

*Advanced Linear and Rotary Actuators  
with Embedded Electronics*

## **Tritex II™ DC Powered Actuators**



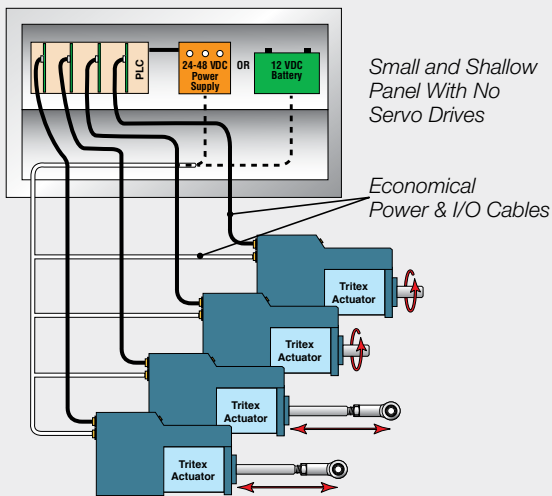
**EXLAR**

# Industry's Most Compact All-In-One Linear & Rotary Motion Actuators

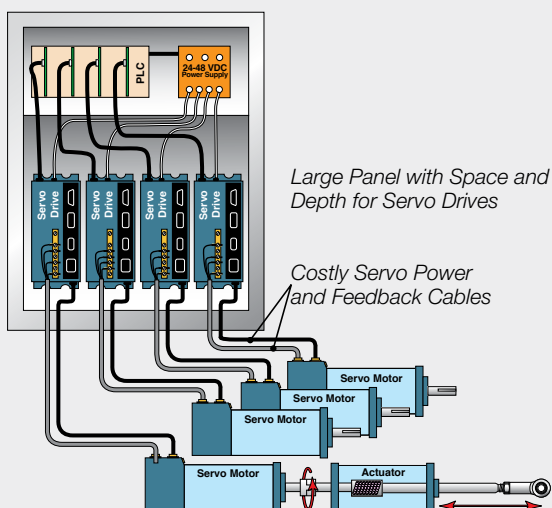
By combining the latest electronic power technology with advanced thermal management modeling technology, Exlar has set a new benchmark for electric actuator performance versus size. The Tritex II actuators now integrate a DC powered servo drive, digital position controller, brushless motor and linear or rotary actuator in one elegant, compact, sealed package. Now you can distribute motion control and solve your application with one integrated device. Simply connect DC power, I/O, communications and go!



## Tritex II System



## Alternative Systems



## Dramatically Reduce Space Requirements

Tritex II actuators are the highest power density, smallest footprint servo drive devices on the market. Finally, you can incorporate a fully electronic solution in the space of your existing hydraulic or pneumatic cylinder. You can also eliminate troublesome ball screw actuators or bulky servo gear reducers. And the space previously consumed by panel mount servo drives and motion controllers is no longer needed. Tritex II actuators may also reduce the size of your machine design while offering significant reliability improvement.

## Reduce Costs

Because the new DC powered Tritex II houses the servo drive, digital positioner, and actuator all in one convenient package, you eliminate the labor costs for mounting and wiring the panels. Cable costs are also significantly reduced by eliminating the need for expensive, high-maintenance specialty servo cables. All that is required is an economical standard DC power cord, and standard communication cable for digital and analog I/O.

Also eliminated are the issues associated with power signals and feedback signals traveling long distances from servo drive to servo motor. With the Tritex II, the servo drive and motor are always integrated in the same housing.

## No Compromises on Power, Performance or Reliability

With forces to approximately 1,000 lbs (4kN) continuous and 1,300 lbs peak (6 kN), and speeds to 33 in/sec (800 mm/sec), the DC Tritex II linear actuators also offer a benefit that no other integrated product offers—POWER! No longer are you limited to trivial amounts of force, or speeds so slow that many motion applications are not possible. And the new Tritex II with DC power electronics operates with maximum reliability over a broad range of ambient temperatures; -40°C to +65°C.

The DC powered Tritex II actuators contain a 750 W servo amplifier and a very capable motion controller. With standard features such as analog following for position, compound moves, move chaining and individual force/torque control for each move, the Tritex II Series is the ideal solution for most motion applications.

# Applications

## DC Power Solution

Tritex II DC actuators offer the ideal self contained actuator solution for customers needing 12-48 VDC power input. By incorporating power, actuation and control the Tritex II DC actuators provide a complete motion solution in one package.

## Linear Applications

Tritex II linear actuators employ Exlar's patented, inverted roller screw mechanism for converting rotary motion to highly robust and long-life linear motion. These characteristics enable the Tritex II actuator 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 into linear motion in order to move the load. Ideal for mobile and remote applications using DC power sources, the Tritex II DC actuators offer the power needed to perform real world applications. Simple to configure, yet powerful interface software allows the Tritex II actuators perform nearly any motion application. The Tritex II linear actuator can be programmed to follow an analog command signal, making it ideal for controlling valves and dampers in process control applications or adjustment mechanisms on mobile equipment.

## Rotary Applications

Tritex II rotary motors and gearmotors provide high response and precise control of a rotatable shaft similar to that found in any electric motor. The difference is that with Tritex II 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 preprogrammed position. You can also program the unit to run at a preset velocity until a switch input is received or a preprogrammed torque level is produced against a load. Alternatively, the rotary Tritex II actuators can be set up to follow an analog signal, either voltage or current, representing your choice of torque, velocity, or position.

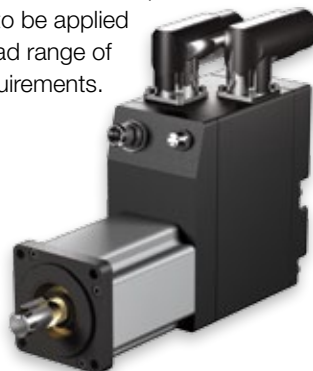
Signals for initiating the preprogrammed velocity and position commands come from optically isolated inputs or directly via network communications. Likewise, isolated output commands of the status and events allow precise coordination with your system controls or machine operator.

## Flexible Communications

Multiple feedback types, including absolute feedback, allow you to select the system that is best-suited for your application. Digital and analog I/O plus popular communication networks such as Modbus TCP, Ethernet/IP and PROFINET IO (future networks include CANopen and Hart) allow the Tritex II to become an integral part of your control architecture or machine control processes.

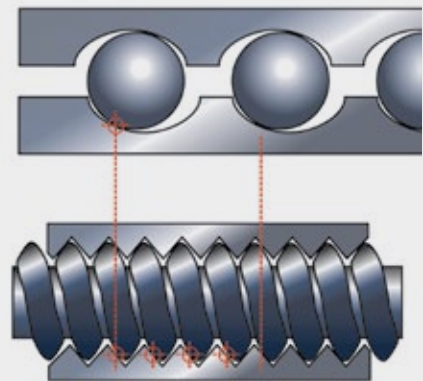
## Optional Internal Gear Reducer

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



## 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 arduous conditions. This makes roller screws the ideal choice for demanding, continuous-duty linear motion applications. 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 higher load-carrying capacity and improved stiffness.*

# The Exlar Advantage

*Exlar has delivered thousands of roller screw linear actuator solutions around the world in applications ranging from demanding automatic welding 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.*

## Typical Applications

- Process Control
- Test
- Simulation
- Food Processing
- Industrial Automation
- Forestry
- Semi-conductor
- Remote Vehicles
- Medical Equipment
- Automotive Assembly
- Molding
- Die Casting
- Welding

## Tritex II DC Agency Approvals

Agency/Standard	Tritex Models/Options
<b>CE, EMC EN61800-3</b>	All models
<b>CSA 139, Pending</b>	All models, when supply voltage is 24 V dc or less
<b>CSA Class I, Div 2, Pending</b>	75 mm size only, when supply voltage is 24 V dc or less. Requires NPT option. For network options, contact Exlar.
<b>IP 65</b>	Standard on TDX, RDM, RDG models, available on TDM models with P5 option

## Tritex II Models

- TDM standard mechanical capacity actuator, 60 and 75 mm
- TDX high mechanical capacity actuator, 60 and 75 mm
- RDM rotary motor, 60 and 90 mm
- RDG rotary gearmotor, 60 and 90 mm

## Power Requirements

- DC Power 12-48 VDC nominal
- Connections for external braking resistor

## Feedback Types

- Analog Hall with 1000 count resolution
- Incremental encoder with 8192 count resolution
- Absolute Feedback (analog hall with multi-turn, battery backup)

## Communications & I/O

### Digital I/O:

- 8 digital inputs (4 with IA4)
  - 10 to 30 VDC opto-isolated
- 4 digital outputs (3 with IA4)
  - 30 VDC maximum, 100 mA, opto-isolated

### Analog I/O:

- 1 analog input
  - 0-10V mode, 12 bit resolution
  - +/-10V mode, 13 bit resolution
  - Force/torque, velocity, position
- 1 analog output
  - 0-10V 11 bit resolution
  - Force/torque, velocity, position
- Optional isolated 4-20mA board
  - 1 4-20 mA isolated analog input, 16 bit resolution
  - 1 4-20 mA isolated analog output, 12 bit resolution
  - IA4 limits digital I/O to 4 inputs and 3 outputs

### Standard Communications:

- 1 RS 485 port, Modbus RTU, opto-isolated for programming, controlling and monitoring



*Tritex II rotary motor with cable glands shown left and Tritex II linear actuator with threaded ports shown below.*



CE  Class I Div 2  
163694

## Tritex II Series Operation

The Tritex II 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 II non-volatile memory. A standard RS/485 serial interface allows control, programming and monitoring of all aspects of the motor or actuator as it performs your application. Optional communications protocols are available.

## Operating Modes

### 1) Move to a position (or switch)

The Tritex II Series actuators allow you to execute up to 16 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 II 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 II Series provides the functionality to position a control valve by following an analog input signal. This allows the Tritex II Series to deliver precise valve control — control that cannot be achieved by other electric, hydraulic or pneumatic actuators.

### 4) Velocity proportional to an analog signal

Tritex II actuators offer you the capability to control velocity with an analog signal. This is particularly useful with Tritex II rotary motors 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 while in torque mode.

## Tritex Option Boards

- Option boards offer additional functionality to the base Tritex II actuators
  - Terminal board for customer I/O
  - Isolated 4-20mA analog input and output
  - Customer specific
- Communication buses
  - Ethernet/IP
  - Modbus TCP
  - PROFINET IO
  - CANopen (future)
  - HART (future)

## Connectivity

- Internal terminals accessible through removable cover (75 and 90 mm only)
- Threaded ports for cable glands (75 and 90 mm only)
- Optional connectors
  - M23 Power
  - M23 I/O
- M8 connector for RS485
- M12 connector for Ethernet options
- Custom connection options

## Selectable Input Functions

- Enable
- Move (0-15)
- Dedicated Position
- Jog+
- Jog- select move (0-15)
- Jog Fast
- Home
- Extend Switch
- Retract Switch
- Home Switch
- Teach Enable
- Teach Move (0-15)
- Stop
- Hold
- Alternate Mode; allows you to switch between 2 operating modes.

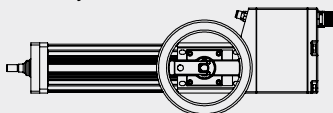
## Selectable Output Functions

- Enabled
- Homed
- Ready (Enabled and Homed)
- Fault
- Warning
- Fault or Warning Active
- Move (0-15) in Progress
- Homing
- Jogging
- Jogging+
- Jogging-
- Motion
- In Position
- At Home Position
- At Move (0-15)
- Position
- Stopped
- Holding
- In Current Limit
- In Current Fold back
- Above Rated Current
- Home

## Manual Override Options (Available on 75 mm linear and 90 mm rotary only, rotary not shown)

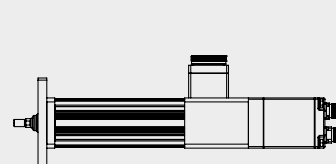
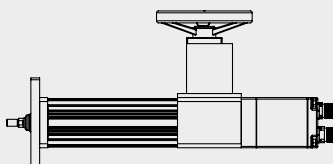
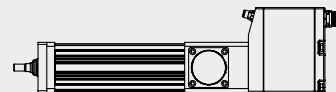
### Handwheel

This option gives you a manual engagement switch that can be used to disable the power to the actuator for manual operation without any external tools.



