EL120

ATEX Rated Explosion-Proof Linear Actuators

Perfect for valve control or other hazardous environment applications, the EL120 is a high performance electric actuator offered as a direct replacement to hydraulics. Exlar's EL120 actuators offer a longer life, linear speeds up to 37 inches per second, closed loop feedback, 90% efficiency and 100% duty cycle.

For gas turbines with variable guide vanes, the EL120 actuators provide precise positioning and feedback for fine tuning injector airflow maintaining CO and NOx emissions. In Oil & Gas applications, the EL120 is well suited for position based drilling choke valves.

Exlar's EL120 explosion-proof linear actuators are rated for Class I, Div 1, Groups B, C, D and T4 hazardous environments. The EL120 linear actuators also meet ATEX requirements for use in potentially explosive atmospheres and are in conformity with the EU ATEX Directive 94/9/EC.

The EL Series linear actuators integrate a highly efficient planetary roller screw mechanism with a high torque servomotor in a single self-contained package. The roller screw consists of multiple threaded rollers assembled in a planetary arrangement around a threaded shaft. This highly robust design is designed to provide reliable and precise operation over thousands of hours, handling heavy loads even under very arduous conditions.

The EL120 Actuator is compatable with nearly any manufactures' servo amplifier.

EL120
Explosion-Proof
Linear Actuator
Class I, Div 1,
Groups B, C, D, and T4

CE 0518

Ex II 2G
SIRA 10ATEX1037X
IECEx CSA 14.0014
Ex d II B +H2 T4 Gb IP66S, Type 4

c SP us 163694
Class I, Div 1
Group B,C,D,T4

Features
Forces to 4000 lbs
Speeds to 37.5 ips
Strokes up to 18 inches
8 pole brushless motors
Feedback configurations for nearly any servo amplifier
Several mounting configurations
Windings available from 24 VDC to 460 Vrms
CSA Class I, Div 1 Group B, C, D and T4 hazardous environment rating
ATEX, Ex d II B +H2 T4 Gb IP66S, Type 4
IECEx CSA 14.0014
Completely sealed motor assures trouble-free operation

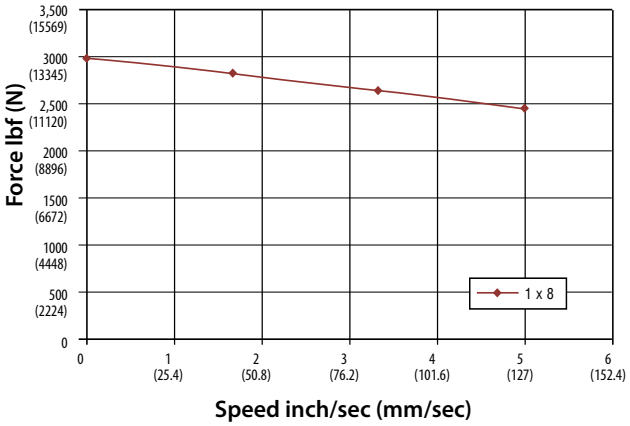
EL120 explosion-proof actuators are well-suited to many applications such as:

- Valve control
- Turbine control
- Fuel control
- Damper control
- Choke valves
- Plunger pumps

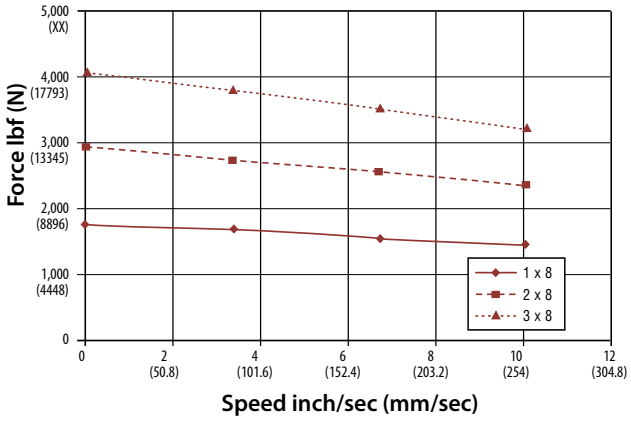
EL120 Performance Curves

The below speed vs. force curves represent approximate continuous thrust ratings at indicated linear speed. Different types of servo amplifiers will offer varying motor torque and thus actuator thrust. These values are at constant velocity and do not account for motor torque required for acceleration.

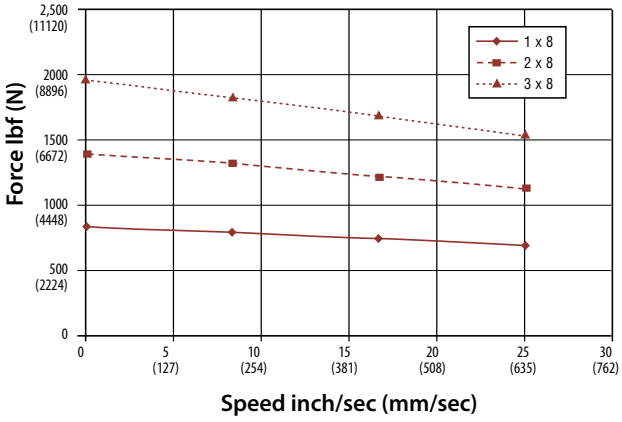
EL120-.1 Inch Lead



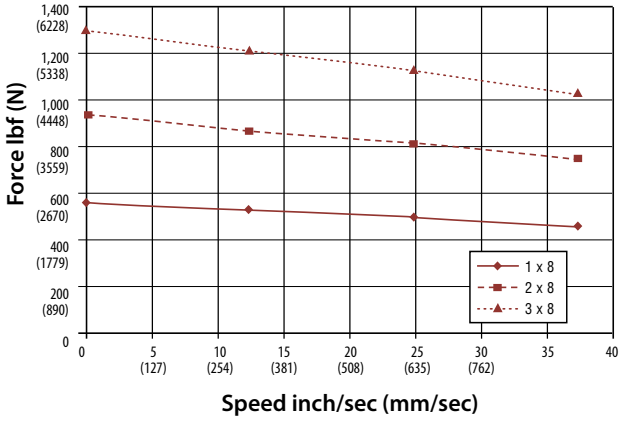
EL120-.2 Inch Lead



EL120-.5 Inch Lead



EL120-.75 Inch Lead



EL120 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.

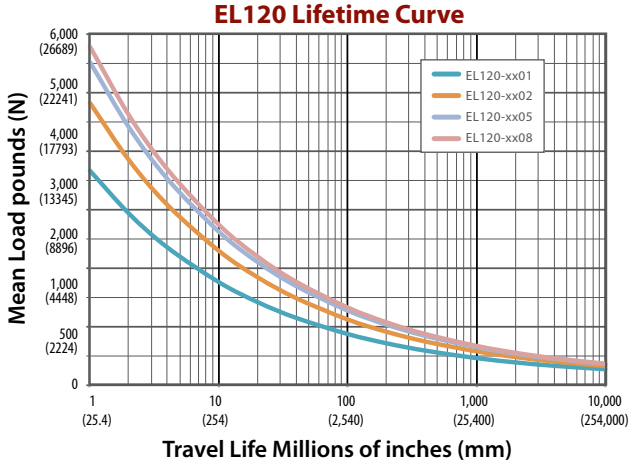
The underlying formula that defines this value is:
Travel life in millions of inches, where:

C = Dynamic load rating (lbf)
F = Cubic mean applied load (lbf)
S = Roller screws lead (inches)

$$L_{10} = \left(\frac{C}{F}\right)^3 \times S$$

All curves represent properly lubricated and maintained actuators. Ratings may vary depending on application.

