to move the load. Use the Critical Speed graph (page TK_11&12) for the screw and the Moment and Load Capacity table (pg. TK_8) for the actuator.

2 COMPARE LOAD TO MAXIMUM LOAD CAPACITIES

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

Moment and Load Capacity table (pg. TK_10) for the actuator consider:

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

3 CALCULATE LOAD FACTOR LF

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

$$L_f = \frac{M_x}{M_{x_{max}}} + \frac{M_y}{M_{y_{max}}} + \frac{M_z}{M_{z_{max}}} + \frac{F_y}{F_{y_{max}}} + \frac{F_z}{F_{z_{max}}} \leq 1.5$$

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

4 ESTABLISH YOUR MOTION PROFILE AND CALCULATE ACCELERATION RATE

Using the application stroke length and maximum carrier velocity (or time to complete the linear motion), establish the motion profile. Select either triangular (accel-decel) or trapezoidal (accel-constant speed-decel) profile. Now cal-

culate the maximum acceleration and deceleration rates of the move. Based on the stroke length, speed and acceleration rate, etc. select either a screw-driven (TKS) or belt-driven (TKB). In a TKS screw-driven actuator speed should not exceed the value in the critical speed capacity graph (page TK_11&12) for the screw/nut combination chosen. Also, do not exceed safe rates of dynamic inertia moments determined in step #3. In a TKB belt-driven actuator verify that the belt thrust and acceleration values to not exceed allowable limits (page TK_21).

5 SELECT THE LEAD SCREW

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 anti-backlash 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.

6 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] to calculate the application thrust and torque requirements. Refer to Motor sections & [MRS] to determine the motor and drive.

7 DETERMINE MOUNTING PLATE REQUIREMENTS

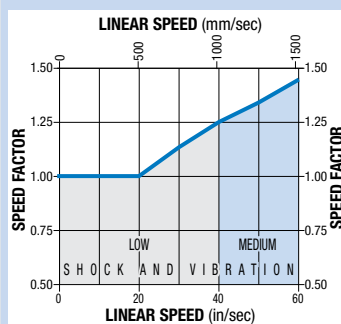
- Consult the Support Recommendations graph for the model selected (page TK_10)
- Cross reference the application load and maximum distance between supports
- Select the appropriate number of mounting plates if required for motor and adapter clearance.

8 CONSIDER OPTIONS

- BE2 Bellows for ingress protection
- LU Low dust generating grease
- BRK In-line mounted brake
- Switches - Reed, Solid State PNP or NPN, all available normally open or normally closed

SPEED FACTOR

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



TKS Rodless Screw Drive Actuator

ORDERING



BASE MODEL SPECIFICATIONS

TKS 50 BN02 SK55 LMB

MODEL	
TKS	TruTrack Screw Drive Actuator

PAYLOAD LIMITS	
10	100 lbs
25	250 lbs
50	500 lbs
75	750 lbs

NUT/SCREW CONFIGURATION	
MODELS	
SOLID NUT / PITCH (turn/in)	SERIES
SN01	TKS50
SN02	TKS10, 25
SN04	TKS75
BALL NUT / PITCH (turn/in)	SERIES
BN01	TKS75
BN02	TKS25, 50, 75
BN04	TKS75
BN05	TKS25, 50
BN08	TKS10

STROKE LENGTH	
SK	Stroke, then enter desired stroke length in decimal inches
MODEL	MAX STROKE* (in)
TKS10 Ball Nut	29
TKS10 Solid Nut	96
TKS25 Ball Nut	63
TKS25 Solid Nut	96
TKS50 Ball Nut	63
TKS50 Solid Nut	96
TKS75 Ball/Solid Nut	96

*Actuator cover has maximum stroke of 48 inches

! Not all codes listed are compatible with all options.

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

OPTIONS SPECIFICATIONS

DC18 KT2 BE2 BRK LU MP4

MOTOR MOUNTING / REDUCTIONS

! The length on the leadscrew and coupling device is determined by motor selection. Motor type and frame size must be specified when ordering.

(must choose one)

- LMI In-Line mount
- LMB In-Line mount with brake
- LMG In-Line mount with gearhead
- 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

! When the LMB option is selected, the configurator picks the appropriate screw and hardware to accommodate the mounting of the brake based on motor selection. The brake option "BRK" must also be indicated in the configuration string.

When the LMG option is selected, the configurator picks the appropriate screw and hardware to accommodate the mounting of the gearhead based on motor selection. A gearhead reduction must also be indicated in the configuration string. Please reference the motor ordering pages for available options.

AUXILIARY CARRIER

DC_ Auxiliary Carrier, then center-to-center spacing desired in decimal inches. (Center-to-Center spacing will add to overall dead length and will not subtract from the stroke length)

SWITCHES

RT_ Reed Switch (Form A) with 5-meter lead, and quantity desired

BT_ Reed Switch (Form C) with 5-meter lead, and quantity desired

KT_ Hall-effect Sinking Switch with 5-meter lead, and quantity desired

TT_ Hall-effect Sourcing Switch with 5-meter lead, and quantity desired

SP*_ Sensor Package

*Includes: Two Form C reed switches w/5-meter leads, mounted 1" from end-of-stroke and one Hall-effect sinking switch w/5-meter lead, mounted 2" from end-of-stroke on motor end.

