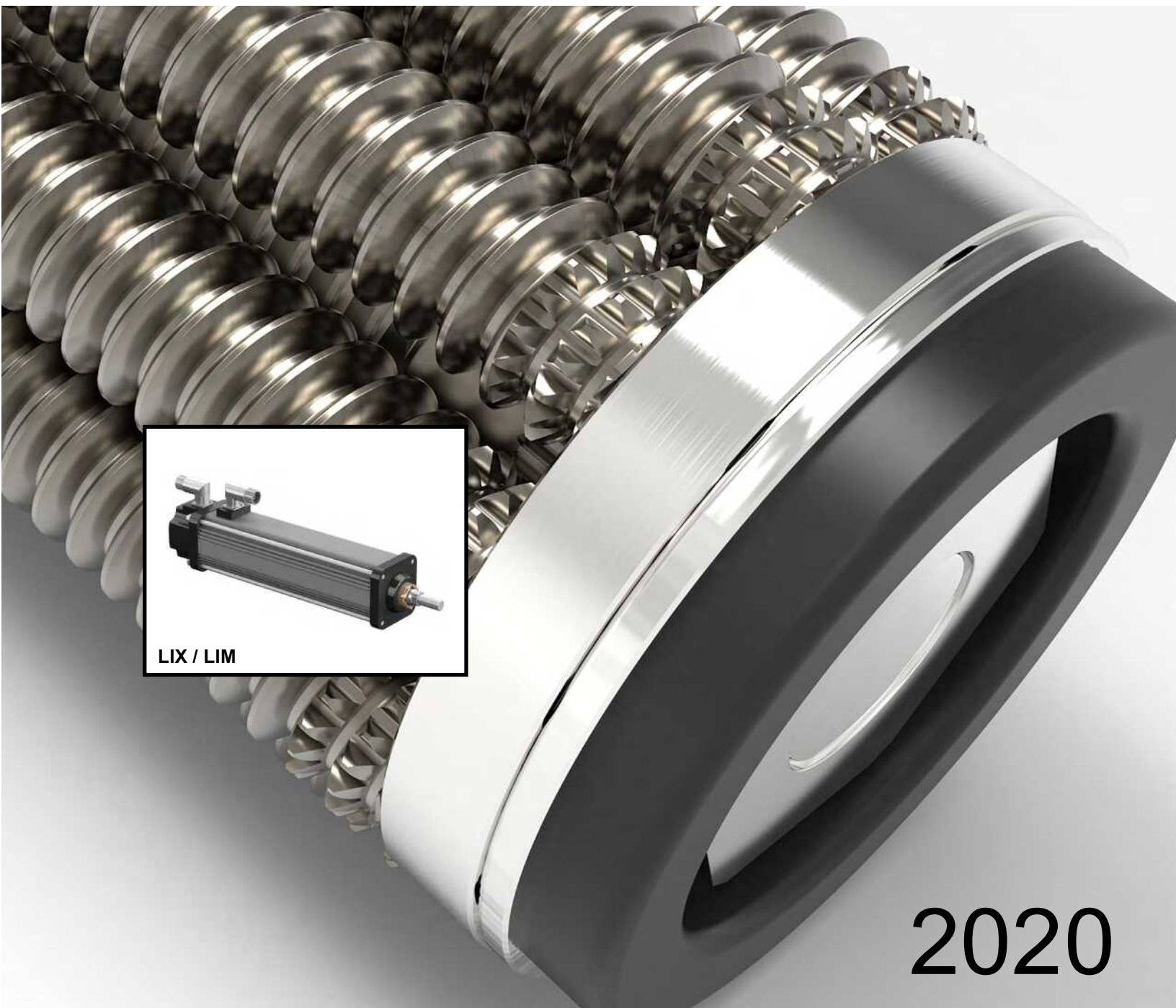




i-mold

MOLDING INNOVATIONS



LIX / LIM

2020

Roller Screw Technology

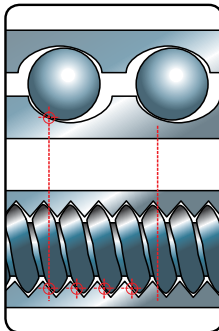
The Advantages of Roller Screw Technology

Designers have five basic choices when it comes to achieving controlled linear motion. The table on page 3 gives you a quick overview of the general advantages that are associated with each. Because the roller screw technology common to all linear actuators might not be familiar to everyone using this catalog, allow us to present a general overview.

Roller Screw Basics

A roller screw is a mechanism for converting rotary torque into linear motion in a similar manner to acme screws or ball screws. Unlike those devices, roller screws can carry heavy loads for thousands of hours in the most arduous conditions. This makes roller screws the ideal choice for demanding, continuous-duty applications.

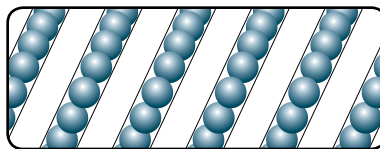
The difference is in the way the roller screw is designed to transmit forces. Multiple threaded helical rollers are assembled in a planetary arrangement around a threaded shaft (shown below) which converts the motor's rotary motion into linear movement of the shaft or nut.



Roller Screws vs Ball Screws Performance

Loads and Stiffness: Due to design factors, the number of contact points in a ball screw is limited by the ball size. Planetary roller screw designs provide many more contact points than possible on comparably sized ball screws. Since the number of contact points is greater, roller screws have greater load carrying capacities, plus improved stiffness. Plus an roller screw actuator takes up much less space to meet the designer's specified load rating.

Travel Life: As you would expect, with their higher load capacities, roller screws deliver major advantages in working life. Usually measured in "Inches of Travel," the relative travel lives for roller and ball screws are displayed on the graph on page 3. As shown, in a 2,000 lb. average load application applied to a 1.2 inch screw diameter with a 0.2 inch lead, the roller screw will have an expected service life that is 15 times greater than that of the ball screw.



Speeds: Typical ball screw speeds are limited to 2000 rpm and less, due to the interaction of the balls colliding with each other as the race rotates. In contrast, the rollers in a roller screw are

fixed in planetary fashion by journals at the ends of the nut and therefore do not have this limitation. Hence, roller screws can work at 5000 rpm and higher, producing comparably higher linear travel rates.

LIX SERIES

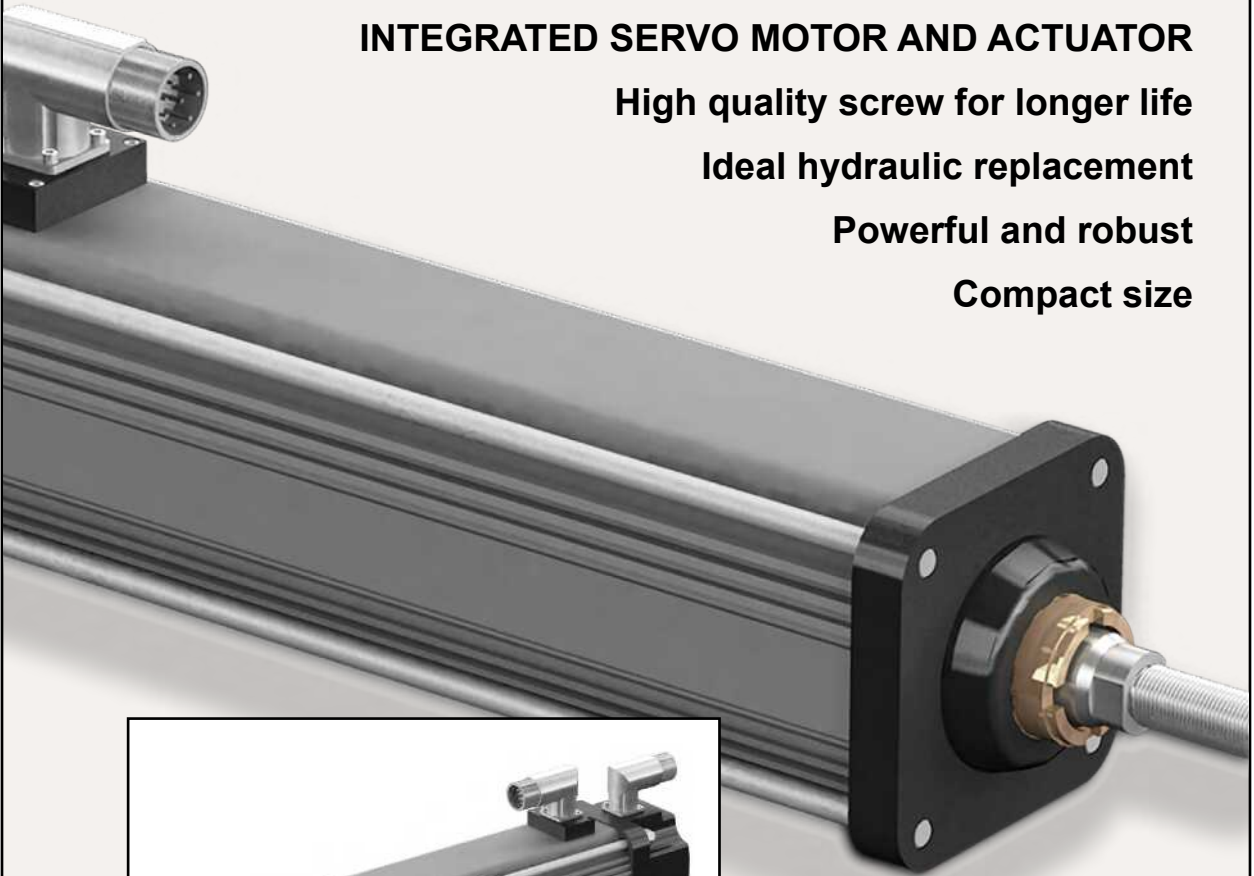
INTEGRATED SERVO MOTOR AND ACTUATOR

High quality screw for longer life

Ideal hydraulic replacement

Powerful and robust

Compact size



LIX Series Integrated Motor/Actuator

LIX Series

High Capacity Integrated Motor/Actuator

Description

For applications that require long life and continuous duty, even in harsh environments, the LIX Series actuator offers a robust solution. The life of these actuators can exceed that of a ball screw actuator by 15 times, all while delivering high speeds and high forces.

Sealed for Long Life with Minimum Maintenance

LIX Series actuators have strong advantages wherever outside contaminants are an issue. In most rotary-to-linear devices, critical mechanisms are exposed to the environment. Thus, these actuators must be frequently inspected, cleaned and lubricated.

In contrast, the converting components in all LIX units are mounted within sealed motor housing. With a simple bushing and seal on the smooth extending rod, abrasive particles or other contaminants are prevented from reaching the actuator's critical mechanisms. This assures trouble-free operation even in the most harsh environments.

Similarly, lubrication requirements are minimal. LIX actuators can be lubricated with either grease or recirculated oil. Recirculated oil systems eliminate this type of maintenance altogether. A LIX Series actuator with a properly operating recirculating oil system will operate indefinitely, without any other lubrication requirements.

Operating Conditions and Usage		
Accuracy:		
Screw Lead Error	in/ft (µm / 300 mm)	0.001 (25)
Screw Travel Variation	in/ft (µm / 300 mm)	0.0012 (30)
Screw Lead Backlash	in	0.004 maximum
Ambient Conditions:		
Standard Ambient Temperature	°C	0 to 65
Extended Ambient Temperature*	°C	-30 to 65
Storage Temperature	°C	-40 to 85
IP Rating		IP65S
Vibration**		3.5 grms; 5 to 520 hz

