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GSX SERIES

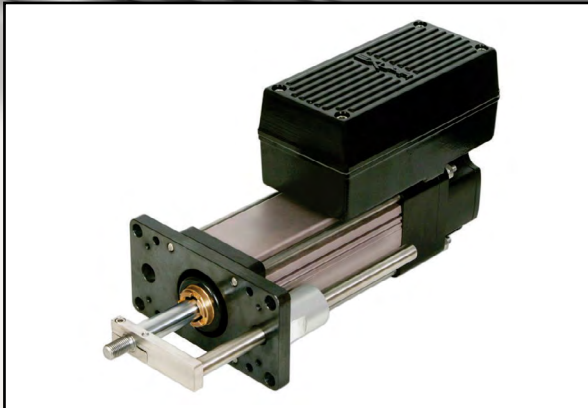
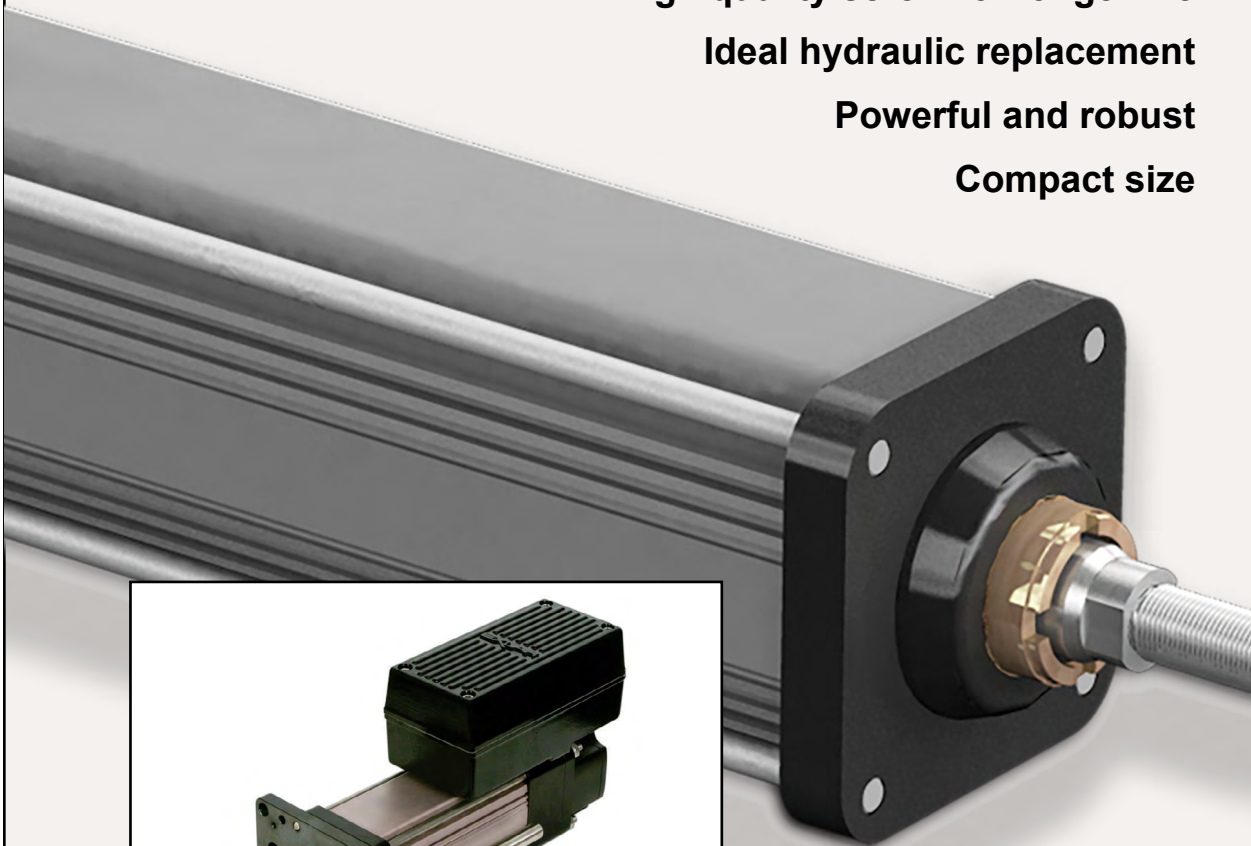
INTEGRATED SERVO MOTOR AND ACTUATOR

High quality screw for longer life

Ideal hydraulic replacement

Powerful and robust

Compact size



GSX Series

High Capacity Integrated Motor/Actuator

Description

For applications that require long life and continuous duty, even in harsh environments, the GSX 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

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

Feature	Standard	Optional
External anti-rotate mechanism	No	Yes
Internal Anti-rotate Mechanism	No	Yes
Electric brake	No	Yes
External Limit Switches	No	Yes
Connectors	Right Angle, Rotatable	
Mounting Style	Extended Tie Rods, Side Tapped Mounting Holes, Trunnion, Rear Clevis, Front or Rear Flange	
Rod End	Male or Female: U.S. Standard or Metric	Specials available to meet OEM requirements
Lubrication	Greased, Oil Connection Ports are Built-in for Customer Supplied Recirculated Oil Lubrication	
Primary Feedback	Standard Encoders or Resolvers to Meet Most Amplifier Requirements	

Technical Characteristics	
Frame Sizes in (mm)	2 (50.8), 3 (76.2), 4 (101.6), 5.5 (139.7), 7 (177.8)
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 (76), 4 (102), 6 (152), 8 (203), 10 (254), 12 (305), 14 (357), 18 (457)
Force Range	103 to 11,528 lbf (458 to 51 kN)
Maximum Speed	up to 37.5 in/sec (952 mm/s)