EL120 Lifetime Curve



EL120 Performance Specifications

Model No.	Frame Size in (mm)	Stroke* in (mm)	Screw Lead in (mm)	Force Rating** lb (N) 1/2/3 Stack	Maximum Velocity in/sec (mm/sec)	Maximum Static Load lb (N)	Armature Inertia*** lb-in-s^2 (Kg-m^2)	Dynamic Load lb (N)	Weight (approx.) lb (kg)
EL120-0401	4.7 (120)	4 (102)	0.1 (2.54)	2,984/NA/NA (13,272/NA/NA)	5 (127)	5400 (24020)	0.0140 (0.001582)	7900 (35141)	55 (25)
EL120-0402			0.2 (5.08)	1,748/NA/NA (7,776/NA/NA)	10 (254)			8300 (36920)	
EL120-0405			0.5 (12.7)	839/NA/NA (3,733/NA/NA)	25 (635)			7030 (31271)	
EL120-0408			0.75 (19.05)	559/NA/NA (2,488/NA/NA)	37.5 (953)			6335 (28179)	
EL120-0601	4.7 (120)	6 (152)	0.1 (2.54)	2,984/CONSULT/NA (13,272/CONSULT/NA)	5 (127)	5400 (24020)	0.0152 (0.001717)	7900 (35141)	59 (27)
EL120-0602			0.2 (5.08)	1,748/2,865/NA (7,776/12,744/NA)	10 (254)			8300 (36920)	
EL120-0605			0.5 (12.7)	839/1,375/NA (3,733/6,117/NA)	25 (635)			7030 (31271)	
EL120-0608			0.75 (19.05)	559/917/NA (2,488/4,078/NA)	37.5 (953)			6335 (28179)	
EL120-0801	4.7 (120)	8 (203)	0.1 (2.54)	2,984/CONSULT/CONSULT (13,272/CONSULT/CONSULT)	5 (127)	5400 (24020)	0.0163 (0.001842)	7900 (35141)	63 (29)
EL120-0802			0.2 (5.08)	1,748/2,865/4,081 (7,776/12,744/18,152)	10 (254)			8300 (36920)	
EL120-0805			0.5 (12.7)	839/1,375/1,959 (3,733/6,117/8,713)	25 (635)			7030 (31271)	
EL120-0808			0.75 (19.05)	559/917/1,306 (2,488/4,078/5,809)	37.5 (953)			6335 (28179)	
EL120-1001	4.7 (120)	10 (254)	0.1 (2.54)	2,984/CONSULT/CONSULT (13,272/CONSULT/CONSULT)	5 (127)	5400 (24020)	0.0175 (0.001977)	7900 (35141)	67 (31)
EL120-1002			0.2 (5.08)	1,748/2,865/4,081 (7,776/12,744/18,152)	10 (254)			8300 (36920)	
EL120-1005			0.5 (12.7)	839/1,375/1,959 (3,733/6,117/8,713)	25 (635)			7030 (31271)	
EL120-1008			0.75 (19.05)	559/917/1,306 (2,488/4,078/5,809)	37.5 (953)			6335 (28179)	
EL120-1201	4.7 (120)	12 (305)	0.1 (2.54)	2,984/CONSULT/CONSULT (13,272/CONSULT/CONSULT)	5 (127)	5400 (24020)	0.0186 (0.002102)	7900 (35141)	72 (33)
EL120-1202			0.2 (5.08)	1,748/2,865/4,081 (7,776/12,744/18,152)	10 (254)			8300 (36920)	
EL120-1205			0.5 (12.7)	839/1,375/1,959 (3,733/6,117/8,713)	25 (635)			7030 (31271)	
EL120-1208			0.75 (19.05)	559/917/1,306 (2,488/4,078/5,809)	37.5 (953)			6335 (28179)	
EL120-1801	4.7 (120)	18 (457)	0.1 (2.54)	2,984/CONSULT/CONSULT (13,272/CONSULT/CONSULT)	5 (127)	5400 (24020)	0.022 (0.002486)	7900 (35141)	84 (38)
EL120-1802			0.2 (5.08)	1,748/2,865/4,081 (7,776/12,744/18,152)	10 (254)			8300 (36920)	
EL120-1805			0.5 (12.7)	839/1,375/1,959 (3,733/6,117/8,713)	25 (635)			7030 (31271)	

*Please note that stroke mm are Nominal dimensions.
**Force ratings at 25 degrees celsius.
***Inertia +/-5%

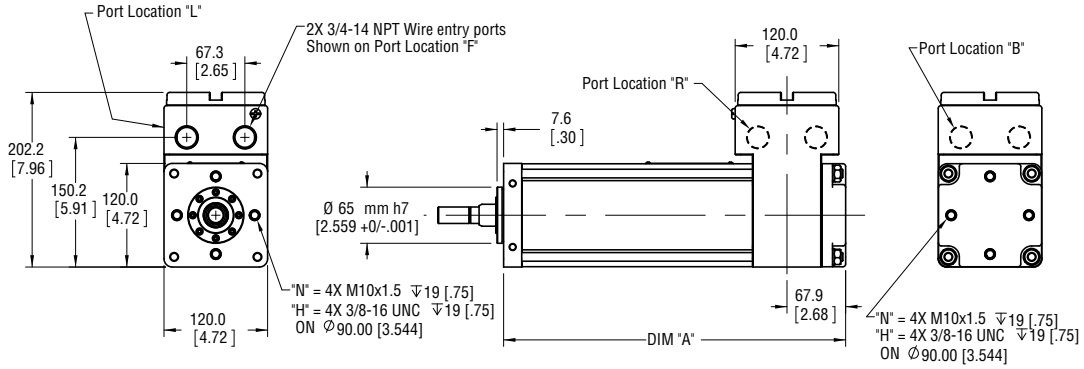
EL120 Electrical/Mechanical Specifications

Nominal Backlash	in (mm)	0.004 (0.10)									
Maximum Backlash (preloaded)	in (mm)	0.0									
Lead Accuracy in/ft	(mm/300 mm)	0.001 (0.025)									
Maximum Radial Load	lb (N)	40 (179)									
Environmental Rating	Standard	IP66S									
Motor Stator Ambient Temperature		**118 25˚C**	**138 25˚C**	**158 25˚C**	**168 25˚C**	**238 25˚C**	**258 25˚C**	**268 25˚C**	**338 25˚C**	**358 25˚C**	**368 25˚C**
RMS SINUSOIDAL COMMUTATION DATA											
Continuous Motor Torque	lbf-in (N-m)	74.1 (8.37)	74.1 (8.37)	74.3 (8.39)	74.1 (8.37)	123.6 (13.96)	121.4 (13.72)	123.6 (13.96)	172.3 (19.46)	168.9 (19.09)	176.9 (19.98)
Peak Motor Torque	lbf-in (N-m)	148.20 (16.74)	148.20 (16.74)	148.60 (16.79)	148.10 (16.74)	247.20 (27.93)	242.80 (27.43)	247.20 (27.93)	344.50 (38.93)	337.80 (38.17)	353.70 (39.96)
Torque Constant (Kt)	lbf-in (N-m/A)	4.30 (0.49)	8.70 (1.00)	15.70 (1.80)	17.30 (2.00)	8.70 (1.00)	15.80 (1.80)	17.30 (2.00)	8.50 (1.00)	15.80 (1.80)	17.50 (2.00)
Continuous Current Rating	Greased (IG) A	19.10	9.50	5.30	4.80	15.90	8.60	8.00	22.70	11.90	11.30
Peak Current Rating	A	38.20	19.10	10.60	9.50	31.80	17.10	15.90	45.40	23.80	22.50
0-PEAK SINUSOIDAL COMMUTATION											
Continuous Motor Torque	lbf-in (N-m)	74.1 (8.37)	74.1 (8.37)	74.3 (8.39)	74.1 (8.37)	123.6 (13.96)	121.4 (13.72)	123.6 (13.96)	172.3 (19.46)	168.9 (19.09)	176.9 (19.98)
Peak Motor Torque	lbf-in (N-m)	148.20 (16.74)	148.20 (16.74)	148.60 (16.79)	148.10 (16.74)	247.20 (27.93)	242.80 (27.43)	247.20 (27.93)	344.50 (38.93)	337.80 (38.17)	353.70 (39.96)
Torque Constant (Kt)	lbf-in/A (N-m/A)	3.10 (0.35)	6.10 (0.70)	11.10 (1.30)	12.30 (1.40)	6.10 (0.70)	11.20 (1.30)	12.30 (1.40)	6.00 (0.70)	11.20 (1.30)	12.40 (1.40)
Continuous Current Rating	Greased (IG) A	27.00	13.50	7.50	6.70	22.50	12.10	11.30	32.10	16.90	15.90
Peak Current Rating	A	54.00	27.00	15.00	13.50	45.00	24.20	22.50	64.20	33.70	31.90
MOTOR DATA											
Voltage Constant @ 25˚C (Ke)	Vrms/Krpm	29.6 (41.9)	59.2 (83.8)	106.9 (151.2)	118.5 (167.6)	59.2 (83.8)	108.2 (153.0)	118.5 (167.6)	58.0 (82.0)	108.2 (153.0)	119.8 (169.4)
Pole Configuration		8	8	8	8	8	8	8	8	8	8
Resistance (L-L)	Ohms	0.20	0.80	2.60	3.21	0.34	1.17	1.35	0.20	0.72	0.81
Inductance (L-L)	mH	3.30	11.90	42.40	48.30	5.90	21.10	25.30	3.70	11.60	17.10
Brake Inertia	lbf-in-sec^2 (kg-cm^2)	0.00146 (1.66)									
Brake Current @24 VDC +/- 10%	A	1.0									
Brake Holding Torque - Dry	lbf-in (Nm/A)	177 (20)									
Brake Engage/Disengage Time	ms	13/50									
Mechanical Time Constant (tm)	ms	0.79	0.79	0.79	0.79	0.60	0.63	0.60	0.54	0.56	0.51
Electrical Time Constant (te)	ms	16.26	14.88	16.34	15.06	17.60	18.06	18.72	18.51	16.06	21.16
Friction Torque	lbf-in (N-m)	1.43 (0.16)	1.43 (0.16)	1.43 (0.16)	1.43 (0.16)	1.81 (0.20)	1.81 (0.20)	1.81 (0.20)	2.32 (0.26)	2.32 (0.26)	2.32 (0.26)
Bus Voltage	Vrms	115	230	400	460	230	400	460	230	400	460
Speed @ Bus Voltage	rpm	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Insulation Class		180(H)									
Ambient Temperature Rating		-29°C to 93°C									
Insulation System Voltage Rating		T4, 135° Maximum Allowable Surface Temperature									

