TTX Series

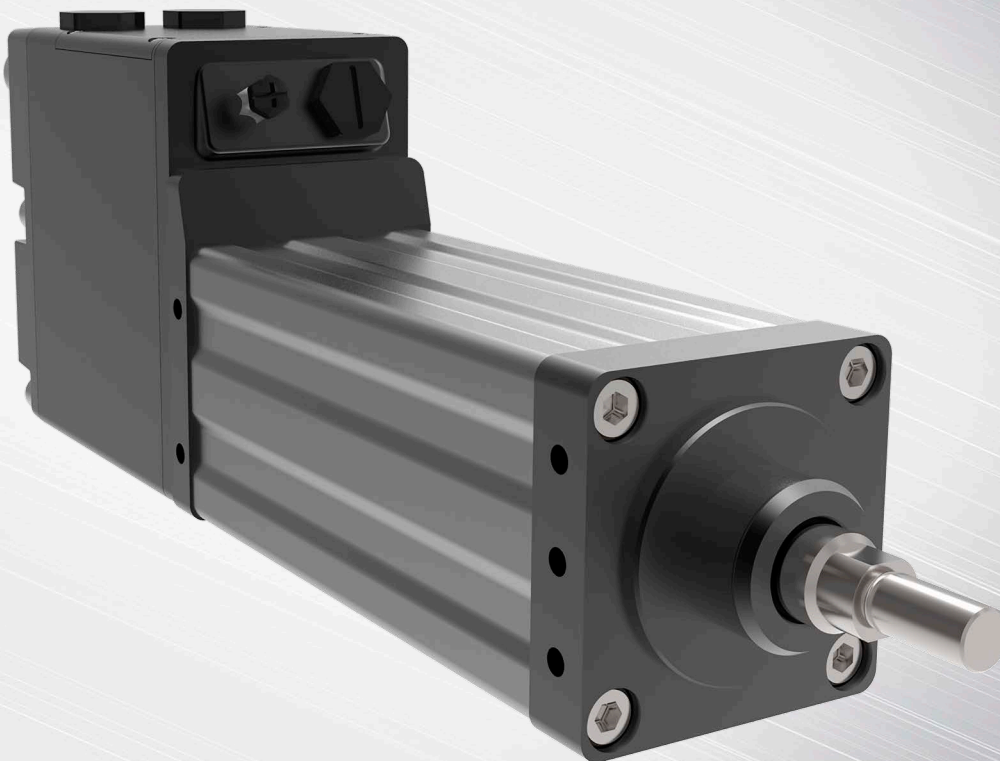## FULLY INTEGRATED SERVO DRIVE / MOTOR / ACTUATOR

Ideal for stand-alone applications

Multiple networking options

AC or DC powered models

EXLAR®

TTX Series

Fully Integrated Drive/Motor/Actuator

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. TTX Series actuators now integrate an AC or DC powered servo drive, digital position controller, brushless motor and linear actuator in one elegant, compact, sealed package. Now you can distribute motion control and resolve your application challenges with one integrated device. Simply connect power, I/O, communications and go!

Reduce Panel Space

TTX Series 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; and the space previously consumed by panel mount servo drives and motion controllers is no longer needed. TTX Series actuators may also reduce the size of your machine design while significantly improving reliability.

Reduce Costs

Now you can eliminate the labor costs for mounting and wiring panels because the TTX Series houses the servo drive, digital positioner, and actuator in one convenient package. 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 AC or DC power cord, and standard communication cable for digital and analog I/O.

These actuators also eliminate the issues associated with power signals and feedback signals traveling long distances from servo drive to servo motor. With the TTX Series, the servo drive and motor are always integrated in the same housing.
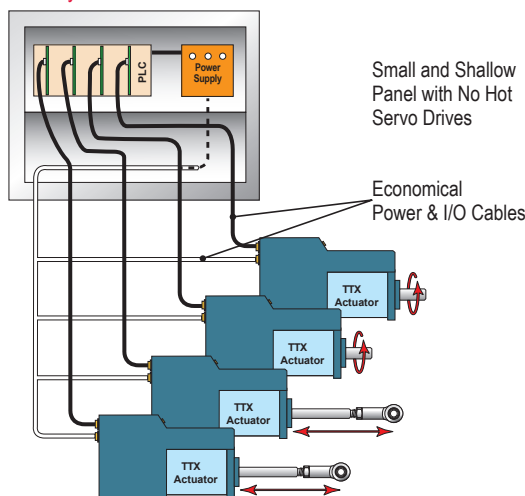
Flexible Communications

Digital and analog I/O, plus popular communication networks, such as Modbus TCP, Modbus RTU (standard), Ethernet/IP, and PROFINET IO, allow the TTX Series to become an integral part of your control architecture or machine control processes.
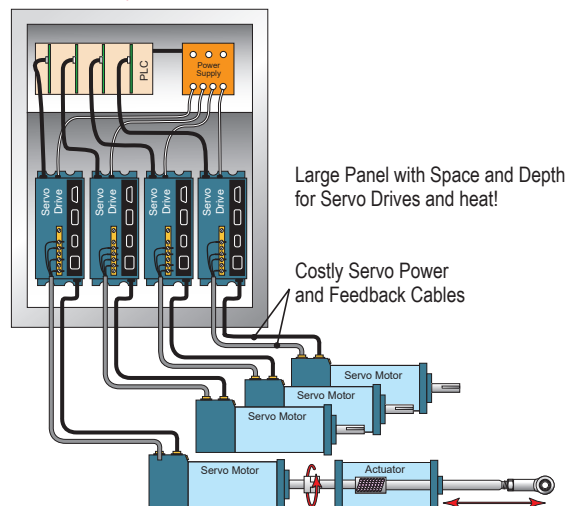
Improves Power, Performance, and Reliability

TTX Series actuators give you unrivaled power, performance, and reliability. No longer are you limited to trivial amounts of force or speeds so slow that many motion applications are not possible.

TTX System — Small and Shallow Panel with No Hot Servo Drives — Economical Power & I/O Cables

Alternative Systems — Large Panel with Space and Depth for Servo Drives and heat! — Costly Servo Power and Feedback Cables

Linear Applications

TTX Series linear actuators employ a superior inverted roller screw mechanism for converting rotary motion to highly robust and long-life linear motion. These characteristics enable the TTX Series 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 TTX Series DC actuators have the power needed to perform. The simple to configure, yet robust interface software allows either the AC or DC TTX Series actuators to perform nearly any motion control application. The TTX Series linear actuator can be programmed to follow an analog command signal, making it ideal for numerous factory automation applications

TTX Series Models

TTX Series AC and DC Models
- TTX Series high mechanical capacity actuator, 80 mm

Feedback Type
- Absolute Feedback (analog hall with multi-turn, battery backup)

Option Boards and I/O
Standard I/O:
- 8 - Digital Inputs
- 8 - Digital Outputs
- 1 - ±10V Analog Input
- 1 - 0-10V Analog Output

Ethernet / IP - Includes all standard I/O
Modbus TCP - Includes all standard I/O
Profinet I/O - Includes all standard I/O
4-20 mA - 4 digital inputs, 3 digital outputs, Isolated 4-20 mA input, Isolated 4-20 mA output

Standard Communications (All Models):
- 1 RS485 port, Modbus RTU, opto-isolated for programming, controlling and monitoring

TTX Series Option Boards
- Option boards offer adding functionality to the base TTX Series actuators
  - Terminal board for customer I/O
  - Isolated 4-20mA analog input and output
- Communication buses
  - EtherNet/IP
  - Modbus TCP
  - PROFINET IO

Connectivity
- Internal terminals accessible through removable cover
- M23 Power Connector (DC & AC Models differ)
- M23 I/O
- M8 connector for RS485 (may use internal connection instead)
- M12 connector for EtherNet options (may use internal connection instead)
- Power and I/O connectors may be removed by customer for M25 threaded port
- Power and I/O connectors may be replaced by customer with cable glands
- Power and I/O connectors may be replaced by customer with 1/2 inch NPT adaptors

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TTX Series Operation

The TTX 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 TTX Series non-volatile memory. A standard RS485 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 TTX 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*
   The TTX 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 TTX Series provides the functionality to position a control valve by following an analog input signal. Therefore, it delivers precise valve control — which cannot be achieved by other electric, hydraulic, or pneumatic actuators.

