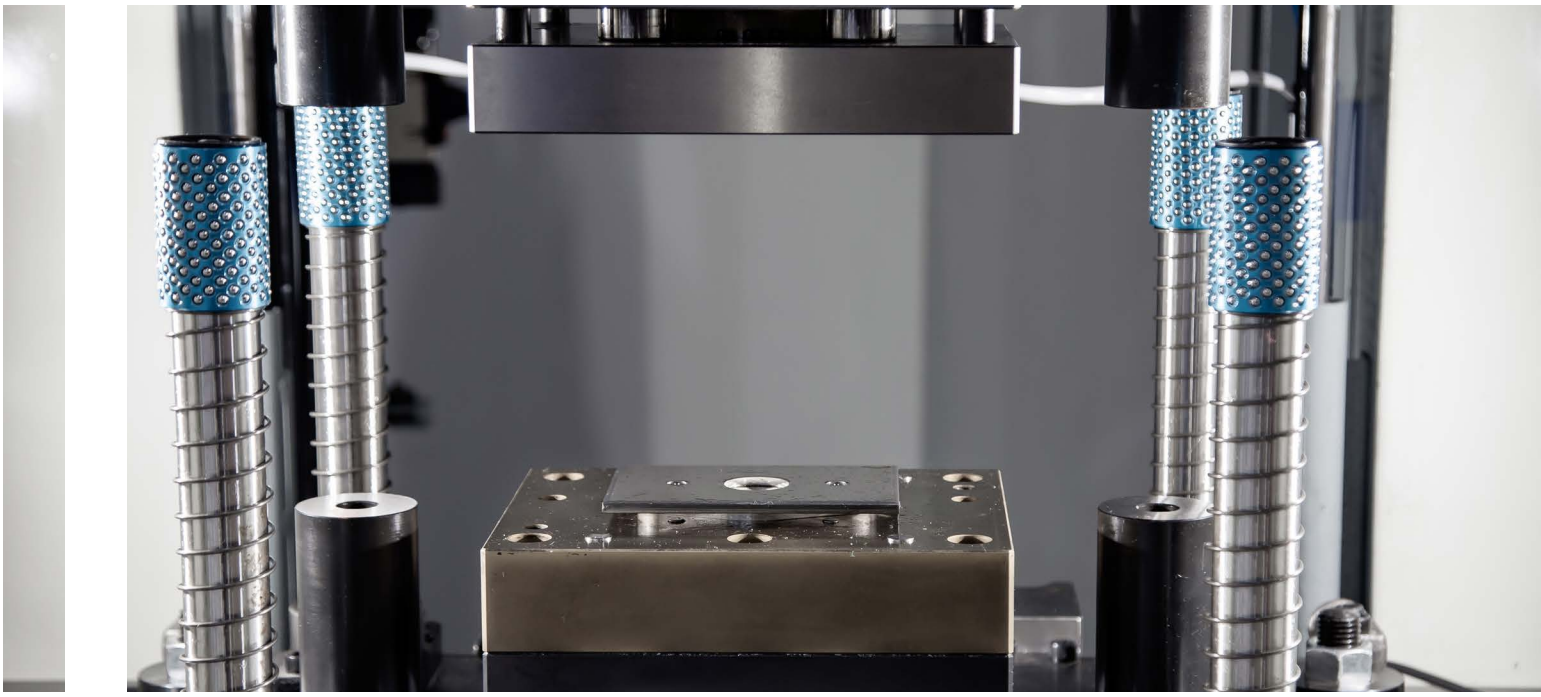
CURTISS-WRIGHT



Exlar® FTP Catalog

High-Force Electric Roller Screw Press Actuator

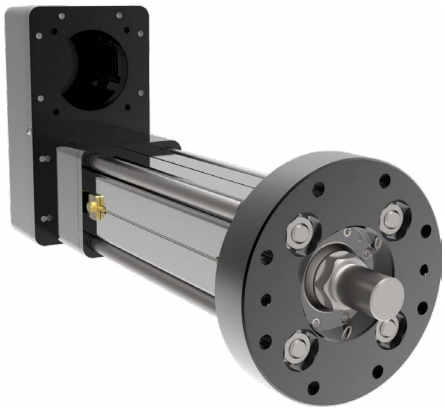


Table of Contents

Exlar® FTP

High-Force Electric Press Actuators

Key Features

- Ideal hydraulic press replacement
- Industry-leading power density
- Rugged and reliable
- Flexible and precise

Applications

- Automotive
  - Stamping, clinching, pressing
- Machining
  - Metal forming, molding, forging, straightening
- Material Handling
  - Stamping, punching, pressing

Hydraulic Press Replacement

Based on planetary rollers screw technology, the Exlar FTP 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 Exlar 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 Exlar FTP utilizes commonly understood servo motor technology, offering accuracy, control and flexibility not available with hydraulics.

Reliable and Efficient

The Exlar FTP 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 typically consume 25% less energy than a typical hydraulic solution. Increase your operational efficiency today by switching to the Exlar FTP actuators.

