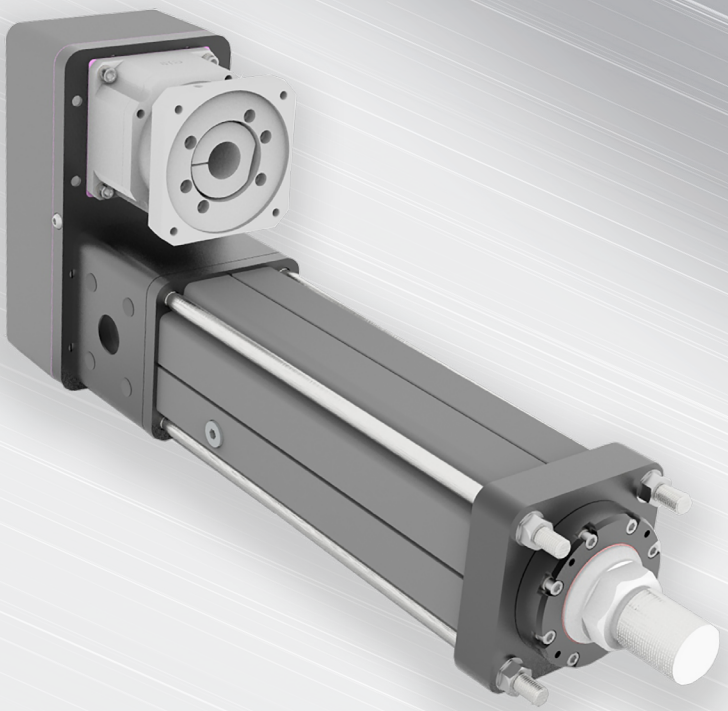
FTX Series
FTP Series



NEXT GENERATION HIGH FORCE ACTUATORS

- HYDRAULIC CYLINDER REPLACEMENT
- HIGH SPEED AND LONG LIFE
- LONG STROKE LENGTHS
- RUGGED AND RELIABLE

CURTISS-WRIGHT

EXLAR®

INDUSTRIAL ▪ ACTUATION ▪ SOLUTIONS

FTX Series
High Force Linear Actuators

Hydraulic Cylinder Replacement
Hydraulic cylinders provide long life and high force in a small package size. The FTX Series high force electric actuators were designed specifically to allow migration from traditional hydraulic actuation to electric. Based on planetary roller screw technology, the FTX offers life and force density not attainable with more common ball screw based electric actuators. With up to 15X the life and 2X the force density, the roller screw based FTX is the right choice when migrating from hydraulic to electric actuation.

Rugged and Reliable
Hydraulic cylinders are commonly installed in harsh industrial settings. Therefore all FTX Series models are environmentally sealed to IP65. In addition, its planetary roller screw mechanism withstands significantly higher shock loads than weaker ball screw alternatives. Migrate to electric with confidence knowing the FTX Series is every bit as rugged and reliable as the hydraulics they are designed to replace.

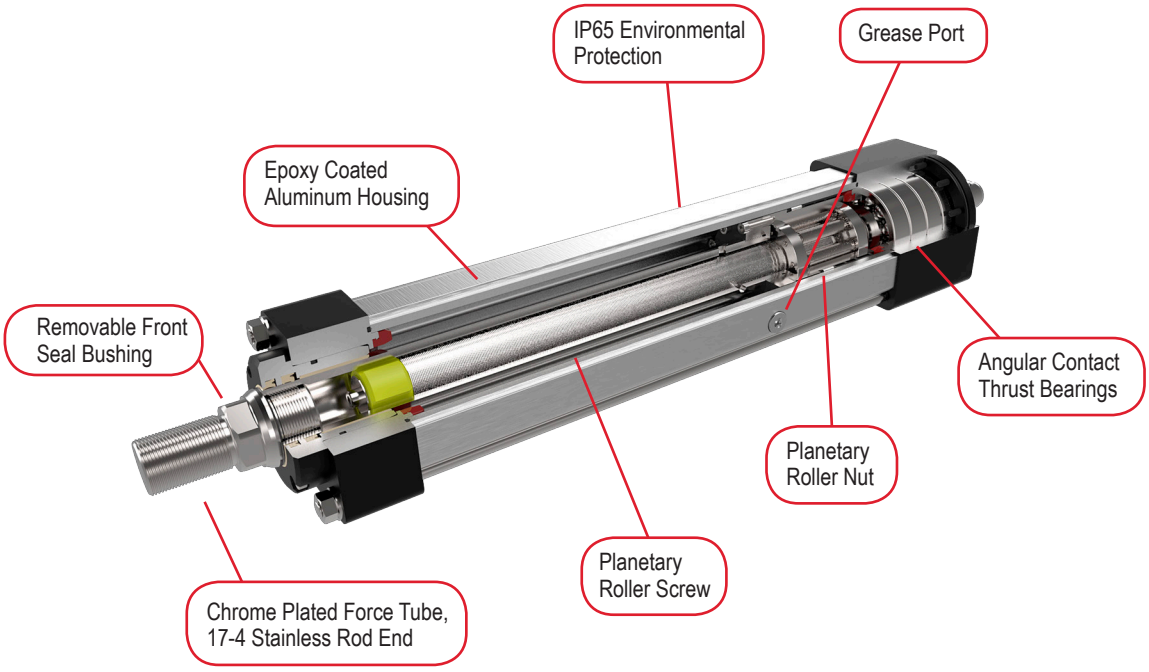
Minimal Maintenance
More and more machine builders are looking to eliminate the mess and downtime associated with hydraulic fluid leaks. Electric actuation not only eliminates the problems associated with fluid leaks, it offers significantly higher levels of performance and flexibility than is possible even with servo-hydraulic solutions. FTX Series roller screw actuators allow machine builders to meet the ever-increasing performance demands of their customers while minimizing or eliminating the maintenance issues associated with traditional hydraulic solutions.

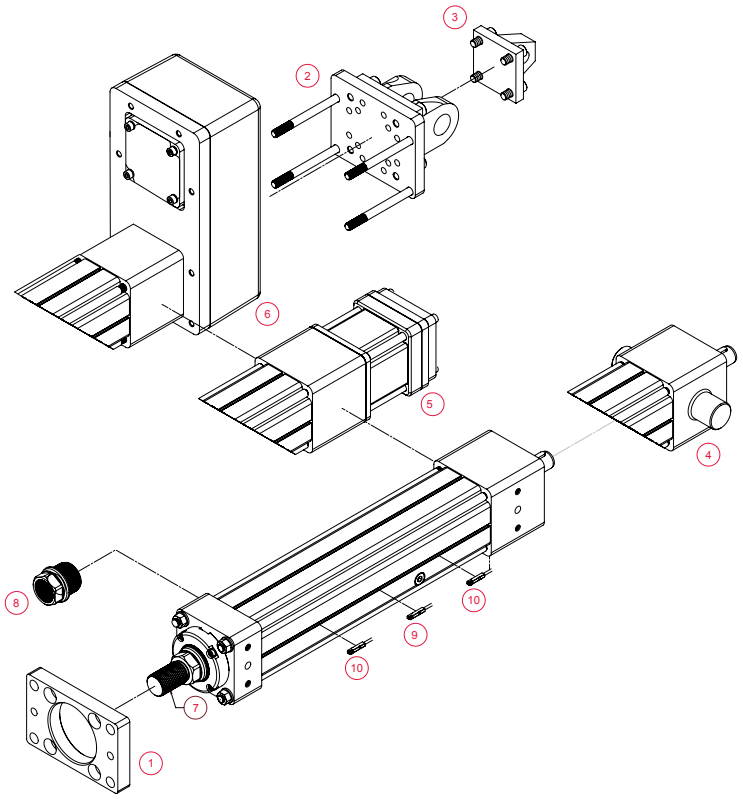
Technical Characteristics	
Frame Sizes - mm (in)	95 (3.74), 125 (5), 215 (8.5)
Screw Leads - mm (in)	5 (0.20), 6 (0.25), 10 (0.39), 12 (0.50), 20 (0.79), 30 (1.18)
Standard Stroke Lengths mm (in)	150 (6), 300 (12), 600 (24), 900 (36)
Force Range	up to 178 kN (40000 lbf)
Maximum Speed	up to 1500 mm/sec (59 in/sec)

Operating Conditions and Usage		
Accuracy:		
Screw Travel Variation	mm (in)	0.030 (0.0012)
Screw Lead Error	mm/300 mm (in/ft)	0.025 (0.001)
Screw Lead Backlash	mm (in)	0.06 (0.002)
Ambient Conditions:		
Standard Ambient Temperature	°C	-40° to 85°
IP Rating		IP65

* Consult Exlar for extended temperature operation.

Product Features





1 - Front flange
2 - Rear clevis
3 - Rear eye
4 - Rear trunnion
5 - Inline direct drive
6 - Parallel, 1:1 belt reduction
Parallel, 2:1 belt reduction
7 - Male, metric thread
8 - Female, metric thread
9 - External limit switch - N.O., PNP or NPN
10 - External limit switch - N.C., PNP or NPN

Standard Motor/Gearbox Mount Codes for the FTX

FTX095 (Inline or Parallel - 1:1)

Bolt Circle Diameter (mm)	Pilot Diameter (mm)	Shaft Diameter (mm)	Shaft Length (mm)	Key Width (mm)	Motor Mount Code
68	60	16	48	5	GFA
75	60	16	48	5	GHA
165	130	28	60	8	IRB
165	130	32	58	10	IRC
165	130	32	50	10	IRD
145	110	28	63	8	JQA

FTX095 (Parallel - 2:1)

Bolt Circle Diameter (mm)	Pilot Diameter (mm)	Shaft Diameter (mm)	Shaft Length (mm)	Key Width (mm)	Motor Mount Code
68	60	16	48	5	GFA
75	60	16	48	5	GHA
130	110	24	50	8	IPB
165	130	24	50	8	IRA
100	80	19	40	6	IMC
145	110	24	55	8	JQD

FTX125 (Inline or Parallel - 1:1)

Bolt Circle Diameter (mm)	Pilot Diameter (mm)	Shaft Diameter (mm)	Shaft Length (mm)	Key Width (mm)	Motor Mount Code
120	90	32	88	10	G7A
200	114.3	42	113	10	JSD
215	130	32	60	10	ITE
215	180	38	80	10	ITF
215	180	42	82	12	ITG

FTX125 (Parallel - 2:1)

Bolt Circle Diameter (mm)	Pilot Diameter (mm)	Shaft Diameter (mm)	Shaft Length (mm)	Key Width (mm)	Motor Mount Code
85	70	22	56	6	GIA
165	130	24	50	8	IRA
165	130	32	58	10	IRC
200	114.3	35	80	10	JSA

FTX215 (Inline or Parallel - 1:1)

Bolt Circle Diameter (mm)	Pilot Diameter (mm)	Shaft Diameter (mm)	Shaft Length (mm)	Key Width (mm)	Motor Mount Code
215	160	55	112	16	GTA
265	230	42	110	12	IVC
265	230	60	140	18	JVC
300	250	48	112	14	IWA
300	250	60	140	18	JWA

FTX215 (Parallel - 2:1)

Bolt Circle Diameter (mm)	Pilot Diameter (mm)	Shaft Diameter (mm)	Shaft Length (mm)	Key Width (mm)	Motor Mount Code
165	130	40	112	12	GRA
215	180	38	80	10	ITF
265	230	38	110	10	IVB
265	230	42	110	12	IVC

DEFINITIONS:

Maximum Force: Calculated Cubic Mean Load for the application should not exceed this value. (Values are derived from the design capacity of the FT Series actuator and should not be exceeded or relied upon for continuous operation.)