4. *Velocity proportional to an analog signal*
   TTX Series actuators offer you the capability to control velocity with an analog signal.

5. *Force proportional to analog signal*
   Perfect for pressing applications, you can control force with an analog input while in force mode.

Selectable Input Functions
• Enable • Execute Move (0-15) • Dedicated Position • Jog+
• Jog- • Jog Fast • Home • Extend Switch • Retract Switch
• Home Switch • Teach Enable • Teach Move (1-16)
• Select Move • Stop • Hold • Reset Faults
• 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

Expert User Interface

Expert, the TTX user interface software, provides you with a simple way to select all aspects of configuration and control required to set up and operate a TTX Series 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 TTX Series actuators. Motion setup, homing, teach mode, tuning parameters, jogging, I/O configurations, 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 TTX Series acts as the Slave device, only responding to requests commanded through the software. The Expert software allows full access to commissioning, configuring, monitoring, and controlling the TTX Series.

In addition, the following protocol options are available by selecting the communication option boards. Exlar requires initial commissioning of a TTX Series 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

commissioning, configuring, monitoring and controlling the Tritex II. Communication protocol DSP 301 is supported as well as DSP 402 supporting Profile Torque, Profile Velocity, Profile Position and Homing. Setup on the system is most easily achieved with the Expert software using the RS485 port. 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 allows a PLC program to perform a single read operation and a single write operation to all the parameters.

EtherNet/IP

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

PROFINET IO

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

Modbus Mapping Screen
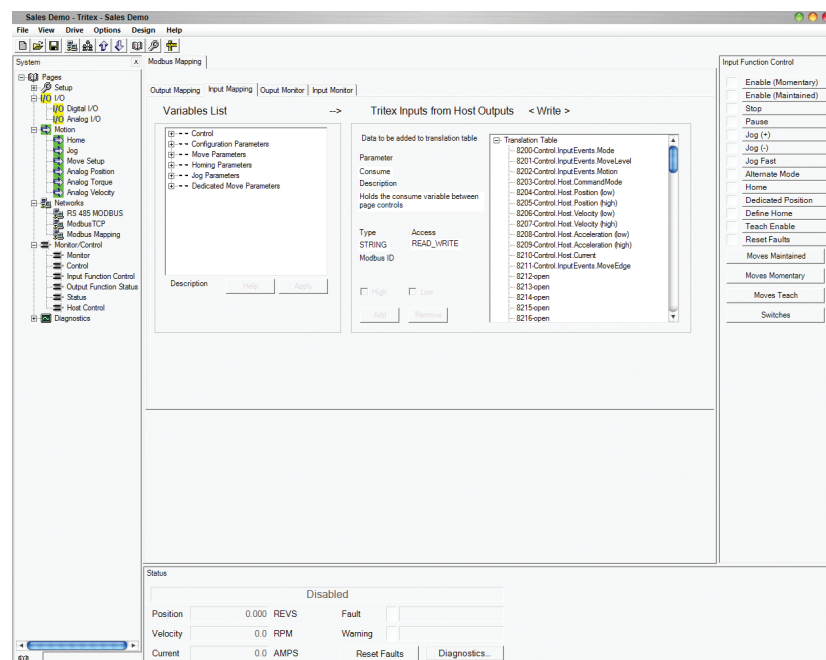
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Motion Setup

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. At the click of a button, you can configure a move to position, move to switch, or move to force motion. TTX Series 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 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. 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 drop down menu allows all I/O to be set up in a matter of minutes. Inputs can be configured to be maintained or momentary, depending on the application requirements. Input and output logic can be inverted with a single click.

Scope

The Expert Software includes a four-channel digital oscilloscope feature.

You 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, and 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.

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.
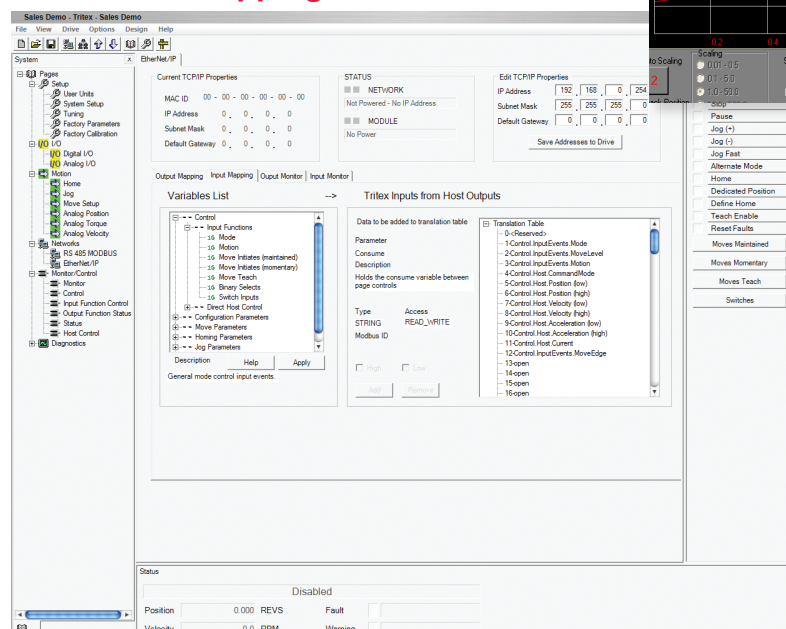
Teach Mode

In this mode, you can jog the actuator to the desired position, and activate an input. Alternatively, you can 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
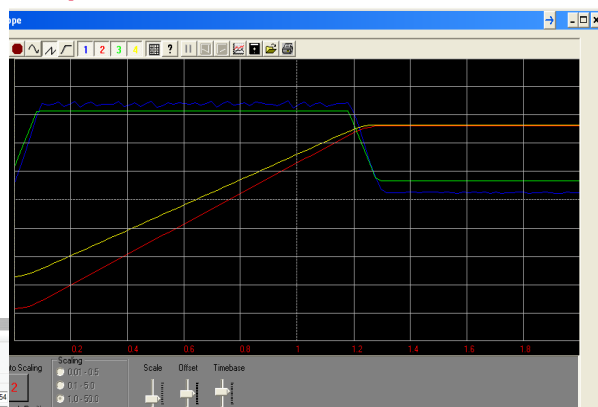
EtherNet IP Mapping Screen

Process Control Functionality

Precise valve and damper control are perfect applications for TTX Series actuators. They outperform other electric, hydraulic and pneumatic actuators by providing small hysteresis and dead band, quick response to small signal changes, and stable dynamic responses. Fully programmable to follow an analog or digital signal representing either position or force, the TTX Series linear actuator is well suited for control valve applications with thrust requirements up to 4404 N.

Additionally, TTX Series actuators can be mounted on any valve from any manufacturer giving you maximum flexibility.