### Side Drive

This option allows for emergency operation in a power down condition using a standard socket wrench.



# Expert User Interface

Expert, the Tritex II 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 II 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 II actuators. Motion setup, homing, teach mode, tuning parameters, jogging, I/O configuration, and local control are all accomplished with ease using Expert software.

## Protocol Options

The standard communication protocol for Tritex is an RS485 connection using Modbus RTU. The Modbus protocol provides a simple and robust method to connect industrial electronic devices on the same network. The Expert software acts as a Modbus Master and the Tritex II acts as the Slave device, only responding to requests commanded from the software. The Expert software allows full access to commissioning, configuring, monitoring and controlling the Tritex II.

In addition to Modbus RTU communications, the following protocol options are available by selecting communication option boards. Exlar requires initial commissioning of a Tritex II actuator to be performed with the Modbus protocol.

### Modbus TCP

Modbus TCP couples Modbus communication structure from Modbus RTU with EtherNet connectivity. The Modbus TCP option is fully supported by the Expert software and offers seamless use for commissioning, configuring, monitoring

and controlling the Tritex II. A Modbus mapping table allows you to map all of the parameters you wish to read and modify into a register bank of up to 100 registers. This will allow a PLC program to perform a single read operation and a single write operation to all the parameters.

To maintain standard connectivity, we offer the EtherNet connection through a sealed M12 connector.

### EtherNet/IP

EtherNet/IP allows you to change, monitor and control the Tritex II through implicit or explicit messaging initiated from your Rockwell PLC. Tritex parameters are set up through the Expert software using a Tritex II parameter to EtherNet/IP parameter mapping table. Up to 100 input and 100 output 16 bit registers can be mapped to Tritex II parameters.

To maintain standard connectivity, we offer the EtherNet/IP connection through a sealed M12 connector.

### PROFINET IO

PROFINET IO allows you to change, monitor and control the Tritex II from your Siemens PLC. Tritex parameters are set up through the Expert software using a Tritex II parameter to PROFINET IO parameter mapping table. Up to 100 input and 100 output 16 bit registers can be mapped to Tritex II parameters. Connection is made through a sealed M12 connector.

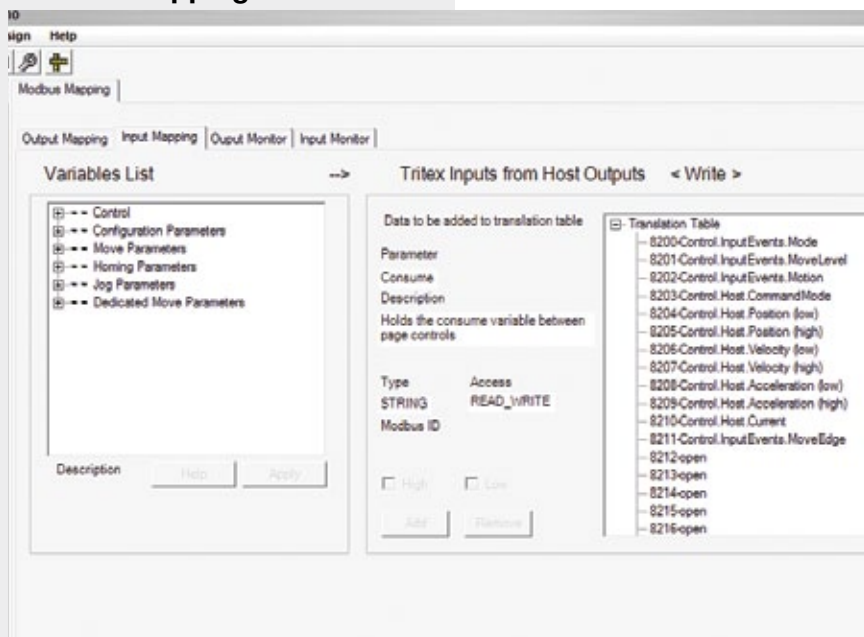
### CANopen (future)

The Tritex II implementation of CANopen follows the DS402 device profile for motion control distributed through CAN in Automation (CiA). CANopen protocol specifies which identifier is used for predefined purposes.

### HART (future)

The HART Protocol is the global standard for sending and receiving digital information across analog wires between smart devices and the control or monitoring system.

## Modbus Mapping Screen



## Motion Setup

Exlar configuration provides several templates for various applications. These can serve as your configuration, or as a starting point for your configuration. You can also begin by selecting configuration details specific to your application. You can configure a move to position, move to switch, or move to force motion at the click of a button. The Tritex II products offer absolute and incremental motion, as well as moves ending on a condition such as a specific force or torque.

## Control Page

The Expert control page gives you the ability to initiate all motion functions from one single, simple screen. This screen provides you with very easy system start-up and testing without all the inconvenience of machine wiring.

The control 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.

## Monitoring and Diagnostics

All input functions can be monitored and activated from the Expert monitor page, and all output functions can be monitored. 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

A pull down menu 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

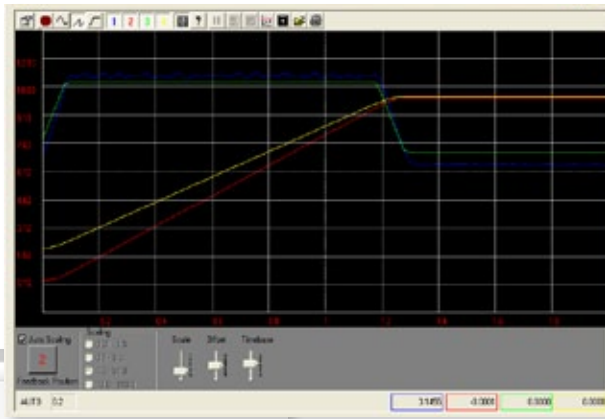
You can home to an input, by using a proximity or limit switch, or home to a specific force or torque.

Homing to a force or torque 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

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.

## Scope



## EtherNet IP Mapping Screen

Current TCP/IP Properties

MAC ID 00 - 00 - 00 - 00 - 00 - 00

IP Address 0 . 0 . 0 . 0

Subnet Mask 0 . 0 . 0 . 0

Default Gateway 0 . 0 . 0 . 0

STATUS

NETWORK

Not Powered - No IP Address

MODULE

No Power

Edit TCP/IP Properties

IP Address 192 . 168 . 0 . 254

Subnet Mask 255 . 255 . 255 . 0

Default Gateway 0 . 0 . 0 . 0

Save Addresses to Drive

Output Mapping | Input Mapping | Output Monitor | Input Monitor

Variables List → Tritex Inputs from Host Outputs

Control

- Input Functions
  - Mode
  - Motion
  - Move Initiates (maintained)
  - Move Initiates (momentary)
  - Move Teach
  - Binary Selects
  - Switch Inputs
- Direct Host Control
- Configuration Parameters
- Move Parameters
- Homing Parameters
- Jog Parameters

Description Help Apply

General mode control input events

Data to be added to translation table

Parameter	Type	Access
Consume	STRING	READ_WRITE
Description		
Holds the consume variable between page controls		
Type		
Modbus ID		

High Low

Add Remove

Translation Table

- 0-(Reserved)
- 1-Control.Input.Events.Mode
- 2-Control.Input.Events.MoveLevel
- 3-Control.Input.Events.Motion
- 4-Control.Host.CommandMode
- 5-Control.Host.Position.Low
- 6-Control.Host.Position.High
- 7-Control.Host.Velocity.Low
- 8-Control.Host.Velocity.High
- 9-Control.Host.Acceleration.Low
- 10-Control.Host.Acceleration.High
- 11-Control.Host.Current
- 12-Control.Input.Events.MoveEdge
- 13-open
- 14-open
- 15-open
- 16-open

## Scope

The Expert Software includes a four channel digital oscilloscope feature.

The user can select up to four Tritex drive parameters to be monitored simultaneously.

For high speed requirements the data can be captured in the drive's memory at an adjustable rate down to 100 micro seconds, then uploaded for plotting. The plots can be saved or printed and the captured data can be saved as a comma separated file for further analysis with Excel.

# Process Control Functionality

Tritex II actuators, available in both rotary and linear versions, provide a perfect solution for your valve actuation needs. Small hysteresis and dead band, quick response to small signal changes and stable dynamic responses delivered by Tritex II actuators are all key parameters for process control.

Fully programmable to follow an analog signal representing either position or force, the Tritex II linear actuator is perfectly designed for sliding stem valve applications with thrust requirements up to 3685 lbs. Highly accurate position feedback allows the Tritex II to achieve combined repeatability and hysteresis as low as 0.25%.

The Tritex II Rotary actuators are ideal for operating quarter-turn, full-turn, or multi-turn valves or shaft driven dampers. In shaft driven applications, the rotary Tritex II actuators are directly coupled shaft-to-shaft. This eliminates the ungainly mechanisms usually necessary to convert the linear motion of pneumatic and hydraulic cylinders to rotational motion. Gear ratios of 4:1 to 100:1 allow the power of Tritex II to be applied to a broad range of applications.

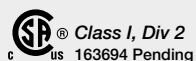
Tritex II actuators can be mounted on any valve from any manufacturer.

## Valve Software

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.

## Class I Division 2 Rating

Exlar's Tritex II actuators will be available for applications requiring CSA Class I Division 2 certification. Ordering a standard I/O interconnect with or without 4-20 mA Analog I/O, and the N option for the NPT port will provide you with Class I Division 2 rated product. Available only on 24 VDC 75 mm frame size. For network options, contact Exlar.



## Benefits for Process Control Applications

### 100% Torque Availability

Full Torque means almost zero deadband, and stiction in the valve stem is no problem. Current is always available so it will hold its position. This provides excellent process loop control.

### Speed of Response

Tritex II response rate is measured in milliseconds. This provides excellent modulating control of both ball valves and butterfly valves.

### High Accuracy

Tritex II actuators have a built-in position feedback sensor, providing much higher accuracy over potentiometer-based actuators.

### Custom Valve Seat

Exlar linear actuators stroke the valve based on position, but can switch to torque mode when seating the valve. This allows a tight cut-off. It also helps with retrofitting valves that may have some wear. For new valves, it makes sure damage isn't done due to over-forcing the stroke.

### High Stiffness

Similar to hydraulic actuators, but without the cost or maintenance issues, Tritex II actuators are extremely stiff. This allows control down to the smallest operating range (<1%) and also eliminates dynamic flow problems such as negative gradients.

### Fast Stroke Speeds

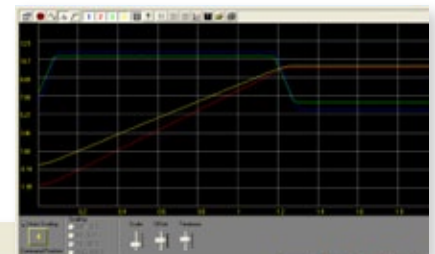
Most other electric actuators are known for being slow - a major disadvantage. Tritex actuators can close a valve in milliseconds if needed.

### Improved Control

Under modulating conditions, Tritex II actuators provide precise closed loop tracking by effectively eliminating non-linearities and deadtime.

### Absolute Feedback

The absolute feedback option gives the actuator memory after teaching the valve limits. Upon power loss, the battery backup will maintain the valve limits.