Life at Maximum Force: Estimated life that can be expected from the actuator when running at Maximum Force for intermittent periods of time. (Theoretical calculation based on the Dynamic Load Rating of the actuator and using the Maximum Force rating as the Cubic Mean Load.)

C_a (Dynamic Load Rating): A design constant used when calculating the estimated travel life of the roller screw.

Maximum Input Torque: The torque required at the screw to produce the Maximum Force rating. Exceeding this value can cause permanent damage to the actuator.

Maximum Rated RPM: The maximum allowable rotational screw speed determined by either screw length limitations or the rotational speed limit of the roller screw nut.

Maximum Linear Speed: The linear speed achieved by the actuator when Maximum Rated RPM is applied to the roller screw input shaft.

Mechanical Specifications

FTX095

		05	10	20
Screw Lead	mm	5	10	20
	in	0.197	0.394	0.787
Maximum Force*	kN	22.2	22.2	22.2
	lbf	5000	5000	5000
Life at Maximum Force	km	392	626	1440
	in x 10^6	15.4	24.6	56.7
C_a (Dynamic Load Rating)	kN	95.2	88.3	92.5
	lbf	21400	19850	20800
Maximum Input Torque	Nm	22.1	44.3	88.5
	lbf-in	196	392	783
Max Rated RPM @ Input Shaft	RPM	4500	4500	4500
Maximum Linear Speed @ Maximum Rated RPM	mm/sec	373	750	1500
	in/sec	14.7	29.5	59.3
Friction Torque	Nm	1.12	1.12	1.12
	lbf-in	10	10	10

Intermediate and custom stroke lengths are also available. Belt and pulley inertia varies with ratio and motor selection. Please contact your local sales representative.

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

Weights kg (lbs)

Base Actuator Weight (Zero Stroke)	kg	10
	lb	21
Actuator Weight Adder (Per 25 mm of stroke)	kg	0.39
	lb	0.87
Adder for Inline (excluding motor)	kg	2.9
	lb	6.5
Adder for Parallel Drive (excluding motor)	kg	13.1
	lb	28.9
Adder for Front Flange	kg	1.9
	lb	4.2
Adder for Rear Clevis	kg	5.3
	lb	11.7
Adder for Rear Eye	kg	5.1
	lb	11.3
Adder for Rear Trunnion	kg	1.9
	lb	4.3

Base Unit Inertia		**Zero Stroke [kg-m² (lbf-in-sec²)]**	**Add per 25 mm [kg-m² (lbf-in-sec²)]**
5 mm Lead		8.27×10^{-4} (7.32×10^{-3})	2.19×10^{-6} (1.94×10^{-5})
10 mm Lead		8.33×10^{-4} (7.37×10^{-3})	2.42×10^{-6} (2.14×10^{-5})
20 mm Lead		8.57×10^{-4} (7.58×10^{-3})	3.31×10^{-6} (2.93×10^{-5})
Inline Drive Inertia	**Inline Unit - w/Motor Coupling**	**Inline Unit - w/Motor Coupling For Gearbox Mount**	**Add per 25 mm**
5 mm Lead	9.27×10^{-4} (8.20×10^{-3})	1.09×10^{-3} (9.62×10^{-3})	2.19×10^{-6} (1.94×10^{-5})
10 mm Lead	9.33×10^{-4} (8.26×10^{-3})	1.09×10^{-3} (9.67×10^{-3})	2.42×10^{-6} (2.14×10^{-5})
20 mm Lead	9.57×10^{-4} (8.47×10^{-3})	1.12×10^{-3} (9.89×10^{-3})	3.31×10^{-6} (2.93×10^{-5})
Parallel Drive Inertia		**1:1 Reduction**	**2:1 Reduction**
5 mm Lead (zero stroke)		4.90×10^{-3} (4.34×10^{-2})	2.22×10^{-3} (1.97×10^{-2})
Add per 25 mm stroke		2.19×10^{-6} (1.94×10^{-5})	5.48×10^{-7} (4.85×10^{-6})
10 mm Lead (zero stroke)		4.91×10^{-3} (4.34×10^{-2})	2.23×10^{-3} (1.97×10^{-2})
Add per 25 mm stroke		2.42×10^{-6} (2.14×10^{-5})	6.04×10^{-7} (5.34×10^{-6})
20 mm Lead (zero stroke)		4.93×10^{-3} (4.37×10^{-2})	2.23×10^{-3} (1.98×10^{-2})
Add per 25 mm stroke		3.31×10^{-6} (2.93×10^{-5})	8.28×10^{-7} (7.33×10^{-6})

FTX125

		05	10
Screw Lead	mm	5	10
	in	0.197	0.394
Maximum Force*	kN	44.5	44.5
	lbf	10000	10000
Life at Maximum Force	km	249.2	486.3
	in x 10^6	9.81	19.14
C_a (Dynamic Load Rating)	kN	163.7	162.4
	lbf	36800	36500
Maximum Input Torque	Nm	46.5	82.3
	lbf-in	412	728
Max Rated RPM @ Input Shaft	RPM	3500	3500
Maximum Linear Speed @ Maximum Rated RPM	mm/sec	292	583
	in/sec	11.5	23
Friction Torque	Nm	2.23	2.23
	lbf-in	20	20

Intermediate and custom stroke lengths are also available. Belt and pulley inertia varies with ratio and motor selection. Please contact your local sales representative.

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

Weights kg (lbs)

Base Actuator Weight (Zero Stroke)	kg	21
	lb	47
Actuator Weight Adder (Per 25 mm of stroke)	kg	0.84
	lb	1.85
Adder for Inline (excluding motor)	kg	6.8
	lb	15.0
Adder for Parallel Drive (excluding motor)	kg	25.6
	lb	56.5
Adder for Front Flange	kg	3.6
	lb	7.9
Adder for Rear Clevis	kg	6.5
	lb	14.3
Adder for Rear Eye	kg	6.3
	lb	13.8
Adder for Rear Trunnion	kg	3.1
	lb	6.8

Base Unit Inertia		**Zero Stroke [kg-m² (lbf-in-sec²)]**	**Add per 25 mm [kg-m² (lbf-in-sec²)]**
5 mm Lead		2.55×10^{-3} (2.26×10^{-2})	4.62×10^{-5} (4.09×10^{-4})
10 mm Lead		2.56×10^{-3} (2.27×10^{-2})	4.65×10^{-5} (4.12×10^{-4})
Inline Drive Inertia	**<32 mm Motor Shaft Diameter**	**>32 mm Motor Shaft Diameter**	**Add per 25 mm**
5 mm Lead	2.81×10^{-3} (2.49×10^{-2})	3.35×10^{-3} (2.97×10^{-2})	4.62×10^{-5} (4.09×10^{-4})
10 mm Lead	2.82×10^{-3} (2.50×10^{-2})	3.36×10^{-3} (2.98×10^{-2})	4.65×10^{-5} (4.12×10^{-4})
Parallel Drive Inertia		**1:1 Reduction**	**2:1 Reduction**
5 mm Lead (zero stroke)		9.43×10^{-3} (8.34×10^{-2})	4.66×10^{-3} (4.12×10^{-2})
Add per 25 mm stroke		4.62×10^{-5} (4.09×10^{-4})	1.15×10^{-5} (1.02×10^{-4})
10 mm Lead (zero stroke)		9.44×10^{-3} (8.35×10^{-2})	4.66×10^{-3} (4.13×10^{-2})
Add per 25 mm stroke		4.65×10^{-5} (4.12×10^{-4})	1.16×10^{-5} (1.03×10^{-4})

FTX215

		06	12	30
Screw Lead	mm	6	12	30
	in	0.24	0.5	1.18
Maximum Force*	kN	178	178	178
	lbf	40000	40000	40000
Life at Maximum Force	km	79	111	414
	in x 10^6	3	4	16
C_a (Dynamic Load Rating)	kN	398	384	377
	lbf	89500	86400	84700
Maximum Input Torque	Nm	243	425	976
	lbf-in	2148	3760	8642
Max Rated RPM @ Input Shaft	RPM	1750	1750	1750
Maximum Linear Speed @ Maximum Rated RPM	mm/sec	175	351	875
	in/sec	7	14	34
Friction Torque	Nm	5.7	5.7	5.7
	lbf-in	50	50	50

Intermediate and custom stroke lengths are also available. Belt and pulley inertia varies with ratio and motor selection. Please contact your local sales representative.

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

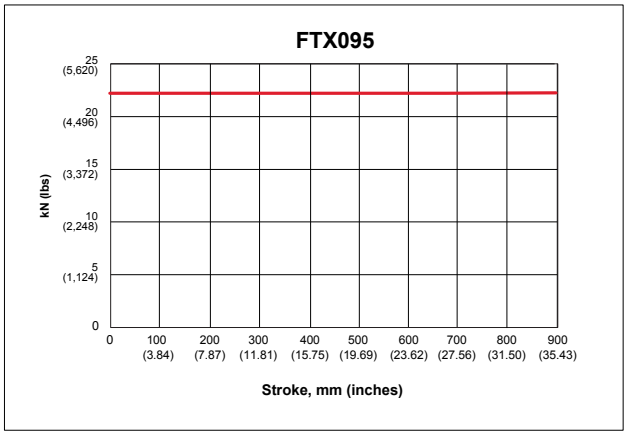
Weights kg (lbs)

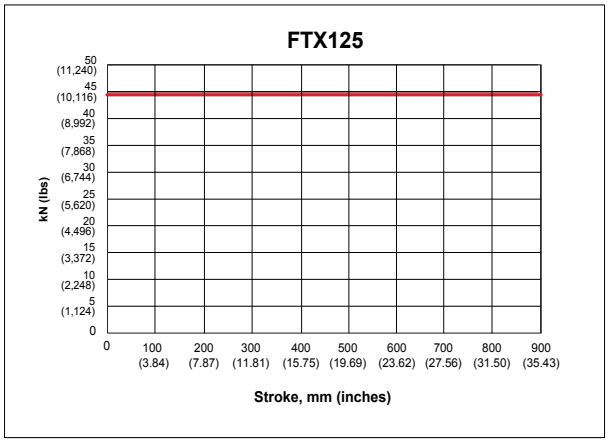
Base Actuator Weight (Zero Stroke)	kg	103
	lb	227
Actuator Weight Adder (Per 25 mm of stroke)	kg	2.70
	lb	5.96
Adder for Inline (excluding motor)	kg	38.6
	lb	85.1
Adder for Parallel Drive (excluding motor)	kg	62.3
	lb	137.3
Adder for Front Flange	kg	26.7
	lb	58.8
Adder for Rear Clevis	kg	32.5
	lb	71.6
Adder for Rear Eye	kg	32.5
	lb	71.6
Adder for Rear Trunnion	kg	9.6
	lb	21.2