Benefits for Process Control Applications

Extreme Accuracy
The Exlar actuators stroke the valve based on position, not air or oil pressure. Accuracy and repeatability are better than 0 .1%.

100% Duty Cycle
A roller screw provides a unique way of converting rotary motor motion to a linear force, and offers full modulation capability. Life is measured in hundreds of million strokes vs. thousands like typical electric actuators.

Built in Positioner
TTX Series actuators include a built in positioner with a 4-20 mA or digital signal to tell you the exact stroke position. An analog output is also available.

Flexibility
These actuators include digital I/O and analog control. This provides the user with options for additional control such as emergency stop, +/- jog, or various diagnostic conditions.

Low Power Consumption
The TTX Series actuator only uses the current needed for a given force. This extreme efficiency makes it suitable for use with solar panels and batteries.

Fast Response and Stroke Speeds
Most other electric actuators are known for being slow—a major disadvantage. TTX Series response rate is measured in milliseconds. Stoke speeds can be up to 762 mm/sec.

Hydraulic Replacement
Tritex actuators have the same capabilities as a hydraulic equivalent, but without the cost or maintenance issues. High force, fast speeds and precise movements make it a superior substitute for hydraulic applications.

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

Diagnostics
All inputs and outputs can be monitored including position, temperature, current, and many more. An oscilloscope feature allows you to select up to four parameters to be monitored simultaneously. The data can be captured in the drive's memory at an adjustable rate, down to 100 micro sec, and then uploaded for plotting.

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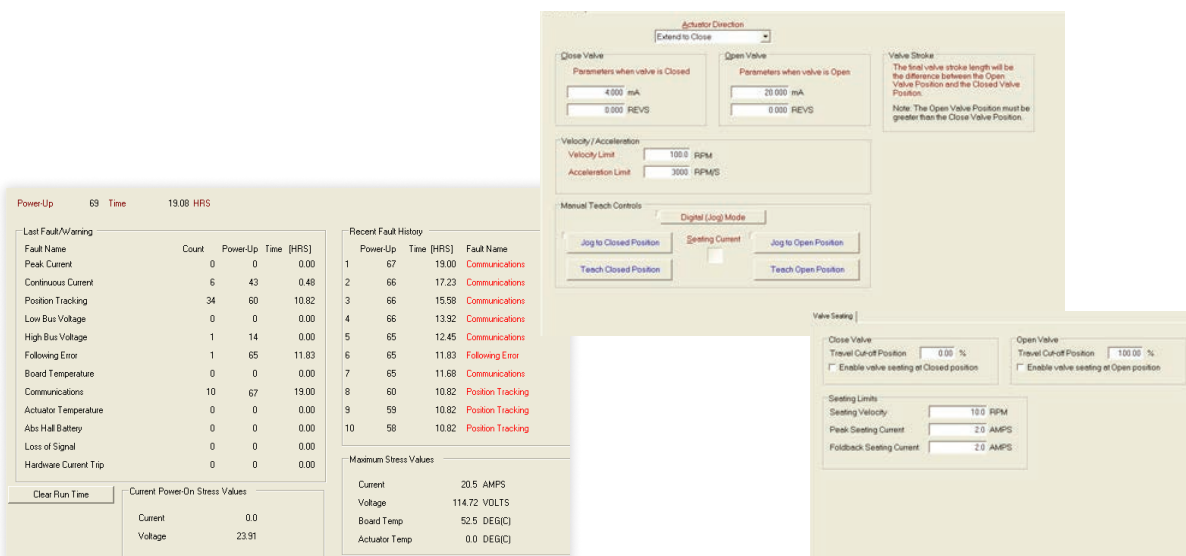
TTX Series Agency Approval

Shown below are additional agency approvals applied to TTX Series Actuators.

Agency Standards & Approvals			TTX-AC Models	TTX-DC Models
UL			UL 1004-1	N/A
			UL 1004-3	
			UL 1004-6	
			UL 508C (TTX080 PCB)	
			UL 61800-5-1 (TTX100 PCB)	
CSA			CSA C22.2 NO. 77	N/A
			CSA C22.2 NO. 100	
			CSA C22.2 NO. 274 (PCB)	
CE	EMC		EN 61800-3	EN 61800-3
	Safety		EN 61800-5-1	N/A
	RoHS		RoHS 2011/65/EU	RoHS 2011/65/EU
Vibration	Qual. Test Only		2.5 grms; 5 to 500 Hz	5.0 grms; 5 to 500 Hz
ODVA			Ethernet IP	Ethernet IP
PROFINET				Profinet IO

TTX Series (AC Power)

No Compromising on Power, Performance or Reliability

With forces up to almost 6,000 N (1,350 lbf) continuous and and speeds to 635 mm/sec (25 in/sec), the AC TTX Series 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. The TTX Series with AC power electronics operates with maximum reliability over a broad range of ambient temperatures: O˚C to +65˚C. The AC powered TTX Series actuators contain a 1.5 kW 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 TTX Series is the ideal solution for most motion applications.

TTX Series Models
- TTX Series high mechanical capacity actuator, 80 mm

Power Requirements
- AC Power 100V - 230V, +/- 10%, single phase
- Built-in AC line filter
- Connections for external braking resistor

Feedback
- Absolute Feedback (analog hall with multi-turn, battery backup)

Connectivity
- Internal terminals acessible through removable cover
- M23 connectors
- M8 connector for RS485
- M12 connector for Ethernet options

TTX Linear AC Actuator

TTX Series (DC Power)

Linear Actuators

No Compromising on Power, Performance or Reliability
With forces up to approximately 3879 N (872 lbf) continuous and speeds up to 508 mm/sec (20 in/sec). The DC TTX Series 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. The new TTX Series with DC power electronics operates with maximum reliability over a large temperature range: 0˚C to +65˚C. The DC powered TTX Series 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 TTX Series is the ideal solution for most motion applications.

TTX Series Models
- TTX Series high mechanical capacity actuator, 80 mm

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

Feedback
- Absolute Feedback (analog hall with multi-turn, battery backup)

Connectivity
- Internal terminals accessible through removable cover
- M23 connectors
- M8 connector for RS485
- M12 connector for EtherNet options

Operating Conditions and Usage for AC and DC Units		
Accuracy:		
Screw Lead Error	µm / 300 mm	25
	in/ft	0.001
Screw Travel Variation	µm / 300 mm	30
	in/ft	0.0012
Standard Ambient Temperature*	°C	0 to 65
	°F	32 to 149
IP Rating		IP66S
Friction Torque (typical)	Frame Size (Nm)	080
		0.23

TTX Linear DC Actuator

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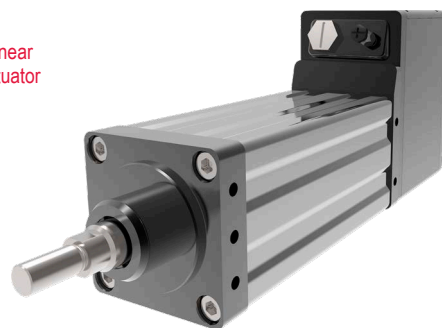
Communications & I/O

All models include digital IO and an isolated RS485 communication port. Digital I/O is isolated from other channels as a group, with all channels referenced to the negative side of the I/O supply.

The IO count and type vary with the actuator model and option module selected.

TTX AC and DC I/O

	SIO, EIP, PIO, TCP	IA4
Digital inputs	8	4
Digital outputs	4	3
Analog input, voltage	1	0
Analog output, voltage	1	0
Analog input 4-20mA	0	1
Analog output 4-20mA	0	1

Digital Inputs:
10 to 30 VDC Opto-isolated but common return

Digital Outputs:
30 VDC maximum
Opto-isolated but common supply & return
100 mA continuous output Isolated

SIO
Analog Input (Voltage):
+/-10 Vdc Range
13 bit resolution over full range
May be assigned to control Position, Velocity, Torque, or Velocity Override.