The software interface includes several configuration sections:

- Close Value:** Parameters when valve is Closed (4.000 mA, 0.000 PSE/VS).
- Open Value:** Parameters when valve is Open (20.000 mA, 0.000 PSE/VS).
- Velocity / Acceleration:** Velocity Limit (100.0 RPM), Acceleration Limit (2000 RPM/S).
- Teach Mode:** Digital Limit Mode, Jog to Closed Position, Seating Current, Jog to Open Position, Teach Closed Position, Teach Open Position.
- Value Stroke:** Note: The Open Value Position must be greater than the Close Value Position.
- Valve Seating:**
  - Close Valve: Travel Cut-off Position (0.00 %), Enable valve seating at Closed position (checkbox).
  - Open Valve: Travel Cut-off Position (100.00 %), Enable valve seating at Open position (checkbox).
  - Seating Limits: Seating Velocity (10.0 RPM), Peak Seating Current (2.0 AMP), Foldback Seating Current (2.0 AMP).
- Inventory Table:**

Part No.	Qty	Part No.	Qty
End Feed/Strap		End Feed/Strap	
Full Base	1	Full Base	1
Peak Limit	1	Peak Limit	1
Control Cover	1	Control Cover	1
Position Encoder	1	Position Encoder	1
Low End Motor	1	Low End Motor	1
High End Motor	1	High End Motor	1
Following Drive	1	Following Drive	1
Base/Temp Sensor	1	Base/Temp Sensor	1
Communication	1	Communication	1
Actuator Temperature	1	Actuator Temperature	1
Actuator Position	1	Actuator Position	1
Low End Motor	1	Low End Motor	1
High End Motor	1	High End Motor	1

# Travel Life and Temperature Ratings

## Travel Life

### TDM/TDX Lifetime Curves

The  $L_{10}$  expected life of a roller screw linear actuator is expressed as the linear travel distance that 90% of properly maintained roller screws manufactured are expected to meet or exceed. For higher than 90% reliability, the result should be multiplied by the following factors: 95% x 0.62; 96% x 0.53; 97% x 0.44; 98% x 0.33; 99% x 0.21. This is not a guarantee and these charts should be used for estimation purposes only.

The underlying formula that defines this value is:

Travel life in millions of inches, where: 
$$L_{10} = \left(\frac{C}{F}\right)^3 \times S =$$

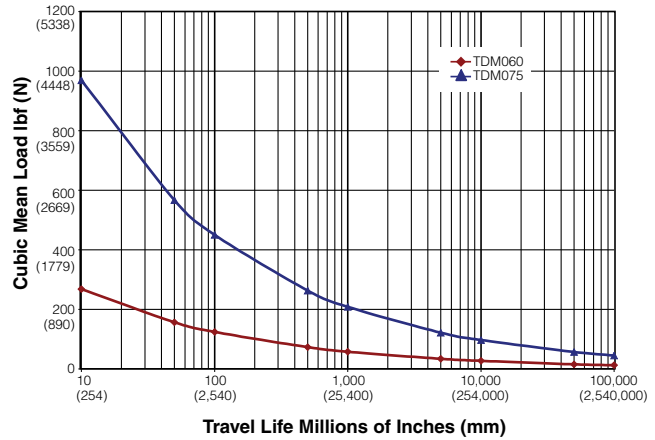
C = Dynamic load rating (lbf)

F = Cubic mean applied load (lbf)

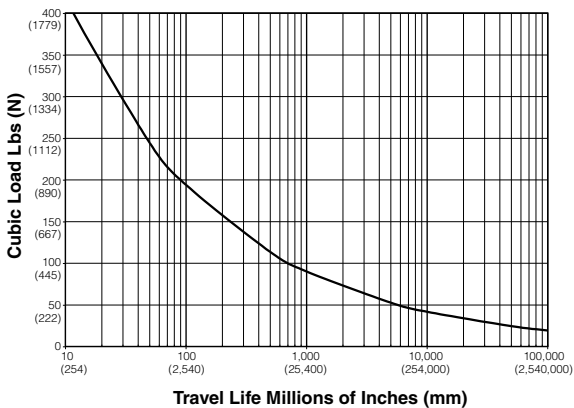
S = Roller screws lead (inches)

*All curves represent properly lubricated and maintained actuators.*

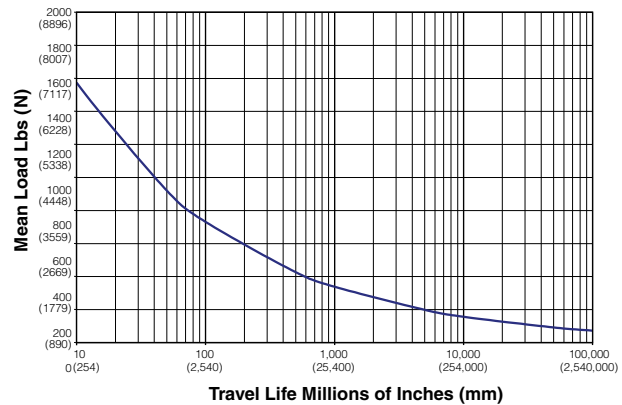
TDM060 and TDM075  
 $L_{10}$  Travel Life



TDX060  
 $L_{10}$  Travel Life



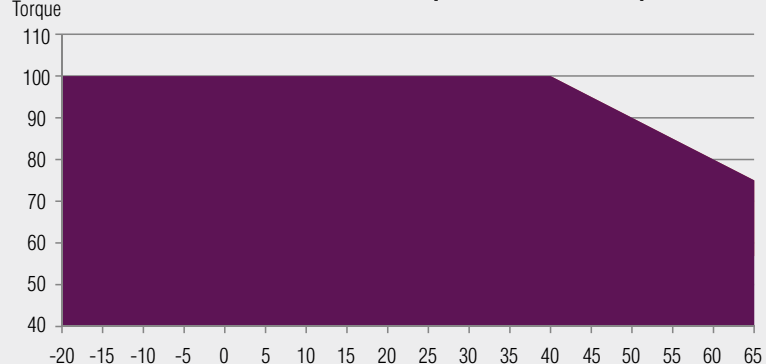
TDX075  
 $L_{10}$  Travel Life



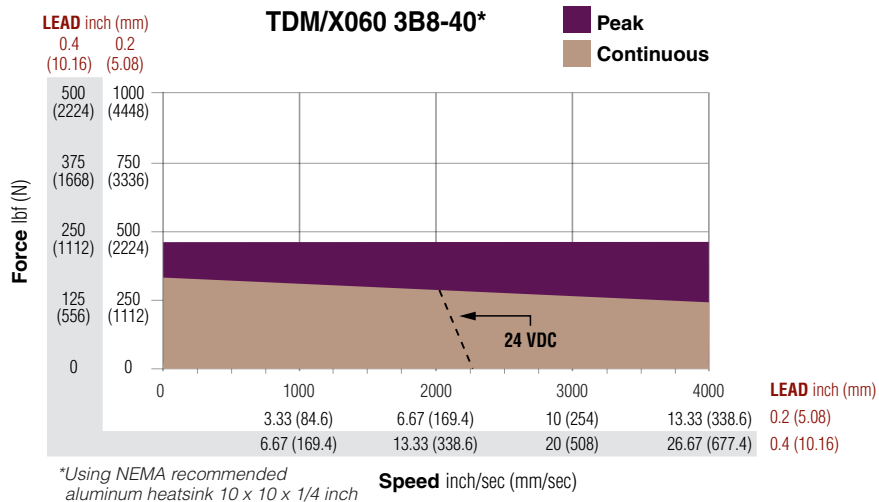
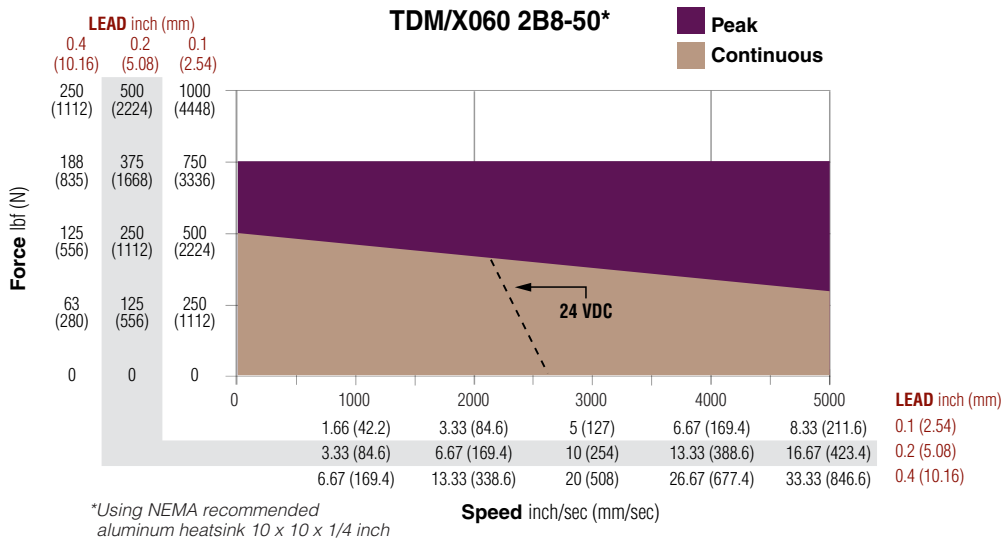
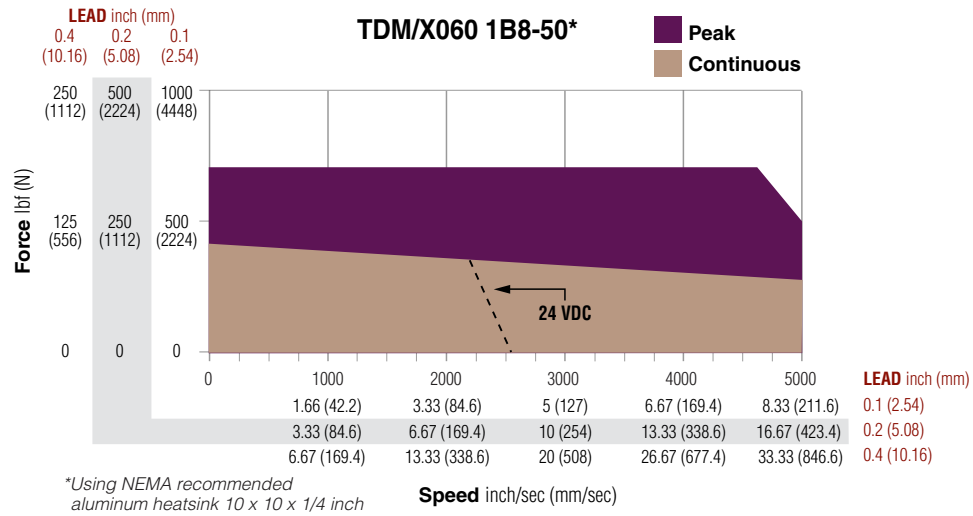
## Extended Temperature De-Rating Curve

The speed/torque curves are based on 40° C ambient conditions. The actuators may be operated at ambient temperatures up to 65° C. Use the curve shown right for continuous torque/force deratings above 40° C.