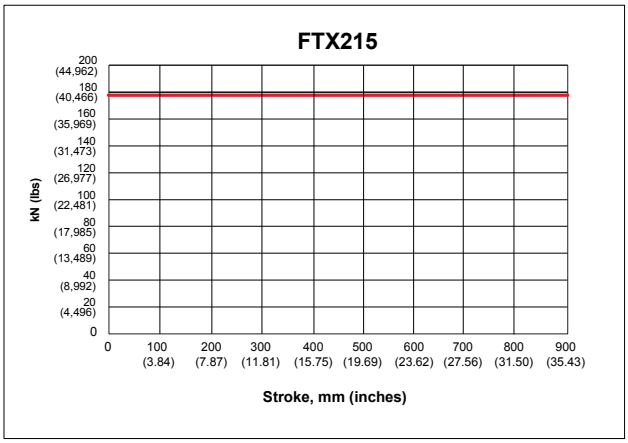
Base Unit Inertia		**Zero Stroke [kg-m² (lbf-in-sec²)]**	**Add per 25 mm [kg-m² (lbf-in-sec²)]**
6 mm Lead		4.25×10^{-2} (3.76×10^{-1})	8.00×10^{-4} (7.08×10^{-3})
12 mm Lead		4.26×10^{-2} (3.77×10^{-1})	8.02×10^{-4} (7.10×10^{-3})
30 mm Lead		4.31×10^{-2} (3.82×10^{-1})	8.15×10^{-4} (7.21×10^{-3})
Inline Drive Inertia	**<55 mm Motor Shaft Diameter**	**>55 mm Motor Shaft Diameter**	**Add per 25 mm**
6 mm Lead	4.43×10^{-2} (3.92×10^{-1})	6.15×10^{-2} (5.44×10^{-1})	8.00×10^{-4} (7.08×10^{-3})
12 mm Lead	4.44×10^{-2} (3.93×10^{-1})	6.16×10^{-2} (5.45×10^{-1})	8.02×10^{-4} (7.10×10^{-3})
30 mm Lead	4.49×10^{-2} (3.98×10^{-1})	6.21×10^{-2} (5.50×10^{-1})	8.15×10^{-4} (7.21×10^{-3})
Parallel Drive Inertia		**1:1 Reduction**	**2:1 Reduction**
6 mm Lead (zero stroke)		9.42×10^{-2} (8.34×10^{-1})	3.50×10^{-2} (3.10×10^{-1})
Add per 25 mm stroke		8.00×10^{-4} (7.08×10^{-3})	2.00×10^{-4} (1.77×10^{-3})
12 mm Lead (zero stroke)		9.43×10^{-2} (8.34×10^{-1})	3.50×10^{-2} (3.10×10^{-1})
Add per 25 mm stroke		8.02×10^{-4} (7.10×10^{-3})	2.01×10^{-4} (1.78×10^{-3})
30 mm Lead (zero stroke)		9.48×10^{-2} (8.39×10^{-1})	3.52×10^{-2} (3.11×10^{-1})
Add per 25 mm stroke		8.15×10^{-4} (7.21×10^{-3})	2.04×10^{-4} (1.80×10^{-3})

Data Curves

Maximum Force Rating

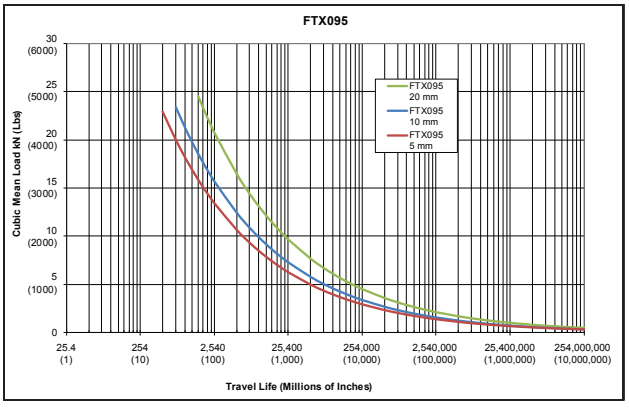


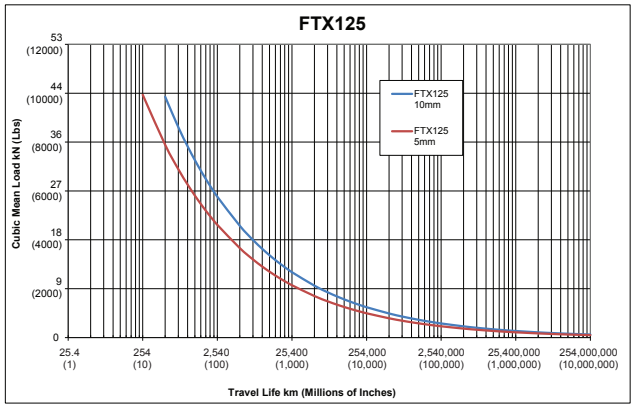




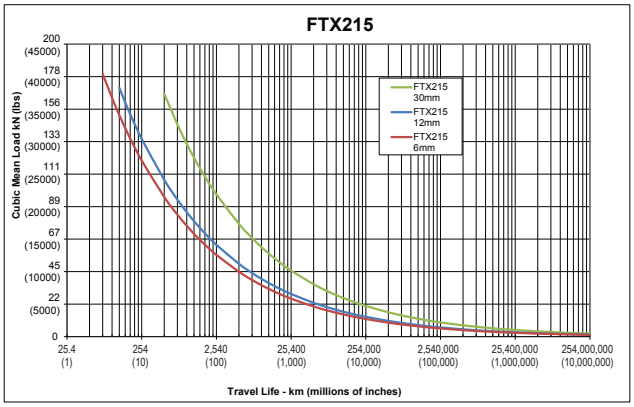
* With longer stroke length actuators, the rated speed of the actuator is determined by the critical speed

Estimated Service Life





Estimated Service Life Continued



Service Life Estimate Assumptions:

- Sufficient quality and quantity of lubrication is maintained throughout service life
- 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.

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. This is not a guarantee and these charts should be used for estimation purposes only.

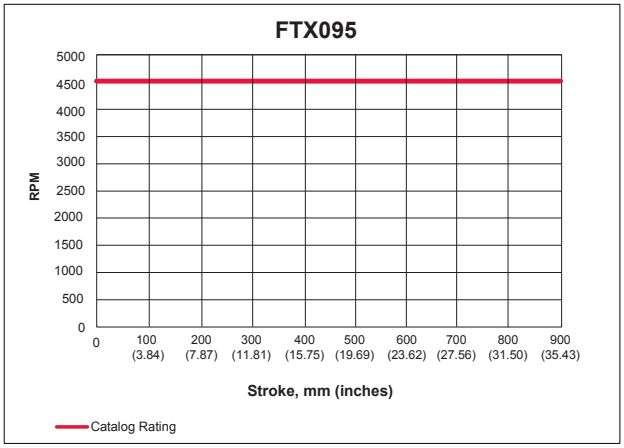
The underlying formula that defines this value is:
Travel life in millions of inches, where:

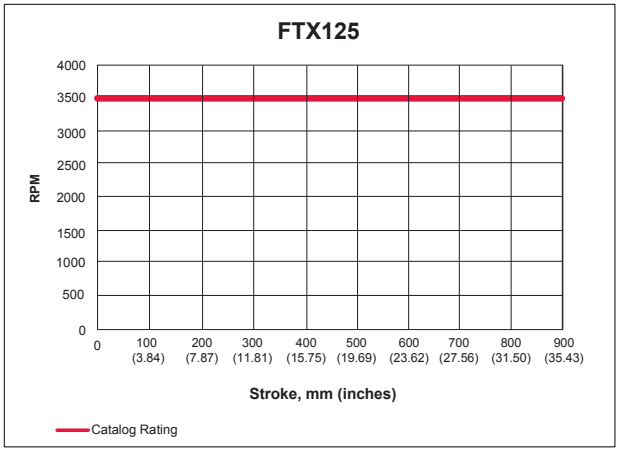
C_a = Dynamic load rating (lbf)
F_{cml} = Cubic mean applied load (lbf)
ℓ = Roller screw lead (inches)

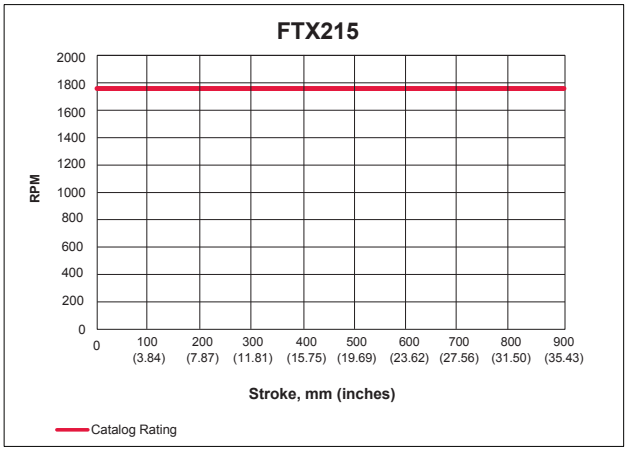
$$L_{10} = \left(\frac{C_a}{F_{cml}} \right)^3 \times \ell$$

.