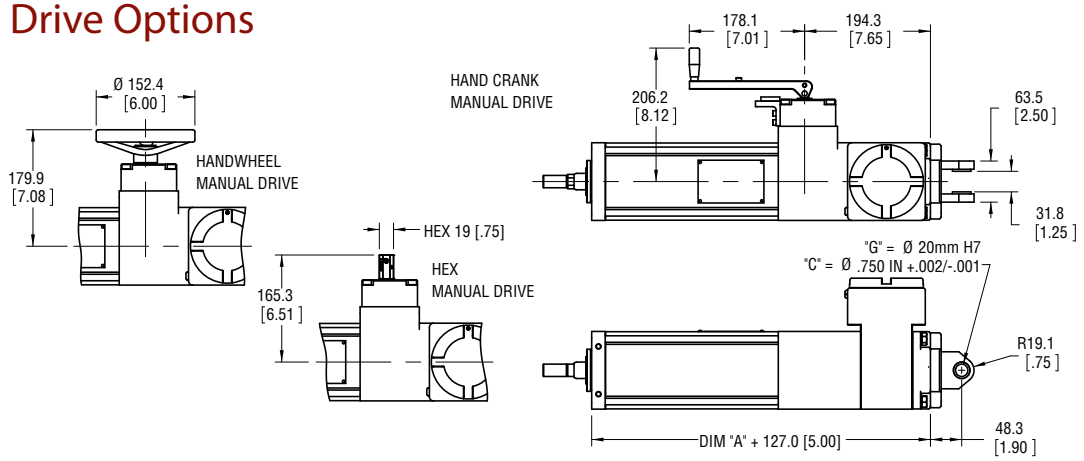
Test data derived using NEMA recommended aluminum heatsink 12" x 12" x 1/2"

EL120 Base Actuator

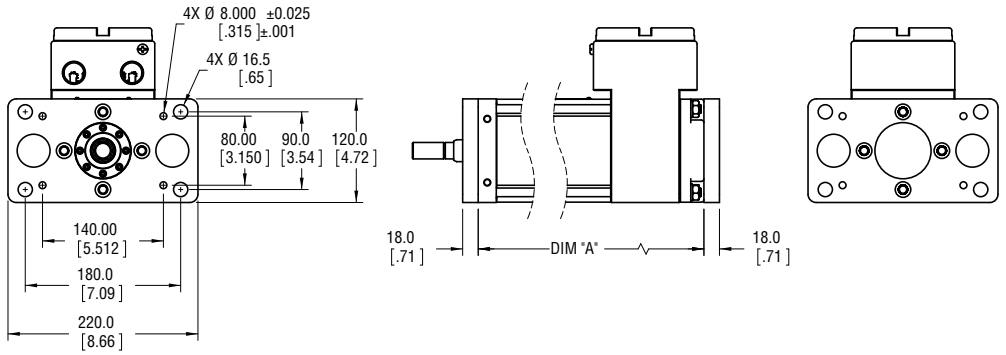
All dimensions shown in mm (inches)



EL120 Clevis Mount and Manual Drive Options



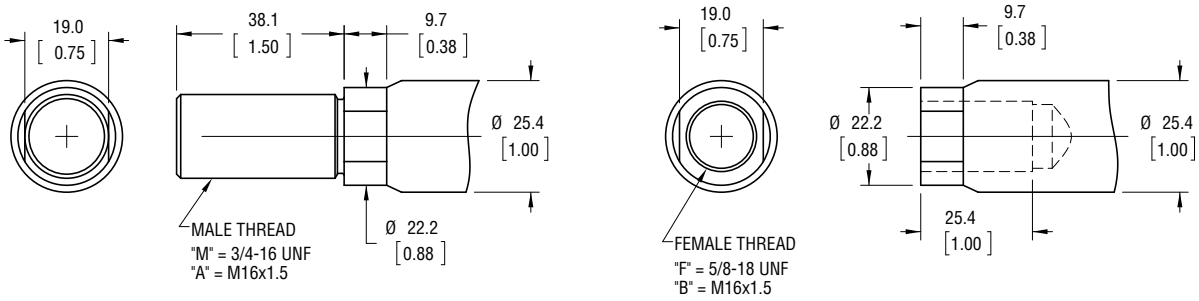
EL120 Front and Rear Flange Mount



Dim	4" (102 mm) Stroke in (mm)	6" (152 mm) Stroke in (mm)	8" (203 mm) Stroke in (mm)	10" (254 mm) Stroke in (mm)	12" (305 mm) Stroke in (mm)	18" (457 mm) Stroke in (mm)
A	345 (13.6)	396 (15.6)	447 (17.6)	498 (19.6)	549 (21.6)	701 (27.6)

Note: Add 1.63 Inches (41.4 mm) to Dims "A" if ordering a brake without a manual drive.

EL120 Rod End Options



EL120 Class I Division 1 Actuator

EL120 - BBCC - DEF - GGG - HIJ - KK - (XX..XX)

EL120 = 120 mm Frame Actuator

BB = Stroke Length
04 = 4 in
06 = 6 in
08 = 8 in
10 = 10 in
12 = 12 in
18 = 18 in
XX = Special Stroke (not to exceed 18 in)

CC = Lead (linear travel per screw revolution)
01 = 0.1 in/rev (2.54 mm/rev)
02 = 0.2 in/rev (5.08 mm/rev)
05 = 0.5 in/rev (12.7 mm/rev)
08 = 0.8 in/rev (20.3 mm/rev)
XX = Special Lead

D = Connections
F = Two 0.75 in NPT Ports, Front Facing (as viewed from rod end)
B = Two 0.75 in NPT Ports, Back Facing (as viewed from rod end)
R = Two 0.75 in NPT Ports, Right Facing (as viewed from rod end)
L = Two 0.75 in NPT Ports, Left Facing (as viewed from rod end)
X = Special NPT Ports, up to 4 x 0.75 in NPT or smaller

E = Mounting
N = Threaded Front & Rear Face, Metric
H = Threaded Front & Rear Face, English
F = Standard Front Flange
R = Standard Rear Flange
G = Metric Rear Clevis
C = English Rear Clevis
J = Metric Rear Eye
K = English Rear Eye
X = Special Flange or Clevis

F = Rod End
M = Male, US Standard Thread
A = Male, Metric Thread
F = Female, US Standard Thread
B = Female, Metric Thread
X = Special (please specify)

GGG = Feedback Type (Also specify the Amplifier/Drive Model being used when ordering)
- Std Incremental Encoder – 2048 line (8192 cts) per rev., index pulse, Hall Commutation, 5 VDC
- Standard Resolver – Size 15, 1024 line (2048 cts) per rev, 2 pole resolver
- Motor files for use with select Emerson/CT, and Danaher/Kollmorgen drives are available at www.exlar.com.

Custom Feedback: Please consult application engineering:
XX1 = Wiring and feedback device information must be provided and new feedback callout will be created

Allen-Bradley/Rockwell:
RA2 = Hiperface Stegmann SRM50 multi-turn absolute encoder. MPL Type M feedback (1024 sin/cos)^2
RA3 = Standard incremental encoder. MPL Type H feedback (2048 line)
RA4 = Standard Resolver - MPL Type R feedback (4 pole)

AMKASYN:
AK1 = EnDat Heidenhain EQN1325 multi-turn absolute encoder - 120 frame size. DS motor wiring w/M23 euro

Advanced Motion Control:
AM1 = Standard Incremental Encoder
AM2 = Encoder 1000 line, with commutation, 5 VDC
AM3 = Standard Resolver
AM5 = Encoder 5000 line, with commutation, 5 VDC

API Controls:
AP1 = Standard Resolver
AP2 = Standard Incremental Encoder

Aerotech:
AR1 = Encoder 5000 line, with commutation, 5 VDC
AR2 = Standard Incremental Encoder

Baldor:
BD2 = Standard Resolver - BSM motor wiring
BD3 = Standard Incremental Encoder - BSM motor wiring

Beckhoff:
BE2 = EnDat Heidenhain EQN1125 multi-turn absolute encoder - AM5XX motor wiring

Baumueller:
BM2 = Standard Resolver

B&R Automation:
BR1 = Standard Resolver
BR2 = EnDat Heidenhain EQN1325 multi-turn absolute encoder – 8LS/8LM motor wiring

Copley Controls:
CO1 = Standard Incremental Encoder
CO2 = Standard Resolver

Control Techniques/Emerson:
CT1 = Hiperface Stegmann SRM050 multi-turn absolute encoder –120 frame size. FM/UM/EZ motor wiring
CT4 = Std Incremental Encoder – FM/UM/EZ motor wiring
CT5 = Standard Resolver – FM/UM/EZ motor wiring
CT7 = Encoder 5000 line, with commutation, 5 VDC – FM/UM/EZ motor wiring

Delta Tau Data Systems:
DT1 = Encoder 1000 line, with commutation, 5 VDC
DT2 = Standard Resolver

Elmo Motion Control:
EL1 = Standard Resolver
EL2 = Standard Incremental Encoder
EL3 = EnDat Heidenhain EQN1125 multi-turn absolute encoder

Emerson/Control Techniques:
EM2 = Standard Incremental Encoder – NT motor wiring w/MS connectors for 'M' option
EM5 = Encoder 5000 line, with commutation, 5 VDC – NT motor wiring w/MS connectors for 'M' option