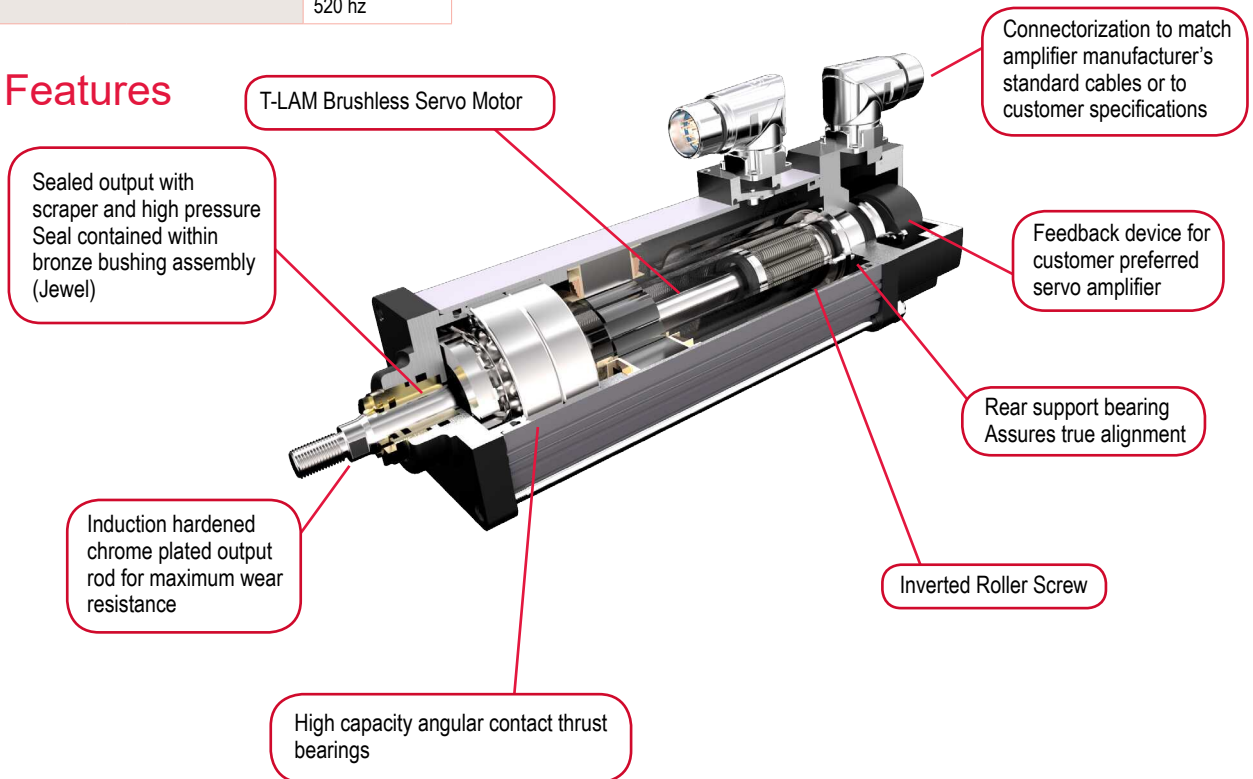
Technical Characteristics	
Frame Sizes in (mm)	2 (60), 3 (80), 4 (100), 5.5 (140), 7 (180)
Screw Leads in (mm)	0.1 (2), 0.2 (5), 0.25 (6), 0.4 (10), 0.5 (13), 0.75 (19), 1 (25)
Standard Stroke Lengths	3 (75), 4 (100), 6 (150), 8 (200), 10 (250), 12 (300), 14 (350), 18 (450)
Force Range	103 to 11,528 lbf (458 to 51 kN)
Maximum Speed	up to 37.5 in/sec (952 mm/s)

* Consult i-mold for extended temperature operations

** Resolver feedback

Ratings at 25°C, operation over 25°C requires de-rating.

Product Features



Mechanical Specifications

LIX20

Model No. (Motor Stacks)		1 Stack			2 Stack			3 Stack	
Screw Lead Designator		01	02	04	01	02	04	02	04
Screw Lead	in	0.1	0.2	0.4	0.1	0.2	0.4	0.2	0.4
	mm	2.54	5.08	10.16	2.54	5.08	10.16	5.08	10.16
Continuous Force (Motor Limited)	lbf	367	195	103	578	307	163	409	216
	N	1632	867	459	2571	1366	723	1817	962
Max Velocity	in/sec	8.3	16.8	33.3	8.3	16.8	33.3	16.8	33.3
	mm/sec	211.7	423.3	846.7	211.7	423.3	846.7	423.3	846.7
Friction Torque (standard screw)	in-lbf	1.0			1.1			1.1	
	N-m	0.11			0.12			0.12	
Friction Torque (preloaded screw)	in-lbf	2.3			2.3			2.3	
	N-m	0.25			0.26			0.26	
Min Stroke	in	3			3			6	
	mm	75			75			150	
Max Stroke	in	12			12			12	
	mm	300			300			300	
C _a (Dynamic Load Rating)	lbf	2075	1540	1230	2075	1540	1230	1540	1230
	N	9230	6850	5471	9230	6850	5471	6850	5471
Inertia (zero stroke)	lb-in-s ²	0.0007758			0.0008600			0.0009442	
	Kg-m ²	0.00008766			0.00009717			0.0001067	
Inertia Adder (per inch of stroke)	lb-in-s ² /in				0.00004667				
	Kg-m ² /in				0.000005273				
Weight (zero stroke)	lb	4.5			5.0			5.5	
	Kg	2.04			2.27			2.49	
Weight Adder (per inch of stroke)	lb				0.5				
	Kg				0.23				

LIX30

Model No. (Motor Stacks)		1 Stack			2 Stack			3 Stack	
Screw Lead Designator		01	02	05	01	02	05	02	05
Screw Lead	in	0.1	0.2	0.5	0.1	0.2	0.5	0.2	0.5
	mm	2.54	5.08	12.7	2.54	5.08	12.7	5.08	12.7
Continuous Force (Motor Limited)	lbf	792	449	190	1277	724	306	1020	432
	N	3521	1995	845	5680	3219	1363	4537	1922
Max Velocity	in/sec	5.0	10.0	25.0	5.0	10.0	25.0	10.0	25.0
	mm/sec	127.0	254.0	635.0	127.0	254.0	635.0	254.0	635.0
Friction Torque (standard screw)	in-lbf	1.5			1.7			1.9	
	N-m	0.17			0.19			0.21	
Friction Torque (preloaded screw)	in-lbf	3.3			3.5			3.7	
	N-m	0.37			0.39			0.41	
Min Stroke	in	3			3			5.9	
	mm	75			75			150	
Max Stroke	in	18			18			18	
	mm	450			450			450	
C _a (Dynamic Load Rating)	lbf	5516	5800	4900	5516	5800	4900	5800	4900
	N	24536	25798	21795	24536	25798	21795	25798	21795
Inertia (zero stroke)	lb-in-s ²	0.002655			0.002829			0.003003	
	Kg-m ²	0.0003000			0.0003196			0.00033963	
Inertia Adder (per inch of stroke)	lb-in-s ² /in				0.0001424				
	Kg-m ² /in				0.00001609				
Weight (zero stroke)	lb	6.5			7.65			8.8	
	Kg	2.95			3.47			3.99	
Weight Adder (per inch of stroke)	lb				1.1				
	Kg				0.50				

LIX Series Integrated Motor/Actuator

LIX40

Model No. (Motor Stacks)	1 Stack				2 Stack				3 Stack				
Screw Lead Designator	01	02	05	08	01	02	05	08	02	05	08		
Screw Lead	in	0.1	0.2	0.5	0.75	0.1	0.2	0.5	0.75	0.2	0.5	0.75	
	mm	2.54	5.08	12.7	19.05	2.54	5.08	12.7	19.05	5.08	12.7	19.05	
Continuous Force (Motor Limited)	lbf	2089	1194	537	358	3457	1975	889	593	2687	1209	806	
	N	9293	5310	2390	1593	15377	8787	3954	2636	11950	5378	3585	
Max Velocity	in/sec	5.0	10.0	25.0	37.5	5.0	10.0	25.0	37.5	10.0	25.0	37.5	
	mm/sec	127.0	254.0	635.0	953.0	127.0	254.0	635.0	953.0	254.0	635.0	953.0	
Friction Torque (standard screw)	in-lbf	2.7				3.0				3.5			
	N-m	0.31				0.34				0.40			
Friction Torque (preloaded screw)	in-lbf	7.2				7.5				8.0			
	N-m	0.82				0.85				0.91			
Min Stroke	in	4				6				8			
	mm	100				150				200			
Max Stroke	in	18		12		18		12		18		12	
	mm	450				450				450			
C _s (Dynamic Load Rating)	lbf	7900	8300	7030	6335	7900	8300	7030	6335	8300	7030	6335	
	N	35141	36920	31271	28179	35141	36920	31271	28179	36920	31271	28179	
Inertia (zero stroke)	lb-in-s ²	0.01132				0.01232				0.01332			
	Kg-m ²	0.0012790				0.001392				0.001505			
Inertia Adder (per inch of stroke)	lb-in-s ² /in					0.0005640							
	Kg-m ² /in					0.00006372							
Weight (zero stroke)	lb	8.0				11.3				14.6			
	Kg	3.63				5.13				6.62			
Weight Adder (per inch of stroke)	lb					2.0							
	Kg					0.91							

LIX50

Model No. (Motor Stacks)	1 Stack				2 Stack				3 Stack				
Screw Lead Designator	01	02	05	10	01	02	05	10	02	05	10		
Screw Lead	in	0.1	0.2	0.5	1.0	0.1	0.2	0.5	1.0	0.2	0.5	1.0	
	mm	2.54	5.08	12.7	25.4	2.54	5.08	12.7	25.4	5.08	12.7	25.4	
Continuous Force (Motor Limited)	lbf	4399	2578	1237	619	7150	4189	2011	1005	5598	2687	1344	
	N	19568	11466	5503	2752	31802	18634	8944	4472	24901	11953	5976	
Max Velocity	in/sec	4.0	8.0	20.0	40.0	4.0	8.0	20.0	40.0	8.0	20.0	40.0	
	mm/sec	101.6	203.0	508.0	1016.0	101.6	203.0	508.0	1016.0	203.0	508.0	1016.0	
Friction Torque (standard screw)	in-lbf	4.1				4.6				5.3			
	N-m	0.46				0.53				0.60			
Friction Torque (preloaded screw)	in-lbf	10.1				10.6				11.3			
	N-m	1.14				1.21				1.36			
Min Stroke	in	6				6				10			
	mm	152				152				254			
Max Stroke	in	10	14		10	10	14		10	14		10	
	mm	350				350				350			
C _s (Dynamic Load Rating)	lbf	15693	13197	11656	6363	15693	13197	11656	6363	13197	11656	6363	
	N	69806	58703	51848	28304	69806	58703	51848	28304	58703	51848	28304	
Inertia (zero stroke)	lb-in-s ²	0.02084				0.02300				0.02517			
	Kg-m ²	0.002356				0.002599				0.002844			
Inertia Adder (per inch of stroke)	lb-in-s ² /in					0.001208							
	Kg-m ² /in					0.0001365							
Weight (zero stroke)	lb	46.0				53.0				60.0			
	Kg	20.87				24.04				27.2			
Weight Adder (per inch of stroke)	lb					3.0							
	Kg					1.36							

LIX60

Model No. (Motor Stacks)		1 Stack			2 Stack			3 Stack		
Screw Lead Designator		03	05	10	03	05	10	03	05	10
Screw Lead	in	0.25	0.5	1.0	0.25	0.5	1	0.25	0.5	1
	mm	6.35	12.7	25.4	6.35	12.7	25.4	6.35	12.7	25.4
Continuous Force (Motor Limited)	lbf	4937	2797	1481	8058	4566	2417	11528	6533	3459
	N	21958	12443	6588	35843	20311	10753	51278	29058	15383
Max Velocity	in/sec	10.0	20.0	40.0	10.0	20.0	40.0	10.0	20.0	40.0
	mm/sec	254.0	508.0	1016.0	254.0	508.0	1016.0	254.0	508.0	1016.0
Friction Torque (standard screw)	in-lbf		8.1			10.8			14.5	
	N-m		0.91			1.22			1.64	
Friction Torque (preloaded screw)	in-lbf		14.1			16.8			20.5	
	N-m		1.59			1.90			2.32	
Min Stroke	in		6			10			10	
	mm		150			250			250	
Max Stroke	in		10			10			10	
	mm		250			250			250	
C _a (Dynamic Load Rating)	lbf	25300	22800	21200	25300	22800	21200	25300	22800	21200
	N	112540	101420	94302	112540	101420	94302	112540	101420	94302
Inertia (zero stroke)	lb-in-s ²		0.0804			0.1114			0.1424	
	Kg-m ²		0.009087			0.001259			0.01609	
Inertia Adder (per inch of stroke)	lb-in-s ² /in					0.005190				
	Kg-m ² /in					0.0005864				
Weight (zero stroke)	lb		48			62			76	
	Kg		21.77			28.12			34.47	
Weight Adder (per inch of stroke)	lb					8.0				
	Kg					3.63				

DEFINITIONS:

Continuous Force: The linear force produced by the actuator at continuous motor torque.

Max Velocity: The linear velocity that the actuator will achieve at rated motor rpm.

Friction Torque (standard screw): Amount of torque required to move the actuator when not coupled to a load.

Friction Torque (preloaded screw): Amount of torque required to move the actuator when not coupled to a load.

Min Stroke: Shortest available stroke length.

Max Stroke: Longest available stroke length.

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

Inertia (zero stroke): Base inertia of an actuator with zero available stroke length.

Inertia Adder (per inch of stroke): Inertia per inch of stroke that must be added to the base (zero stroke) inertia to determine the total actuator inertia.

Weight (zero stroke): Base weight of an actuator with zero available stroke length.

Weight Adder (per inch of stroke): Weight adder per inch of stroke that must be added to the base (zero stroke) weight to determine the total actuator weight.