Critical Speed vs Stroke Length:





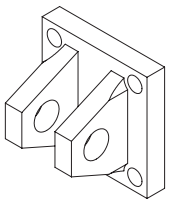


* With longer stroke length actuators, the rated speed of the actuator is determined by the critical speed

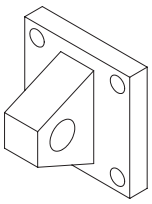
FTX Series Accessories

Limit Switches	
Part Number	**Description**
43403	Normally Open PNP Limit Switch (10-30 VDC, 1m. 3 wire embedded cable)
43404	Normally Closed PNP Limit Switch (10-30 VDC, 1m. 3 wire embedded cable)
67634	Normally Open NPN Limit Switch (10-30 VDC, 1m. 3 wire embedded cable)
67635	Normally Closed NPN Limit Switch (10-30 VDC, 1m. 3 wire embedded cable)

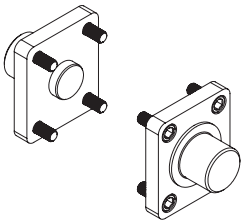
Rear Clevis Mount (MP1 Option)



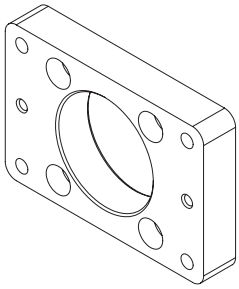
Rear Eye Mount (MP3 Option)



Rear Trunnion Mount (MT2 Option)

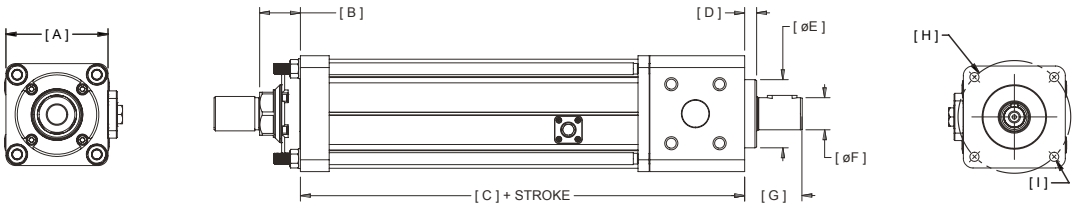


Front Flange Mount (ME5 Option)

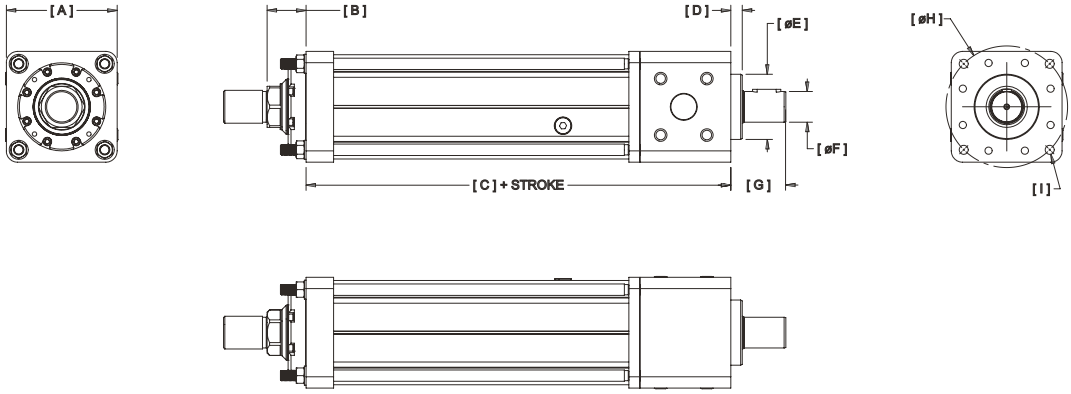


Dimensions

Base Actuator (FTX095)



Base Actuator (FTX125, FTX215)

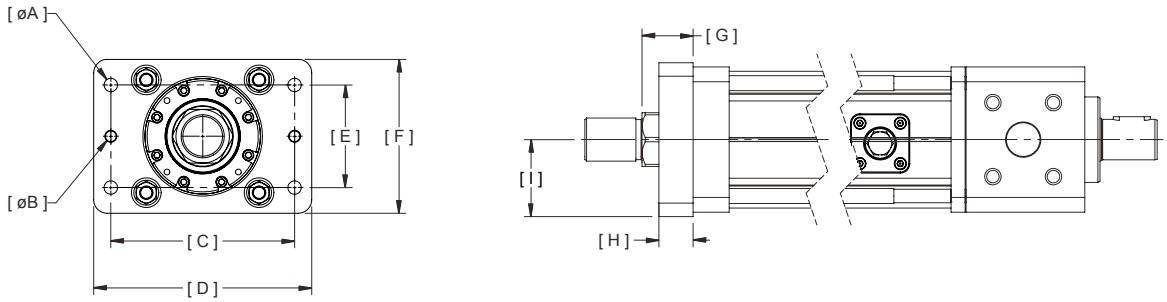


		FTX095	FTX125	FTX215
A	mm	95.0	125.0	215.9
	in	3.74	4.92	8.50
B	mm	38.8	49.1	76.0
	in	1.53	1.98	2.99
C	mm	308.6 ± 1.5	358.6 ± 1.5	523.0 ± 1.5
	in	12.15 ± 0.06	14.12 ± 0.06	20.59 ± 0.06
D	mm	16.0	18.0	22.4
	in	0.63	0.72	0.88
E	mm	Ø60.0	Ø80.0	Ø127.0
	in	Ø2.36	Ø3.15	Ø5.00

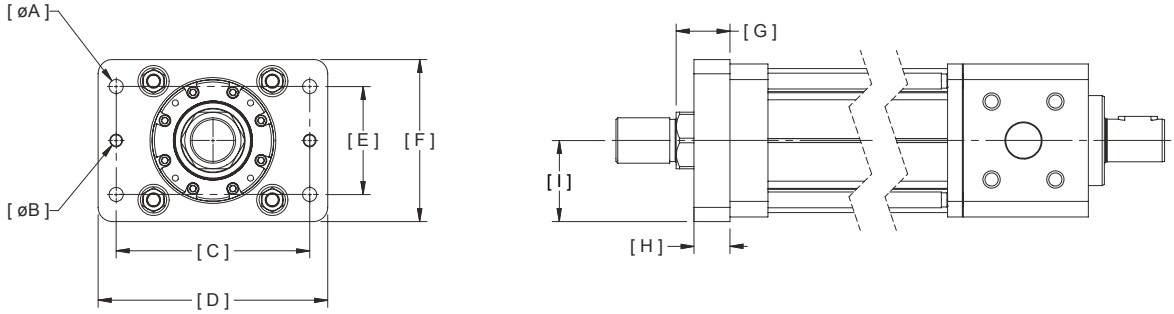
		FTX095	FTX125	FTX215
F	mm	Ø19.0 +0.00 / -0.0013	Ø28.0 +0.00 / -0.0013	Ø60.0 +0.00 / -0.0013
	in	Ø0.748 +0.00 / -0.0005	Ø1.102 +0.00 / -0.0005	Ø2.362 +0.00 / -0.0005
G	mm	66.3	80.0	107.3
	in	2.61	3.15	4.23
H	mm	Ø105.0	Ø137.0	Ø237.0
	in	Ø4.13 BC	Ø5.39 BC	Ø9.33 BC
I		4X M10x1.5 - 6H ↓ 24 mm	4X M12x1.75 - 6H ↓ 33 mm	4X M20x2.5 - 6H ↓ 20 mm

Front Flange Mount (ME5 Option)

(FTX095)



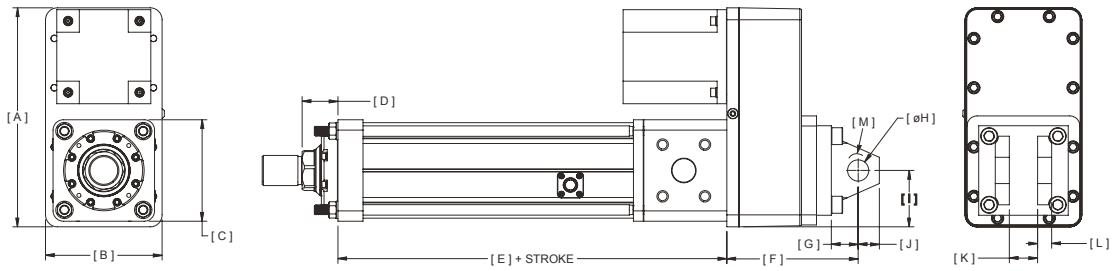
(FTX125, FTX215)



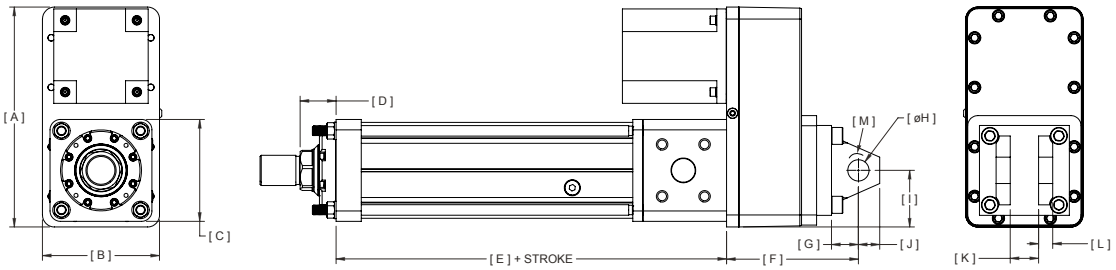
		FTX095	FTX125	FTX215
A	mm	Ø13.5	Ø18.0	Ø22.0
	in	Ø0.53	Ø0.71	Ø0.87
B	mm	Ø8.00 +0.03 / -0.00	Ø12.00 +0.03 / -0.00	Ø16.00 +0.03 / -0.00
	in	Ø0.315 +0.001 / -0.000	Ø0.472 +0.001 / -0.000	Ø0.630 +0.001 / -0.000
C	mm	149.0	162.0	300.0
	in	5.87	6.38	11.81
D	mm	171.0	200.0	360.0
	in	6.73	7.87	14.17
E	mm	83.0	97.0	190.0
	in	3.27	3.82	7.48
F	mm	105.0	130.0	245.0
	in	4.13	5.12	9.65
G	mm	38.8	49.1	76.0
	in	1.53	1.93	2.99
H	mm	22.0	30.0	58.0
	in	0.87	1.18	2.28
I	mm	52.5	65.0	112.5
	in	2.07	2.56	4.82

Rear Clevis Mount (MP1 Option)

(FTX095)



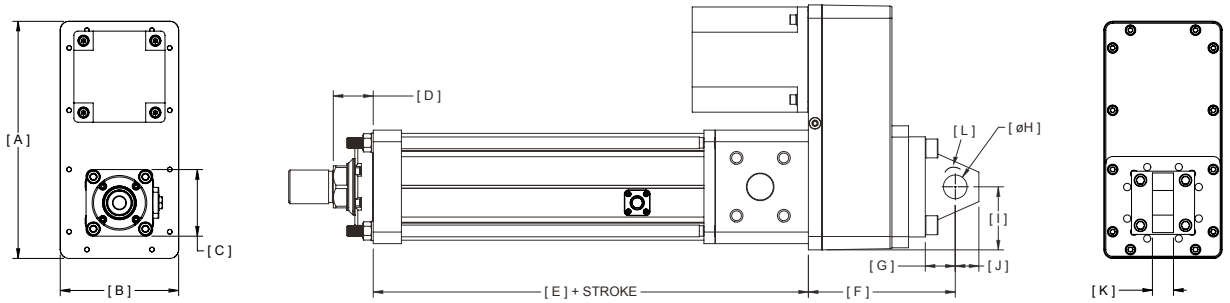
(FTX125, FTX215)