Analog Output (Voltage):
0 -10 Vdc Range
11 bit resolution over full range
May be assigned to monitor one of many internal parametes.

IA4
Analog Input (4-20 mA):
16 bit resolution Isolated
Assignable to Position, Velocity, or Torque command
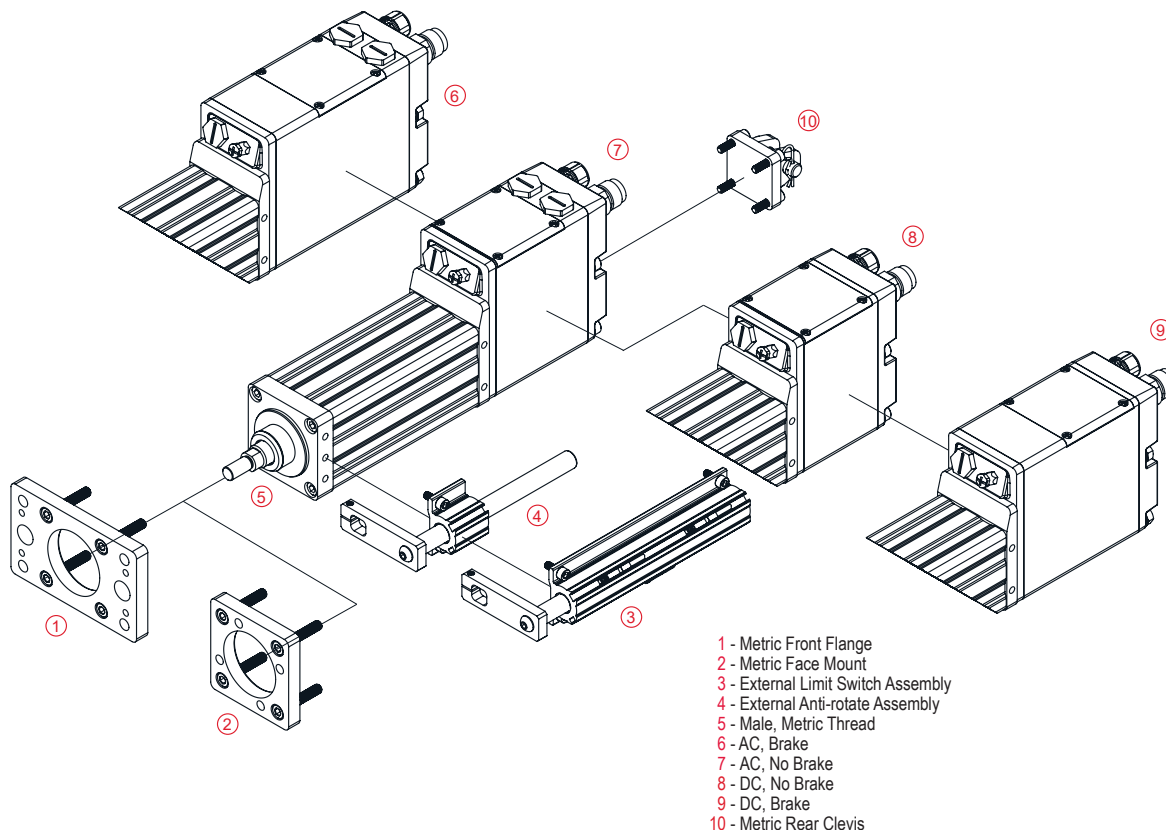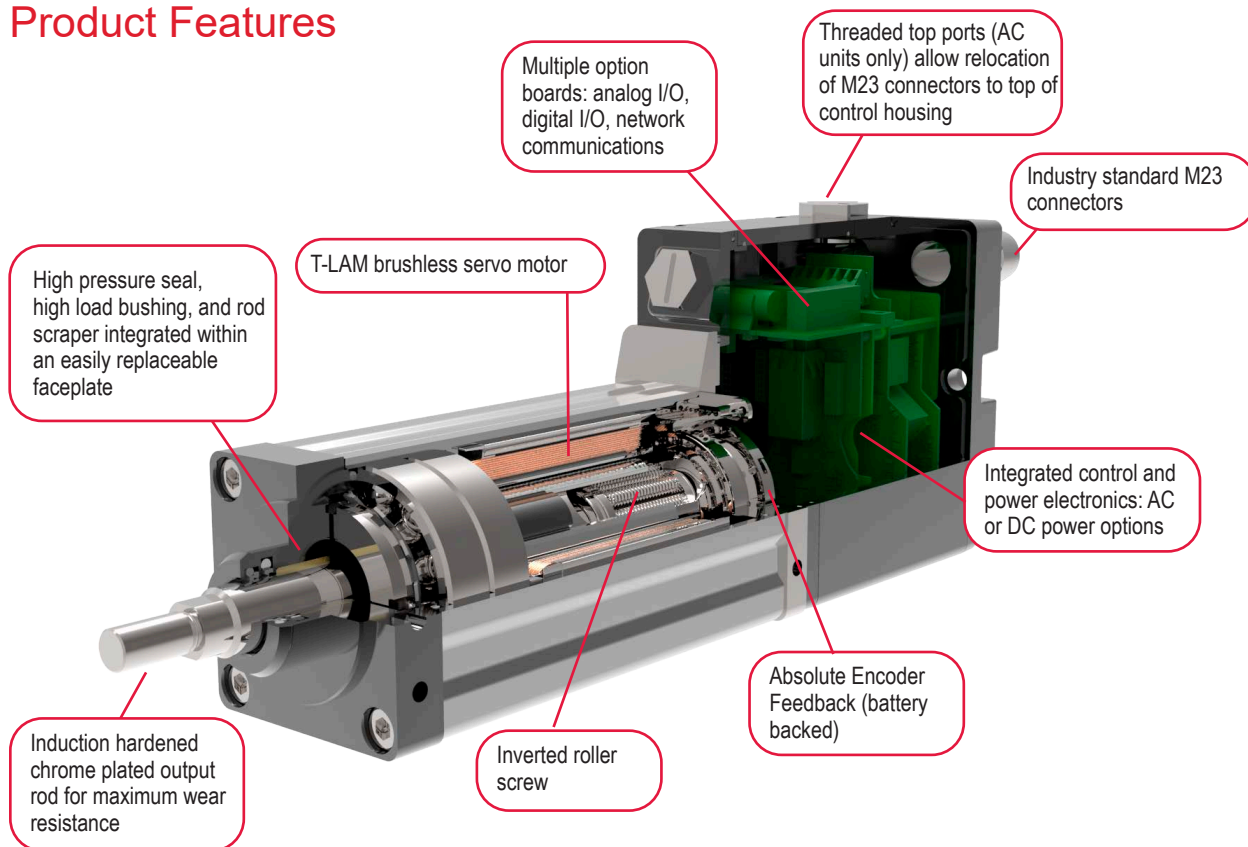
Analog Output (4-20 mA):
12 bit resolution
Assignable to Position, Velocity, Current, Temperature, etc

Standard Communications:
1 RS485 port opto-isolated, for programming, controlling and monitoring. Uses Modbus RTU protocol

Product Features

Multiple option boards: analog I/O, digital I/O, network communications

Threaded top ports (AC units only) allow relocation of M23 connectors to top of control housing

Industry standard M23 connectors

High pressure seal, high load bushing, and rod scraper integrated within an easily replaceable faceplate

