

EXLAR
EL Explosion Proof Linear Actuators

EL Series Explosion Proof Linear Actuators

The EL Series linear actuators offer users all of the advantages of Exlar's patented inverted roller screw actuator designs in a Class I, div 1, Groups B, C or D* explosion-proof package. These electro-mechanical systems provide 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.

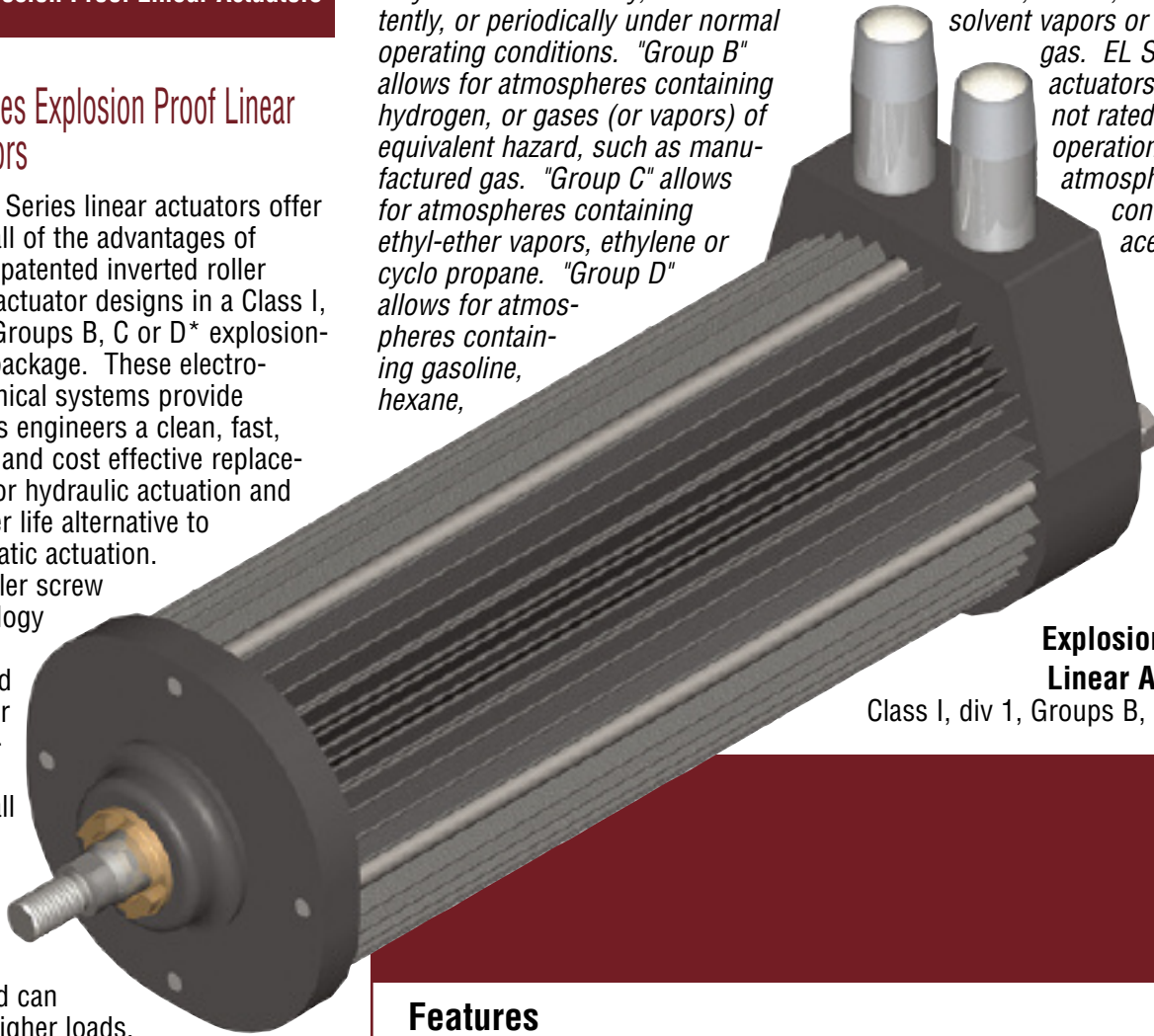
The compact design allows users to effectively replace hydraulic or air cylinders with an electromechanical actuator, yet meet all required capabilities of the application.

