

FT Series Linear Actuators

Exlar FT Series force tube actuators use a planetary roller screw mounted inside a telescoping tube mechanism. The follower is attached to the moveable force tube, which then extends and retracts as the screw rotates. An external motor (supplied by Exlar or the customer) provides the rotational force.

High Performance

As with all of Exlar's roller screw products, the FT Series actuators deliver heavy load capacity, high speed capabilities, and exceptionally long life when compared to other linear actuator technologies.

Other comparably-sized screw actuator products on the market - specifically ball screw and acme screw actuators - have relatively low load capacities, short working lives and limited speed capabilities. At equivalent sizes, under moderate to heavy loads, it is reasonable to project that FT units will deliver up to 15 times the working life of those other designs. For OEM designers, this often means much more power and durability can be achieved from a much smaller footprint when Exlar FT units are used.

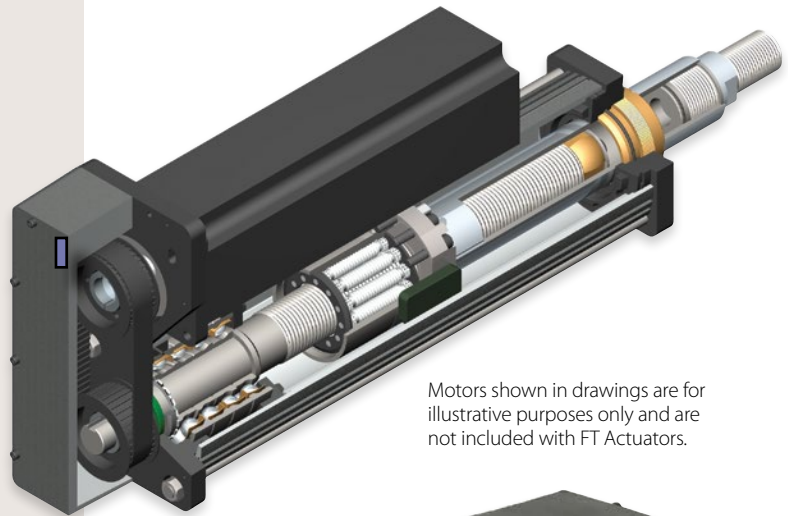
Contamination Protection

The FT Series design has all the contamination-isolation advantages of hydraulic cylinders without the limited load, life, and speed of designs built around ball or acme screws. The bearing and roller screw components in the Exlar FT Series force tubes are mounted within the sealed housing. This prevents abrasive particles and other contaminants from entering the actuator's critical mechanisms, and assures trouble-free operation even in the most severe environments.

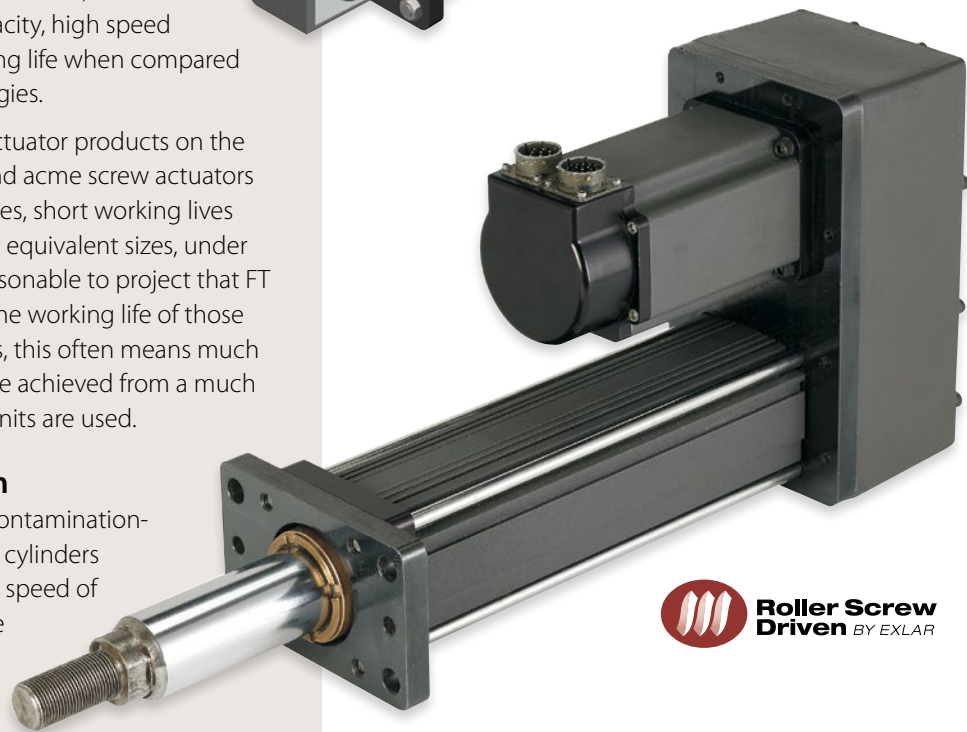
FT Series actuators are provided with standard grease lubrication. Custom provisions can be made for oil filled lubrication.

Engineered Compatibility

Exlar has removed much of the end-user-engineering burden by designing the FT series to be compatible with a wide variety of standard motors. Motor mounting, actuator mounting, and gearing configurations are available to meet nearly any application's requirements.



Motors shown in drawings are for illustrative purposes only and are not included with FT Actuators.



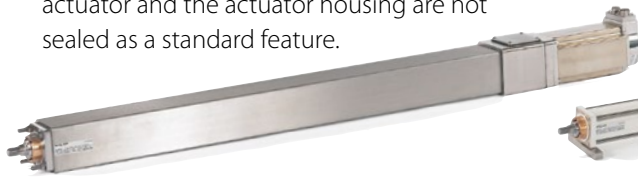
Feature	Standard	Optional
Long Strokes	6", 12", 18", 24", 36", and 48"	Intermediate Lengths up to 96"
Pre-Loaded Follower	No	Yes
External Limit Switches	No	One, two or three Adjustable Switches
Multiple Actuator Mountings	Side Mount, Side Lug, Extended Tie Rods, Rear Clevis, Front Flange, Side Trunnion, Rear Flange, Front/Rear Flange	Specials Available
Multiple Motor Mounting Configurations	Inline Direct Drive, Parallel 1:1 Drive, Parallel, 2:1 Reduction	Specials Available

Special Sealing Options

The base unit of the FT actuators are sealed at the extending rod end by a rod seal, and on the drive end by a shaft seal (see base unit drawings on pages 80, 82, 84 and 86). These rod and shaft seals, and o-ring sealing provides IP65S sealing for the FT actuator base units.

In standard units with inline or parallel motor mounting, the mounting surface between the actuator and the motor, and between the end cover, or inline cover of the actuator and the actuator housing are not sealed as a standard feature.

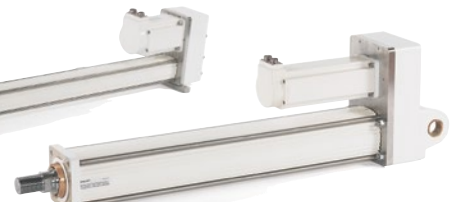
These areas of the FT actuators can be sealed as a special option if the environment in which the actuator will be mounted requires the actuator to be sealed. Because of the vast differences in the design of various brands of motors that are mounted to the FT Series actuators, sealing of these two areas may alter the design of the actuator. Please contact your local sales representative for details and quotations on special sealing of this type.



Stainless steel FT35 with stainless steel SLM115 motor



Food grade & stainless steel FT35 with food grade SLM90 motor



Food grade & stainless steel FT60 with food grade SLG90 motor

FT Series

Exlar FT Series Actuators Applications Include:

Hydraulic cylinder replacement

Ball screw replacement

Pneumatic cylinder replacement

Chip and wafer handling

Automated flexible fixturing

Dispensers

Machine tool

Automated assembly

Parts clamping

Automatic tool changers

Volumetric pumps

Medical equipment

Conveyor diverters / gates

Plastics equipment

Cut-offs

Die cutters

Packaging machinery

Entertainment

Sawmill equipment

Open / close doors

Fillers

Formers

Precision grinders

Indexing stages

Lifts

Product sorting

Material cutting

Material handling

Riveting / fastening / joining

Molding

Semiconductor

Pick and place systems

Robot manipulator arms

Simulators

Precision valve control

Ventilation control systems

Pressing

Process control

Tube bending

Welding

Stamping

Test stands

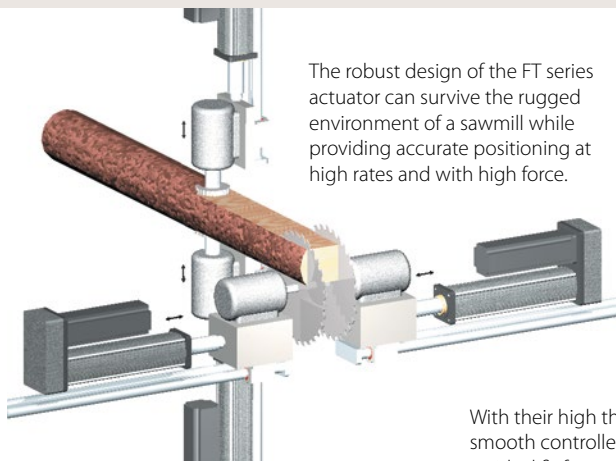
Tension control

Web guidance

Wire winding

Food Processing

Dampers

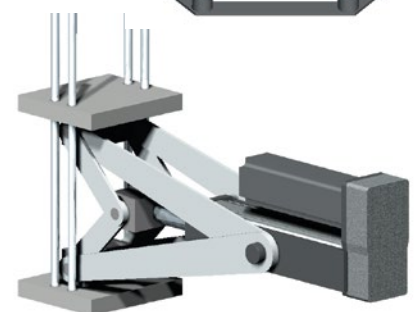


The robust design of the FT series actuator can survive the rugged environment of a sawmill while providing accurate positioning at high rates and with high force.

Motors shown in drawings are for illustrative purposes only and are not included with FT Actuators.