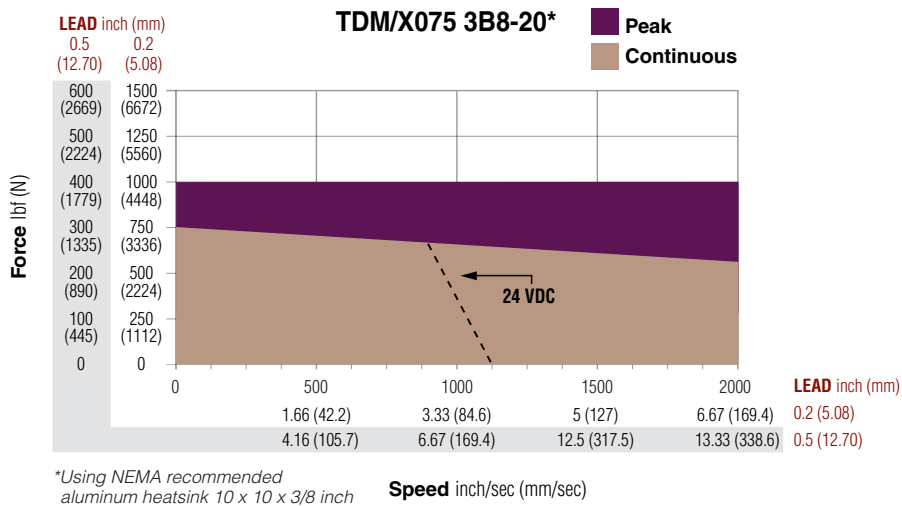
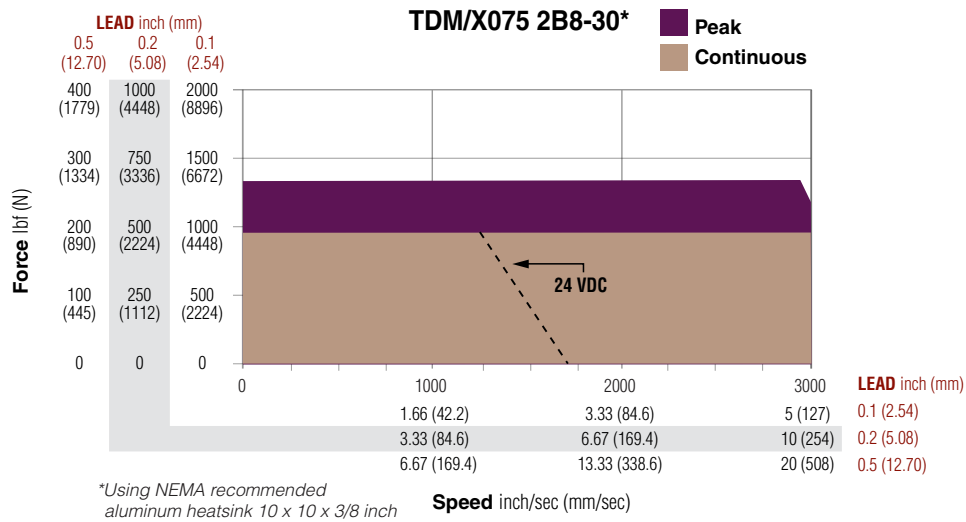
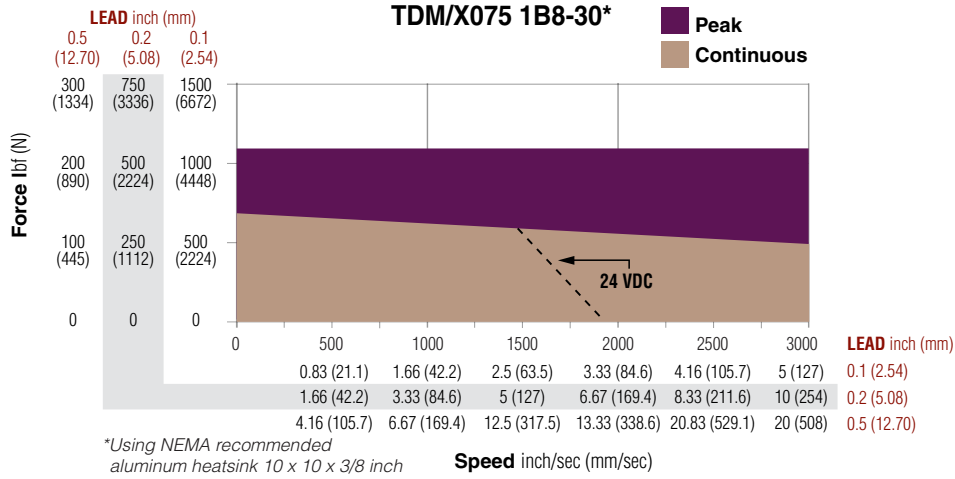
% of Available Continuous Torque vs Ambient Temperature



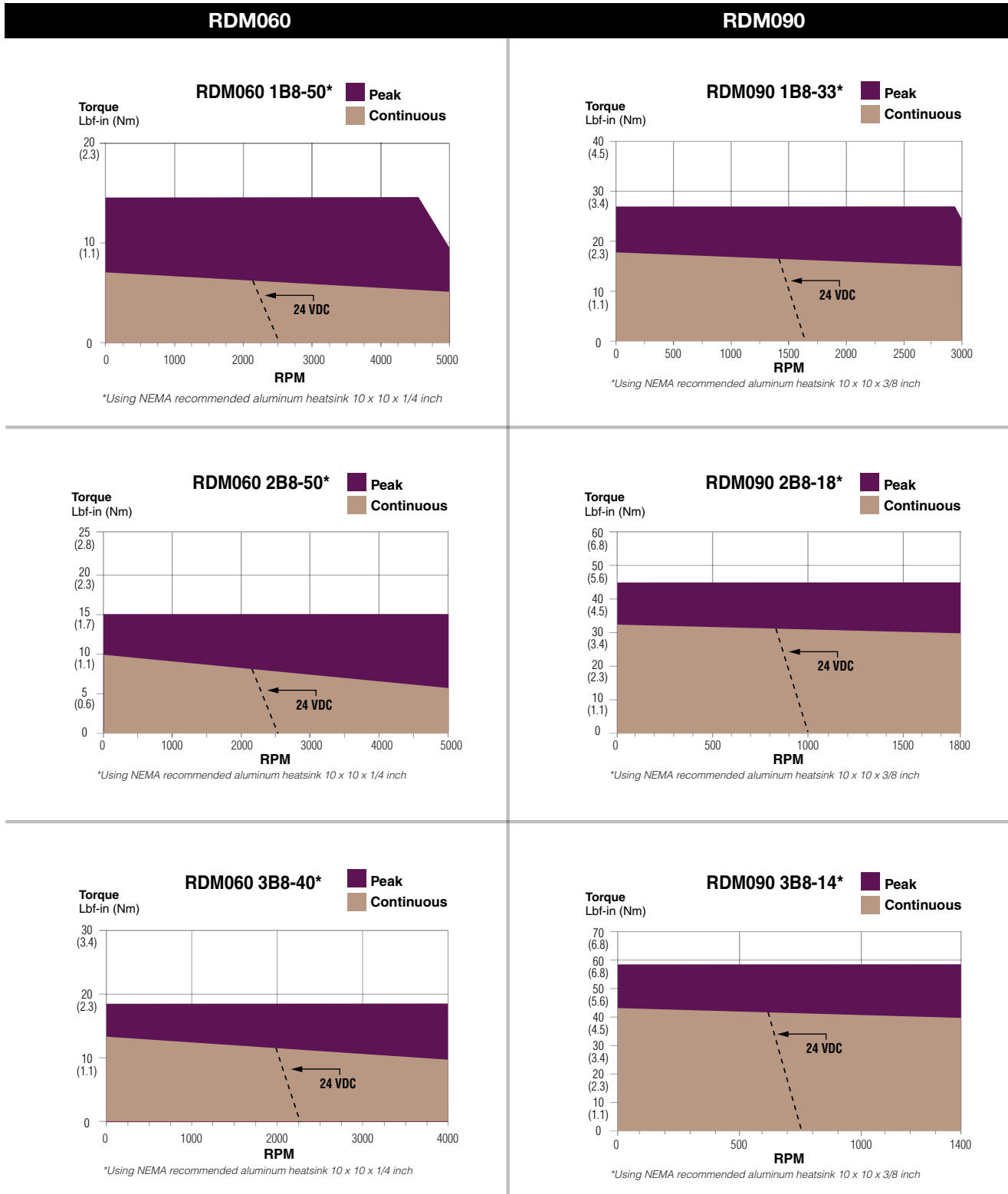
# TDM/X060 Linear Actuator Speed vs. Force Curves



# TDM/X075 Linear Actuator Speed vs. Force Curves



# RDM060/RDM090 Linear Actuator Speed vs. Force Curves



For RDM gearmotors, multiply torque by ratio and efficiency. Divide speed by gear ratio.

# TDM/X Linear Actuator Performance Specifications

TDM/X060 Linear Actuator Performance Specifications					
<b>Backlash</b>		in (mm)	0.004 (0.10)		
<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			
		<b>Stator</b>	<b>1 Stack 1B8-50</b>	<b>2 Stack 2B8-50</b>	<b>3 Stack 3B8-40</b>
<b>Lead</b>		<b>RPM @ 48 VDC</b>	<b>5000</b>	<b>5000</b>	<b>4000</b>
<b>0.1</b>	<b>Continuous Stall Force</b>	lbf (N)	367 (1632)	503 (2237)	N/A
	<b>Peak Stall Force</b>	lbf (N)	734 (3265)	829 (3688)	N/A
	<b>Max Speed @ 48 VDC</b>	in/sec (mm/sec)	8.33 (211.6)	8.33 (211.6)	N/A
<b>0.2</b>	<b>Continuous Stall Force</b>	lbf (N)	183 (814)	251 (1117)	327 (1455)
	<b>Peak Stall Force</b>	lbf (N)	367 (1632)	415 (1846)	465 (2068)
	<b>Max Speed @ 48 VDC</b>	in/sec (mm/sec)	16.67 (423.4)	16.67 (423.4)	13.33 (338.6)
<b>0.4</b>	<b>Continuous Stall Force</b>	lbf (N)	92 (409)	126 (560)	163 (725)
	<b>Peak Stall Force</b>	lbf (N)	183 (814)	207 (921)	232 (1032)
	<b>Max Speed @ 48 VDC</b>	in/sec (mm/sec)	33.33 (846.6)	33.33 (846.6)	26.67 (677.4)
<b>Drive Current @ Continuous Stall Force</b>		Amps	14.75	21.5	21.5
<b>Available Stroke Lengths</b>		in (mm)	3 (75), 6 (150), 10 (254), 12 (300)		
<b>Approximate Weight</b>		lb (kg)	4 lbs – 3 in stroke, 1 stack, add 1 lb per inch of stroke, add 3 lbs per stack, add 3 lbs for brake. (1.8 kg – 75 mm stroke, 1 stack, add 0.5 kg per 25 mm of stroke, add 1.4 kg per stroke, add 1.4 kg for brake.)		
<b>Maximum Continuous Power Supply Current*</b>		Amps	8.5	14.5	15

\*Power supply current is based on software current limit, not thermal limit. Consideration for peak current should also be considered when sizing power supplies.

\*Rating based on 40° C ambient conditions.

TDM/X075 Linear Actuator Performance Specifications					
<b>Backlash</b>		in (mm)	0.004 (0.10)		
<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			
		<b>Stator</b>	<b>1 Stack 1B8-30</b>	<b>2 Stack 2B8-30</b>	<b>3 Stack 3B8-20</b>
<b>Lead</b>		<b>RPM @ 48 VDC</b>	<b>3000</b>	<b>3000</b>	<b>2000</b>
<b>0.1</b>	<b>Continuous Stall Force</b>	lbf (N)	653 (2905)	955 (4248)	N/A
	<b>Peak Stall Force</b>	lbf (N)	1106 (4920)	1307 (5814)	N/A
	<b>Max Speed @ 48 VDC</b>	in/sec (mm/sec)	5.00 (127)	5.00 (127)	N/A
<b>0.2</b>	<b>Continuous Stall Force</b>	lbf (N)	327 (1455)	478 (2126)	754 (3354)
	<b>Peak Stall Force</b>	lbf (N)	553 (2460)	653 (2905)	1030 (4582)
	<b>Max Speed @ 48 VDC</b>	in/sec (mm/sec)	10.00 (254)	10.00 (254)	6.67 (169.4)
<b>0.5</b>	<b>Continuous Stall Force</b>	lbf (N)	131 (583)	191 (850)	302 (1343)
	<b>Peak Stall Force</b>	lbf (N)	221 (83)	261 (1161)	412 (1833)
	<b>Max Speed @ 48 VDC</b>	in/sec (mm/sec)	25.00 (635)	25.00 (635)	16.67 (423.4)
<b>Drive Current @ Continuous Stall Force</b>		Amps	18.5	22.5	22.5
<b>Available Stroke Lengths</b>		in (mm)	3 (75), 6 (150), 10 (254), 12 (300), 14 (355), 18 (450)		
<b>Approximate Weight</b>		lb (kg)	11 lbs – 3 in stroke, add 1 lb per inch of stroke, add 3 lbs per stack, add 3 lbs for brake (5 kg – 75 mm stroke, 1 stack, add 0.5 kg per 25 mm of stroke, add 1.4 kg per stroke, add 1.4 kg for brake.)		
<b>Maximum Continuous Power Supply Current*</b>		Amps	1 Stack 11	2 Stack 18	3 Stack 18

\*Power supply current is based on software current limit, not thermal limit. Consideration for peak current should also be considered when sizing power supplies.

\*Rating based on 40° C ambient conditions.

# RDM/RDG060 Rotary Motor/Gearmotor Performance Specifications

## RDM060 Rotary Motor Torque and Speed Ratings

	Stator	1 Stack 1B8-50	2 Stack 2B8-50	3 Stack 3B8-40
	<b>RPM at 48 VDC</b>	<b>5000</b>	<b>5000</b>	<b>4000</b>
<b>Continuous Stall Torque</b>	lbf-in (Nm)	7.3 (0.82)	10 (1.13)	13 (1.47)
<b>Peak Stall Torque</b>	lbf-in (Nm)	14 (1.58)	15 (1.69)	18 (2.03)
<b>Drive Current @ Continuous Stall Force</b>	Amps	14.75	21.5	21.5
<b>Maximum Continuous Power Supply Current*</b>	Amps	8	11	13

\*Power supply current is based on software current limit, not thermal limit. Consideration for peak current should also be considered when sizing power supplies. For output torque of RDG gearmotors, multiply by ratio and efficiency. Please note maximum allowable output torques found at bottom of page. Ratings based on 40° C ambient conditions.