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

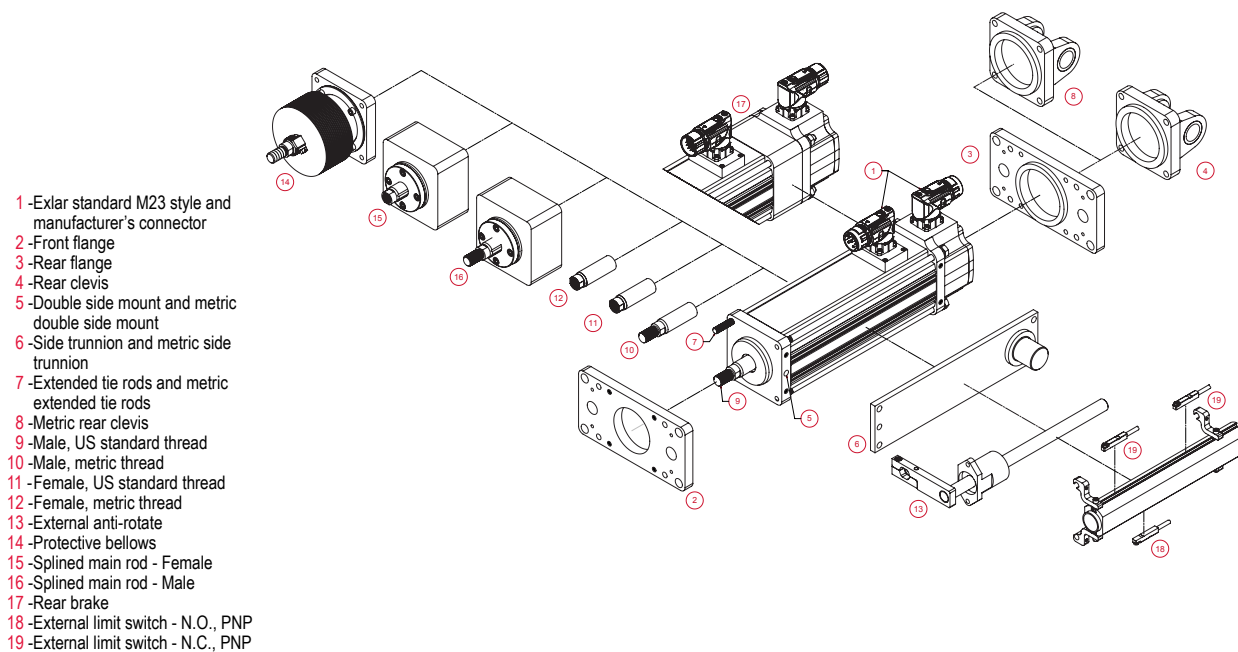
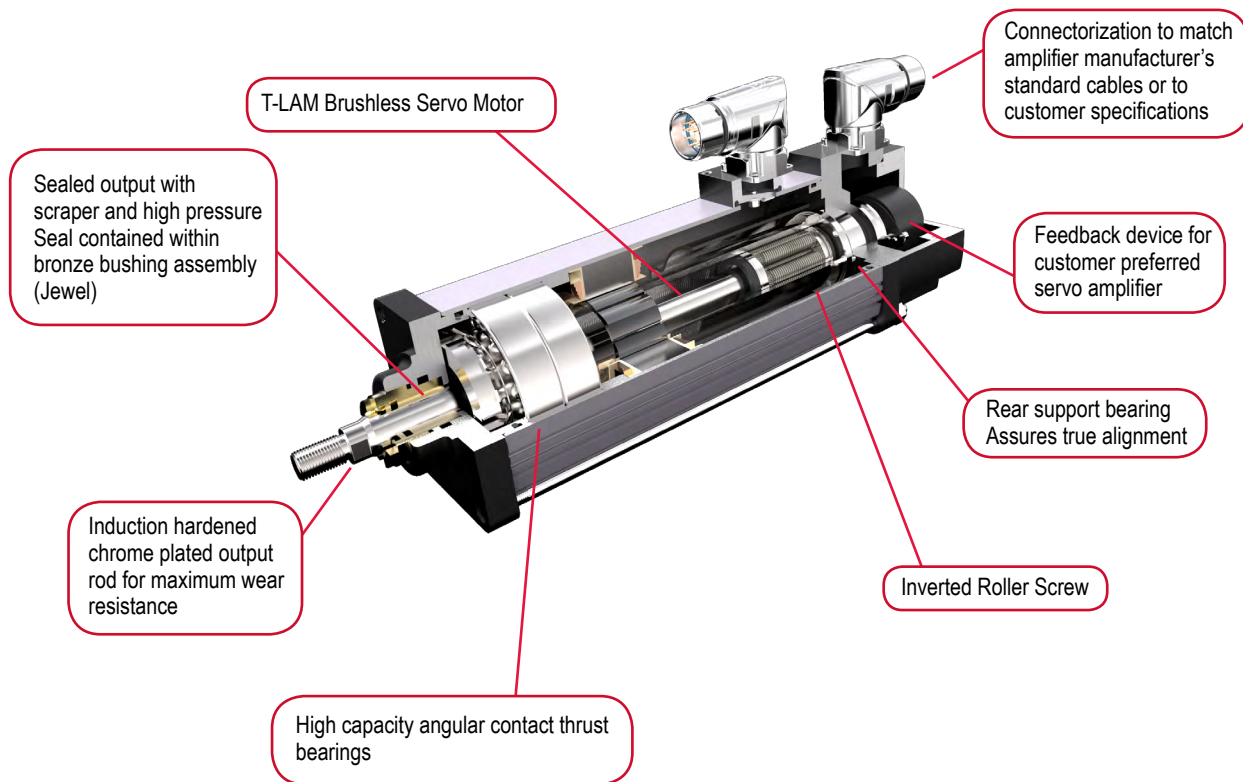
* Consult Exlar for extended temperature operations

** Resolver feedback

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

GSX Series Integrated Motor/Actuator

Product Features



Mechanical Specifications

GSX30

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			6	
	mm	76			76			152	
Max Stroke	in	18			18			18	
	mm	457			457			457	
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			0.0001424			0.0001424	
	Kg-m ² /in	0.00001609			0.00001609			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			1.1			1.1	
	Kg	0.50			0.50			0.50	

GSX40

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	102				152				203		
Max Stroke	in	18		12		18		12		18		12
	mm	457		305		457		305		457		305
C _a (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				0.0005640				0.0005640		
	Kg-m ² /in	0.00006372				0.00006372				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				2.0				2.0		
	Kg	0.91				0.91				0.91		

GSX Series Integrated Motor/Actuator

GSX50

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	14	10	
	mm	254	356	254	254	356	254	356	254	356	254	
C _a (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						

GSX60

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	152			254			254		
Max Stroke	in	10			10			10		
	mm	254			254			254		
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					

Weight Adders of GSX Accessories

Weight Adders of GSX Accessories	GSX20		GSX30		GSX40		GSX50		GSX60	
	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg
Front Flange Mount	0.7	0.3	1.7	0.8	4.0	1.8	10.8	4.9	15.2	6.9
Rear Flange Mount	1.0	0.5	1.8	0.8	5.0	2.3	12.8	5.8	30.4	13.7
Side Mount	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Extended Tie Rod	0.0	0.0	0.1	0.0	0.2	0.1	0.3	0.2	0.5	0.2
Side Trunnion	0.8	0.3	0.8	0.3	1.8	0.8	4.6	2.1	9.3	4.2
3 inch Stroke	2.2	1.0	2.8	1.3	NA	NA	NA	NA	NA	NA
4 inch Stroke	NA	NA	NA	NA	5.1	2.3	NA	NA	NA	NA
6 inch Stroke	3.1	1.4	3.6	1.6	5.9	2.7	14.3	6.5	26.6	12.1
8 inch Stroke	NA	NA	NA	NA	6.7	3.0	NA	NA	NA	NA
10 inch Stroke	3.9	1.8	5.0	2.3	7.5	3.4	17.7	8.0	32.3	14.7
12 inch Stroke	4.4	2.0	5.7	2.6	8.2	3.8	NA	NA	NA	NA
14 inch Stroke	NA	NA	6.9	3.1	NA	NA	21.1	9.6	NA	NA
18 inch Stroke	NA	NA	7.6	3.5	10.6	4.8	NA	NA	NA	NA
Rear Clevis Mount w/ Pin	0.4	0.2	1.1	0.5	1.9	0.8	5.1	2.3	13.6	6.2
Anti-Rotation (incl. flange)	1.1	0.5	2.6	1.2	5.3	2.4	6.6	3.0	21.0	10.0
External Limit Switch (incl. AR)	1.2	0.5	2.8	1.2	5.6	2.5	6.9	3.1	21.4	9.7
3 inch Stroke	1.4	0.6	3.0	1.4	NA	NA	NA	NA	NA	NA
6 inch Stroke	1.5	0.7	3.2	1.5	6.0	2.7	7.8	3.5	22.2	10.1
8 inch Stroke	NA	NA	NA	NA	6.1	2.8	NA	NA	NA	NA
10 inch Stroke	1.6	0.7	3.5	1.6	6.3	2.8	8.1	3.7	22.4	10.2
12 inch Stroke	1.7	0.8	3.6	1.6	6.4	2.9	NA	NA	NA	NA
14 inch Stroke	NA	NA	3.7	1.7	NA	NA	8.5	3.9	NA	NA
18 inch Stroke	NA	NA	3.9	1.8	6.7	3.1	NA	NA	NA	NA
Splined Main Rod	0.3	0.1	1.0	0.5	2.2	1.0	4.8	2.2	14.8	6.7
Protective Bellows	0.2	0.1	0.3	0.1	0.3	0.2	0.4	0.2	0.9	0.4
Rod Clevis	0.2	0.1	0.5	0.2	1.4	0.6	3.5	1.6	8.2	3.7
Spherical Rod Eye	0.2	0.1	0.2	0.1	0.7	0.3	1.6	0.7	NA	NA
Rod Eye	0.2	0.1	0.3	0.2	1.2	0.5				

GSX Series Integrated Motor/Actuator

Electrical Specifications

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.

