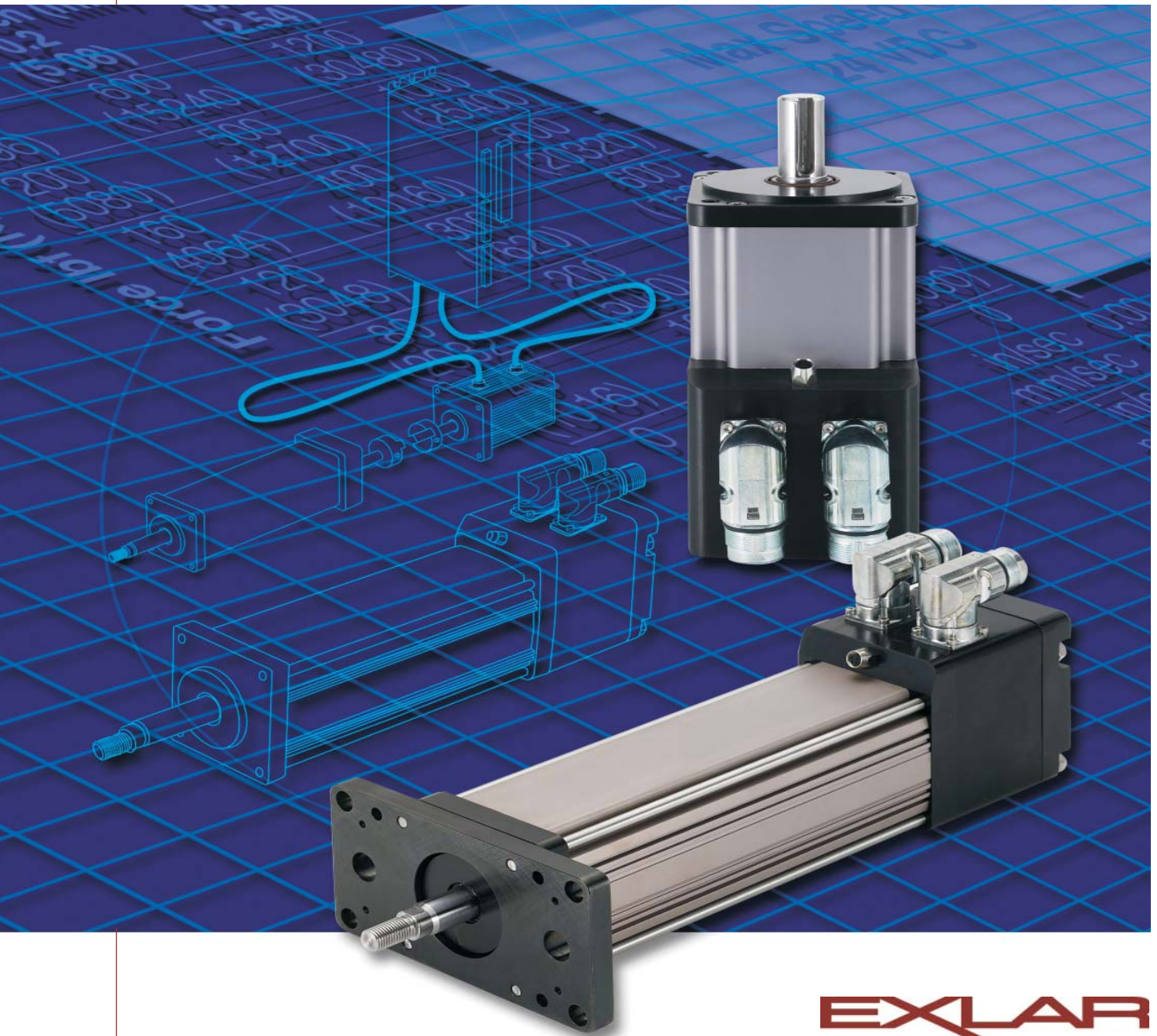


# TRITEX

## Linear and Rotary Electric Actuation

- ▶ Without the oil and air of fluid power
- ▶ Without the amplifier, cables and panel space of a servo system



EXLAR

# Three Technologies—One Actuator

Exlar's Tritex™ Series actuators combine three technologies to deliver for the first time a truly simple and low-cost electric alternative for fluid power actuators and costly servo systems.

Tritex actuators represent an all-electric actuator solution for moving and positioning mechanical devices in a large variety of commercial, industrial or military grade applications. Tritex actuators eliminate the

need for pneumatic and hydraulic cylinders while improving position performance, reducing cycle times and eliminating the maintenance associated with fluid power devices.

Ball screw mechanisms, or separately mounted gear reducers are also a thing of the past. Rotary-to-linear converters or mechanical reducers necessary to move the load are embedded into the Tritex design.

## Less is More

The Tritex Series of electric actuators combine a brushless motor, servo amplifier and position controller in a single

industrial grade enclosure. This eliminates both the external servo amplifier and the expensive and failure prone cables associated with a typical servo system. Servo system component selection, design and installation are completely eliminated. Trouble shooting and debugging of individual components; gear reducers, rotary-to-linear converter mechanisms and the complex wiring layout typical of such a system are gone. Moreover, the panel space for a separately mounted amplifier and installation of that amplifier are no longer necessary.

## Rotary Applications

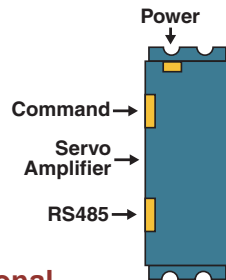
Tritex rotary motors and gear-motors provide high response and precise control of a rotatable shaft similar to that found in any electric motor. The difference is that with Tritex you can program (via your PC) the rotational speed and position of the output shaft in response to external commands. For example, the motor can be commanded to rotate at a controlled velocity and precisely stop at a pre-programmed position. You can also program the unit



to run at a preset velocity until a switch input is received or a pre-programmed torque level is produced against a load. Alternatively, the rotary

Tritex can be set up to follow an analog signal, either voltage or current, representing your choice of torque, velocity, or position.

Signals for initiating the preprogrammed velocity and position commands come from optically isolated inputs or directly via the Modbus serial communication channel provided on each Tritex unit. Likewise, isolated output commands of the status and events allow precise coordination with your system controls or machine operator.

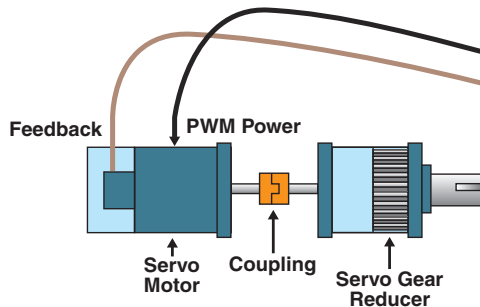
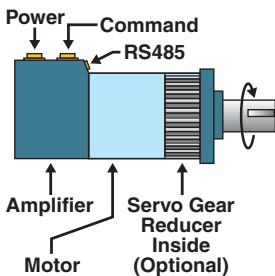


## Conventional Rotary Servo System

## Optional Internal Gear Reducer

If the application requires greater torque and less speed than available with the base unit, the Tritex is available with an integral servo grade planetary gear reducer. Gear ratios of 4:1 to 100:1 allow the power of Tritex to be applied over a broad range of torque requirements.

## Tritex Actuator



## Linear Applications

Tritex linear actuators employ Exlar's patented, inverted roller screw mechanism for converting the rotational motion generated within the Tritex actuator to the highly robust and long-life linear motion required to solve applications that previously required pneumatic or hydraulic cylinders. No additional mechanisms (such as acme or ball screws) are necessary to convert the actuator's rotary power



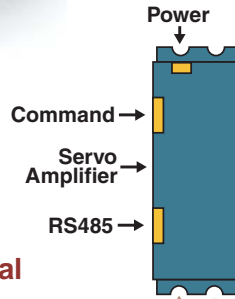
to the linear motion required to move the load.

The Tritex linear actuator contains the same control capability of the Tritex rotary actuator. (See previous page.)

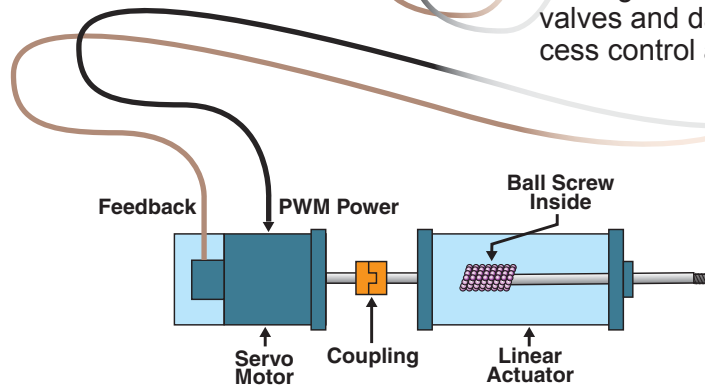
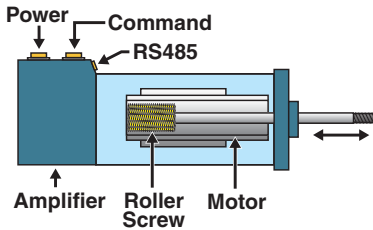
In addition, the Tritex software allows you to create a sequence which causes the actuator, when commanded, to move forward while pressing an object into position. You can establish a pre-programmed force which triggers an event (such as stopping or retracting to another position) or it can maintain that force level until commanded otherwise. The sequence is ideal for assembly, test, fastening and pressing applications.

As with the rotary Tritex, the linear Tritex can be programmed to follow an analog command signal, making it ideal for controlling valves and dampers in process control applications.

## Conventional Linear Servo System



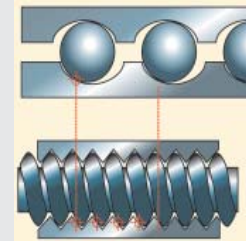
## Tritex Actuator



## Roller Screw Basics

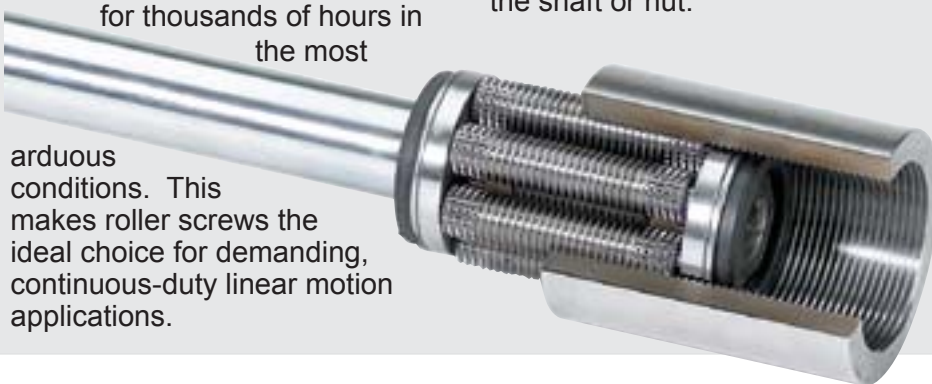
Exlar's patented, inverted roller screw is a mechanism for converting rotary torque into linear motion, in a similar manner to acme screws or ball screws. But, unlike those devices, roller screws can carry heavy loads for thousands of hours in the most

The difference is in the roller screw's design for transmitting forces. Multiple threaded helical rollers are assembled in a planetary arrangement around a threaded shaft as seen below, which converts a motor's rotary motion into linear movement of the shaft or nut.



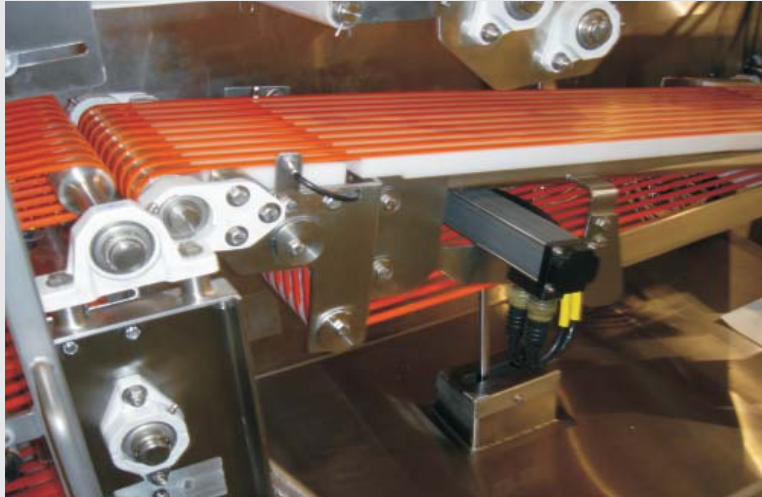
Compare a similar size ball screw to Exlar's planetary roller screw design and see many more contact points on the roller screw. This results in up to 15 times the load-carrying capacity of ball screws and improved stiffness.

arduous conditions. This makes roller screws the ideal choice for demanding, continuous-duty linear motion applications.



# The Exlar Advantage

Exlar has delivered thousands of roller screw based linear actuator solutions around the world in applications ranging from weld guns to controlling fuel or steam valves on turbine generators. Exlar's linear actuators provide trouble-free, precise linear motion control for millions of cycles of operation.



Food Processing

## Typical Applications

- Process Control
- Defense
- Aerospace
- Test
- Simulation
- Food Processing
- Industrial Automation
- Forestry



Cut-to-Length in Sawmills

## Tritex Product Features

- 24 to 48 VDC Power
- Integrated brushless motor, amplifier & controller
- Multiple termination and connector options

## Rotary Tritex

- 60 and 90 mm frame sizes
- Up to 42 lbf-in (4.7 Nm) continuous and 84 lbf-in (9.4 Nm) peak torque
- IP65 sealing
- Integrated planetary gearing option 4:1 to 100:1 ratios
- Up to 5000 rpm base motor speed



Simulation

- Semi-conductor
- Remote Vehicles
- Medical Equipment
- Automotive Assembly
- Molding
- Die Casting
- Welding



Process Control in Power Plants



## Linear Tritex

- 2 and 3 inch (51 and 76 mm) frame sizes
- 3 to 18 inch (75 to 455 mm) strokes available
- 0.1, 0.2, 0.4 and 0.5 inch lead (2.54, 5.08, 10.16 and 12.7 mm) planetary roller screws
- Up to 1250 lbf (5560 N) max continuous thrust capacity, 2270 lbf (10,000N) peak
- Up to 33 inches (838 mm) per second max linear velocity
- IP54 sealing standard, IP65 optional
- Multiple mounting options

## Tritex Series Operation

The Tritex Series actuators can operate in one of five different motion producing modes. These modes solve an endless variety of applications in industrial automation, medical equipment, fastening and joining, blow molding, injection molding, testing, food processing, and more.

Programmed functions are stored in the Tritex non-volatile memory. An RS/485 serial interface allows control, programming and monitoring of all aspects of the motor or actuator as it performs your application.

## Operating Modes

### 1) Move To A Position (Or Switch)

The Tritex Series actuators allow you to execute your programmed positions or distances. You may also use a limit switch or other input device as the end condition of a move. This combination of index flexibility provides a simple solution for point-to-point indexing.

### 2) Move To A Preset Force Or Torque

The Tritex Series allows you to terminate your move upon the achievement of a programmed torque or force. This is an ideal mode for pressing and clamping applications.

### 3) Position Proportional To An Analog Signal

Ideal for process control solutions, the Tritex Series provides the functionality to position valve's dampers by following an analog input signal. This allows the Tritex Series to be a drop-in replacement for inconvenient and inefficient hydraulic and pneumatic solutions already positioning to analog signals.

### 4) Velocity Proportional to An Analog Signal

Tritex actuators offer you the capability to control velocity with an analog signal. This is particularly useful with Tritex rotary actuators offering precise control of the speed of any process or operation.

### 5) Force/Torque Proportional to Analog Signal

Perfect for pressing and torquing applications, you can control torque from an analog input.

## Communications & I/O

**Digital I/O:** 8 input, 4 output, 10-24 VDC, optically isolated

### Selectable Input Functions

Enable • Initiate Move (1-4) • Dedicated Position • Jog+ • Jog- • Jog Fast • Home • Extend Switch • Retract Switch • Home Switch • Teach Enable • Teach Move (1-4) • Stop • Hold



• Alternate Mode; allows allows you to switch between 2 operating modes.

### Selectable Output Functions

Enabled • Homed • Ready (Enabled and Homed) • Fault • Warning • Fault or Warning Active • Move (1-4) in Progress • Homing • Jogging • Jogging+ • Jogging- • Motion • In Position • At Home Position • At Move (1-4) • Position • Stopped • Holding • In Current Limit • In Current Fold back • Above Rated Current • Maintain a Preset Force • Home

**Analog Input:** 0 to +10 VDC or 4-20mA, 12 bit resolution

• Force/torque • velocity • position

**Analog Output:** 4-20mA, 11 bit resolution

• Force/torque • velocity • position

**Serial Interface:** RS485, Modbus RTU

• Programming • controlling • monitoring

## Custom Products

While Exlar delivers Tritex actuators off the shelf, Exlar prides itself in its ability to modify the products thereby fulfilling your exact needs and assuring the success of your application.

Exlar also welcomes the opportunity to work with you to develop custom software pages tailored to your application needs. Customer logos, specialty control pages and pre-configured setups are just some of the software tools that we can provide to make Tritex products a perfect fit for your application.

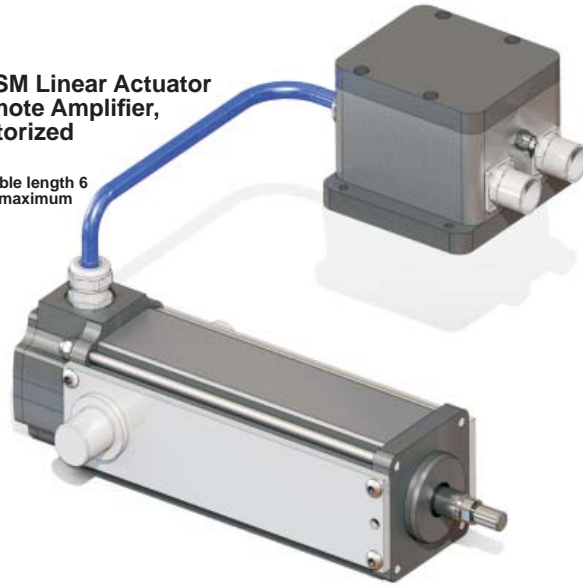
Contact Exlar at (952) 368-3434 or [info@exlar.com](mailto:info@exlar.com) to discuss the details.

# Remote Amplifier Option

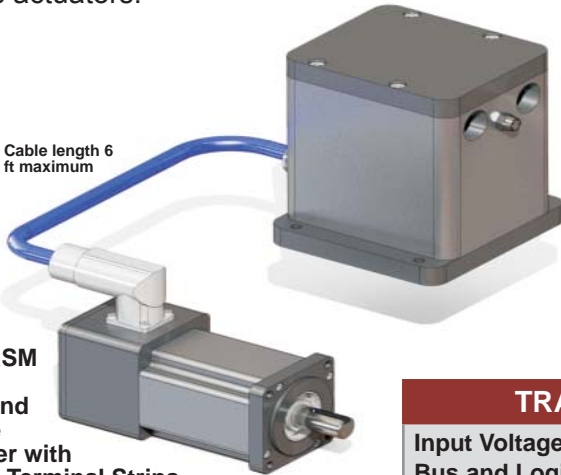
Normally the Tritex electronics are mounted directly within the actuator's housing. Exlar also offers the convenience of the Tritex electronics in a remote IP67 rated enclosure for applications where physical size or temperature constraints don't allow the electronics to be mounted on the actuator. The TRA500 remote electronics work with Exlar's TSM and RSM Series actuators.