LIX Series Integrated Motor/Actuator

Electrical Specifications

LIX20

Motor Stator		118	138	158	168	218	238	258	268	318*	338*	358*	368*
Bus Voltage	Vrms	115	230	400	460	115	230	400	460	115	230	400	460
Speed @ Bus Voltage	rpm	5000											
RMS SINUSOIDAL COMMUTATION													
Continuous Motor Torque	lbf-in	7.6	7.3	7.0	7.0	11.9	11.5	11.0	11.3	15.0	15.3	14.6	14.9
	Nm	0.86	0.83	0.79	0.79	1.34	1.30	1.25	1.28	1.70	1.73	1.65	1.69
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	2.5	5.2	7.5	9.5	2.5	5.2	8.6	10.1	2.5	5.3	8.8	10.1
	Nm/A	0.28	0.59	0.85	1.07	0.28	0.59	0.97	1.15	0.29	0.59	0.99	1.15
Continuous Current Rating	(Greased) A	3.4	1.6	1.0	0.8	5.4	2.5	1.4	1.2	6.6	3.2	1.9	1.6
	(Oil Cooled) A	6.9	3.1	2.1	1.6	10.8	4.9	2.9	2.5	13.2	6.5	3.7	3.3
Peak Current Rating	A	6.9	3.1	2.1	1.6	10.8	4.9	2.9	2.5	13.2	6.5	3.7	3.3
O-PK SINUSOIDAL COMMUTATION													
Continuous Motor Torque	lbf-in	7.6	7.3	7.0	7.0	11.9	11.5	11.0	11.3	15.0	15.3	14.6	14.9
	Nm	0.86	0.83	0.79	0.79	1.34	1.30	1.25	1.28	1.70	1.73	1.65	1.69
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	1.7	3.7	5.3	6.7	1.7	3.7	6.1	7.2	1.8	3.7	6.2	7.2
	Nm/A	0.20	0.42	0.60	0.76	0.20	0.42	0.69	0.81	0.20	0.42	0.70	0.81
Continuous Current Rating	(Greased) A	4.9	2.2	1.5	1.2	7.6	3.5	2.0	1.8	9.4	4.6	2.6	2.3
	(Oil Cooled) A	9.7	4.5	2.9	2.3	15.2	7.0	4.1	3.5	18.7	9.2	5.3	4.7
Peak Current Rating	A	9.7	4.5	2.9	2.3	15.2	7.0	4.1	3.5	18.7	9.2	5.3	4.7
MOTOR STATOR DATA													
Voltage Constant (Ke) (+/- 10% @ 25°C)	Vrms/Krpm	16.9	35.5	51.5	64.8	16.9	35.5	58.6	69.3	17.3	36.0	59.9	69.3
	Vpk/Krpm	23.9	50.2	72.8	91.7	23.9	50.2	82.9	98.0	24.5	50.9	84.8	98.0
Pole Configuration		8	8	8	8	8	8	8	8	8	8	8	8
Resistance (L-L)(+/- 5% @ 25°C)	Ohms	2.6	12.5	28.8	45.8	1.1	5.3	15.5	20.7	0.76	3.1	9.6	12.2
Inductance (L-L)(+/- 15%)	mH	4.6	21.4	47.9	68.3	2.5	10.2	28.3	39.5	1.7	7.4	18.5	27.4
Brake Inertia	lbf-in-sec ²	0.00012											
	Kg-cm ²	0.135											
Brake Current @ 24 VDC	A	0.33											
Brake Holding Torque	lbf-in	19											
	Nm	2.2											
Brake Engage/Disengage Time	ms	14/28											
Mechanical Time Constant (tm), ms	min	4.7	5.1	5.5	5.6	2.0	2.1	2.3	2.2	1.3	1.2	1.4	1.3
	max	6.6	7.2	7.9	7.9	2.8	3.0	3.3	3.1	1.8	1.8	1.9	1.8
Electrical Time Constant (te)	ms	1.8	1.7	1.7	1.5	2.2	1.9	1.8	1.9	2.3	2.4	1.9	2.2
Insulation Class		180 (H)											

For amplifiers using peak sinusoidal ratings, multiply RMS sinusoidal Kt by 0.707 and current by 1.414.
Test data derived using NEMA recommended aluminum heatsink 10" x 10" x 1/4" at 25°C ambient.

Specifications subject to change without notice.

LIX Series Integrated Motor/Actuator

LIX30

Motor Stator		118	138	158	168	218	238	258	268	318*	338*	358*	368*
Bus Voltage	Vrms	115	230	400	460	115	230	400	460	115	230	400	460
Speed @ Bus Voltage	rpm	3000											
RMS SINUSOIDAL COMMUTATION													
Continuous Motor Torque	lbf-in	16.9	16.8	16.3	16.0	26.9	27.1	26.7	27.0	38.7	38.2	36.2	36.3
	Nm	1.91	1.90	1.84	1.81	3.04	3.06	3.01	3.05	4.37	4.32	4.09	4.10
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	4.4	8.7	15.5	17.5	4.4	8.7	15.5	17.5	4.4	8.7	15.6	17.5
	Nm/A	0.49	0.99	1.75	1.97	0.49	0.99	1.75	1.97	0.50	0.98	1.77	1.98
Continuous Current Rating	(Greased) A	4.3	2.2	1.2	1.0	6.9	3.5	1.9	1.7	9.7	4.9	2.6	2.3
	(Oil Cooled) A	8.6	4.3	2.4	2.0	13.8	6.9	3.8	3.4	19.5	9.9	5.2	4.6
Peak Current Rating	A	8.6	4.3	2.4	2.0	13.8	6.9	3.8	3.4	19.5	9.9	5.2	4.6
O-PK SINUSOIDAL COMMUTATION													
Continuous Motor Torque	lbf-in	16.9	16.8	16.3	16.0	26.9	27.1	26.7	27.0	38.7	38.2	36.2	36.3
	Nm	1.91	1.90	1.84	1.81	3.04	3.06	3.01	3.05	4.37	4.32	4.09	4.10
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	3.1	6.2	11.0	12.4	3.1	6.2	11.0	12.4	3.1	6.1	11.1	12.4
	Nm/A	0.35	0.70	1.24	1.40	0.35	0.70	1.24	1.40	0.35	0.69	1.25	1.40
Continuous Current Rating:	(Greased) A	6.1	3.0	1.7	1.4	9.7	4.9	2.7	2.4	13.8	7.0	3.7	3.3
	(Oil Cooled) A	12.2	6.1	3.3	2.9	19.5	9.8	5.4	4.9	27.6	13.9	7.3	6.5
Peak Current Rating	A	12.2	6.1	3.3	2.9	19.5	9.8	5.4	4.9	27.6	13.9	7.3	6.5
MOTOR STATOR DATA													
Voltage Constant (Ke) (+/- 10% @ 25°C)	Vrms/Krpm	29.8	59.7	105.8	119.3	29.8	59.7	105.8	119.3	30.3	59.2	106.8	119.8
	Vpk/Krpm	42.2	84.4	149.7	168.7	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
Resistance (L-L)(+/- 5% @ 25°C)	Ohms	2.7	10.8	36.3	47.9	1.1	4.4	14.1	17.6	0.65	2.6	9.3	11.6
Inductance (L-L)(+/- 15%)	mH	7.7	30.7	96.8	123.0	3.7	14.7	46.2	58.7	2.5	9.5	30.9	38.8
Brake Inertia	lbf-in-sec ²	0.00033											
	Kg-cm ²	0.38											
Brake Current @ 24 VDC	A	0.5											
Brake Holding Torque	lbf-in	70											
	Nm	8											
Brake Engage/Disengage Time	ms	19/29											
Mechanical Time Constant (tm), ms	min	4.9	4.9	5.2	5.4	2.0	2.0	2.0	2.0	1.1	1.2	1.3	1.3
	max	9.4	9.5	10.1	10.5	3.9	3.8	3.9	3.8	2.2	2.3	2.5	2.5
Electrical Time Constant (te)	ms	2.9	2.8	2.7	2.6	3.3	3.4	3.3	3.3	3.8	3.7	3.3	3.3
Insulation Class		180 (H)											

For amplifiers using peak sinusoidal ratings, multiply RMS sinusoidal Kt by 0.707 and current by 1.414.
 *Refer to performance specifications on page 7 for availability of 3 stack stator by stroke/lead combination.
 Test data derived using NEMA recommended aluminum heatsink 10" x 10" x 3/8" at 25°C ambient.

Specifications subject to change without notice.

LIX Series Integrated Motor/Actuator

LIX40

Motor Stator		118	138	158	168	218	238	258	268	338*	358*	368*
Bus Voltage	Vrms	115	230	400	460	115	230	400	460	230	400	460
Speed @ Bus Voltage	rpm	3000										
RMS SINUSOIDAL COMMUTATION												
Continuous Motor Torque	lbf-in	47.5	47.5	45.9	45.4	75.1	78.6	78.7	79.5	106.9	105.3	106.9
	Nm	5.37	5.36	5.19	5.13	8.49	8.89	8.89	8.99	12.08	11.90	12.08
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	4.1	8.2	14.5	16.8	4.1	8.2	14.5	16.8	8.4	14.5	16.8
	Nm/A	0.46	0.93	1.64	1.90	0.46	0.93	1.64	1.90	0.95	1.64	1.90
Continuous Current Rating	(Greased) A	12.9	6.5	3.5	3.0	20.5	10.7	6.0	5.3	14.2	8.1	7.1
	(Oil Cooled) A	25.9	12.9	7.1	6.0	40.9	21.4	12.1	10.6	28.5	16.2	14.2
Peak Current Rating	A	25.9	12.9	7.1	6.0	40.9	21.4	12.1	10.6	28.5	16.2	14.2
O-PK SINUSOIDAL COMMUTATION												
Continuous Motor Torque	lbf-in	47.5	47.5	45.9	45.4	75.1	78.6	78.7	79.5	106.9	105.3	106.9
	Nm	5.37	5.36	5.19	5.13	8.49	8.89	8.89	8.99	12.08	11.90	12.08
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	2.9	5.8	10.3	11.9	2.9	5.8	10.3	11.9	5.9	10.3	11.9
	Nm/A	0.33	0.66	1.16	1.34	0.33	0.66	1.16	1.34	0.67	1.16	1.34
Continuous Current Rating	(Greased) A	18.3	9.1	5.0	4.3	28.9	15.1	8.5	7.5	20.1	11.4	10.1
	(Oil Cooled) A	36.6	18.3	10.0	8.6	57.9	30.3	17.1	15.0	40.3	22.9	20.1
Peak Current Rating	A	36.6	18.3	10.0	8.6	57.9	30.3	17.1	15.0	40.3	22.9	20.1
MOTOR STATOR DATA												
Voltage Constant (Ke) (+/- 10% @ 25°C)	Vrms/Krpm	28.0	56.0	99.3	114.6	28.0	56.0	99.3	114.6	57.3	99.3	114.6
	Vpk/Krpm	39.6	79.2	140.5	162.1	39.6	79.2	140.5	162.1	81.0	140.5	162.1
Pole Configuration		8	8	8	8	8	8	8	8	8	8	8
Resistance (L-L)(+/- 5% @ 25°C)	Ohms	0.42	1.7	5.7	7.8	0.2	0.72	2.26	3.0	0.5	1.52	2.0
Inductance (L-L)(+/- 15%)	mH	3.0	11.9	37.5	49.9	1.2	5.4	18.2	23.1	4.0	12.0	16.0
Brake Inertia	lbf-in-sec ²	0.00096										
	Kg-cm ²	1.08										
Brake Current @ 24 VDC	A	0.67										
Brake Holding Torque	lbf-in	97										
	Nm	11										
Brake Engage/Disengage Time	ms	20/29										
Mechanical Time Constant (tm), ms	min	4.5	4.5	4.8	4.9	2.1	1.9	1.9	1.9	1.2	1.3	1.2
	max	6.0	6.0	6.4	6.6	2.8	2.6	2.6	2.5	1.7	1.7	1.7
Electrical Time Constant (te)	ms	7.0	7.0	6.6	6.4	5.9	7.5	8.0	7.8	8.2	7.9	8.2
Insulation Class		180 (H)										

*Refer to performance specifications on page 8 for availability of 3 stack stator by stroke/lead combination.
Test data derived using NEMA recommended aluminum heatsink 12" x 12" x 1/2" at 25°C ambient.

Specifications subject to change without notice.