GSX Series Integrated Motor/Actuator

GSX40

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.

GSX Series Integrated Motor/Actuator

GSX50

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.

GSX Series Integrated Motor/Actuator

GSX60

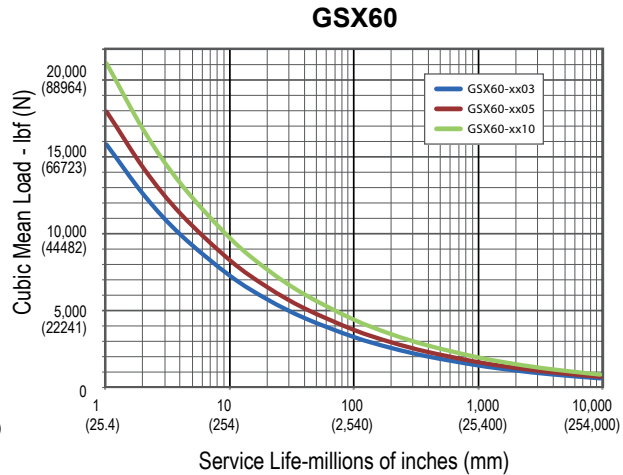
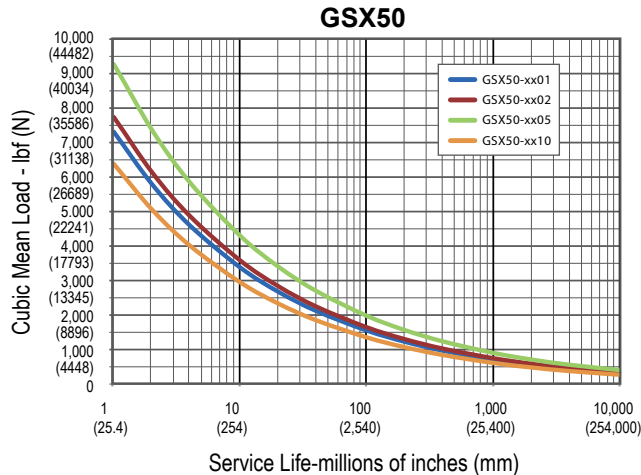
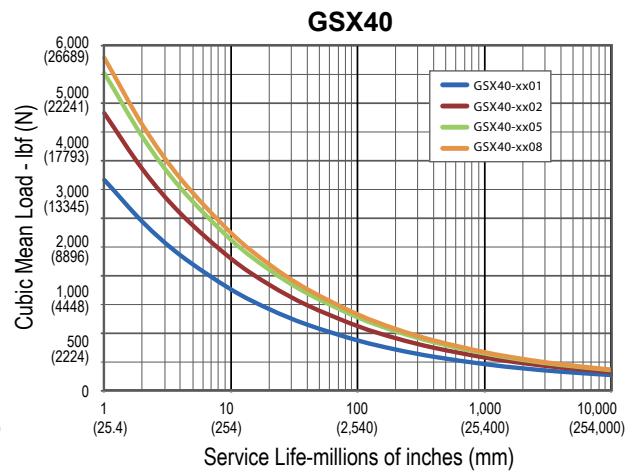
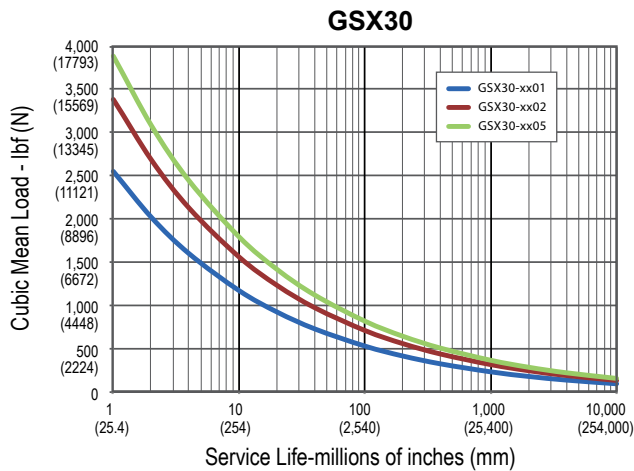
Motor Stator		138	158	168	238	258	268	358	368
Bus Voltage	Vrms	230	400	460	230	400	460	400	460
Speed @ Bus Voltage	rpm	2400							
RMS SINUSOIDAL COMMUTATION									
Continuous Motor Torque	lbf-in	254.2	249.9	261.9	424.8	423.0	427.5	595.6	615.0
	Nm	28.72	28.23	29.59	47.99	47.79	48.30	67.29	69.49
Torque 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
The GSX60-06 can only accommodate a single stack stator.

Specifications subject to change without notice.

GSX 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)