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	0° to 85°
IP Rating		IP65S

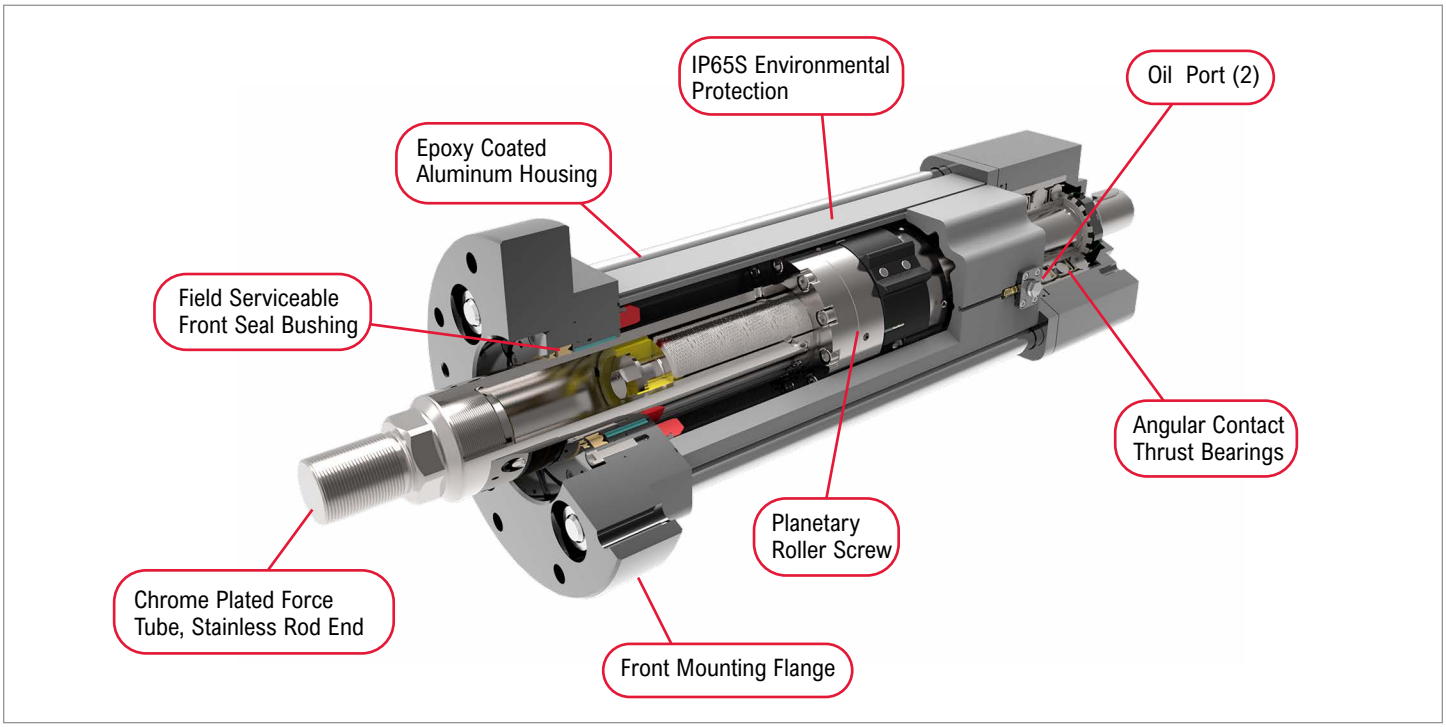


Figure 1: Product Features

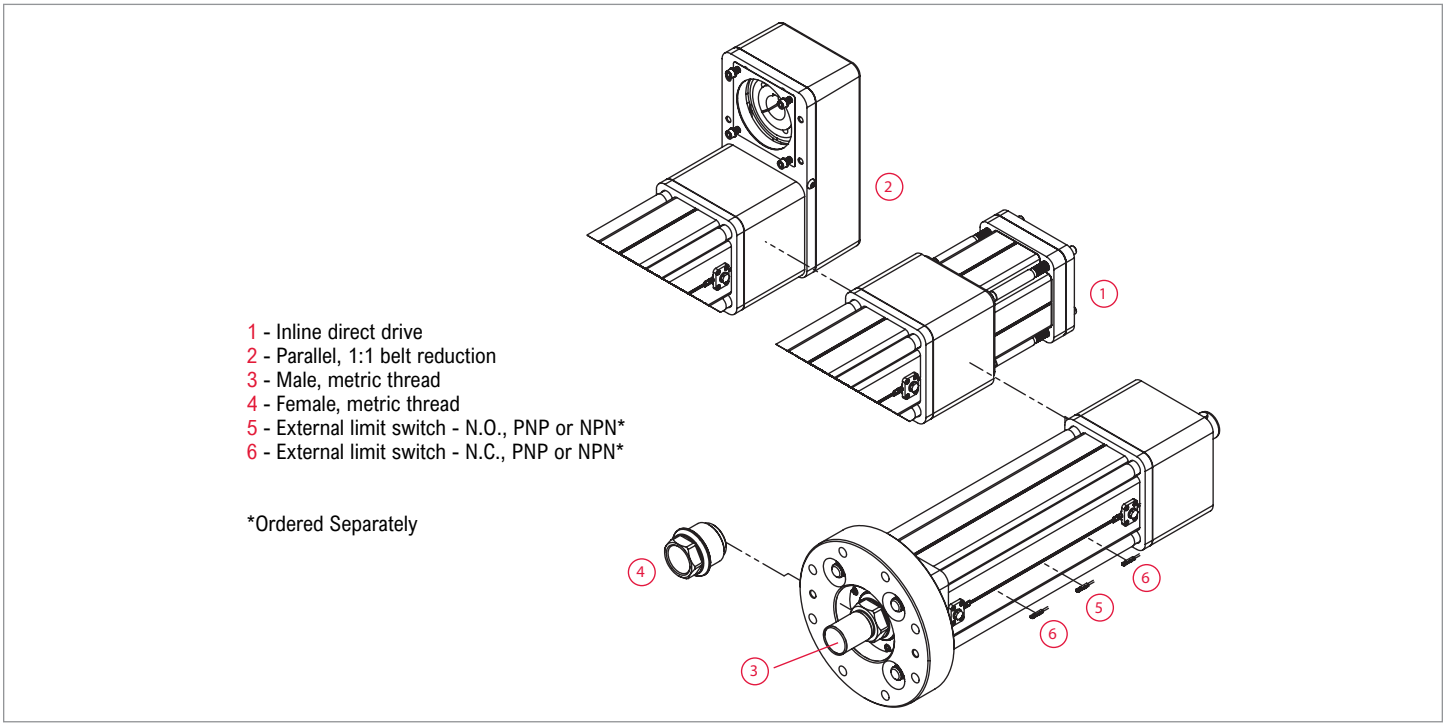


Figure 2: Exploded View

Mechanical Specifications

Exlar FTP160

Screw Lead	mm	12
	in	0.472
Maximum Force (Extension)	kN	200.0
	lbf	45,000
Maximum Force (Retraction)	kN	89.0
	lbf	20,000
Life at Maximum Force (Minimum)	Press Cycles	3 Million
Maximum Full Load Press Stroke	mm	12
	in	0.47
C_a (Dynamic Load Rating)	kN	290.0
	lbf	65,200
Maximum Input Torque	Nm	472
	lbf-in	4,225
Max Rated RPM @ Input Shaft	RPM	2,000
Maximum Linear Speed @ Maximum Rated RPM	mm/sec	401
	in/sec	15.8
Friction Torque (Typical)	Nm	4.54
	lbf-in	40

Weights kg (lbs)		
Base Actuator Weight (Zero Stroke)	kg	56
	lb	124
Actuator Weight Adder (Per 25 mm of stroke)	kg	1.73
	lb	3.8
Adder for Inline (excluding motor)	kg	14.2
	lb	30.7
Adder for Parallel Drive (excluding motor)	kg	53.1
	lb	117.8
Adder for Front Flange	kg	19.0
	lb	41.7

Base Unit Inertia		Zero Stroke [kg-m^2 (lbf-in-sec^2)]	Add per 25 mm [kg-m^2 (lbf-in-sec^2)]
12 mm Lead		1.35 x 10^{-2} (1.20 x 10^{-1})	2.58 x 10^{-4} (2.28 x 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	1.47 x 10^{-2} (1.30 x 10^{-1})	1.68 x 10^{-2} (1.49 x 10^{-1})	2.58 x 10^{-4} (2.28 x 10^{-3})
Parallel Drive Inertia		**1:1 Reduction**	**Add per 25 mm**
12 mm Lead (zero stroke)		5.28 x 10^{-2} (4.67 x 10^{-1})	2.58 x 10^{-4} (2.28 x 10^{-3})