LIX Series Integrated Motor/Actuator

LIX50

Motor Stator		138	158	168	238	258	268	338	358	368
Bus Voltage	Vrms	230	400	460	230	400	460	230	400	460
Speed @ Bus Voltage	rpm	2400								
RMS SINUSOIDAL COMMUTATION										
Continuous Motor Torque	lbf-in	107.2	104.8	109.4	179.9	178.8	177.8	233.3	237.2	238.3
	Nm	12.12	11.84	12.36	20.32	20.20	20.09	26.36	26.80	26.93
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	11.8	20.2	23.6	11.8	20.2	23.6	12.0	20.2	24.0
	Nm/A	1.33	2.28	2.67	1.33	2.28	2.67	1.36	2.28	2.71
Continuous Current Rating	(Greased) A	10.2	5.8	5.2	17.0	9.9	8.4	21.7	13.1	11.1
	(Oil Cooled) A	20.3	11.6	10.4	34.1	19.8	16.8	43.4	26.2	22.2
Peak Current Rating	A	20.3	11.6	10.4	34.1	19.8	16.8	43.4	26.2	22.2
O-PK SINUSOIDAL COMMUTATION										
Continuous Motor Torque	lbf-in	107.2	104.8	109.4	179.9	178.8	177.8	233.3	237.2	238.3
	Nm	12.12	11.84	12.36	20.32	20.20	20.09	26.36	26.80	26.93
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	8.3	14.3	16.7	8.3	14.3	16.7	8.5	14.3	17.0
	Nm/A	0.94	1.62	1.88	0.94	1.62	1.88	0.96	1.62	1.92
Continuous Current Rating	(Greased) A	14.4	8.2	7.3	24.1	14.0	11.9	30.7	18.5	15.7
	(Oil Cooled) A	28.7	216.4	14.7	48.2	27.9	23.8	61.4	37.1	31.4
Peak Current Rating	A	28.7	16.4	14.7	48.2	27.9	23.8	61.4	37.1	31.4
MOTOR STATOR DATA										
Voltage Constant (Ke) (+/- 10% @ 25°C)	Vrms/Krpm	80.6	138.1	161.1	80.6	138.1	161.1	82.0	138.1	164.0
	Vpk/Krpm	113.9	195.3	227.9	113.9	195.3	227.9	116.0	195.3	232.0
Pole Configuration		8	8	8	8	8	8	8	8	8
Resistance (L-L)(+/- 5% @ 25°C)	Ohms	0.87	2.68	3.34	0.34	1.01	1.39	0.22	0.61	0.86
Inductance (L-L)(+/- 15%)	mH	21.7	63.9	78.3	8.9	27.6	41.5	6.3	17.8	28.2
Brake Inertia	lbf-in-sec ²	0.0084								
	Kg-cm ²	9.5								
Brake Current @ 24 VDC	A	1								
Brake Holding Torque	lbf-in	354								
	Nm	40								
Brake Engage/Disengage Time	ms	25/73								
Mechanical Time Constant (tm), ms	min	2.2	2.3	2.1	0.9	0.9	0.9	0.5	0.5	0.5
	max	2.8	3.0	2.7	1.1	1.1	1.1	0.7	0.7	0.7
Electrical Time Constant (te)	ms	25.0	23.9	23.4	26.1	27.3	29.9	28.0	29.0	32.9
Insulation Class		180 (H)								

Test data derived using NEMA recommended aluminum heatsink 12" x 12" x 1/2" at 25°C ambient

Specifications subject to change without notice.

LIX Series Integrated Motor/Actuator

LIX60

Motor Stator		138	158	168	238	258	268	358	368
Bus Voltage	Vrms	230	400	460	230	400	460	400	460
Speed @ Bus Voltage	rpm	2400							
RMS SINUSOIDAL COMMUTATION									
Continuous Motor Torque	lbf-in	254.2	249.9	261.9	424.8	423.0	427.5	595.6	615.0
	Nm	28.72	28.23	29.59	47.99	47.79	48.30	67.29	69.49
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	12.6	21.8	25.2	12.6	21.8	25.2	21.4	25.2
	Nm/A	1.42	2.46	2.84	1.42	2.46	2.84	2.42	2.84
Continuous Current Rating	(Greased) A	22.6	12.8	11.6	37.7	21.7	19.0	31.1	27.3
	(Oil Cooled) A	45.2	25.6	23.3	75.5	43.4	38.0	62.2	54.6
Peak Current Rating	A	45.2	25.6	23.3	75.5	43.4	38.0	62.2	54.6
O-PK SINUSOIDAL COMMUTATION									
Continuous Motor Torque	lbf-in	254.2	249.9	261.9	424.8	423.0	427.5	595.6	611.6
	(Nm)	28.72	28.23	29.59	47.99	47.79	48.30	67.29	69.10
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	8.9	15.4	17.8	8.9	15.4	17.8	15.1	17.8
	Nm/A	1.01	1.74	2.01	1.01	1.74	2.01	1.71	2.01
Continuous Current Rating	(Greased) A	31.9	18.1	16.4	53.4	30.7	26.8	44.0	38.4
	(Oil Cooled) A	63.9	36.2	32.9	106.7	61.3	53.7	88.0	76.8
Peak Current Rating	A	63.9	36.2	32.9	106.7	61.3	53.7	88.0	76.8
MOTOR STATOR DATA									
Voltage Constant (Ke) (+/- 10% @ 25°C)	Vrms/Krpm	85.9	148.9	171.8	85.9	148.9	171.8	146.1	171.8
	Vpk/Krpm	121.5	210.6	243.0	121.5	210.6	243.0	206.6	243.0
Pole Configuration		8	8	8	8	8	8	8	8
Resistance (L-L)(+/- 5% @ 25°C)	Ohms	0.3	1.0	1.2	0.13	0.41	0.5	0.23	0.3
Inductance (L-L)(+/- 15%)	mH	8.3	24.8	29.4	3.9	11.8	15.8	7.5	10.3
Brake Inertia	lbf-in-sec ²	0.02815							
	Kg-cm ²	31.8							
Brake Current @ 24 VDC	A	1.45							
Brake Holding Torque	lbf-in	708							
	Nm	80							
Brake Engage/Disengage Time	ms	53/97							
Mechanical Time Constant (tm), ms	min	3.9	4.0	3.6	1.6	1.6	1.6	1.0	0.9
	max	4.3	4.5	4.1	1.8	1.8	1.8	1.1	1.0
Electrical Time Constant (te)	ms	25.4	24.6	24.0	29.4	29.1	29.8	32.1	33.8
Insulation Class		180 (H)							

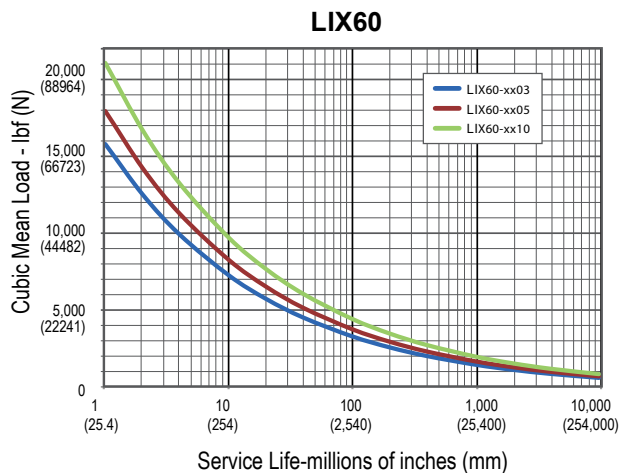
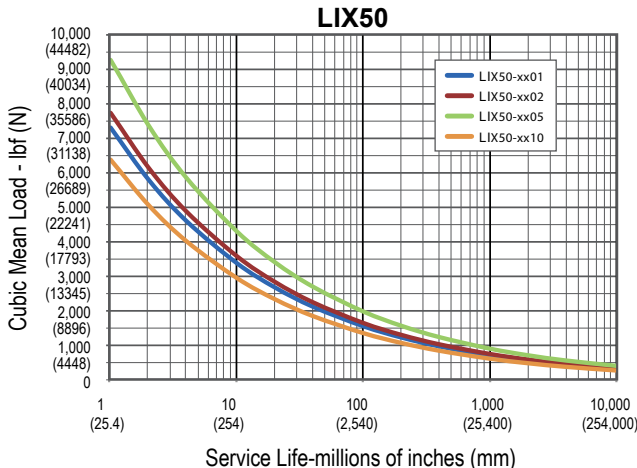
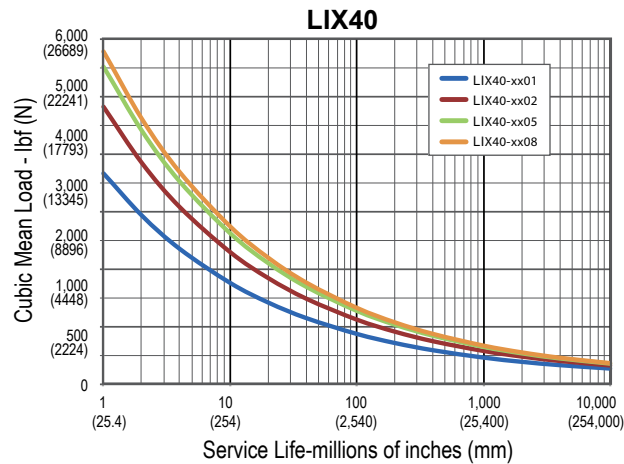
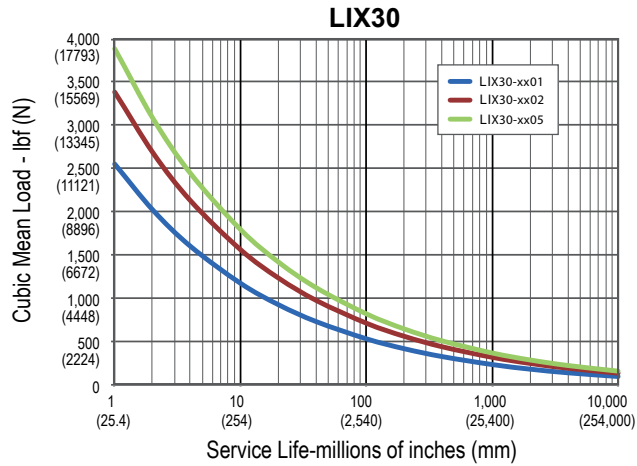
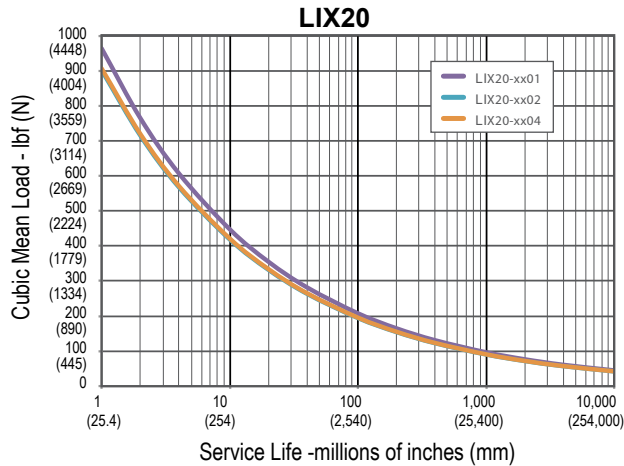
Test data derived using NEMA recommended aluminum heatsink 16" x 16" x 1" at 25°C ambient

Specifications subject to change without notice.

The LIX60-06 can only accommodate a single stack stator.

LIX Series Integrated Motor/Actuator

Estimated Service Life



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:

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

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

For additional details on calculating estimated service life, please refer to the Engineering Reference, page 169.

Service Life Estimate Assumptions:

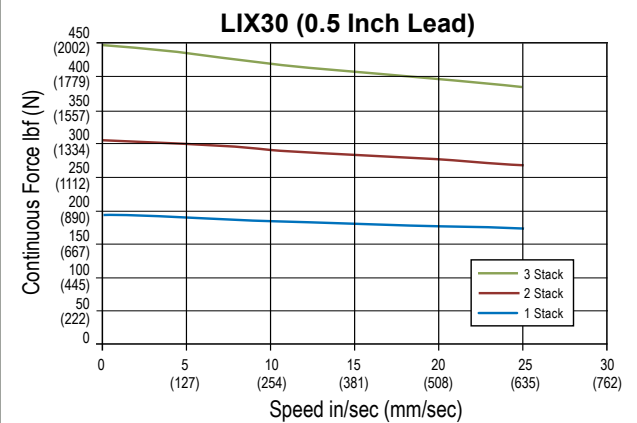
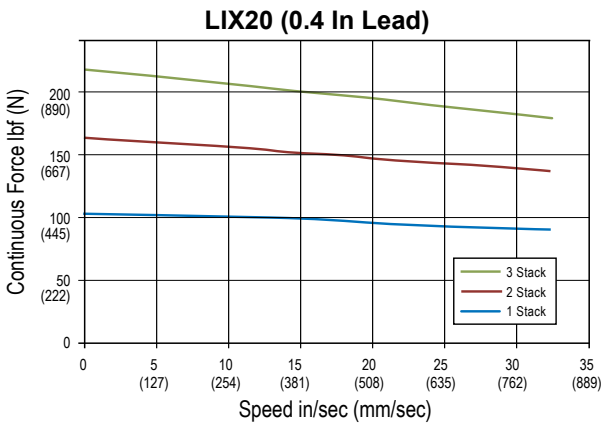
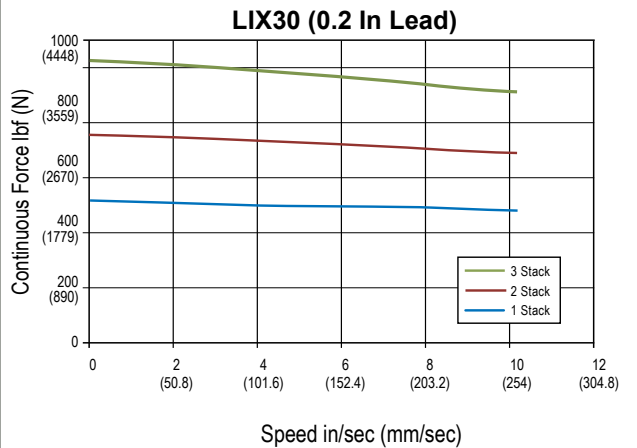
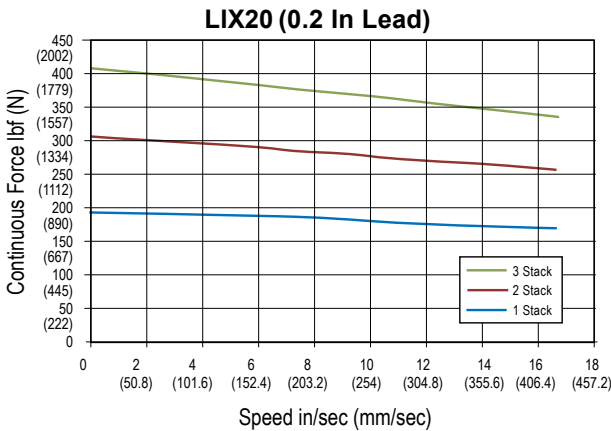
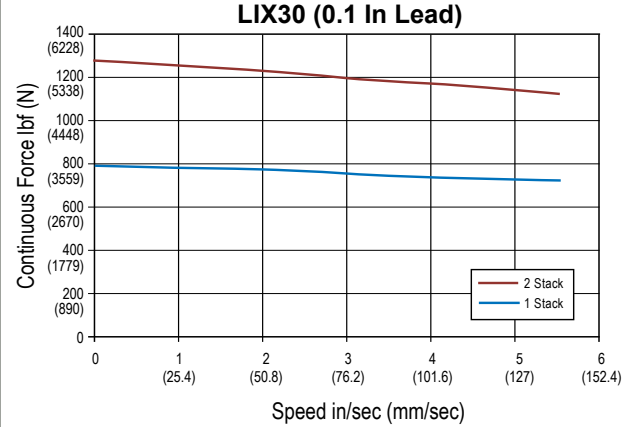
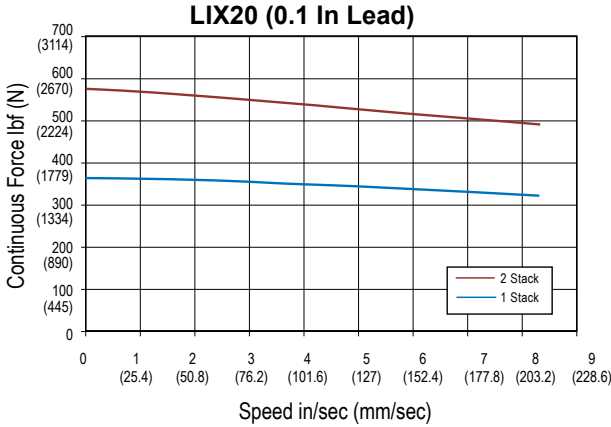
- Sufficient quality and quantity of lubrication is maintained throughout service life
- Bearing and screw temperature between 20° C and 40° C
- No mechanical hard stops (external or internal) or impact loads
- No external side loads
- Does not apply to short stroke, high frequency applications such as fatigue testing or short stroke, high force applications such as pressing.