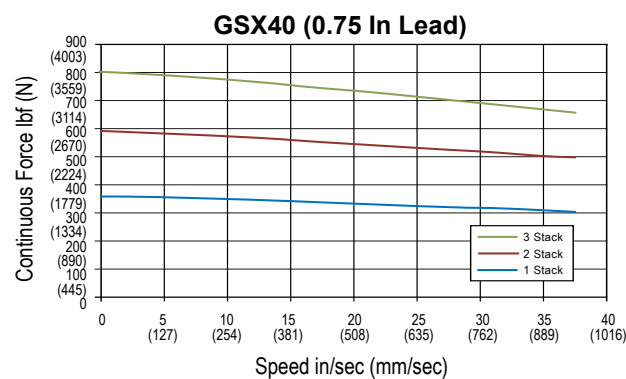
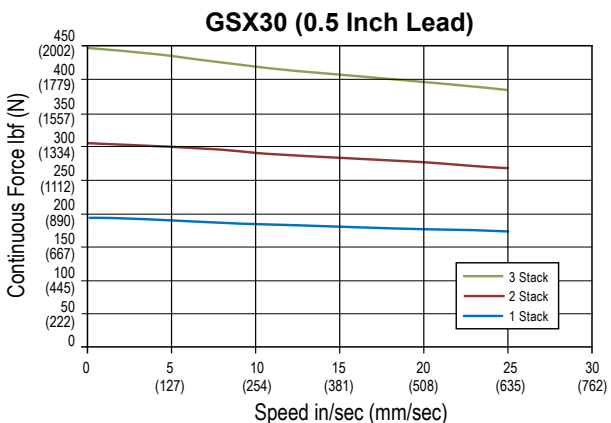
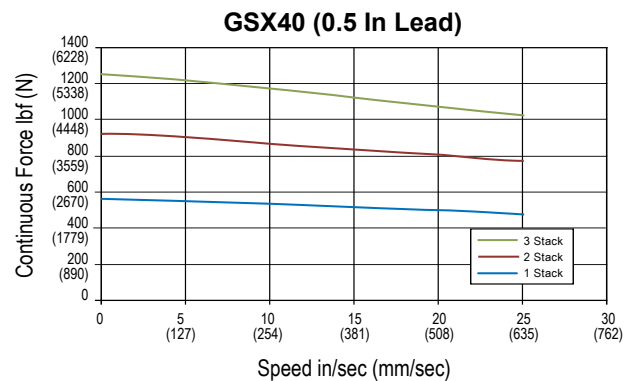
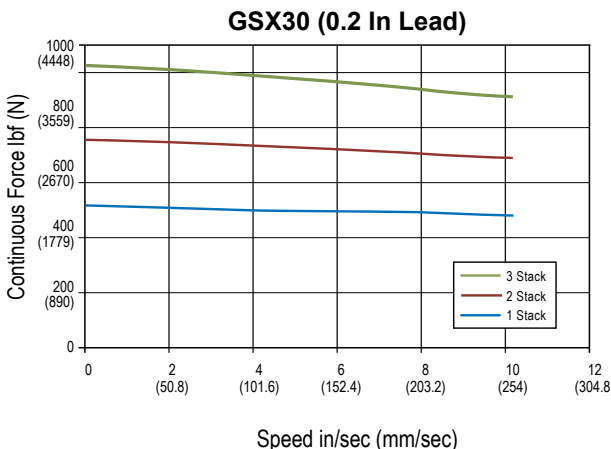
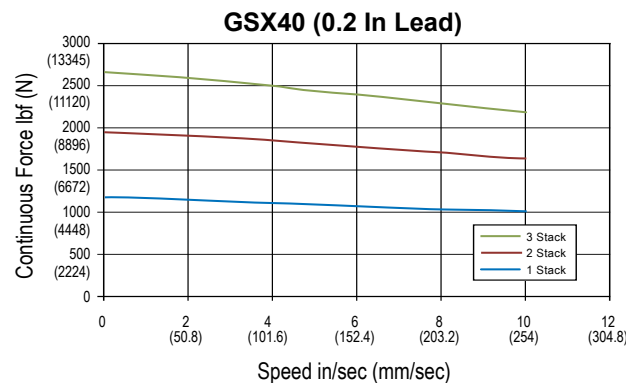
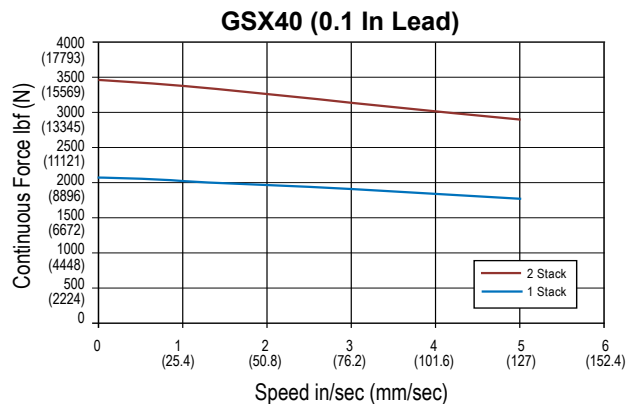
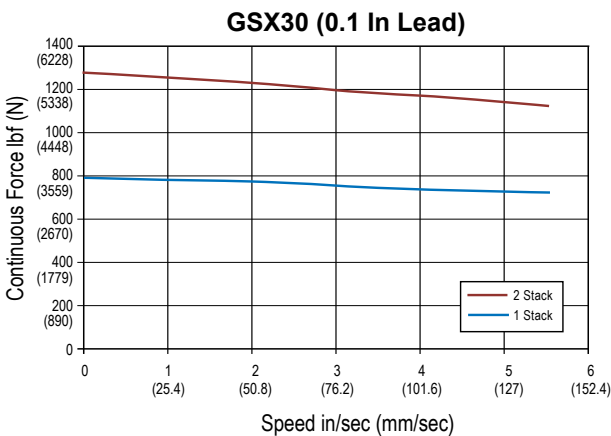
For additional details on calculating estimated service life, please refer to the Engineering Reference in the back of the book.

Service Life Estimate Assumptions:

- Sufficient quality and quantity of lubrication is maintained throughout service life (please refer to engineering reference for lubrication interval estimates.)
- 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. (For information on calculating estimating life for unique applications please refer to the engineering reference in the back of the book)

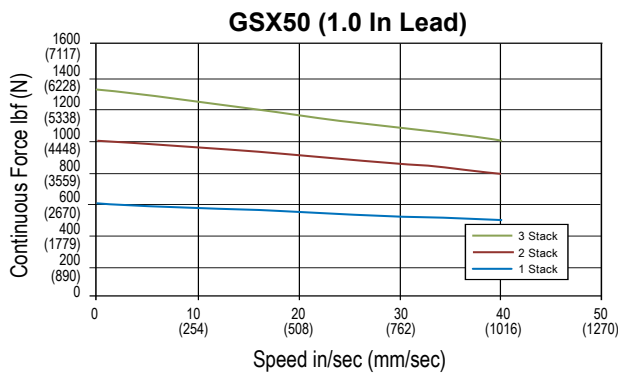
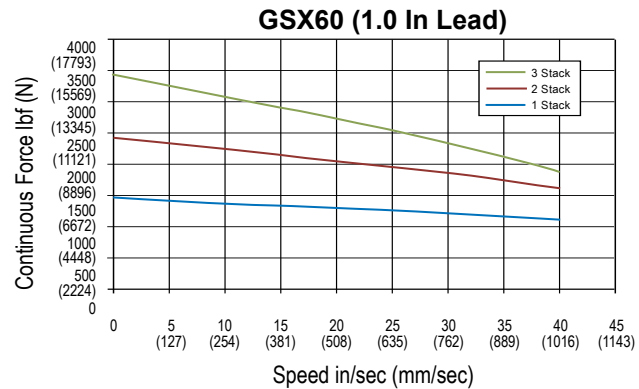
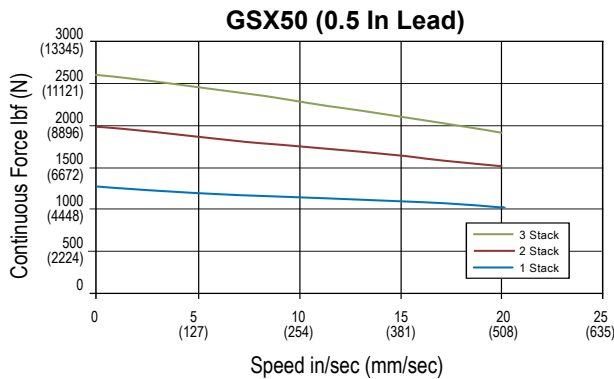
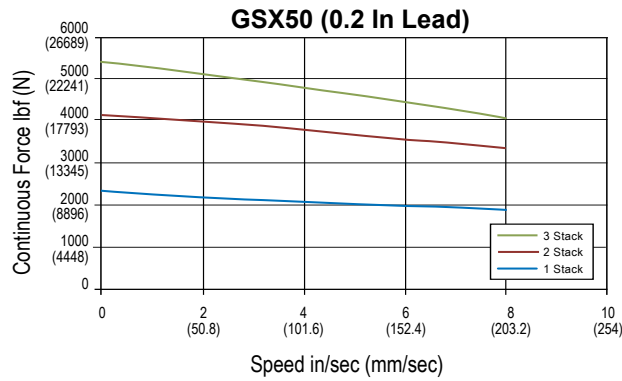
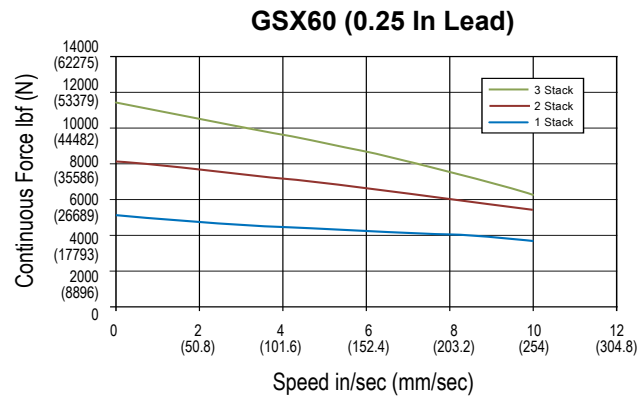
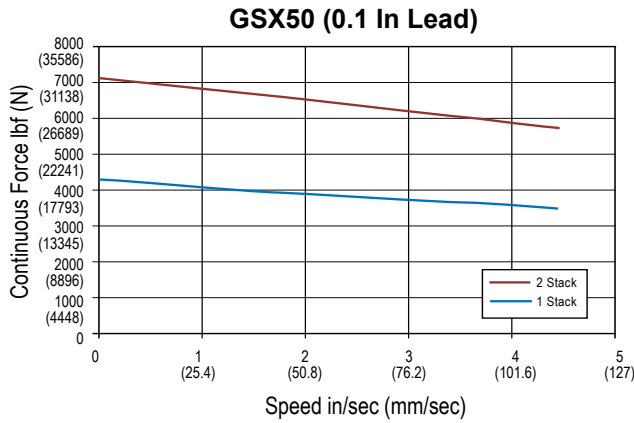
Speed vs. Force Curves

These charts represent typical linear speed versus linear force curves for the GSX actuators using common brushless motor amplifiers. The GSX 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.)