The EL Series actuator is 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 haz-

ardous 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.



EL30
Explosion-Proof Linear Actuator
 Class I, div 1, Groups B, C and D

Features
T-LAM technology yielding 35% increase in continuous motor torque over traditional windings
Resolver feedback
8 pole motors
Rod end options
1,2, or 3 stack motor compatible with nearly any servo amplifier
Several mounting configurations
Potted NPT connectors
Windings available from 24 VDC to 460 VAC rms
Class 180H insulation system

TYPICAL APPLICATIONS FOR EL SERIES EXPLOSION-PROOF MOTORS ARE WELL-SUITED TO MANY APPLICATIONS SUCH AS:

Turbine fuel flow
Printing presses

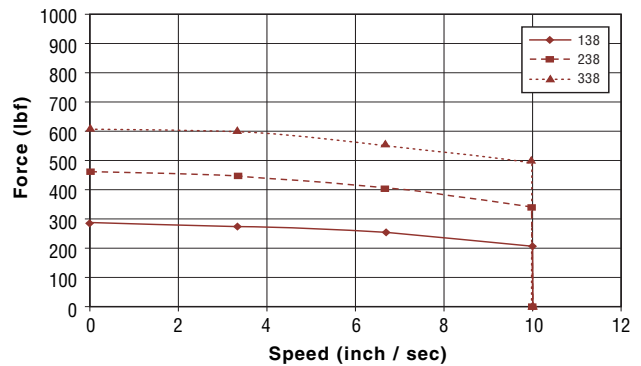
Engine test stands
Fuel distribution systems

Chemical process plants
Shipbound fuel management

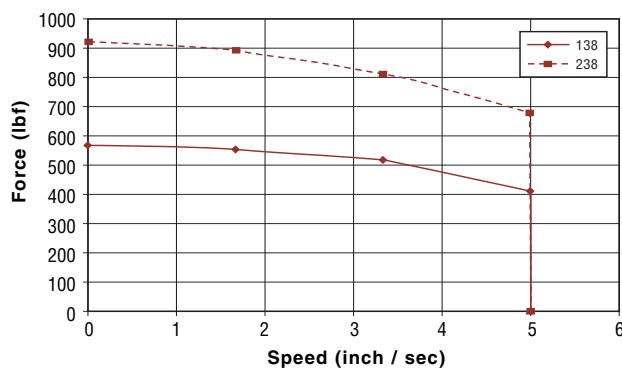
EL Series Performance Curves

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.