LIX Series Integrated Motor/Actuator

Speed vs. Force Curves

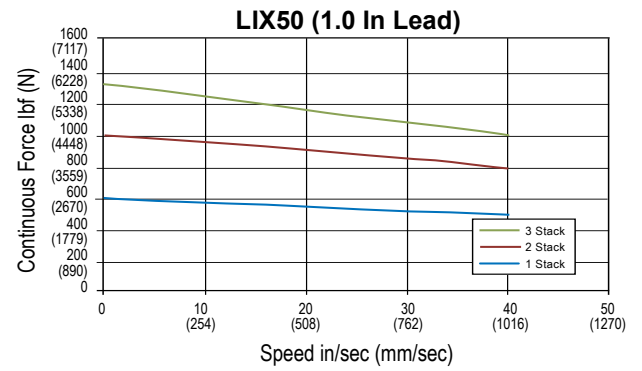
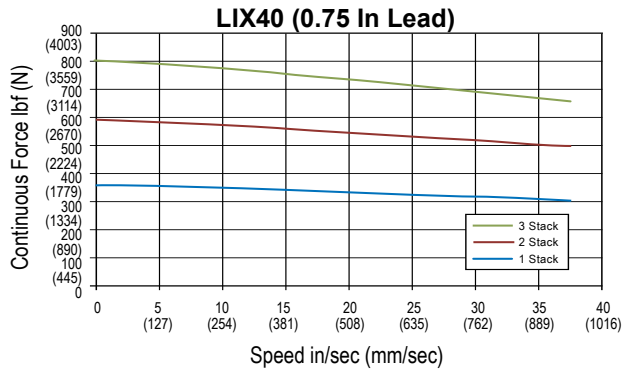
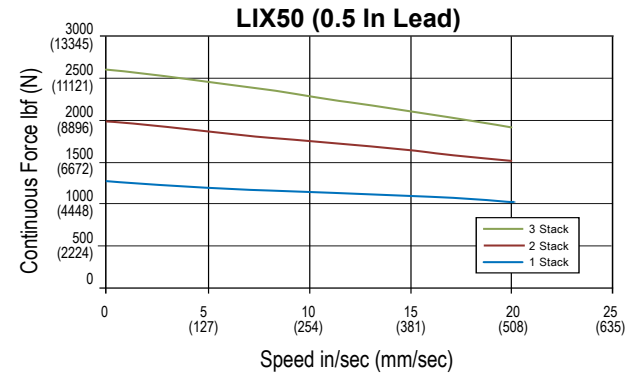
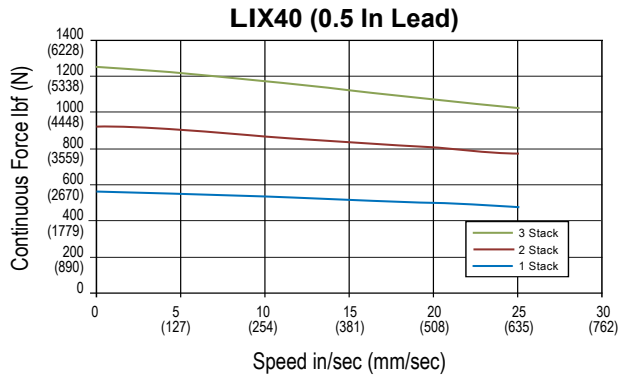
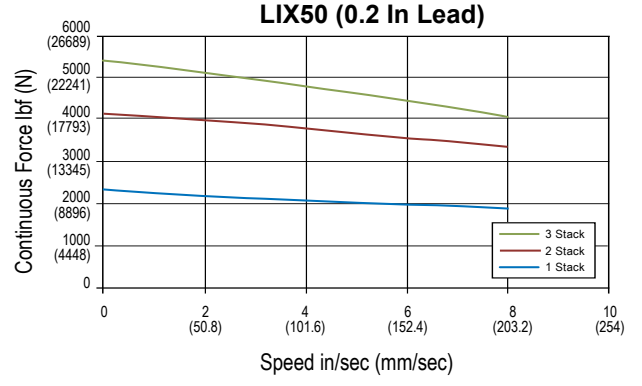
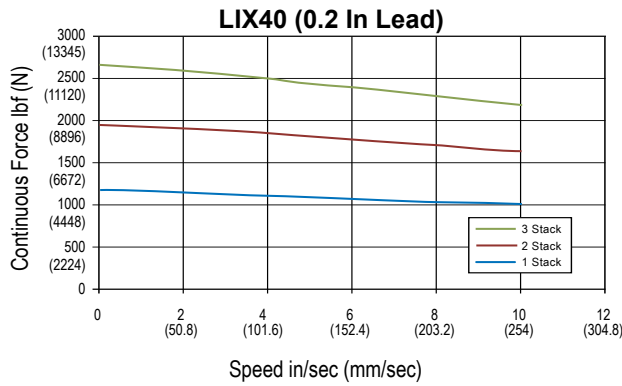
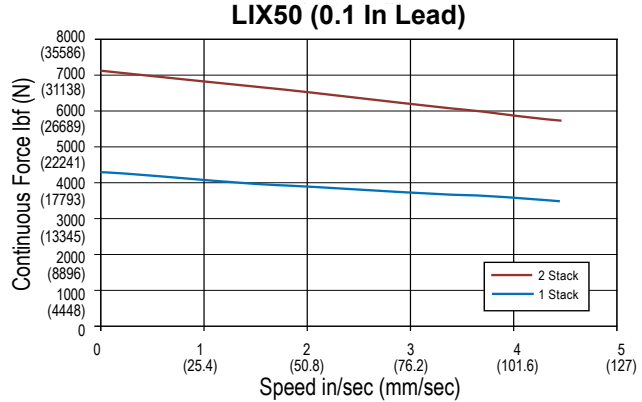
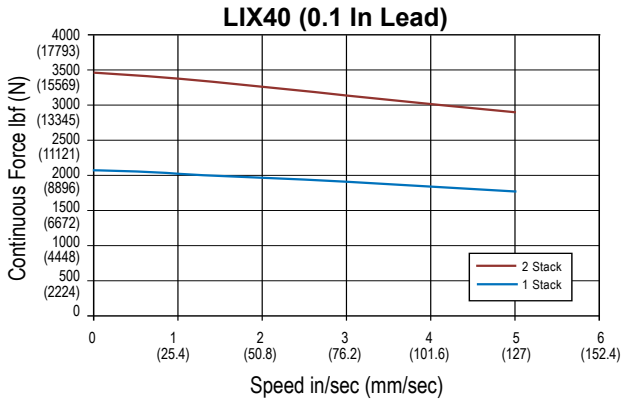
These charts represent typical linear speed versus linear force curves for the LIX actuators using common brushless motor amplifiers. The LIX Series are compatible with many different brushless motor amplifiers; any differences in the performance

ratings of these amplifiers can alter the actuator's performance. Thus, the curves below should be used for estimation only. (Further information is available by contacting your local sales representative.)

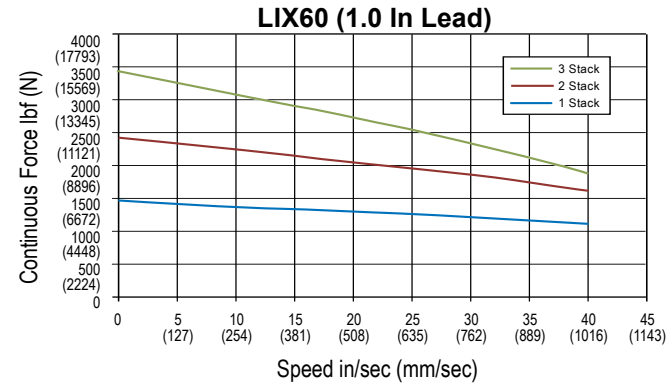
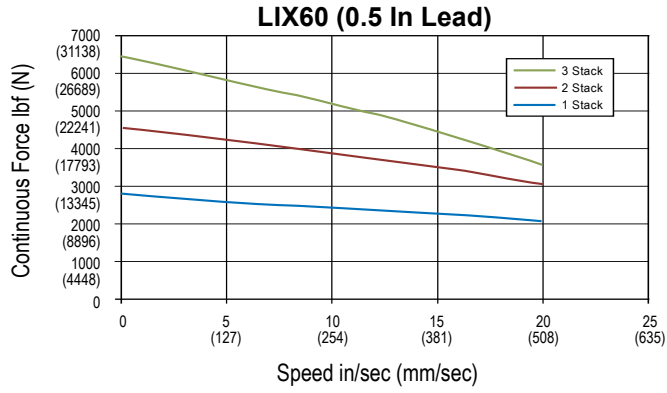
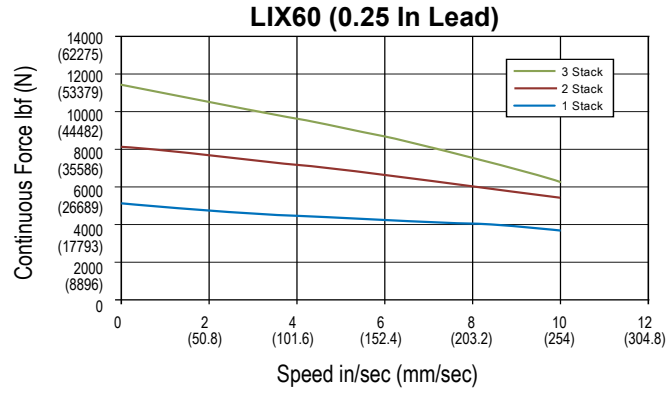


Test data derived using NEMA recommended aluminum heatsink 10" x 10" x 1/4" for LIX20 and 10" x 10" x 3/8" for LIX30. Testing ambient temperature 25°C.

LIX Series Integrated Motor/Actuator



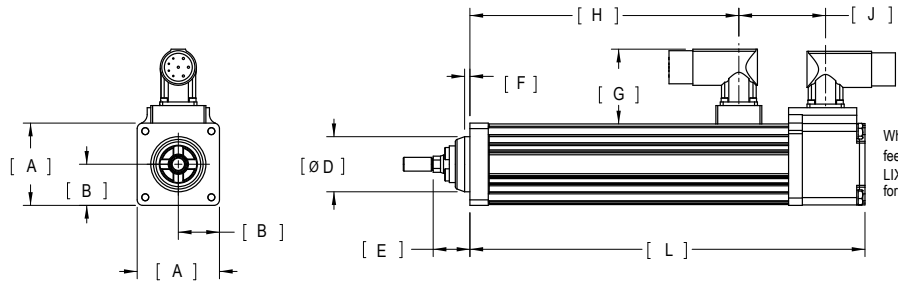
LIX Series Integrated Motor/Actuator



Test data derived using NEMA recommended aluminum heatsink 12" x 12" x 1/2" for LIX40, 12" x 12" x 1/2" for LIX50, and 16" x 16" x 1" for LIX60. Testing ambient temperature 25°C.

