



Product Segments

Industrial Motion

TiMOTION's MA1 series linear actuator is the proven choice for applications requiring a durable, long life solution. Specifically designed for harsh working environments, the MA1 linear actuator is ideal for use in heavy-duty machinery, industrial equipment and off road vehicles. This linear actuator has been certified for applications requiring IP69K compliance. Available options for the MA1 linear actuator include AC or DC power, ball or acme spindles, mechanical or electrical braking and a load limiting clutch or limit switches.

General Features

Max. load ACME screw: 2,500N (push / pull)

Ball screw: 4,500N (push / pull)

Max. speed at max. load 15mm/s (ACME screw, DC motor)

14.8mm/s (Ball screw, DC motor)

Max. speed at no load 31.2mm/s (ACME screw, DC motor)

59mm/s (Ball screw, DC motor)

Retracted length ≥ Stroke + 160mm (ACME screw, without POT)

≥ Stroke + 201mm (Ball screw, without POT)

IP rating IP69K
Certificate UL73, EMC

Stroke 20~1000mm (ACME screw); 50~800mm (Ball screw)

Output Signals Hall sensors, POT

Options Overload clutch, electromagnetic brake Voltage 12/24/36/48V DC; 110/220V AC

Spindle ACME or Ball screw

Color Black

Operational temperature range $-30^{\circ}\text{C} \sim +65^{\circ}\text{C}$ Operational temperature range $+5^{\circ}\text{C} \sim +45^{\circ}\text{C}$

at full performance Mechanical brake

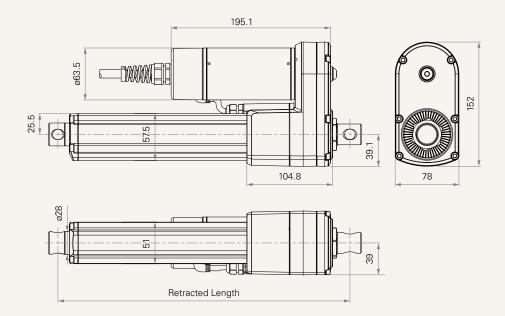
Higher duty cycle (25%), corrosion proof

Manual drive

MA1 Series

Drawing

Standard Dimensions (mm)





Load and Speed

Rated L	oad and Self-	Lock Force						
CODE	Load (N)		Self Locking	Force (N)	Duty Cycle	Overload Clutch Range (N)		
	Push	Push Pull	EM Brake	EM Brake				
			Without		With			•
			No Brake	Mechanical Brake	No Brake	Mechanical Brake		
A_B	1500	1500	500	1950	1950	1950	25%	2250~3000
A_C	2500	2500	500	3250	3250	3250	25%	3750~5000
B_A	2500	2500	N/A	3250	N/A	3250	25%	3250~4000
B_B	3500	3500	N/A	4550	N/A	4550	25%	5250~7000
B_C	4500	4500	N/A	5850	N/A	5850	25%	6750~9000

Rated C	Current ar	nd Speed										
CODE	24VDC				110VAC	;			220VA	3		
	Typical Current (A)		Typical (mm/s)	speed	Typical (A)	Current	Typical (mm/s)		Typical (A)	Current	Typical (mm/s)	speed
	No Load	With Load	No Load	With Load	No Load	With Load	No Load	With Load	No Load	With Load	No Load	With Load
	Motor Speed (4100RPM)			Motor	Motor Speed (3600RPM)			Motor	Motor Speed (2900RPM)			
$\mathbf{A}_{\mathbf{B}}$	2.5	7.5	31.2	27.4	1.7	2.0	28.0	24.7	0.8	1.0	23.5	21.0
A_C	2.0	6.5	17.0	15.0	1.7	2.0	14.5	12.8	0.8	1.0	12.1	11.2
B_A	3.5	14.0	59.0	45.0	1.8	2.4	56.5	38.5	1.0	1.3	46.0	40.0
B_B	2.5	8.5	31.0	26.0	1.7	2.1	27.5	22.5	1.0	1.1	23.2	19.2
B_C	2.0	6.3	16.6	14.8	1.7	2.0	14.2	13.0	1.0	1.0	12.1	11.0

Note

- 1 Please refer to the approved drawing for the final authentic value.
- 2 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
- 3 The self-locking force is a minimum value and can be actually higher.
- 4 The current & speed in table are tested when the actuator is extending under push load.
- 5 The current & speed in table are tested with 24V DC motor. With a 12V DC motor, the current is approximately twice the current measured in 24V DC. With a 36V DC motor, the current is approximately two-thirds the current measured in 24V DC. With a 48V DC motor, the current is approximately half the current measured in 24V DC. Speed will be similar for all the voltages.
- 6 Standard stroke: Min. 20mm, Max. please refer to below table.