Elau:
EU1 = Hiperface Stegmann SRM050 single-turn absolute encoder – 120 frame size. SH motor wiring w/MS connectors for 'M' option

Exlar:
EX4 = Standard Resolver
EX5 = Standard Resolver with KTY84 thermistor
EX6 = EnDat Heidenhain EQN/125 multi-turn absolute encoder
EX7 = Incremental encoder, 5000 line with commutation, 5Vdc
EX8 = Hiperface Stegmann SRM50 multi-turn absolute encoder

G&L Motion Control/Danaher Motion:
GL1 = Standard Incremental Encoder – HSM motor wiring
GL2 = Standard Incremental Encoder – LSM-MSM motor wiring
GL3 = Standard Incremental Encoder – NSM motor wiring
GL4 = EnDat Heidenhain EQN1125 multi-turn absolute encoder – AKM motor wiring

Infranor:
IF1 = Standard Resolver

Indramat/Bosch-Rexroth:
IN6 = Standard Resolver – MKD/MHD motor wiring
IN7 = Hiperface Stegmann SKM036 multi-turn absolute encoder – MSK motor wiring

Jetter Technologies:
JT1 = Standard Resolver – JH/JL motor wiring

Kollmorgen/Danaher:
KM4 = EnDat Heidenhain EQN1325 multi-turn absolute encoder – AKM motor wiring
KM5 = Standard Resolver – AKM motor wiring
KM6 = Standard Incremental Encoder – AKM motor wiring

Lenze/AC Tech:
LZ1 = Hiperface Stegmann SRM050 multi-turn absolute encoder – MCS motor wiring
LZ5 = Standard Resolver – MCS motor wiring
LZ6 = Standard Incremental Encoder – MCS motor wiring

Metronix:
MX1 = Standard Resolver
MX2 = Hiperface Stegmann SKM036 multi-turn absolute encoder
MX3 = EnDat Heidenhain EQN1125 multi-turn absolute encoder
Momentum:
MN1 = Hiperface Stegmann SRM050 multi-turn absolute encoder - MN motor wiring
MN2 = EnDat Heidenhain EQN1325 multi-turn absolute encoder - MN motor wiring
MN3 = Std incremental encoder - MN motor wiring
MN4 = Std resolver - MN motor wiring
Moog:
MG1 = Standard Resolver
Ormec:
OR1 = Standard Resolver
OR2 = Standard Incremental Encoder – G series motor wiring
Parker Compumotor:
PC6 = Standard Incremental Encoder – SMH motor wiring
PC7 = Standard Resolver – SMH motor wiring
PC8 = Standard Incremental Encoder – MPP series motor wiring
PC9 = Hiperface Stegmann SRM050 multi-turn absolute encoder – MPP motor wiring
PC0 = Standard Resolver – MPP motor wiring
Pacific Scientific:
PS2 = Standard Incremental Encoder
PS3 = Standard Resolver – PMA motor wiring
Stober Drives:
SB2 = Standard resolver ED/EK motor wiring
SB3 = EnDat Heidenhain EQN1125 multi-turn absolute encoder – ED/EK motor wiring
Siemens:
SM2 = Standard Resolver – 1FK7 motor wiring
SM3 = EnDat Heidenhain EQN1325 multi-turn absolute enc. 120 frame. 1FK7 motor wiring
SEW/Eurodrive:
SW1 = Standard Resolver – CM motor wiring
SW2 = Standard Incremental Encoder
SW3 = Hiperface Stegmann SRM050 multi-turn absolute encoder – CM motor wiring

H = Motor Stator
1 = 1 stack motor
2 = 2 stack motor
3 = 3 stack motor

I = Rated Voltage
1 = 115 Volt RMS
3 = 230 Volt RMS
5 = 400 Volt RMS
6 = 460 Volt RMS
X = Special Voltage (voltage not to exceed 460 Volt RMS)

J = Motor Poles
8 = 8 pole motor

KK = Rated Motor Speed at Rated Voltage
01 - 45 Two digit number x 100 = rated RPM

(XX..XX) = Mechanical Option (Multiple options may apply, separated by "-"
XL = Special lubrication, Mobilgrease 28 or other (please specify)
PF = Preloaded follower[1]
AR = External anti-rotate assembly
RB = Rear brake
HW = Handwheel Drive - Standard
SD = Side Hex Drive
CD = Crank Drive
XT = Special Housing Option - See list below
Non standard roller count
Deep groove ball bearings
Stainless steel main rod
XH = Special Housing Option
Special coating

= Part Number
5 digit numeric part number unique to model configuration

Notes:
1. 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 same size and lead of a non-preloaded screw.
2. Not compatible with Kinetix 300 Drives.

EL30 and EL100
Explosion-Proof Linear Actuators

This electromechanical system provides process engineers a clean, fast, simple and cost effective replacement for hydraulic actuation and a longer life alternative to pneumatic actuation. The roller screw technology manufactured by Exlar outperforms rival ball screws by 15 times in travel life, and can carry higher loads. The compact design allows users to effectively replace hydraulic or air cylinders with an electromechanical actuator, yet meet all required capabilities of the application. Reduced emissions, reduced energy consumption (80% system energy efficiency), increased position control and accuracy – all leading to reduced cost – are provided by servo electric actuation.

The EL30 explosion-proof linear actuator offers CSA Class I*, Division 1, Groups B, C, D, T4 and T3A rating.

The EL100 explosion-proof linear actuator offers a Class I, Division 1, Groups B, C, D & T3 rating. The EL100 linear actuators also meet ATEX essential requirements and are in conformance with the EU ATEX Directive 94/9/EC.

The EL Series linear actuators are compatible with nearly any Manufacturers' resolver-based amplifier.

** "Class I" means that flammable gases or vapors may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. "Division 1" means that hazardous concentrations in the air may exist continuously, intermittently, or periodically under normal operating conditions. "Group B" allows for atmospheres containing hydrogen, or gases (or vapors) of equivalent hazard, such as manufactured gas. "Group C" allows for atmospheres containing ethyl-ether vapors, ethylene or cyclo propane. "Group D" allows for atmospheres containing gasoline, hexane, naphtha, benzene, butane, alcohol, acetone, benzol, lacquer solvent vapors or natural gas. EL Series actuators are not rated for operation in atmospheres containing acetylene Temperature classification defines the maximum surface temperature the product will reach at full load. T3 = 200° C, T3A – 180° C, T4 = 135° C*

EL30 and EL100 explosion-proof motors are well-suited to many applications:

Turbine fuel flow	Chemical process plants
Printing presses	Fuel distribution systems
Engine test stands	Shipbound fuel management
Valve control	Damper control
Paint booths	Fuel Skids
Weapons Room	Silos

EL30
Explosion-Proof
Linear Actuator
Class I, Div 1,
Groups B, C, D, T4 and T3A

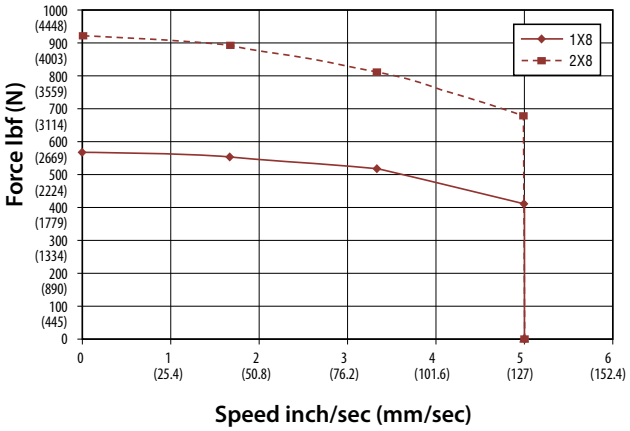
EL100
Explosion-Proof
Linear Actuator
Class I, Div 1, Groups B, C, D and T3

Features
T-LAM technology yielding 35% increase in continuous motor torque over traditional windings
Forces to 2000 lbs
Speeds to 25 ips
Resolver feedback
Strokes up to 6 inches
8 pole motors
Rod end options
Several mounting configurations
Potted NPT connectors
Windings available from 24 VDC to 460 VAC rms
Class 180H insulation IP65S Standard EL30, IP66S Standard EL100

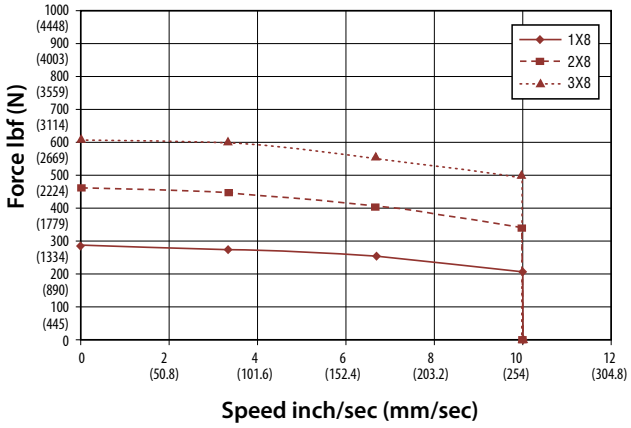
EL Series Performance Curves

The below speed vs. force curves represent approximate continuous thrust ratings at indicated linear speed. Different types of servo amplifiers will offer varying motor torque and thus actuator thrust. These values are at constant velocity and do not account for motor torque required for acceleration.

