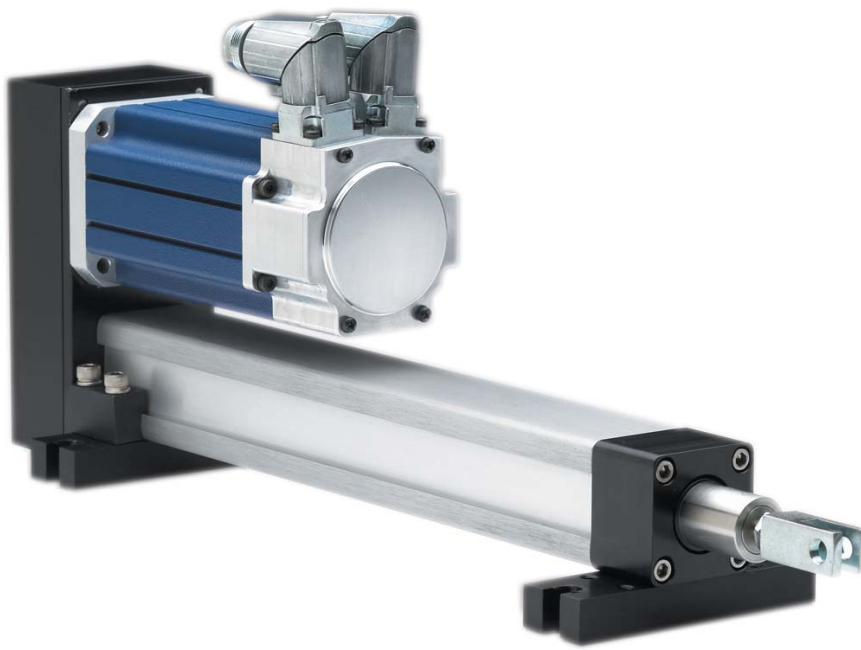




ITT

Cleveland Motion Controls



**Linear Actuator
Product Guide**

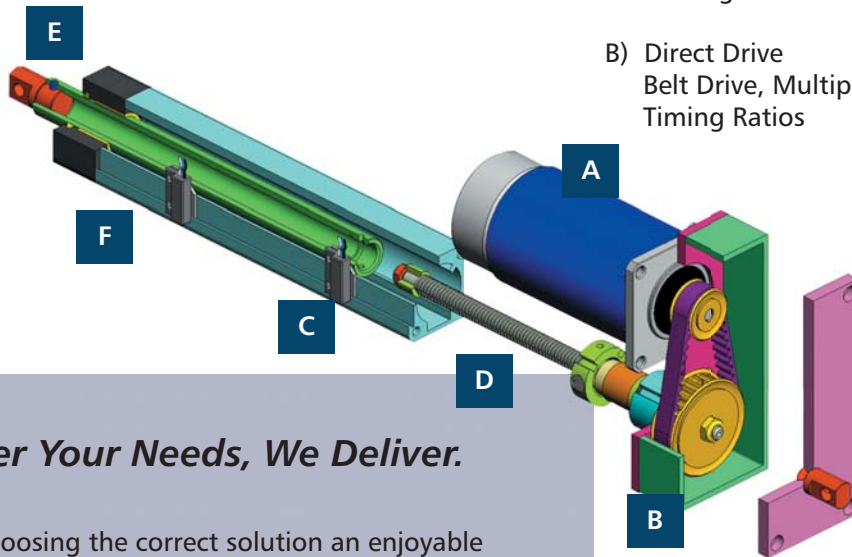


More solutions from us means more options for you.

At Cleveland Motion Controls, our aim has always been to offer our customers the broadest range of solutions. Experience has taught us that each application is unique, which is why we strive to ensure that the linear actuator you choose from us is uniquely suited to your needs. Our competitors may stack their shelves with actuators and hardware, but we go much further by filling ours with engineered solutions. By doing so, you have at your disposal just about any type of solution you could require, from simple integration components such as brakes, gears and limit switches, to elaborate breakthrough designs.