## RDM/RDG060 Inertia

	Stator	1 Stack	2 Stack	3 Stack
<b>RDM 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>RDG 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 inertia.

## Radial Load and Bearing Life

RPM	50	100	250	500	1000
lbf (N)	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.

## RDG060 Gearmotor Mechanical Ratings

Model	Ratio	Maximum Allowable Output Torque-Set by User lbf-in (Nm)	Output Torque at Motor Speed for 10,000 Hour Life		
			1000 RPM lbf-in (Nm)	1500 RPM lbf-in (Nm)	2000 RPM lbf-in (Nm)
RDG060-004	4:1	603 (68.1)	144 (16.2)	104 (11.7)	88 (9.9)
RDG060-005	5:1	522 (58.9)	170 (19.2)	125 (14.1)	105 (11.9)
RDG060-010	10:1	327 (36.9)	200 (22.6)	140 (15.8)	120 (13.6)
RDG060-016	16:1	603 (68.1)	224 (25.3)	160 (18.1)	136 (15.4)
RDG060-020	20:1	603 (68.1)	240 (27.1)	170 (19.2)	146 (16.5)
RDG060-025	25:1	522 (58.9)	275 (31.1)	200 (22.6)	180 (20.3)
RDG060-040	40:1	603 (68.1)	288 (32.5)	208 (23.5)	180 (20.3)
RDG060-050	50:1	522 (58.9)	340 (38.4)	245 (27.7)	210 (23.7)
RDG060-100	100:1	327 (36.9)	320 (36.1)	280 (31.6)	240 (27.1)

Two torque ratings for the RDG 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 RDG 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.

## RDG060 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	(0.149)	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)

## Backlash and Efficiency

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

## RDM060 Motor and RDG060 Gearmotor Weights

	RDM060 without Gears	RDG060 with 1 Stage Gearing	RDG060 with 2 Stage Gearing	Added Weight for Brake
<b>1 Stack Stator</b> lb (kg)	3.0 (1.4)	7.5 (3.4)	9.3 (4.2)	3 (1.4)
<b>2 Stack Stator</b> lb (kg)	4.1 (1.9)	8.6 (3.9)	10.4 (4.7)	
<b>3 Stack Stator</b> lb (kg)	5.2 (2.4)	9.7 (4.4)	11.5 (5.2)	

# RDM/RDG090 Rotary Motor/Gearmotor Performance Specifications

RDM090 Rotary Motor Torque and Speed Ratings				
	Stator	1 Stack 1B8-33	2 Stack 2B8-18	3 Stack 3B8-14
	RPM at 48 VDC	3300	1800	1400
Continuous Stall Torque	lbf-in (Nm)	18 (2.03)	32 (3.62)	42 (4.75)
Peak Stall Torque	lbf-in (Nm)	26 (2.94)	44 (4.97)	58 (6.55)
Drive Current @ Continuous Stall Force	Amps	22	22	22
Maximum Continuous Power Supply Current*	Amps	18	18	18

\*Power supply current is based on software current limit, not thermal limit. Consideration for peak current should also be considered when sizing power supplies. For output torque of RDG gearmotors, multiply by ratio and efficiency. Please note maximum allowable output torques found at bottom of page. Ratings based on 40° C ambient conditions.

RDM/RDG090 Inertia				
	Stator	1 Stack	2 Stack	3 Stack
RDM Motor Armature Inertia (+/-5%)	lbf-in-sec <sup>2</sup> (kg-cm <sup>2</sup> )	0.00054 (0.609)	0.00097 (1.09)	0.00140 (1.58)
RDG 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 inertia.

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

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

RDG090 Gearmotor Mechanical Ratings					
Model	Ratio	Maximum Allowable Output Torque-Set by User lbf-in (Nm)	Output Torque at Motor Speed for 10,000 Hour Life		
			1000 RPM lbf-in (Nm)	1500 RPM lbf-in (Nm)	2000 RPM lbf-in (Nm)
RDG090-004	4:1	2078 (234.8)	600 (67.8)	552 (62.4)	504 (56.9)
RDG090-005	5:1	1798 (203.1)	775 (87.6)	714 (80.7)	652 (73.7)
RDG090-010	10:1	1126 (127.2)	890 (100.6)	820 (92.7)	750 (84.7)
RDG090-016	16:1	2078 (234.8)	912 (103.4)	830 (94.7)	763 (86.2)
RDG090-020	20:1	2078 (234.8)	980 (110.7)	900 (101.7)	820 (92.6)
RDG090-025	25:1	1798 (203.1)	1250 (141.2)	1150 (130)	1050 (118.6)
RDG090-040	40:1	2078 (234.8)	1200 (135.6)	1107 (125)	1013 (114.4)
RDG090-050	50:1	1798 (203.1)	1550 (169.4)	1434 (162)	1317 (148.8)
RDG090-100	100:1	1126 (127.2)	1100 (124.3)	1100 (124.3)	1100 (124.3)

Two torque ratings for the RDG 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 RDG 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.

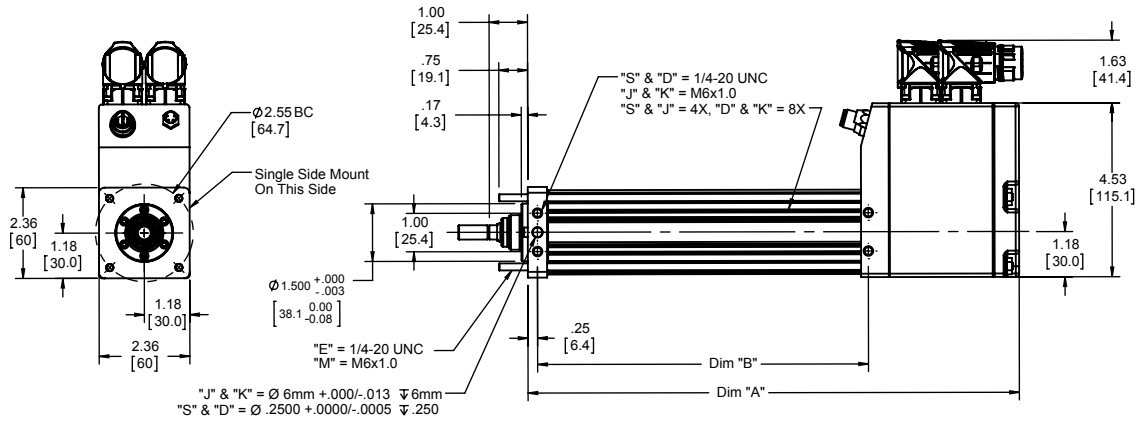
RDG090 Gearing Reflected Inertia					
Gear Stages	Single Reduction		Double Reduction		
	lbf-in-sec <sup>2</sup>	(kg-cm <sup>2</sup> )	Gear Stages	lbf-in-sec <sup>2</sup>	(kg-cm <sup>2</sup> )
4:1	0.0000154	(0.174)	16:1	0.000115	(0.130)
5:1	0.0000100	(0.113)	20:1, 25:1	0.0000756	(0.0854)
10:1	0.0000265	(0.0300)	40:1, 50:1, 100:1	0.0000203	(0.0230)

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

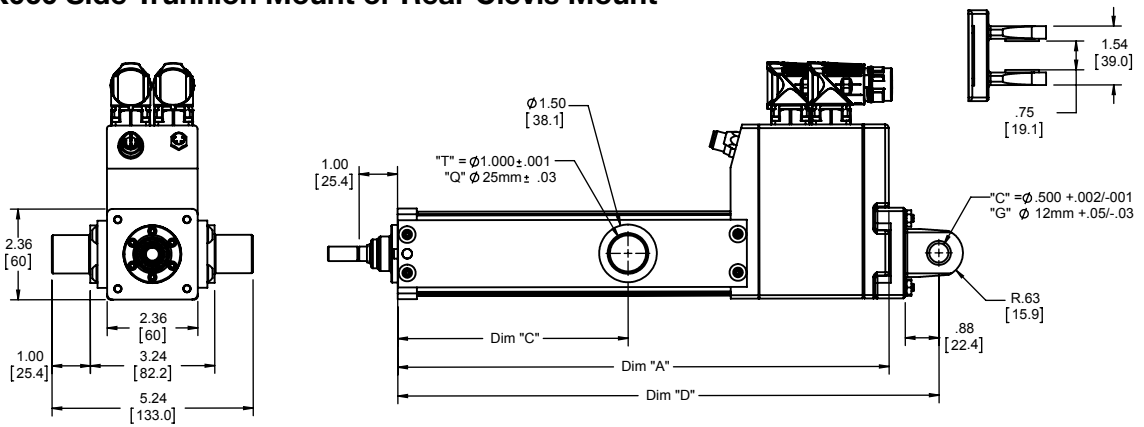
RDM090 Motor and RDG090 Gearmotor Weights				
	RDM090 without Gears	RDG090 with 1 Stage Gearing	RDG090 with 2 Stage Gearing	Added Weight for Brake
1 Stack Stator	lb (kg)	12.5 (5.7)	20.5 (9.3)	23.5 (10.7)
2 Stack Stator	lb (kg)	15.5 (7.0)	23.5 (10.7)	26.5 (12)
3 Stack Stator	lb (kg)	18.5 (8.4)	26.5 (12.0)	29.5 (13.4)

# TDM/X060 Linear Actuator Dimensions

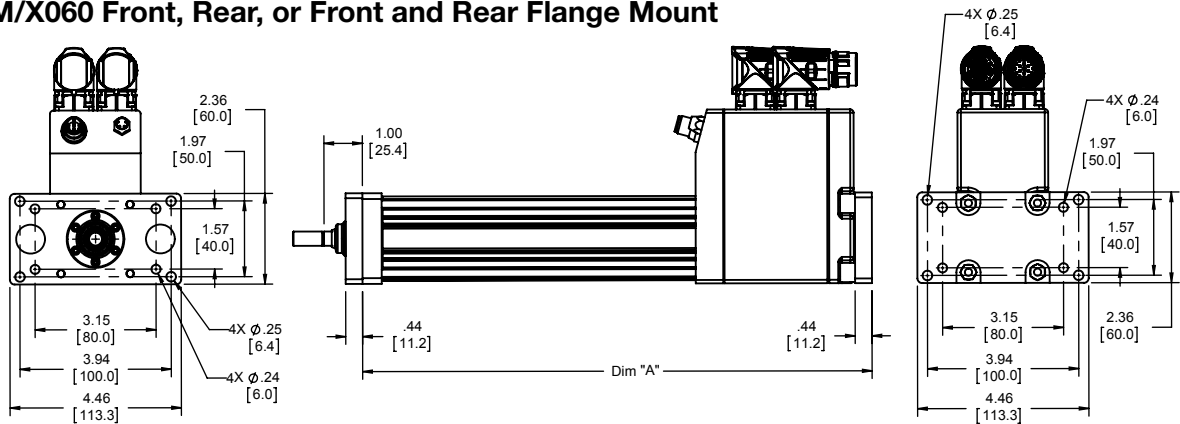
## TDM/X060 Double Side Mount or Extended Tie Rod Mount