With their high thrust capability, compact size and smooth controlled motion, FT Series actuators are an ideal fit for replacing hydraulics or pneumatics on injection mold toggles. Control improvements from an electromechanical servo system offer less abuse of valuable molds and more consistent performance.

The smooth and accurate motion of Exlar's actuators combined with today's servo technology make multiple degree of freedom motion simulation applications easier to implement, cleaner and more efficient than hydraulic solutions.



FT Series 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:

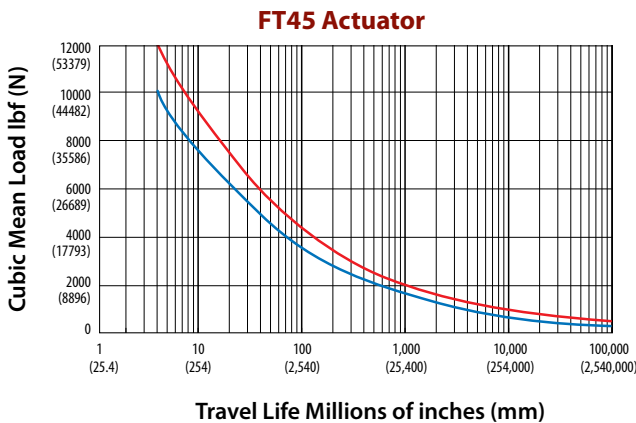
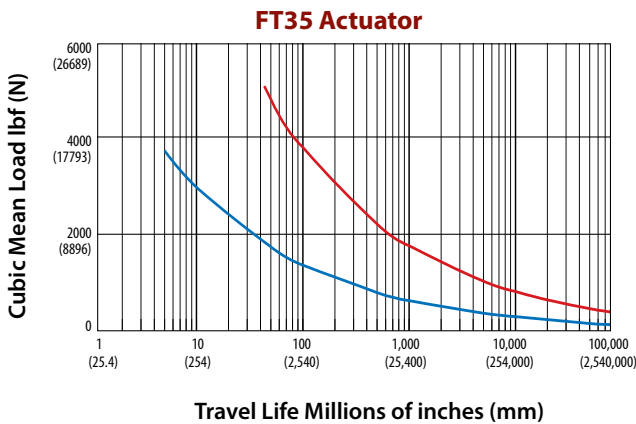
Travel life in millions of inches, where:

C = Dynamic load rating (lbf)

F = Cubic mean applied load (lbf) $L_{10} = \left(\frac{C}{F}\right)^3 \times S$

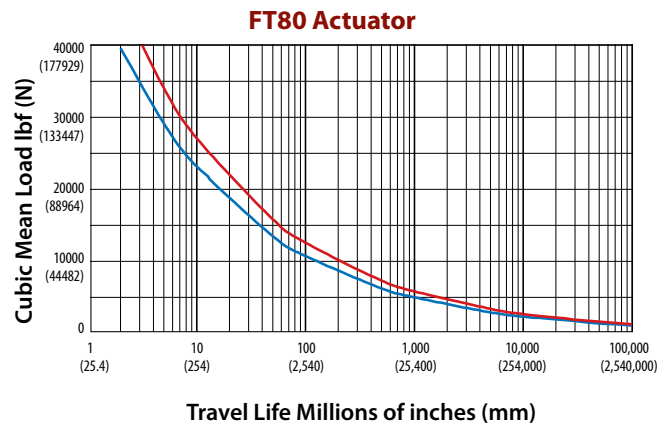
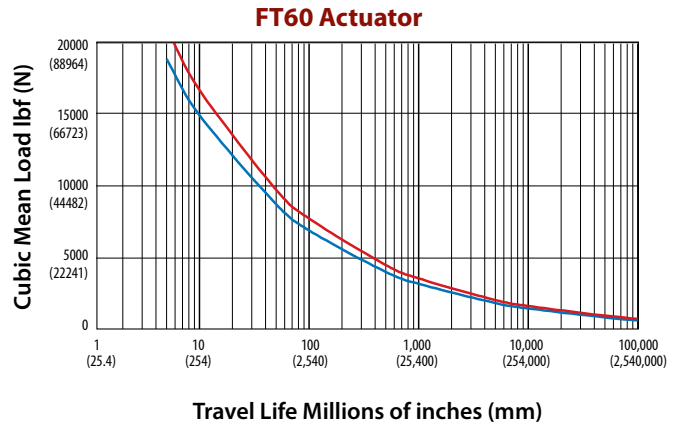
S = Roller screw's lead (inches)

All curves represent properly lubricated and maintained actuators.



— FT35, 45, 60 & 80 High Capacity
— FT35, 45, 60 & 80 Standard Capacity

If your application requires high force over a stroke length shorter than the length of the nut, please contact Exlar for derated life calculations. You may also download the article "Calculating Life Expectancy" at www.exlar.com/technical_reference_notes



Standard Inline Coupling Maximum Torque Ratings and Inertia

	Torque Rating	Inertia
FT35	354 lbf-in (40 Nm)	0.000104 kg-m ² (0.000920 lbf-in s ²)
FT45	780 lbf-in (88 Nm)	0.00010743 kg-m ² (0.000951 lbf-in s ²)

Shown right are pulley inertias reflected at motor including typical pulleys, belt and standard bushings. Because of differences in belt and pulley selection due to particular motor choices, please contact your local sales representative if these values are critical to your application.

FT35 Series Performance Specifications

Model No.	Nominal Frame Size in (mm)	Stroke in (mm)	Screw Lead in (mm)	Max Force ² lbf (kN)	Linear Speed at Max Rated RPM in/sec (mm/sec)	Dynamic Load Rating (Std capacity screw) lbf (kN)	Dynamic Load Rating (High capacity screw) lbf (kN)	Life at Max Force (Std capacity screw) 10 ⁶ in (Km)	Life at Max Force (High capacity screw) 10 ⁶ in (Km)	Max Input Torque lbf-in (Nm)	Max Rated Input rpm	Weight Base lb (kg)
FT35-0605	3.5 (89)	6 (152)	0.197 (5)	5,000 (22.2)	14.7 (373)	17,800 (79.2)	21,400 (95.2)	8.88 (225.6)	15.4 (392)	196 (22.1)	4,500	30 (14)
0.394 (10)			29.5 (750)		16,500 (73.4)	19,850 (88.3)	14.15 (359.4)	24.6 (626)	392 (44.3)			
0.787 (20)			59.3 (1500)		17,200 (76.5)	20,800 (92.5)	32.05 (814.2)	56.7 (1,440)	783 (88.5)			
FT35-1205	3.5 (89)	12 (305)	0.197 (5)	5,000 (22.2)	14.7 (373)	17,800 (79.2)	21,400 (95.2)	8.88 (225.6)	15.4 (392)	196 (22.1)	4,500	35 (16)
0.394 (10)			29.5 (750)		16,500 (73.4)	19,850 (88.3)	14.15 (359.4)	24.6 (626)	392 (44.3)			
0.787 (20)			59.3 (1500)		17,200 (76.5)	20,800 (92.5)	32.05 (814.2)	56.7 (1,440)	783 (88.5)			
FT35-1805	3.5 (89)	18 (457)	0.197 (5)	5,000 (22.2)	14.7 (373)	17,800 (79.2)	21,400 (95.2)	8.88 (225.6)	15.4 (392)	196 (22.1)	4,500	40 (18)
0.394 (10)			29.5 (750)		16,500 (73.4)	19,850 (88.3)	14.15 (359.4)	24.6 (626)	392 (44.3)			
0.787 (20)			59.3 (1500)		17,200 (76.5)	20,800 (92.5)	32.05 (814.2)	56.7 (1,440)	783 (88.5)			
FT35-2405	3.5 (89)	24 (610)	0.197 (5)	5,000 (22.2)	14.7 (373)	17,800 (79.2)	21,400 (95.2)	8.88 (225.6)	15.4 (392)	196 (22.1)	4,500	45 (21)
0.394 (10)			29.5 (750)		16,500 (73.4)	19,850 (88.3)	14.15 (359.4)	24.6 (626)	392 (44.3)			
0.787 (20)			59.3 (1500)		17,200 (76.5)	20,800 (92.5)	32.05 (814.2)	56.7 (1,440)	783 (88.5)			
FT35-3605	3.5 (89)	36 (914)	0.197 (5)	5,000 (22.2)	8.9 (226)	17,800 (79.2)	21,400 (95.2)	8.88 (225.6)	15.4 (392)	196 (22.1)	2,700	55 (25)
0.394 (10)			17.8 (452)		16,500 (73.4)	19,850 (88.3)	14.15 (359.4)	24.6 (626)	392 (44.3)			
0.787 (20)			35.6 (903)		17,200 (76.5)	20,800 (92.5)	32.05 (814.2)	56.7 (1,440)	783 (88.5)			
FT35-4805	3.5 (89)	48 (1219)	0.197 (5)	5,000 (22.2)	5.7 (145)	17,800 (79.2)	21,400 (95.2)	8.88 (225.6)	15.4 (392)	196 (22.1)	1,700	65 (30)
0.394 (10)			11.4 (290)		16,500 (73.4)	19,850 (88.3)	14.15 (359.4)	24.6 (626)	392 (44.3)			
0.787 (20)			22.4 (568)		17,200 (76.5)	20,800 (92.5)	32.05 (814.2)	56.7 (1,440)	783 (88.5)			

¹ FT35 actuators with high capacity screw option are 20 mm longer. See dimensions page 80.

² Maximum allowable actuator-generated force that can be applied routinely. Exceeding this force may result in permanent damage to the actuator. For maximum allowable externally-applied axial forces, consult factory. For high force, short stroke applications, consult factory.