Our Custom Engineered MS Series Linear Actuators Can Include:

- A) Brush and Brushless Servomotors
Customer Supplied Motors
Cabling
- B) Direct Drive
Belt Drive, Multiple Timing Ratios
- C) Linear Potentiometers
Magnetic Limit Switches
Brakes
- D) Acme Screws with Bronze or Delrin* Nuts
Ball Screws
- E) Incremental Stroke Lengths
IP 65 Environmental Sealing
- F) Inline & Parallel Mounting
Multiple Front & Rear Mounting Options



Whatever Your Needs, We Deliver.

We make choosing the correct solution an enjoyable process. Our expertly trained sales force will work closely with you so they can gain a thorough understanding of your specific application. Thus enabling them to determine how to create the best solution for you. Once that judgment has been made, our application development engineers step in to ensure that you receive a reliable, high-quality working solution. When all is said and done, you get just what you need because Cleveland Motion Controls will design a product to fit your application — rather than altering your application to fit our product.

Benefit From Our Vast Selection and Expertise.

For over three decades, Cleveland Motion Controls has developed many innovative solutions to support our customers' needs for linear actuators. Today, the flexibility of the MS Series product line enables our engineering staff to size virtually any screw, nut and motor combination. We can also combine that flexibility with multiple rod end and end mounting designs to help meet your application, regardless of its uniqueness.



MS Series Platforms

MS Standard Design Features:

100% Duty Cycle Ball Screws,
60% Duty Cycle Acme Screws
Stroke Length Up to 30 in.
(91.5 cm) – 1 in. (25.4 mm) increments
Accuracy to 0.0005 in. (0.013 mm)

Durable Aluminum Body
Corrosion Resistant Stainless Steel Rod
Protective Rod Wiper
End of Stroke Bumpers

Rigid Application Development Process

Application Review
Motion Profile Analysis
FEA, 3D Modeling & Computer Simulation
Prototype Design
Performance Verification



Platform MS 65								1:1 Timing Ratio Performance Data																	
General Capabilities				Max Design Thrust				Max Design Speed				Screw Type		Thrust		Speed		Tested Motor		Torque					
Max Stroke		Available Screws		lb. Force		N		in/sec		mm/sec		Screw Type		lb. Force		N		in/sec		mm/sec		Tested Motor		Torque	
in.	mm	Acme	Ball	lb. Force	N	in/sec	mm/sec																		
5.9	150	A2, A4	MB1	65	290	10	254	A4		65		290		10		254		AC Servo		9		63.7			
		A16, A20						A16		65		290		10		254									



Platform MS 150								2:1 Timing Ratio Performance Data																	
General Capabilities				Max Design Thrust				Max Design Speed				Screw Type		Thrust		Speed		Tested Motor		Torque					
Max Stroke		Available Screws		lb. Force		N		in/sec		mm/sec		Screw Type		lb. Force		N		in/sec		mm/sec		Tested Motor		Torque	
in.	mm	Acme	Ball	lb. Force	N	in/sec	mm/sec																		
10	254	A2, A5	B8	150	667	30	762	A2		150		667		12.4		315									
		A10						A5		150		667		4.2		107		BMR 2202D		5		0.57			
								A10		150		667		2.3		58									
								B8		150		667		2.9		74									



Platform MS 400								2:1 Timing Ratio Performance Data																	
General Capabilities				Max Design Thrust				Max Design Speed				Screw Type		Thrust		Speed		Tested Motor		Torque					
Max Stroke		Available Screws		lb. Force		N		in/sec		mm/sec		Screw Type		lb. Force		N		in/sec		mm/sec		Tested Motor		Torque	
in.	mm	Acme	Ball	lb. Force	N	in/sec	mm/sec																		
30	762	A2.7	B2, B5	400	1780	30	762	A2.7		400		1780		10.0		254									
		A5, A10						A5		400		1780		5.5		140		BMR 2202D		5		0.57			
								A10		400		1780		2.7		67									
								B2		400		1780		12.4		315									
								B5		400		1780		5.6		142									