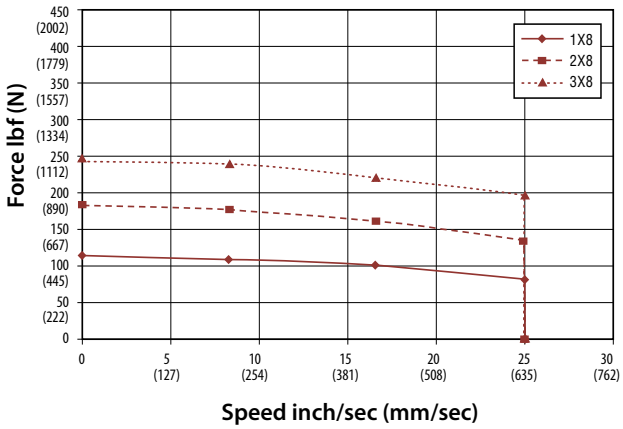
EL30-.1 Inch Lead



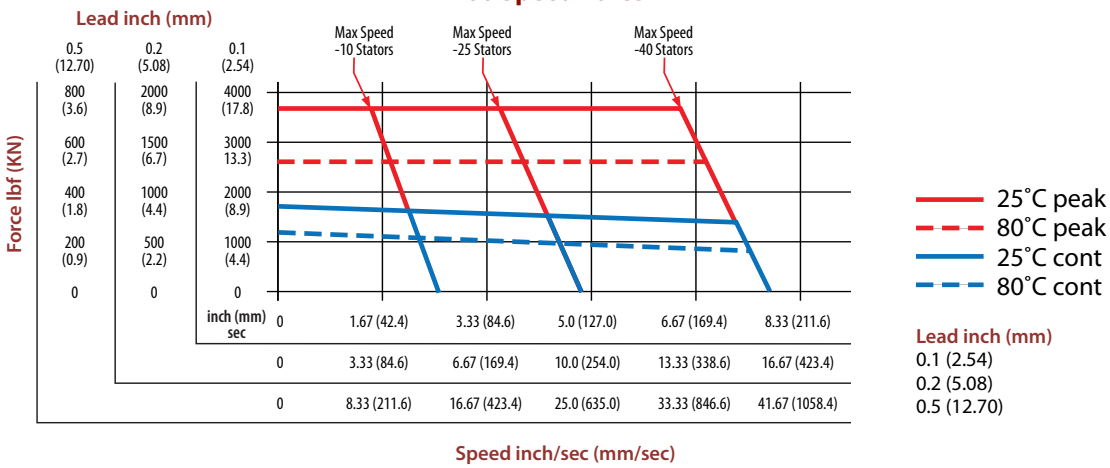
EL30-.2 Inch Lead



EL30-.5 Inch Lead



EL100 Speed Force



EL30 Performance Specifications

Model No.	Frame Size in (mm)	Stroke* in (mm)	Screw Lead in (mm)	Force Rating lb (N) 1/2/3 Stack	Max Velocity in/sec (mm/sec)	Maximum Static Load lb (N)	Armature Inertia** lb-in-s² (Kg-m²)	Dynamic Load lb (N)	Weight (approx.) lb (kg)
EL30-0301	3.125 (79.0)	3 (76)	0.1 (2.54)	543/885/NA (2415/3936/NA)	5 (127.0)	2700 (12010)	0.00319 (0.00036)	5516 (24536)	12 (5.4)
EL30-0302			0.2 (5.08)	271/442/NA (1205/1966/NA)	10 (254.0)			5800 (25798)	
EL30-0305			0.5 (12.7)	109/177/NA (485/787/NA)	25 (635.0)			4900 (21795)	
EL30-0601	3.125 (79.0)	6 (152)	0.1 (2.54)	543/885/NA (2415/3936/NA)	5 (127.0)	2700 (12010)	0.00361 (0.00041)	5516 (24536)	15 (6.8)
EL30-0602			0.2 (5.08)	271/442/626 (1205/1966/2785)	10 (254.0)			5800 (25798)	
EL30-0605			0.5 (12.7)	109/177/250 (485/787/1112)	25 (635.0)			4900 (21795)	

EL100 Performance Specifications

Model No.	Frame Size in (mm)	Stroke* in (mm)	Stator	Screw Lead in (mm)	Force Rating lb (N) 25˚C/80˚C	Max Velocity in/sec (mm/sec)	Maximum Static Load lb (N)	Armature Inertia** lb-in-s² (Kg-m²)	Dynamic Load lb (N)	Weight (approx.) lb (kg)
EL100-0601	3.9 (100)	6 (152)	238-40	0.1 (2.54)	2,011 (8,943)	6.66 (169.33)	2700 (12010)	0.00361 (0.000408)	5516 (24536)	26.2 (11.9)
EL100-0602			238-40	0.2 (5.08)	1,005 (4,472)	13.33 (338.58)			5800 (25798)	
EL100-0605			238-40	0.5 (12.70)	402 (1,789)	33.33 (846.58)			4900 (21795)	

*Please note that stroke mm are nominal dimensions.
**Inertia +/– 5%
See page 13 for definition of terms.

Specifications subject to change without notice.

EL30 Mechanical/Electrical Specifications

Maximum Backlash (not preloaded)	in (mm)	0.004 (.10)															
Maximum Backlash (preloaded)	in (mm)	0.0															
Lead Accuracy	in/ft (mm/300 mm)	0.001 (.025)															
Maximum Radial Load	lb (N)	30 (134)															
Environmental Rating:	Standard	IP65S															
Motor Stator-T4 Ratings		**1A8**	**1B8**	**118**	**138**	**158**	**168**	**2A8**	**2B8**	**218**	**238**	**258**	**268**	**318***	**338***	**358***	**368***
RMS SINUSOIDAL COMMUTATION																	
Continuous Motor Torque** (+/– 10% @ 80˚C)	lbf-in (Nm)	10.8 (1.22)	10.8 (1.22)	11.1 (1.25)	11.0 (1.24)	10.7 (1.21)	10.5 (1.18)	17.4 (1.97)	17.4 (1.97)	17.7 (2.00)	17.8 (2.01)	17.5 (1.98)	17.5 (1.98)	25.2 (2.84)	24.9 (2.81)	23.6 (2.66)	22.5 (2.55)
Torque Constant (Kt)** (+/– 10% @ 80˚C)	lbf-in/ (Nm/A)	1.1 (0.13)	1.1 (0.13)	4.4 (0.49)	8.7 (0.99)	15.5 (1.75)	17.5 (1.97)	1.1 (0.13)	1.1 (0.13)	4.4 (0.49)	8.7 (0.99)	15.5 (1.75)	17.5 (1.97)	4.4 (0.50)	8.7 (0.98)	15.6 (1.77)	13.7 (1.54)
Continuous Current Rating**	A	10.7	10.7	2.8	1.4	0.8	0.7	17.3	17.3	4.5	2.3	1.3	1.1	6.3	3.2	1.7	1.8
Peak Current Rating	A	21.3	21.3	5.7	2.8	1.5	1.3	34.5	34.5	9.0	4.5	2.5	2.2	12.7	6.4	3.4	3.7
O-PK SMUSOIDAL COMMUTATION																	
Continuous Motor Torque** (+/– 10% @ 80˚C)	lbf-in (Nm)	10.8 (1.22)	10.8 (1.22)	11.1 (1.25)	11.0 (1.24)	10.7 (1.21)	10.5 (1.18)	17.4 (1.97)	17.4 (1.97)	17.7 (2.00)	17.8 (2.01)	17.5 (1.98)	17.5 (1.97)	25.2 (2.84)	24.9 (2.81)	23.6 (2.66)	23.6 (2.67)
Torque Constant (Kt)** (+/– 10% @ 80˚C)	lbf-in/A (Nm/A)	0.8 (0.09)	0.8 (0.09)	3.1 (0.35)	6.2 (0.70)	11.0 (1.24)	12.4 (1.40)	0.8 (0.09)	0.8 (0.09)	3.1 (0.35)	6.2 (0.70)	11.0 (1.24)	12.4 (1.40)	3.1 (0.35)	6.1 (0.69)	11.1 (1.25)	17.5 (1.98)
Continuous Current Rating	A	15.1	15.1	4.0	2.0	1.1	0.9	24.4	24.4	6.4	3.2	1.8	1.6	9.0	4.5	2.4	1.5
Peak Current Rating	A	30.2	30.2	8.0	4.0	2.2	1.9	48.8	48.8	12.8	6.4	3.6	3.2	17.9	9.1	4.8	3.0
MOTOR STATOR DATA																	
Voltage Constant (Ke)**	Vrms/Krpm	7.7	7.7	29.8	59.7	105.8	119.3	7.7	7.7	29.8	59.7	105.8	119.3	30.3	59.2	106.8	119.8
(+/– 10% @ 25˚C)	Vpk/Krpm	10.9	10.9	42.2	84.5	149.7	168.7	10.9	10.9	42.2	84.4	149.7	168.7	42.9	83.7	151.0	169.4
Pole Configuration		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Resistance (L-L)(+/– 5% @ 80˚C)	Ohms	0.19	0.19	2.7	10.8	36.3	47.9	0.08	0.08	1.1	4.4	14.1	18.0	0.65	2.6	9.3	11.6
Inductance (L-L)(+/– 5%)	mH	0.51	0.51	7.7	30.7	96.8	123.0	0.24	0.24	3.7	14.7	46.2	58.7	2.5	9.5	30.9	38.8
Electrical Time Constant (te)	ms	2.7	2.7	2.9	2.8	2.7	2.6	3.2	3.2	3.3	3.4	3.3	3.3	3.8	3.7	3.3	3.3
Friction Torque	lbf-in (Nm)	1.46 (0.17)						1.60 (0.18)						1.80 (0.20)			
Bus Voltage	Vrms	24VDC	48VDC	115	230	400	460	24VDC	48VDC	115	230	400	460	115	230	400	460
Speed @ Bus Voltage	rpm	1500	3000	3000	3000	3000	3000	1500	3000	3000	3000	3000	3000	3000	3000	3000	3000
Insulation Class		180 (H)															
Temperature Class	˚C	T4 = 135˚C															
Connectors		Potted NPT Connectors Only															