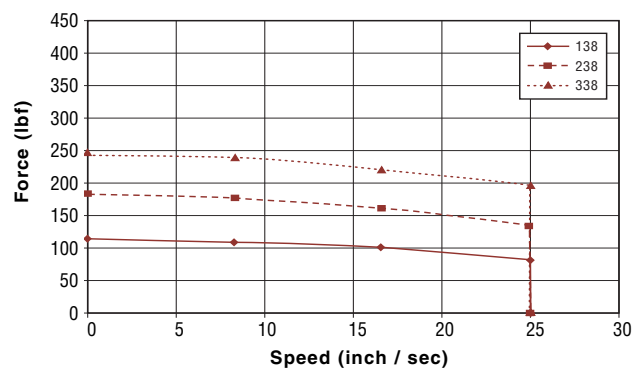
EL30-.2 Inch Lead



EL30-.1 Inch Lead



EL30-.5 Inch Lead



EL30 Performance Specifications

Model No.	Frame Size in. (mm)	Stroke in (mm)*	Screw Lead in (mm)	Force Rating 1 stack/ 2 stack lb (N)	Max. Velocity in/sec (mm/sec)	Approx.* Cont. Motor Torque 1 stack/ 2 stack lb-in (Nm)	Maximum Static Load lb (N)	Armature Inertia Rating** Lb-in-s ² (Kg-m ²)	Dynamic Load lb (N)	Weight (approx) lb (Kg)
EL30-0301	3.125 (79.0)	3 (75.0)	0.1 (2.54)	543/885/NA (2415/3936/NA)	5 (127.0)	10.8/17.6/NA (1.22/1.99/NA)	2700 (12010)	0.00319 (0.00036)	5516 (24536)	12 (5.4)
EL30-0302	3.125 (79.0)	3 (75.0)	0.2 (5.08)	271/442/NA (1205/1966/NA)	10 (254.0)	10.8/17.6/NA (1.22/1.99/NA)	2700 (12010)	0.00319 (0.00036)	5800 (25798)	12 (5.4)
EL30-0305	3.125 (79.0)	3 (75.0)	0.5 (12.7)	109/177/NA (485/787/NA)	25 (635.0)	10.8/17.6/NA (1.22/1.99/NA)	2700 (12010)	0.00319 (0.00036)	4900 (21795)	12 (5.4)
EL30-0601	3.125 (79.0)	6 (150.0)	0.1 (2.54)	543/885/NA (2415/3936/NA)	5 (127.0)	10.8/17.6/NA (1.22/1.99/NA)	2700 (12010)	0.00361 (0.00041)	5516 (24536)	15 (6.8)
EL30-0602	3.125 (79.0)	6 (150.0)	0.2 (5.08)	271/442/626 (1205/1966/2785)	10 (254.0)	10.8/17.6/24.9 (1.22/1.99/2.81)	2700 (12010)	0.00361 (0.00041)	5800 (25798)	15 (6.8)
EL30-0605	3.125 (79.0)	6 (150.0)	0.5 12.7	109/177/250 (485/787/1112)	25 (635.0)	10.8/17.6/24.9 (1.22/1.99/2.81)	2700 (12010)	0.00361 (0.00041)	4900 (21795)	15 (6.8)

*Please note that stroke mm are nominal dimensions. **Inertia +/- 5%.

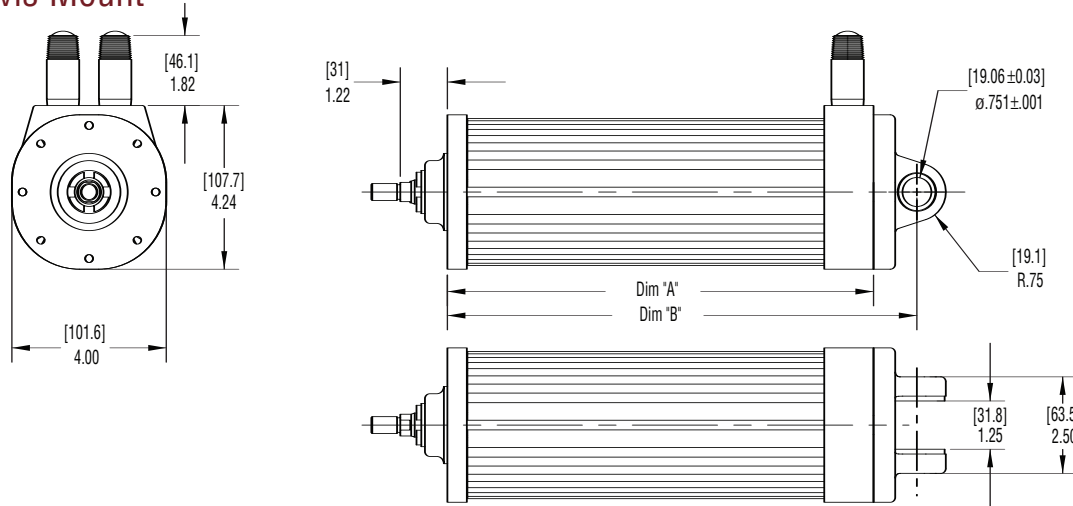
For definition of terms see page 12.