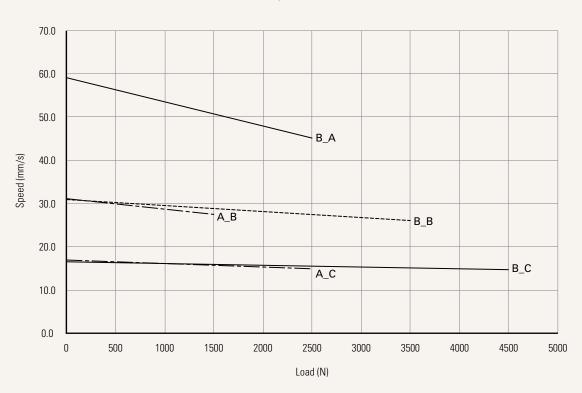
CODE	Load (N)	Max Stroke (mm)
A_B	≤1500	1000
A_C, B_A	≤2500	800
B_B, B_C	≤4500	600



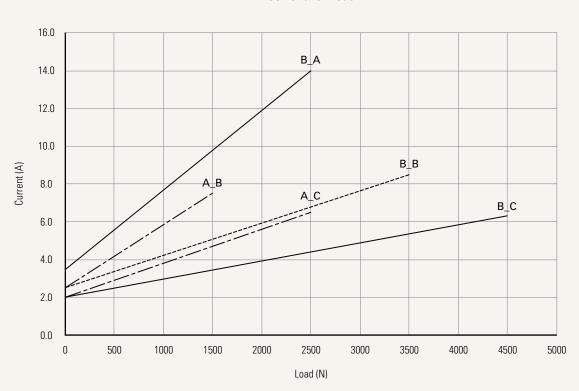
Performance Data (24V DC Motor)

Motor Speed (4100RPM)

Speed vs. Load



Current vs. Load

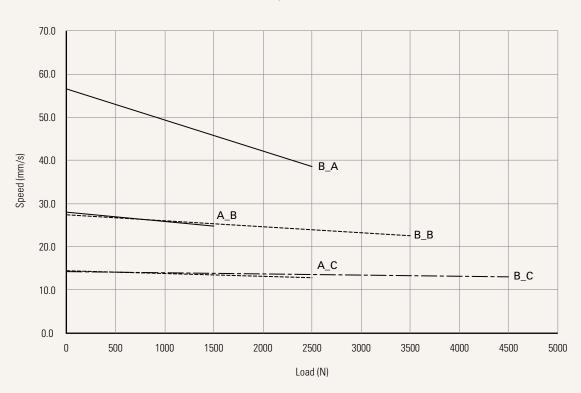




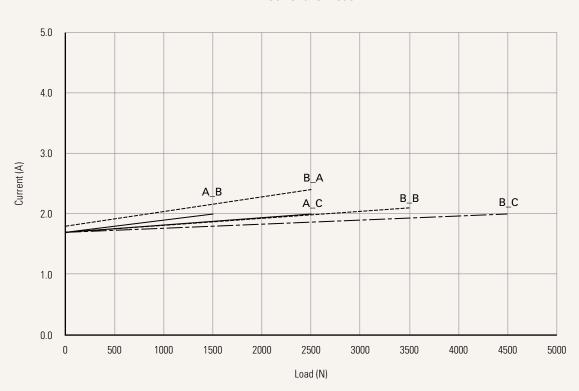
Performance Data (110V AC Motor)

Motor Speed (3600RPM)

Speed vs. Load



Current vs. Load

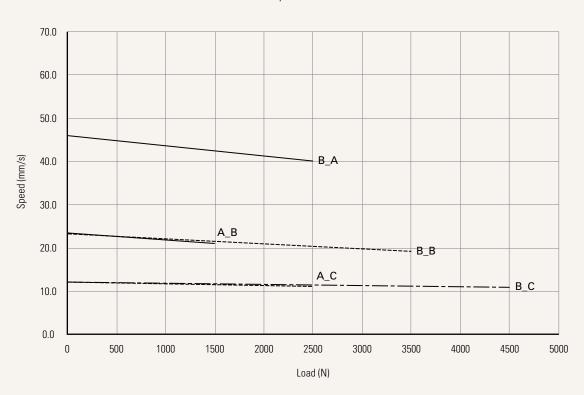




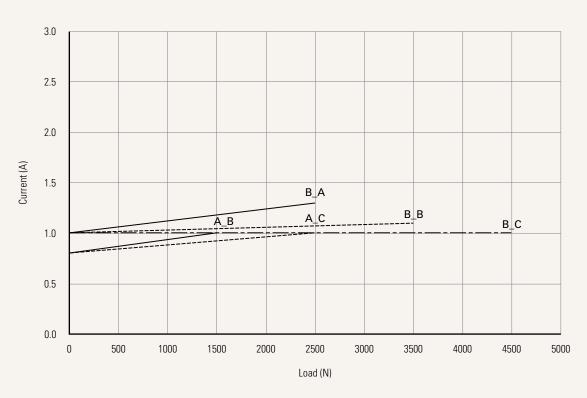
Performance Data (220V AC Motor)

Motor Speed (2900RPM)