**Tritex TSM Linear Actuator and Remote Amplifier, Connectorized**

Cable length 6 ft maximum



Cable length 6 ft maximum



**Tritex RSM Rotary Motor and Remote Amplifier with Internal Terminal Strips**

## TRA500

- Connectorization options include either connectors or internal terminals
- 24 - 48 VDC
- IP67 to be mounted 'on machine'
- All the functionality of the integrated Tritex electronics

### Small Size

- Reduces the size of the actuator by making the electronics remote
- Compact electronics housing can be machine mounted up to 6 feet away

### High Heat

- Moves the electronics away from a hot environment
- 55° C environmental temperature rating
- Allows the actuator to be mounted in the higher temperature environment

## TRA500 REMOTE AMPLIFIER SPECIFICATIONS

<b>Input Voltage, Bus and Logic</b>	24-48 Volts DC nominal, 20-60 Volts continuous operating range. Under-voltage trip 19V, over-voltage trip 85V					
<b>I/O Power Supply</b>	24V nominal, 30V max, 12V min					
<b>Digital Inputs</b>	8 opto-isolated, 24V nominal 30V max, programmable functions					
<b>Digital Outputs</b>	4 opto-isolated 50 mA continuous, 24V nominal 30V max, short circuit protected, programmable functions					
<b>Analog Input</b>	0-10 Volts or 0-20 mAmps, differential input 12 bit resolution, programmable as position, velocity or torque command					
<b>Analog Output</b>	0-20 mAmps, 11 bit resolution, programmable functions					
<b>Serial Interface</b>	RS-485, Modbus RTU protocol, max baud rate 38.4k					
<b>Commutation</b>	SInusoidal, 15kHz PWM					
<b>Feedback</b>	Analog Hall					
<b>Continuous Output Current (Peak of Sine Amps)*</b>	<b>25° C Ambient</b>		<b>40° C Ambient</b>		<b>55° C Ambient</b>	
	<b>Stall</b>	<b>Rated</b>	<b>Stall</b>	<b>Rated</b>	<b>Stall</b>	<b>Rated</b>
	15	15	14	12	12	8.5
<b>Peak Output Current (Peak of sine Amps)</b>	20					
<b>Termination Options</b>	Threaded ports with internal terminal strip, connectors or flying leads					
<b>Environmental</b>	IP67, Humidity: 10 to 95%, non-condensing					

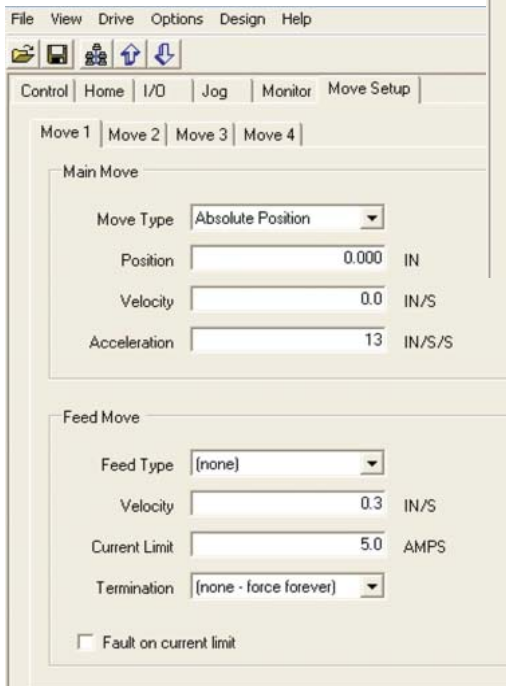
\*Actual output current may be reduced if the motor/actuator continuous and peak current ratings are lower

# Expert User Interface

Expert, the Tritex user interface software, provides you with a simple way to select all aspects of configuration and control required to set up and operate a Tritex actuator. Easy-to-use tabbed pages provide access to input all of the parameters necessary to successfully configure your motion application. 'Application' files give you a convenient way to store and redistribute configurations amongst multiple computers, and 'Drive' files allow the same configuration to be distributed to multiple Tritex actuators. Motion setup, homing, teach mode, tuning parameters, jogging, I/O configuration, and local control are all accomplished with ease using Expert software.

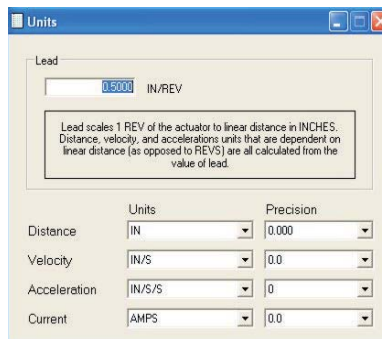
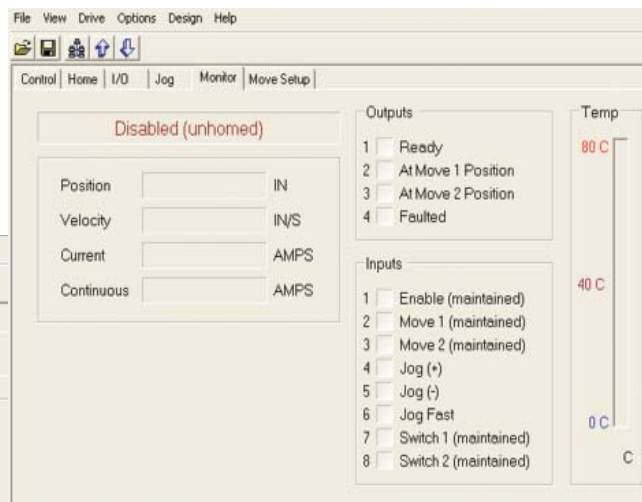
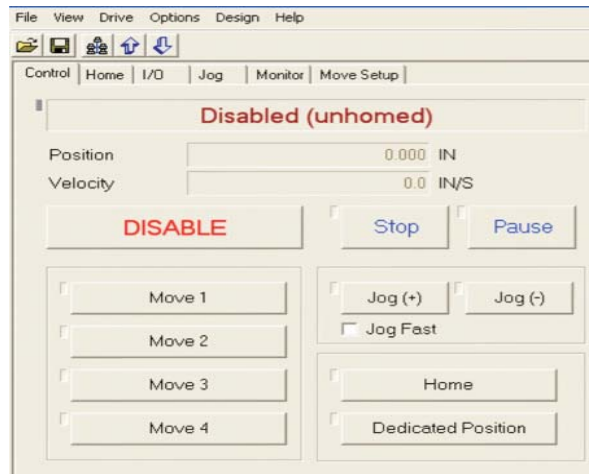
## Motion Setup

Within the Expert software, Exlar provides several system configurations for various applications.



These can serve as your configuration, or as a starting point for your configuration. Alternatively, you can begin from scratch selecting configuration details specific to your application.

Easy selection of move conditions, distance, speed and acceleration are shown in the setup screen shown lower left.



You can configure move to position, move to switch, or move to force motion at the click of a button. The Tritex products offer absolute and incremental motion, as well as feed moves ending on a condition such as a specific force being reached, or an input being triggered by a proximity switch.

The Expert software gives you the flexibility to format your units as you wish for your your application as shown below left.

## Control Page

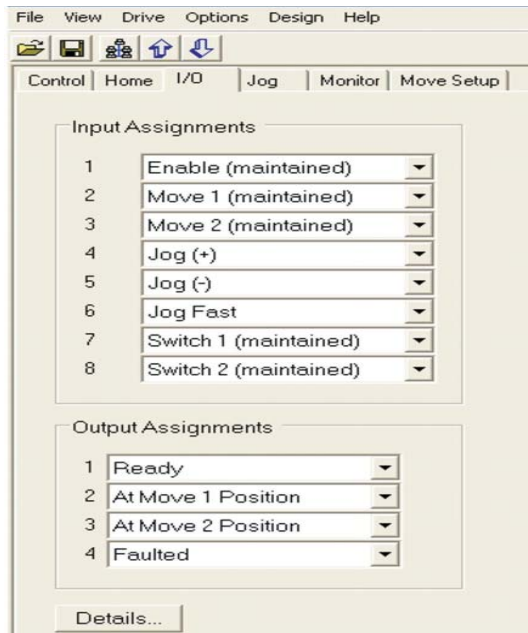
The Expert control page gives you the ability to operate or initiate all motion functions from one single, simple screen. This screen provides you

very easy system start up and testing without all the inconvenience of machine wiring.

This page offers the capability to enable and disable the drive and perform fast and slow jogs. This gives you the ability to verify motion before needing any I/O wiring.

## Monitor Page

All input functions can be monitored and activated from the Expert Monitor Page, and all output functions can be monitored. These functions can be monitored and controlled, even if they are not programmed as the function of any particular hardware input or output. Information on critical fault and status data is available as a separate page, or as a fixed window on the bottom of each page of the software.



## Configuring I/O

Configuring I/O points to one of over 40 available input or output functions couldn't be easier. A pull down menu adjacent to each I/O point allows all I/O to be set up in minutes.

Inputs can be configured to be maintained, or momentary, depending on the application requirements.

Input and output logic can also be inverted with a simple click.

## Homing

The Tritex homing setup is simple to use. It allows you to home to an input, by using a proximity or limit switch, or allows homing to a specific force or torque.

This type of homing is ideal for setting up applications that require motion referenced to a hard stop, like the closed position of a valve, or the final position of a press.

## Teach Mode

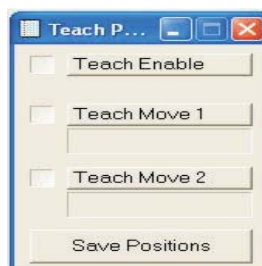
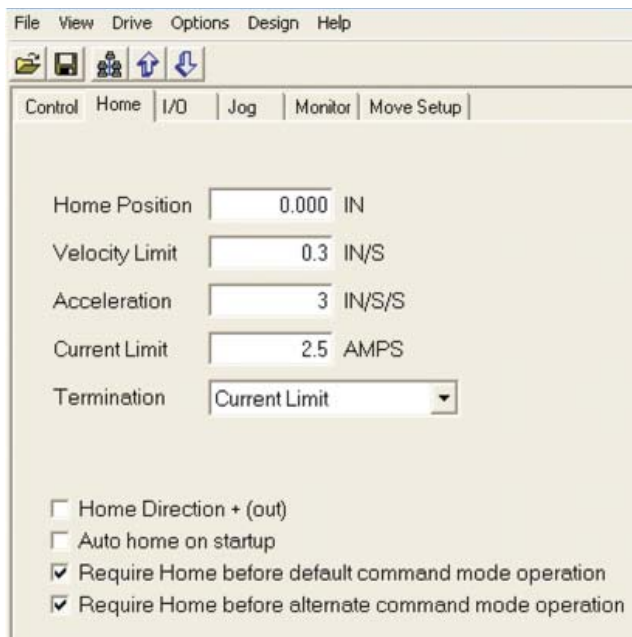
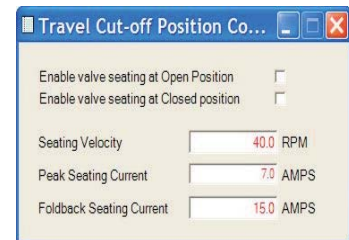
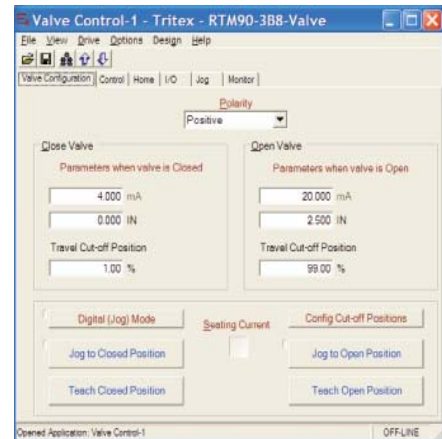
To provide the easiest motion set up possible, Tritex products offer 'Teach mode.' In this mode, you can jog the actuator to the desired

position, and activate an input, or click a button in the Expert software and the current position of the actuator becomes the defined distance or absolute position associated with a particular move command.

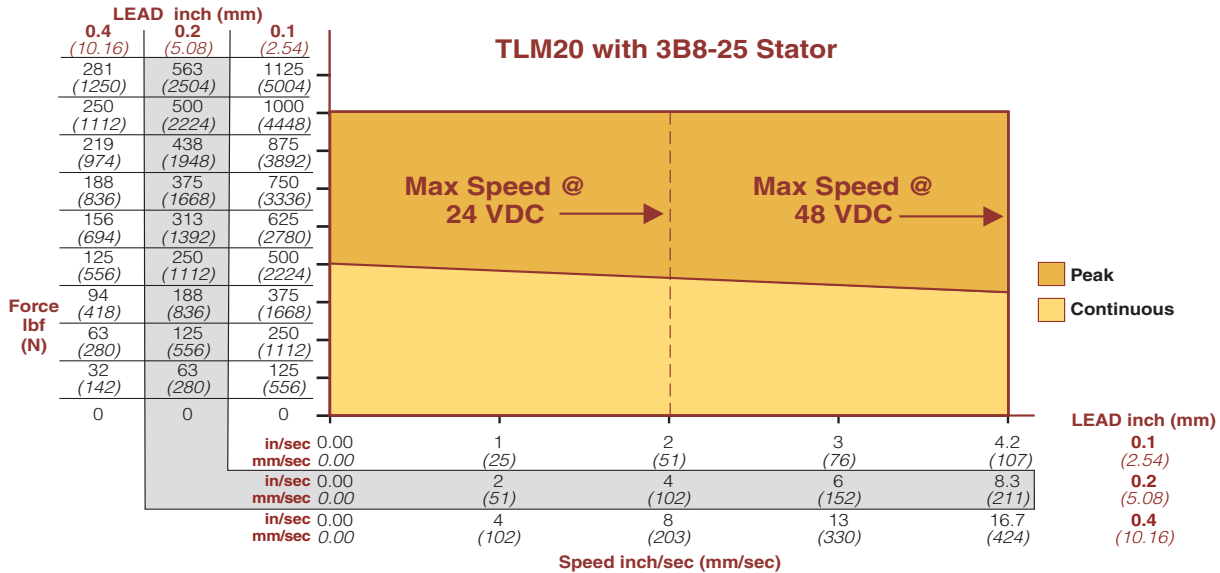
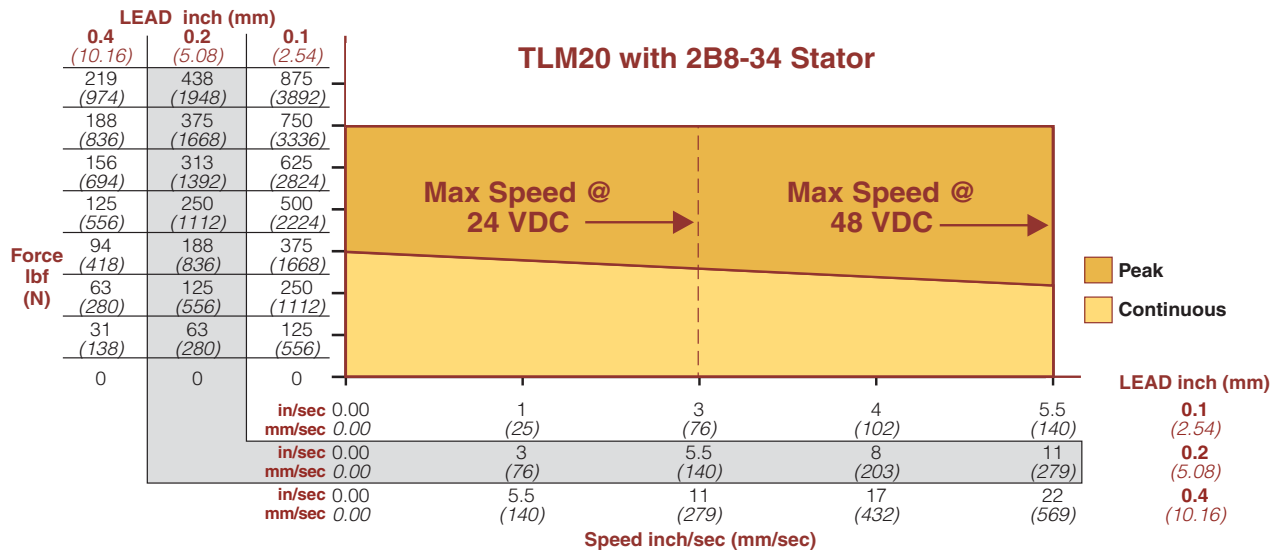
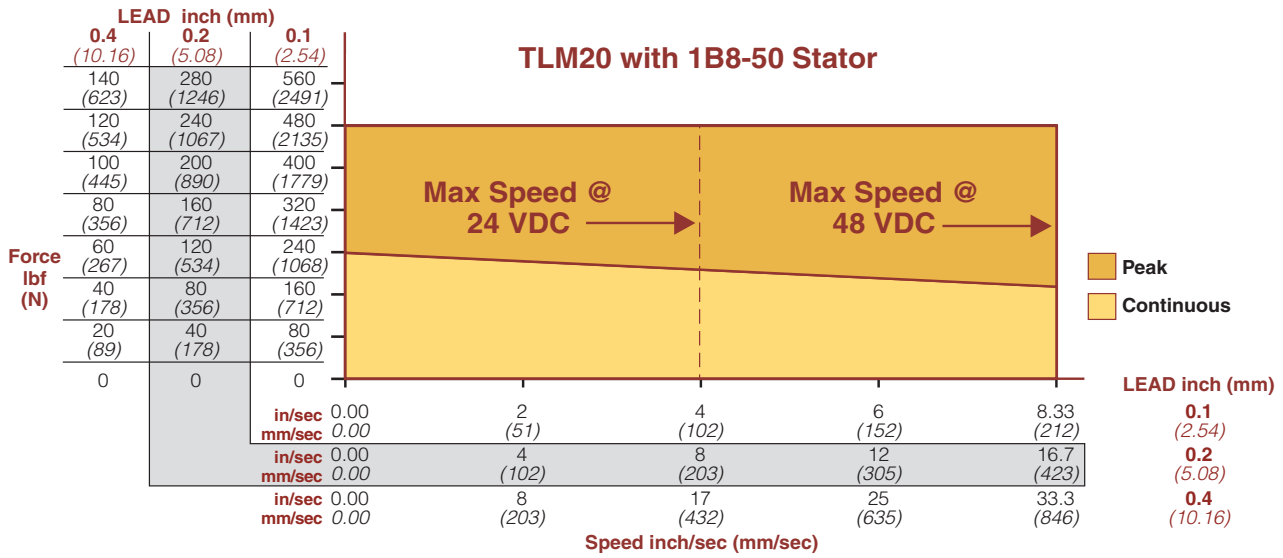
## Valve Software

Tritex actuators provide a perfect solution for your valve actuation needs. Small hysteresis and dead band, quick response to small signal changes and stable dynamic responses are all key parameters delivered by Tritex actuators. Our valve software is simple to use, featuring a teach mode for foolproof configuration. Included is a programmable valve cut off position feature that enables a firm valve seat on both new valves, or retrofitted valves.