FT45 Series Performance Specifications

Model No.	Nominal Frame Size in (mm)	Stroke in (mm)	Screw Lead in (mm)	Max Force lbf (kN)	Linear Speed at Max Rated RPM in/sec (mm/sec)	Dynamic Load Rating (Std capacity screw) lbf (kN)	Dynamic Load Rating (High capacity screw) lbf (kN)	Life at Max Force (Std capacity screw) 10 ⁶ in (Km)	Life at Max Force (High capacity screw) 10 ⁶ in (Km)	Max Input Torque lbf-in (Nm)	Max Rated Input rpm	Weight Base lb (kg)
FT45-0605	4.8 (122)	6 (152)	0.197 (5)	10,000 (44.5)	11.5 (292)	30650 (136.3)	36800 (163.7)	5.67 (144.0)	9.81 (249.2)	392 (44.1)	3,500	57 (26)
FT45-0610			0.394 (10)		23.0 (583)	30400 (135.2)	36500 (162.4)	11.06 (280.9)	19.14 (486.3)	783 (88.2)		
FT45-1205	4.8 (122)	12 (305)	0.197 (5)	10,000 (44.5)	11.5 (292)	30650 (136.3)	36800 (163.7)	5.67 (144.0)	9.81 (249.2)	392 (44.1)	3,500	68 (31)
FT45-1210			0.394 (10)		23.0 (583)	30400 (135.2)	36500 (162.4)	11.06 (280.9)	19.14 (486.3)	783 (88.2)		
FT45-1805	4.8 (122)	18 (457)	0.197 (5)	10,000 (44.5)	11.5 (292)	30650 (136.3)	36800 (163.7)	5.67 (144.0)	9.81 (249.2)	392 (44.1)	3,500	79 (36)
FT45-1810			0.394 (10)		23.0 (583)	30400 (135.2)	36500 (162.4)	11.06 (280.9)	19.14 (486.3)	783 (88.2)		
FT45-2405	4.8 (122)	24 (610)	0.197 (5)	10,000 (44.5)	11.5 (292)	30650 (136.3)	36800 (163.7)	5.67 (144.0)	9.81 (249.2)	392 (44.1)	3,500	90 (41)
FT45-2410			0.394 (10)		23.0 (583)	30400 (135.2)	36500 (162.4)	11.06 (280.9)	19.14 (486.3)	783 (88.2)		
FT45-3605	4.8 (122)	36 (914)	0.197 (5)	10,000 (44.5)	11.5 (292)	30650 (136.3)	36800 (163.7)	5.67 (144.0)	9.81 (249.2)	392 (44.1)	3,500	112 (51)
FT45-3610			0.394 (10)		23.0 (583)	30400 (135.2)	36500 (162.4)	11.06 (280.9)	19.14 (486.3)	783 (88.2)		
FT45-4805	4.8 (122)	48 (1219)	0.197 (5)	10,000 (44.5)	8.2 (208)	30650 (136.3)	36800 (163.7)	5.67 (144.0)	9.81 (249.2)	392 (44.1)	2,500	135 (61)
FT45-4810			0.394 (10)		16.4 (417)	30400 (135.2)	36500 (162.4)	11.06 (280.9)	19.14 (486.3)	783 (88.2)		

FT35 Reflective Inertias	5 mm Lead	10 mm Lead	20 mm Lead	
NMT Unit - J (0)	0.0004087	0.0004121	0.0004259	kg-m ² (at input shaft)
NMT Unit - J (Stroke)	0.0000159	0.0000162	0.0000171	kg-m ² /inch of stroke
Inline w/ Coupler - J (0)	0.0005127	0.0005161	0.0005299	
Inline w/ Coupler - J (Stroke)	0.0000159	0.0000162	0.0000171	
Parallel 1:1 - J (0)	0.0011042	0.0011855	0.0014480	kg-m ² (at motor shaft)
Parallel 1:1 - J (Stroke)	0.0000159	0.0000162	0.0000171	kg-m ² /inch of stroke
Parallel 2:1 - J (0)	0.0014029	0.0014038	0.0015345	
Parallel 2:1 - J (Stroke)	0.0000040	0.0000040	0.0000043	

*Pulleys for parallel mount match actuator max performance ratings

FT45 Reflective Inertias	5 mm Lead	10 mm Lead	
NMT Unit - J (0)	0.002463	0.002474	kg-m ² (at input shaft)
NMT Unit - J (Stroke)	0.000045	0.000046	kg-m ² /inch of stroke
Inline w/ Coupler - J (0)	0.002571	0.002581	
Inline w/ Coupler - J (Stroke)	0.000045	0.000046	
Parallel 1:1 - J (0)	0.006911	0.006921	kg-m ² (at motor shaft)
Parallel 1:1 - J (Stroke)	0.000045	0.000046	kg-m ² /inch of stroke
Parallel 2:1 - J (0)	0.003466	0.003469	
Parallel 2:1 - J (Stroke)	0.000011	0.000011	

*Pulleys for parallel mount match actuator max performance ratings

Intermediate and custom stroke lengths are available. Intermediate leads may also be available. Belt and pulley inertia varies with ratio & motor selection. Please contact your local sales representative. See page 78 for definition of terms.

FT60 Series Performance Specifications

Model No.	Nominal Frame Size in (mm)	Stroke in (mm)	Screw Lead in (mm)	Max Force* lbf (kN)	Linear Speed at Max Rated RPM in/sec (mm/sec)	Dynamic Load Rating (Std capacity screw) lbf (kN)	Dynamic Load Rating (High capacity screw) lbf (kN)	Life at Max Force (Std capacity screw) 10 ⁶ in (Km)	Life at Max Force (High capacity screw) 10 ⁶ in (Km)	Max Input Torque lbf-in (Nm)	Max Rated Input rpm	Weight Base lb (kg)
FT60-1206	6.0 (152)	12 (305)	0.236 (6)	20,000 (89.0)	7.9 (201)	51,900 (230.9)	57,933 (257.7)	4.1 (104.8)	5.7 (145.8)	940 (106)	2000	100 (45)
FT60-1212			0.472 (12)		15.8 (401)	44,600 (198.4)	49,750 (221.3)	5.2 (133.1)	7.3 (184.7)	1880 (212)		
FT60-1230			1.181 (30)		39.0 (1000)	41,700 (185.5)	63,958 (284.5)	10.7 (271.9)	38.6 (981.1)	4699 (531)		
FT60-2406	6.0 (152)	24 (610)	0.236 (6)	20,000 (89.0)	7.9 (201)	51,900 (230.9)	57,933 (257.7)	4.1 (104.8)	5.7 (145.8)	940 (106)	2000	130 (59)
FT60-2412			0.472 (12)		15.8 (401)	44,600 (198.4)	49,750 (221.3)	5.2 (133.1)	7.3 (184.7)	1880 (212)		
FT60-2430			1.181 (30)		39.0 (1000)	41,700 (185.5)	63,958 (284.5)	10.7 (271.9)	38.6 (981.1)	4699 (531)		
FT60-3606	6.0 (152)	36 (914)	0.236 (6)	20,000 (89.0)	7.9 (201)	51,900 (230.9)	57,933 (257.7)	4.1 (104.8)	5.7 (145.8)	940 (106)	2000	160 (72)
FT60-3612			0.472 (12)		15.8 (401)	44,600 (198.4)	49,750 (221.3)	5.2 (133.1)	7.3 (184.7)	1880 (212)		
FT60-3630			1.181 (30)		39.0 (1000)	41,700 (185.5)	63,958 (284.5)	10.7 (271.9)	38.6 (981.1)	4699 (531)		
FT60-4806	6.0 (152)	48 (1219)	0.236 (6)	20,000 (89.0)	7.9 (201)	51,900 (230.9)	57,933 (257.7)	4.1 (104.8)	5.7 (145.8)	940 (106)	2000	190 (86)
FT60-4812			0.472 (12)		15.8 (401)	44,600 (198.4)	49,750 (221.3)	5.2 (133.1)	7.3 (184.7)	1880 (212)		
FT60-4830			1.181 (30)		39.0 (1000)	41,700 (185.5)	63,958 (284.5)	10.7 (271.9)	38.6 (981.1)	4699 (531)		

Intermediate and custom stroke lengths are also available. Intermediate leads may also be available. Belt and pulley inertia varies with ratio and motor selection.

* Maximum allowable actuator-generated force that can be applied routinely. Exceeding this force may result in permanent damage to the actuator. For maximum allowable externally-applied axial forces, consult factory. For high force, short stroke applications, consult factory.

Standard Inline Coupling Maximum Torque Ratings and Inertia

FT60	Torque Rating	Inertia
	885 lbf-in (100 N-m)	0.000330 kg-m ² (0.002921 lbf-in s ²)

Shown right are pulley inertias reflected at motor including typical pulleys, belt and standard bushings. Because of differences in belt and pulley selection due to particular motor choices, please contact your local sales representative if these values are critical to your application.

FT60 Reflective Inertias

	6 mm Lead	12 mm Lead	30 mm Lead	
NMT Unit - J (0)	0.0078464	0.0078709	0.0080424	kg-m ² (at input shaft)
NMT Unit - J (Stroke)	0.0002539	0.0002547	0.0002600	kg-m ² /inch of stroke
Inline w/ Coupler - J (0)	0.0081764	0.0082009	0.0083724	kg-m ² (at motor shaft)
Inline w/ Coupler - J (Stroke)	0.0002539	0.0002547	0.0002600	
Parallel 1:1 - J (0)	0.0129357	0.0146113	0.0312682	kg-m ² /inch of stroke
Parallel 1:1 - J (Stroke)	0.0002539	0.0002547	0.0002600	
Parallel 2:1 - J (0)	0.0049158	0.0057202	0.0214777	
Parallel 2:1 - J (Stroke)	0.0000635	0.0000637	0.0000650	

*Pulleys for parallel mount match actuator max performance ratings

DEFINITIONS:

Max Linear Speed: The linear speed achieved by the actuator at a screw speed equal to the max rotational speed value.

Max Force: Values are derived from the design capacity of the FT actuator and should not be exceeded or relied upon for continuous operation.

Dynamic Load Rating: A design constant used in calculating the estimated travel life of the roller screw. The dynamic mean load is the mean load at which the device will perform one million revolutions.

Torque at Rated Force: The torque required at the screw to produce the force rating.

Screw Inertia: The rotary inertia of the planetary roller screw in the actuator.

Max. Rot. Speed: The maximum allowable rotational screw speed determined by the screw length or the rotational speed limit of the roller screw nut.