T-LAM brushless servo motor

Integrated control and power electronics: AC or DC power options

Induction hardened chrome plated output rod for maximum wear resistance

Inverted roller screw

Absolute Encoder Feedback (battery backed)

1 - Metric Front Flange
2 - Metric Face Mount
3 - External Limit Switch Assembly
4 - External Anti-rotate Assembly
5 - Male, Metric Thread
6 - AC, Brake
7 - AC, No Brake
8 - DC, No Brake
9 - DC, Brake
10 - Metric Rear Clevis
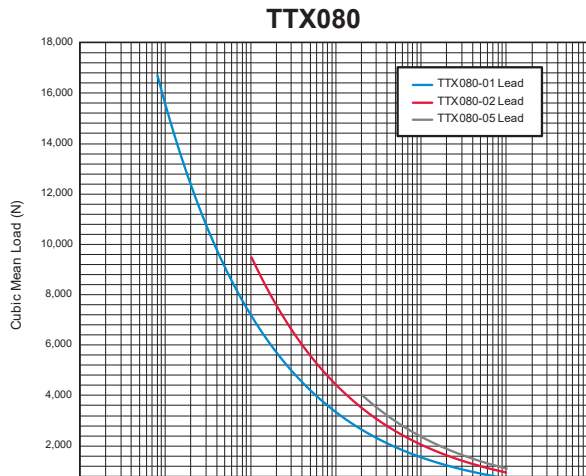
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Mechanical Specifications

TTX080

	Stroke mm (in)	Screw Lead mm (in)	Continuous Force Rating N (lbf)		Peak Force Rating N (lbf)		Max Velocity mm/s (in/s)		Dynamic Load Rating N (lbf)	Armature Inertia kg-m^2 (in-lb-s^2)	Maximum Continuous Input Current	
			4 (VAC)	D (VDC)	4 (VAC)	D (VDC)	4 (VAC)	D (VDC)			4 (VAC) (A-RMS)	D (VDC) (A-DC)
TTX080-100-01	100 (3.9)	2.54 (0.1)	5,897 (1,326)	4,970 (1,117)	11,794 (2,651)	8,946 (2,011)	127 (5.0)	102 (4.0)	24,535 (5,516)	0.000340 (0.003013)		
TTX080-100-02		5.08 (0.2)	3,342 (751)	2,816 (633)	6,683 (1,502)	5,069 (1,140)	254 (10.0)	203 (8.0)	25,798 (5,800)			
TTX080-100-05		12.7 (0.5)	1,415 (318)	1,193 (268)	2,830 (636)	2,147 (483)	635 (25.0)	508 (20.0)	21,795 (4,900)			
TTX080-150-01	150 (5.9)	2.54 (0.1)	5,897 (1,326)	4,970 (1,117)	11,794 (2,651)	8,946 (2,011)	127 (5.0)	102 (4.0)	24,535 (5,516)	0.000369 (0.003267)		
TTX080-150-02		5.08 (0.2)	3,342 (751)	2,816 (633)	6,683 (1,502)	5,069 (1,140)	254 (10.0)	203 (8.0)	25,798 (5,800)			
TTX080-150-05		12.7 (0.5)	1,415 (318)	1,193 (268)	2,830 (636)	2,147 (483)	635 (25.0)	508 (20.0)	21,795 (4,900)		4.1	18.0
TTX080-300-01	300 (11.8)	2.54 (0.1)	5,897 (1,326)	4,970 (1,117)	11,794 (2,651)	8,946 (2,011)	127 (5.0)	102 (4.0)	24,535 (5,516)	0.000455 (0.004029)		
TTX080-300-02		5.08 (0.2)	3,342 (751)	2,816 (633)	6,683 (1,502)	5,069 (1,140)	254 (10.0)	203 (8.0)	25,798 (5,800)			
TTX080-300-05		12.7 (0.5)	1,415 (318)	1,193 (268)	2,830 (636)	2,147 (483)	635 (25.0)	508 (20.0)	21,795 (4,900)			
TTX080-450-01	450 (17.7)	2.54 (0.1)	5,897 (1,326)	4,970 (1,117)	11,794 (2,651)	8,946 (2,011)	127 (5.0)	102 (4.0)	24,535 (5,516)	0.000541 (0.004790)		
TTX080-450-02		5.08 (0.2)	3,342 (751)	2,816 (633)	6,683 (1,502)	5,069 (1,140)	254 (10.0)	203 (8.0)	25,798 (5,800)			
TTX080-450-05		12.7 (0.5)	1,415 (318)	1,193 (268)	2,830 (636)	2,147 (483)	635 (25.0)	508 (20.0)	21,795 (4,900)			

Specifications subject to change without notice.
Test data derived using NEMA recommended aluminum heatsink 10" x 10" x 3/8" at 25°C ambient.
Maximum velocities listed at maximum voltages

Estimated Service Life

TTX080

Legend:
- TTX080-01 Lead
- TTX080-02 Lead
- TTX080-05 Lead

Y-axis: Cubic Mean Load (N) — 2,000; 4,000; 6,000; 8,000; 10,000; 12,000; 14,000; 16,000; 18,000

Service Life Estimate Assumptions:

- Sufficient quality and quantity of lubrication is maintained throughout service life (please refer to the engineering reference section for lubrication interval estimates.)
- Bearing and screw temperature between 20° C and 40° C
- No mechanical hard stops (external or internal) or impact loads
- No external side loads
- Does not apply to short stroke, high frequency applications such as fatigue testing or short stroke, high force applications such as pressing. (For information on calculating estimating life for unique applications please refer to the engineering reference section.)

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 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; these charts should be used for estimation purposes only.

The underlying formula that defines this value is:
Travel life in millions of inches, where:

C_a = Dynamic load rating (lbf)
F_{cml} = Cubic mean applied load (lbf)
ℓ = Roller screw lead (inches)

$$L_{10} = \left(\frac{C_a}{F_{cml}} \right)^3 \times \ell$$

For additional details on calculating estimated service life, please refer www.exlar.com.

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Accessories

Internal Holding Brake
This option provides an internal holding brake. The brake is spring activated and electrically released.

External Anti-rotate Assembly
This option provides a rod and bushing to restrict the actuator rod from rotating when the load is not held by another method. Shorter actuators have single sided anti-rotation attachments. Longer lengths require attachments on both sides for proper operation.
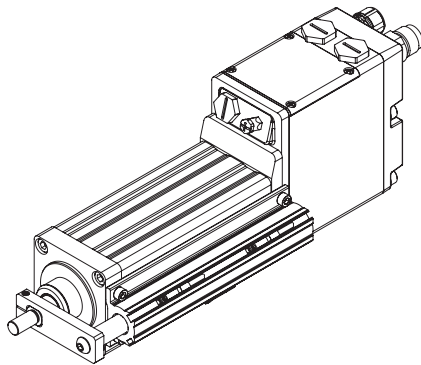
Description	Weight kg (lb)
TTX080-100	5.5 (12.2)
TTX080-150	6.2 (13.5)
TTX080-300	8.0 (17.6)
TTX080-450	9.8 (21.6)
Brake Adder	1.1 (2.5)
Front Flange (1)	1.0 (2.2)
Tapped Face (3)	0.6 (1.2)
Rear Clevis (5)	0.4 (0.8)
Imperial Flange (F)	0.8 (1.8)
Imperial Clevis (C)	0.8 (1.7)
Anti Rotate (100 mm stroke)	0.5 (1.1)
Anti Rotate (150 mm stroke)	0.6 (1.3)
Anti Rotate (300 mm stroke)	0.8 (1.8)
Anti Rotate (450 mm stroke)	1.1 (2.4)
Limit Switch Assembly (100 mm stroke)	0.9 (1.9)
Limit Switch Assembly (150 mm stroke)	1.0 (2.3)
Limit Switch Assembly (300 mm stroke)	1.6 (3.5)
Limit Switch Assembly (450 mm stroke)	2.1 (4.7)