Speed vs. Load



Current vs. Load





MA1 Ordering Key



MA1

Version: 20220407-G

Spindle Type	A = ACME Screw	B = BALL Screw		
Voltage	1 = 12V DC 2 = 24V DC	3 = 36V DC 9 = 48V DC	4 = 110V AC 60Hz 5 = 220V AC 50Hz	
Load and Speed	See page 3			
Stroke (mm)	See page 3			
Retracted Length (mm)	See page 8			
Rear Attachment (mm) See page 8	1 = #45 Steel CNC, withou	ut slot, hole 13.0		
Front Attachment (mm) See page 8	1 = #45 Steel CNC, withou	ut slot, hole 13.0		
Direction of Rear Attachment (Counterclockwise) See page 9	1 = 90° (Standard)	2 = 0°		
Functions for Limit Switches		pose overload clutch) etracted / extended position etracted / extended position		
Overload Clutch	0 = Without	1 = With		
Mechanical Brake See page 9	0 = Without	1 = With (Ball Screw's	standard option)	
Electromagnetic Brake See page 9	0 = Without (Standard)	1 = With (Not support t slow start / stop or		ed adjustment function, such as
IP Rating	6 = IP66D	8 = IP69K		
Manual Drive	1 = With			
Output Signals See page 10	0 = Without	1 = POT	5 = Hall sensors*2	
Connector	1 = Tinned leads			
Cable Length (mm)	1 = Straight, 500	2 = Straight, 1000	3 = Straight, 1500	4 = Straight, 2000

MA1 Ordering Key Appendix



Retracted Length (mm)

- 1. Calculate A+B+C=Y
- 2. Retracted length needs to \geq Stroke + Y

A. Type		
ACME	Ball	
+160	+201	

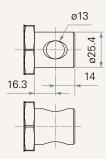
B. Mechan	B. Mechanical Brake						
	ACME	Ball					
0	-	N/A					
1	+35	-					

C. Output Signals

	ACME, DC	ACME, AC	Ball, DC	Ball, AC
0	-	-	-	-
1	+36	+36	+40	+40
5	-	+36	-	+40

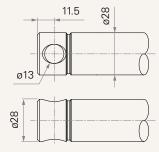
Rear Attachment (mm)

1 = #45 Steel CNC, without slot, hole 13.0



Front Attachment (mm)

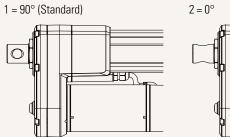
1 = #45 Steel CNC, without slot, hole 13.0

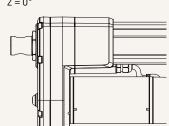


MA1 Ordering Key Appendix



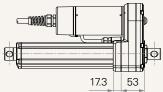
Direction of Rear Attachment (Counterclockwise)

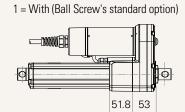




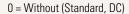
Mechanical Brake

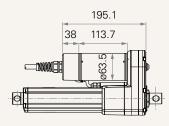


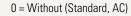


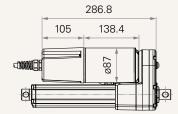


Electromagnetic Brake

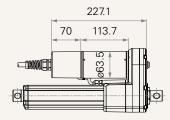








1 = With (DC)

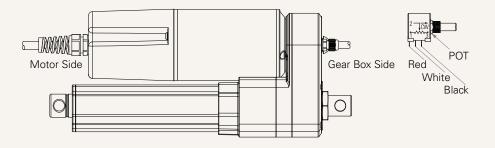


MA1 Ordering Key Appendix



Output Signals

Wire Definitions			AWG	Output Signal (Output Signal Code			
				0. Without	0. Without 1. POT		5.2 Hall	
DC Motor	Motor Side	Black	26	-	-	GND	GND	
		Blue	26	-	-	-	S2	
		O White	26	-	-	S1	S1	
		Red	26	-	-	+5V	+5V	
		Red/Green	14	Extend+	Extend+	Extend+	Extend+	
		Black/Yellow	14	Retract+	Retract+	GND GND - S2 S1 S1 +5V +5V Extend+ Extend+ Retract+ Retract+ Retract+ Retract+ Extend+ Extend+ PCBA+ PCBA+ Neutral Neutral GND GND +5V +5V S1 S1		
	Gear Box Side	Red	26	-	pin 1	-	-	
		O White	26	-	pin 2	-	-	
		Black	26	-	pin 3	-	-	
AC Motor	Motor Side	Black	18	Retract+	Retract+	Retract+	Retract+	
		Grey	18	Extend+	Extend+	Extend+	Extend+	
		Brown	18	PCBA+	PCBA+	PCBA+	PCBA+	
		Blue	18	Neutral	Neutral	Neutral	Neutral	
		Green/Yellow	18	GND	GND	GND	GND	
	Gear Box Side	Red	20	-	pin1	+5V	+5V	
		O White	20	-	pin2	S1	S1	
		Blue	20	-	-	-	S2	
		Black	20	-	pin3	GND	GND	



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