LIX Series Integrated Motor/Actuator

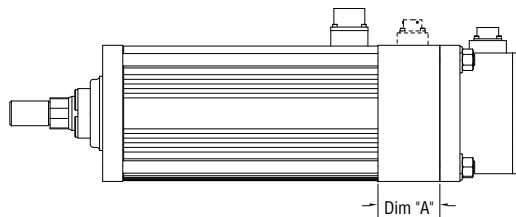
Dimensions Base Actuator



		LIX20	LIX30	LIX40	LIX50	LIX60
A	in	2.24	3.05	3.90	5.50	7.00
	mm	56.9	77.4	99.1	139.7	177.8
B	in	1.12	1.52	1.95	2.75	3.5
	mm	28.4	38.7	49.5	69.9	88.9
Ø D	in	1.500	2.000	2.500	3.000	3.375
		+0.00/-0.03	+0.00/-0.03	+0.00/-0.03	+0.00/-0.03	+0.00/-0.03
	mm	38.10	50.80	63.50	76.20	85.73
		+0.00/-0.08	+0.00/-0.08	+0.00/-0.08	+0.00/-0.08	+0.00/-0.08
E ⁵	in	1.00	1.32	1.65	2.13	1.94
	mm	25.4	33.5	41.9	54.0	49.4
F	in	0.14	0.09	0.10	0.13	0.13
	mm	3.7	2.3	2.5	3.2	3.2
G	in	2.04	2.04	2.04	2.04	2.04
	mm	51.7	51.7	51.7	51.7	51.7
H (zero stroke)	in	1.3	1.5	2.9	4.0	3.6
	mm	34	38	73	102	93
J ⁴	in	2.36	2.63	2.63	3.09	4.18
	mm	60.0	66.7	66.7	78.6	106.2
L ⁴ (zero stroke)	in	4.8	5.2	6.6	8.3	9.2
	mm	122	133	167	212	235

If ordering a brake, add the following to dimensions J and L: LIX20 + 45.2 mm, LIX30 + 40.6 mm LIX40 + 59.2 mm LIX50 + 63.5 mm, LIX60 + 90.9 mm

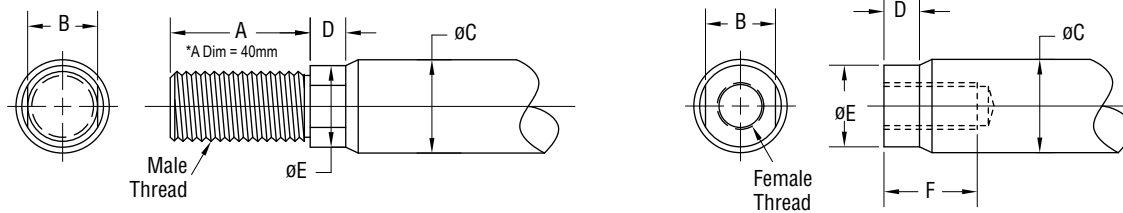
Rear Brake Extension Option



	LIX20	LIX30	LIX40	LIX50	LIX60
A in (mm)	1.78 (45.2)	1.60 (40.6)	2.33 (59.2)	2.50 (63.5)	3.58 (90.9)

*Consult i-mold for connector and wiring information if ordering brake option.

Actuator Rod End Options



	A	B	øC	D	øE	F	Male U.S.	Male Metric	Female U.S.	Female Metric
LIX20 in (mm)	0.813 (20.7)	0.375 (9.5)	0.500 (12.7)	0.200 (5.1)	0.440 (11.2)	0.750 (19.1)	3/8 – 24 UNF – 2A	M8 x 1 6g	5/16 – 24 UNF – 2B	M8 x 1 6H
LIX30 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
LIX40 in (mm)	1.500 (38.1)	0.750 (19.1)	1.000 (25.4)	0.381 (9.7)	0.875 (22.2)	1.000 (25.4)	3/4 – 16 UNF – 2A	M16 x 1.5 6g	5/8 – 18 UNF – 2B	M16 x 1.5 6H
LIX50 in (mm)	1.625 (41.3)	1.125 (28.6)	1.375 (34.9)	0.750 (19.1)	1.250 (31.8)	1.750 (44.5)	1 – 14 UNS – 2A	M27 x 2 6g	1 – 14 UNS – 2B	M24 x 2 6H
LIX60 in (mm)	2.500 (63.5)	1.250 (31.8)	1.750 (44.5)	0.550 (14.0)	1.625 (41.3)	1.750 (44.5)	1 1/4 – 12 UNF – 2A	M30 x 2 6g	7/8 – 14 UNF – 2B	M25 x 1.5 6H

LIM SERIES

INTEGRATED SERVO MOTOR AND ACTUATOR

Economical alternative to LIX

Standard capacity screw



LIM Series

Standard Capacity Roller Screw Technology Description

This design incorporates superior roller screw technology with an integral brushless servo motor for medium to high performance motion control applications. The LIM Series offers 5 times the travel life and a smaller package with higher speed and higher load capacity than ball screws and other traditional rotary-to-linear conversion mechanisms. These features make the LIM Series an excellent replacement for ball screw actuators.

Selection of the proper feedback configuration allows LIM Series actuators to be powered by nearly any brand of brushless motor amplifier on the market. This flexibility allows these actuators to be incorporated into the highest performance single and multi-axis motion control systems in use today. In applications varying from food and beverage packaging, to multi-axis turning centers, to aircraft assembly, the LIM Series shows incredible performance and durability.

Operating Conditions and Usage		
Accuracy:		
Screw Lead Error	in/ft	0.001
Screw Lead Variation	in	0.0012
Screw Lead Backlash	in	0.008 maximum
Ambient Conditions:		
Standard Ambient Temperature	°C	0 to 65
Extended Ambient Temperature*	°C	-30 to 65
Storage Temperature	°C	-40 to 85
IP Rating		IP54S
Vibration**		3.5 grms; 5 to 500 hz

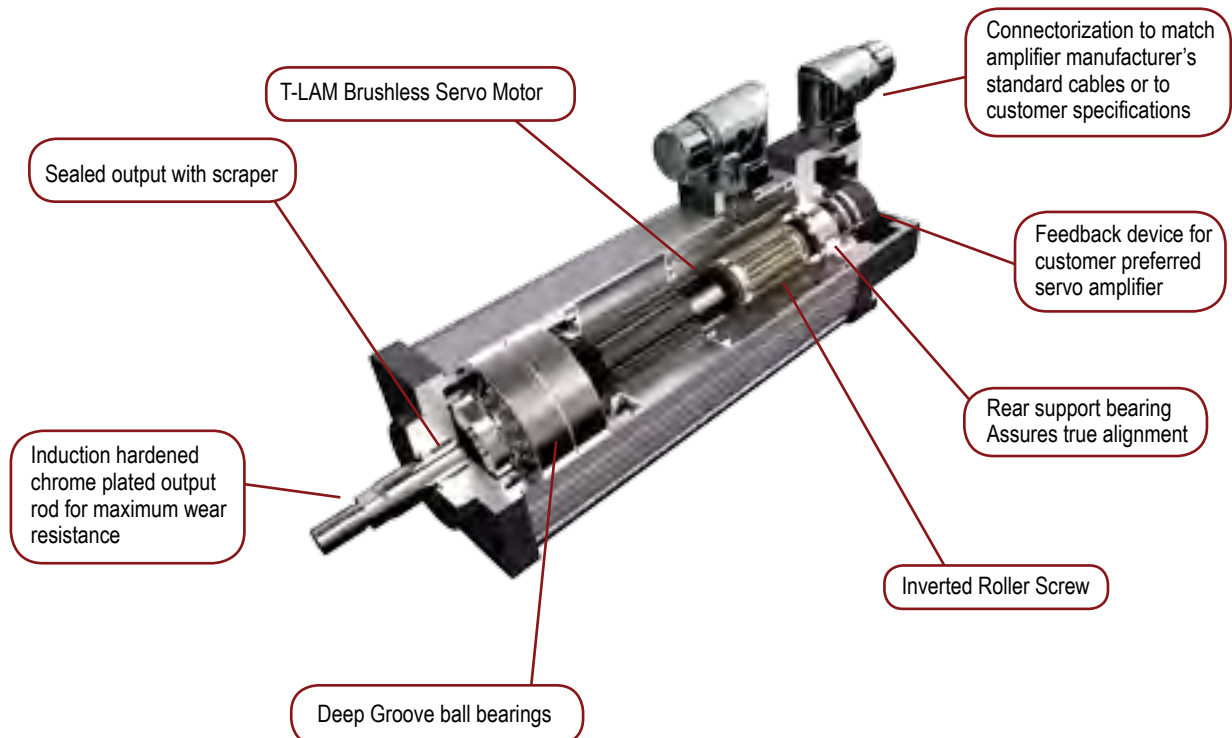
Technical Characteristics	
Frame Sizes in (mm)	2.25 (60), 3.3 (80), 3.9 (100)
Screw Leads in (mm)	0.1 (2.54), 0.2 (5.08), 0.4 (10.16), 0.5 (12.7), 0.75 (19.05)
Standard Stroke Lengths in (mm)	3 (76), 4 (102), 6 (152), 8 (203), 10 (254), 12 (305), 14 (356), 18 (457)
Force Range	103 to 3,457 lbf (458 to 15.3 kN)
Maximum Speed	Up to 37.5 in/sec (952 mm/sec) linear speeds

* Consult i-mold for extended temperature operations

** Resolver feedback

Ratings at 25°C, operation over 25°C requires de-rating.

Product Features



LIM Series Integrated Motor/Actuator

Mechanical Specifications

LIM20

Model No. (Motor Stacks)	1 Stack			2 Stack			
Screw Lead Designator	01	02	04	01	02	04	
Screw Lead	in	0.1	0.2	0.4	0.1	0.2	0.4
	mm	2.54	5.08	10.16	2.54	5.08	10.16
Continuous Force (Motor Limited)	lbf	367	195	103	578	307	163
	N	1632	867	459	2571	1366	723
Max Velocity	in/sec	8.3	16.8	33.3	8.3	16.8	33.3
	mm/sec	211.7	423.3	846.7	211.7	423.3	846.7
Friction Torque (standard screw)	in-lbf	1.0			1.1		
	N-m	0.12			0.12		
Friction Torque (preloaded screw)	in-lbf	1.25			1.25		
	N-m	0.14			0.14		
Back Drive Force ¹	lbf	110	60	30	110	60	30
	N	490	270	135	490	270	135
Min Stroke	in	3			3		
	mm	76			76		
Max Stroke	in	12			12		
	mm	305			305		
C _a (Dynamic Load Rating)	lbf	1568	1219	738	1568	1219	738
	N	6970	5422	3283	6970	5422	3283
Inertia (zero stroke)	lb-in-s ²	0.0007758			0.0008600		
	Kg-m ²	0.00008766			0.00009717		
Inertia Adder (per inch of stroke)	lb-in-s ² /in	0.00004667			0.00004667		
	Kg-m ² /mm	0.000005273			0.000005273		
Weight (zero stroke)	lb	4.5			5.0		
	Kg	2.04			2.27		
Weight Adder (per inch of stroke)	lb	0.5			0.5		
	Kg	0.23			0.23		

LIM30

Model No. (Motor Stacks)	1 Stack			2 Stack			
Screw Lead Designator	01	02	05	01	02	05	
Screw Lead	in	0.1	0.2	0.5	0.1	0.2	0.5
	mm	2.54	5.08	12.7	2.54	5.08	12.7
Continuous Force (Motor Limited)	lbf	792	449	190	1277	724	306
	N	3521	1995	845	5680	3219	1363
Max Velocity	in/sec	5.0	10.0	25.0	5.0	10.0	25.0
	mm/sec	127.0	254.0	635.0	127.0	254.0	635.0
Friction Torque (standard screw)	in-lbf	1.5			1.7		
	N-m	0.17			0.19		
Friction Torque (preloaded screw)	in-lbf	1.75			1.75		
	N-m	0.20			0.20		
Back Drive Force ¹	lbf	180	80	40	180	80	40
	N	800	360	180	800	360	180
Min Stroke	in	3			3		
	mm	75			75		
Max Stroke	in	18			18		
	mm	457			457		
C _a (Dynamic Load Rating)	lbf	3310	3570	3016	3310	3570	3016
	N	14724	15880	13416	14724	15880	13416
Inertia (zero stroke)	lb-in-s ²	0.002655			0.002829		
	Kg-m ²	0.0003000			0.0003196		
Inertia Adder (per inch of stroke)	lb-in-s ² /in	0.0001424			0.0001424		
	Kg-m ² /mm	0.00001609			0.00001609		
Weight (zero stroke)	lb	6.5			7.65		
	Kg	2.95			3.47		
Weight Adder (per inch of stroke)	lb	1.1			1.1		
	Kg	0.50			0.50		

¹ Back drive force is nominal value only. Operating conditions can cause wide variations in back drive force. i-mold cannot assure that an actuator will or will not back drive.