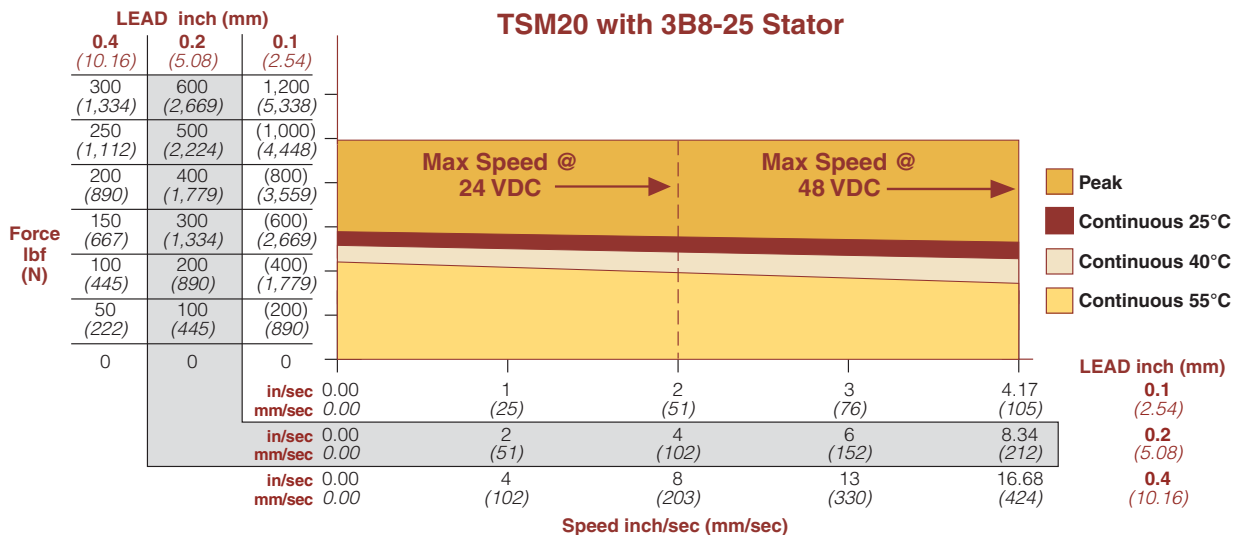
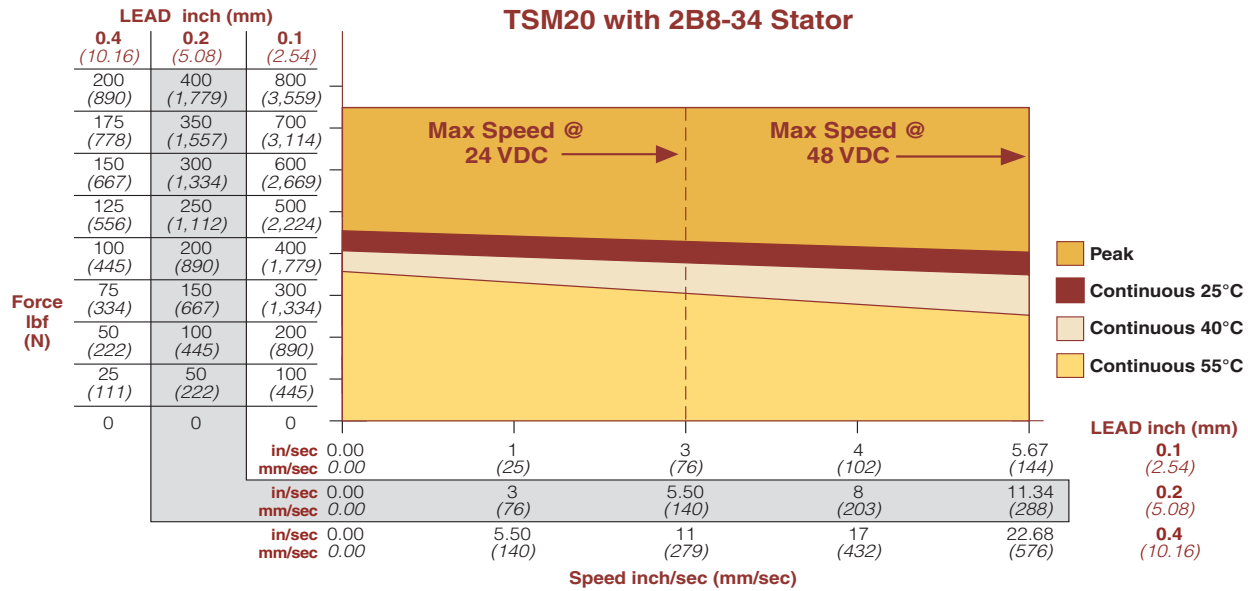
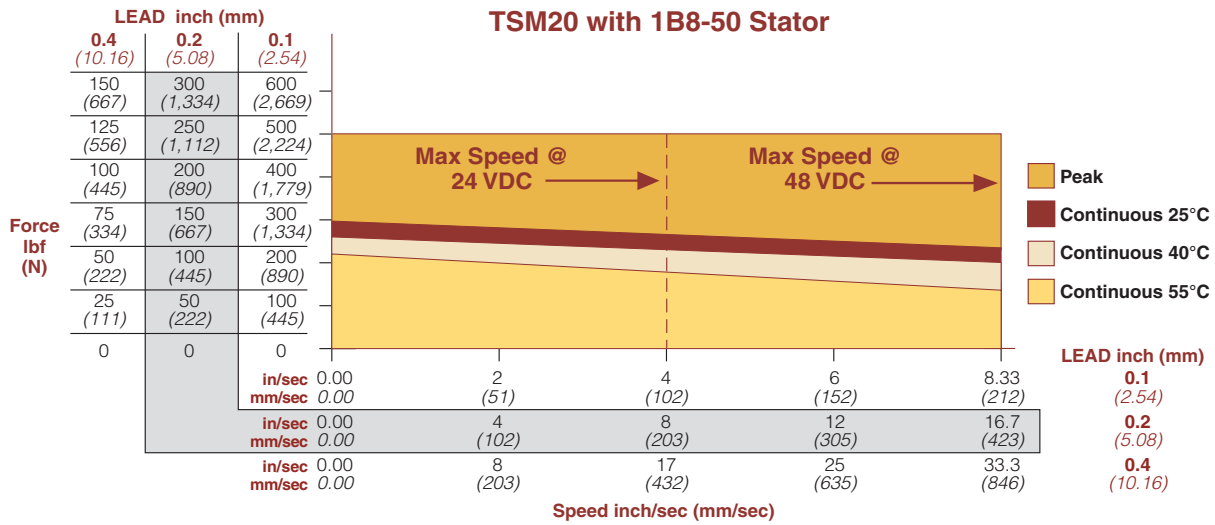
Available in both rotary and linear versions, Tritex actuators can be mounted on any valve from any manufacturer.



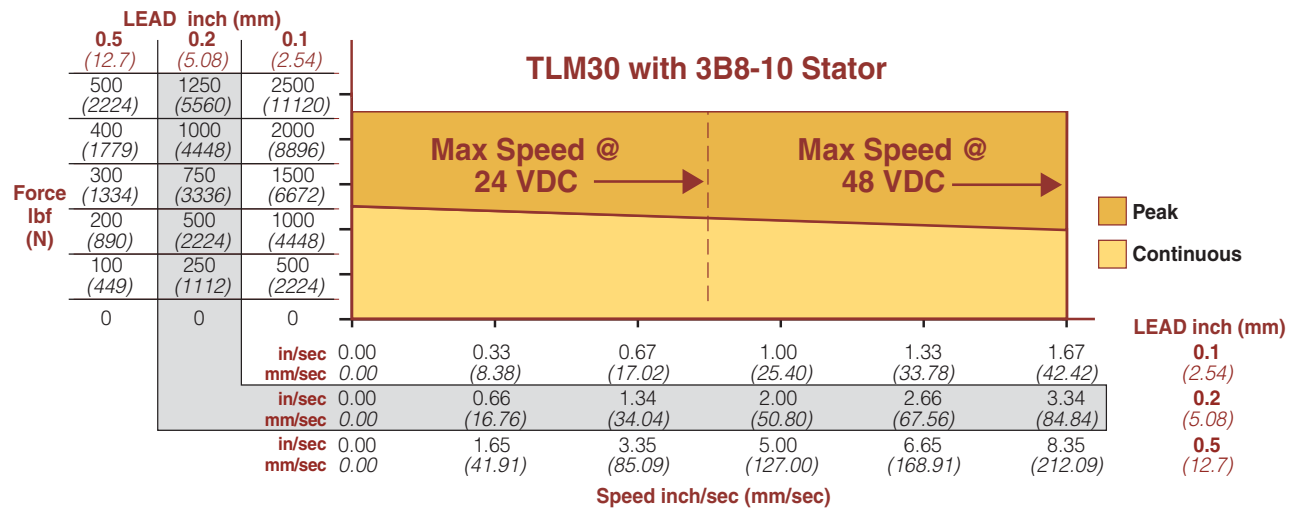
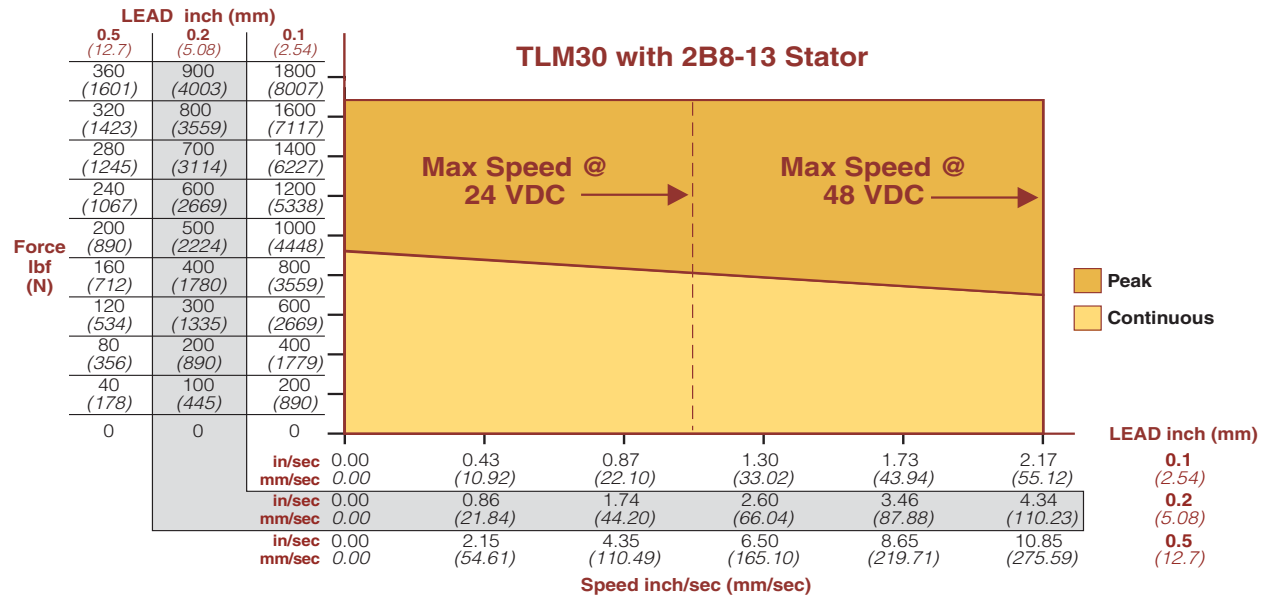
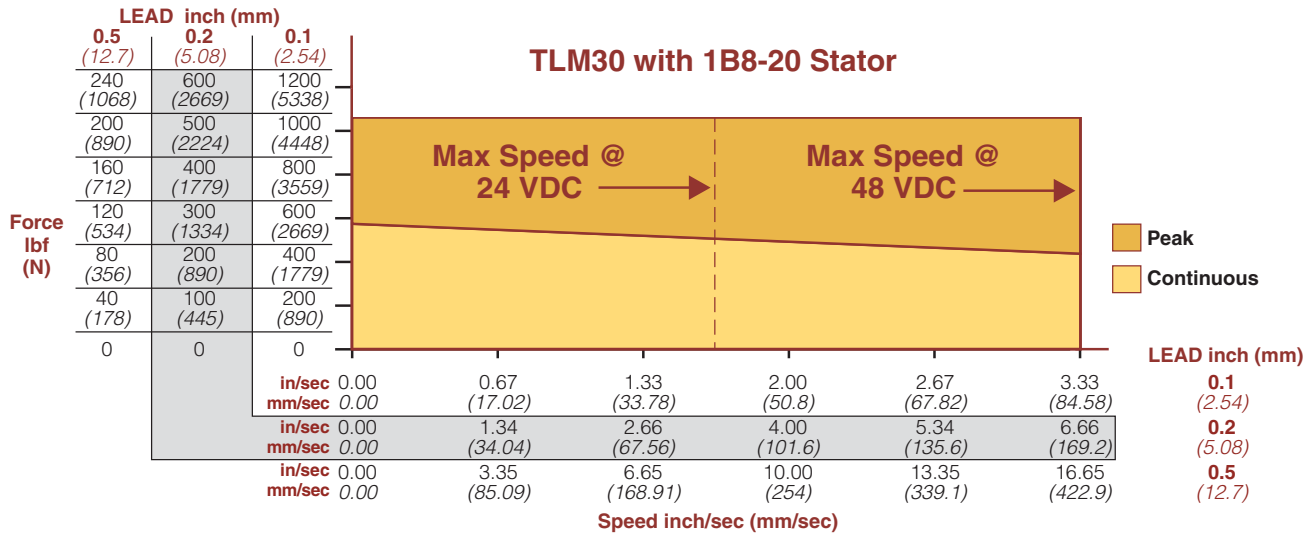
# TLM20 Speed vs. Force Curves



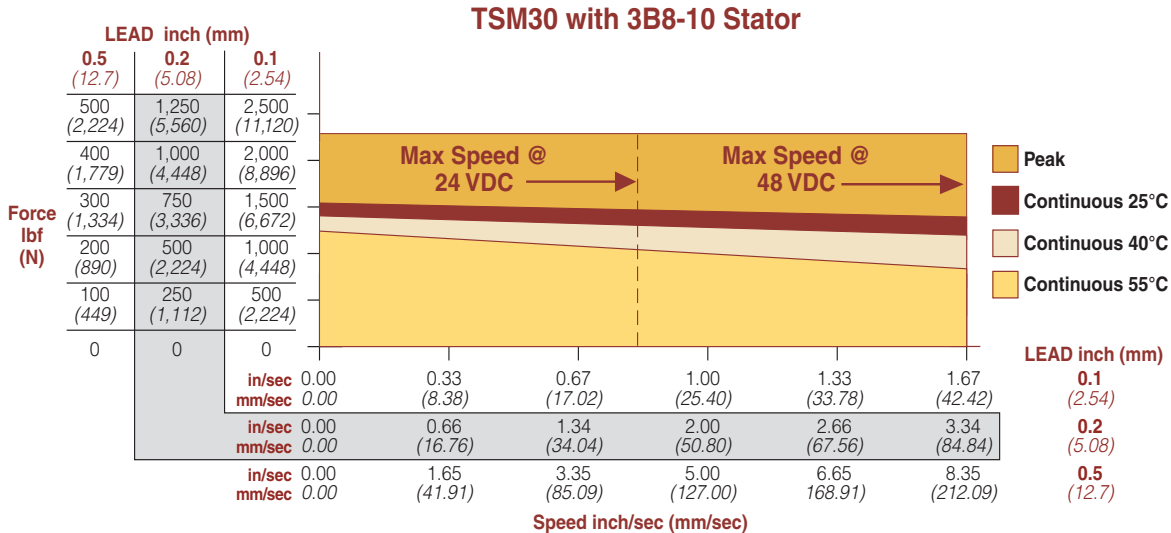
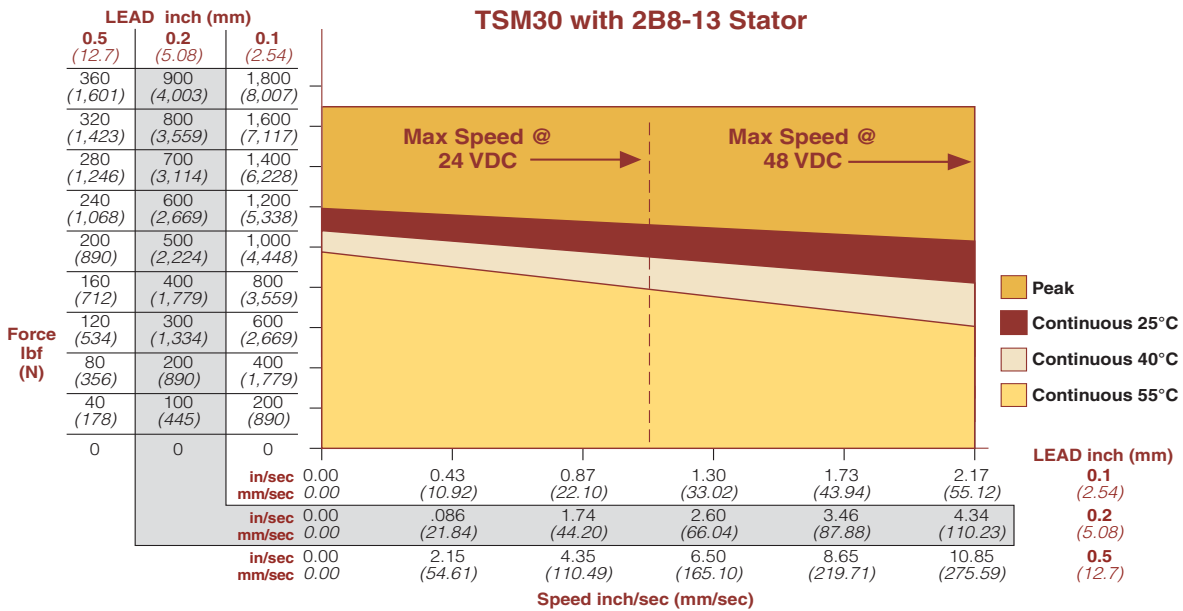
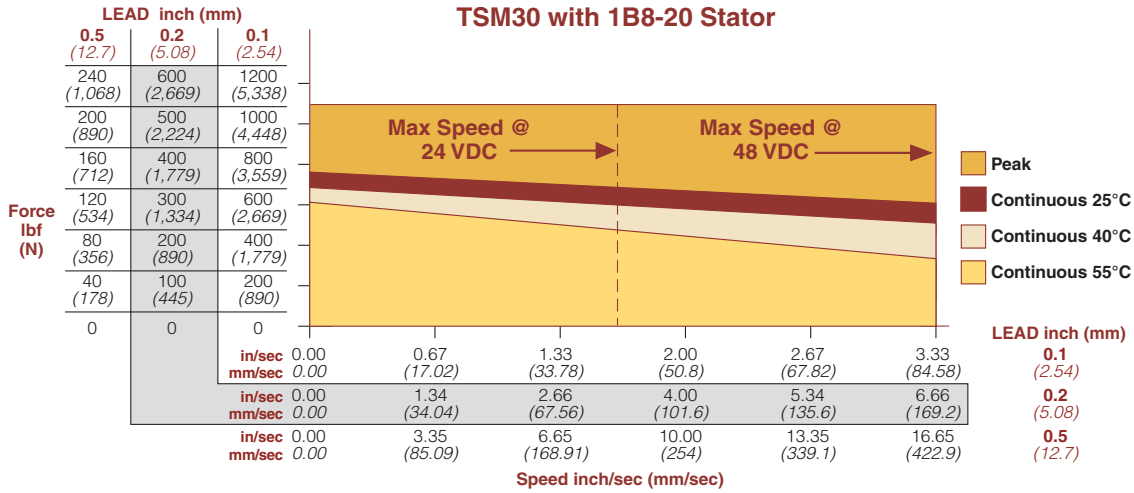
# TSM20 Speed vs. Force Curves (Requires TRA500 Remote Amplifier)