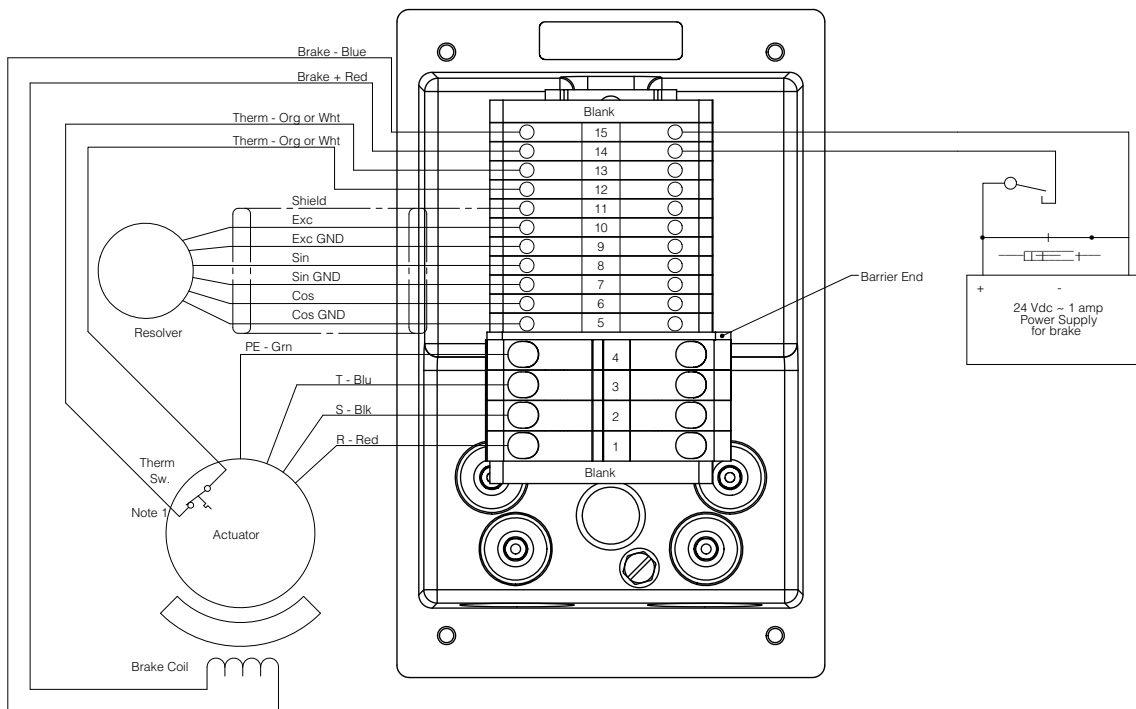
Test data derived using NEMA recommended aluminum heatsink 10" x 10" x 1/4" for GSX20 and 10" x 10" x 3/8" for GSX30. Testing ambient temperature 25°C.

GSX Series Integrated Motor/Actuator



Test data derived using NEMA recommended aluminum heatsink 12" x 12" x 1/2" for GSX40, 12" x 12" x 1/2" for GSX50, and 16" x 16" x 1" for GSX60. Testing ambient temperature 25°C.

Terminal Box Wiring Diagram

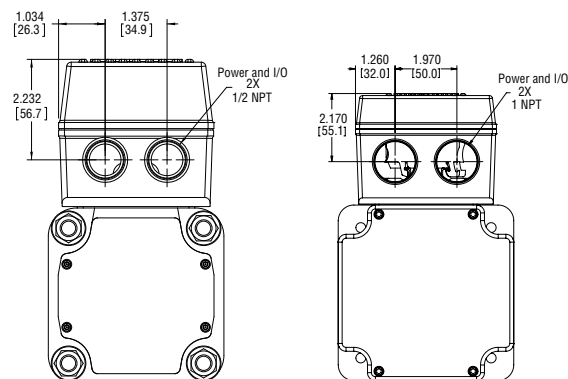


Note 1: Thermal switch normally closed; opens when stator temp exceeds 130 deg. C.

Low Volt Terminal Block- Rockwell 1492-L3		Low Volt Terminal Block- Rockwell 1492-L6	
Voltage Rating	600 VAC/DC	Voltage Rating	600 VAC/DC
Current Rating	27 Amps	Current Rating	50 Amps
Wire Gauge Range	26-12 AWG	Wire Gauge Range	20-8 AWG

Terminal Box Dimensions

Connections
T = Terminal box with NPT ports
Options
NI = Non-Incendive



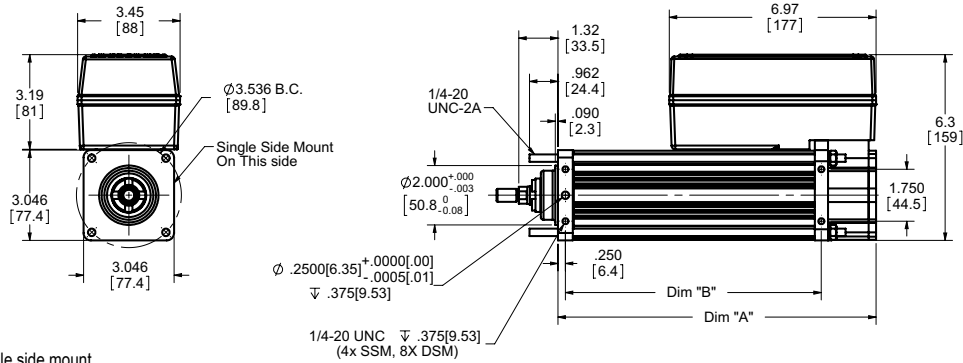
GSX30, GSX40
Applications with >20A rms will require the larger terminal box.

GSX50, GSX60

GSX Series Integrated Motor/Actuator

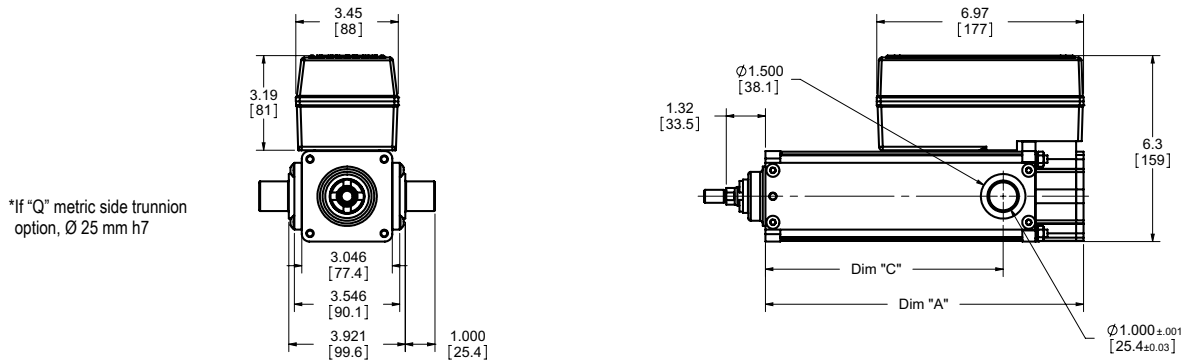
Dimensions

GSX30 Single, Double Side Mounts or Extended Tie Rod Mount with Class 1 Division 2 Option