TTX Brake Speccifications		
Brake Holding Torque (minimum)	Nm	4.5
	lbf-in	40
Brake Voltage	VDC	24 (-10%/+6%)
Nominal Brake Current at 24 VDC	A	0.5
Brake Engage/Disengage Time (typical)	ms	18/35

Speed vs. Force Curves

Temperature Derating
The speed/torque curves are based on 25° C ambient conditions. The actuators may be operated at ambient temperatures up to 85° C.
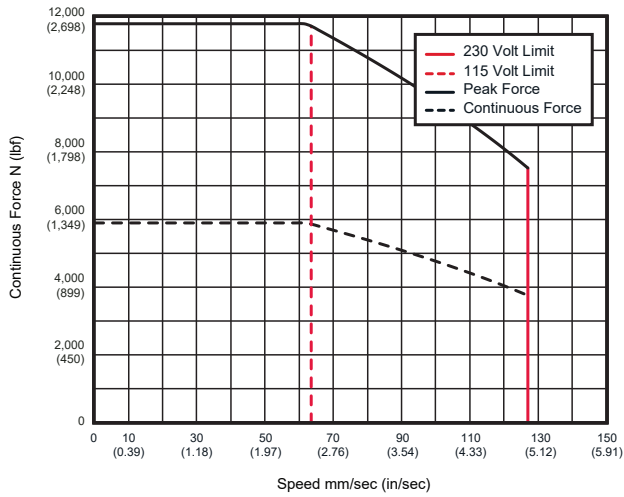
Elevated Ambient Temp Factor (%) =

$$100\% \times \sqrt{\frac{\text{Max Rated Temp } [\sim130°\text{ C}] - \text{Environment Temp } [\text{in °C}]}{\text{Max Rated Temp } [\sim130°\text{ C}] - \text{Rated Ambient } [\sim25°\text{ C}]}} =$$

$$100\% \times \sqrt{\frac{130°\text{ C} - \text{Environment Temp}}{105°\text{ C}}}$$

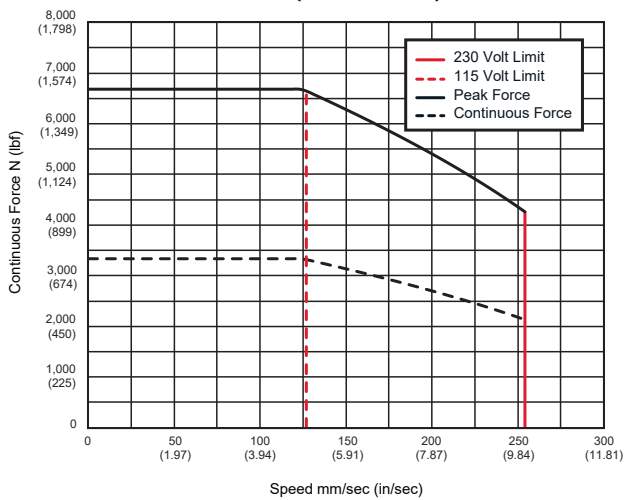= % of published continuous @ 25° C
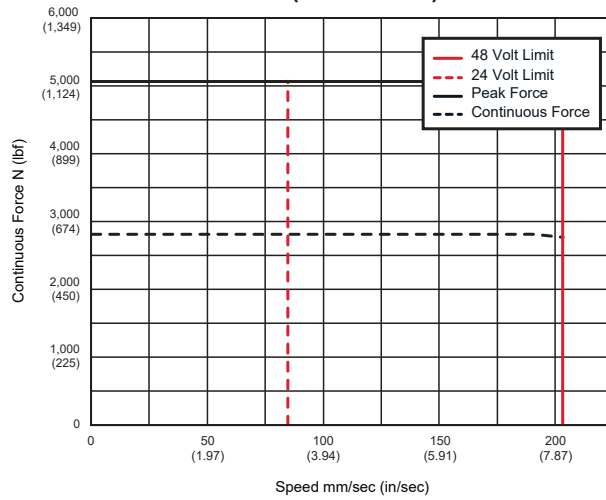
TTX080 (0.1 In Lead)
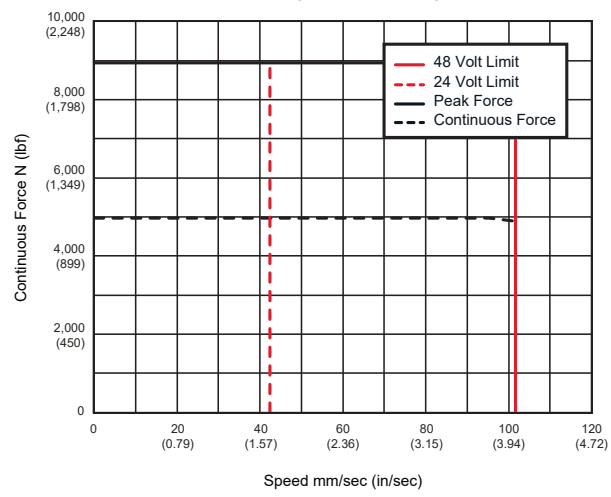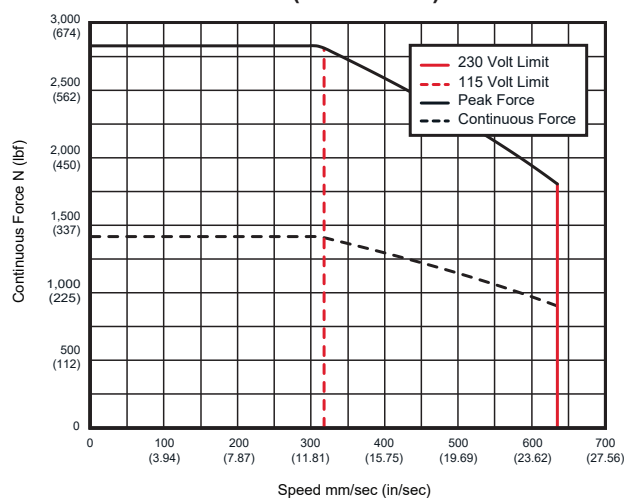

TTX080 (0.1 In Lead)
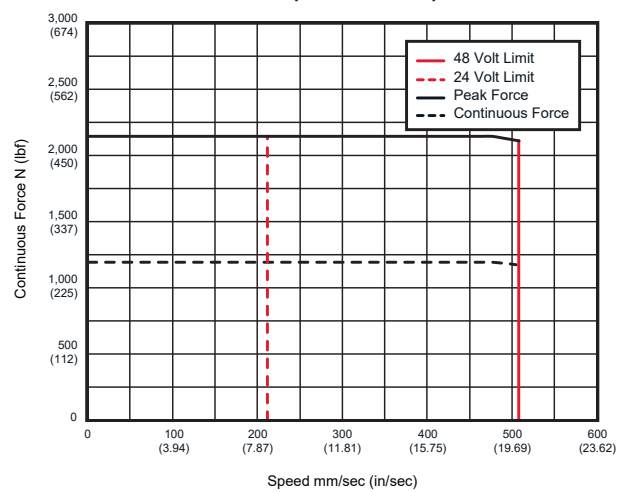

TTX080 (0.2 In Lead)

TTX080 (0.2 In Lead)