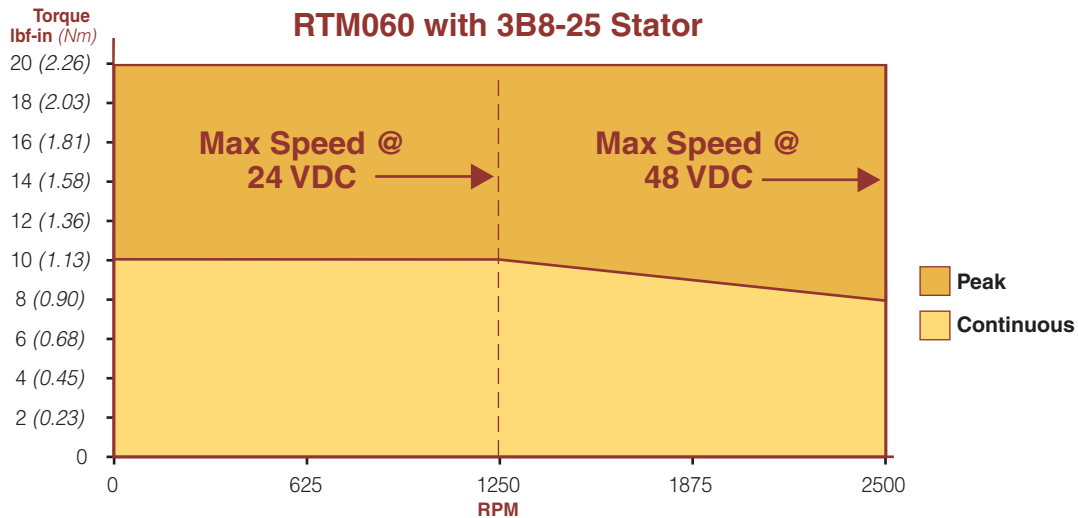
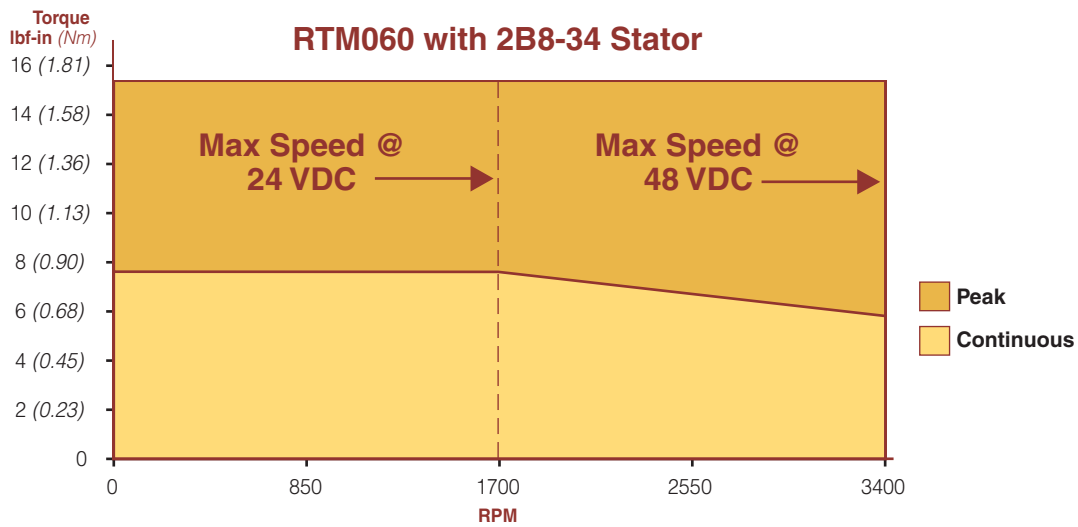
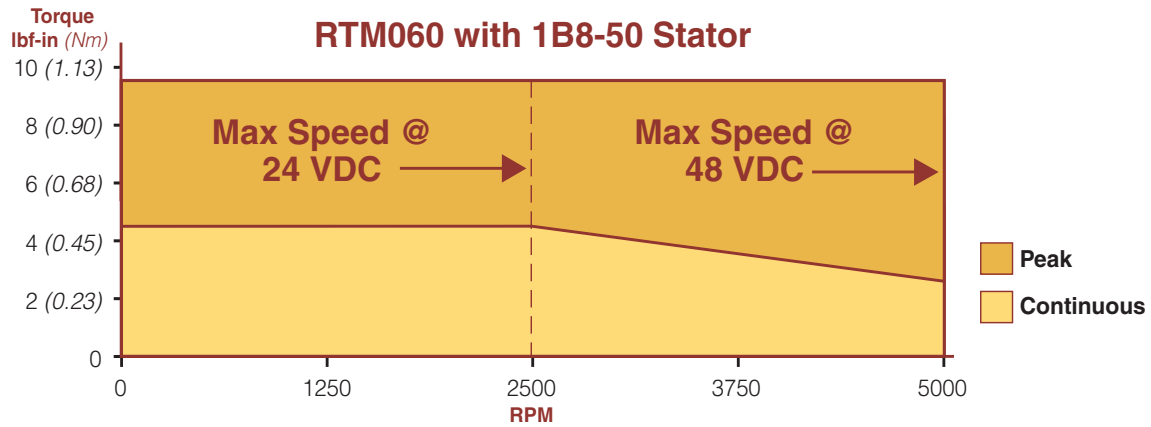
# TLM30 Speed vs. Force Curves



# TSM30 Speed vs. Force Curves (Requires TRA500 Remote Amplifier)

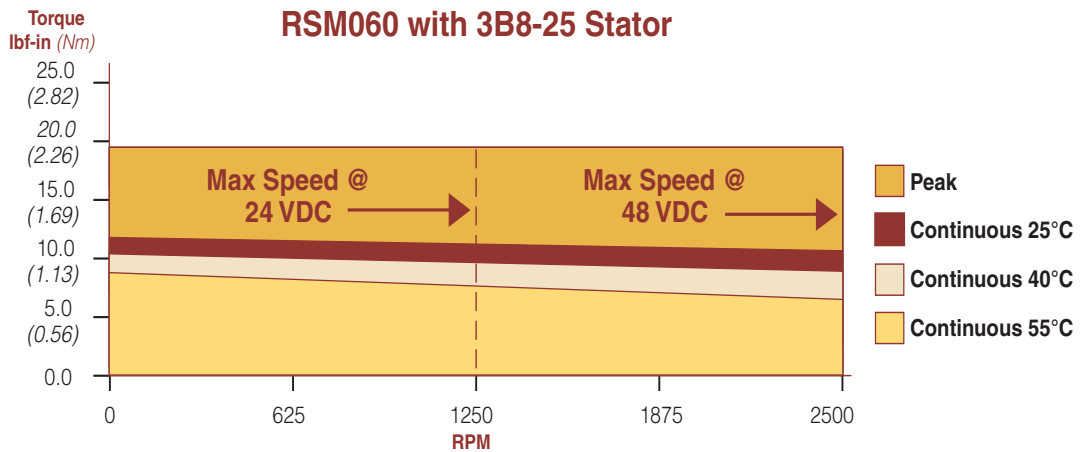
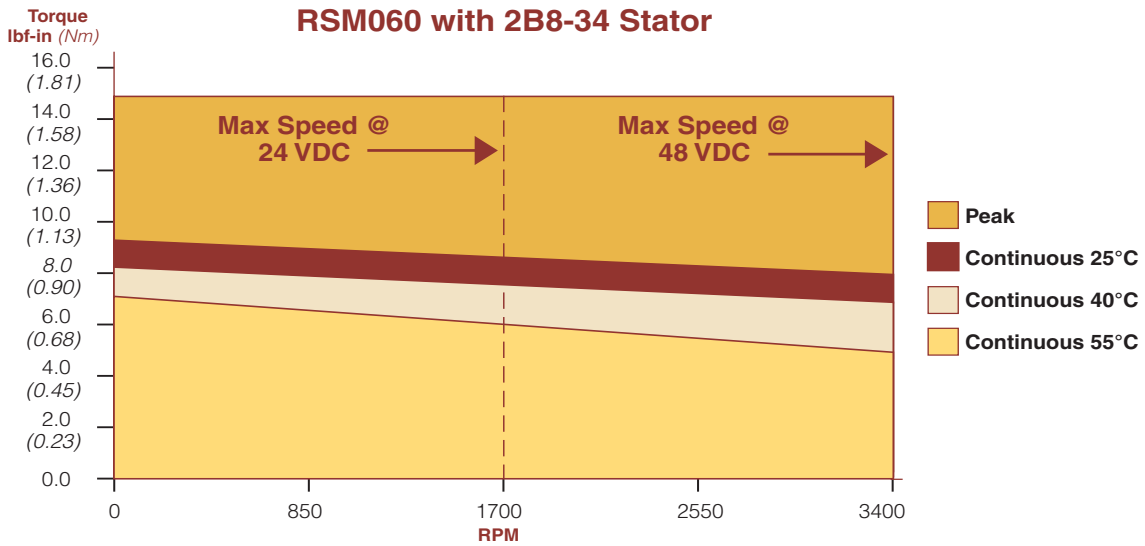
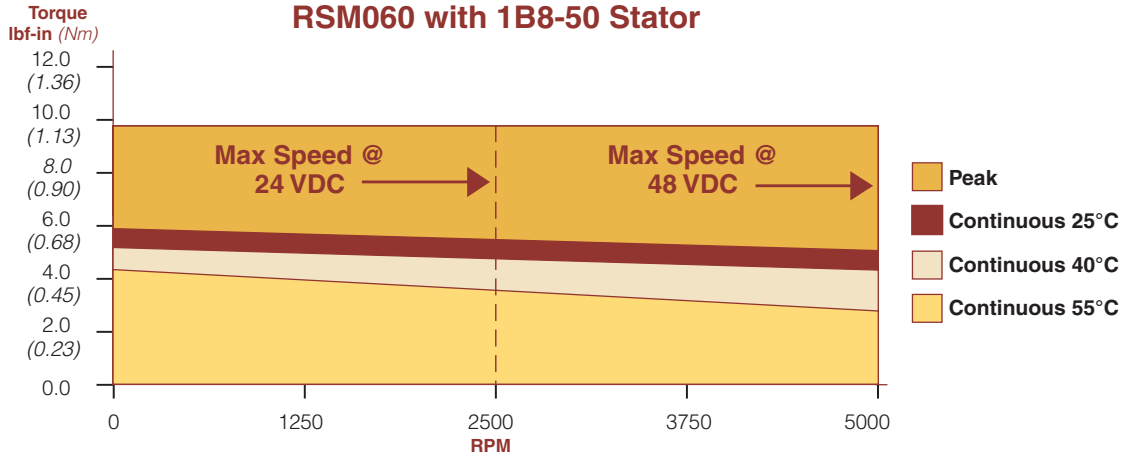


## RTM060 Speed vs. Torque Curves

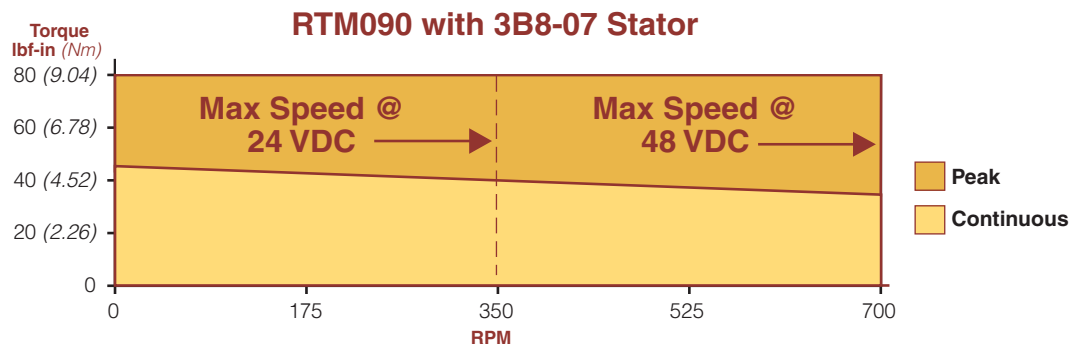
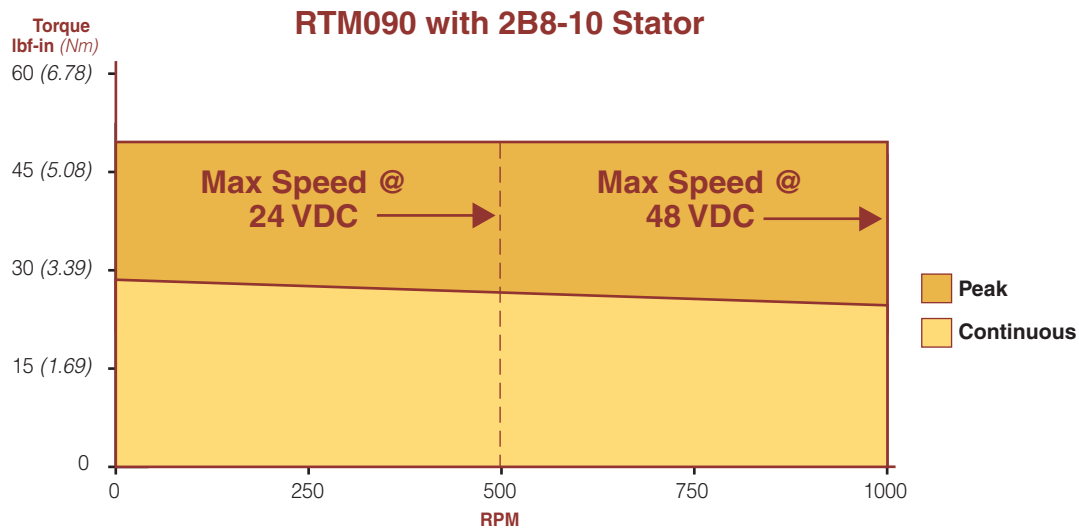
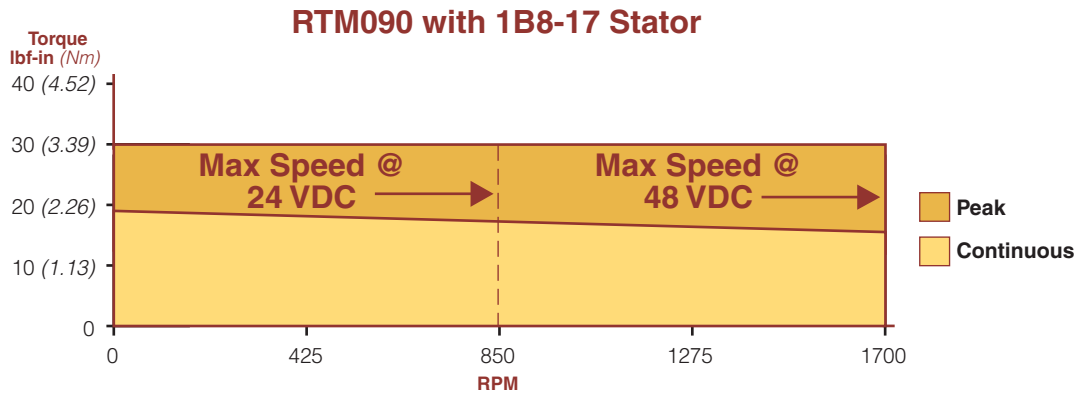


\*For RTG gearmotors, multiply torque by your ratio and efficiency. Divide speed by gear ratio.

# RSM060 Speed vs. Torque Curves (Requires TRA500 Remote Amplifier)

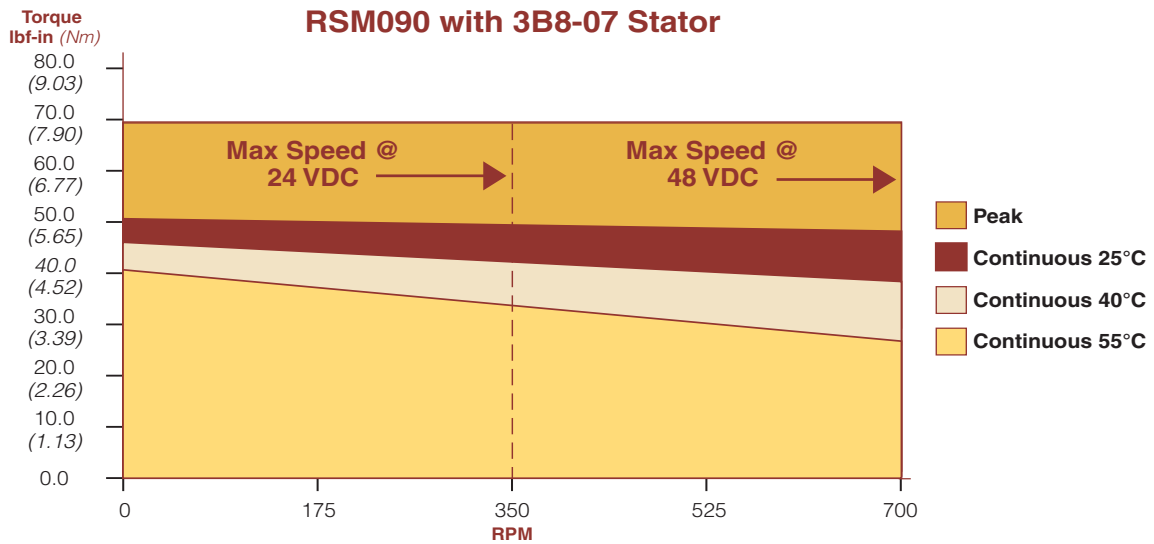
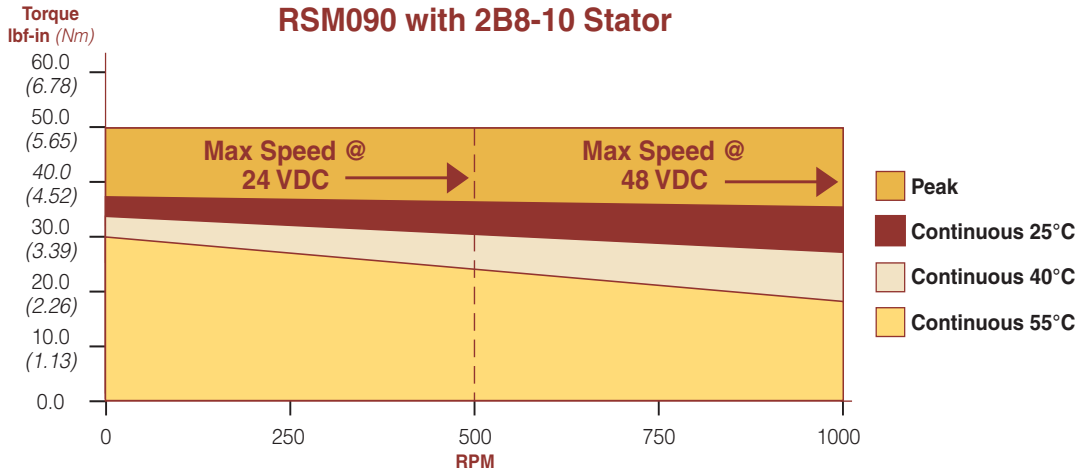
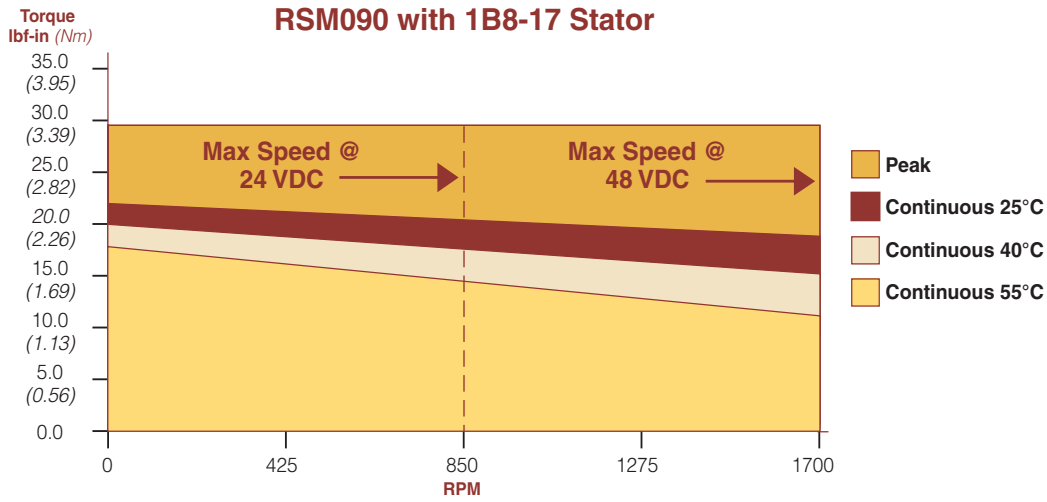


# RTM090 Speed vs. Torque Curves



\*For RTG gearmotors, multiply torque by your ratio and efficiency. Divide speed by gear ratio.