FT80 Series Performance Specifications

Model No.	Nominal Frame Size in (mm)	Stroke in (mm)	Screw Lead in (mm)	Max Force* lbf (kN)	Linear Speed at Max Rated RPM in/sec (mm/sec)	Dynamic Load Rating (Std capacity screw) lbf (kN)	Dynamic Load Rating (High capacity screw) lbf (kN)	Life at Max Force (Std capacity screw) 10 ⁶ in (Km)	Life at Max Force (High capacity screw) 10 ⁶ in (Km)	Max Input Torque lbf-in (Nm)	Max Rated Input rpm	Weight Base lb (kg)
FT80-1206	8.0 (203)	12 (305)	0.236 (6)	40,000 (177.9)	6.9 (175)	80,700 (359)	94,330 (419.6)	1.94 (49.3)	3.1 (78.7)	1,880 (212)	1750	190 (86)
FT80-1212			0.472 (12)		13.8 (351)	70,200 (312.2)	84,079 (374)	2.55 (64.9)	4.4 (111.4)	3,760 (425)		
FT80-1230			1.181 (30)		34.4 (875)	64,700 (287.8)	95,971 (426.9)	5.00 (127)	16.3 (414.3)	9,399 (1,062)		
FT80-2406	8.0 (203)	24 (610)	0.236 (6)	40,000 (177.9)	6.9 (175)	80,700 (359)	94,330 (419.6)	1.94 (49.3)	3.1 (78.7)	1,880 (212)	1750	265 (120)
FT80-2412			0.472 (12)		13.8 (351)	70,200 (312.2)	84,079 (374)	2.55 (64.9)	4.4 (111.4)	3,760 (425)		
FT80-2430			1.181 (30)		34.4 (875)	64,700 (287.8)	95,971 (426.9)	5.00 (127)	16.3 (414.3)	9,399 (1,062)		
FT80-3606	8.0 (203)	36 (914)	0.236 (6)	40,000 (177.9)	6.9 (175)	80,700 (359)	94,330 (419.6)	1.94 (49.3)	3.1 (78.7)	1,880 (212)	1750	340 (153)
FT80-3612			0.472 (12)		13.8 (351)	70,200 (312.2)	84,079 (374)	2.55 (64.9)	4.4 (111.4)	3,760 (425)		
FT80-3630			1.181 (30)		34.4 (875)	64,700 (287.8)	95,971 (426.9)	5.00 (127)	16.3 (414.3)	9,399 (1,062)		
FT80-4806	8.0 (203)	48 (1219)	0.236 (6)	40,000 (177.9)	6.9 (175)	80,700 (359)	94,330 (419.6)	1.94 (49.3)	3.1 (78.7)	1,880 (212)	1750	415 (187)
FT80-4812			0.472 (12)		13.8 (351)	70,200 (312.2)	84,079 (374)	2.55 (64.9)	4.4 (111.4)	3,760 (425)		
FT80-4830			1.181 (30)		34.4 (875)	64,700 (287.8)	95,971 (426.9)	5.00 (127)	16.3 (414.3)	9,399 (1,062)		

Intermediate and custom stroke lengths are also available. Intermediate leads may also be available. Belt and pulley inertia varies with ratio and motor selection. Please contact your local sales representative. See page 78 for definitions of terms.

* Maximum allowable actuator-generated force that can be applied routinely. Exceeding this force may result in permanent damage to the actuator. For maximum allowable externally-applied axial forces, consult factory. For high force, short stroke applications, consult factory.

Standard Inline Coupling Maximum Torque Ratings and Inertia

FT80	Torque Rating	Inertia
	1770 lbf-in (200 N-m)	0.0001210 kg-m ² (0.010709 lbf-in ²)

Shown right are pulley inertias reflected at motor including typical pulleys, belt and standard bushings. Because of differences in belt and pulley selection due to particular motor choices, please contact your local sales representative if these values are critical to your application.

FT80 Reflective Inertias

	6 mm Lead	12 mm Lead	30 mm Lead	
NMT Unit - J (0)	0.0302504	0.0303275	0.0308673	kg-m ² (at input shaft)
NMT Unit - J (Stroke)	0.0008022	0.0008035	0.0008124	kg-m ² /inch of stroke
Inline w/ Coupler - J (0)	0.0314604	0.0315375	0.0320773	kg-m ² (at motor shaft)
Inline w/ Coupler - J (Stroke)	0.0008022	0.0008035	0.0008124	
Parallel 1:1 - J (0)	0.0721056	0.0535533	0.1342578	kg-m ² /inch of stroke
Parallel 1:1 - J (Stroke)	0.0008022	0.0008035	0.0008124	
Parallel 2:1 - J (0)	0.0198765	0.0270490	0.0753395	
Parallel 2:1 - J (Stroke)	0.0002006	0.0002009	0.0002031	

*Pulleys for parallel mount match actuator max performance ratings

FT Series Mechanical Specifications

Model No.	FT35, FT45, FT60, FT80
Roller Screw Backlash <i>in (mm)</i>	0.0004 - 0.001 (0.01 - 0.03)
System Backlash* <i>in (mm)</i>	0.002 (0.06)
Standard Lead Accuracy** <i>in/ft (mm/300mm)</i>	0.001 (0.025)
Friction Torque Values <i>lbf in (nm)</i>	FT35: 7.0 (0.79) FT45: 11.0 (1.24) FT60: 14.0 (1.58) FT80: 35.0 (3.95)
Maximum Allowable Side Load	See chart pg 88
Environmental Rating (Base Unit Only)***	IP65S Standard
Case: Standard Optional	Epoxy-coated aluminum Food Grade Coating

* System backlash will be different with various types of motor mounting arrangements and couplings. Please discuss your particular configuration with your local sales representative.

** Optional lead accuracy – from 0.0002 in/ft (6 µm/300 mm) to 0.002 in/ft (200 µm/10000 mm) – are also available.

*** For IP65S scaling of unit with motor mounted, Please contact your local sales representative.

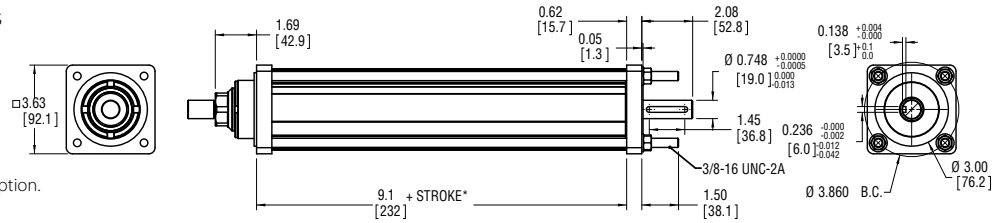
FT35 Series Linear Actuators

FT35 Base Actuator

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

*Add 20mm if choosing high capacity option.



FT35 Clevis Mount

Parallel motor mount shown.

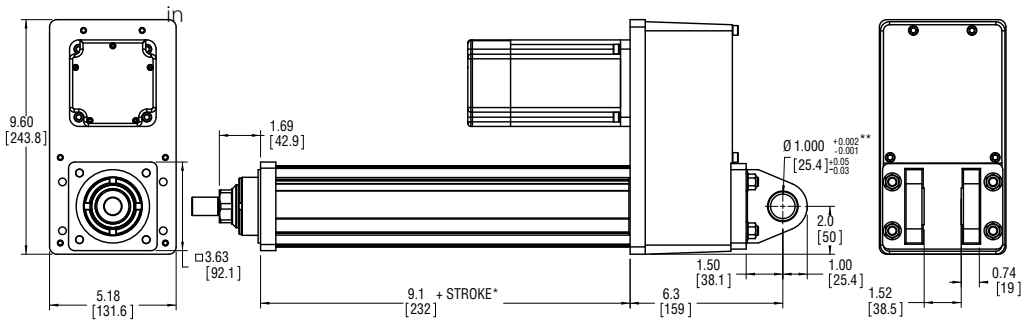
All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

*Add 20mm if choosing high capacity option.

** If "G" metric clevis option, $\varnothing 27$ mm + 0.00 / - 0.06



FT35 Front Flange Mount

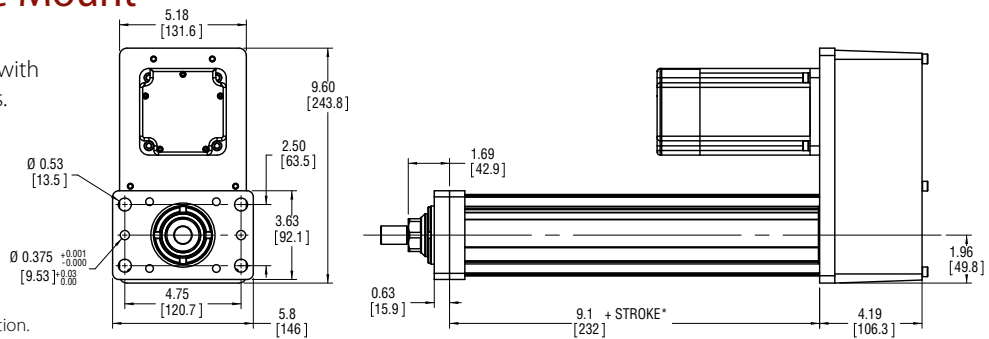
Parallel motor mount shown.

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

*Add 20mm if choosing high capacity option.



FT35 Rear Flange Mount

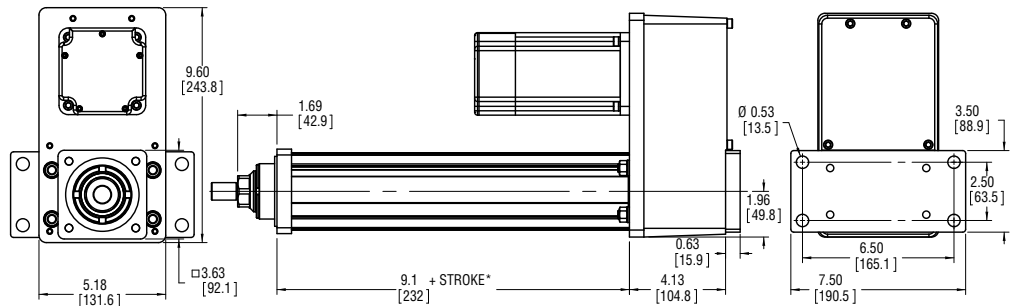
Parallel motor mount shown.