		EL30															
Maximum Backlash (not pre-loaded)	in (mm)	0.004 (.10)															
Maximum Backlash (pre-loaded)	in (mm)	0.0															
Lead Accuracy	in/ft (mm/300 mm)	0.001 (.025)															
Maximum Radial Load	lb (N)	30 (134)															
Environmental Rating: Standard		IP65															
MOTOR STATOR		1A8	1B8	118	138	158	168	2A8	2B8	218	238	258	268	318	338	358	368
RMS Sinusoidal Commutation																	
Continuous Motor Torque	lbf-in (N-m)	10.8 (1.22)	10.8 (1.22)	10.9 (1.23)	10.8 (1.22)	10.7 (1.21)	10.3 (1.16)	17.4 (1.97)	17.4 (1.97)	17.6 (1.99)	17.6 (1.99)	17.5 (1.98)	17.5 (1.98)	25.2 (2.85)	24.9 (2.81)	23.6 (2.67)	23.6 (2.67)
Torque Constant (Kt)	lbf-in/A (+/- 10% @ 80°C)	1.1 (0.13)	1.1 (0.13)	4.4 (0.49)	8.7 (0.99)	15.5 (1.75)	17.5 (1.98)	1.1 (0.13)	1.1 (0.13)	4.4 (0.49)	8.7 (0.99)	15.5 (1.75)	17.5 (1.98)	4.4 (0.50)	8.7 (0.98)	15.7 (1.77)	17.6 (1.98)
Continuous Current Rating	Amps	10.7	10.7	2.8	1.4	0.8	0.7	17.3	17.3	4.5	2.2	1.3	1.1	6.3	3.2	1.7	1.5
Peak Current Rating	Amps	21.3	21.3	5.6	2.8	1.5	1.3	34.5	34.5	9.0	4.5	2.5	2.2	12.7	6.4	3.4	3.0
Trapezoidal Commutation																	
Continuous Motor Torque	lbf-in (N-m)	10.3 (1.16)	10.3 (1.16)	10.4 (1.17)	10.3 (1.17)	10.2 (1.15)	9.8 (1.11)	16.6 (1.88)	16.6 (1.88)	16.8 (1.90)	16.8 (1.90)	16.7 (1.89)	16.7 (1.89)	24.1 (2.72)	23.8 (2.69)	22.5 (2.55)	22.6 (2.55)
Torque Constant (Kt)	lbf-in/A (+/- 10% @ 80°C)	0.9 (0.10)	0.9 (0.10)	3.4 (0.39)	6.8 (0.77)	12.1 (1.37)	13.6 (1.54)	0.9 (0.10)	0.9 (0.10)	3.4 (0.39)	6.8 (0.77)	12.1 (1.37)	13.6 (1.54)	3.5 (0.39)	6.8 (0.76)	12.2 (1.38)	13.7 (1.55)
Continuous Current Rating	Amps	13.1	13.1	3.4	1.7	0.9	0.8	21.1	21.1	5.5	2.8	1.5	1.4	7.8	3.9	2.1	1.8
Peak Current Rating	Amps	26.1	26.1	6.8	3.4	1.9	1.6	42.3	42.3	11.0	5.5	3.1	2.7	15.5	7.9	4.1	3.7
Motor Stator Data																	
Voltage Constant (Ke)	Vrms / Krpm (+/- 10% @ 80°C)	7.7 (10.9)	7.7 (10.9)	29.9 (42.2)	59.7 (84.5)	106.0 (149.9)	119.5 (168.9)	7.7 (10.9)	7.7 (10.9)	29.9 (42.2)	59.7 (84.5)	106.0 (149.9)	119.5 (168.9)	30.3 (42.9)	59.2 (83.8)	106.9 (151.2)	119.9 (169.6)
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	2.8	11.2	36.3	49.6	0.08	0.08	1.1	4.5	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
Mech Time Constant tm,	ms min	6.6	6.6	6.5	6.5	6.7	7.2	2.6	2.6	2.6	2.6	2.6	2.6	1.5	1.5	1.7	1.7
	Max	7.4	7.4	7.3	7.4	7.6	8.1	3.0	3.0	2.9	2.9	3.0	3.0	1.7	1.7	1.9	1.9
Electrical Time Contrant (te)	ms	2.7	2.7	2.8	2.7	2.7	2.5	3.2	3.2	3.3	3.3	3.3	3.3	3.8	3.7	3.3	3.3
Damping Constant	lbf-in/krpm (N-m/krpm)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)	1.23 (0.14)
Friction Torque	lbf-in (N-m)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)	2.00 (0.23)
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
Motor Wire Insulation		Class 180H															
Thermal Switch, Stator Temp.	°C	T4 = 130°C								T3A = 165°C							
Connectors		Potted NPT Connectors Only															