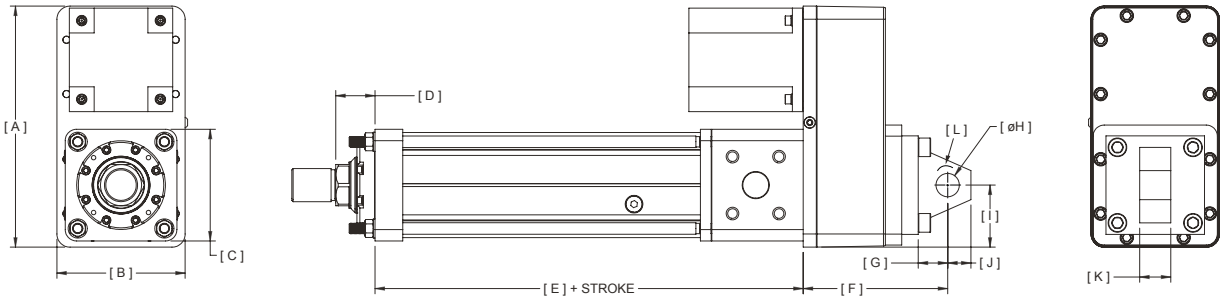
		FTX095	FTX125		FTX215	
		169 mm wide housing	190 mm wide housing	217 mm wide housing	248 mm wide housing	292 mm wide housing
A	mm	338.4	369.5	395.0	466.0	533.4
	in	13.32	14.55	15.55	18.35	21.00
B	mm	168.8	190.0	216.7	248.0	292.1
	in	6.65	7.48	8.53	9.76	11.50
C	mm	95.0	125.0	125.0	215.9	215.9
	in	3.74	4.92	4.92	8.50	8.50
D	mm	38.8	49.1	49.1	76.0	76.0
	in	1.53	1.93	1.93	2.99	2.99
E	mm	308.6 ± 1.5	358.6 ± 1.5	358.6 ± 1.5	523.0 ± 1.5	523.0 ± 1.5
	in	12.15 ± 0.06	14.12 ± 1.06	14.12 ± 0.06	20.59 ±0.06	20.59 ±0.06
F	mm	161.8 ± 1.0	200.7 ± 1.0	201.6 ± 1.0	279.4 ± 1.0	288.7 ± 1.0
	in	6.37 ± 0.04	7.90 ± 0.04	7.93 ± 0.04	11.00 ± 0.04	11.37 ± 0.04
G	mm	32.0	32.0	32.0	57.0	57.0
	in	1.26	1.26	1.26	2.24	2.24
H	mm	Ø20.0 H9	Ø20.0 H9	Ø20.0 H9	Ø45.0 H9	Ø45.0 H9
	in	Ø0.79 H9	Ø0.79 H9	Ø0.79 H9	Ø1.77 H9	Ø1.77 H9
I	mm	79.4 ± 1.8	77.9 ± 1.8	95.3 ± 1.8	120.0 ± 1.18	133.4 ± 1.8
	in	3.13 ±0.07	3.07 ± 0.07	3.75 ± 0.07	4.72 ± 0.07	5.25 ± 0.07
J	mm	N/A	N/A	N/A	45.0	45.0
	in	N/A	N/A	N/A	1.77	1.77
K	mm	30.0	30.0	30.0	60.13 +0.76 / -0.00	60.13 +0.76 / -0.00
	in	1.18	1.18	1.18	2.367 +0.030 / -0.000	2.367 +0.030 / -0.000
L	mm	15.0	15.0	15.0	30.0	30.0
	in	0.59	0.59	0.59	1.18	1.18
M	mm	29.0	29.0	29.0	53.0	53.0
	in	1.14	1.14	1.14	2.09	2.09

Rear Eye Mount (MP3 Option)

(FTX095)



(FTX125, FTX215)

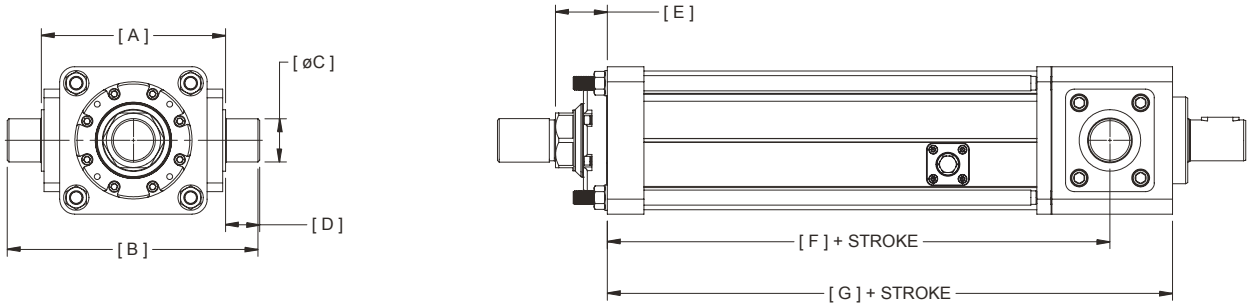


		FTX095	FTX125		FTX215	
		169 mm wide housing	190 mm wide housing	217 mm wide housing	248 mm wide housing	292 mm wide housing
A	mm	338.4	369.5	395.0	466.0	533.4
	in	13.32	14.55	15.55	18.35	21.00
B	mm	168.8	190.0	216.7	248.0	292.1
	in	6.65	7.48	8.53	9.75	11.50
C	mm	95.0	125.0	125.0	215.9	215.9
	in	3.74	4.92	4.92	8.50	8.50
D	mm	38.8	49.1	49.1	76.0	76.0
	in	1.53	1.93	1.93	2.99	2.99
E	mm	308.6 ± 1.5	358.6 ± 1.5	358.6 ± 1.5	523.0 ± 1.5	523.0 ± 1.5
	in	12.15 ± 0.06	14.12 ± 0.06	14.12 ± 0.06	20.59 ± 0.06	20.59 ± 0.06
F	mm	161.8 ± 1.0	200.7 ± 1.0	201.6 ± 1.0	279.4 ± 1.0	288.7 ± 1.0
	in	6.37 ± 0.04	7.90 ± 0.04	7.93 ± 0.04	11.00 ± 0.04	11.37 ± 0.04
G	mm	32.0	32.0	32.0	57.0	57.0
	in	1.26	1.26	1.26	2.24	2.24
H	mm	Ø20.0 H9	Ø20.0 H9	Ø20.0 H9	Ø45.0 H9	Ø45.0 H9
	in	Ø0.79 H9	Ø0.79 H9	Ø0.79 H9	Ø1.77 H9	Ø1.77 H9
I	mm	79.4 ± 1.8	77.9 ± 1.18	95.3 ± 1.18	120.0 ± 1.8	133.4 ± 1.8
	in	3.13 ± 1.07	3.07 ± 0.07	3.75 ± 0.07	4.72 ± 0.07	5.25 ± 0.07
J	mm	N/A	N/A	N/A	45.0	45.0
	in	N/A	N/A	N/A	1.77	1.77
K	mm	60.00 +0.00 / -0.76	60.00 +0.00 / -0.76	60.00 +0.00 / -0.76	60.00 +0.00 / -0.76	60.00 +0.00 / -0.76
	in	2.362 +0.000 / -0.030	2.362 +0.000 / -0.030	2.362 +0.000 / -0.030	2.362 +0.000 / -0.030	2.362 +0.000 / -0.030
L	mm	29.0	29.0	29.0	53.0	53.0
	in	1.14	1.14	1.14	2.09	2.09

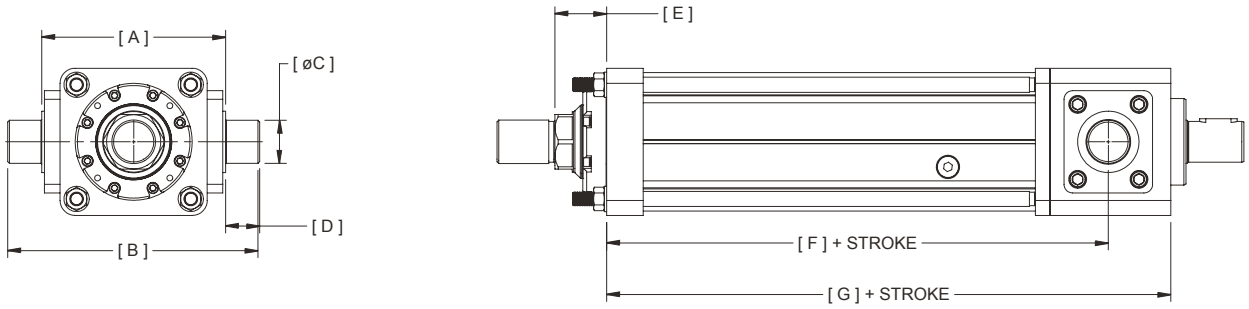
Pre-sale drawings and models are representative and are subject to change. Certified drawings and models are available for a fee. Consult your local Exlar representative for details.

Rear Trunnion Mount (MT2 Option)

(FTX095)

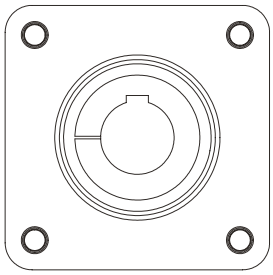


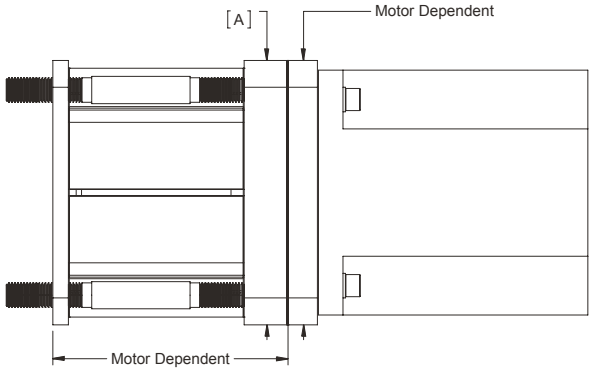
(FTX125, FTX215)



		FTX095	FTX125	FTX215
A	mm	172.0 ± 0.64	167.0 ± 0.64	269.6 ± 0.64
	in	6.77 ± 0.025	6.57 ± 0.025	10.62 ± 0.025
B	mm	212.0 ± 0.38	217.0 ± .038	367.0 ± 0.38
	in	8.35 ± 0.015	8.54 ± 0.015	14.45 ± 0.015
C	mm	Ø25.00 +0.00 / -0.05	Ø32.00 +0.00 / -0.05	Ø63.00 +0.00 / -0.05
	in	Ø0.984 +0.000 / -0.002	Ø1.26 +0.000 / -0.002	Ø2.480 +0.000 / -0.002
D	mm	20.00 ± 0.13	25.00 ± 0.13	50.00 ± 0.13
	in	0.787 ± 0.005	0.984 ± 0.005	1.970 ± 0.005
E	mm	38.8	49.1	76.0
	in	1.53	1.93	2.99
F	mm	269.1 ± 1.5	307.3 ± 1.5	431.3 ± 1.5
	in	10.59 ± 0.06	12.10 ± 0.06	16.98 ± 0.06
G	mm	308.6 ± 1.5	358.6 ± 1.5	523.0 ± 1.5
	in	12.15 ± 0.06	14.12 ± 0.06	20.59 ± 0.06