For amplifiers using peak sinusoidal ratings, multiply RMS sinusoidal Kt by 0.707 and current by 1.414.
Specifications reflect 80˚C test environment

Specifications subject to change without notice.

*Not available with 3" stroke
**For T3A Temperature Class multiply Kt & Ke ratings by 0.83; Continuous Current by 1.245; Continuous Torque by 1.095

EL100 Mechanical/Electrical Specifications

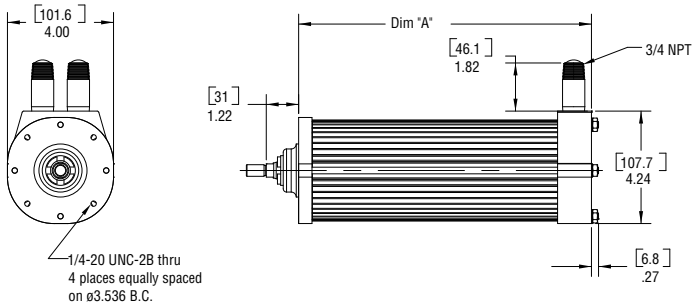
Nominal Backlash	in (mm)	0.004 (.10)						
Maximum Backlash (preloaded)	in (mm)	0.0						
Lead Accuracy in/ft	(mm/300 mm)	0.001 (.025)						
Maximum Radial Load	lb (N)	40 (179)						
Environmental Rating	Standard	IP66S						
Motor Stator Ambient Temperature		**2A8-10 25˚/80˚C**	**2B8-25 25˚/80˚C**	**2C8-40 25˚/80˚C**	**218-40 25˚/80˚C**	**238-40 25˚/80˚C**	**258-40 25˚/80˚C**	**268-40 25˚/80˚C**
RMS SINUSOIDAL COMMUTATION DATA								
Continuous Motor Torque	lbf-in (N-m)	35.2/24.3 (3.98/2.75)	35.9/24.8 (4.06/2.80)	36.5/25.2 (4.12/2.85)	39.6/27.3 (4.47/3.09)	40.0/27.6 (4.52/3.12)	39.5/27.3 (4.46/3.08)	39.9/27.6 (4.51/3.11)
Torque Constant	lbf-in (N-m/A)	1.7/1.7 (0.19/0.19)	1.7/1.7 (0.19/0.19)	2.6/2.6 (0.30/0.30)	3.2/3.2 (0.37/0.37)	6.6/6.6 (0.75/0.75)	11.6/11.6 (1.31/1.31)	13.2/13.2 (1.50/1.50)
Continuous Current Rating	Greased (IG) A	23.1/15.9	23.6/16.3	15.6/10.7	13.6/9.4	6.8/4.7	3.8/2.6	3.4/2.3
Peak Current Rating	A	46.2/31.9	47.1/32.5	31.1/21.5	27.3/18.8	13.5/9.3	7.6/5.3	6.7/4.7
0-PEAK SMUSOIDAL COMMUTATION DATA								
Continuous Motor Torque	lbf-in (N-m)	35.2/24.3 (3.98/2.75)	35.9/24.8 (4.06/2.80)	36.5/25.2 (4.12/2.85)	39.6/27.3 (4.47/3.09)	40.0/27.6 (4.52/3.12)	39.5/27.3 (4.46/3.08)	39.9/27.6 (4.51/3.11)
Torque Constant	lbf-in/A (N-m/A)	1.2/1.2 (0.14/.014)	1.2/1.2 (0.14/0.14)	1.9/1.9 (0.21/0.21)	2.3/2.3 (0.26/0.26)	4.7/4.7 (0.53/0.53)	8.2/8.2 (0.92/.092)	9.4/9.4 (1.06/1.06)
Continuous Current Rating	Greased (IG) A	32.7/22.6	33.3/23.0	22.0/15.2	19.3/13.3	9.5/6.6	5.4/3.7	4.8/3.3
Peak Current Rating	A	65.4/45.1	66.7/46.0	44.0/30.4	38.6/26.6	19.1/13.2	10.8/7.5	9.5/6.6
MOTOR STATOR DATA								
Voltage Constant @ 25˚C (Ke)	Vrms/Krpm	11.6/11.6	11.6/11.6	17.9/17.9	22.1/22.1	45.2/45.2	78.9/78.9	90.4/90.4
	Vpk/Krpm	16.5/16.5	16.5/16.5	25.3/25.3	31.3/31.3	64.0/64.0	111.6/111.6	127.9/127.9
Pole Configuration		8	8	8	8	8	8	8
Resistance (L-L)	Ohms	0.10/0.10	0.1/0.1	0.2/0.2	0.30/0.30	1.2/1.2	3.8/3.8	4.86/4.86
Inductance (L-L)	mH	0.75/0.75	0.8/0.8	1.9/1.9	2.93/2.93	12.2/12.2	37.2/37.2	48.9/48.9
Brake Inertia	lbf-in-sec^2 (kg-cm^2)	0.00047 (.53)						
Brake Current @24 VDC +/- 10%	A	0.5						
Brake Holding Torque - Dry	lbf-in (Nm/A)	70 (8)						
Brake Engage/Disengage Time	ms	25/50						
Mechanical Time Constant (tm)	ms	1.4/1.4	1.3/1.3	1.3/1.3	1.1/1.1	1.1/1.1	1.1/1.1	1.1/1.1
Electrical Time Constant (te)	ms	7.2/7.2	7.9/7.9	8.2/8.2	9.9/9.9	10.1/10.1	9.9/9.9	10.1/10.1
Frictional Torque	lbf-in (N-m)	2.22/2.22 (0.25/0.25)	2.22/2.22 (0.25/0.25)	2.22/2.22 (0.25/0.25)	2.22/2.22 (0.25/0.25)	2.22/2.22 (0.25/0.25)	2.22/2.22 (0.25/0.25)	2.22/2.22 (0.25/0.25)
Bus Voltage	Vrms	24 VDC/24 VDC	48 VDC/48 VDC	120 VDC/120 VDC	115 VAC/115 VDC	230 VAC/230 VDC	400 VAC/400 VDC	460 VAC/460 VDC
Speed @ Bus Voltage	rpm	1,000	2,500	4,000	4,000	4,000	4,000	4,000
Insulation Class		180 (H)						
Ambient Temperature Rating		-29° C to 93° C						
CSA/ATEX Temperature Class		T3, 200˚ C Maximum Allowable Surface Temperature						

For amplifiers using peak sinusoidal ratings, multiply RMS sinusoidal Kt by 0.707, and peak current by 1.414.

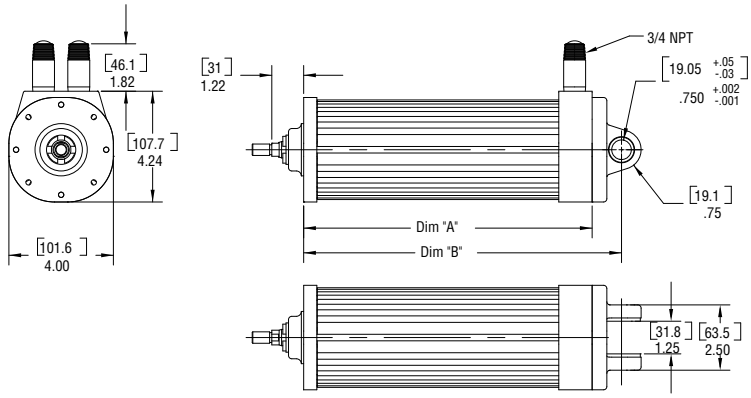
Specifications subject to change without notice.