# RSM090 Speed vs. Torque Curves (Requires TRA500 Remote Amplifier)



## TLM20 and TSM20 Performance Specifications

### TLM20 LINEAR ACTUATOR PERFORMANCE SPECIFICATIONS

<b>Backlash</b>		in (mm)	.008 (.20)		
<b>Lead Accuracy</b>		in/ft (mm/300 mm)	.001 (.025)		
<b>Maximum Radial Load</b>		lb (N)	15 (67)		
<b>Environmental Rating: Std</b>			IP54 / IP65 Optional		
		<b>Stator</b>	<b>1 Stack 1B8-50</b>	<b>2 Stack 2B8-34</b>	<b>3 Stack 3B8-25</b>
<b>Lead</b>		<b>RPM at 48 VDC*</b>	<b>5000</b>	<b>3400</b>	<b>2500</b>
<b>0.1</b>	<b>Stall Force</b>	lbf (N)	239 (1063)	377 (1677)	503 (2237)
	<b>Max Speed</b>	in/sec (mm/sec)	8.33 (212)	5.66 (144)	4.17 (106)
<b>0.2</b>	<b>Stall Force</b>	lbf (N)	119 (529)	188 (836)	251 (1117)
	<b>Max Speed</b>	in/sec (mm/sec)	16.66 (424)	11.33 (288)	8.33 (212)
<b>0.4</b>	<b>Stall Force</b>	lbf (N)	60 (267)	94 (418)	126 (560)
	<b>Max Speed</b>	in/sec (m/sec)	33.33 (848)	22.66 (575)	16.66 (424)
<b>Power Supply Current Draw at Rated Power (48 V)</b>		Amps	10	10	10
<b>Resolution</b>			0.001 revolution x lead		
<b>Accuracy (not including backlash)</b>			+/- 0.005 revolution x lead		
<b>Stroke Length inch (mm)</b>		3 (75)	6 (150)	10 (250)	12 (305)
<b>Approximate Weight lb (kg)</b>		7 (3.2)	8.5 (3.9)	10 (4.5)	11.5 (5.2)

\*RPM @ 24 VDC = 1/2 of listed value

### TSM20 LINEAR ACTUATOR PERFORMANCE SPECIFICATIONS (Requires TRA500 Remote Amp)

<b>Backlash</b>		in (mm)	.008 (.20)								
<b>Lead Accuracy</b>		in/ft (mm/300 mm)	.001 (.025)								
<b>Maximum Radial Load</b>		lb (N)	15 (67)								
<b>Environmental Rating: Std</b>			IP54 / IP65 Optional								
		<b>Stator</b>	<b>1 Stack 1B8-50</b>			<b>2 Stack 2B8-34</b>			<b>3 Stack 3B8-25</b>		
		<b>RPM at 48 VDC*</b>	<b>5000</b>			<b>3400</b>			<b>2500</b>		
<b>Lead</b>	<b>Ambient Temp</b>	<i>Degrees C</i>	25	40	55	25	40	55	25	40	55
<b>0.1</b>	<b>Stall Force</b>	lbf (N)	295 (1312)	262 (1165)	227 (1010)	460 (2046)	411 (1828)	355 (1579)	575 (2558)	514 (2286)	445 (1979)
	<b>Max Speed</b>	in/sec (mm/sec)	8.33 (212)			5.66 (144)			4.17 (106)		
<b>0.2</b>	<b>Stall Force</b>	lbf (N)	148 (658)	131 (583)	113 (503)	230 (1023)	205 (912)	177 (787)	288 (1281)	257 (1143)	223 (992)
	<b>Max Speed</b>	in/sec (mm/sec)	16.66 (424)			11.33 (288)			8.33 (212)		
<b>0.4</b>	<b>Stall Force</b>	lbf (N)	74 (329)	66 (294)	57 (254)	92 (409)	82 (365)	71 (316)	115 (512)	103 (458)	89 (396)
	<b>Max Speed</b>	in/sec (m/sec)	33.33 (848)			22.66 (575)			16.66 (424)		
<b>Power Supply Current Draw at Rated Power (48 V)</b>		Amps	10			10			10		
<b>Resolution</b>			0.001 revolution x lead								
<b>Accuracy (not including backlash)</b>			+/- 0.005 revolution x lead								
<b>Stroke Length inch (mm)</b>		3 (75)	6 (150)			10 (250)			12 (305)		
<b>Approximate Weight lb (kg)</b>		7 (3.2)	8.5 (3.9)			10 (4.5)			11.5 (5.2)		

\*RPM @ 24 VDC = 1/2 of listed value

## TLM30 and TSM30 Performance Specifications

### TLM30 LINEAR ACTUATOR PERFORMANCE SPECIFICATIONS

<b>Backlash</b>		in (mm)	.008 (.20)		
<b>Lead Accuracy</b>		in/ft (mm/300 mm)	.001 (.025)		
<b>Maximum Radial Load</b>		lb (N)	20 (90)		
<b>Environmental Rating: Std</b>			IP54		
		<b>Stator</b>	<b>1 Stack 1B8-20</b>	<b>2 Stack 2B8-13</b>	<b>3 Stack 3B8-10</b>
<b>Lead</b>		<b>RPM at 48 VDC*</b>	<b>2000</b>	<b>1300</b>	<b>1000</b>
<b>0.1</b>	<b>Stall Force</b>	lbf (N)	585 (2606)	935 (4159)	1250 (5560)
	<b>Max Speed</b>	in/sec (mm/sec)	3.33 (84.6)	2.17 (55.1)	1.67 (42.4)
<b>0.2</b>	<b>Stall Force</b>	lbf (N)	293 (1303)	468 (2082)	625 (2780)
	<b>Max Speed</b>	in/sec (mm/sec)	6.67 (169.4)	4.33 (109.9)	3.33 (84.6)
<b>0.5</b>	<b>Stall Force</b>	lbf (N)	117 (520)	187 (832)	250 (1112)
	<b>Max Speed</b>	in/sec (m/sec)	16.67 (423.4)	10.83 (275.1)	8.33 (211.6)
<b>Power Supply Current Draw at Rated Power (48 V)</b>		Amps	10	10	10
<b>Resolution</b>		0.001 revolution x lead			
<b>Accuracy (not including backlash)</b>		+/- 0.005 revolution x lead			
<b>Stroke Length inch (mm)</b>		3 (75)	6 (150)	10 (250)	12 (305) 18 (455)
<b>Approximate Weight lb (kg)</b>		10 (4.5)	12 (5.4)	19.5 (8.8)	21 (9.5) 25.5 (11.6)
*RPM @ 24 VDC = 1/2 of listed value					

### TSM30 LINEAR ACTUATOR PERFORMANCE SPECIFICATIONS (Requires TRA500 Remote Amp)

<b>Backlash</b>		in (mm)	.008 (.20)								
<b>Lead Accuracy</b>		in/ft (mm/300 mm)	.001 (.025)								
<b>Maximum Radial Load</b>		lb (N)	20 (90)								
<b>Environmental Rating: Std</b>			IP54								
		<b>Stator</b>	<b>1 Stack 1B8-20</b>			<b>2 Stack 2B8-13</b>			<b>3 Stack 3B8-10</b>		
		<b>RPM at 48 VDC*</b>	<b>2000</b>			<b>1300</b>			<b>1000</b>		
<b>Lead</b>	<b>Ambient Temp</b>	<b>Degrees C</b>	<b>25</b>	<b>40</b>	<b>55</b>	<b>25</b>	<b>40</b>	<b>55</b>	<b>25</b>	<b>40</b>	<b>55</b>
<b>0.1</b>	<b>Stall Force</b>	lbf (N)	756 (3362)	686 (3051)	608 (2704)	1201 (5342)	1091 (4853)	968 (4306)	1545 (6872)	1404 (6245)	1247 (5547)
	<b>Max Speed</b>	in/sec (mm/sec)	3.33 (84.6)			2.17 (55.1)			1.67 (42.4)		
<b>0.2</b>	<b>Stall Force</b>	lbf (N)	378 (1681)	343 (1526)	304 (1352)	600 (2669)	545 (2425)	484 (2153)	772 (3434)	702 (3123)	623 (2771)
	<b>Max Speed</b>	in/sec (mm/sec)	6.67 (169.4)			4.33 (109.9)			3.33 (84.6)		
<b>0.5</b>	<b>Stall Force</b>	lbf (N)	151 (672)	137 (609)	122 (543)	240 (1068)	218 (970)	194 (862)	309 (1375)	281 (1250)	249 (1108)
	<b>Max Speed</b>	in/sec (m/sec)	16.67 (423.4)			10.83 (275.1)			8.33 (211.6)		
<b>Power Supply Current Draw at Rated Power (48 V)</b>		Amps	15	12	10	15	12	10	15	12	10
<b>Resolution</b>		0.001 revolution x lead									
<b>Accuracy (not including backlash)</b>		+/- 0.005 revolution x lead									
<b>Stroke Length inch (mm)</b>		3 (75)	6 (150)	10 (250)	12 (305)	18 (455)					
<b>Approximate Weight lb (kg)</b>		10 (4.5)	12 (5.4)	19.5 (8.8)	21 (9.5)	25.5 (11.6)					
*RPM @ 24 VDC = 1/2 of listed value											

## RTM/RTG and RSM/RSG060 Performance Specifications

### RTM060 ROTARY MOTOR TORQUE AND SPEED RATINGS

For output torque of RTG gearmotors, multiply by ratio and efficiency. Please note maximum allowable output torques in the table top of page 20.

	Stator	1 Stack 1B8-50	2 Stack 2B8-34	3 Stack 3B8-25
	<b>RPM at 48 VDC*</b>	<b>5000</b>	<b>3400</b>	<b>2500</b>
<b>Continuous Torque</b>	lbf-in (Nm)	4.7 (.53)	7.5 (.85)	10 (1.13)
<b>Peak Torque</b>	lbf-in (Nm)	9.4 (1.06)	15 (1.69)	20 (2.26)
<b>Power Supply Current Draw at Rated Power (48 V)</b>	Amps	10	10	10
<b>Resolution</b>	0.001 revolution / ratio			
<b>Accuracy (not including backlash)</b>	+/- 0.005 revolution / ratio			

\*RPM @ 24 VDC = 1/2 of listed value

### RSM/RSG060 ROTARY MOTOR TORQUE AND SPEED RATINGS (Requires Remote Amp)

RSM and RSG Models require a TRA500 remote amplifier

For output torque of RSG gearmotors, multiply by ratio and efficiency. Please note maximum allowable output torques in the table top of page 20.

	Stator	1 Stack 1B8-50			2 Stack 2B8-34			3 Stack 3B8-25		
	<b>RPM at 48 VDC*</b>	<b>5000</b>			<b>3400</b>			<b>2500</b>		
<b>Ambient Temp</b>	Degrees C	25	40	55	25	40	55	25	40	55
<b>Continuous Torque</b>	lbf-in (Nm)	5.9 (.66)	5.2 (.59)	4.5 (.51)	9.2 (1.0)	8.2 (.93)	7.1 (.80)	11.4 (1.29)	10.2 (1.15)	8.9 (1.01)
<b>Peak Torque</b>	lbf-in (Nm)	9.4 (1.06)			15 (1.69)			20 (2.26)		
<b>Power Supply Current Draw at Rated Power (48 V)</b>	Amps	10			10			10		
<b>Resolution</b>	0.001 revolution / ratio									
<b>Accuracy (not including backlash)</b>	+/- 0.005 revolution / ratio									

\*RPM @ 24 VDC = 1/2 of listed value

### RTM/RTG060 AND RSM/RSG060 INERTIA

	Stator	1 Stack	2 Stack	3 Stack
<b>RTM/RSM Motor Armature Inertia (+/-5%)</b>	lb-in-sec <sup>2</sup> (kg-cm <sup>2</sup> )	0.000237 (0.268)	0.000413 (0.466)	0.000589 (0.665)
<b>RTG/RSG Gearmotor Armature Inertia*</b>	lb-in-sec <sup>2</sup> (kg-cm <sup>2</sup> )	0.000226 (0.255)	0.000401 (0.453)	0.000576 (0.651)

\*Add armature inertia to gearing inertia for total RTM system inertia.

### RTM/RTG060 AND RSM/RSG060 RADIAL LOAD AND BEARING LIFE

RPM	50	100	250	500	1000
<b>lbf (N)</b>	195 (867)	155 (690)	114 (507)	90 (400)	72 (320)

Side load ratings shown above are for 10,000 hour bearing life at 25 mm from motor face at given rpm.

## RTG/RSG060 Performance Specifications

### RTG/RSG060 GEARMOTOR MECHANICAL RATINGS

		Output Torque at Motor Speed for 10,000 Hour Life							
		Maximum Allowable Output Torque - Set by User		1000 RPM		3000 RPM		5000 RPM	
Model	Ratio	lbf-in	Nm	lbf-in	Nm	lbf-in	Nm	lbf-in	Nm
RTG/RSG060-004	4:1	603	(68.1)	144	(16.2)	104	(11.7)	88	(9.9)
RTG/RSG060-005	5:1	522	(58.9)	170	(19.2)	125	(14.1)	105	(11.9)
RTG/RSG060-010	10:1	327	(36.9)	200	(22.6)	140	(15.8)	120	(13.6)
RTG/RSG060-016	16:1	603	(68.1)	224	(25.3)	160	(18.1)	136	(15.4)
RTG/RSG060-020	20:1	603	(68.1)	240	(27.1)	170	(19.2)	146	(16.5)
RTG/RSG060-025	25:1	522	(58.9)	275	(31.1)	200	(22.6)	180	(20.3)
RTG/RSG060-040	40:1	603	(68.1)	288	(32.5)	208	(23.5)	180	(20.3)
RTG/RSG060-050	50:1	522	(58.9)	340	(38.4)	245	(27.7)	210	(23.7)
RTG/RSG060-100	100:1	327	(36.9)	320	(36.1)	280	(31.6)	240	(27.1)

Two torque ratings for the RTG and RSG gearmotors are given in the table above. The left hand columns give the maximum (peak) allowable output torque for the indicated ratios of each size RTG gearmotor. This is **not** the rated output torque of the motor multiplied by the ratio of the reducer.

It is possible to select a configuration of the motor selection and gear ratio such that the rated motor torque, multiplied by the gear ratio exceeds these ratings. It is the responsibility of the user to ensure that the settings of the system do not allow these values to be exceeded.

The right hand columns give the output torque at the indicated speed which will result in 10,000 hour life (L10). The setup of the system will determine the actual output torque and speed.

### RTG/RSG060 GEARING REFLECTED INERTIA

Single Reduction			Double Reduction		
Gear Stages	lbf-in-sec <sup>2</sup>	(kg-cm <sup>2</sup> )	Gear Stages	lbf-in-sec <sup>2</sup>	(kg-cm <sup>2</sup> )
4:1	0.0000132	(0.0149)	16:1	0.0000121	(0.0137)
5:1	0.0000087	(0.00984)	20:1, 25:1	0.0000080	(0.00906)
10:1	0.0000023	(0.00261)	40:1, 50:1, 100:1	0.0000021	(0.00242)

### RTG/RSG060 BACKLASH AND EFFICIENCY

	Single Reduction	Double Reduction
Backlash at 1% Rated Torque	10 Arc min	13 Arc min
Efficiency	91%	86%

### RTM060 MOTOR AND RTG060 GEARMOTOR WEIGHTS

		RTM060 Without Gears	RTG060 with 1 Stage Gearing	RTG060 with 2 Stage Gearing
1 Stack Stator	lb (kg)	3.0 (1.4)	7.5 (3.4)	9.3 (4.2)
2 Stack Stator	lb (kg)	4.1 (1.9)	8.6 (3.9)	10.4 (4.7)
3 Stack Stator	lb (kg)	5.2 (2.4)	9.7 (4.4)	11.5 (5.2)

## RTM/RTG and RSM/RSG090 Performance Specifications

### RTM090 ROTARY MOTOR TORQUE AND SPEED RATINGS

For output torque of RTG gearmotors, multiply by ratio and efficiency. Please note maximum allowable output torques in the table top of page 22.

	Stator	1 Stack 1B8-17	2 Stack 2B8-10	3 Stack 3B8-07
	RPM at 48 VDC*	1700	1000	700
Continuous Torque	lbf-in (Nm)	19 (2.1)	29.3 (3.3)	45 (5.0)
Peak Torque	lbf-in (Nm)	30 (3.4)	50 (5.6)	70 (7.9)
Power Supply Current Draw at Rated Power (48 V)	Amps	12	10	10
Resolution	0.001 revolution / ratio			
Accuracy (not including backlash)	+/- 0.005 revolution / ratio			

\*RPM @ 24 VDC = 1/2 of listed value

### RSM/RSG090 ROTARY MOTOR TORQUE AND SPEED RATINGS (Requires Remote Amp)

RSM and RSG Models require a TRA500 remote amplifier.

For output torque of RSG gearmotors, multiply by ratio and efficiency. Please note maximum allowable output torques in the table top of page 22.

	Stator	1 Stack 1B8-17			2 Stack 2B8-10			3 Stack 3B8-07		
	RPM at 48 VDC*	1700			1000			700		
Ambient Temp	Degrees C	25	40	55	25	40	55	25	40	55
Continuous Torque	lbf-in (Nm)	22.1 (2.5)	20.1 (2.3)	17.7 (2.0)	37.2 (4.2)	33.8 (3.8)	30.0 (3.4)	50.9 (5.7)	46.4 (5.2)	41.5 (4.7)
Peak Torque	lbf-in (Nm)	30 (3.4)			50 (5.6)			70 (7.9)		
Power Supply Current Draw at Rated Power (48 V)	Amps	15	12	10	15	12	10	15	12	10
Resolution	0.001 revolution / ratio									
Accuracy (not including backlash)	+/- 0.005 revolution / ratio									

\*RPM @ 24 VDC = 1/2 of listed value

### RTM/RTG090 AND RSM/RSG090 INERTIA

	Stator	1 Stack	2 Stack	3 Stack
RTM/RSM Motor Armature Inertia (+/-5%)	lb-in-sec <sup>2</sup> (kg-cm <sup>2</sup> )	0.00054 (0.609)	0.00097 (1.09)	0.00140 (1.58)
RTG/RSG Gearmotor Armature Inertia*	lbf-in-sec <sup>2</sup> (kg-cm <sup>2</sup> )	0.00114 (1.29)	0.00157 (1.77)	0.00200 (2.26)

\*Add armature inertia to gearing inertia for total RTM system inertia.

### RTM/RTG090 AND RSM/RTG090 RADIAL LOAD AND BEARING LIFE

RPM	50	100	250	500	1000
lbf (N)	389 (1730)	309 (1375)	227 (1010)	180 (801)	143 (636)

Side load ratings shown above are for 10,000 hour bearing life at 25mm from motor face at given rpm.

## RTG/RSG090 Performance Specifications

RTG/RSG090 GEARMOTOR MECHANICAL RATINGS									
				Output Torque at Motor Speed for 10,000 Hour Life					
		Maximum Allowable Output Torque - Set by User		1000 RPM		1500 RPM		2000 RPM	
Model	Ratio	lbf-in	Nm	lbf-in	Nm	lbf-in	Nm	lbf-in	Nm
RTG/RSG090-004	4:1	2078	234.8	600	(67.8)	552	(62.4)	504	(56.9)
RTG/RSG090-005	5:1	1798	203.1	775	(87.6)	714	(80.7)	652	(73.7)
RTG/RSG090-010	10:1	1126	127.2	890	(100.6)	820	(92.7)	750	(84.7)
RTG/RSG090-016	16:1	2078	234.8	912	(103.4)	830	(94.7)	763	(86.2)
RTG/RSG090-020	20:1	2078	234.8	980	(110.7)	900	(101.7)	820	(92.6)
RTG/RSG090-025	25:1	1798	203.1	1250	(141.2)	1150	(130)	1050	(118.6)
RTG/RSG090-040	40:1	2078	234.8	1200	(135.6)	1107	(125)	1013	(114.4)
RTG/RSG090-050	50:1	1798	203.1	1550	(169.4)	1434	(162)	1317	(148.8)
RTG/RSG090-100	100:1	1126	127.2	1100	(124.3)	1100	(124.3)	1100	(124.3)

Two torque ratings for the RTG and RSG gearmotors are given in the table above. The left hand columns give the maximum (peak) allowable output torque for the indicated ratios of each size RTG gearmotor. This is **not** the rated output torque of the motor multiplied by the ratio of the reducer.

It is possible to select a configuration of the motor selection and gear ratio such that the rated motor torque, multiplied by the gear ratio exceeds these ratings. It is the responsibility of the user to ensure that the settings of the system do not allow these values to be exceeded.

The right hand columns give the output torque at the indicated speed which will result in 10,000 hour life (L10). The setup of the system will determine the actual output torque and speed.