Exlar FTP215

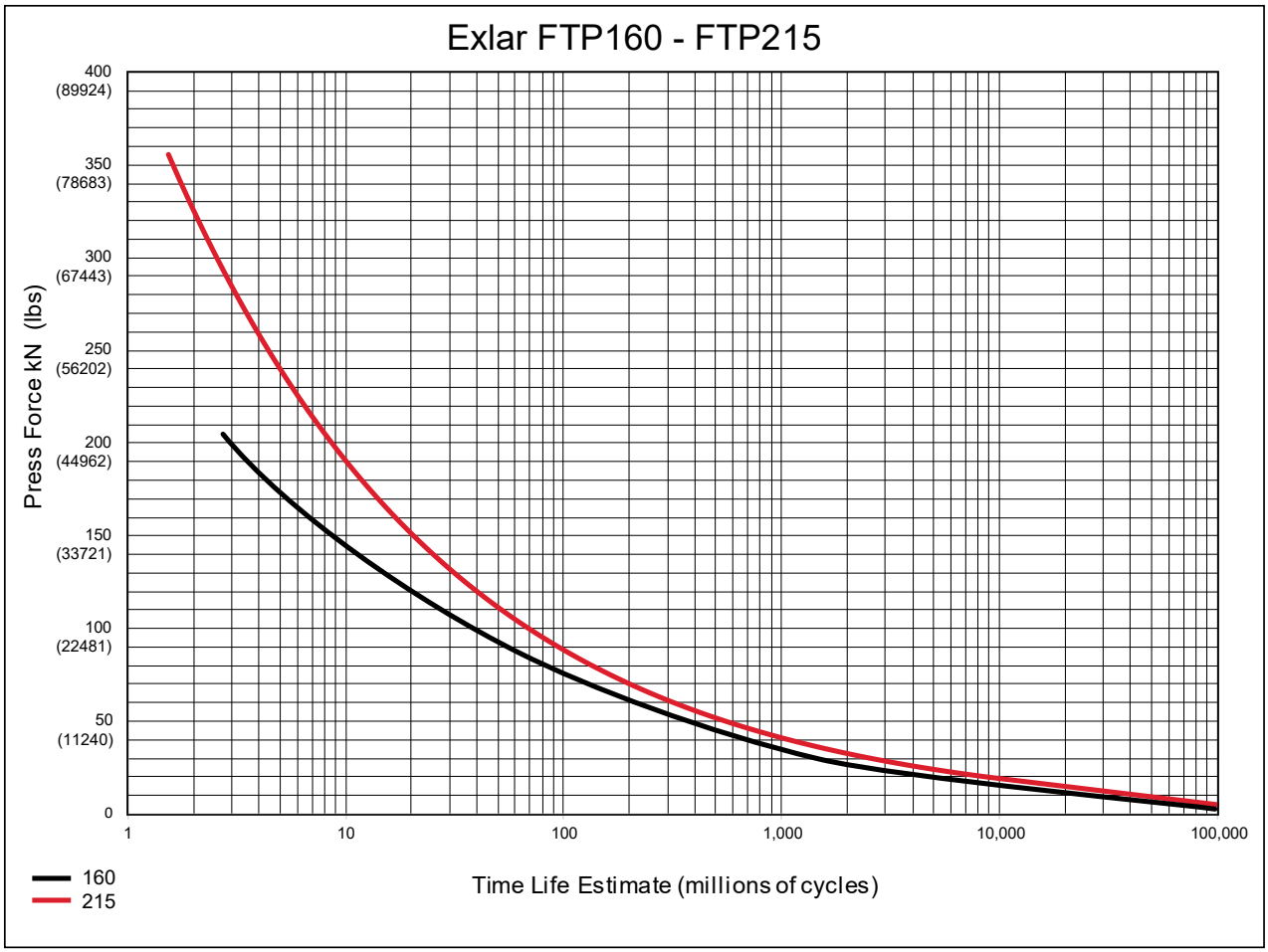
Screw Lead	mm	12
	in	0.472
Maximum Force (Extension)	kN	355.8
	lbf	80,000
Maximum Force (Retraction)	kN	177.9
	lbf	40,000
Life at Maximum Force (Minimum)	Press Cycles	1.6 Million
Maximum Full Load Press Stroke	mm	12
	in	0.47
C_a (Dynamic Load Rating)	kN	423.5
	lbf	95,200
Maximum Input Torque	Nm	850
	lbf-in	7,520
Max Rated RPM @ Input Shaft	RPM	1,750
Maximum Linear Speed @ Maximum Rated RPM	mm/sec	351
	in/sec	13.8
Friction Torque (Typical)	Nm	5.65
	lbf-in	50

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-m^2 (lbf-in-sec^2)]	Add per 25 mm [kg-m^2 (lbf-in-sec^2)]
12 mm Lead		4.26 x 10^{-2} (3.77 x 10^{-1})	8.02 x 10^{-4} (7.10 x 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 x 10^{-2} (3.93 x 10^{-1})	6.16 x 10^{-2} (5.45 x 10^{-1})	8.02 x 10^{-4} (7.10 x 10^{-3})
Parallel Drive Inertia		**1:1 Reduction**	**Add per 25 mm**
12 mm Lead (zero stroke)		9.43 x 10^{-2} (8.34 x 10^{-1})	8.02 x 10^{-4} (7.10 x 10^{-3})

Data Curves

Estimated Service Life



The underlying formula that defines this value is:

L_{10} = Lifetime estimate in millions of cycles, where:

C_a = Dynamic load rating (lbf)

F_{pres} = Press force (press distance ≤ 12mm)

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

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

Exlar FTP Press Sizing Guide

Exlar's FTP actuators meet the most demanding pressing applications in the market. Successful applications include bearing press, stamping, and leak testing. Due to design considerations for the Exlar FTP, the extreme forces are only achievable when extending the main rod. See manufacturer's specifications on page 70 for maximum force ratings for each actuator in the Exlar FTP.

For any press force less than the maximum rating, calculate the estimated L10 life by using the calculation method listed. The press distance must not exceed the maximum rated press distance listed.

If your application is outside the specifications, please fill in the following table and chart. Send the completed document to cha_applications@curtisswright.com. Exlar's sales engineering team will review the application to determine if Exlar has a solution to meet the requirements.