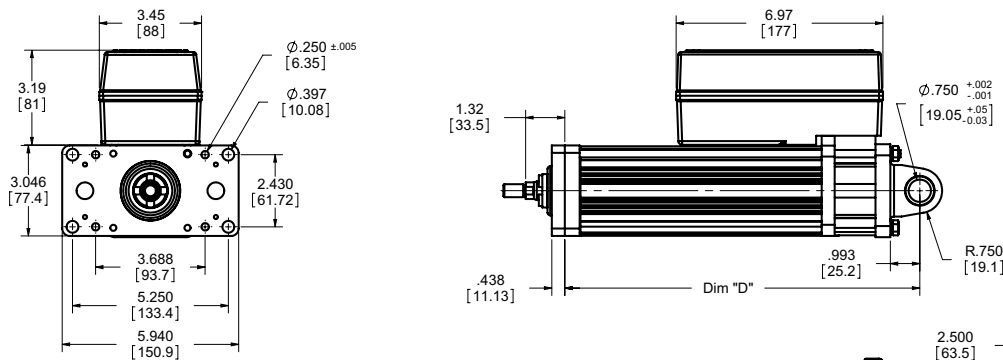


- Three mounting styles shown
 - Shown view is standard side for single side mount
- * If "M" metric tie rod option, thread = M6 x 1
 * If "J" or "K" metric side mount options, M6 x 1.0 ∇ 9 mm with \varnothing 6 mm M7 ∇ 9 mm Dowel Hole

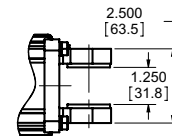
GSX30 Side Trunnion Mount with Class 1 Division 2 Option



GSX30 Rear Clevis Mount or Front Flange Mount with Class 1 Division 2 Option



Dim	3 in (76 mm) Stroke in (mm)	6 in (152 mm) Stroke in (mm)	10 in (254 mm) Stroke in (mm)	12 in (305 mm) Stroke in (mm)	14 in (355 mm) Stroke in (mm)	18 in (457 mm) Stroke in (mm)
A	8.2 (209)	10.7 (272)	15.2 (387)	17.2 (437)	19.2 (488)	23.2 (590)
B	6.1 (156)	8.6 (219)	13.1 (333)	15.1 (384)	17.1 (435)	21.1 (536)
C	5.4 (137)	8.0 (203)	10.0 (254)	12.0 (305)	14.0 (356)	18.0 (457)
D	9.5 (241)	12.0 (304)	16.5 (418)	18.5 (469)	20.5 (520)	24.5 (621)

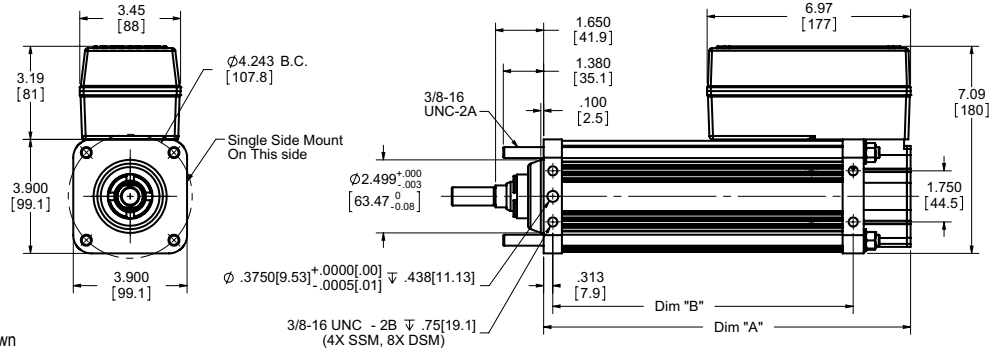


- Two mounting styles shown
- With flange mount, dimension A is equivalent to top two drawings

Note: Add 1.6 Inches (40.64 mm) to Dims "A & D" if ordering a Brake.
 Applications with >20A rms will require the larger terminal box.

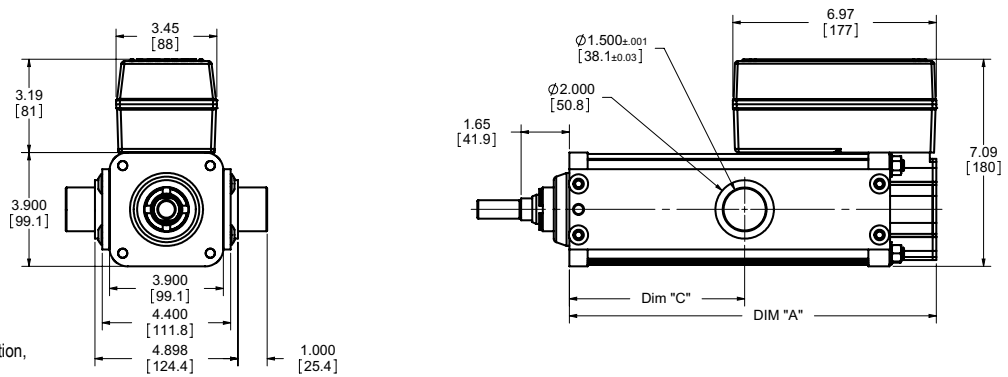
* If "G" metric clevis option, \varnothing 20 mm +0.00 / -0.07
 Drawings subject to change. Consult Exlar for certified drawings.

GSX40 Single, Double Side Mounts or Extended Tie Rod Mount with Class 1 Division 2 Option



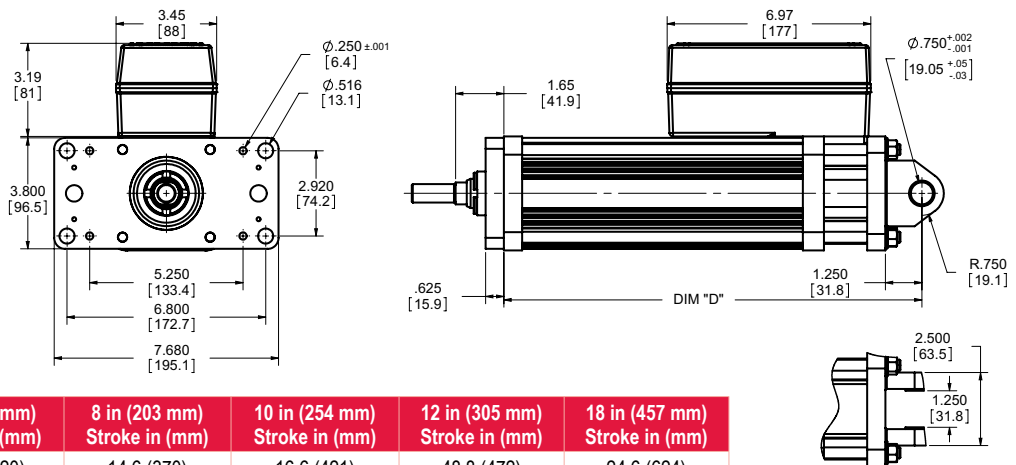
1. Three mounting styles shown
 2. Shown view is standard side for single side mount
- * If "M" metric tie rod option, thread = M8 x 1.25
 * If "J" or "K" metric side mount options, M10 x 1.5 ∇ 19 mm with \varnothing 8 mm M7 ∇ 12 mm Dowel Hole

GSX40 Side Trunnion Mount with Class 1 Division 2 Option



- * If "Q" metric side trunnion option, \varnothing 35 mm h7

GSX40 Rear Clevis Mount or Front Flange Mount with Class 1 Division 2 Option



Dim	6 in (152 mm) Stroke in (mm)	8 in (203 mm) Stroke in (mm)	10 in (254 mm) Stroke in (mm)	12 in (305 mm) Stroke in (mm)	18 in (457 mm) Stroke in (mm)
A	012.6 (320)	14.6 (370)	16.6 (421)	48.8 (472)	24.6 (624)
B	10.3 (262)	12.3 (313)	14.3 (364)	16.3 (414)	22.3 (567)
C	6.0 (152)	8.0 (203)	10.0 (254)	12.0 (305)	18.0 (457)
D	14.5 (364)	16.3 (415)	18.3 (466)	20.3 (516)	26.3 (669)

Note: Add 2.33 Inches (59.18 mm) to Dims "A & D" if ordering a Brake.
 Applications with >20A rms will require the larger terminal box.