LIM Series Integrated Motor/Actuator

LIM40

Model No. (Motor Stacks)		1 Stack				2 Stack			
Screw Lead Designator		01	02	05	08	01	02	05	08
Screw Lead	in	0.1	0.2	0.5	0.75	0.1	0.2	0.5	0.75
	mm	2.54	5.08	12.7	19.05	2.54	5.08	12.7	19.05
Continuous Force (Motor Limited)	lbf	2089	1194	537	358	3457	1975	889	593
	N	9293	5310	2390	1593	15377	8787	3954	2636
Max Velocity	in/sec	5.0	10.0	25.0	37.5	5.0	10.0	25.0	37.5
	mm/sec	127.0	254.0	635.0	953.0	127.0	254.0	635.0	953.0
Friction Torque (standard screw)	in-lbf	2.7				3.0			
	N-m	0.31				0.34			
Friction Torque (preloaded screw)	in-lbf	3.0				3.0			
	N-m	0.34				0.34			
Back Drive Force ¹	lbf	380	150	60	50	380	150	60	50
	N	1700	670	270	220	1700	670	270	220
Min Stroke	in	4				6			
	mm	102				102			
Max Stroke	in	18		12		18		12	
	mm	457				457			
C _a (Dynamic Load Rating)	lbf	4736	4890	4218	3328	4736	4890	4218	3328
	N	21067	21751	18763	14804	21067	21751	18763	14804
Inertia (zero stroke)	lb-in-s ²	0.01132				0.01232			
	Kg-m ²	0.0012790				0.001392			
Inertia Adder (per inch of stroke)	lb-in-s ² /in					0.0005640			
	Kg-m ² /mm					0.00006372			
Weight (zero stroke)	lb	8.0				11.3			
	Kg	3.63				5.13			
Weight Adder (per inch of stroke)	lb					2.0			
	Kg					0.91			

¹ Back drive force is nominal value only. Operating conditions can cause wide variations in back drive force. i-mold cannot assure that an actuator will or will not back drive.

DEFINITIONS:

Continuous Force: The linear force produced by the actuator at continuous motor torque.

Max Velocity: The linear velocity that the actuator will achieve at rated motor rpm.

Friction Torque (standard screw): Amount of torque required to move the actuator when not coupled to a load.

Friction Torque (preloaded screw): Amount of torque required to move the actuator when not coupled to a load.

Back Drive Force: Amount of axial force applied to the rod end of the actuator that will produce motion with no power applied to the actuator.

Min Stroke: Shortest available stroke length.

Max Stroke: Longest available stroke length.

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

Inertia (zero stroke): Base inertia of an actuator with zero available stroke length.

Inertia Adder (per unit of stroke): Inertia per inch of stroke that must be added to the base (zero stroke) inertia to determine the total actuator inertia.

Weight (zero stroke): Base weight of an actuator with zero available stroke length.

Weight Adder (per unit of stroke): Weight adder per inch of stroke that must be added to the base (zero stroke) weight to determine the total actuator weight.

LIM Series Integrated Motor/Actuator

Electrical Specifications

LIM20

Motor Stator		118	138	158	168	218	238	258	268
RMS SINUSOIDAL COMMUTATION									
Continuous Motor Torque	lbf-in	7.6	7.3	7.0	7.0	11.9	11.5	11.0	11.3
	Nm	0.86	0.83	0.79	0.79	1.34	1.30	1.25	1.28
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	2.5	5.2	7.5	9.5	2.5	5.2	8.6	10.1
	Nm/A	0.28	0.59	0.85	1.07	0.28	0.59	0.97	1.15
Continuous Current Rating	A	3.4	1.6	1.0	0.8	5.4	2.5	1.4	1.2
Peak Current Rating	A	6.9	3.1	2.1	1.6	10.8	4.9	2.9	2.5
O-PK SINUSOIDAL COMMUTATION									
Continuous Motor Torque	lbf-in	7.6	7.3	7.0	7.0	11.9	11.5	11.0	11.3
	Nm	0.86	0.83	0.79	0.79	1.34	1.30	1.25	1.28
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	1.7	3.7	5.3	6.7	1.7	3.7	6.1	7.2
	Nm/A	0.20	0.42	0.60	0.76	0.20	0.42	0.69	0.81
Continuous Current Rating	A	4.9	2.2	1.5	1.2	7.6	3.5	2.0	1.8
Peak Current Rating	A	9.7	4.5	2.9	2.3	15.2	7.0	4.1	3.5
MOTOR STATOR DATA									
Voltage Constant (Ke) (+/- 10% @ 25°C)	Vrms/Krpm	16.9	35.5	51.5	64.8	16.9	35.5	58.6	69.3
	Vpk/Krpm	23.9	50.2	72.8	91.7	23.9	50.2	82.9	98.0
Pole Configuration		8	8	8	8	8	8	8	8
Resistance (L-L)(+/- 5% @ 25°C)	Ohms	2.6	12.5	28.8	45.8	1.1	5.3	15.5	20.7
Inductance (L-L)(+/- 15%)	mH	4.6	21.4	47.9	68.3	2.5	10.2	28.3	39.5
Brake Inertia	lbf-in-sec ²	0.00012							
	Kg-cm ²	0.135							
Brake Current @ 24 VDC	A	0.33							
Brake Holding Torque	lbf-in	19							
	Nm	2.2							
Brake Engage/Disengage Time	ms	14/28							
Mechanical Time Constant (tm), ms	min	4.7	5.1	5.5	5.6	2.0	2.1	2.3	2.2
	max	6.6	7.2	7.9	7.9	2.8	3.0	3.3	3.1
Electrical Time Constant (te)	ms	1.8	1.7	1.7	1.5	2.2	1.9	1.8	1.9
Bus Voltage	Vrms	115	230	400	460	115	230	400	460
Speed @ Bus Voltage	rpm	5000							
Insulation Class		180 (H)							

Test data derived using NEMA recommended aluminum heatsink 10" x 10" x 1/4" at 25°C

Specifications subject to change without notice.

LIM Series Integrated Motor/Actuator

LIM30

Motor Stator		118	138	158	168	218	238	258	268
RMS SINUSOIDAL COMMUTATION									
Continuous Motor Torque	lbf-in	16.9	16.8	16.3	16.0	26.9	27.1	26.7	27.0
	Nm	1.91	1.90	1.84	1.81	3.04	3.06	3.01	3.05
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	4.4	8.7	15.5	17.5	4.4	8.7	15.5	17.5
	Nm/A	0.49	0.99	1.75	1.97	0.49	0.99	1.75	1.97
Continuous Current Rating	A	4.3	2.2	1.2	1.0	6.9	3.5	1.9	1.7
Peak Current Rating	A	8.6	4.3	2.4	2.0	13.8	6.9	3.8	3.4
O-PK SINUSOIDAL COMMUTATION									
Continuous Motor Torque	lbf-in	16.9	16.8	16.3	16.0	26.9	27.1	26.7	27.0
	Nm	1.91	1.90	1.84	1.81	3.04	3.06	3.01	3.05
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	3.1	6.2	11.0	12.4	3.1	6.2	11.0	12.4
	Nm/A	0.35	0.70	1.24	1.40	0.35	0.70	1.24	1.40
Continuous Current Rating	A	6.1	3.0	1.7	1.4	9.7	4.9	2.7	2.4
Peak Current Rating	A	12.2	6.1	3.3	2.9	19.5	9.8	5.4	4.9
MOTOR STATOR DATA									
Voltage Constant (Ke) (+/- 10% @ 25°C)	Vrms/Krpm	29.8	59.7	105.8	119.3	29.8	59.7	105.8	119.3
	Vpk/Krpm	42.2	84.4	149.7	168.7	42.2	84.4	149.7	168.7
Pole Configuration		8	8	8	8	8	8	8	8
Resistance (L-L)(+/- 5% @ 25°C)	Ohms	2.7	10.8	36.3	47.9	1.1	4.4	14.1	17.6
Inductance (L-L)(+/- 15%)	mH	7.7	30.7	96.8	123.0	3.7	14.7	46.2	58.7
Brake Inertia	lbf-in-sec ²	0.00033							
	Kg-cm ²	0.38							
Brake Current @ 24 VDC	A	0.5							
Brake Holding Torque	lbf-in	70							
	Nm	8							
Brake Engage/Disengage Time	ms	19/29							
Mechanical Time Constant (tm), ms	min	4.9	4.9	5.2	5.4	2.0	2.0	2.0	2.0
	max	9.4	9.5	10.1	10.5	3.9	3.8	3.9	3.8
Electrical Time Constant (te)	ms	2.9	2.8	2.7	2.6	3.3	3.4	3.3	3.3
Bus Voltage	Vrms	115	230	400	460	115	230	400	460
Speed @ Bus Voltage	rpm	3000							
Insulation Class		180 (H)							

Test data derived using NEMA recommended aluminum heatsink 10" x 10" x 3/8" at 25°C

Specifications subject to change without notice.

LIM Series Integrated Motor/Actuator

LIM40

Motor Stator		118	138	158	168	218	238	258	268
RMS SINUSOIDAL COMMUTATION									
Continuous Motor Torque	lbf-in	47.5	47.5	45.9	45.4	75.1	78.6	78.7	79.5
	Nm	5.37	5.36	5.19	5.13	8.49	8.89	8.89	8.99
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	4.1	8.2	14.5	16.8	4.1	8.2	14.5	16.8
	Nm/A	0.46	0.93	1.64	1.90	0.46	0.93	1.64	1.90
Continuous Current Rating	A	12.9	6.5	3.5	3.0	20.5	10.7	6.0	5.3
Peak Current Rating	A	25.9	12.9	7.1	6.0	40.9	21.4	12.1	10.6
O-PK SINUSOIDAL COMMUTATION									
Continuous Motor Torque	lbf-in	47.5	47.5	45.9	45.4	75.1	78.6	78.7	79.5
	Nm	5.37	5.36	5.19	5.13	8.49	8.89	8.89	8.99
Torque Constant (Kt) (+/- 10% @ 25°C)	lbf-in/A	2.9	5.8	10.3	11.9	2.9	5.8	10.3	11.9
	Nm/A	0.33	0.66	1.16	1.34	0.33	0.66	1.16	1.34
Continuous Current Rating	A	18.3	9.1	5.0	4.3	28.9	15.1	8.5	7.5
Peak Current Rating	A	36.6	18.3	10.0	8.6	57.9	30.3	17.1	15.0
MOTOR STATOR DATA									
Voltage Constant (Ke) (+/- 10% @ 25°C)	Vrms/Krpm	28.0	56.0	99.3	114.6	28.0	56.0	99.3	114.6
	Vpk/Krpm	39.6	79.2	140.5	162.1	39.6	79.2	140.5	162.1
Pole Configuration		8	8	8	8	8	8	8	8
Resistance (L-L)(+/- 5% @ 25°C)	Ohms	0.42	1.7	5.7	7.8	0.2	0.72	2.26	3.0
Inductance (L-L)(+/- 15%)	mH	3.0	11.9	37.5	49.9	1.2	5.4	18.2	23.1
Brake Inertia	lb-in-sec ²	0.00096							
	Kg-cm ²	1.08							
Brake Current @ 24 VDC	A	0.67							
Brake Holding Torque	bf-in	97							
	Nm	11							
Brake Engage/Disengage Time	ms	20/29							
Mechanical Time Constant (tm), ms	min	4.5	4.5	4.8	4.9	2.1	1.9	1.9	1.9
	max	6.0	6.0	6.4	6.6	2.8	2.6	2.6	2.5
Electrical Time Constant (te)	ms	7.0	7.0	6.6	6.4	5.9	7.5	8.0	7.8
Bus Voltage	Vrms	115	230	400	460	115	230	400	460
Speed @ Bus Voltage	rpm	3000							
Insulation Class		180 (H)							