Required Data for Press Applications Outside Listed Specifications

Application Data		
Typical Press Force	kN	
Typical Press Stroke	mm	
Maximum Press Force	kN	
Maximum Press Stroke	mm	
Cycle Rate	Cycles/min	
Dwell Time After Each Cycle	s	
Life Expectancy	Months	

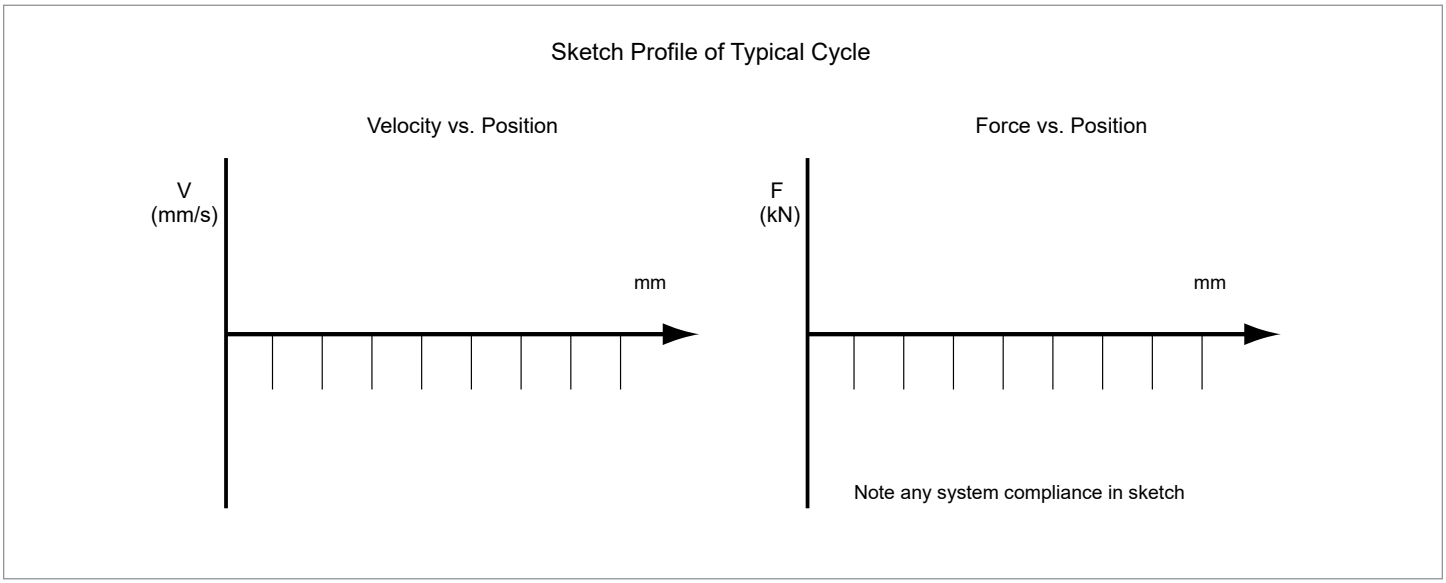


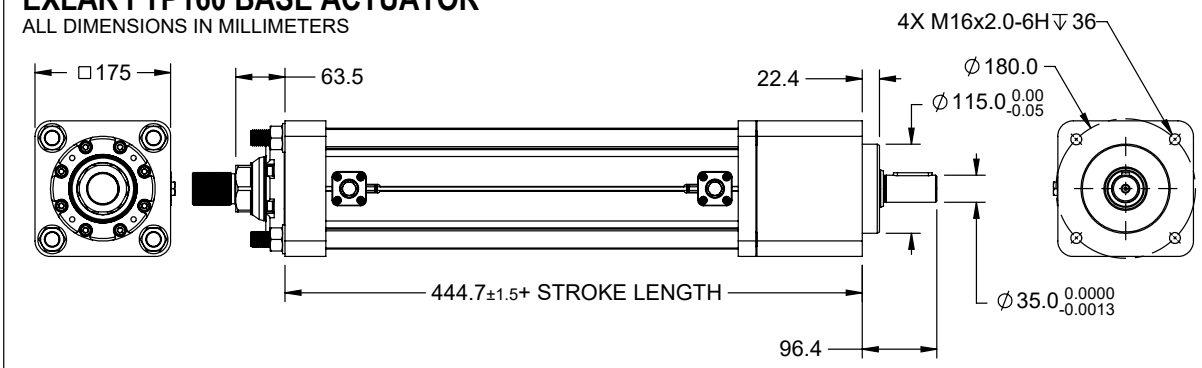