Inline Mount



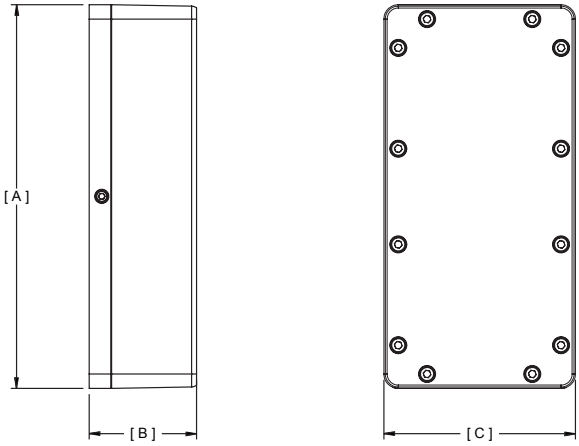


	A
FTX095	□ 95 (3.74)
FTX125	□ 125 (4.92)
FTX215	□ 215 (8.5)

Dimensions shown in metric (English)

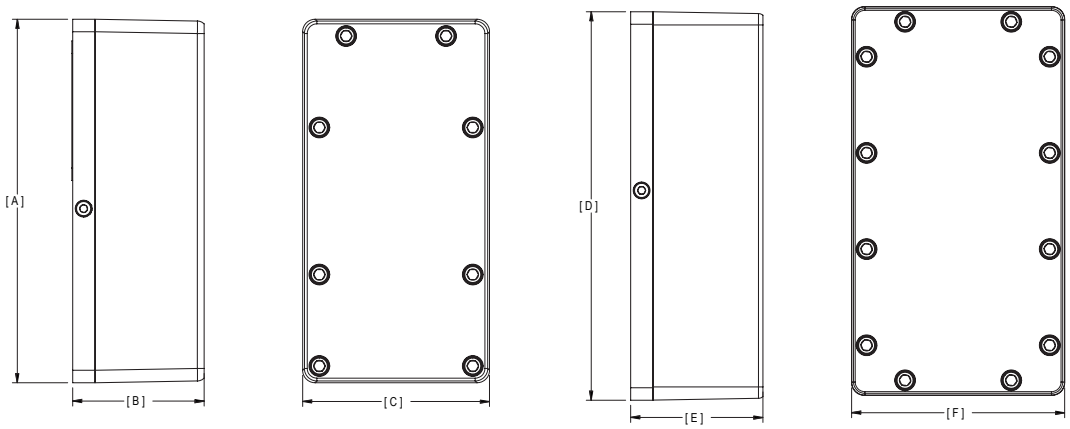
Parallel Mount (FTX095)

		FTX095
A	mm	338.4
	in	13.32
B	mm	94.8
	in	3.73
C	mm	168.8
	in	6.65



169 mm wide housing

Parallel Mount (FTX125)

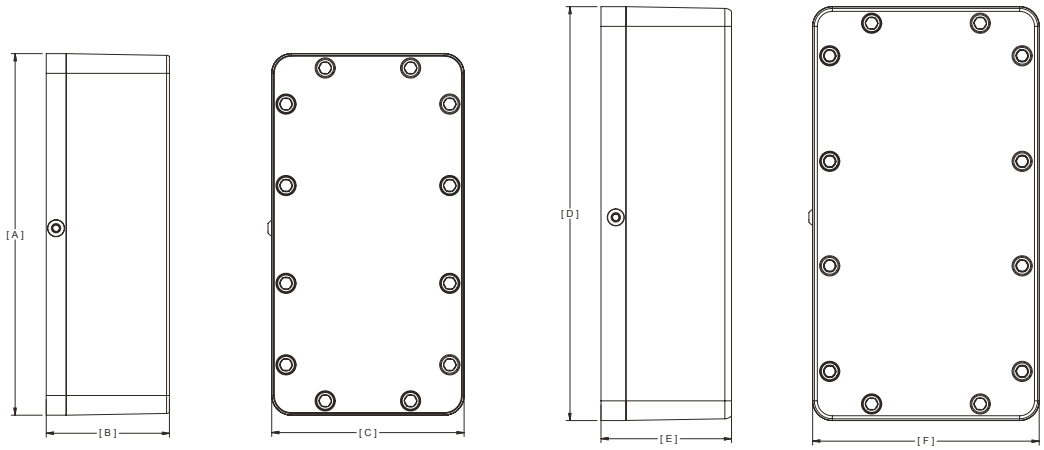


190 mm wide housing

217 mm wide housing

Note: 190 mm wide housing is used for all motors 1:1 drive
217 mm wide housing is used for all 2:1 drive motors

Parallel Mount (FTX215)



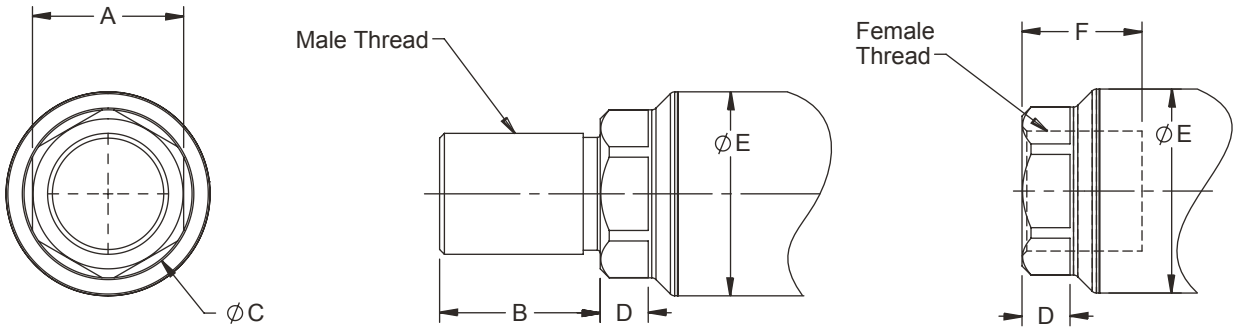
248 mm wide housing

292 mm wide housing

Note: 248 mm wide housing is used for motors with 215 mm B.C. and smaller mounting holes, 1:1 drive
292 mm wide housing is used for all 2:1 drive motors

		FTX125	FTX215
A	mm	369.5	466.0
	in	14.55	18.35
B	mm	133.7	158.9
	in	5.26	6.25
C	mm	190.0	248.0
	in	7.48	9.76
D	mm	395.0	533.4
	in	15.55	21.00
E	mm	134.5	168.2
	in	5.30	6.62
F	mm	216.7	292.1
	in	8.53	11.50

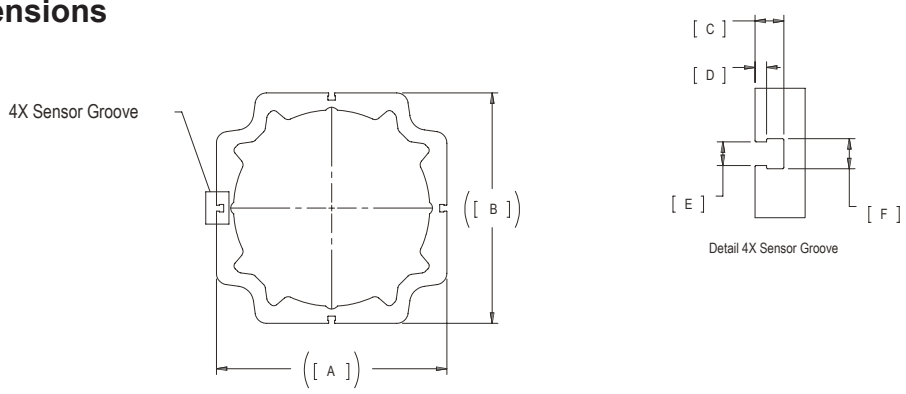
Rod Ends



	A	B	C	D	E	F	Male	Female
FTX095	34.0 (1.34)	28.0 (1.10)	Ø36.4 (1.43)	12.7 (0.50)	Ø44.5 (1.75)	20.0 (0.79)	M20x1.5 6g	M20x1.5 6H
FTX125	46.0 (1.81)	45.0 (1.77)	Ø50.8 (2.00)	15.9 (0.63)	Ø57.2 (2.25)	38.1 (1.50)	M33x2 6g	M33x2 6H
FTX215	80.0 (3.15)	85.0 (3.35)	Ø80.0 (3.50)	25.4 (1.00)	Ø108.0 (4.25)	85.0 (3.35)	M64x3 6g	M64x3 6H

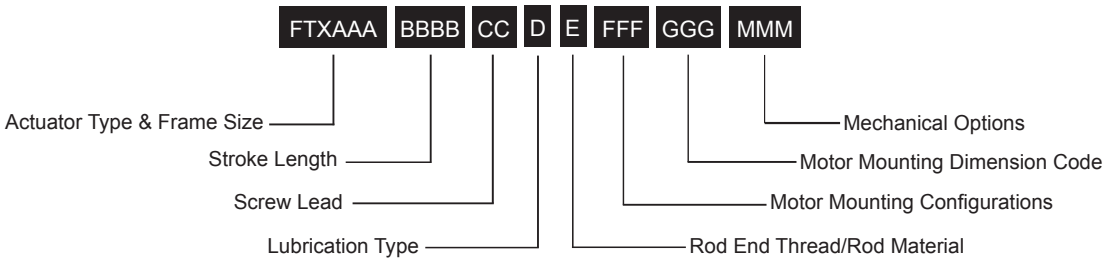
Dimensions shown in metric (English)

Case Dimensions



	A	B	C	D	E	F
FTX095	94 (3.7)	94 (3.7)	4.9 (.19)	1.1 (0.4)	5.2 (.21)	6.6 (.26)
FTX125	118 (4.6)	118 (4.6)	5.6 (.22)	1.8 (.07)	5.2 (.21)	6.6 (.26)
FTX215	203 (8.0)	203 (8.0)	6.4 (.25)	2.5 (.10)	5.2 (.21)	6.6 (.26)

Dimensions shown in metric (English)



AAA = Frame Size
095 = 95 mm
125 = 125 mm
215 = 215 mm

BBBB = Stroke Length
0150 = 150 mm
0300 = 300 mm
0600 = 600 mm
0900 = 900 mm

CC = Screw Lead
05 = 5 mm (FTX095, FTX125)
10 = 10 mm (FTX095, FTX125)
20 = 20 mm (FTX095, FTX125)
06 = 6 mm (FTX215)
12 = 12 mm (FTX215)
30 = 30 mm (FTX215)

D = Lubrication Type
1 = Grease
2 = Oil

E = Rod End Thread
A = Male, metric thread
B = Female, metric thread

FFF = Motor Mounting Configurations[1]
NMT = None, base unit only
N10 = Inline, includes shaft coupling
P10 = Parallel, 1:1 belt reduction
P20 = Parallel, 2:1 belt reduction

GGG = Motor/Gearbox Mounting Dimension Code
See standard motor/gearbox mounting code dimension sheet (Page 4)
NNN = None, base unit only

MMM = Mechanical Options
NNN = None
ME5 = Front Mounting Flange
MP1 = Rear Clevis[2]
MP3 = Rear Eye[2]
MT2 = Rear Trunnion

For options or specials not listed above, please contact Exlar

NOTES:
1. Always discuss your motor selection with your local sales representative.
2. Not available with inline motor mount, contact your local sales representative.

FTP Series

High Force Electric Press Actuators

Hydraulic Press Replacement

Based on planetary rollers screw technology, the FTP Series high force electric press actuators were designed to provide very high force in a small package size making them an ideal alternative to hydraulic cylinders in pressing applications. The FTP offers force density not attainable with more common ball screw based electric actuators, up to 15X the life and 2X the force density in most cases.