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

*Add 20mm if choosing high capacity option.



Drawings subject to change. Consult Exlar for certified drawings.

FT35 Trunnion Mount

Parallel motor mount shown.

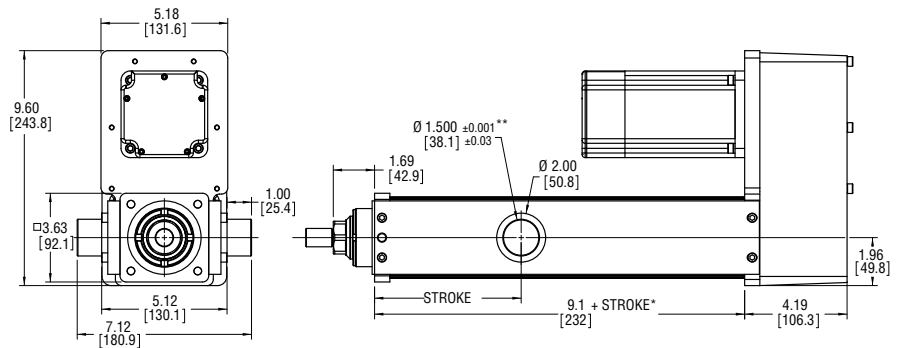
All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

*Add 20mm if choosing high capacity option.

** If "Q" metric side trunnion option, \varnothing 35 mm h7



FT35 Extended Tie Rod Mount

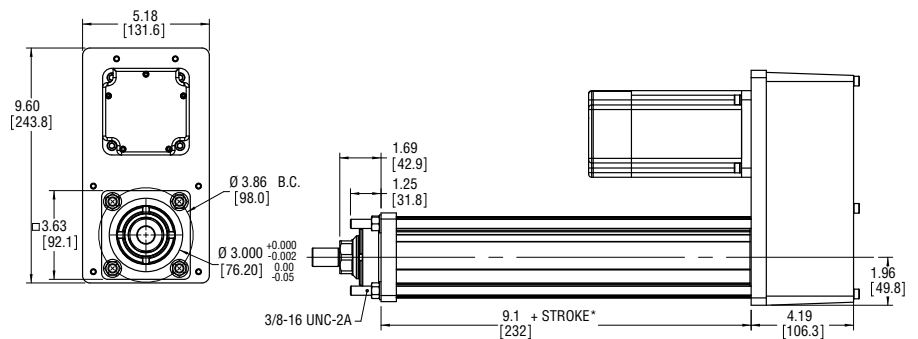
Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

*Add 20mm if choosing high capacity option.



FT35 Side Lug Mount

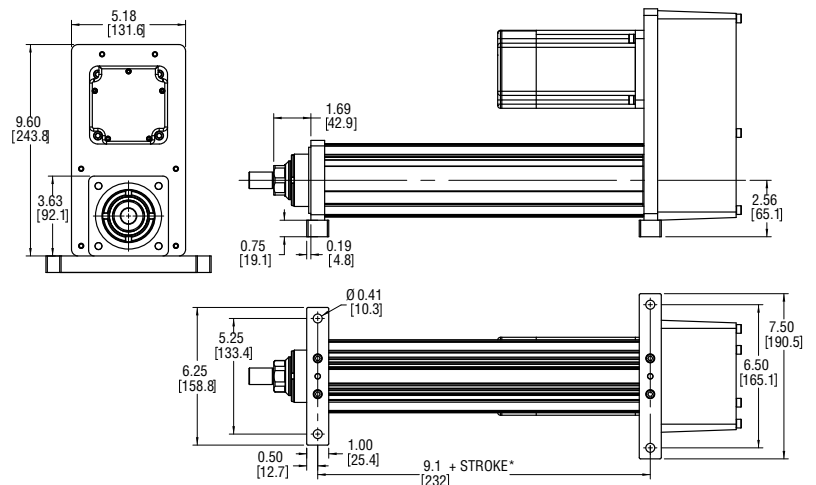
Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

*Add 20mm if choosing high capacity option.



FT35 Side Mount

Parallel motor mount shown.

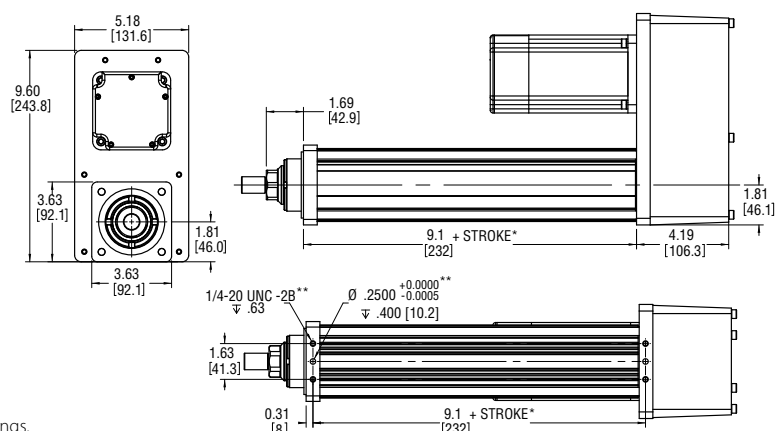
All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

*Add 20mm if choosing high capacity option.

** If "J" or "K" metric side mount options, M6 x 1.0 ∇ 9 mm with \varnothing 6 mm M7 ∇ 9 mm Dowel Hole



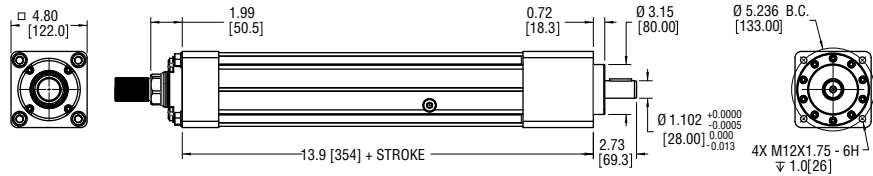
Drawings subject to change. Consult Exlar for certified drawings.

FT45 Series Linear Actuators

FT45 Base Actuator

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.



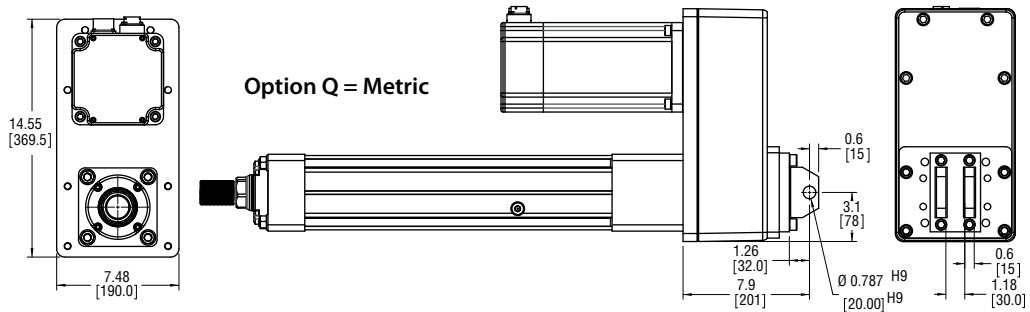
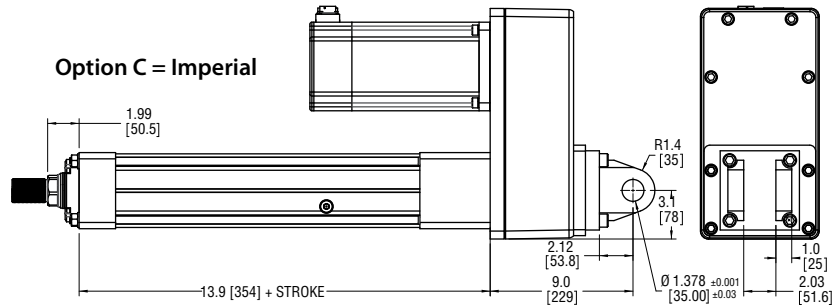
FT45 Clevis Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



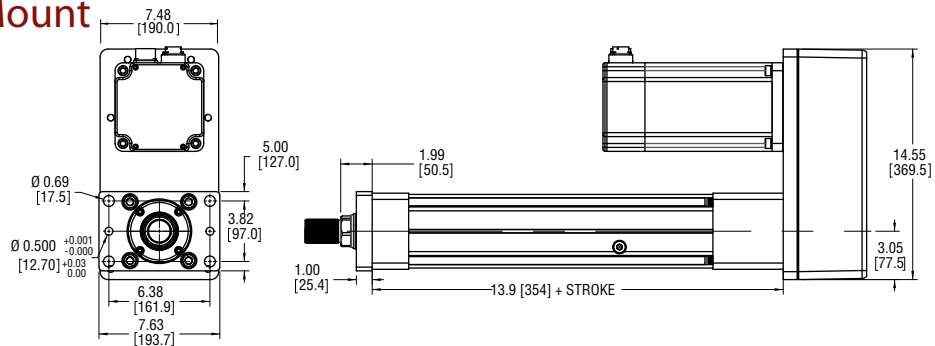
FT45 Front Flange Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



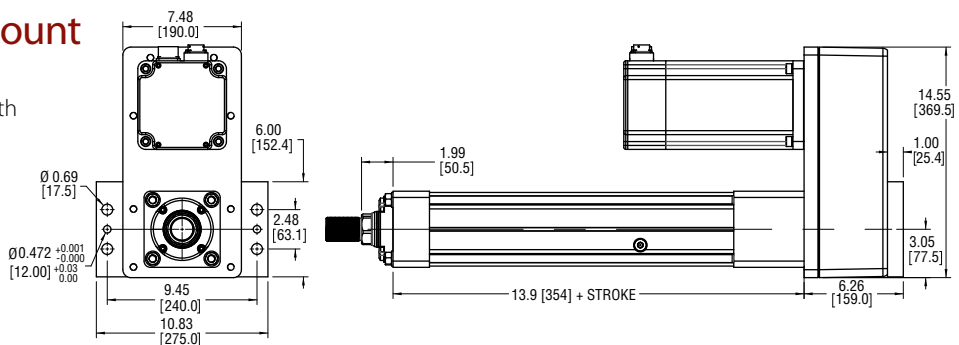
FT45 Rear Flange Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



Drawings subject to change. Consult Exlar for certified drawings.