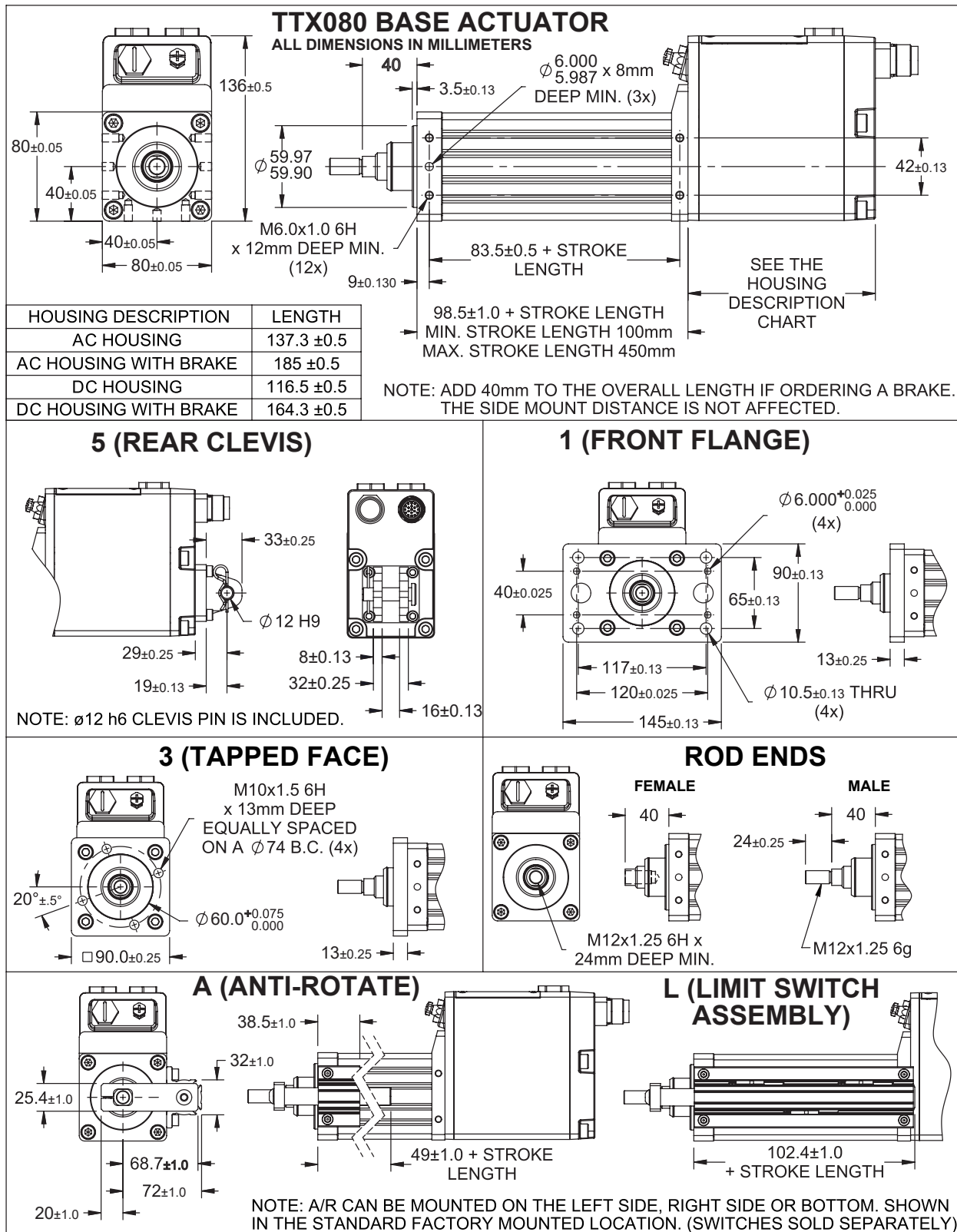

TTX080 (0.5 In Lead)

TTX080 (0.5 In Lead)

*Test data derived using NEMA recommended aluminum heatsink 10" x 10" x 3/8" at 25°C ambient.

EXLAR®

Dimensions
AC and DC Base Actuator

TTX080 BASE ACTUATOR
ALL DIMENSIONS IN MILLIMETERS

136±0.5
80±0.05
40±0.05
40±0.05
80±0.05

40
3.5±0.13
$\varnothing$ 6.000 / 5.987 x 8mm DEEP MIN. (3x)
$\varnothing$ 59.97 / 59.90
M6.0x1.0 6H x 12mm DEEP MIN. (12x)
9±0.130
83.5±0.5 + STROKE LENGTH
42±0.13
SEE THE HOUSING DESCRIPTION CHART

98.5±1.0 + STROKE LENGTH
MIN. STROKE LENGTH 100mm
MAX. STROKE LENGTH 450mm

HOUSING DESCRIPTION	LENGTH
AC HOUSING	137.3 ±0.5
AC HOUSING WITH BRAKE	185 ±0.5
DC HOUSING	116.5 ±0.5
DC HOUSING WITH BRAKE	164.3 ±0.5

NOTE: ADD 40mm TO THE OVERALL LENGTH IF ORDERING A BRAKE. THE SIDE MOUNT DISTANCE IS NOT AFFECTED.

5 (REAR CLEVIS)

33±0.25
29±0.25
19±0.13
$\varnothing$ 12 H9
8±0.13
32±0.25
16±0.13

NOTE: ø12 h6 CLEVIS PIN IS INCLUDED.

1 (FRONT FLANGE)

$\varnothing$ 6.000 $^{+0.025}_{0.000}$ (4x)
40±0.025
90±0.13
65±0.13
117±0.13
120±0.025
145±0.13
13±0.25
$\varnothing$ 10.5±0.13 THRU (4x)

3 (TAPPED FACE)

M10x1.5 6H x 13mm DEEP EQUALLY SPACED ON A $\varnothing$ 74 B.C. (4x)
20°±.5°
$\varnothing$ 60.0 $^{+0.075}_{0.000}$
□ 90.0±0.25
13±0.25

ROD ENDS

FEMALE
40
M12x1.25 6H x 24mm DEEP MIN.

MALE
40
24±0.25
M12x1.25 6g

A (ANTI-ROTATE)

38.5±1.0
32±1.0
25.4±1.0
68.7±1.0
72±1.0
20±1.0
49±1.0 + STROKE LENGTH

L (LIMIT SWITCH ASSEMBLY)