Programmable and Accurate

Attaining any kind of accuracy with a traditional hydraulic solution requires complicated servo valves that are difficult to set up and need frequent adjustment for optimum performance. Once set, changeover to a different part or mode of operation is equally as troublesome. The all-electric FTP Series utilizes commonly understood servo motor technology, offering accuracy, control and flexibility not available with hydraulics.

Reliable and Efficient

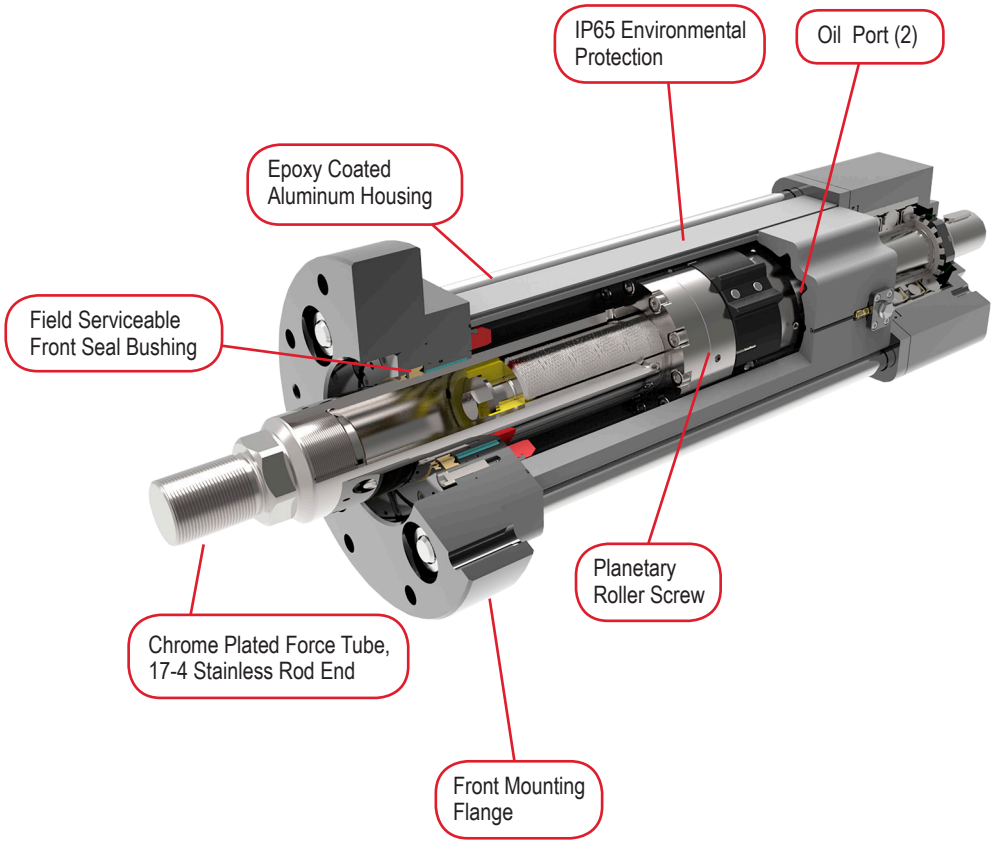
The FTP Series high force electric press actuators allow machine builders to meet the ever-increasing performance demands of their customers while minimizing or eliminating the maintenance issues and downtime associated with traditional hydraulic solutions. Their programmability and flexibility significantly reduces changeover time between production runs enabling smaller batch sizes, and they consume 25% less energy than a typical hydraulic solution. Increase your operational efficiency today by switching to the FTP Series.

Technical Characteristics	
Frame Sizes - mm (in)	215 (8.5)
Screw Leads - mm (in)	12 (0.50)
Standard Stroke Lengths mm (in)	150 (6), 300 (12), 600 (24)
Force Range	36 tf (metric), 40 tf (short) [356 kN (80000 lbf)]
Maximum Speed	351 mm/sec (13.8 in/sec)

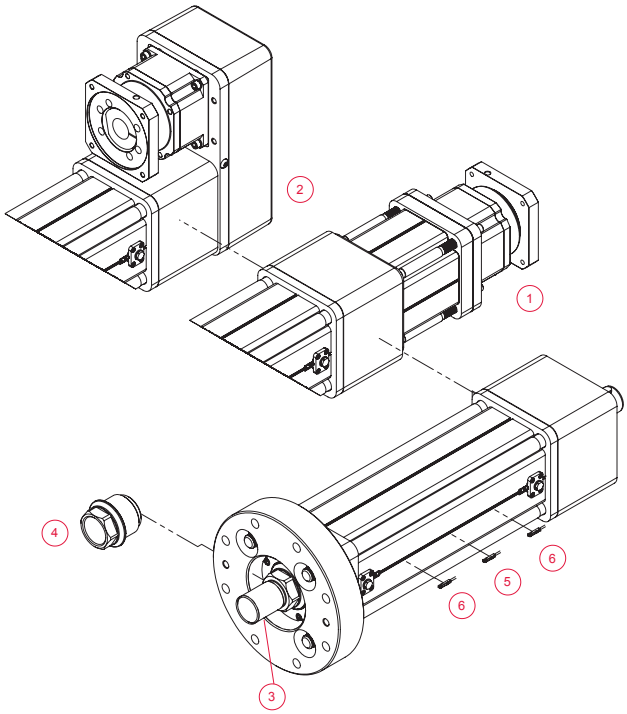
Operating Conditions and Usage		
Accuracy:		
Screw Travel Variation	mm (in)	0.030 (0.0012)
Screw Lead Error	mm/300 mm (in/ft)	0.025 (0.001)
Screw Lead Backlash	mm (in)	0.06 (0.002)
Ambient Conditions:		
Standard Ambient Temperature	°C	-40° to 85°
IP Rating		IP65

* Consult Exlar for extended temperature operation.

Product Features



1 - Inline direct drive
2 - Parallel, 1:1 belt reduction
3 - Male, metric thread
4 - Female, metric thread
5 - External limit switch - N.O., PNP or NPN
6 - External limit switch - N.C., PNP or NPN



Standard Gearbox Mount Codes for the FTP

FTP215 (Inline or Parallel - 1:1)

Bolt Circle Diameter (mm)	Pilot Diameter (mm)	Shaft Diameter (mm)	Shaft Length (mm)	Key Width (mm)	Motor Mount Code
165	130	40	112	12	GRA
165	130	40	102	12	GRC
215	160	55	112	16	GTA
250	180	75	143	20	G8A

DEFINITIONS:

Maximum Force: Calculated Cubic Mean Load for the application should not exceed this value. (Values are derived from the design capacity of the FT Series actuator and should not be exceeded or relied upon for continuous operation.)

Life at Maximum Force: Estimated life that can be expected from the actuator when running at Maximum Force for intermittent periods of time. (Theoretical calculation based on the Dynamic Load Rating of the actuator and using the Maximum Force rating as the Cubic Mean Load.)

C_a (Dynamic Load Rating): A design constant used when calculating the estimated travel life of the roller screw.

Maximum Input Torque: The torque required at the screw to produce the Maximum Force rating. Exceeding this value can cause permanent damage to the actuator.

Maximum Rated RPM: The maximum allowable rotational screw speed determined by either screw length limitations or the rotational speed limit of the roller screw nut.

Maximum Linear Speed: The linear speed achieved by the actuator when Maximum Rated RPM is applied to the roller screw input shaft.

Mechanical Specifications

FTP215

		12
Screw Lead	mm	12
	in	0.472
Maximum Force (Extension)	tf (metric)	36.3
	tf (short)	40.0
	kN	355
	lbf	80000
Maximum Force (Retraction)	tf	13
	kN	130
	lbf	30000
Life at Maximum Force (Minimum)	Press Cycles	Consult Factory
Maximum Input Torque	Nm	850
	lbf-in	7520
Max Rated RPM @ Input Shaft	RPM	1750
Maximum Linear Speed @ Maximum Rated RPM	mm/sec	351
	in/sec	13.8
Friction Torque	Nm	5.65
	lbf-in	50

Intermediate and custom stroke lengths are also available. Belt and pulley inertia varies with ratio and motor selection. Please contact your local sales representative.

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

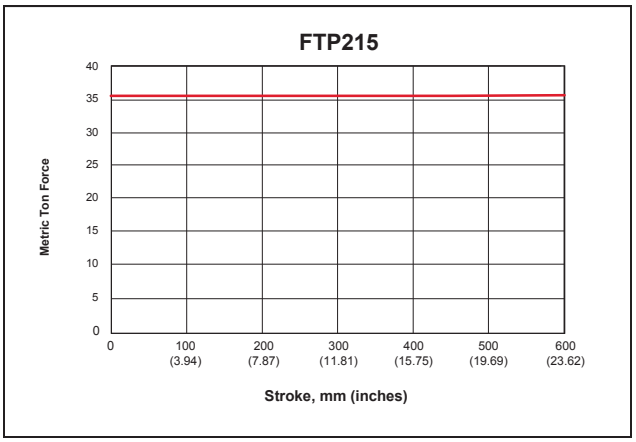
Weights kg (lbs)

Base Actuator Weight (Zero Stroke)	kg	127
	lb	280
Actuator Weight Adder (Per 25 mm of stroke)	kg	2.7
	lb	5.96
Adder for Inline (excluding motor)	kg	38.6
	lb	85.1
Adder for Parallel Drive (excluding motor)	kg	62.3
	lb	137.35
Adder for Front Flange	kg	46.5
	lb	102.5

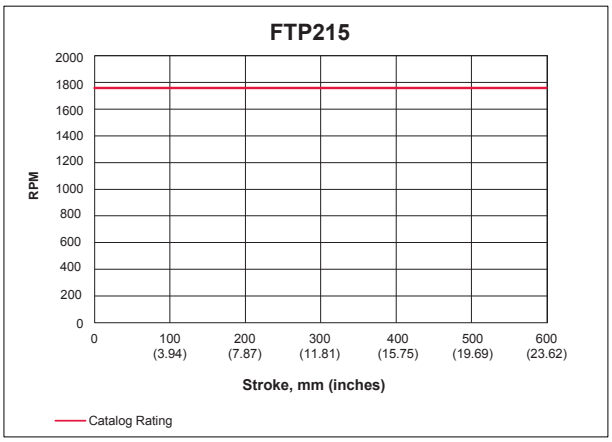
Base Unit Inertia		**Zero Stroke [kg-m² (lbf-in-sec²)]**	**Add per 25 mm [kg-m² (lbf-in-sec²)]**
12 mm Lead		4.26×10^{-2} (3.77×10^{-1})	8.02×10^{-4} (7.10×10^{-3})
Inline Drive Inertia	**Inline Unit - w/Motor Coupling**	**Inline Unit - w/Motor Coupling For Gearbox Mount**	**Add per 25 mm**
12 mm Lead	4.44×10^{-2} (3.93×10^{-1})	6.16×10^{-2} (5.45×10^{-1})	8.02×10^{-4} (7.10×10^{-3})
Parallel Drive Inertia		**1:1 Reduction**	**Add per 25 mm**
12 mm Lead (zero stroke)		9.43×10^{-2} (8.34×10^{-1})	8.02×10^{-4} (7.10×10^{-3})