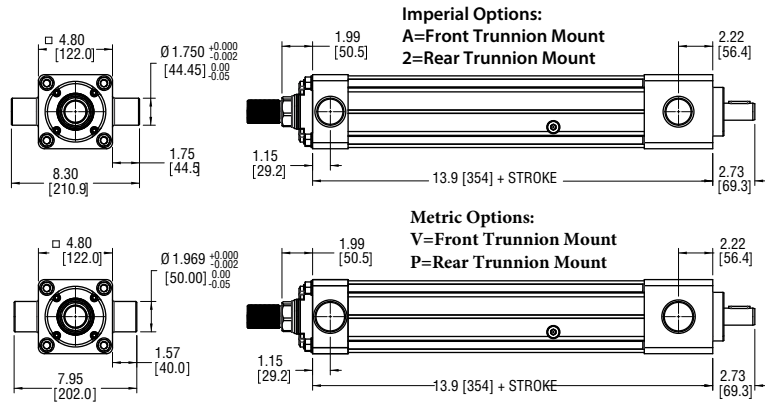
FT45 Trunnion Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



FT45 Extended Tie Rod Mount

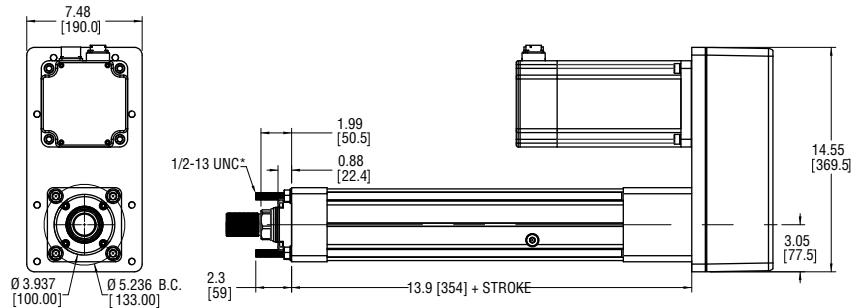
Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

*If "M" metric extended tie rod option, M12 x 1.75-6g



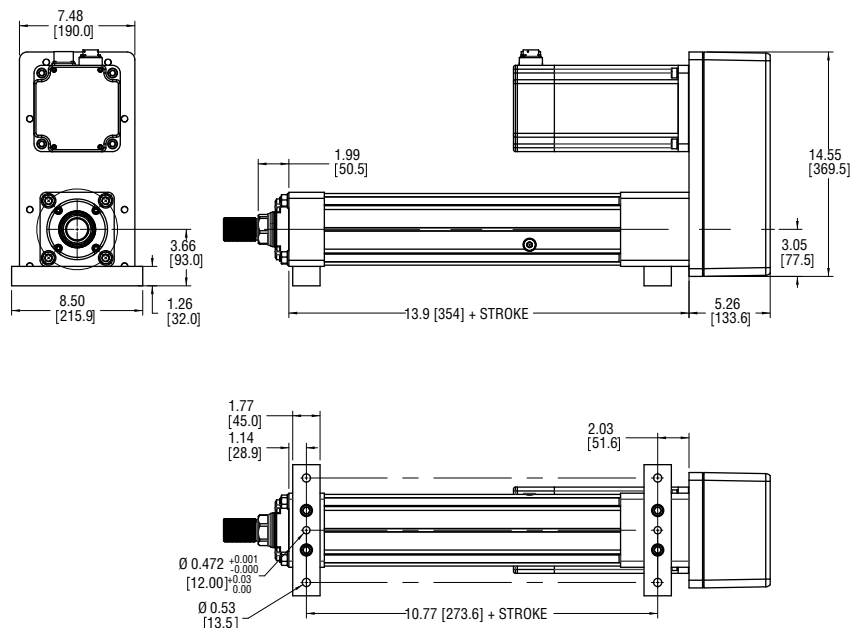
FT45 Side Lug Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



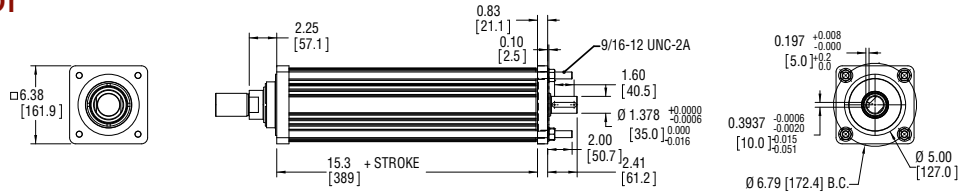
Drawings subject to change. Consult Exlar for certified drawings.

FT60 Series Linear Actuators

FT60 Base Actuator

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.



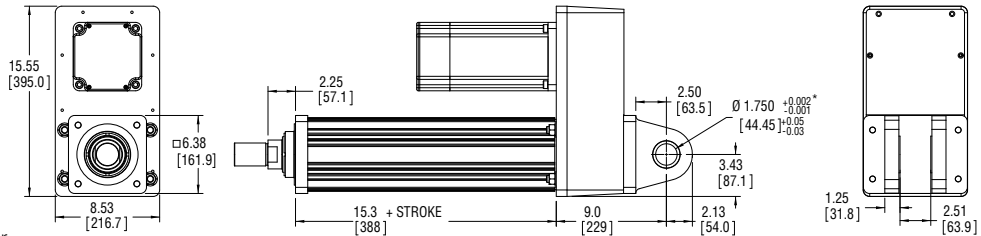
FT60 Clevis Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



* If "G" metric clevis option, $\varnothing 45$ mm + 0.00 / - 0.08

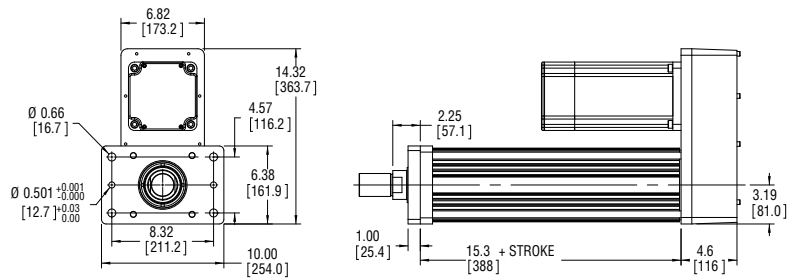
FT60 Front Flange Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



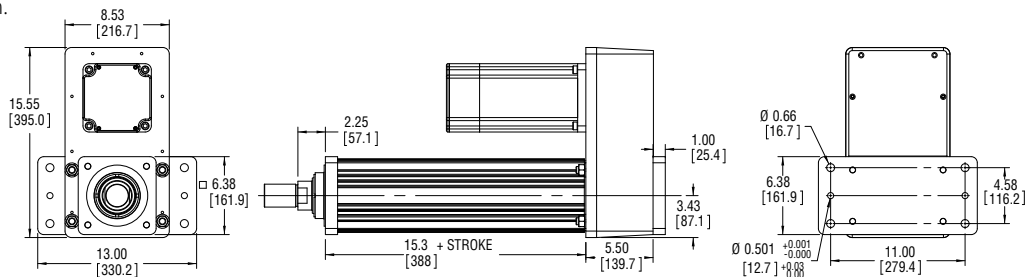
FT60 Rear Flange Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



Drawings subject to change. Consult Exlar for certified drawings.

FT60 Trunnion Mount

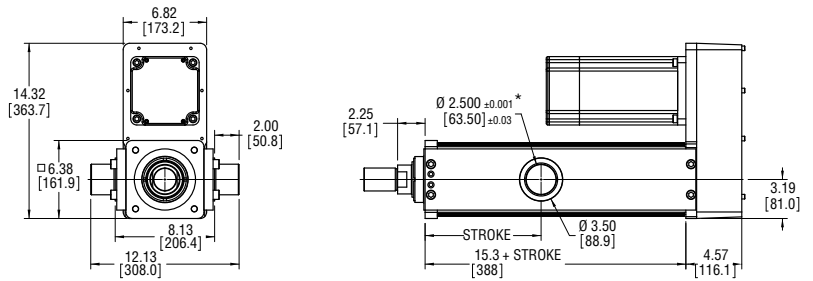
Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

* If "Q" metric side trunnion option, $\varnothing 60$ mm h9



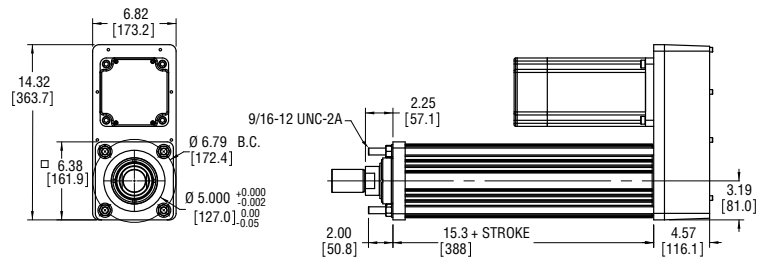
FT60 Extended Tie Rod Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



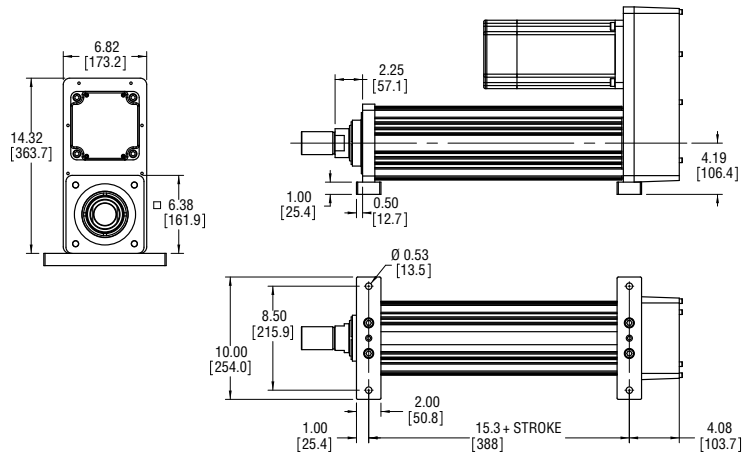
FT60 Side Lug Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