BELLOWS

BE2 Bellows option (increases the dead length of the actuator, see pg. TK_12)

BRAKE OPTION

BRK In-line mounted brake***

*** Used with the LMB in-line mounting option.

SPECIAL LUBRICATION

LU Low dust generating grease

MOUNTING PLATES

MP_ Mounting Plates plus quantity desired



NOTE: MRV motors are discontinued contact Tolomatic for equivalent replacement

FIELD RETROFIT KITS				
ITEM	TKS10	TKS25	TKS50	TKS75
Mounting Plates	0601-9803	0602-9803	0603-9803	0604-9803

TKB Rodless Belt Drive Actuator

ORDERING



BASE MODEL SPECIFICATIONS

TKB 50 SK48 SDBR2

MODEL	
TKB	TruTrack Belt Drive Actuator

PAYLOAD LIMITS	
10	100 lbs
25	250 lbs
50	500 lbs
75	750 lbs

STROKE LENGTH	
SK	Stroke, then enter desired stroke length in decimal inches
MODEL	MAX STROKE* (in)
TKB All Sizes	96

*Actuator cover has maximum stroke of 48 inches

MOTOR MOUNTING / REDUCTIONS	
<i>(must choose one)</i>	
DIRECT DRIVE	
SDL	Direct Drive - Left
SDR	Direct Drive - Right
▲ A motor size and code must be selected when specifying a 1:1 or 2:1 reduction.	
REDUCTION DRIVE	
SDTL1	1:1 Reduction Drive / Top Left
SDTR1	1:1 Reduction Drive / Top Right
SDBL1	1:1 Reduction Drive / Bottom Left
SDBR1	1:1 Reduction Drive / Bottom Right
SDTL2	2:1 Reduction Drive / Top Left
SDTR2	2:1 Reduction Drive / Top Right
SDBL2	2:1 Reduction Drive / Bottom Left
SDBR2	2:1 Reduction Drive / Bottom Right

OPTIONS SPECIFICATIONS

DC18 KT2 BE2 LU MP4

AUXILIARY CARRIER	
DC_	Auxiliary Carrier, then center-to-center spacing desired in decimal inches. (Center-to-Center spacing will add to overall dead length and will not subtract from the stroke length)

SWITCHES	
RT_	Reed Switch (Form A) with 5-meter lead, and quantity desired
BT_	Reed Switch (Form C) with 5-meter lead, and quantity desired
KT_	Hall-effect Sinking Switch with 5-meter lead, and quantity desired
TT_	Hall-effect Sourcing Switch with 5-meter lead, and quantity desired
SP*	Sensor Package

*Includes: Two Form C reed switches w/5-meter leads, mounted 1" from end-of-stroke and one Hall-effect sinking switch w/5-meter lead, mounted 2" from end-of-stroke on motor end.

BELLOWS	
BE2	BelloWS option (increases the dead length of the actuator, see pg. TKB_8)

SPECIAL LUBRICATION	
LU	Low dust generating grease

MOUNTING PLATES	
MP_	Mounting Plates plus quantity desired

▲ 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: MRV motors are discontinued contact Tolomatic for equivalent replacement

FIELD RETROFIT KITS				
ITEM	TKB10	TKB25	TKB50	TKB75
Mounting Plates	0601-9803	0602-9803	0603-9803	0604-9803

THE TOLOMATIC DIFFERENCE

What you expect from the industry leader:



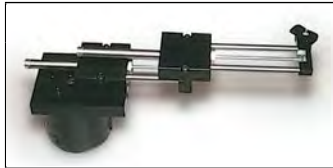
EXCELLENT CUSTOMER SERVICE & TECHNICAL SUPPORT

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



INDUSTRY LEADING DELIVERIES

Tolomatic continues to offer the fastest delivery of standard catalog products. Modified and custom products ship weeks ahead of the competition.



INNOVATIVE PRODUCTS

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



ONLINE SIZING & SELECTION SOFTWARE

Online sizing that is easy to use, accurate and always up-to-date. Input your application data and the software will determine a Tolomatic electric actuator to meet your requirements.



3D MODELS & 2D DRAWINGS AVAILABLE ON THE WEB

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

ALSO CONSIDER THESE OTHER TOLOMATIC PRODUCTS:

PNEUMATIC PRODUCTS



RODLESS CYLINDERS: Band Cylinders, Cable Cylinders, MAGNETICALLY COUPLED CYLINDERS/SLIDES; GUIDED ROD CYLINDER SLIDES

"FOLDOUT" BROCHURE #9900-9075
PRODUCTS BROCHURE #9900-4028

ELECTRIC PRODUCTS



POWER TRANSMISSION PRODUCTS



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

"FOLDOUT" BROCHURE #9900-9076
PRODUCTS BROCHURE #9900-4029

ROD & GUIDED ROD STYLE ACTUATORS, HIGH THRUST ACTUATORS, SCREW & BELT DRIVE RODLESS ACTUATORS, MOTORS, DRIVES AND CONTROLLERS

"FOLDOUT" BROCHURE #9900-9074
PRODUCTS BROCHURE #9900-4016



3800 County Road 116 • Hamel, MN 55340 U.S.A.
Phone: (763) 478-8000 • Fax: (763) 478-8080

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

Email: help@tolomatic.com • <http://www.tolomatic.com>

All brand and product names are trademarks or registered trademarks of their respective owners. Information in this document is believed accurate at time of printing. However, Tolomatic assumes no responsibility for its use or for any errors that may appear in this document. Tolomatic reserves the right to change the design or operation of the equipment described herein and any associated motion products without notice. Information in this document is subject to change without notice.

Visit www.tolomatic.com for the most up-to-date technical information