Data Curves

Maximum Force Rating (Extension)



Critical Speed vs Stroke Length:



Service Life Estimate Assumptions:

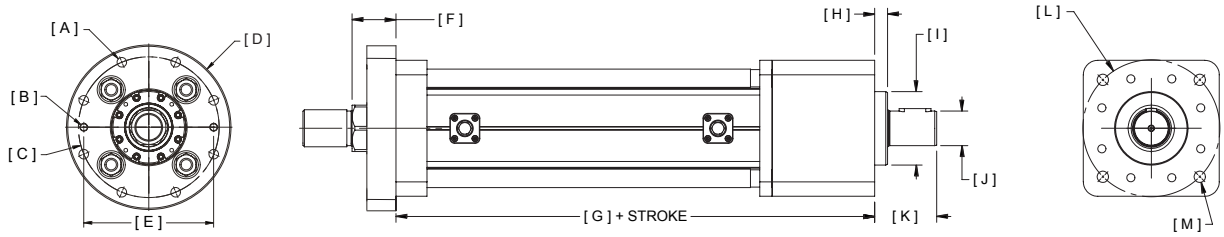
- Sufficient quality and quantity of lubrication is maintained throughout service life
- Bearing and screw temperature between 20° C and 40° C
- No mechanical hard stops (external or internal) or impact loads
- No external side loads

FTP Series Accessories

Limit Switches	
Part Number	**Description**
43403	Normally Open PNP Limit Switch (10-30 VDC, 1m. 3 wire embedded cable)
43404	Normally Closed PNP Limit Switch (10-30 VDC, 1m. 3 wire embedded cable)
67634	Normally Open NPN Limit Switch (10-30 VDC, 1m. 3 wire embedded cable)
67635	Normally Closed NPN Limit Switch (10-30 VDC, 1m. 3 wire embedded cable)

Dimensions

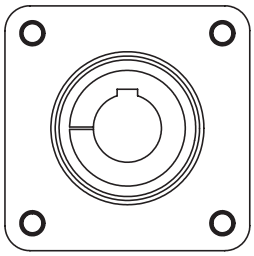
Base Actuator

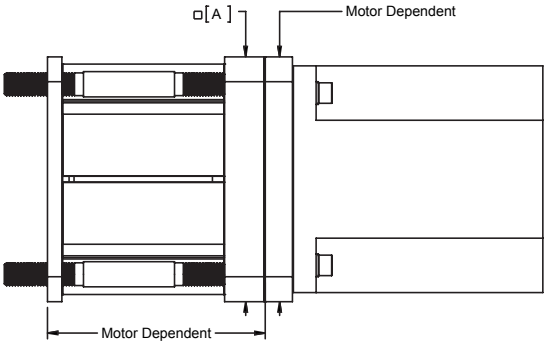


		FTP215
A	mm	Ø22.0
	in	Ø0.87
B	mm	Ø16.00 +0.03 / -0.00
	in	Ø0.630 +0.001 / -0.000
C	mm	Ø325.0
	in	Ø12.80
D	mm	Ø380.0
	in	Ø14.96
E	mm	300.00
	in	11.81
F	mm	76.0
	in	2.99

		FTP215
G	mm	527.7 ± 1.5
	in	20.78 ± 0.06
H	mm	22.4
	in	0.88
I	mm	127.0
	in	Ø5.00
J	mm	Ø60.0 +0.00 / -0.0013
	in	Ø2.362 +0.00 / -0.0005
K	mm	107.3
	in	4.23
L	mm	237.0
	in	Ø9.33 BC
M		4X M20x2.5 - 6H ↓ 20 mm

Inline Mount

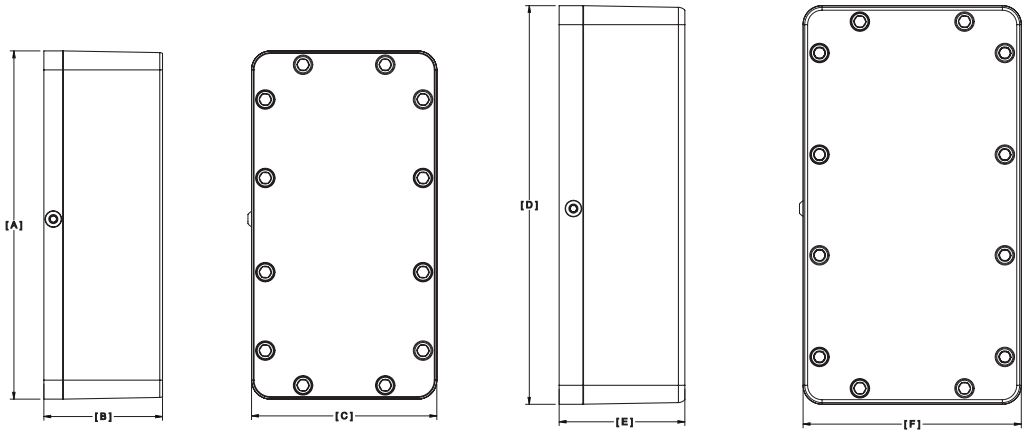




	A
FTP215	□ 215.9 (8.5)

Dimensions shown in metric (English)

Parallel Mount (FTP215)



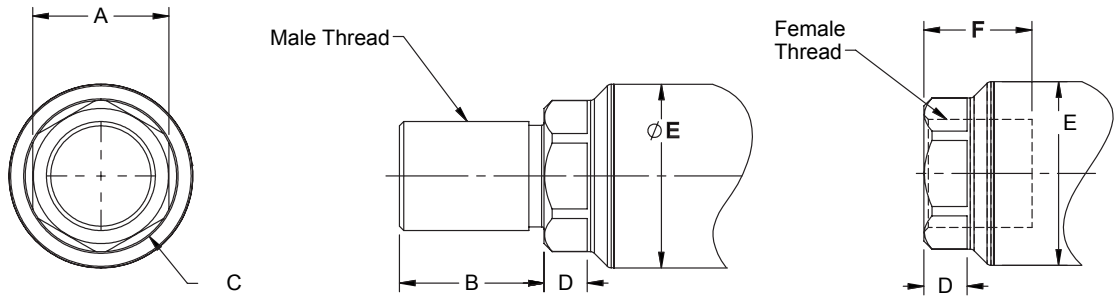
248 mm wide housing

292 mm wide housing

Note: 248 mm wide housing is used for motors with 215 mm B.C. and smaller mounting holes, 1:1 drive

		FTP215
A	mm	466.0
	in	18.35
B	mm	158.9
	in	6.25
C	mm	248.0
	in	9.76
D	mm	533.4
	in	21.00
E	mm	168.2
	in	6.62
F	mm	292.1
	in	11.50

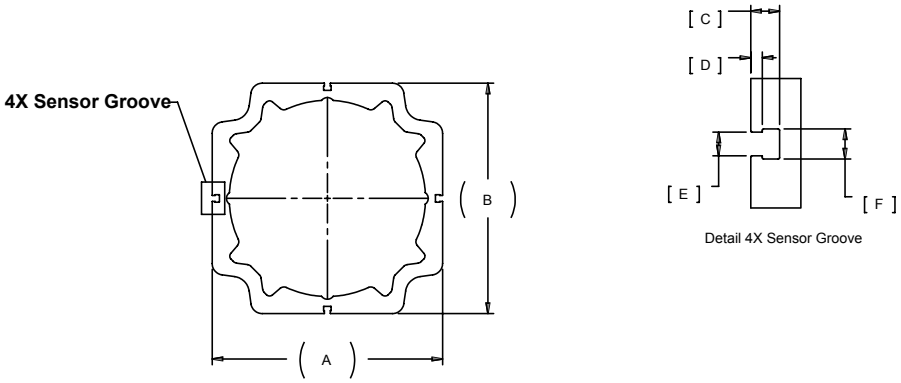
Rod Ends



	A	B	C	D	E	F	Male	Female
FTP215	80.0 (3.15)	85.0 (3.35)	88.9 (3.50)	25.4 (1.00)	108.0 (4.25)	85.0 (3.35)	M64x3 6G	M64x3 6G

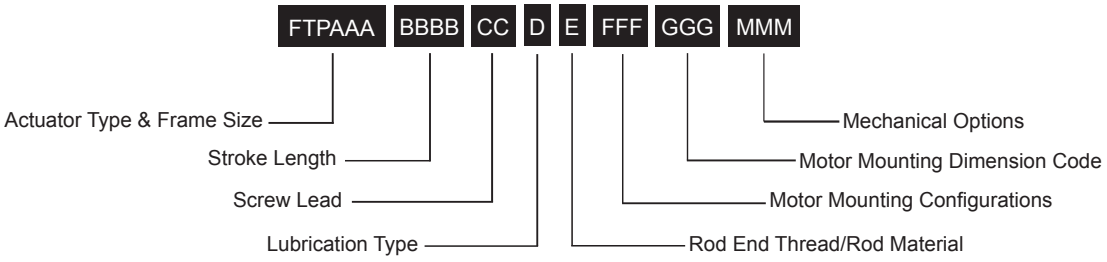
Dimensions shown in metric (English)

Case Dimensions



	A	B	C	D	E	F
FTP215	203 (8.0)	203 (8.0)	6.4 (.25)	2.5 (.10)	5.2 (.21)	6.6 (.26)

Dimensions shown in metric (English)



AAA = Frame Size
215 = 215 mm

BBBB = Stroke Length
0150 = 150 mm
0300 = 300 mm
0600 = 600 mm

CC = Screw Lead
12 = 12 mm

D = Lubrication Type
2 = Oil

E = Rod End Thread
A = Male, metric thread
B = Female, metric thread

FFF = Motor Mounting Configurations[1]
NMT = None, base unit only
N10 = Inline, includes shaft coupling
P10 = Parallel, 1:1 belt reduction

GGG = Gearbox Mounting Dimension Code
See standard gearbox mounting code dimension sheet
NNN = None, base unit only

MMM = Mechanical Options
ME5 = Front Mounting Flange (Required)

NOTES:
1. Always discuss your motor selection with your local sales representative.

For options or specials not listed above, please contact Exlar

NOTES

USA & CANADA
Exlar Corporation
18400 West 77th Street
Chanhassen, MN 55317
Phone: 855-620-6200 (US & Canada)
Fax: 952-368-4877

EUROPE
Exlar Europe GmbH
Schleißheimer Str., 91a
Garching bei München D-85748
Germany
Phone: +49 6124 17590-0

ASIA
Exlar Asia Pacific
1007 Pine City Hotel
No. 777 Zhao Jia Bang Road
Shanghai 200032 China
Phone: +86 021-3307-0220

Distributed by:

www.exlar.com

Exlar® actuators are a brand of Curtiss-Wright, Sensors and Controls Division.

© 2017 Exlar Corporation