Platform MS 800								2:1 Timing Ratio Performance Data																	
General Capabilities				Max Design Thrust				Max Design Speed				Screw Type		Thrust		Speed		Tested Motor		Torque					
Max Stroke		Available Screws		lb. Force		N		in/sec		mm/sec		Screw Type		lb. Force		N		in/sec		mm/sec		Tested Motor		Torque	
in.	mm	Acme	Ball	lb. Force	N	in/sec	mm/sec																		
30	762	A2, A2.7	B2, B5	800	3558	30	762	A2.7		800		3560		7.3		185									
		A5, A10						A5		800		3560		3.9		99		BNR 3045		47		5.13			
								A10		800		3560		1.9		48									
								B2		800		3560		9.7		246									
								B5		800		3560		3.9		99									

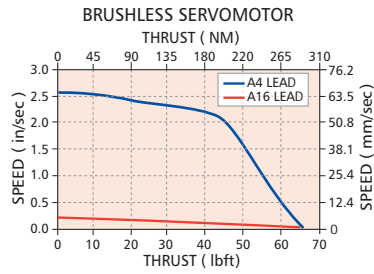
Simply put: Cleveland Motion Controls will design a product to fit your application - rather than altering your application to fit our product.



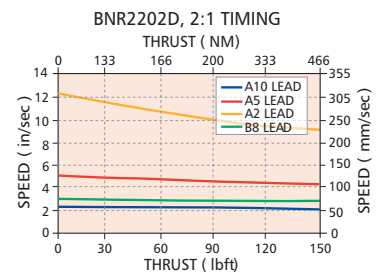
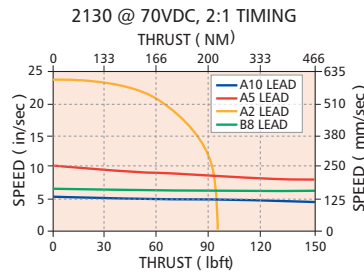
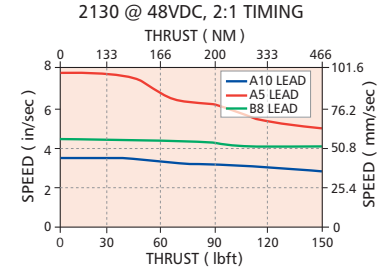
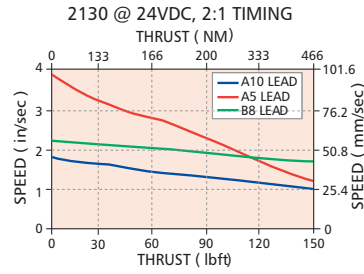
MS Series Platforms