FT60 Side Mount

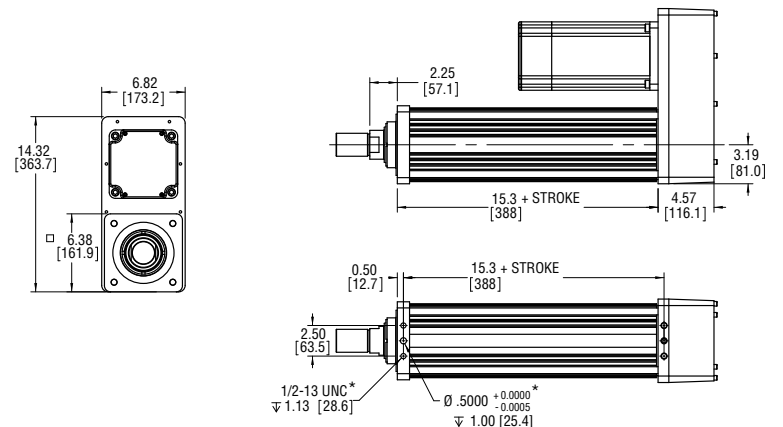
Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

* If "J" or "K" metric side mount options, M12 x 1.75 ∇ 19 mm with $\varnothing 12$ mm M7 ∇ 12 mm Dowel Hole



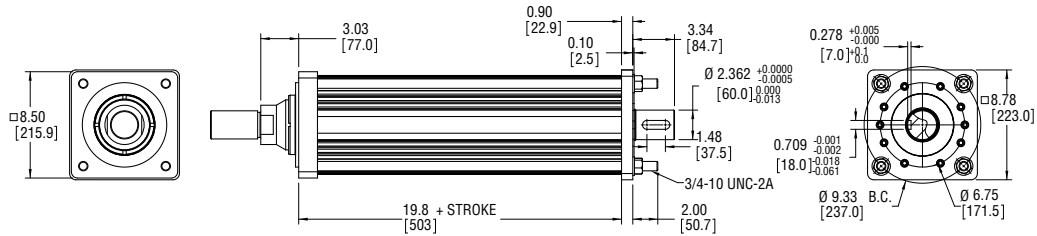
Drawings subject to change. Consult Exlar for certified drawings.

FT80 Series Linear Actuators

FT80 Base Actuator

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.



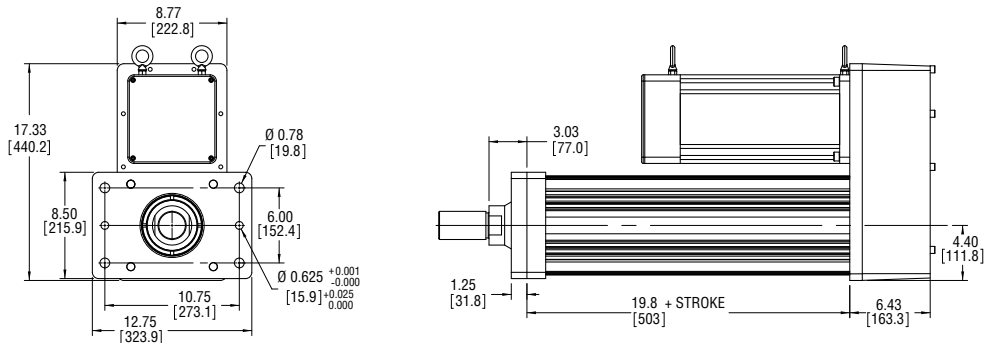
FT80 Front Flange Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



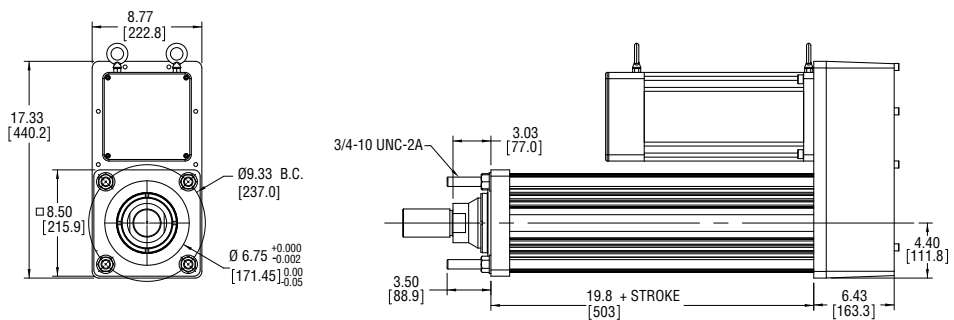
FT80 Extended Tie Rod Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeter equivalent in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



Drawings subject to change. Consult Exlar for certified drawings.

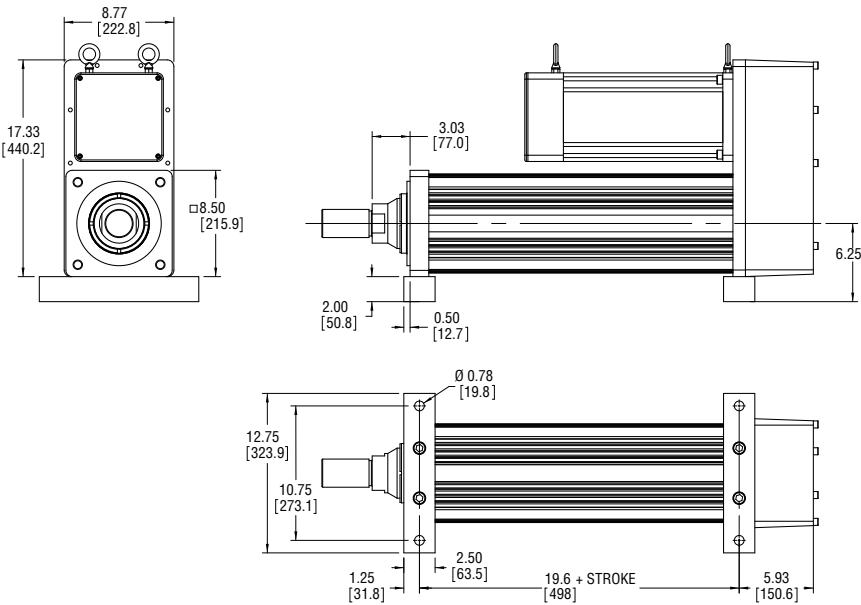
FT80 Side Lug Mount

Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.



FT80 Side Mount

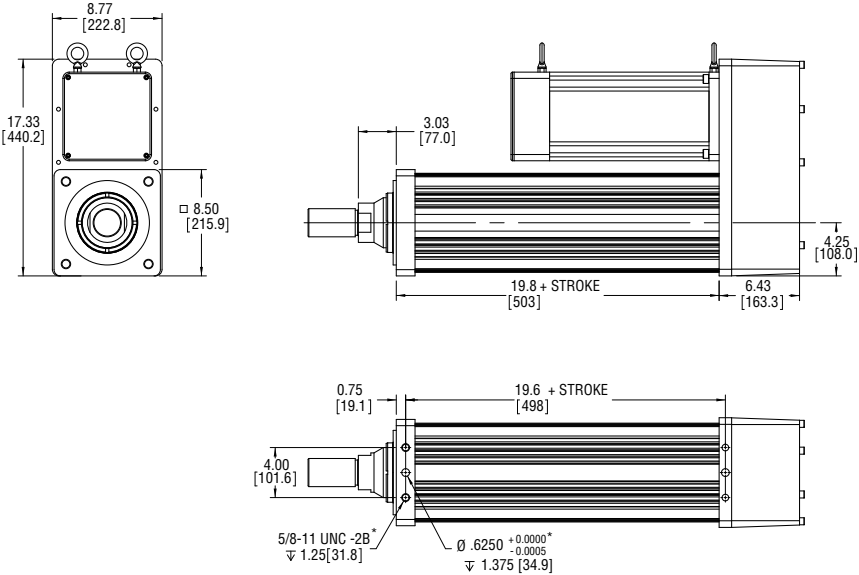
Parallel motor mount shown.

All dimensions shown in inches with millimeters equivalents in brackets.

See rod ends for rod end thread details.

Motor plate and cover dimensions are subject to change depending on the motor and ratio selection.

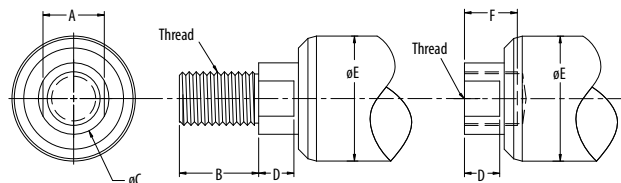
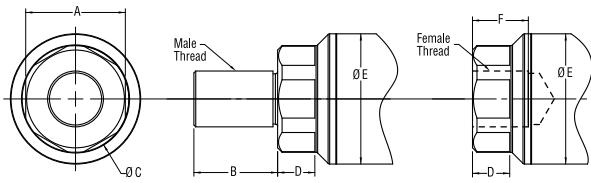
* If "J" or "K" metric side mount options,
M16 x 2.0 ∇ 16 mm with \varnothing 12 mm
M7 ∇ 12 mm Dowel Hole