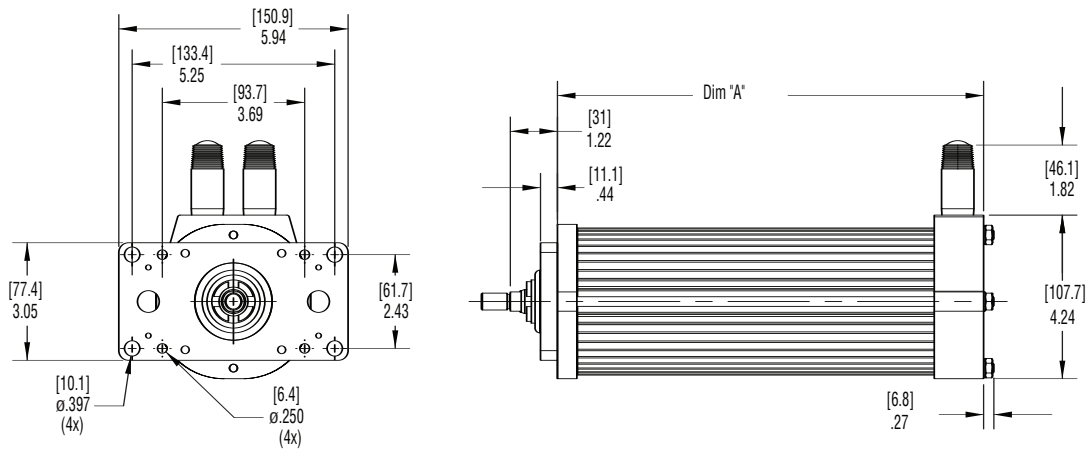
For amplifiers using peak sinusoidal ratings, multiply RMS sinusoidal Kt by 0.707, and peak current by 1.414.
Specifications reflect 80 °C test environment

Specifications subject to change without notice.

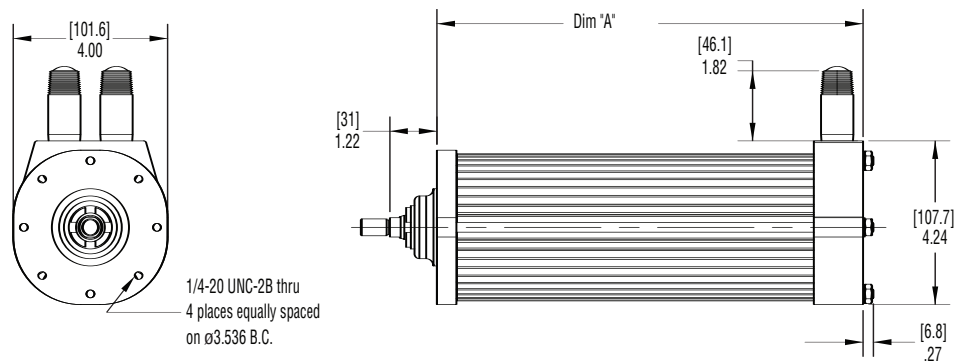
EL30 Clevis Mount



EL30 Front Flange Mount



EL30 Base Unit



1/4-20 UNC-2B thru
4 places equally spaced
on $\phi 3.536$ B.C.