EL30 Base Unit

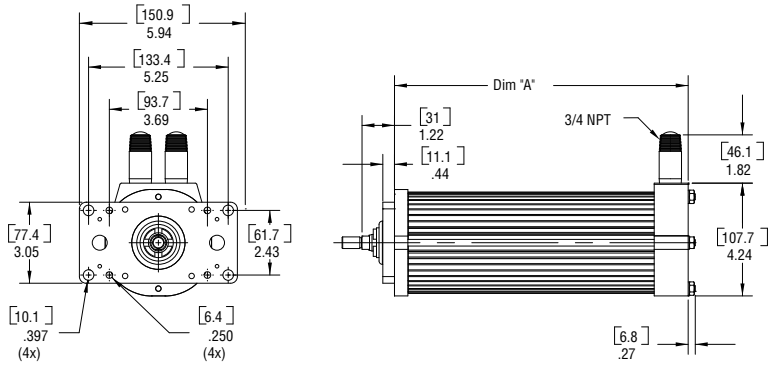
Dim	3" (76.2 mm) Stroke	6" (152.4 mm) Stroke
A	8.6 (218)	11.0 (281)
B	9.7 (246)	12.2 (309)



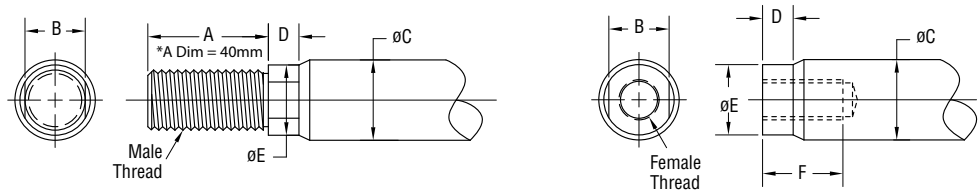
EL30 Clevis Mount



EL30 Front Flange Mount

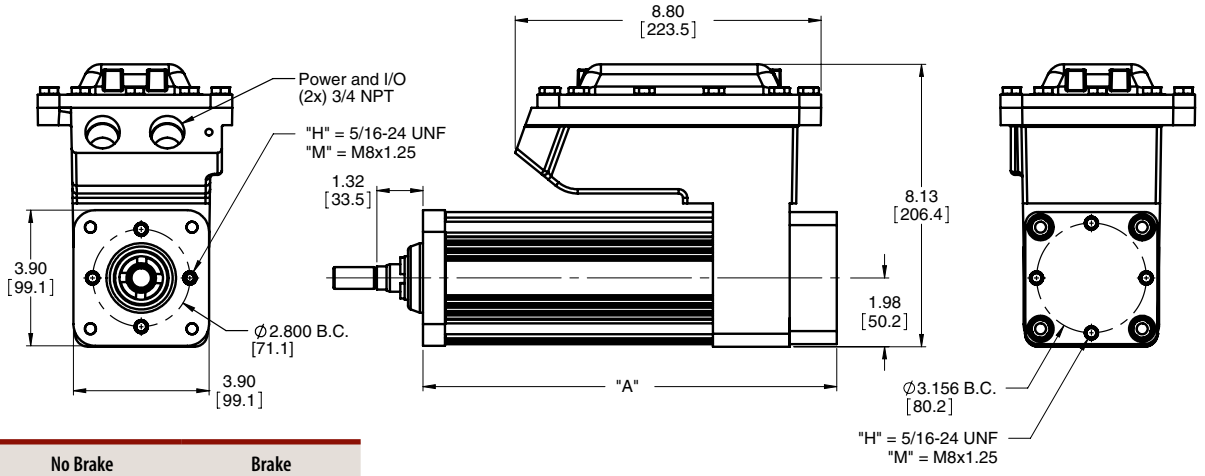


EL30 Actuator Rod End Options



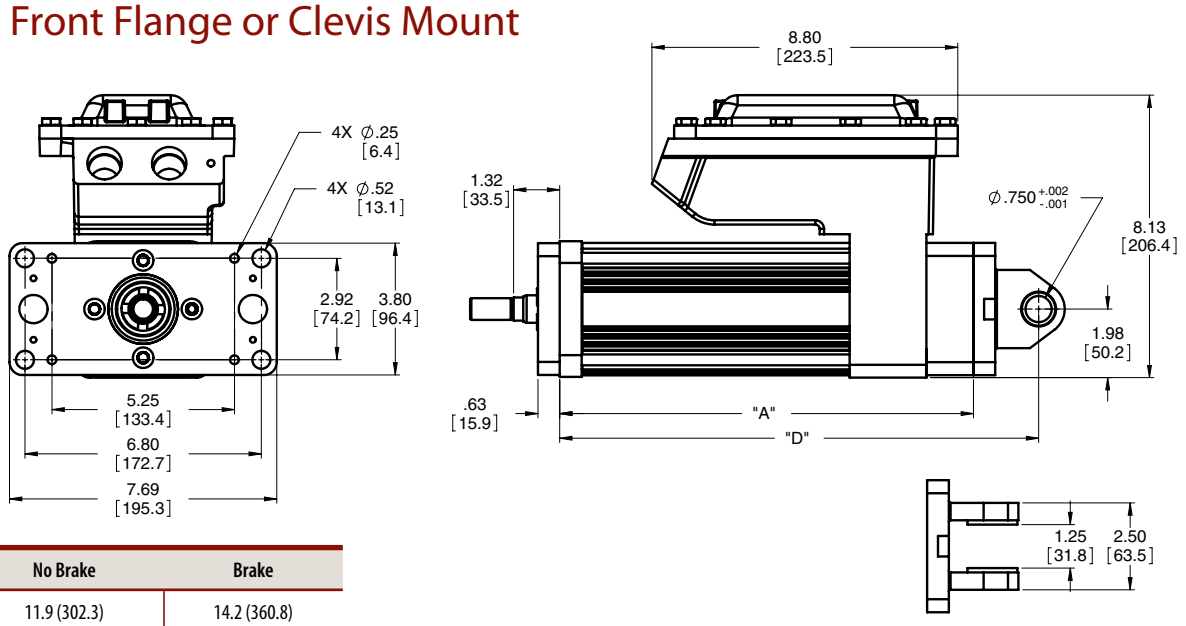
	A	B	ØC	D	ØE	F	Male U.S.	Male Metric	Female U.S.	Female Metric
EL30 in (mm)	0.750 (19.1)	0.500 (12.7)	0.625 (15.9)	0.281 (7.1)	0.562 (14.3)	0.750 (19.1)	7/16 - 20 UNF – 2A	M12 x 1.75° 6g	7/16 - 20 UNF – 2B	M10 x 1.5 6h

EL100 Base Unit



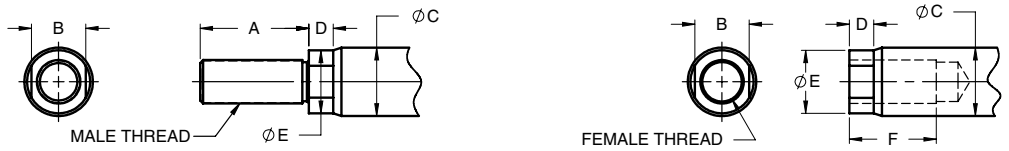
Dim	No Brake	Brake
A	11.9 (302.3)	14.2 (360.8)

EL100 Front Flange or Clevis Mount



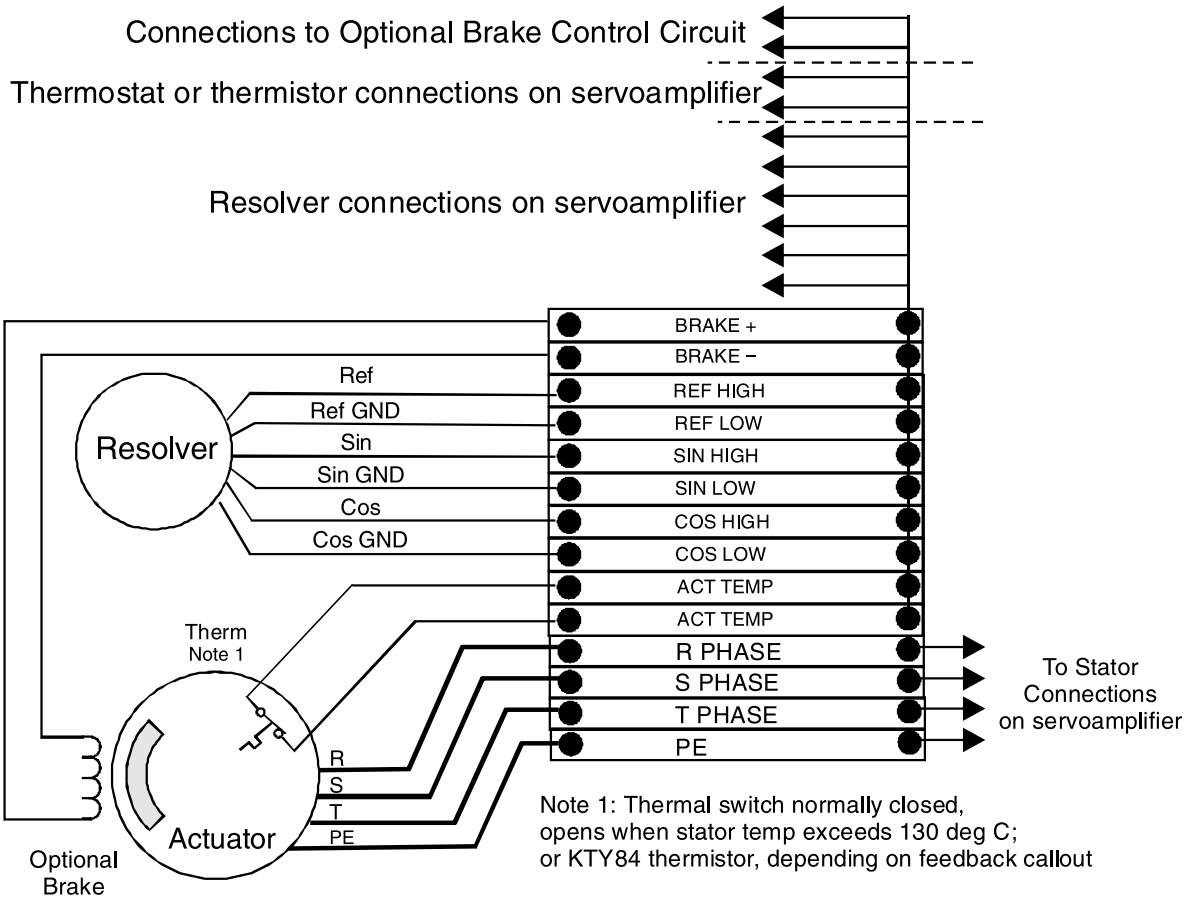
Dim	No Brake	Brake
A	11.9 (302.3)	14.2 (360.8)
D	13.77 (349.9)	16.7 (408.2)