NOTE: For Clevis, Trunnion or Rear Flange, Consult Exlar

FT Series Linear Actuators

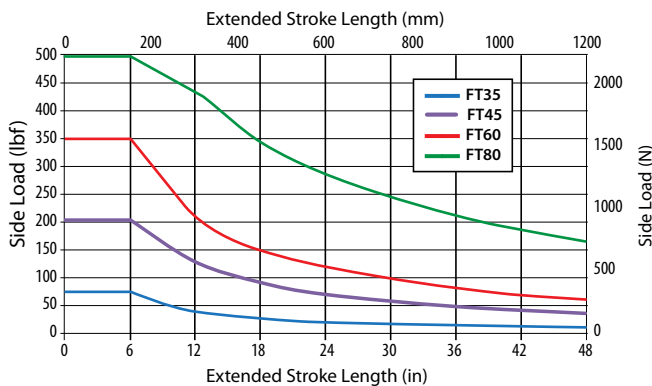
Rod Ends



	A	B	ØC	D	ØE	F	Male U.S.	Male Metric	Female U.S.	Female Metric
	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)				
FT35	1.34 (34)	1.125 (28.6)	1.434 (36.4)	0.50 (12.7)	1.750 (44.5)	0.750 (19.1)	3/4-16 UNF-2A	M16x1.5 6g	3/4-16 UNF-2B	M16x1.5 6h
FT45	1.81 (46.0)	2.25 (57.2)	2.0 (50.8)	0.63 (15.9)	2.250 (57.2)	1.50 (38.1)	1 1/2-12 UN-2A	M36x3 6g	1 1/2-12 UN-2B	M36x3 6h

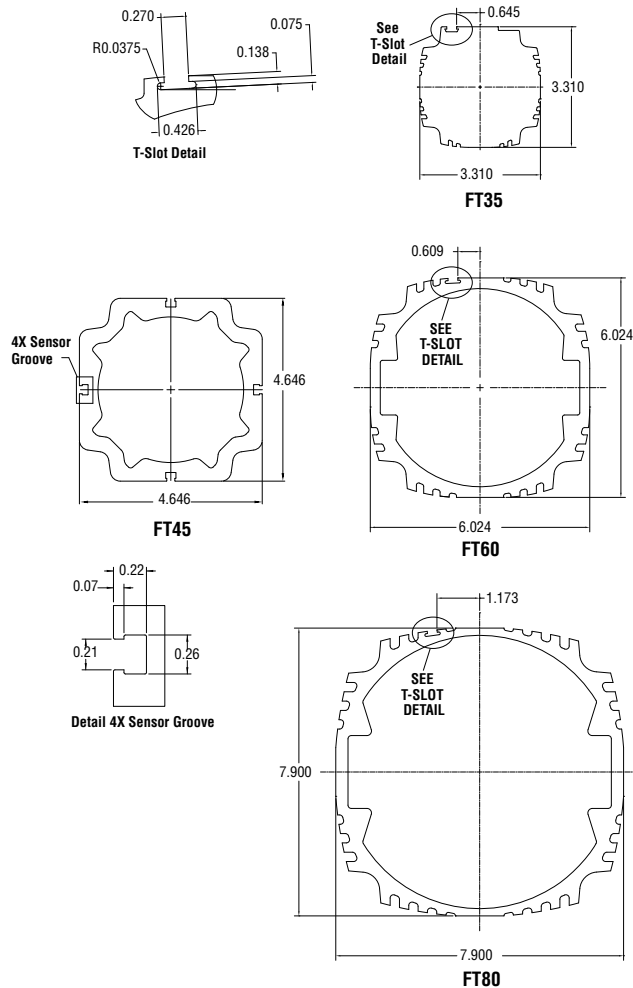
	A	B	ØC	D	ØE	F	Male U.S.	Male Metric	Female U.S.	Female Metric
	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)				
FT60	2.00 (50.8)	2.750 (69.9)	2.360 (59.9)	0.750 (19.1)	3.000 (76.2)	2.000 (50.8)	1 7/8-12 UN-2A	M42x4.5 6g	1 7/8-12 UN-2B	M42x4.5 6h
FT80	2.75 (69.9)	4.019 (102.1)	3.143 (79.8)	1.000 (25.4)	4.000 (101.6)	2.250 (57.2)	2 1/2-12 UN-2A	M56x5.5 6g	2 1/2-12 UN-2B	M56x5.5 6h

FT Series Max. Allowable Side Load



*Side load values derived from limiting PV of bronze bushing

Case Dimensions



AA = FT Frame Size

- 35 = 3.5 inch (90 mm)
- 45 = 4.8 inch (122 mm)
- 60 = 6.0 inch (150 mm)
- 80 = 8.0 inch (200 mm)

BB = Stroke Length

- 06 = 6 inch (152 mm) FT35
- 12 = 12 inch (305 mm) FT35, 45, 60, 80
- 18 = 18 inch (457 mm) FT35, 45
- 24 = 24 inch (610 mm) FT35, 45, 60, 80
- 36 = 36 inch (914 mm) FT35, 45, 60, 80
- 48 = 48 inch (1219 mm) FT35, 45, 60, 80

CC = Screw Lead

- 05 = 0.2 inch, FT35, 45
- 06 = 0.23 inch, FT60, 80
- 10 = 0.39 inch, FT35, 45
- 12 = 0.47 inch, FT60, 80
- 20 = 0.79 inch, FT35
- 30 = 1.18 inch, FT60, 80

D = Mounting Style¹

- N = None**
- B = Front/rear flange, English⁴
- F = Front flange, English
- Z = Front flange, Metric, FT45
- R = Rear flange, English⁴
- C = Rear clevis, English^{4,5}
- G = Rear clevis, Metric^{4,5}
- Y = Rear eye, English⁴, FT45
- W = Rear eye, Metric⁴, FT45
- L = Side lugs
- S = Side mount, English
- J = Side mount, Metric
- D = Double side mount, English
- K = Double side mount, Metric
- T = Side trunnion mount, English^{5,7}
FT35, 60, 80
- Q = Side trunnion mount, Metric^{5,7}
FT35, 60, 80
- A = Front trunnion mount, English, FT45
- V = Front trunnion mount, Metric, FT45
- 2 = Rear trunnion mount, English, FT45
- P = Rear trunnion mount, Metric, FT45
- E = Extended tie rods, English
- M = Extended tie rods, Metric
- X = Special (please specify)

E = Motor Mounting Configurations

- N = None**
- I = Inline direct drive (includes Exlar standard coupling)
- P = Parallel, 1:1 belt reduction
- Q = Parallel, 2:1 belt reduction
- X = Special

F = Rod End

- M = Male, US std. thread
- A = Male, metric thread
- F = Female, US std. thread
- B = Female, metric thread
- W = Male, US std. thread SS, rod end only
- R = Male metric thread SS, rod end only
- V = Female, US std. thread SS, rod end only
- L = Female, metric thread SS, rod end only
- X = Special (please specify)

GGG = Motor Mount Provisions⁴

- AA# = Alpha numeric motor call out – Contact your local sales representative. Motor not included.
- NMT = No motor mount – keyed shaft on base unit only
- N23 = Nema 23 standard dimension
- N34 = Nema 34 standard dimension
- N42 = Nema 42 standard dimension
- N56 = Nema 56 standard demension
- M60 = Exlar 60 mm SLM. Motor not included.
- M90 = Exlar 90 mm SLM. Motor not included.
- M11 = Exlar 115 mm SLM and ER. Motor not included.
- M14 = Exlar 142 mm SLM. Motor not included.
- M18 = Exlar 180 mm SLM. Motor not included.
- G60 = Exlar 60 mm SLG. Motor not included.
- G90 = Exlar 90 mm SLG. Motor not included.
- G11 = Exlar 115 mm SLG and ER. Motor not included.
- AB3, 4, 6, 8 = Allen Bradley Ultra 3, 4, 6 and 8 inch motors
- BD3, 4, 6, 8 = Baldor 3, 4, 6 & 8 inch motors
- CM3, 4, 6, 8 = Parker (Custom Servo Motors) Metric 3, 4, 6 & 8 inch motors
- EE3, 4 = Emerson EMC Imperial 3 & 4 inch
- EM3, 4, 6, 8 = Emerson EMC Metric 3, 4, 6 & 8 inch
- FA 4, 6, 8 = Fanuc 4, 6 & 8 inch motors
- IN3, 4, 6, 8 = Bosch-Rexroth (Indramat) 3, 4, 6 and 8 inch motors
- KM2, 4, 6, 8 = Kollmorgen B & M 20, 40, 60 and 80 Series
- MT3, 4, 6, 8 = Mitsubishi 3, 4, 6 & 8 inch motors
- PS3, 4, 6, 8 = Pacific Scientific PMA/PMB Series
- PC2, 3, 4, 6 = Parker Compumotor Apex 2.7, 3.6, 4.5 and 5.6 inch
- SM2 = Siemens 2 inch motor
- SM3 = Siemens 3 inch motor
- YS3, 4, 6, 8 = Yaskawa 3, 4, 6 and 8 inch motors

XX .. XX = Options

Housing Options

- XH = Special housing options
- HC = Type III hard coat anodized, class I²
- XT = High capacity roller screw
- SS = Stainless steel²
- FG = Smooth white epoxy²
- (IP65S sealing of unit with motor mounted requires "XH" option.)²
- XL = Special Lubricant (Please specify)

Special Follower

- PF = Preloaded follower⁶

End Switches (adjustable position throughout stroke)

- L1 = One adjustable switch, (10-30 VDC, PNP, N.C., 1m. 3 wire embedded cable)
- L2 = Two adjustable switches, (10-30 VDC, PNP, N.C., 1m. 3 wire embedded cable)
- L3 = Three adjustable switches, (10-30 VDC, PNP, N.C., 1m. 3 wire embedded cable)

Please provide a drawing of motor dimensions with all orders to insure proper mounting compatibility.

= Part No. Designator for Specials

Optional 5 digit assigned part number to designate unique model numbers for specials.

Note:

1. Mounting face size, shaft length and other details of particular motors may require special adapters or provisions for mounting. Always discuss your motor selection with your local sales representative.
2. These housing options may also indicate the need for special material main rods, faceplate and motor mounting provisions. Internal anti-rotate is not available with stainless steel options. Please contact your local sales representative.
3. MAX Std. motor size
FT35: 5.6 inch/142 mm
FT45: 7.1 inch/180 mm
FT60: 7.9 inch/200 mm
FT80: 8.5 inch/215 mm
For oversized motors, contact your local sales representative.
4. Not available with inline motor mount, contact your local sales representative.
5. Application details must be discussed for an FT80.
6. The dynamic load rating of zero backlash, preloaded screws is 63% of the dynamic load rating of the standard 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 non-preloaded screw for the same application.
7. IP65 environmental sealing option not available.