Typical Velocity Thrust Profiles - Many Others Available

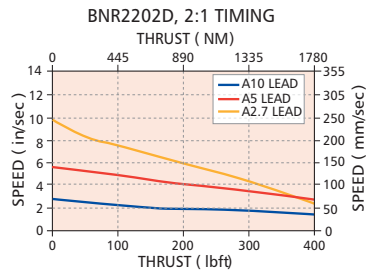
MS65



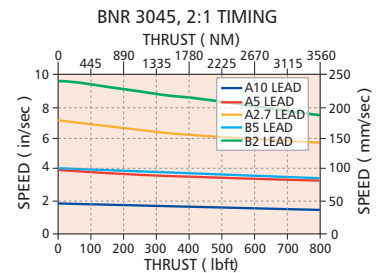
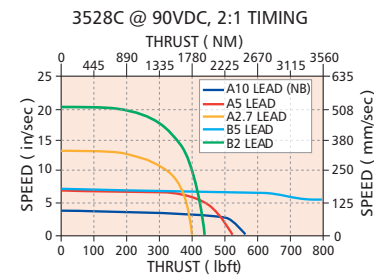
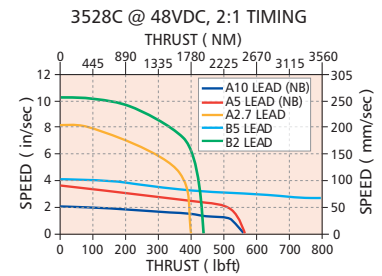
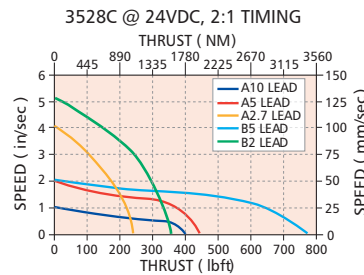
MS150



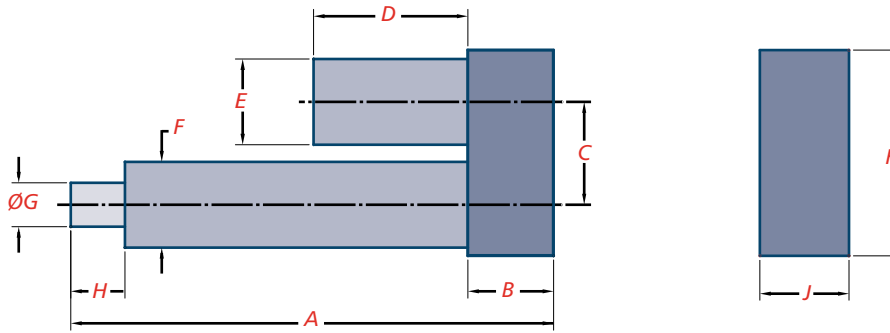
MS400



MS800

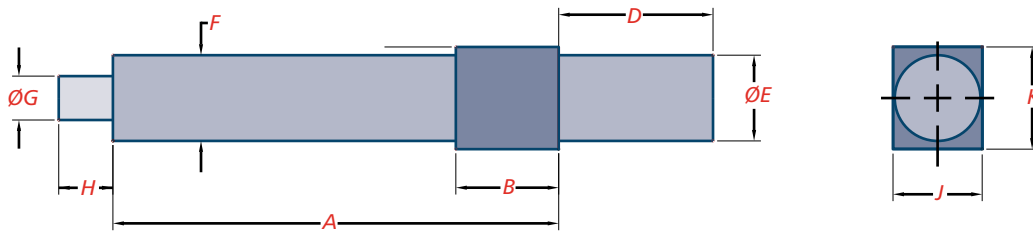


Today, the flexibility of CMC's linear actuator product line enables our engineering staff to size virtually any screw, nut and motor combination.