102.4±1.0 + STROKE LENGTH

NOTE: A/R CAN BE MOUNTED ON THE LEFT SIDE, RIGHT SIDE OR BOTTOM. SHOWN IN THE STANDARD FACTORY MOUNTED LOCATION. (SWITCHES SOLD SEPARATELY)
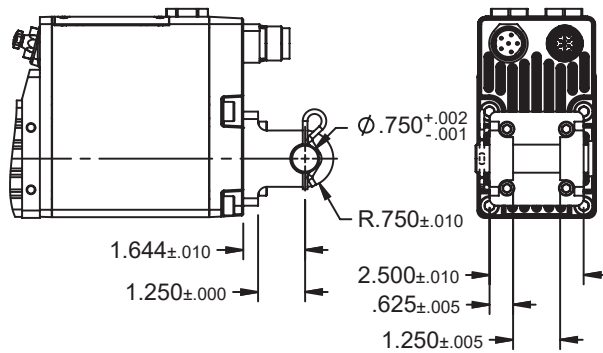
Pre-sale drawings and models are representative and are subject to change. Visit exlar.com to download a 3D model of your desired configuration.
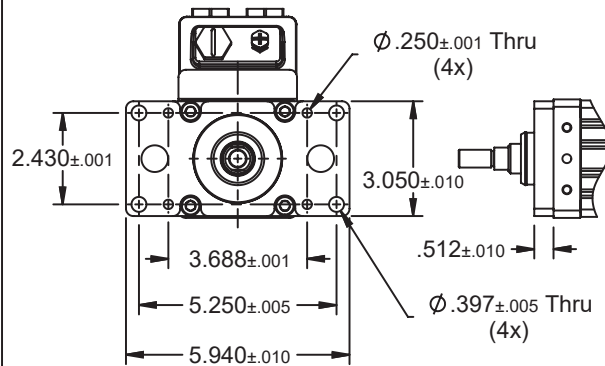
TTX080 IMPERIAL OPTIONS
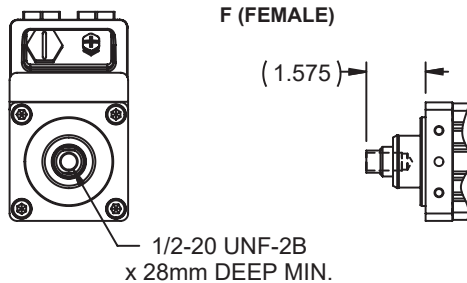**ALL DIMENSIONS IN INCHES**

C (GSX30 REAR CLEVIS)

$\varnothing .750^{+.002}_{-.001}$

R.750±.010

1.644±.010
1.250±.000
2.500±.010
.625±.005
1.250±.005

NOTE: ø0.746/ø0.741 CLEVIS PIN IS INCLUDED.

F (GSX30 FRONT FLANGE)

$\varnothing .250$±.001 Thru (4x)

2.430±.001
3.050±.010
.512±.010

3.688±.001
5.250±.005
5.940±.010

$\varnothing .397$±.005 Thru (4x)

ROD ENDS

F (FEMALE)

(1.575)

1/2-20 UNF-2B
x 28mm DEEP MIN.

M (MALE)

(1.575)
.945±.010

1/2-20 UNF-2A

ROD CLEVIS

ALL DIMENSIONS IN MM

ø34 (Max)
ø12 H9 PIN DIA

45.6 (Max)
34 (Max)
16 A16

19 (Min)
36 JS13
16 (Min)

M12x1.25

Weight (kg): 0.25

ORDER CODE: TTX080-RC1-KIT

*TTX080 ROD END CODE "A" REQUIRED

SPHERICAL ROD EYE

ALL DIMENSIONS IN MM

Ø16 H7
Ø45 (Max)

14 H12
11 H13

20 (Min)
17 (Min)

48 JS13

3°
3°

21 (Max)

M12x1.25

Weight (kg): 0.21

ORDER CODE: TTX080-REI-KIT

*TTX080 ROD END CODE "A" REQUIRED

EXLAR®

Cables and Accessories

TTX Series Cables & Accessories	Part No.
"I" Connection	
Power cables, molded M23 style connector, 8 pin, xxx = length in feet. Standard lengths 15, 25, 50 feet (DC Stator)	CBL-TTIPC-SMI-xxx
Power cable with M23 6 pin xxx = Length in feet, std lengths 15, 25, 50, 75, 100 (AC Stator)	CBL-T2IPC-SMI-xxx
I/O cables, molded M23 style connector, 19 pin, xx = length in feet. Standard lengths 15, 25, 50 feet	CBL-TTIOC-SMI-xxx
Communications Accessories - RECOMMENDED PC COMMUNCIATIONS CABLE	
PC to TTX Communications cable-USB/RS485 to M8 connector, 6 feet	CBL-T2USB485-M8-006
PC to TTX Communications cable-USB/RS485 to M8 connector, 15 feet	CBL-T2USB485-M8-015
Multi-Drop RS485 Accessories	
RS485 splitter - M8 Pin plug to double M8 Socket receptacle	TT485SP
Multidrop Communications Cable for use with TT485SP, 6 feet	CBL-TTDAS-006
Multidrop Communications Cable for use with TT485SP, 15 feet	CBL-TTDAS-015
Multi-Purpose Communications Accessories	
Communication cable, PICO type connector, 4 pin, xxx = length in meters, Standard lengths 4.572, 7.62, 15.24 meters	CBL-TTCOM-xxx

CBL-T2USB485-M8-006 or 015
Our recommended communications cable.
No special drivers or setup required for use with
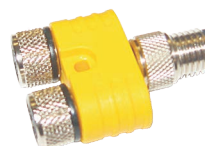MS Windows™.

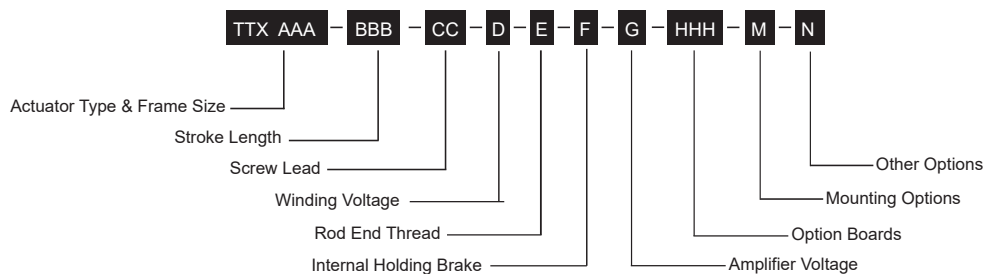CBL-TTIOC-SMI-xxx

CBL-TTIPC-SMI-xxx / CBL-T2IPC-SMI-xxx

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

CBL-TTDAS-006 or 015
For use with TT485SP for
multi-drop applications.

TT485SP
RS485 communications splitter.
Use to daisy-chainmultiple TTX
actuators.

TTX AAA — BBB — CC — D — E — F — G — HHH — M — N

Actuator Type & Frame Size
Stroke Length
Screw Lead
Winding Voltage
Rod End Thread
Internal Holding Brake
Amplifier Voltage
Option Boards
Mounting Options
Other Options

Actuator Type
TTX = Integrated Drive / Motor / Actuator

AAA = Actuator Frame Size
080 = 80 mm (3.15 in)

BBB = Stroke Length
100 = 100 mm
150 = 150 mm
300 = 300 mm
450 = 450 mm

CC =Screw Lead
01 = 0.10 in (2.54 mm)
02 = 0.20 in (5.08 mm)
05 = 0.50 in (12.7 mm)

D = Winding Voltage
4 = 230 VAC Max
D = 48 VDC Max

E = Rod End Thread
A = Male Metric
B = Female Metric[2]
M = Male, English)[2]
F = Female, English[2]

F = Internal Holding Brake
N = No Brake
B = Internal Holding Brake, Electrically Released

G = Amplifier Voltage
A = 200 VAC Class
D = 48 VDC Class

HHH = Option Boards
SIO = Standard I/O Interconnect
IA4 = 4-20 mA Analog I/O
EIP = SIO plus Ethernet/IP w/M12 connector
PIO = SIO plus Profinet IO w/M12 connector
TCP = SIO plus Modbus TCP w/M12 connector

M = Mounting Options
N = None
1 = Front Flange, Metric
3 = Tapped Face, Metric
5 = Rear Clevis, Metric
F = Front Flange, English[2]
C = Rear Clevis, English[2]

N = Accessory Options
N = None
A = Anti-Rotate Assembly
L = Limit Switch Housing / Anti-Rotate Assembly[1]

[1] Switches sold separately
[2] Available option. May add lead time.

For options or specials not listed above or for
extended temperature operation, please contact Exlar

EXLAR®