## TDM/X060 Side Trunnion Mount or Rear Clevis Mount



## TDM/X060 Front, Rear, or Front and Rear Flange Mount

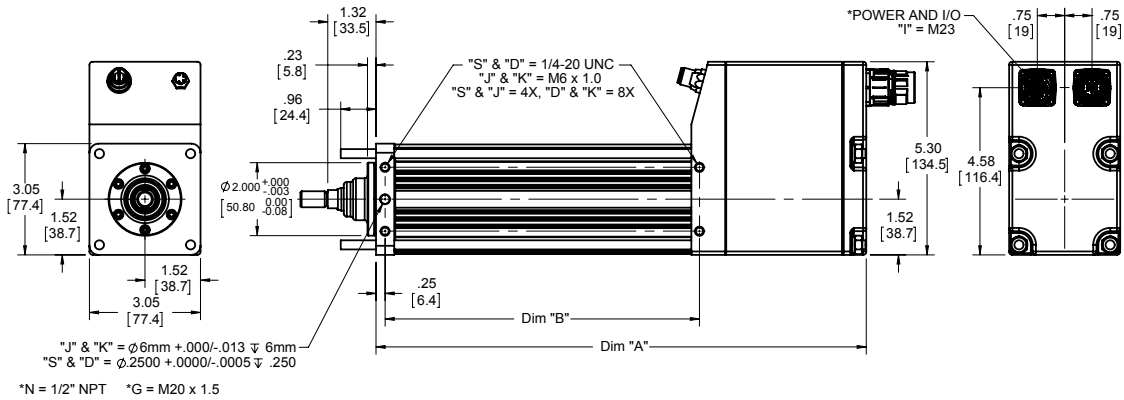


DIM	3 inch (75 mm) stroke in (mm)	6 inch (150 mm) stroke in (mm)	10 inch (250 mm) stroke in (mm)	12 inch (300 mm) stroke in (mm)
A	9.79 (248.7)	12.79 (324.9)	16.79 (426.5)	18.79 (477.3)
B	5.62 (142.8)	8.62 (218.9)	12.62 (320.6)	14.62 (371.4)
C	3.00 (76.2)	6.00 (152.4)	10.00 (254.0)	12.00 (304.8)
D	11.10 (281.9)	14.10 (358.1)	18.10 (459.7)	20.10 (510.5)

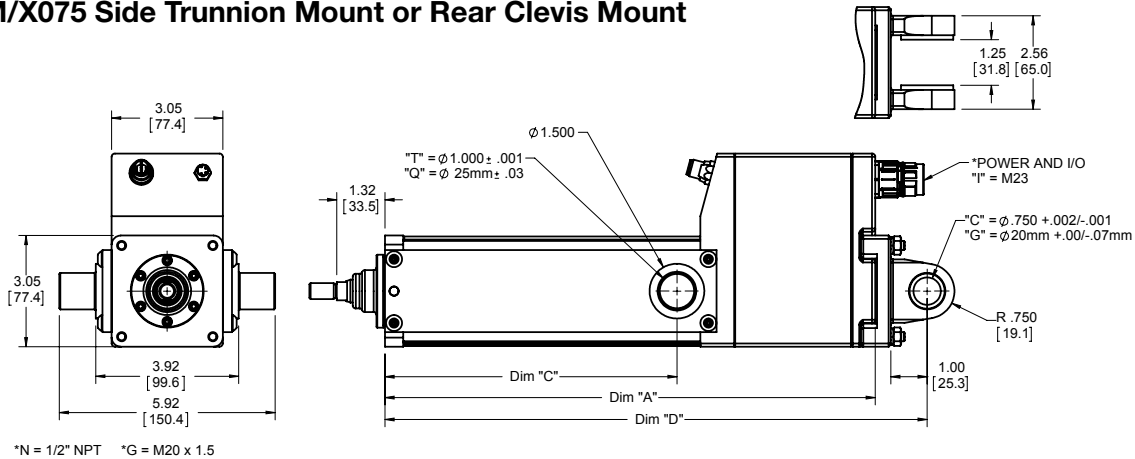
Note: Add 1.748 inches to dimensions "A", "B" and "D" if ordering a brake.

# TDM/X075 Linear Actuator Dimensions

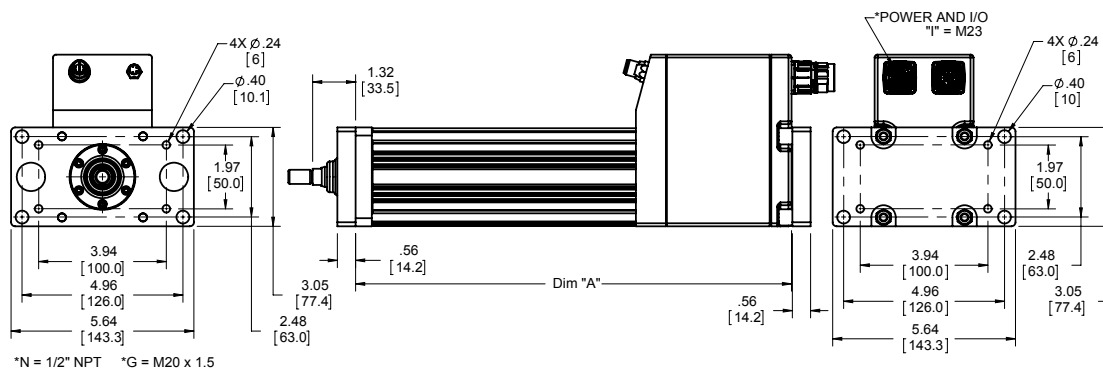
## TDM/X075 Double Side Mount or Extended Tie Rod Mount



## TDM/X075 Side Trunnion Mount or Rear Clevis Mount



## TDM/X075 Front, Rear, or Front and Rear Flange Mount

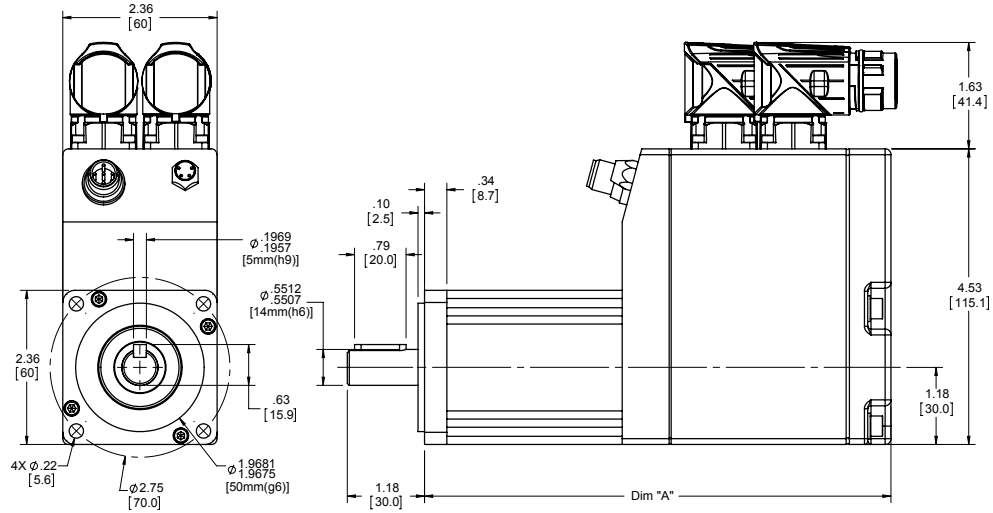


DIM	3 inch (75 mm) stroke in (mm)	6 inch (150 mm) stroke in (mm)	10 inch (250 mm) stroke in (mm)	12 inch (300 mm) stroke in (mm)	14 inch (350 mm) stroke in (mm)	18 inch (450 mm) stroke in (mm)
A	10.45 (265.4)	13.45 (341.6)	17.45 (443.2)	19.45 (494.0)	21.45 (544.8)	25.45 (646.4)
B	5.62 (142.8)	8.62 (218.9)	12.62 (320.6)	14.62 (371.4)	16.62 (422.2)	20.62 (523.8)
C	3.00 (76.2)	8.00 (203.2)	10.00 (254.0)	12.00 (304.8)	14.00 (355.6)	18.00 (457.2)
D	11.87 (301.5)	14.87 (377.7)	18.87 (479.3)	20.87 (530.1)	22.87 (580.9)	26.87 (682.5)

Note: Add 1.61 inches to dimensions "A", "B" and "D" if ordering a brake.

# RDM/RDG060 Rotary Motor/Gearmotor Dimensions

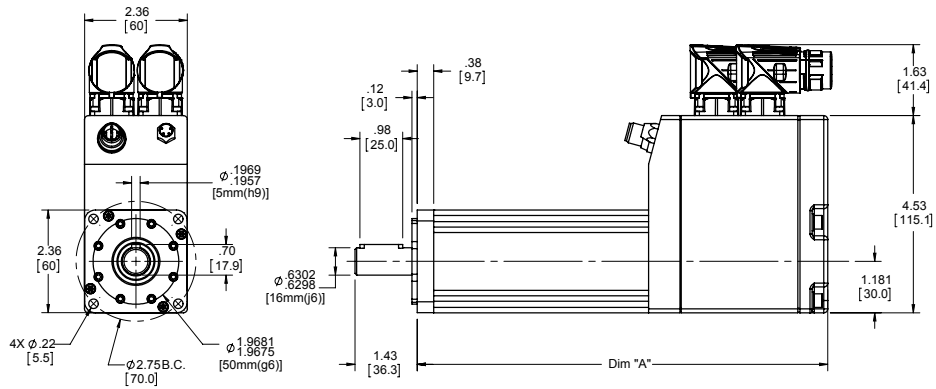
## RDM060 Dimensions



Without Brake Option			
DIM	1 Stack Stator	2 Stack Stator	3 Stack Stator
A	7.146 (185.1)	8.396 (213.3)	9.646 (245.0)

With Brake Option			
DIM	1 Stack Stator	2 Stack Stator	3 Stack Stator
A	7.856 (199.5)	9.106 (231.3)	10.356 (263.0)

## RDG060 Dimensions

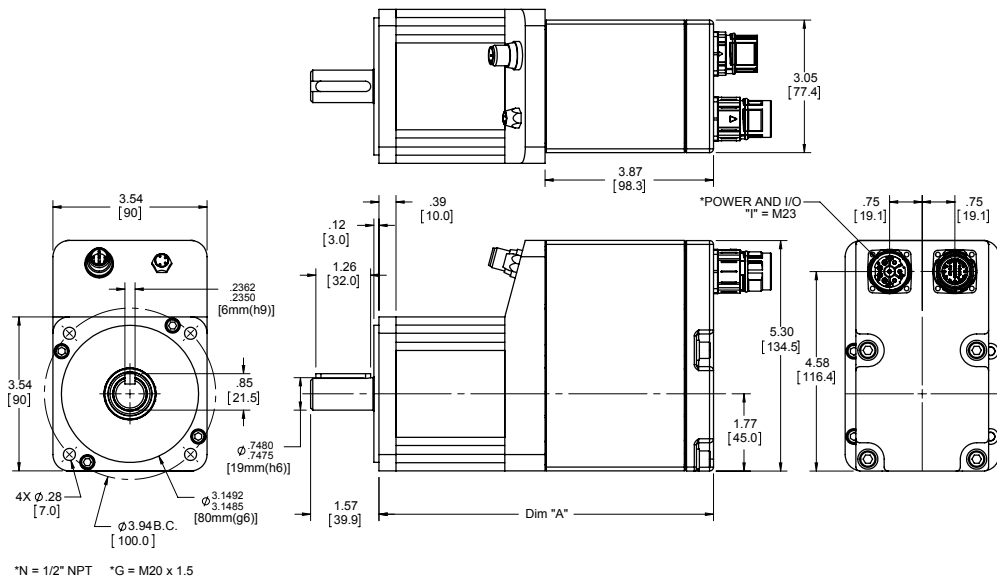


Without Brake Option			
DIM	1 Stack Stator 1 Stage Gearhead	2 Stack Stator 1 Stage Gearhead	3 Stack Stator 1 Stage Gearhead
A	9.434 (240)	10.684 (271)	11.934 (303)
DIM	1 Stack Stator 2 Stage Gearhead	2 Stack Stator 2 Stage Gearhead	3 Stack Stator 2 Stage Gearhead
A	10.479 (266)	11.729 (298)	12.979 (330)

With Brake Option			
DIM	1 Stack Stator 1 Stage Gearhead	2 Stack Stator 1 Stage Gearhead	3 Stack Stator 1 Stage Gearhead
A	10.144 (258)	11.394 (289)	12.644 (321)
DIM	1 Stack Stator 2 Stage Gearhead	2 Stack Stator 2 Stage Gearhead	3 Stack Stator 2 Stage Gearhead
A	11.189 (284)	12.439 (316)	13.689 (348)