Figure 3: Typical Cycle

Dimensions

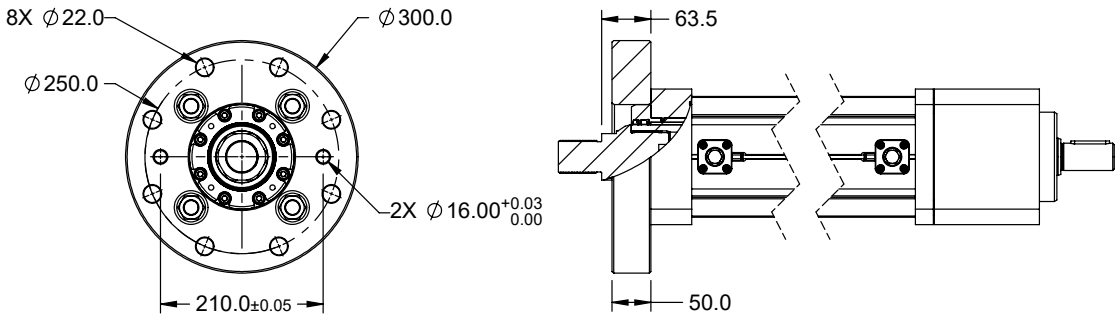
Exlar FTP160

EXLAR FTP160 BASE ACTUATOR

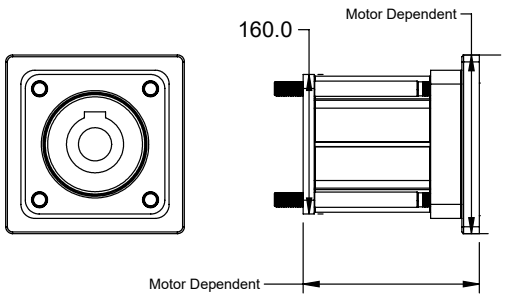
ALL DIMENSIONS IN MILLIMETERS



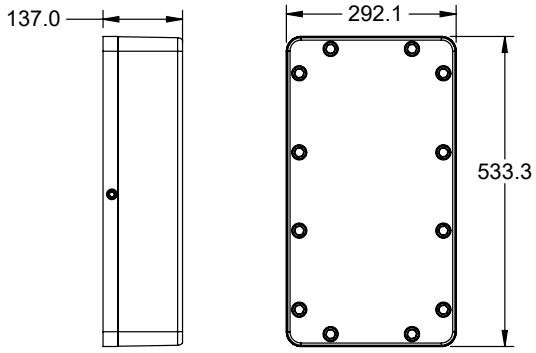
1 (FRONT FLANGE)



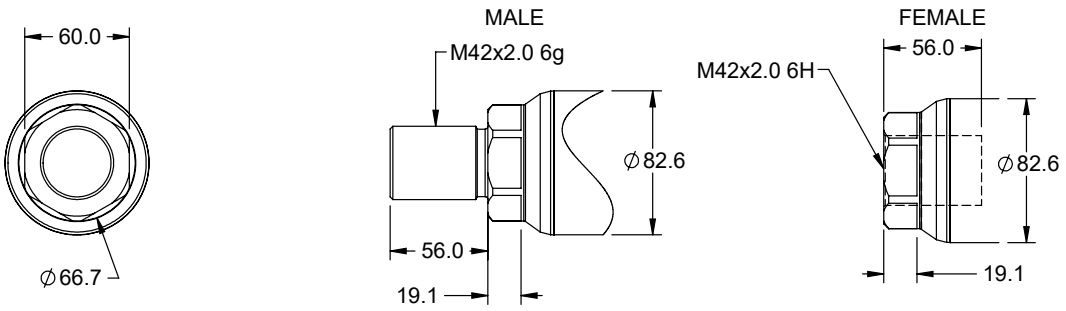
N10 (INLINE MOUNT)



P10 (PARALLEL MOUNT)