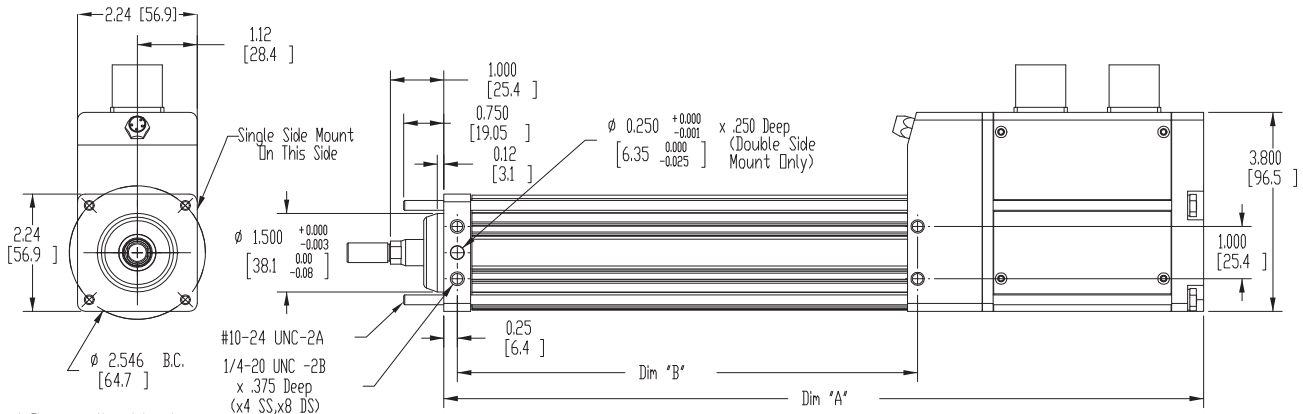
RTG/RSG090 GEARING REFLECTED INERTIA					
Single Reduction			Double Reduction		
Gear Stages	lbf-in-sec <sup>2</sup>	(kg-cm <sup>2</sup> )	Gear Stages	lbf-in-sec <sup>2</sup>	(kg-cm <sup>2</sup> )
4:1	0.000154	(0.174)	16:1	0.000115	(0.130)
5:1	0.000100	(0.113)	20:1, 25:1	0.0000756	(0.0854)
10:1	0.0000265	(0.0300)	40:1, 50:1, 100:1	0.0000203	(0.0230)

RTG/RSG090 BACKLASH AND EFFICIENCY		
	Single Reduction	Double Reduction
Backlash at 1% Rated Torque	10 Arc min	13 Arc min
Efficiency	91%	86%

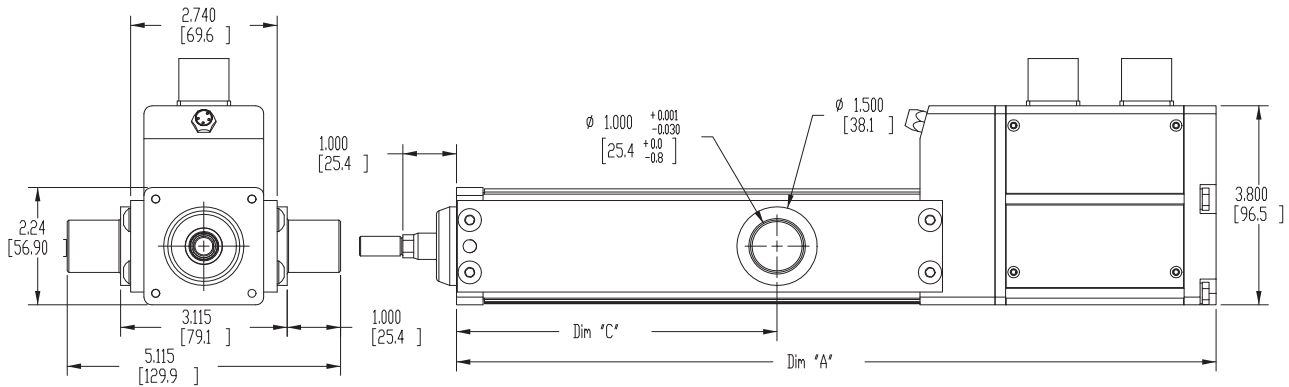
RTM090 MOTOR AND RTG090 GEARMOTOR WEIGHTS				
		RTM090 Without Gears	RTG090 with 1 Stage Gearing	RTG090 with 2 Stage Gearing
1 Stack Stator	lb (kg)	5.4 (2.5)	12.8 (5.8)	14.8 (6.7)
2 Stack Stator	lb (kg)	7.8 (3.5)	15.2 (6.9)	17.2 (7.8)
3 Stack Stator	lb (kg)	10.2 (4.6)	17.6 (7.9)	19.6 (8.9)

# TLM20 Dimensions

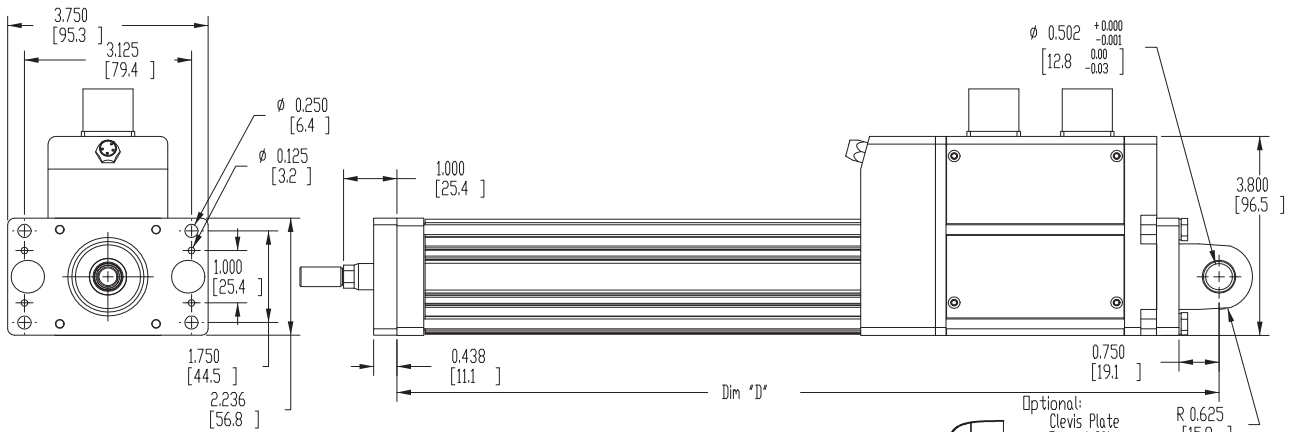
## TLM20 Double Side Mounts or Extended Tie Rod Mount



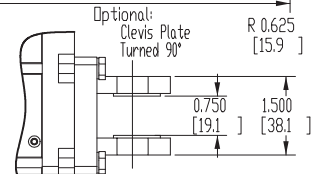
## TLM20 Side Trunnion Mount



## TLM20 Rear Clevis Mount or Front Flange Mount



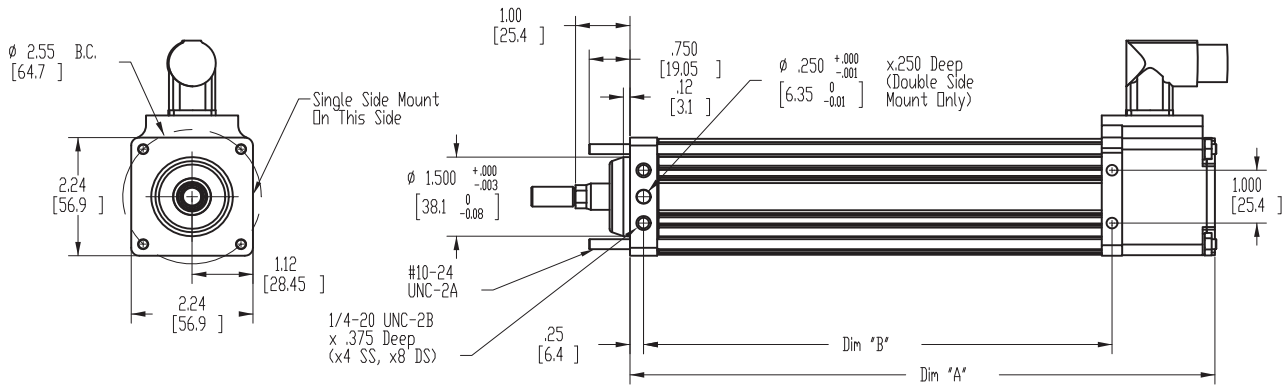
Dim	3 inch (mm) stroke	6 inch (mm) stroke	10 inch (mm) stroke	12 inch (mm) stroke
A	11.215 (284.9)	14.215 (361.1)	18.215 (462.7)	22.215 (564.3)
B	5.613 (142.6)	8.613 (218.8)	12.613 (320.4)	14.613 (371.2)
C	3.000 (76.2)	6.000 (152.4)	10.000 (254.4)	12.000 (304.8)
D	12.422 (315.5)	15.422 (391.7)	19.422 (493.3)	21.422 (544.1)



- Two mounting styles shown
- With flange mount, dimension "A" is equivalent to top two drawings.

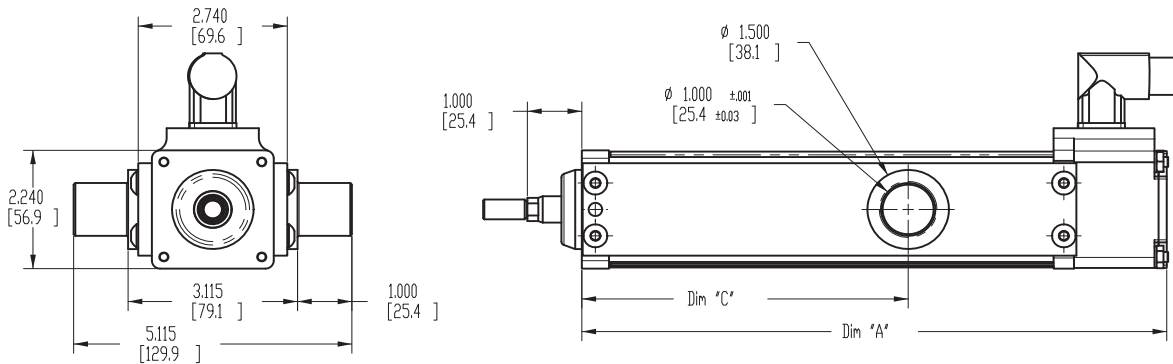
## TSM20 Dimensions (Requires TRA500 Remote Amplifier)

### TSM20 Double Side Mounts or Extended Tie Rod Mount

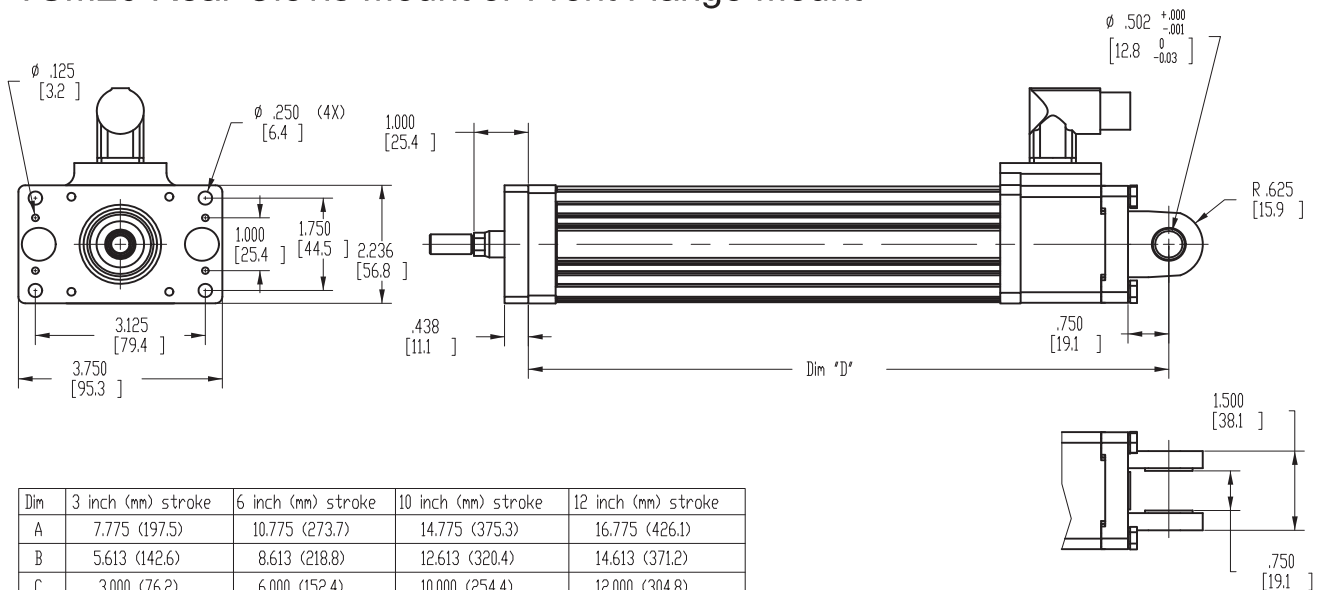


1. Three mounting styles shown.
  2. Shown view is standard side for single side mount.
- \*If "M" (metric) tie rod option, thread = M5x0.8

### TSM20 Side Trunnion Mount



### TSM20 Rear Clevis Mount or Front Flange Mount



Dim	3 inch (mm) stroke	6 inch (mm) stroke	10 inch (mm) stroke	12 inch (mm) stroke
A	7.775 (197.5)	10.775 (273.7)	14.775 (375.3)	16.775 (426.1)
B	5.613 (142.6)	8.613 (218.8)	12.613 (320.4)	14.613 (371.2)
C	3.000 (76.2)	6.000 (152.4)	10.000 (254.4)	12.000 (304.8)
D	8.775 (222.9)	11.775 (299.1)	15.775 (400.7)	17.775 (451.5)

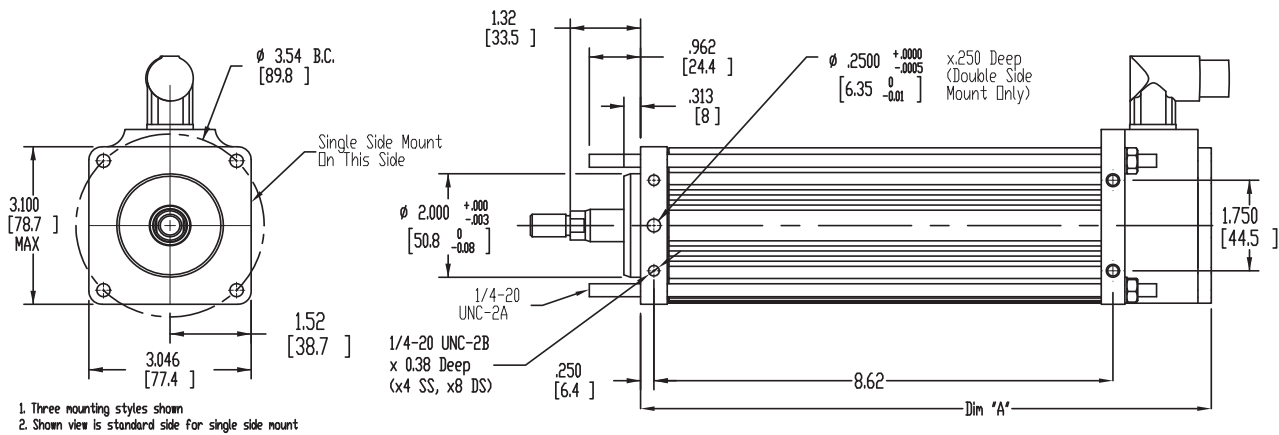
Note: Add 1.784 Inches to Dims "A&D" if ordering an Electric Brake or Internal End of Travel Switches.

1. Two mounting styles shown.
2. With Flange mount, dimension "A" is equivalent to the top two drawing views.

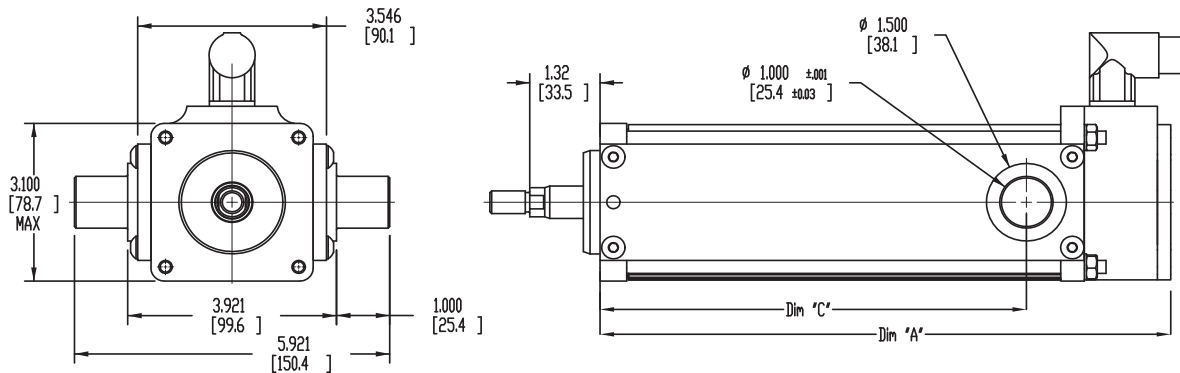


# TSM30 Dimensions (Requires TRA500 Remote Amplifier)

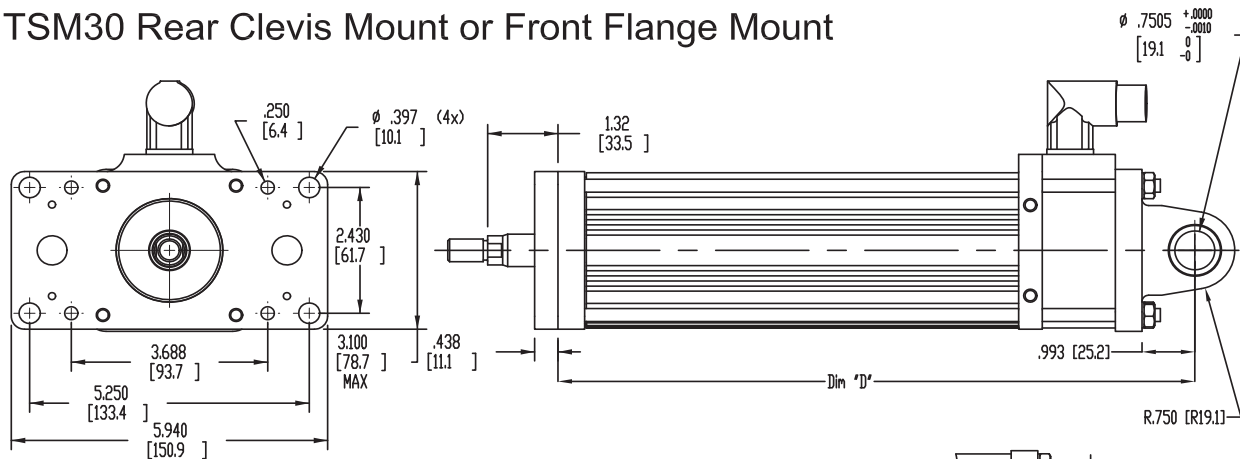
## TSM30 Double Side Mounts or Extended Tie Rod Mount



## TSM30 Side Trunnion Mount

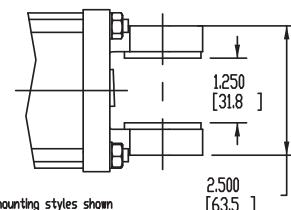


## TSM30 Rear Clevis Mount or Front Flange Mount



Dim	3 inch (mm) stroke	6 inch (mm) stroke	10 inch (mm) stroke	14 inch (mm) stroke	18 inch (mm) stroke
A	8.243 (209.4)	10.716 (272.2)	15.215 (386.5)	19.215 (488.1)	23.215 (589.7)
B	6.147 (156.1)	8.620 (218.9)	13.119 (333.3)	17.119 (434.8)	21.119 (536.4)
C	5.380 (136.7)	8.006 (203.4)	10.000 (254.0)	14.000 (355.6)	18.000 (457.2)
D	9.486 (240.9)	11.959 (303.8)	16.458 (418.0)	20.458 (519.6)	24.458 (621.2)

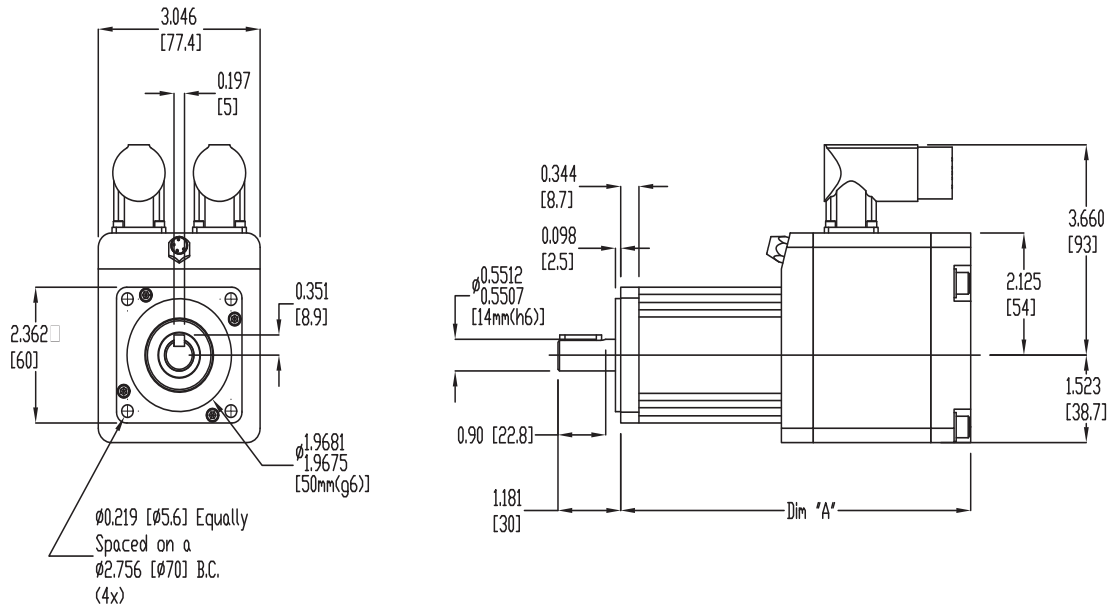
Note: Add 1.6 Inches to Dims 'A&D' if ordering a Brake.