# RDM/RDG090 Rotary Motor/Gearmotor Dimensions

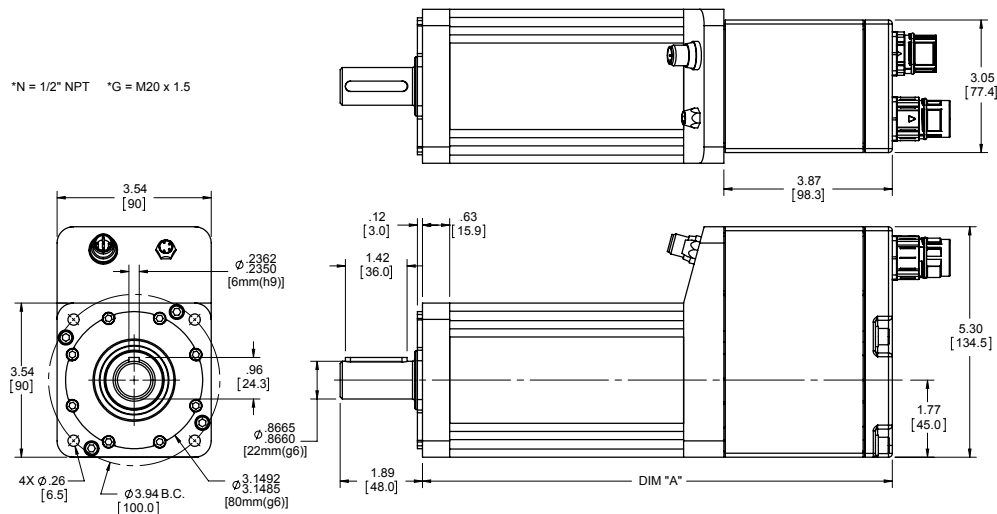
## RDM090 Dimensions



Without Brake Option			
DIM	1 Stack Stator	2 Stack Stator	3 Stack Stator
A	7.69 (195.3)	8.69 (220.7)	9.69 (246.1)

With Brake Option			
DIM	1 Stack Stator	2 Stack Stator	3 Stack Stator
A	9.0 (228.6)	10.00 (254.0)	11.00 (279.4)

## RDG090 Dimensions

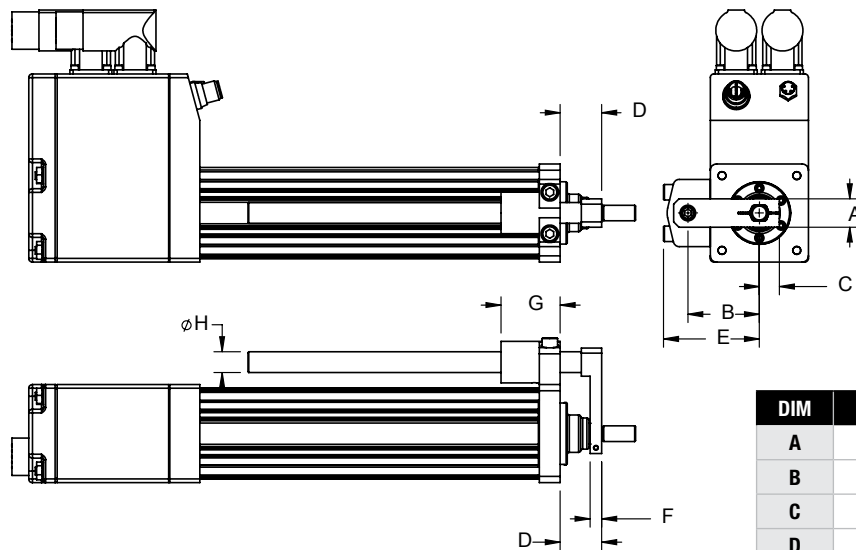


Without Brake Option			
DIM	1 Stack Stator 1 Stage Gearhead	2 Stack Stator 1 Stage Gearhead	3 Stack Stator 1 Stage Gearhead
A	10.80 (274.3)	11.80 (299.7)	12.80 (325.1)
DIM	1 Stack Stator 2 Stage Gearhead	2 Stack Stator 2 Stage Gearhead	3 Stack Stator 2 Stage Gearhead
A	12.06 (306.3)	13.06 (331.7)	14.06 (357.1)

With Brake Option			
DIM	1 Stack Stator 1 Stage Gearhead	2 Stack Stator 1 Stage Gearhead	3 Stack Stator 1 Stage Gearhead
A	12.13 (308.1)	13.11 (333.0)	14.11 (358.4)
DIM	1 Stack Stator 2 Stage Gearhead	2 Stack Stator 2 Stage Gearhead	3 Stack Stator 2 Stage Gearhead
A	13.37 (339.6)	14.37 (365.0)	15.37 (390.4)

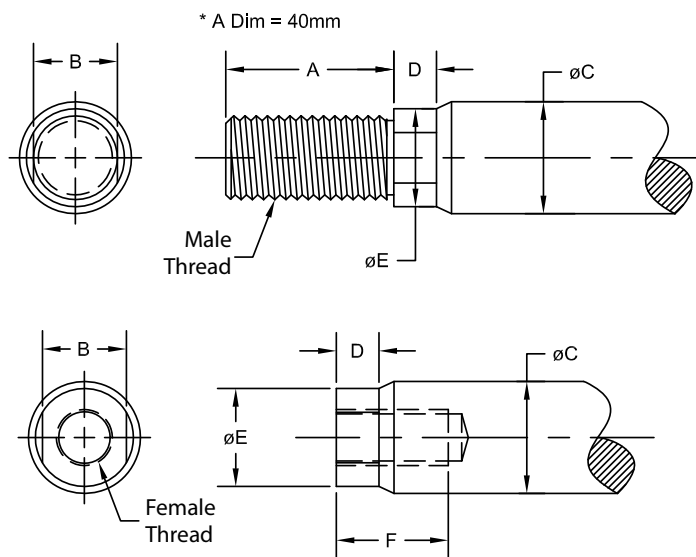
# Options Dimensions

## Anti-Rotate Option



DIM	TDM/X060	TDM/X075
A	0.68 (17.3)	0.82 (20.9)
B	1.72 (43.7)	2.21 (56.1)
C	0.48 (12.2)	0.60 (15.2)
D	1.00 (25.4)	1.32 (33.5)
E	2.31 (58.7)	2.71 (68.8)
F	0.28 (7.1)	0.39 (9.9)
G	1.43 (36.3)	1.70 (43.2)
ØH	0.50 (12.7)	0.63 (15.9)

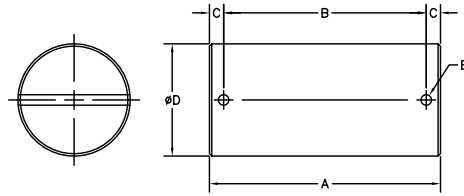
## Actuator Rod End Option



DIM	TDM/X060	TDM/X075
A	0.813 (20.7)	0.750 (19.1)
B	0.375 (9.5)	0.500 (12.7)
ØC	0.500 (12.7)	0.625 (15.9)
D	0.200 (5.1)	0.281 (7.1)
ØE	0.440 (11.2)	0.562 (14.3)
F	0.750 (19.1)	0.750 (19.1)
Male-Inch	3/8-24 UNF-2A	7/16-20 UNF-2A
Male-Metric	M8 x 1.75-6g	M12 x 1.75-6g
Female-Inch	5/16-24 UNF-2B	7/16-20 UNF-2B
Female-Metric	M8 x 1-6h	M10 x 1.5-6h

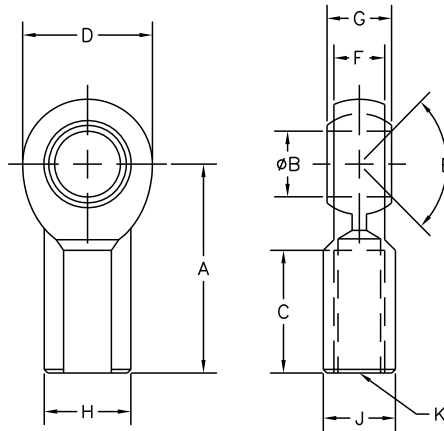
# Rod End Attachment Dimensions

## Clevis Pin



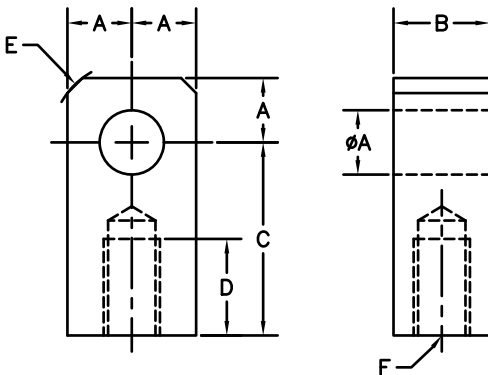
DIM	TDM/X060	TDM/X075
	CP050 in (mm) Rear Clevis, RE050 & RC050	CP075 in (mm) Rear Clevis
A	2.28 (57.9)	3.09 (78.5)
B	1.94 (49.28)	2.72 (69.1)
C	0.17 (4.32)	1.19 (4.82)
$\varnothing D$	0.50 (12.7)	0.75 (19.1)
$\varnothing E$	0.095 (2.41)	0.14 (3.56)

## Spherical Rod Eye



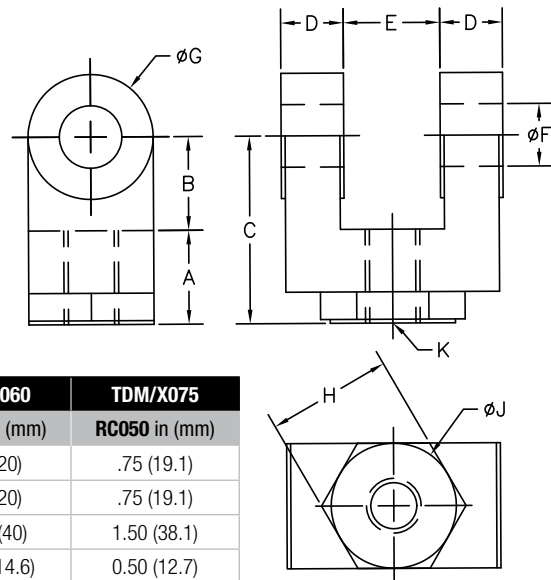
DIM	TDM/X060	TDM/X075
	SRM038 in (mm)	SRM044 in (mm)
A	1.625 (41.3)	1.81 (46.0)
$\varnothing B$	.375 (9.525)	0.438 (11.13)
C	.906 (23.0)	1.06 (26.9)
D	1.0 (25.6)	1.13 (28.7)
E	12 Deg	14 Deg
F	.406 (10.3)	0.44 (11.1)
G	.500 (12.7)	0.56 (14.2)
H	.688 (17.7)	0.75 (19.1)
J	.562 (14.3)	0.63 (16.0)
K	3/8-24	7/16-20

## Rod Eye



DIM	TDM/X060	TDM/X075
	RE038 in (mm)	RE050 in (mm)
$\varnothing A$	0.50 (12.7)	0.50 (12.7)
B	0.560 (14.2)	0.75 (19.1)
C	1.000 (25.4)	1.50 (38.1)
D	0.500 (12.7)	0.75 (19.1)
E	0.25 x 45° (6.35)	0.63 (15.9)
F	3/8-24	7/16-20

## Rod Clevis



DIM	TDM/X060	TDM/X075
	RC038 in (mm)	RC050 in (mm)
A	.787 (20)	.75 (19.1)
B	.787 (20)	.75 (19.1)
C	1.574 (40)	1.50 (38.1)
D	0.575 (14.6)	0.50 (12.7)
E	0.375 (9.5)	0.765 (19.43)
$\varnothing F$	0.375 (9.5)	0.50 (12.7)
$\varnothing G$	0.75 (19.1)	1.00 (25.4)
H	N/A	1.00 (25.4)
$\varnothing J$	N/A	1.00 (25.4)
K	3/8-24	7/16-20

# Linear Actuator Ordering Guide

## Tritex II DC TDM/X Linear Actuator Ordering Information

### TDM/X = Actuator Type

TDM = Tritex II Linear Actuator, standard mechanical capacity  
 TDX = Tritex II Linear Actuator, high mechanical capacity

### BBB = Actuator Frame Size

060 = 60 mm  
 075 = 75 mm

### CC = Stroke Length

03 = 3 inch (75 mm)  
 06 = 6 inch (150 mm)  
 10 = 10 inch (250 mm)  
 12 = 12 inch (305 mm)  
 14 = 14 inch (355 mm) (75 mm only)  
 18 = 18 inch (455 mm) (75 mm only)