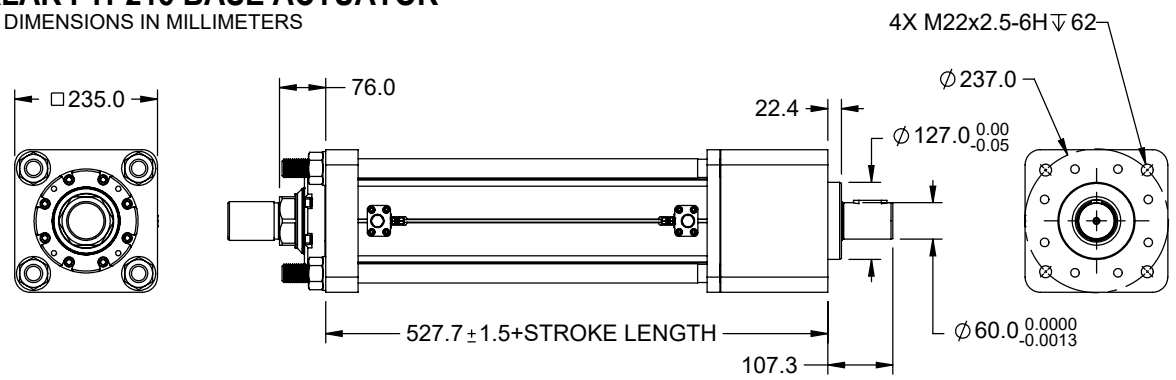
ROD ENDS



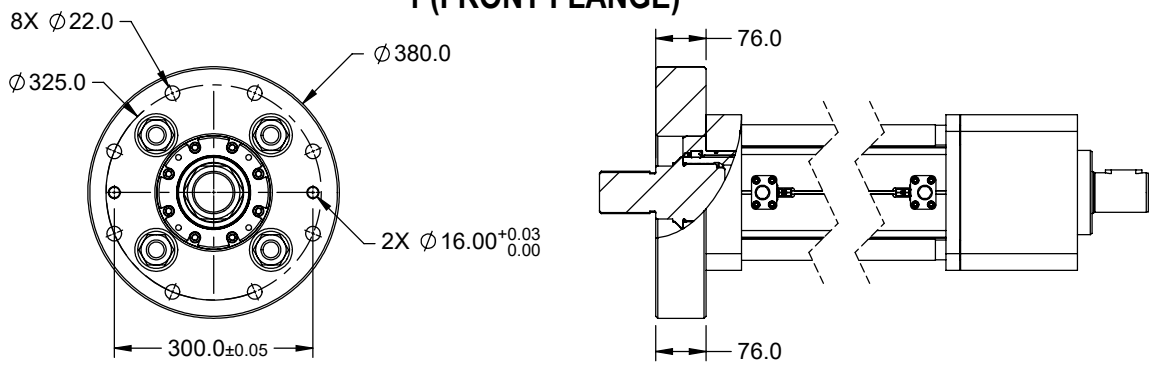
EXLAR FTP215

EXLAR FTP215 BASE ACTUATOR

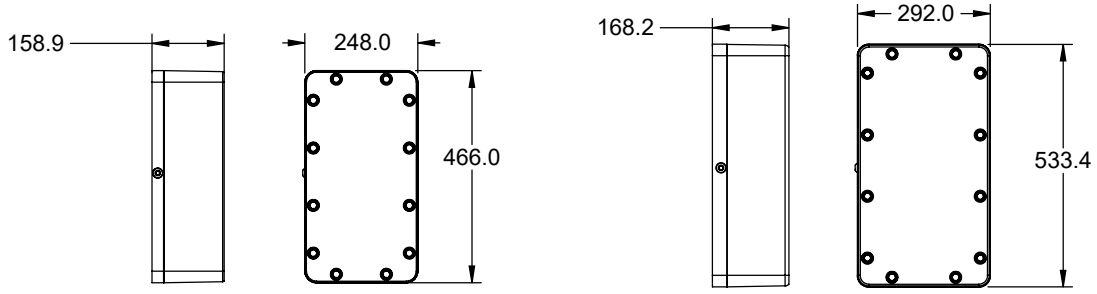
ALL DIMENSIONS IN MILLIMETERS



1 (FRONT FLANGE)

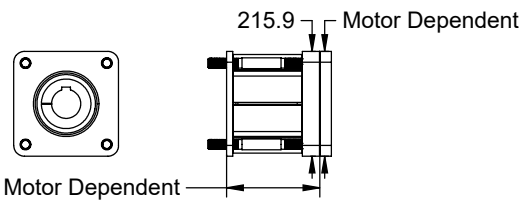


P10 (PARALLEL MOUNT)

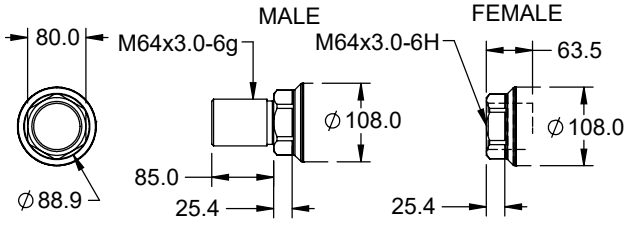


NOTE: 248mm Wide Housing used for Motors with 215mm Mounting B.C. and Smaller P10 1:1 Mounts,

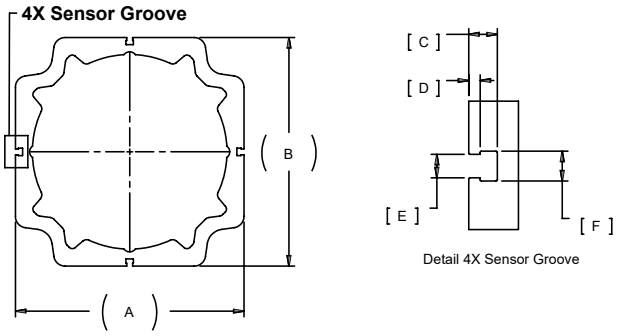
N10 (INLINE MOUNT)