1. Two mounting styles shown  
2. With flange mount, dimension A is equivalent to top two drawings

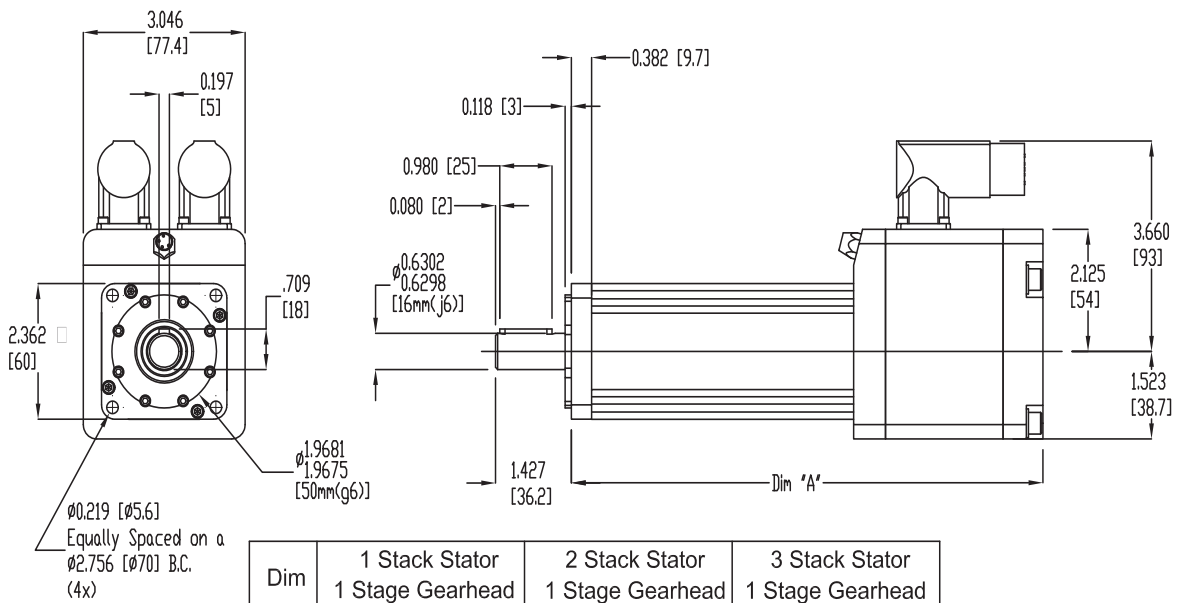
# RTM060 / RTG060 Dimensions

## RTM60



Dim "A"	
1 Stack, no brake	6.592 [167]
2 Stack, no brake	7.842 [199]
3 Stack, no brake	9.092 [231]

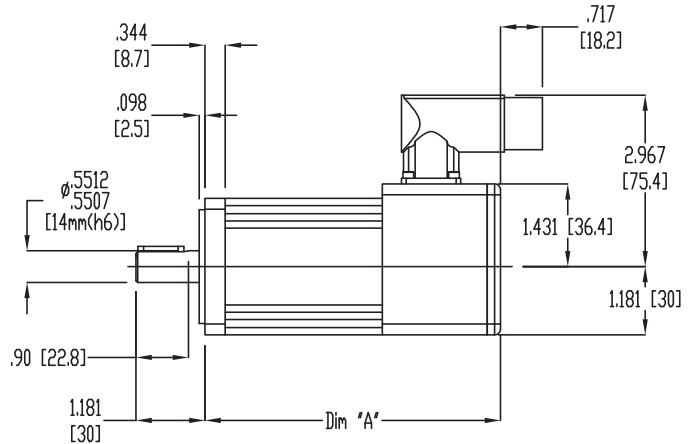
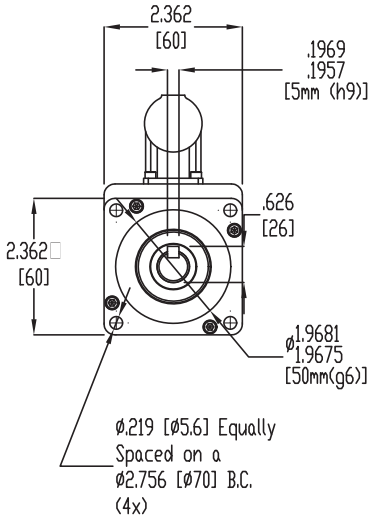
## RTG60



Dim	1 Stack Stator 1 Stage Gearhead	2 Stack Stator 1 Stage Gearhead	3 Stack Stator 1 Stage Gearhead
A	8.882 [226]	10.132 [257]	11.382 [289]
Dim	1 Stack Stator 2 Stage Gearhead	2 Stack Stator 2 Stage Gearhead	3 Stack Stator 2 Stage Gearhead
A	9.927 [252]	11.177 [284]	12.427 [316]

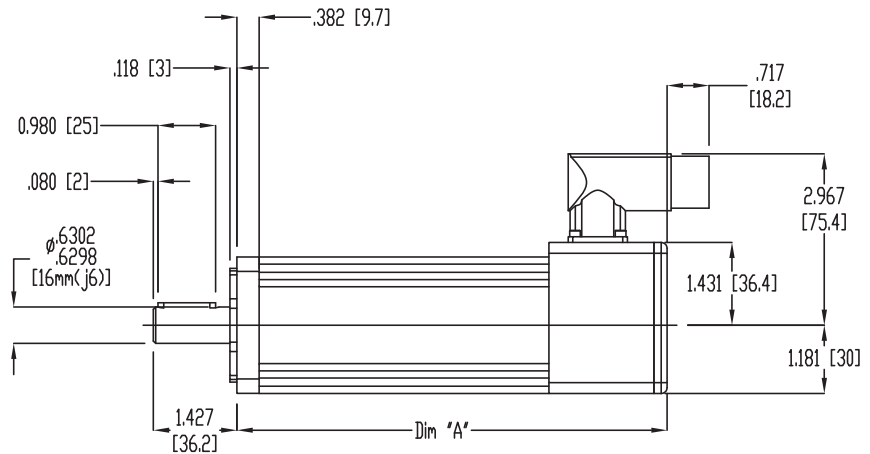
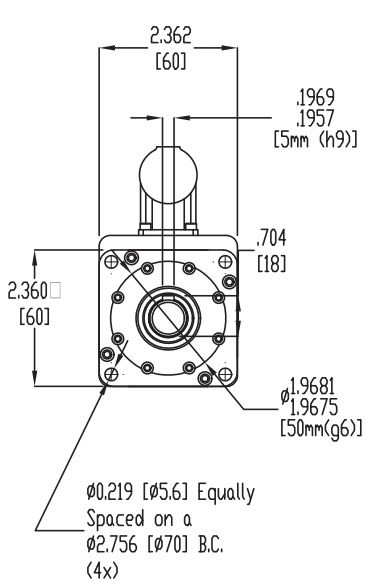
# RSM060 / RSG060 Dimensions (Requires TRA500 Remote Amplifier)

## RSM060



Dim "A"	
1 Stack, no brake	5.048 [128]
2 Stack, no brake	6.298 [160]
3 Stack, no brake	7.548 [192]

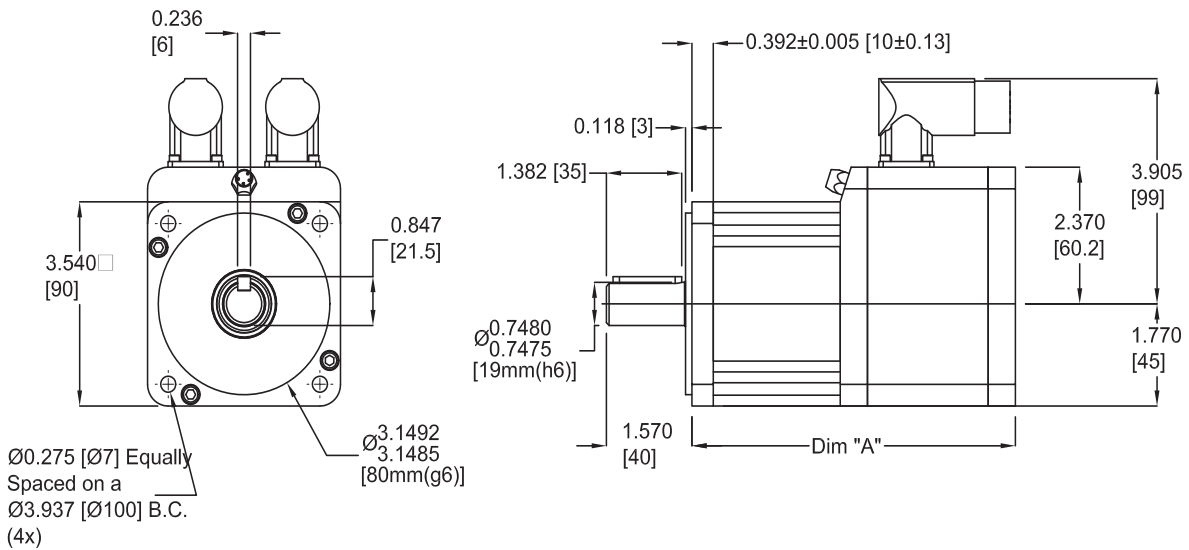
## RSG060



Dim	1 Stack Stator 1 Stage Gearhead	2 Stack Stator 1 Stage Gearhead	3 Stack Stator 1 Stage Gearhead
A	7.351 [187]	8.601 [218]	9.851 [250]
Dim	1 Stack Stator 2 Stage Gearhead	2 Stack Stator 2 Stage Gearhead	3 Stack Stator 2 Stage Gearhead
A	8.396 [213]	9.646 [245]	10.896 [277]

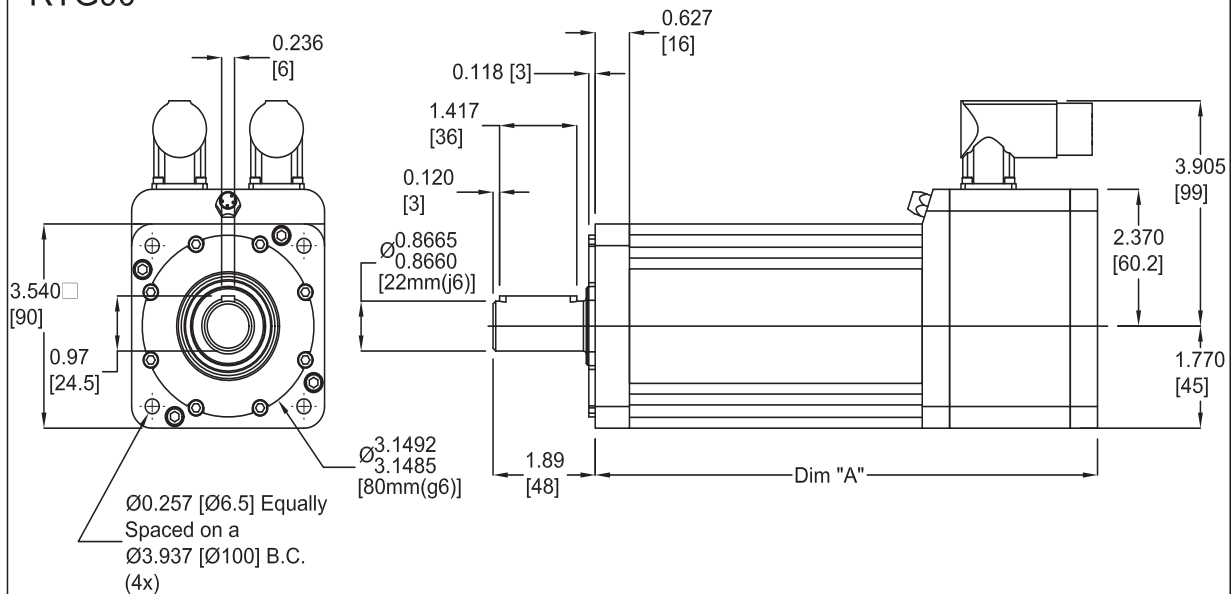
# RTM090 / RTG090 Dimensions

## RTM90



Dim "A"	
1 Stack, no brake	5.937 [151]
2 Stack, no brake	6.937 [176]
3 Stack, no brake	7.937 [202]

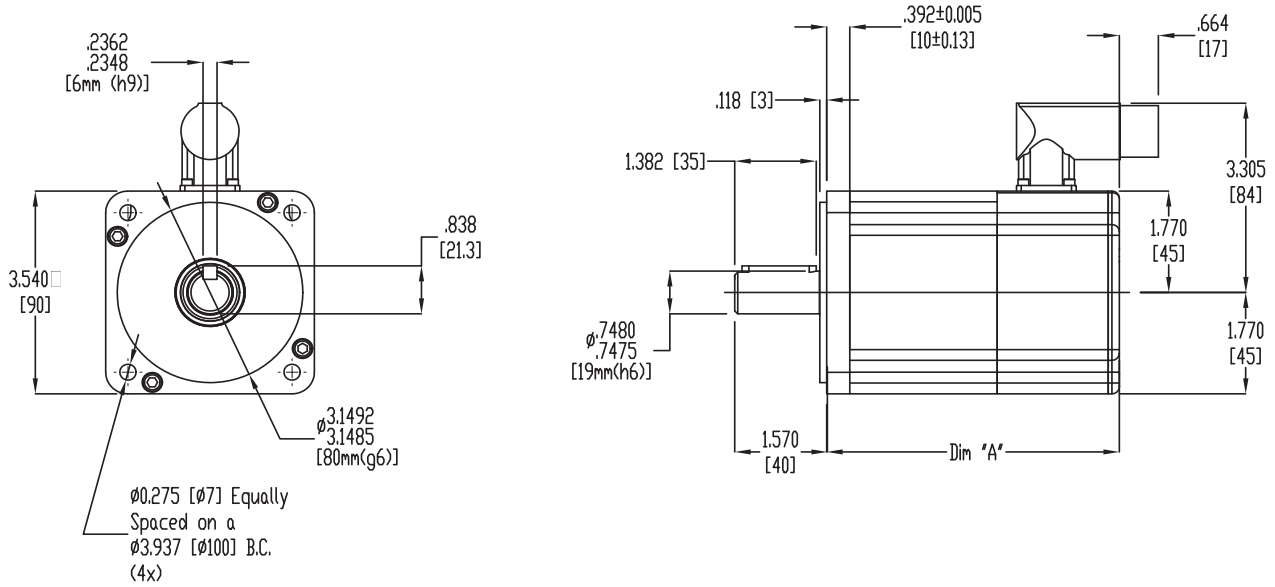
## RTG90



Dim	1 Stack Stator 1 Stage Gearhead	2 Stack Stator 1 Stage Gearhead	3 Stack Stator 1 Stage Gearhead
A	9.217 [234]	10.217 [260]	11.217 [285]
Dim	1 Stack Stator 2 Stage Gearhead	2 Stack Stator 2 Stage Gearhead	3 Stack Stator 2 Stage Gearhead
A	10.482 [266]	11.482 [292]	12.482 [317]

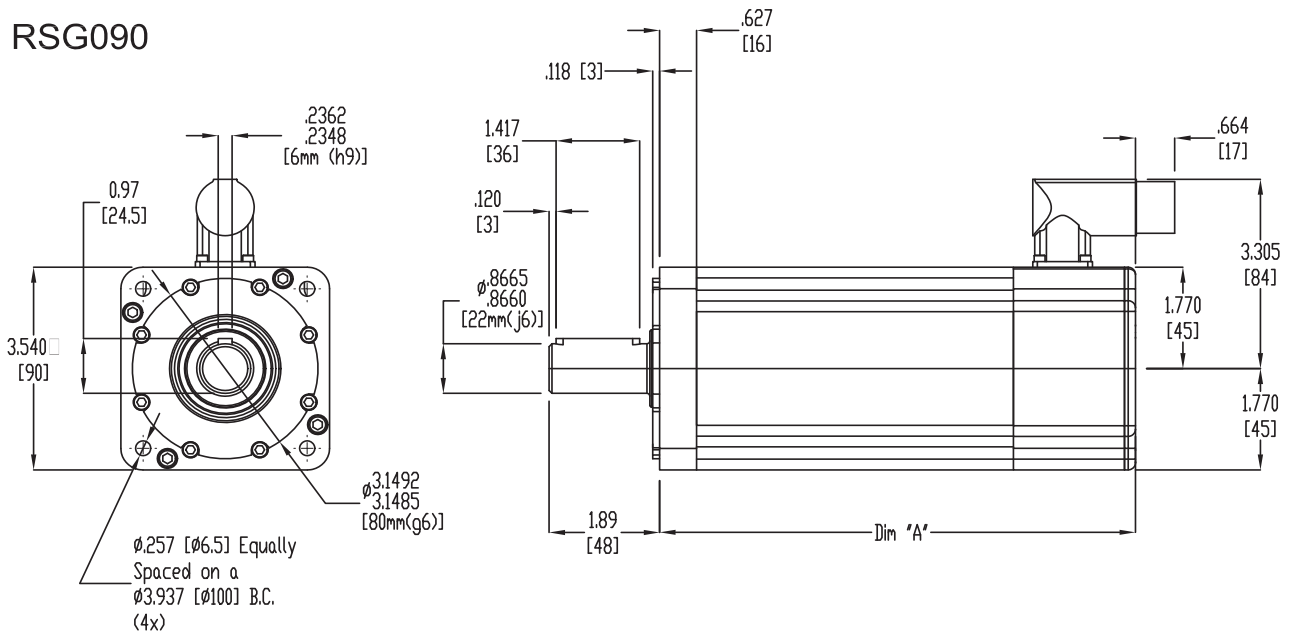
# RSM090 / RSG090 Dimensions (Requires TRA500 Remote Amplifier)

## RSM090



Dim "A"	
1 Stack, no brake	4.964 [126]
2 Stack, no brake	5.964 [152]
3 Stack, no brake	6.964 [177]

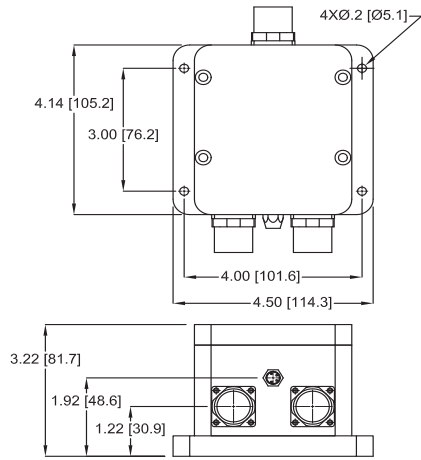
## RSG090



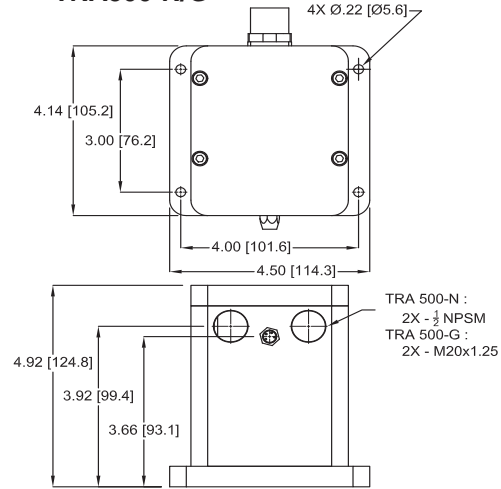
Dim	1 Stack Stator 1 Stage Gearhead	2 Stack Stator 1 Stage Gearhead	3 Stack Stator 1 Stage Gearhead
A	8.074 [205]	9.074 [230]	10.074 [256]
Dim	1 Stack Stator 2 Stage Gearhead	2 Stack Stator 2 Stage Gearhead	3 Stack Stator 2 Stage Gearhead
A	9.339 [237]	10.339 [263]	11.339 [288]