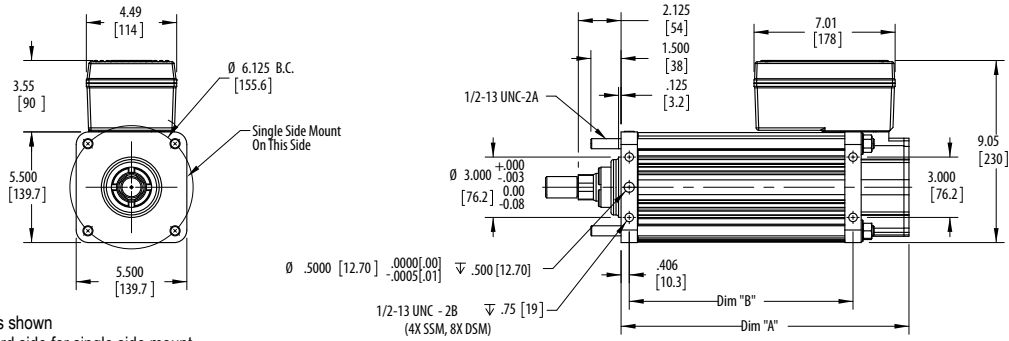
* If "G" metric clevis option, \varnothing 20 mm +0.00 / -0.07

Drawings subject to change. Consult Exlar for certified drawings.

1. Two mounting styles shown
2. With flange mount, dimension A is equivalent to top two drawings

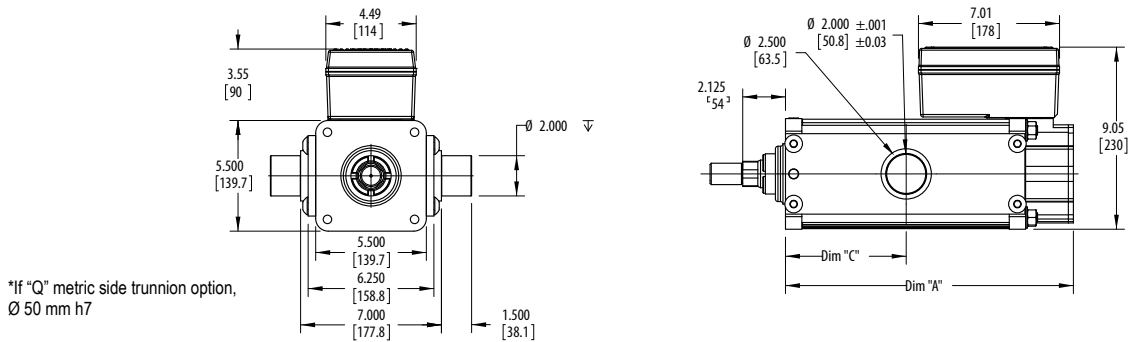
GSX Series Integrated Motor/Actuator

GSX50 Single, Double Side Mounts or Extended Tie Rod Mount with Class 1 Division 2 Option



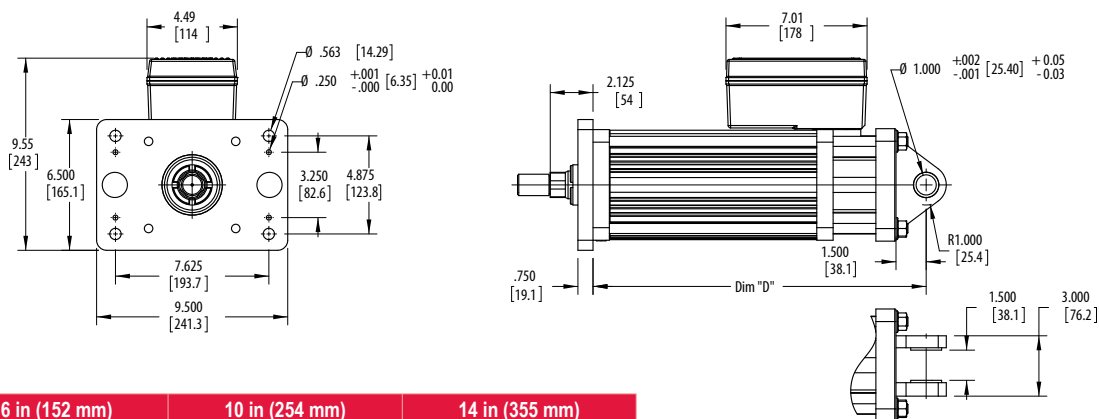
- Three mounting styles shown
 - Shown view is standard side for single side mount
- * If "M" metric tie rod option, thread = M8 x 1.25
 * If "J" or "K" metric side mount options, M12 x 1.75 ∇ 19 mm with \varnothing 12 mm M7 ∇ 12 mm Dowel Hole

GSX50 Side Trunnion Mount with Class 1 Division 2 Option



*If "Q" metric side trunnion option, \varnothing 50 mm h7

GSX50 Rear Clevis Mount or Front Flange Mount with Class 1 Division 2 Option



Dim	6 in (152 mm) Stroke in (mm)	10 in (254 mm) Stroke in (mm)	14 in (355 mm) Stroke in (mm)
A	14.3 (364)	18.3 (465)	22.3 (567)
B	11.1 (282)	15.1 (384)	19.1 (486)
C	6.0 (152)	10.0 (254)	14.0 (356)
D	16.6 (421)	20.6 (522)	24.6 (624)

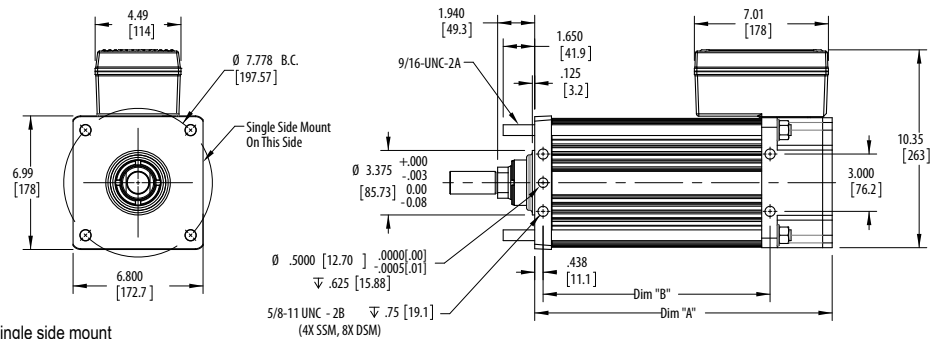
- Two mounting styles shown
- With flange mount, dimension A is equivalent to top two drawings

Note: Add 2.5 Inches to Dims "A & D" if ordering a Brake.