Dim	3 inch (76.2 mm) stroke	6 inch (152.4 mm) stroke
A	8.57 (217.7)	11.04 (280.5)
B	9.70 (246.4)	12.17 (309.1)

EXLAR
EL Explosion Proof Linear Actuators

EL AA BB CC DDD E F GGG HHH II JJJ XX #####

EL30 Series
Ordering Information

EL = Model Series
 EL = EL Series

AA = Frame Size
 30 = 3 inch nominal

BB = Nomimal Stroke Length
 03 = 3 inch stroke
 06 = 6 inch stroke
 XX = Special stroke not to exceed 6 inches

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
 X## = length of flying leads in feet

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
 X = Special rod end

Notes:
 1. Amplifiers require motor data files for operation. See www.exlar.com or contact Exlar Engineering.
 2. Use of the Allen-Bradley 1394 requires assistance from Allen-Bradley to configure the axis for a custom motor.
 3. 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. Preloaded follower is not available with absolute internal feedback option.

GGG = Feedback Options (Please indicate the amplifier to be used.)
 XX1 = Custom feedback -buyer to supply drawing of desired feedback
 001 = Standard feedback mount - actuator is supplied ready for size 15 resolver, includes .375 mm shaft
 002 = Same as above with 8 mm shaft
 AB6 = Allen-Bradley 1394² (resolver type 2)
 AP1 = API (resolver based, type 2)
 AM3 = Advanced Motion Controls (resolver, type 1)
 BD2 = Baldor Flex Series (resolver type 1)
 BO1 = Bosch (resolver, type 2)
 CC1 = Cleveland Machine Controls (resolver, type 1)
 CM1 = Comau (resolver, type 1)
 CS1 = Parker (Custom Servo Motors) MPA, MPSTL (resolver, type 1)
 EL1 = Elmo Motion Control (resolver, type 1)
 EM4 = Emerson UniDrive SP (resolver, type 1)
 EX4 = Exlar SV Series (resolver, type 1)
 IN4 = Bosch-Rexroth (Indramat) ECO Drive (standard resolver, type 1) (replaces IN3)
 KM1 = Kollmorgen Servo Star¹ (resolver, type 2)
 KM5 = Kollmorgen ServoStar 600 and ServoStar CD¹ (resolver, type 2)
 LZ1 = Lenze 9300 (resolver, type 2)
 MD1 = Modicon (resolver, type 1)
 MX1 = Metronix ARS Series (resolver, type 1)
 OR1 = Ormec (resolver, type 2)
 PC1 = Parker Compumotor Apex & Z Series (resolver, type 1)
 PS3 = Pacific Scientific SC9000, 700 Series (resolver, type 1)
 SM2 = Siemens (resolver, type 1)
 SP2 = In Motion, PAM Series (resolver, type 1)
 WD1 = Whedco (GE-Fanuc) (resolver, type 1)

HHH = Motor Stator

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

II = Motor Speed
 8 = 8 motor poles
 01 - 99 = Two didit number - rated speed in rpm x 100

JJJ = Hazardous Location Temperature Rating
 T3A = 180 deg C (Samariam Cobolt magnets)
 T4 = 135 deg C (Neodymium-Iron-Boron magnets)

XX = Optional Speed & Mechanical Designations -Multiples possible
 XL = Special lubrication
 PF = Preloaded follower³
 XT = Special travel option

= Part Number Designator for Specials
 ##### = Optional 5 digit assigned part number to designate unique model number for specials