# TRA500 Remote Amplifier and Rod End Attachment Dimensions

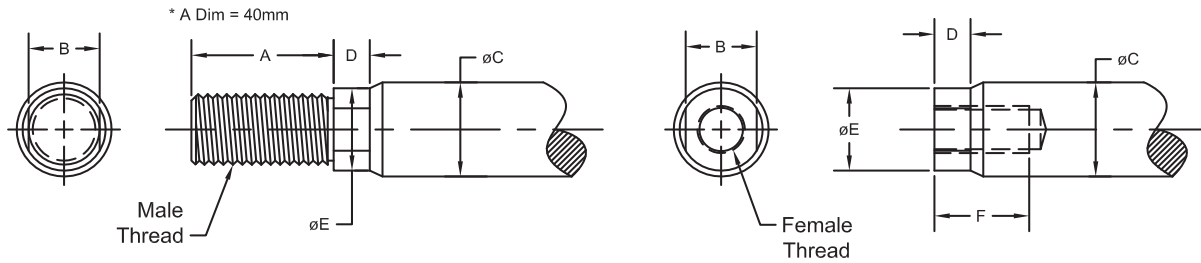
## TRA500-I



## TRA500-N/G



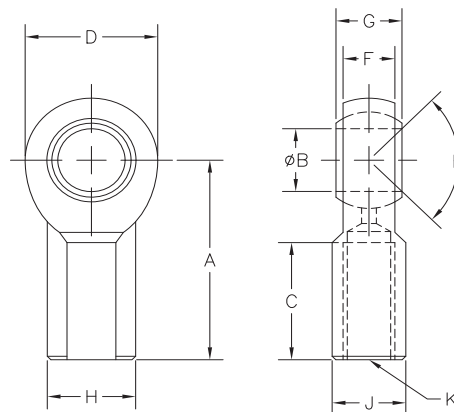
## TLM/TSM Rod Ends



	A inch (mm)	B inch (mm)	øC inch (mm)	D inch (mm)	øE inch (mm)	F inch (mm)	Male U.S.	Male Metric	Female U.S.	Female Metric
TLM/TSM20	0.813 (20.7)	0.375 (9.5)	0.500 (12.7)	0.200 (5.1)	0.440 (11.2)	0.750 (19.1)	3/8-24 UNF-2A	M8X1	5/16-24 UNF-2B	M8X1
TLM/TSM30	0.750 (19.1)	0.500 (12.7)	0.625 (15.9)	0.281 (7.1)	0.562 (14.3)	0.750 (19.1)	7/16-20 UNF-2A	M12X1.75 *	7/16-20 UNF-2A	M10X1.5

## Spherical Rod Eye

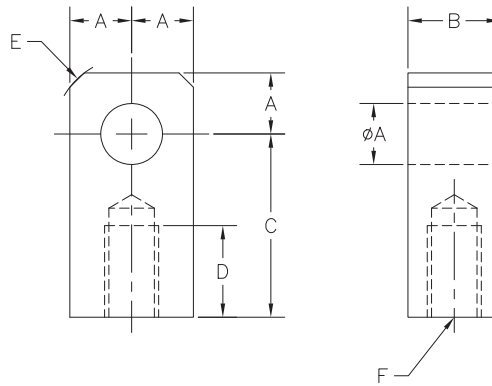
	TLM/TSM20 SRM038	TLM/TSM30 SRM044
A	1.625" (41.3 mm)	1.81" (46.0 mm)
øB	0.375" (9.525 mm)	0.438" (11.13 mm)
C	.906" (23.0 mm)	1.06" (26.9 mm)
D	1.0" (25.6 mm)	1.13" (28.7 mm)
E	12 Deg	14 Deg
F	.406" (10.3 mm)	0.44" (11.1 mm)
G	.500" (12.7 mm)	0.56" (14.2 mm)
H	.688" (17.7 mm)	0.75" (19.1 mm)
J	.562" (14.3 mm)	0.63" (16.0 mm)
K	3/8-24	7/16-20



## Rod End Attachment Dimensions (continued)

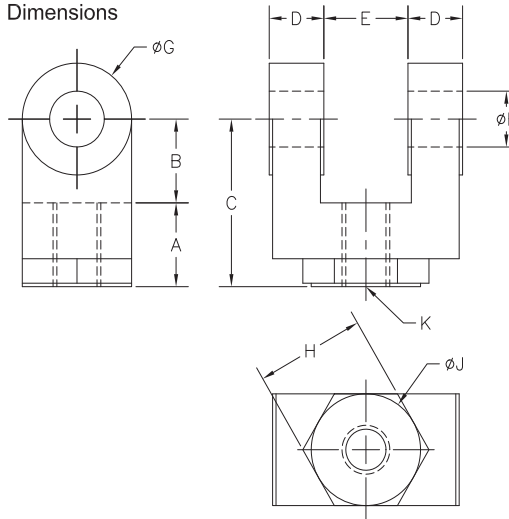
### Rod Eye Dimensions

	TLM/TSM30 RE050
øA	0.50" (12.70 mm)
B	0.75" (19.1 mm)
C	1.50" (38.1 mm)
D	0.75" (19.1 mm)
E	0.63" (15.9mm)
F	7/16-20

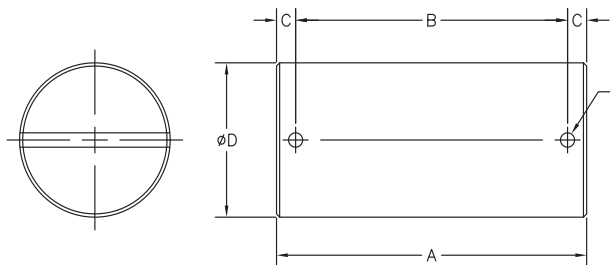


### Rod Clevis Dimensions

	TLM/TSM20 RC038	TLM/TSM30 RC050
A	.787" (20 mm)	.75" (19.1 mm)
B	.787" (20 mm)	.75" (19.1 mm)
C	1.574" (40 mm)	1.50" (38.1 mm)
D	0.575" (14.6 mm)	0.50" (12.7 mm)
E	0.375" (9.5 mm)	0.765" (19.43 mm)
øF	0.375" (9.5 mm)	0.50" (12.7 mm)
øG	0.75" (19.1 mm)	1.00" (25.4 mm)
H	NA	1.00" (25.4 mm)
øJ	NA	1.00" (25.4 mm)
K	3/8-24	7/16-20



### Clevis Pin Dimensions



	A	B	C	øD	øE
CP050 - TLM/TSM20 Clevis and TLM/TSM30 Rod Eye and Rod Clevis	2.28" (57.9 mm)	1.94" (49.28 mm)	0.17" (4.32 mm)	0.50" (12.7 mm)	0.095" (2.41 mm)
CP075 - TLM/TSM30 Rear Clevis	3.09" (78.5 mm)	2.72" (69.1 mm)	0.19" (4.82 mm)	0.75" (19.1 mm)	0.14" (3.56 mm)

## Options/Accessories



### Model TTUSB485

The TTUSB485 is a USB (Universal Serial Bus) port to 2 or 4 wire isolated RS-485/422 converter. The serial port side can be set up for an RS-422 or RS-485 network. USB bus supplies power so no separate power supply is needed.



### Model TT232485

The Model TT232485 is a feature packed RS232 to RS-422/485 9-pin converter. The driver uses automatic SD (send data) or TS (handshake) control, or can be configured as always enabled for use in RS-422 systems.



### Model TTSR1

Shunt regulator dissipates excess kinetic or potential energy to prevent amplifier over-voltage shut down.



### Model TTPS1048

Model TTPS1048 unregulated 48 VDC, 10A power supply.



### Model TT485SP

RS485 Communications splitter. Use to daisy-chain multiple Tritex actuators.

## TRITEX TLM SERIES ORDERING GUIDE

**AAABB-CCDD-E-FG-HHH-HH - (XX.XX - #####)**

AAA = Actuator Type		G = Rod End	
TLM = Tritex Linear Actuator		M = Male US Standard Thread	A = Male Metric
BB = Actuator Frame Size		F = Female US Standard	B = Female Metric
20 = 2 inch (50 mm)		X = Special (please specify)	
30 = 3 inch (75 mm)		HHH-HH = Motor Stator	
CC = Stroke Length		<b>TLM20</b>	
03 = 3 inch (75 mm)		1B8-50 = 1 Stack, 5000 rpm at 48 VDC, 2500 rpm at 24 VDC	
06 = 6 inch (150 mm)		2B8-34 = 2 Stack, 3400 rpm at 48 VDC, 1700 rpm at 24 VDC	
10 = 10 inch (250 mm)		3B8-25 = 3 Stack, 2500 rpm at 48 VDC, 1250 rpm at 24 VDC (1)	
12 = 12 inch (305 mm)		<b>TLM30</b>	
18 = 18 inch (455 mm) (TLM30 only)		1B8-20 = 1 Stack, 2000 rpm at 48 VDC, 1000 rpm at 24 VDC	
DD = Lead (linear motion per screw revolution)		2B8-13 = 2 Stack, 1300 rpm at 48 VDC, 650 rpm at 24 VDC	
01 = 0.1 inch (2.54 mm)		3B8-10 = 3 Stack, 1000 rpm at 48 VDC, 500 rpm at 24 VDC (1)	
02 = 0.2 inch (5.08 mm)		X..XX = Travel and Housing Options (Multiple Possible)	
04 = 0.4 inch (10.16 mm) (TLM20 only)		<b>Travel Options</b>	
05 = 0.5 inch (12.7 mm) (TLM30 only)		AR = External Anti-rotate	L1/2/3 = External Limit Switches
E = Connections		PF = Preloaded Follower (2)	RB = Rear Brake
I = Exlar Std M23 style connector		XT = Special Travel Options	
Bxx = Embedded leads, xx = length in feet, 3 ft std		<b>Housing Options</b>	
Jxx = Emb. leads w/receptacle, std M23 style connector, xx = ft, 3 ft std		P5 = IP65 sealed housing	
X = Special (please specify)		<b>Special Motor Options</b>	
F = Mounting		XL = Special Lubrication	
C = Rear Clevis	D = Double Side Mount	XM = Special Motor Option	
E = Extended Tie Rod	F = Front Flange	##### = Part Number Desitnator for Specials	
S = Side Mount	T = Side Trunnion	Optional 5 digit assigned PN to designate unique model numbers	
M = Metric Extended Tie Rod	X = Special		

(1) Not available on 3 inch stroke

(2) The dynamic load rating of zero backlash, preloaded screws is 63% of the dynamic load rating of the std non-preloaded screws. The calculated travel life of a preloaded screw will be 25% of the calculated travel life of the same size and lead of a non-preloaded screw.

**TRITEX TSM SERIES ORDERING GUIDE (Also See TRA500 Next Page)**

<b>AAABB-CCDD-E-FG-HHH-HH - (XX..XX - #####)</b>	
<b>AAA = Actuator Type</b>	<b>G = Rod End</b>
TSM = Tritex Linear Actuator Used with TRA500 Remote Amplifier	M = Male US Standard Thread      A = Male Metric
<b>BB = Actuator Frame Size</b>	F = Female US Standard      B = Female Metric
20 = 2 inch (50 mm)	X = Special (please specify)
30 = 3 inch (75 mm)	<b>HHH-HH = Motor Stator</b>
<b>CC = Stroke Length</b>	<b>TSM20</b>
03 = 3 inch (75 mm)	1B8-50 = 1 Stack, 5000 rpm at 48 VDC, 2500 rpm at 24 VDC
06 = 6 inch (150 mm)	2B8-34 = 2 Stack, 3400 rpm at 48 VDC, 1700 rpm at 24 VDC
10 = 10 inch (250 mm)	3B8-25 = 3 Stack, 2500 rpm at 48 VDC, 1250 rpm at 24 VDC (1)
12 = 12 inch (305 mm)	<b>TSM30</b>
18 = 18 inch (455 mm) (TSM30 only)	1B8-20 = 1 Stack, 2000 rpm at 48 VDC, 1000 rpm at 24 VDC
<b>DD = Lead (linear motion per screw revolution)</b>	2B8-13 = 2 Stack, 1300 rpm at 48 VDC, 650 rpm at 24 VDC
01 = 0.1 inch (2.54 mm)	3B8-10 = 3 Stack, 1000 rpm at 48 VDC, 500 rpm at 24 VDC (1)
02 = 0.2 inch (5.08 mm)	<b>X..XX = Travel and Housing Options (Multiple Possible)</b>
04 = 0.4 inch (10.16 mm) (TSM20 only)	<b>Travel Options</b>
05 = 0.5 inch (12.7 mm) (TSM30 only)	AR = External Anti-rotate      L1/2/3 = External Limit Switches
<b>E = Connections</b>	PF = Preloaded Follower (2)      RB = Rear Brake
I = Exlar Std M23 style connector	XT = Special Travel Options
J3 = Emb. leads w/receptacle, std M23 style conn., 3 ft.	<b>Housing Options</b>
J6 = Emb. leads w/receptacle, std M23 style conn., 6 ft.	P5 = IP65 sealed housing
X = Special (please specify)	<b>Special Motor Options</b>
<b>F = Mounting</b>	XL = Special Lubrication
C = Rear Clevis      D = Double Side Mount	XM = Special Motor Option
E = Extended Tie Rod      F = Front Flange	<b>##### = Part Number Designator for Specials</b>
S = Side Mount      T = Side Trunnion	Optional 5 digit assigned PN to designate unique model numbers
M = Metric Extended Tie Rod      X = Special	

(1) Not available on 3 inch stroke

(2) The dynamic load rating of zero backlash, preloaded screws is 63% of the dynamic load rating of the std non-preloaded screws. The calculated travel life of a preloaded screw will be 25% of the calculated travel life of the same size and lead of a non-preloaded screw.

**TRITEX RTM/RTG SERIES ORDERING GUIDE**

<b>AAABBB-CCC-D-E-FFF-FF- (XX...XX) - #####</b>	
<b>AAA = Actuator Type</b>	<b>E = Connector Options</b>
RTM = Tritex Rotary Motor	I = Exlar Std M23 style connector
RTG = Tritex Rotary Gearmotor	Bxx = Embedded leads, xx = length in feet, 3 ft std
<b>BBB = Frame Size</b>	Jxx = Embedded leads w/recpt., M23 std, xx = length in ft, 3 ft std
060 = 60 mm	X = Special (please specify)
090 = 90 mm	<b>FFF-FF = Motor Stators</b>
<b>CCC = Gear Ratio</b>	<b>RTM / RTG060</b>
Blank = RTM	1B8-50 = 1 Stack, 5000 rpm at 48 VDC, 2500 rpm at 24 VDC
<b>Single Reduction Ratios</b>	<b>Double Reduction Ratios</b>
004 = 4:1	016 = 16:1    020 = 20:1
005 = 5:1	025 = 25:1    040 = 40:1
010 = 10:1	050 = 50:1    100 = 100:1
<b>D = Shaft Type</b>	<b>RTM / RTG090</b>
K = Keyed	1B8-17 = 1 Stack, 1700 rpm at 48 VDC, 850 VDC at 24 VDC
R = Smooth/Round	2B8-10 = 2 Stack, 1000 rpm at 48 VDC, 500 VDC at 24 VDC
X = Special Shaft	3B8-07 = 3 Stack, 700 rpm at 48 VDC, 350 VDC at 24 VDC
	<b>XX = Special Options</b>
	XH = Special Housing Options
	XM = Special Motor Options
	XL = Special Lubrication
	<b>##### = Part Number Designator for Specials</b>
	Optional 5 digit assigned PN to designate unique model number

TRITEX RSM/RSG SERIES ORDERING GUIDE (Also see TRA500 Below)		
<b>AAABBB-CCC-D-E-FFF-FF- (XX...XX) - #####</b>		
<b>AAA = Actuator Type</b>		<b>E = Connector Options</b>
RSM = Tritex Rotary Motor Used with Remote Amplifier		I = Exlar Std M23 style connector
RSG = Tritex Rotary Gearmotor Used with Remote Amp		J3 or J6 = Embedded leads w/receptacle, M23, J3 = 3 ft, J6 = 6 ft
<b>BBB = Frame Size</b>		<b>FFF-FF = Motor Stators</b>
060 = 60 mm		<b>RSM / RSG060</b>
090 = 90 mm		1B8-50 = 1 Stack, 5000 rpm at 48 VDC, 2500 rpm at 24 VDC
<b>CCC = Gear Ratio</b>		2B8-34 = 2 Stack, 3400 rpm at 48 VDC, 1700 rpm at 24 VDC
Blank = RSM		3B8-25 = 3 Stack, 2500 rpm at 48 VDC, 1250 rpm at 24 VDC
<b>Single Reduction Ratios</b>	<b>Double Reduction Ratios</b>	<b>RSM / RSG090</b>
004 = 4:1	016 = 16:1    020 = 20:1	1B8-17 = 1 Stack, 1700 rpm at 48 VDC, 850 VDC at 24 VDC
005 = 5:1	025 = 25:1    040 = 40:1	2B8-10 = 2 Stack, 1000 rpm at 48 VDC, 500 VDC at 24 VDC
010 = 10:1	050 = 50:1    100 = 100:1	3B8-07 = 3 Stack, 700 rpm at 48 VDC, 350 VDC at 24 VDC
<b>D = Shaft Type</b>		<b>XX = Special Options</b>
K = Keyed		XH = Special Housing Options
R = Smooth/Round		XM = Special Motor Options
X = Special Shaft		XL = Special Lubrication
		<b>##### = Part Number Designator for Specials</b>
		Optional 5 digit assigned PN to designate unique model number

TRITEX TRA500 REMOTE AMPLIFIER ORDERING GUIDE
AAABBB-C-#####
<b>AAA = Amplifier Type</b>
AAA = TRA Remote Amplifier
<b>BBB = Power</b>
500 = 500 Watts
<b>C = Connector Options</b>
N = 1/2 inch NPSM Threaded Holes
G = PG Threaded Holes
I = Exlar Standard M23 Style Connector
Bxx = Embedded Leads, 3 ft std., xx = length in feet
Jxx = Embedded Leads w/M23 receptacle, 3 ft std., xx = length in feet
<b>##### = Part Number Designator for Specials</b>
Optional 5 digit assigned PN to designate unique model number

TRITEX SERIES CABLES & ACCESSORIES	Part Number
Power Cables, molded M23 style connector, 8 pin, xxx = Length in feet. Std lengths 15, 25, 50 feet	CBL-TTIPC-SMI-xxx
I/O Cables, molded M23 style connector, 19 pin, xxx = Length in feet. Std lengths 15, 25, 50 feet	CBL-TTIOC-SMI-xxx
Communication Cable, PICO type connector, 4 pin, xxx = Length in feet. Std lengths 15, 25, 50 feet	CBL-TTCOM-xxx
Communication Cable for use with TT485SP, xxx = Length in feet. Std lengths 15, 25, 50 feet	CBL-TTDAS-xxx
Cable with connectors both ends from TRA to actuator, 3 or 6 feet	CBL-TTUMB-00x
Universal Serial bus port to RS-485/422 converter	TTUSB485
RS-232 to RS-422/485 converter	TT232485
48 VDC, 10A power supply	TTPS1048
Shunt regulator	TTMRI
RS-485 Splitter	TT485SP



The Company - Headquartered in suburban Minneapolis, Minnesota, Exlar serves a global customer base with an extensive standard product line and complete engineering support for custom actuator applications.

Exlar supports a large network of sales representatives in North America. To find your local dealer, visit our website at [www.exlar.com](http://www.exlar.com) or call our headquarters at 952-368-3434. For assistance outside North America, please contact Exlar direct or one of our worldwide partners listed below.

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**Austria**

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**Belgium**

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