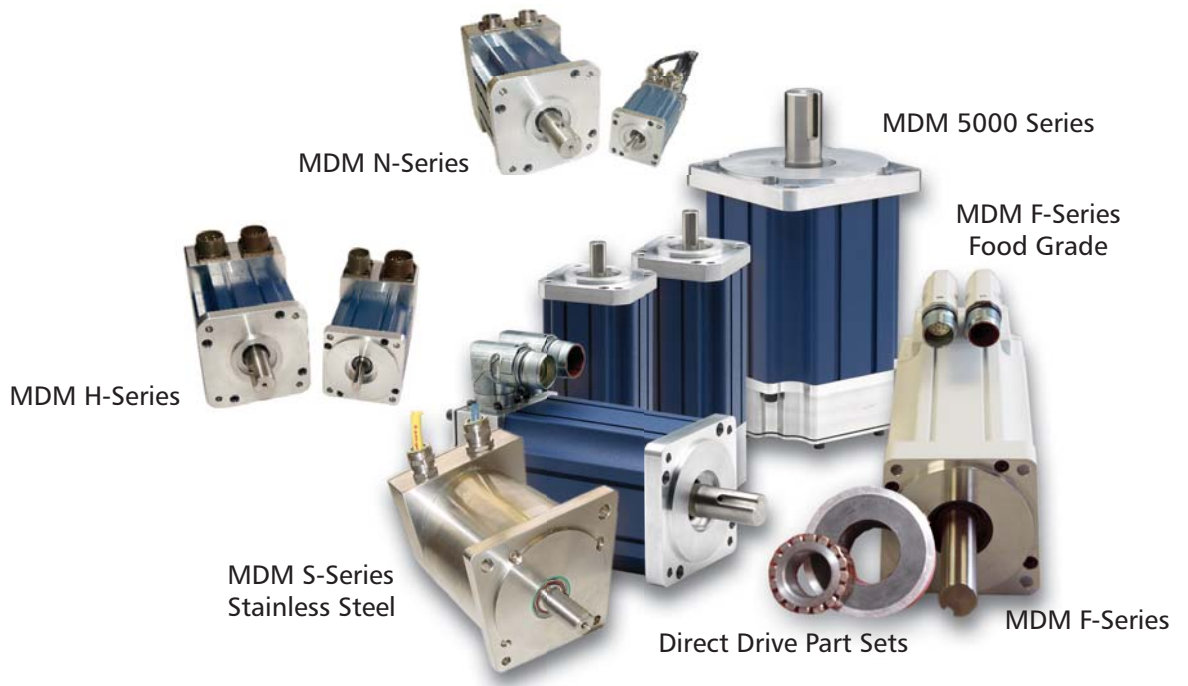
Motor Paralle Mount Dimensions																				
	A		B		C		D		E		F		ØG		H		J		K	
	inches	m	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
MS 65	3.79 + S	96.3 + S	0.94	23.9	1.13	28.7	2.52	64.0	0.98	24.9	1.02	25.9	0.47	11.9	0.44	11.2	1.00	25.4	2.19	55.6
MS 150	7.29 + S	185.2 + S	1.44	36.6	2.32	58.9	5.67	144.0	2.25	57.2	1.5	38.1	0.75	19.1	0.91	23.1	2.25	57.2	4.81	122.2
MS 400	7.82 + S	198.6 + S	1.63	41.4	2.32	58.9	5.67	144.0	2.25	57.2	2.25	57.2	1.00	25.4	0.91	23.1	2.25	57.2	4.81	122.2
MS 800	8.19 + S	208.0 + S	2.00	50.8	3.30	83.8	6.4	162.6	3.38	85.9	2.25	57.2	1.00	25.4	0.91	23.1	3.38	85.9	7.00	177.8

* Retracted Length
S = Stroke Length



Motor In-Line Mount Dimensions																		
	A		B		D		ØE		F		ØG		H		J		K	
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
MS 65	6.20 + S	157.5 + S	1.24	31.5	2.52	64.0	0.98	24.9	1.02	25.9	0.47	11.9	0.44	11.2	1.00	25.4	1.00	25.4
MS 150	4.94 + S	125.5 + S	2.06	52.3	5.55	141.0	2.27	57.7	1.5	38.1	0.75	19.1	0.91	23.1	2.25	57.2	2.25	57.2
MS 400	7.53 + S	191.3 + S	2.25	57.2	5.67	144.0	2.25	57.2	2.25	57.2	1.00	25.4	0.91	23.1	2.50	63.5	2.50	63.5
MS 800	8.88 + S	225.6 + S	2.69	68.3	6.40	162.6	3.38	85.9	2.25	57.2	1.00	25.4	0.91	23.1	3.38	85.9	3.38	85.9

* Retracted Length
S = Stroke Length



Cleveland Motion Controls, Inc.
7550 Hub Parkway * Cleveland, OH 44125
Tel: 216.524.8800 or 800.321.8072
Fax: 216.642.2199
cmcsales@itt.com
www.cmcccontrols.com