* If "G" metric clevis option, \varnothing 27 mm +0.00 / -0.06

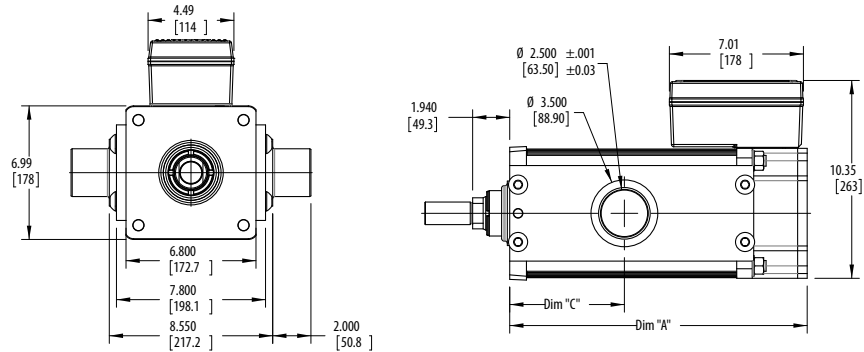
Drawings subject to change. Consult Exlar for certified drawings.

GSX60 Single, Double Side Mounts or Extended Tie Rod Mount with Class 1 Division 2 Option



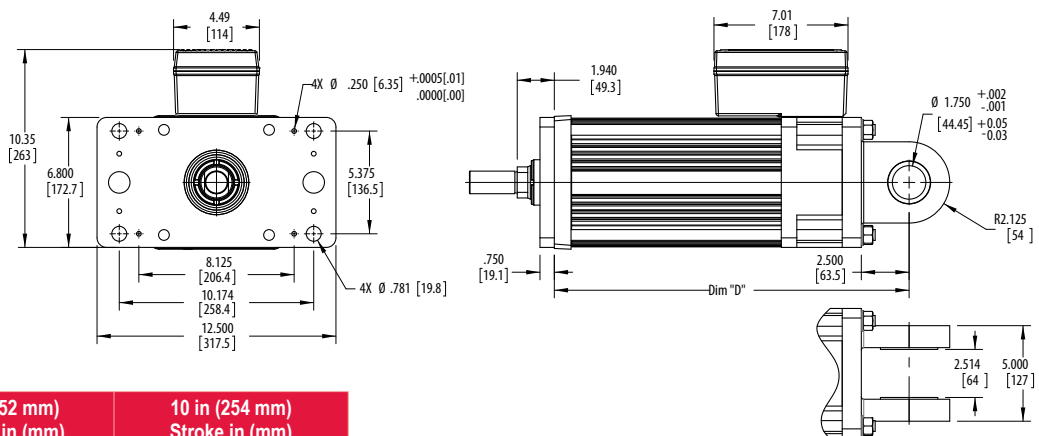
- Three mounting styles shown
 - Shown view is standard side for single side mount
- * If "M" metric tie rod option, thread = M14 x 2
 - * If "J" or "K" metric side mount options, M16 x 2.0 ∇ 16 mm with \varnothing 12 mm M7 ∇ 12 mm Dowel Hole

GSX60 Side Trunnion Mount with Class 1 Division 2 Option



- * If "Q" metric side trunnion option, \varnothing 60 mm h9

GSX60 Rear Clevis Mount or Front Flange Mount with Class 1 Division 2 Option



Dim	6 in (152 mm) Stroke in (mm)	10 in (254 mm) Stroke in (mm)
A	15.2 (387)	19.2 (488)
B	11.9 (302)	15.9 (403)
C	6.0 (152)	10.0 (254)
D	18.5 (469)	22.5 (571)

- Two mounting styles shown
- With flange mount, dimension A is equivalent to top two drawings

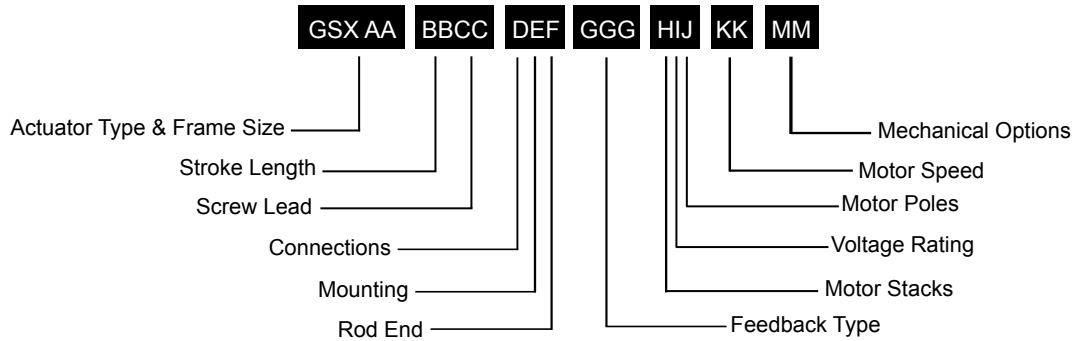
Note: Add 3.575 Inches to Dims "A & D" if ordering a Brake.

* If "G" metric clevis option, \varnothing 45 mm +0.00 / -0.08

Drawings subject to change. Consult Exlar for certified drawings.

GSX Series Integrated Motor/Actuator

Sample Product Number: GSX30-0603-TFA-KM5-2B8-30-SDXL
(Class 1, Division 2)



AA = Actuator Frame Size

- 30 = 3 inch (76 mm)
- 40 = 4 inch (102 mm)
- 50 = 5.5 inch (140 mm)
- 60 = 7 inch (178 mm)

BB = Stroke Length

- 03 = 3 inch (76 mm) GSX30
- 04 = 4 inch (102mm) GSX40
- 06 = 5.9 inch (152 mm) GSX30
6 inch (GSX20, 40, 50, 60)
- 08 = 8 inch (203 mm) GSX40
- 10 = 10 inch (254 mm) all models
- 12 = 12 inch (305 mm) GSX30, 40
- 14 = 14 inch (356 mm) GSX30, 50
- 18 = 18 inch (457 mm) GSX30, 40

CC = Lead (position change per motor revolution)

- 01 = 0.1 inch (2.54 mm) GSX30, 40, 50
- 02 = 0.2 inch (5.08 mm) GSX30, 40, 50
- 03 = 0.25 inch (6.35 mm) GSX60
- 05 = 0.5 inch (12.7 mm) GSX30, 40, GSX50, 60
- 08 = 0.75 inch (19.05 mm) GSX40¹
- 10 = 1.0 inch (25.4 mm) GSX50, 60

D = Connections

- T = Terminal box with NPT ports

E = Mounting

- C = Rear clevis
- F = Front flange
- R = Rear flange
- D = Double side mount
- T = Side trunnion
- E = Extended tie rods
- K = Metric double side mount
- Q = Metric side trunnion
- M = Metric extended tie rods
- G = Metric rear clevis

F = Rod End

- M = Male, US std thread
- A = Male, metric thread
- F = Female, US std thread
- B = Female, metric thread

GGG = Feedback Type

See page 89 for detailed information

H = Motor Stacks

- 1 = 1 stack magnets
- 2 = 2 stack magnets
- 3 = 3 stack magnets

I = Voltage Rating

- A = 24 V DC
- B = 48 V DC
- C = 120 V DC
- 1 = 115 Volt RMS
- 3 = 230 Volt RMS
- 5 = 400 Volt RMS
- 6 = 460 Volt RMS

J = Motor Poles

- 8 = 8 motor poles

KK = Motor Speed

- 24 = 2400 rpm, GSX/M50, GSX60
- 30 = 3000 rpm, GSX/M30, 40

MM = Mechanical Options

- NI = Non-incendive construction required for Class 1, Division 2
- AR = External anti-rotate
- RB = Rear electric brake
- PB = Protective bellows²

NOTES:

1. 0.75 inch (19.05 mm) lead N/A over 12 inch (450 mm) stroke.
2. Not available with extended tie rod mounting option.



For options or specials not listed above or for extended temperature operation, please contact Exlar