ROD ENDS

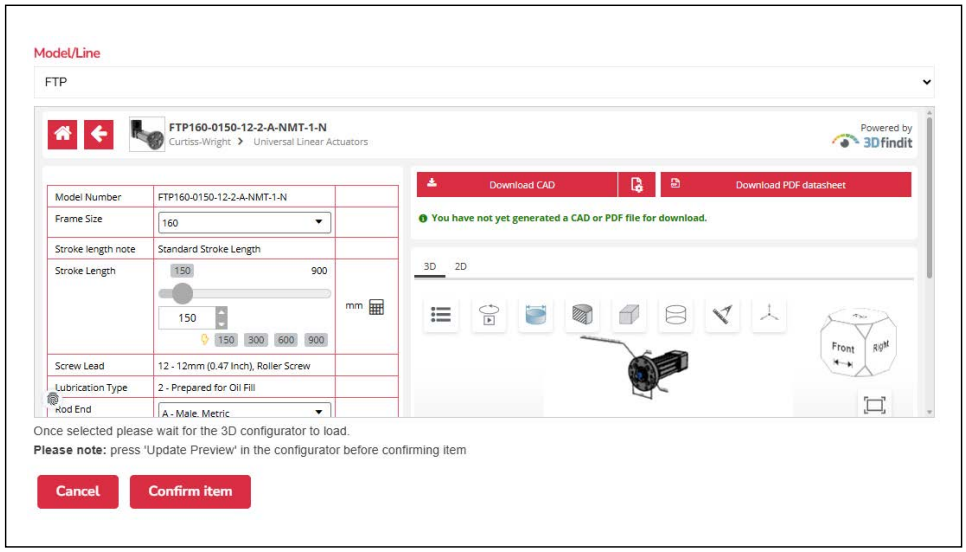


Exlar FTP Case Dimensions



Frame Size		A	B	C	D	E	F
160	mm	156	156	5.5	1.7	5.3	6.6
	in	6.1	6.1	0.22	0.07	0.21	0.26
215	mm	203	203	6.4	2.5	5.2	6.6
	in	8.0	8.0	0.25	0.10	0.21	0.26

The online 3D model builder allows for the configuration of the Exlar FTP actuator and can be downloaded into common 3D and 2D formats.



Standard Gearbox Mount Codes for the Exlar FTP

Exlar FTP160 Gearbox Mounts

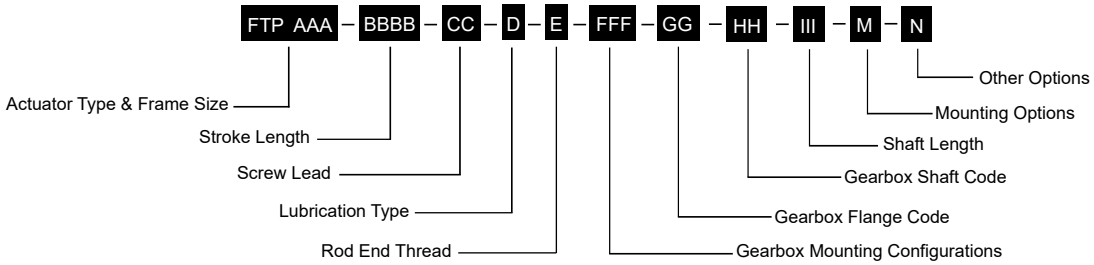
None		Inline				Parallel 1:1			
				Dimension in mm				Dimension in mm	
Motor Flange Code		Motor Flange Code		Bolt Circle	Pilot Diam.	Motor Flange Code		Bolt Circle	Pilot Diam.
NMT-	00	N10-	19	165	130	P10-	19	165	130
		N10-	22**	215	160	P10-	22	215	160
Motor Shaft Code		Motor Shaft Code		Shaft Diam.	Key Width	Motor Shaft Code		Shaft Diam.	Key Width
00		QA		40	12	QA		40	12
		UA		55	16	UA		55	16
Shaft Length		Shaft Length				Shaft Length			
000		080, 082, 085, 088, 097, 100, 105, 110, 112, 113, 116		* Pick closest shaft length within 2mm if your exact length is not listed		060-124		* Allowable shaft length range in 1 mm increments	

**Only allow shaft lengths 105, 112, 113 for UA and only 100 for QA

Exlar FTP215 Gearbox Mounts

None		Inline				Parallel 1:1			
				Dimension in mm				Dimension in mm	
Motor Flange Code		Motor Flange Code		Bolt Circle	Pilot Diam.	Motor Flange Code		Bolt Circle	Pilot Diam.
NMT-	00	N10-	19	165	130	P10-	19	165	130
		N10-	22	215	160	P10-	22	215	160
		N10-	27	250	180	P10-	27	250	180
Motor Shaft Code		Motor Shaft Code	Shaft Diam.	Key Width	Min. Shaft Length	Motor Shaft Code		Shaft Diam.	Key Width
00		QA	40	12	80	QA		40	12
		UA	55	16	105	UA		55	16
		XA	75	20	105	XA		75	20
Shaft Length		Shaft Length				Shaft Length			
000		080, 082, 085, 097, 100, 102, 105, 110, 112, 116, 140		* Pick closest shaft length within 2 mm if your exact length is not listed		070-155		* Allowable shaft length range in 1 mm increments	

Exlar FTP Actuator Ordering Information



AAA = Actuator Frame Size
Exlar FTP160 = 160 mm
Exlar FTP215 = 215 mm

BBBB = Stroke Length
0150 = 150 mm
0300 = 300 mm
0600 = 600 mm
0900 = 900 mm (FTP160 only)

CC = Screw Lead
12 = 12 mm

D = Lubrication Type
2 = Oil

E = Rod End Thread
A = Male, Metric
B = Female, Metric

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

GG = Motor/Gearbox Flange Code
See standard gearbox mounting code dimension sheet

HH = Motor Shaft Code
See standard gearbox mounting code dimension sheet

III = Shaft Length
See standard gearbox mounting code dimension sheet

M = Mounting Option
1 = Front Flange, Metric (Required)

N = Other Options
N = None

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

For Exlar FTP options or specials not listed above, please contact:
cha_applications@curtisswright.com

Exlar 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)

Warranty and Limitations of Liability

Please see our warranty on our website here: https://www.cw-actuation.com/en-gb/about/terms-conditions for details.

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