EL100 Actuator Rod End Options



	A	B	ØC	D	ØE	F	Male "M" Inch	Male "A" Metric	Female "F" Inch	Female "B" Metric
EL100 in (mm)	1.250 (31.8)	0.625 (17.0)	0.787 (20.0)	0.281 (7.1)	0.725 (18.4)	1.000 (25.4)	1/2 - 20 UNF – 2A	M16 x 1.5 6g	1/2 - 20 UNF – 2B	M16 x 1.5 6h

EL100 Terminal Box Wiring



EL30 Ordering Information

ELAA - BBCC - DDDEF - GGG - HHH - II - JJJ - XX - #####

EL30 = Model

AA = Frame Size
30 = 3 inch (80 mm) nominal

BB = Nomimal Stroke Length
03 = 3 inch (76 mm) stroke
06 = 6 inch (152 mm) stroke
XX = Special stroke not to exceed 6 inch (152 mm)

CC = Screw Lead
01 = 0.1 inch lead
02 = 0.2 inch lead
05 = 0.5 inch lead
XX = Special

DDD = Connector Options
N## = Potted NPT with flying leads
= Length of flying leads in feet (not to exceed 99') Contact your local sales representative if longer length is needed.

E = Mounting Options
F = Front Flange
C = Rear Clevis
H = Threaded Face
X = Special Mounting

F = Rod Ends
M = Male, US std thread
A = Male, Metric std thread
F = Female, US std thread
B = Female, Metric std thread

GGG = FeedbackType
(Also specify the Amplifier/Drive Model being used when ordering) -– Standard Resolver – Size 15 1024 line (2068 cts) per rev, two phase resolver
XX1 = Custom Feedback – Wiring and feedback device information must be provided and new feedback callout will be created – contact your local sales representative. Resolver only.
AB6 = Allen-Bradley/Rockwell – Standard Resolver
AM3 = Advanced Motion Control – Standard Resolver
AP1 = API Controls – Standard Resolver
BD2 = Baldor – Standard Resolver
BM2 = Baumueller – Standard Resolver
BR1 = B&R Automation – Standard Resolver
CO2 = Copley Controls – Standard Resolver
CT5 = Standard Resolver – FM/UM/EZ motor wiring w/M23 euro connectors for 'M' option
DT2 = Delta Tau Data Systems – Standard Resolver
EL1 = Elmo Motion Control – Standard Resolver
EX4 = Exlar – Standard Resolver
IF1 = Infranor – Standard Resolver
IN6 = Indramat/Bosch-Rexroth – Standard Resolver
JT1 = Jetter Technologies – Standard Resolver
KM5 = Kollmorgen/Danaher – Standard Resolver
LZ5 = Lenze/AC Tech – Standard Resolver
MD1 = Modicon – Standard Resolver
MG1 = Moog – Standard Resolver
MN4 = Momentum – Standard Resolver
MX1 = Metronix – Standard Resolver
OR1 = Ormec – Standard Resolver
PC7 = Parker – Standard Resolver – European only
PC0 = Parker – Standard Resolver – US Only
PS3 = Pacific Scientific – Standard Resolver
SM2 = Siemens – Standard Resolver
SW1 = SEW/Eurodrive – Standard Resolver
WD1= Whedco/Fanuc – Standard Resolver

HHH = Motor Stator all 8 pole
1A8 = 1 stack, 24 Vrms
218 = 2 stack, 115 Vrms
1B8 = 1 stack, 48 Vrms
238 = 2 stack, 230 Vrms
118 = 1 stack, 115 Vrms
258 = 2 stack, 400 Vrms
138 = 1 stack, 230 Vrms
268 = 2 stack, 460 Vrms
158 = 1 stack, 400 Vrms
318 = 3 stack, 115 Vrms[2]
168 = 1 stack, 460 Vrms
338 = 3 stack, 230 Vrms[2]
2A8 = 2 stack, 24 Vrms
358 = 3 stack, 400 Vrms[2]
2B8 = 2 stack, 48 Vrms
368 = 3 stack, 460 Vrms[2]

II = Motor Speed
01-99 = Two digit number - rated speed in rpm x 100

JJJ = Hazardous Location Temperature Rating
T4 = 135˚ C (Neodymium-Iron-Boron magnets)

XX = Optional Speed & Mechanical Designations – Multiples possible
XL = Special lubrication
PF = Preloaded follower[1]
XT = Special travel option

= Part No. Designator for Specials
Optional 5 digit assigned part number to designate unique model numbers for specials.

Notes:
1. 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 of a non-preloaded screw.
2. Not available with 3" stroke.

EL100 Ordering Information

EL100 = Model Series

CC = Stroke Length
06 = 5.9 inch (150 mm)

DD = Roller Screw Lead (Linear Travel per Screw Revolution)
01 = 0.1 in/rev (2.54 mm/rev)
02 = 0.2 in/rev (5.08 mm/rev)
05 = 0.5 in/rev (12.7 mm/rev)
XX = Special Lead

E = Connections
S = Terminal strips with 3/4" NPT port access, single row

F = Mounting
H = Threaded front and rear face, US standard thread
N = Threaded front and rear face, metric thread
B = Front and rear flange
F = Standard front flange
C = Standard rear clevis
R = Rear flange
X = Special flange, clevis or threaded face mount

G = Rod End
M = Male, US standard thread
A = Male, metric thread
F = Female, US standard thread
B = Female, metric thread
W = Male, US standard thread SS
R = Male, metric thread SS
V = Female, US standard thread SS
L = Female, metric thread SS
X = Special rod end (consult Exlar)

HHH = Controller Feedback Option
XX1 = Custom Feedback. Resolver only. Consult Exlar
AB6 = Allen-Bradley/Rockwell - standard resolver
AM3 = Advanced Motion Control - standard resolver
AP1 = API Controls - standard resolver
BD2 = Baldor - standard resolver
BM2 = Baumueller - standard resolver
BR1 = B&R Automation
CT5 = Control Techniques - standard resolver
CO2 = Copely Controls - standard resolver
DT2 = Delta Tau Data Systems - standard resolver
EL1 = Elmo Motion Control - standard resolver
EX4 = Exlar - standard resolver
IF1 = Infranor - standard resolver
IN6 = Indramat/Bosch-Rexroth - standard resolver
JT1 = Jetter Technologies - standard resolver
KM5 = Kollmorgen/Danaher - standard resolver
LZ5 = Lenze/AC Tech - standard resolver
MD1 = Modicon - standard resolver
MG1 = Moog - standard resolver
MN4 = Momentum – Standard Resolver
MX1 = Metronix - standard resolver
OR1 = Ormec - standard resolver
PC7 = Parker - standard resolver - European only
PC0 = Parker - standard resolver - US only
PS3 = Pacific Scientific - standard resolver
SM2 = Siemens - standard resolver
SW1 = SEW/Eurodrive - standard resolver
WD1 = Whedco/Fanuc - standard resolver

I = Motor Stacks
2 = 2 stack motor

J = Rated Voltage
A = 24 VDC
B = 48 VDC
C = 120 VDC
1 = 115 Volt RMS
3 = 230 Volt RMS
5 = 400 Volt RMS
6 = 460 Volt RMS
X = Special voltage rating - not to exceed 460 Volt RMS

K = Motor Poles
8 = 8 Pole Motor

LL = Rated Motor Speed at Rated Voltage
01 - 99 = Two digit number x 100 = rated RPM

MM = Mechanical Option (Multiple options may apply - separated by "-")
XL = Special lubrication, Mobilgrease 28 or other (please specify)
PF = Pre-loaded roller screw follower[1]
AR = External anti-rotate assembly (requires flange mount option)
RB = Rear brake
XT = Special travel option

NN = Haz Loc Temp Rating
T3 = 200˚ C max allowable surface temperature

= Part No. Designator for Specials
Optional 5 digit assigned part number to designate unique model numbers for specials.

Notes:
1. 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 of a non-preloaded screw.