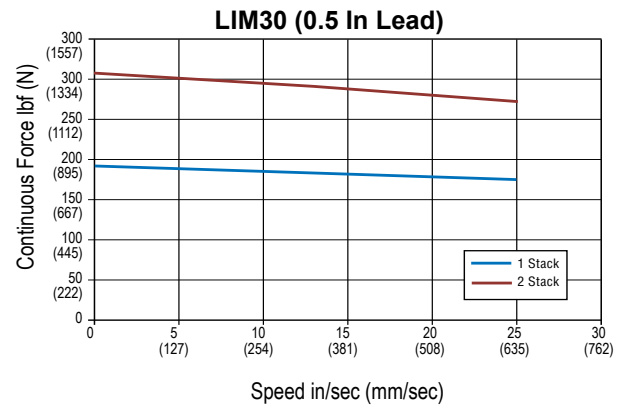
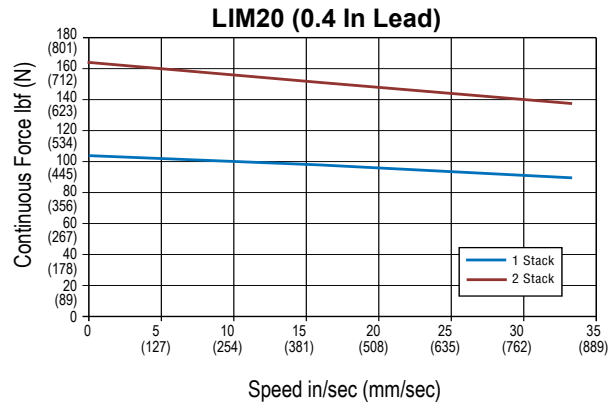
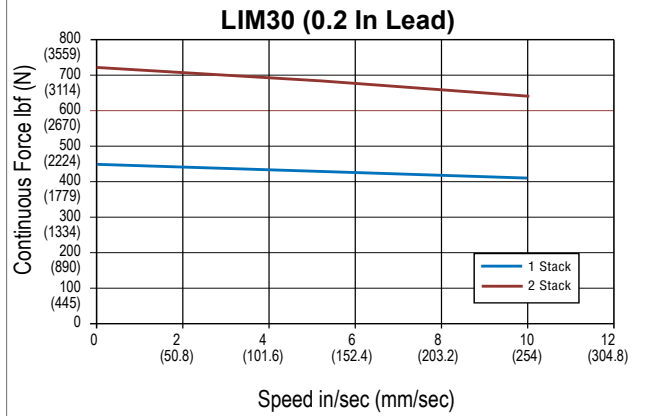
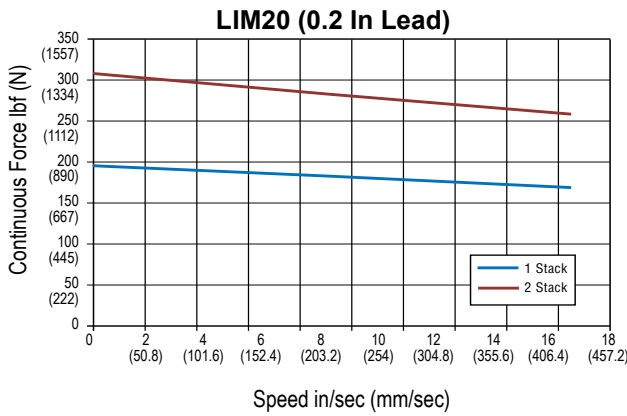
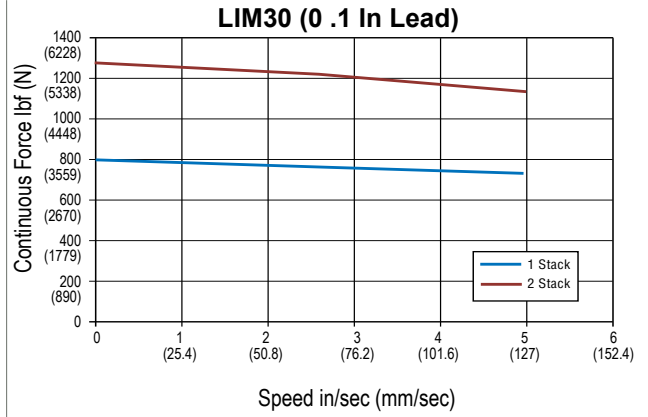
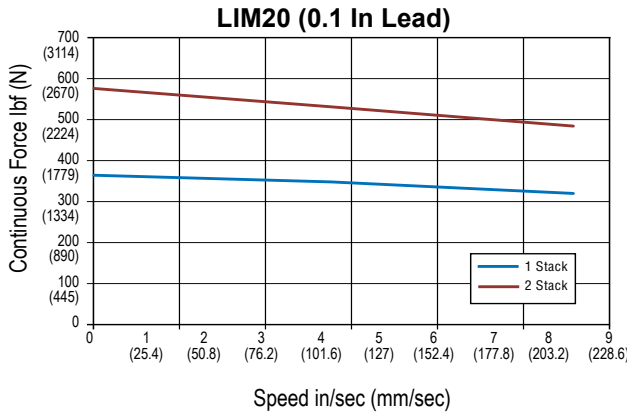
Test data derived using NEMA recommended aluminum heatsink 12" x 12" x 1/2" at 25°C

Specifications subject to change without notice.

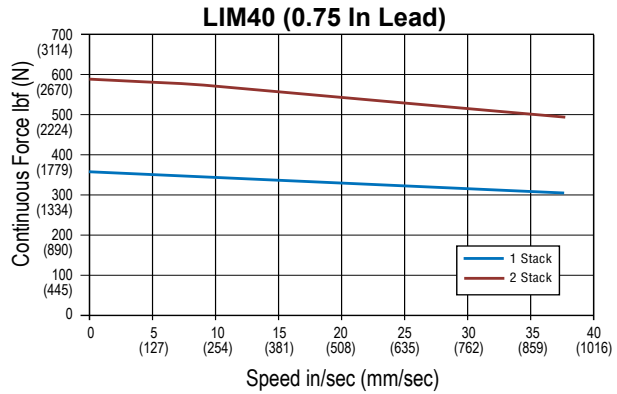
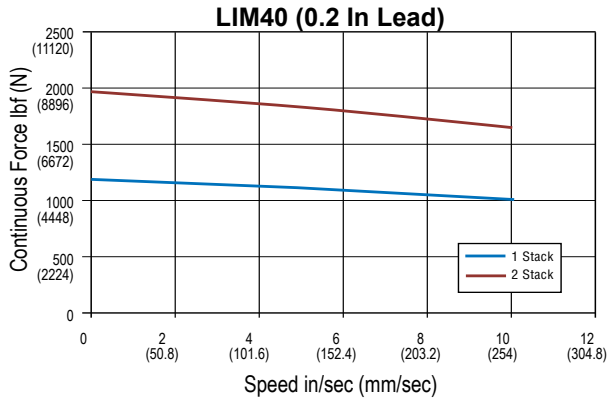
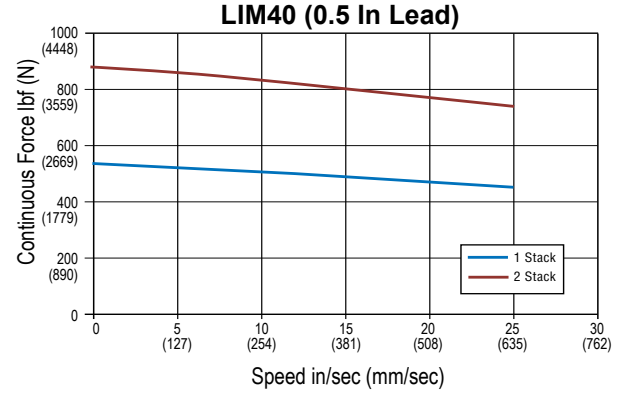
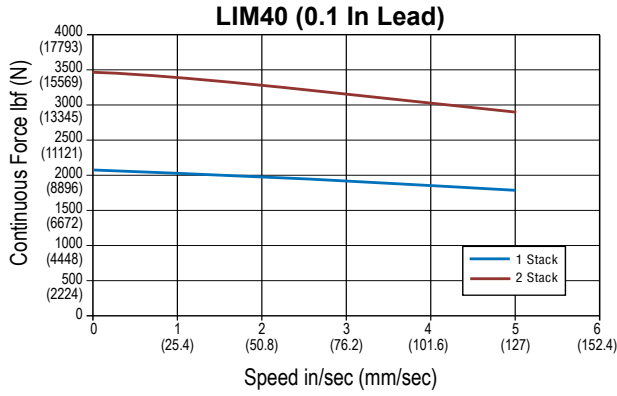
Performance Curves

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

actuator thrust. These values are at constant velocity and do not account for motor torque required for acceleration.

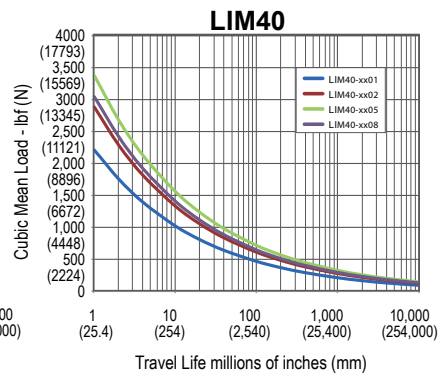
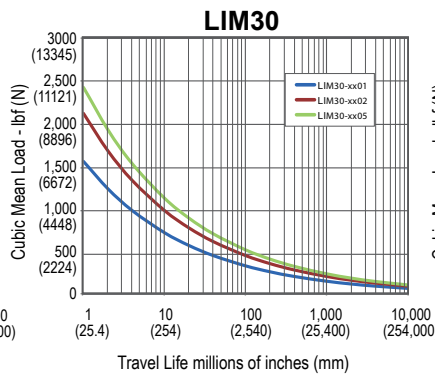
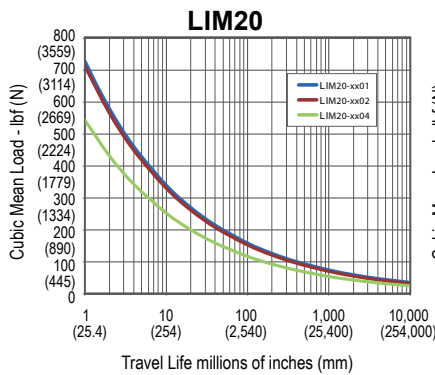


LIM Series Integrated Motor/Actuator



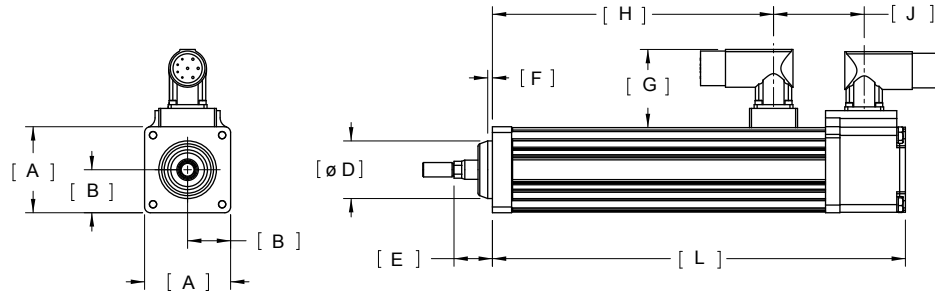
Test data derived using NEMA recommended aluminum heatsink 12" x 12" x 1/2" on LIM40

Life Curves Estimated L₁₀ Travel Life



If your application requires high force over a stroke length shorter than the length of the nut, please contact i-mold for derated life calculations.

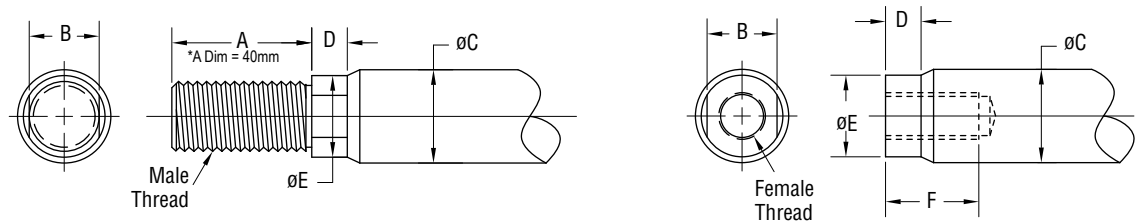
Dimensions Base Actuator



		LIM20	LIM30	LIM40
A	in	2.24	3.05	3.90
	mm	56.9	77.4	99.1
B	in	1.12	1.52	1.95
	mm	28.4	38.7	49.5
Ø D	in	1.500	2.000	2.500
		+0.000/-0.003	+0.000/-0.003	+0.000/-0.003
	mm	38.10	50.80	63.50
		0.00/0.08	0.00/0.08	0.00/0.08
E ⁵	in	1.00	1.32	1.65
	mm	25.4	33.5	41.9
F	in	0.12	0.31	0.10
	mm	3.1	8.0	2.5
G	in	2.04	2.04	2.04
	mm	51.7	51.7	51.7
H (zero stroke)	in	1.3	1.5	2.9
	mm	34	38	73
J ⁴	in	2.36	2.63	2.63
	mm	60.0	66.7	66.7
L ⁴ (zero stroke)	in	4.8	5.2	6.6
	mm	122	133	167

If ordering a brake, add the following to dimensions J and L: LIM20 + 45.2 mm, LIM30 + 40.6 mm, LIM40 + 59.2 mm

Actuator Rod End Options



	A	B	ØC	D	ØE	F	Male U.S.	Male Metric	Female U.S.	Female Metric
LIM20 in (mm)	0.813 (20.7)	0.375 (9.5)	0.500 (12.7)	0.200 (5.1)	0.440 (11.2)	0.750 (19.1)	3/8 - 24 UNF - 2A	M8 x 1.6g	5/16 - 24 UNF - 2B	M8 x 1.6h
LIM30 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
LIM40 in (mm)	1.500 (38.1)	0.750 (19.1)	1.000 (25.4)	0.381 (9.7)	0.875 (22.2)	1.000 (25.4)	3/4 - 16 UNF - 2A	M16 x 1.5 6g	5/8 - 18 UNF - 2B	M16 x 1.5 6h