### DD = Lead (linear travel per screw revolution)

01 = 0.1 inch (2.54 mm)<sup>4</sup>  
 02 = 0.2 inch (5.08 mm)  
 04 = 0.4 inch (10.16 mm) (60 mm only)  
 05 = 0.5 inch (12.7 mm) (75 mm only)

### E = Connections

G = Std Straight Threaded Port w/internal terminals, M20x1.5 (75 mm only)  
 N = NPT Threaded Port via Adapter with Internal Terminals, 1/2" NPT (75 mm only)  
 I = Intercontec Style - Exlar std, M23 Style Connector  
 X = Custom Connectivity

### F = Mounting

B = Front & Rear Flange  
 C = Rear Clevis

G = Metric Rear Clevis  
 D = Double Side Mount  
 K = Metric Double Side Mount  
 E = Extended Tie Rod  
 M = Metric Extended Tie Rod  
 F = Front Flange  
 R = Rear Flange  
 S = Side Mount  
 J = Metric Side Mount  
 T = Side Trunnion  
 Q = Metric Side Trunnion  
 X = Special

### G = Rod End

M = Male US Standard Thread<sup>1</sup>  
 A = Male Metric Thread<sup>1</sup>  
 F = Female US Standard Thread<sup>1</sup>  
 B = Female Metric Thread<sup>1</sup>  
 W = Male, US Standard Thread 17-4 SS  
 R = Male Metric Thread 17-4 SS  
 V = Female US Standard Thread 17-4 SS  
 L = Female Metric Thread 17-4 SS  
 X = Special (please specify)

### HH = Feedback Type

HD = Analog Hall Device  
 IE = Incremental Encoder, 8192 count resolution  
 AF = Absolute Feedback

### III-II = Motor Stator, All 8 Pole

**TDM/X060 Stator Specifications**  
 1B8-50 = 1 Stack, 48 VDC, 5000 rpm  
 2B8-50 = 2 Stack, 48 VDC, 5000 rpm  
 3B8-40 = 3 Stack, 48 VDC, 4000 rpm<sup>4</sup>

## AAABBB-CCDD-EFG-HH-III-II-JJJ-KKK- (XX..XX - #####)

### TDM/X075 Stator Specifications

1B8-30 = 1 Stack, 48 VDC, 3000 rpm  
 2B8-30 = 2 Stack, 48VDC, 3000 rpm  
 3B8-20 = 3 Stack, 48 VDC, 2000 rpm<sup>4</sup>

### JJJ = Voltage

048 = 12-48 VDC

### KKK = Option Board

SIO = Standard I/O Interconnect  
 IA4 = SIO plus 4 - 20 mA Analog I/O  
 EIP = SIO plus EtherNet/IP  
 TCP = SIO plus Modbus TCP

### X..XX = Travel and Housing Options (Multiples Possible)

#### Travel Options

AR = External Anti-rotate  
 PF = Preloaded Follower<sup>2</sup>  
 L1/2/3 = External Limit Switches<sup>6</sup>  
 RB = Rear Brake  
 SD = Side Manual Drive (75 mm)  
 HW = Manual Drive Hand Wheel with Interlock Switch (TDX075 only)  
 PB = Protective Bellows<sup>8</sup>  
 SR = Splined Main Rod<sup>7</sup>  
 ET = External Linear Transducer  
 XT = Special Travel Options, high temp. bellows<sup>8</sup>

#### Housing Options

P5 = IP65 Sealed Housing (TDM only)  
 HC = Type III Hard Coat Anodized<sup>3</sup>  
 FG = White Epoxy Coating<sup>3</sup>  
 XH = Special Housing Option

### Special Motor Options

XL = Special Lubrication<sup>5</sup>  
 XM = Special Motor Option  
 XH = Special Housing Option

### ##### = Part Number Designator for Specials

Optional 5 digit assigned PN to designate unique model numbers

#### NOTES:

1. Chrome-plated carbon steel. Threads not chrome-plated.
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-pre loaded screw.
3. This housing option may indicate the need for special material main rods or mounting.
4. Not available on 0.1" lead. Not available on 3" stroke.
5. To achieve -40 operating temperature, specify -XL in the actuator model mask and define Mobilgrease 28 in order notes. Other special lubricants are also available.
6. Limit switch option requires AR option.
7. This option is not sealed and is not suitable for any environment in which contaminants come in contact with actuator and may enter the actuator.
8. Not available with extended tie rod mounting option.

# Rotary Motor and Gearmotor Ordering Guide

## Tritex II DC RDM Motor or RDG Gearmotor Ordering Information

### RDM/G = Motor Type

RDM = Tritex II DC Rotary Motor  
 RDG = Tritex II DC Rotary Gearmotor

### AAA = Frame Size

060 = 60 mm  
 090 = 90 mm

### BBB = Gear Ratio (available with 060 only)

Blank = R2M

### Single Reduction Ratios

004 = 4:1  
 005 = 5:1  
 010 = 10:1

### Double Reduction Ratios

016 = 16:1    020 = 20:1  
 025 = 25:1    040 = 40:1  
 050 = 50:1    100 = 100:1

### C = Shaft Type

K = Keyed

R = Smooth/Round  
 X = Special Shaft

### D = Connections

G = Std straight threaded port w/internal terminals, M20x1.5 (90 mm only)  
 N = NPT threaded port via adapter w/internal terminals, 1/2" NPT (90 mm only)  
 I = Intercontec style - Exlar std, M23 Style Connector  
 X = Custom Connectivity

### E = Housing Options

G = Exlar Standard  
 H = Type III Hard Coat Anodized  
 F = White Epoxy Coating  
 E = Electroless Nickel Plating  
 X = Special or Custom

### F = Brake Option

S = No Brake, Standard  
 B = Electric Brake, 24 VDC

### GG = Feedback Type

HD = Analog Hall Device  
 IE = Incremental Encoder, 8192 Count Resolution  
 AF = Absolute Feedback

### HHH-HH = Motor Stators - All 8 Pole

**RDM/G060 Stator Specifications**  
 1B8-50 = 1 Stack, 48 VDC, 5000 rpm  
 2B8-50 = 2 Stack, 48 VDC, 5000 rpm  
 3B8-40 = 3 Stack, 48 VDC, 4000 rpm

### RDM/G090 Stator Specifications

1B8-33 = 1 Stack, 48 VDC, 3300 rpm  
 2B8-18 = 2 Stack, 48 VDC, 1800 rpm  
 3B8-14 = 3 Stack, 48 VDC, 1400 rpm

### III = Voltage

048 = 12-48 VDC

### JJJ = Option Board

SIO = Standard I/O Interconnect  
 IA4 = SIO plus Isolated 4-20 mA Analog I/O

## AAA-BBB-CDEF-GG-HHH-HH-III-JJJ (XX...XX) - #####

EIP = SIO plus EtherNet/IP  
 TCP = SIO plus Modbus TCP

### XX = Special Travel and Housing Options (multiples possible)

HW = Manual Drive Handwheel with Interlock Switch (90 mm only)  
 SD = Side Manual Drive (90 mm only)  
 XH = Special Housing Options  
 XM = Special Motor Options  
 XL = Special Lubrication<sup>1</sup>

### ##### = Part Number Designator for Specials

Optional 5 digit assigned PN to designate unique model no.

#### NOTES:

1. To achieve -40 operating temperature, specify -XL in the actuator model mask and define Mobilgrease 28 in order notes. Other special lubricants are also available.

# Cables/Accessories Ordering Guide

<b>Tritex II DC Series Cable &amp; Accessories</b>	<b>Part No.</b>
<b>“G” Connection Accessories</b>	
Nickel plated cable gland- M20 x 1.5 - CE shielding- 2 required	GLD-T2M20 x 1.5
Power cable prepared on one end for use with GLD-T2M20 x 1.5 xxx = Length in ft, Standard lengths 015, 025, 050, 075, 100	CBL-TTIPC-RAW-xxx
I/O cable prepared on one end for use with GLD-T2M20 x 1.5 xxx = Length in ft, Standard lengths 015, 025, 050, 075, 100	CBL-T2IOC-RAW-xxx
<b>“N” Connection Accessories</b>	
M20 x 1.5 to 1/2" NPT threaded hole adapter for use with conduit	ADAPT-M20-NPT1/2
<b>“I” Connection</b>	
Power cable with M23 8 pin xxx = Length in feet, std lengths 015, 025, 050, 075, 100	CBL-TTIPC-SMI-xxx
I/O cable with M23 19 pin xxx = Length in feet, std lengths 015, 025, 050, 075, 100	CBL-TTIOC-SMI-xxx
<b>Communications Accessories - Tritex uses a 4 pin M8 RS485 communications connector</b>	
Recommended PC to Tritex communications cable-USB/RS485 to M8 connector - xxx = Length in feet, 006 or 015 only	CBL-T2USB485-M8-xxx
<b>Multi-Drop RS485 Accessories</b>	
RS485 splitter - M8 Pin plug to double M8 Socket receptacle	TT485SP
Multidrop Communications Cable M8 to M8 for use with TT485SP/RS485 splitter - xxx = Length in feet, 006 or 015 only	CBL-TTDAS-xxx
<b>Multi-Purpose Communications Accessories for long runs, requires terminal block interconnections</b>	
USB to RS485 convertor/cable - USB to RS485 flying leads - xxx = Length in feet, 006 or 015 only	CBL-T2USB485-xxx
Communications cable M8 to flying leads cable xxx = Length in feet, standard lengths 015, 025, 050, 075, 100	CBL-TTCOM-xxx
<b>Option Board Cables</b>	
EIP and TCP option Ethernet cable - M12 to RJ45 cable xxx = Length in feet, standard lengths 015, 025, 050, 075, 100	CBL-T2ETH-R45-xxx
<b>Electrical Accessories</b>	
48VDC, 10Amp Unregulated Power Supply	TTPS1048
48VDC, 15Amp Unregulated Power Supply	TTPS1548
Shunt resistor used for Dynamic Braking	TTSR1
Replacement -AF Battery - 75 mm frame only used for absolute feedback option	TTBAT1
External -AF Battery DIN rail mounted - Required for absolute feedback option on 60mm frame size	TTBAT2
Surge Filter DIN rail mounted	TDCESF1
Replacement Normally Closed External Limit Switch (Turck Part No. BIM-UNT-RP6X)	43404
Replacement Normally Open External Limit Switch (Turck Part No. BIM-UNT-AP6X)	43403
<b>Mechanical Accessories</b>	
Clevis Pin for TDM/X060 Rod Clevis & Rear Clevis	CP050
Clevis Pin for TDM/X075 Rear Clevis	CP075
Spherical Rod Eye for TDM/X060 male “M” rod end 3/8-24 thread	SRM038
Spherical Rod Eye for TDM/X075 male “M” rod end 7/16-20 thread	SRM044
Rod Eye for TDM/X075 male “M” rod end 7/16-20 thread	RE050
Rod Clevis for TDM/X060 male “M” rod end 3/8-24 thread	RC038
Rod Clevis for TDM/X075 male “M” rod end 7/16-20 thread	RC050
Jam Nut for TDM/X060 male rod end, 3/8-24	JAM3/8-24-SS
Jam Nut for TDM/X075 male rod end, 7/16-20	JAM7/16-20-SS

\*Also available for TDM/X075 with RC050, RE050

## Options/Accessories



### **CBL-T2USB485-M8-xxx**

Our recommended communications cable.



### **CBL-T2USB485-xxx**

Use for terminal connections with CBL-TTCOM for long cable runs.



### **CBL-TTCOM-xxx**

Use with CBL-T2USB485-xxx for long cable runs.



### **CBL-TTDAS-xxx**

For use with TT485SP for multi-drop applications.



### **TT485SP**

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

### **TDCESF1**

Surge filter designed for use on Tritex 48VDC rotary and linear actuators provides EFT/B and surge disturbance immunity to IEC/EN 61800-3:2004-08 Second Environment (industrial) levels. Electrical Fast Transient/Burst (EFT/B) and surge disturbances are caused by a number of events including switching inductive loads, relay contact bounce, power system switching activity or faults, nearby lightning strikes, etc.



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