

# MA2

## series



### Product Segments

#### • Industrial Motion

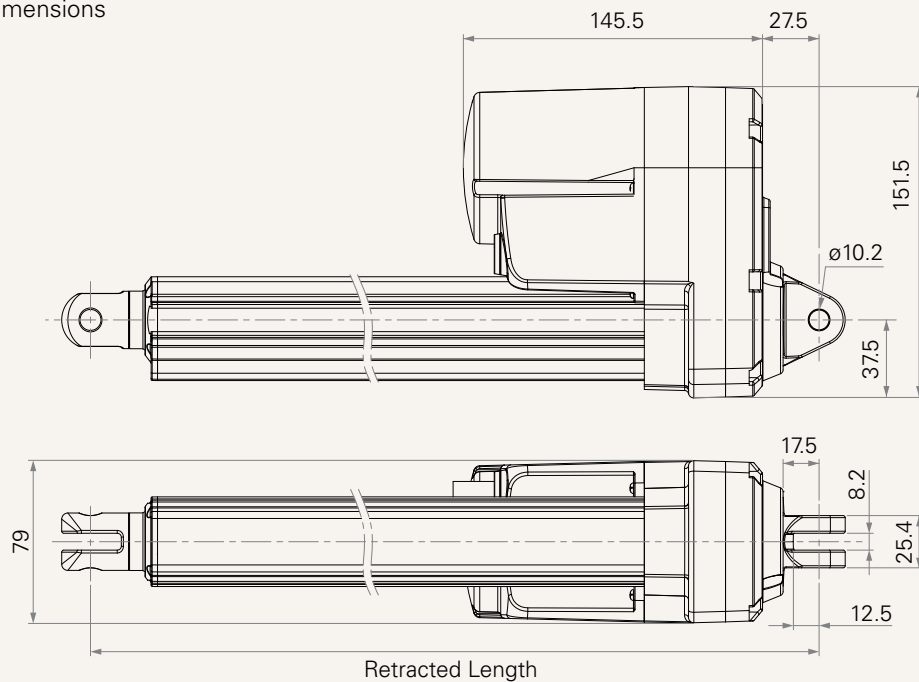
TiMOTION's MA2 series linear actuator was specifically designed for applications which face harsh working environments and require ruggedness and durability. Its IP69K protection ensures it will withstand high temperature, high pressure water jets, and the ingress of dust and other solid contaminants. The MA2 also has optional Reed switches along the outer tube which allow users to adjust the stroke length. For improved control and accuracy of motion, the MA2 can be customized with many different feedback options depending on your application requirements. Example applications suitable for the MA2: Agricultural equipment such as spreaders, harvesters, grain handlers, combines and tractors. Example applications suitable for the MA2: Agricultural equipment such as spreaders, harvesters, grain handlers, combines and tractors. Commercial and industrial applications such as commercial lawn mowers, scrubbers and sweepers, material handling equipment and livestock ventilation systems.

#### General Features

Voltage of motor	12V DC, 24V DC, 36V DC; 12V DC, 24V DC, 36V DC (thermal control)
Maximum load	6,000N in push and pull
Maximum speed at full load:	43mm/s (with 1000N in a push or pull condition)
Stroke	25~1000mm
Minimum installation dimension	Stroke + 131mm
IP rating	Up to IP69K
Certificate	EN 61000-6-1, EN 61000-6-3
Operational temperature range	-30°C~+65°C
Operational temperature range at full performance	+5°C~+45°C
Options	Hall sensor(s), POT

## Drawing

Standard Dimensions  
(mm)



## Load and Speed

CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
	Push	Pull		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (5200RPM, duty cycle 25%)							
F	1000	1000	1300	2.7	8.4	52.5	43.0
G	2000	2000	2600	2.4	7.5	25.5	22.3
H	4000	4000	5200	2.3	8.0	13.2	11.1
J	6000	6000	7800	2.0	6.8	6.6	6.1

## Note

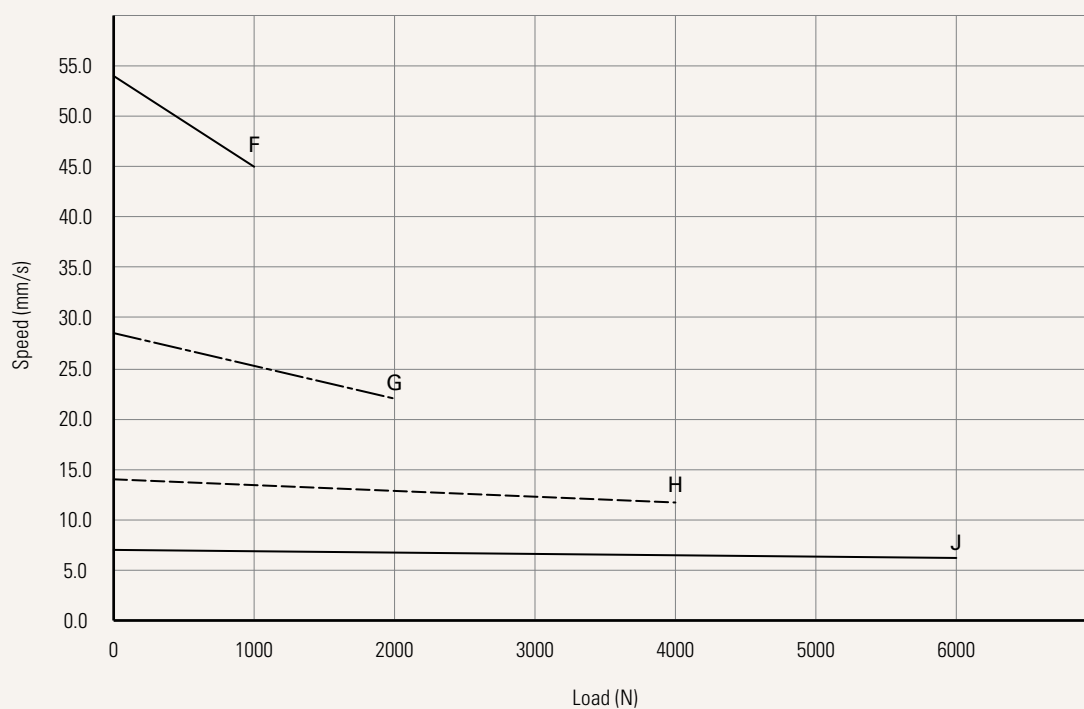
- 1 With a 12V motor, the current is approximately twice the current measured in 24V. With a 36V motor, the current is approximately two-thirds the current measured in 24V; speed will be similar for both voltages.
- 2 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
- 3 Standard stroke: Min. ≥25mm, Max. please refer to below table.

Load (N)	Max Stroke (mm)
≥ 4000	600
= 2000	800
= 1000	1000

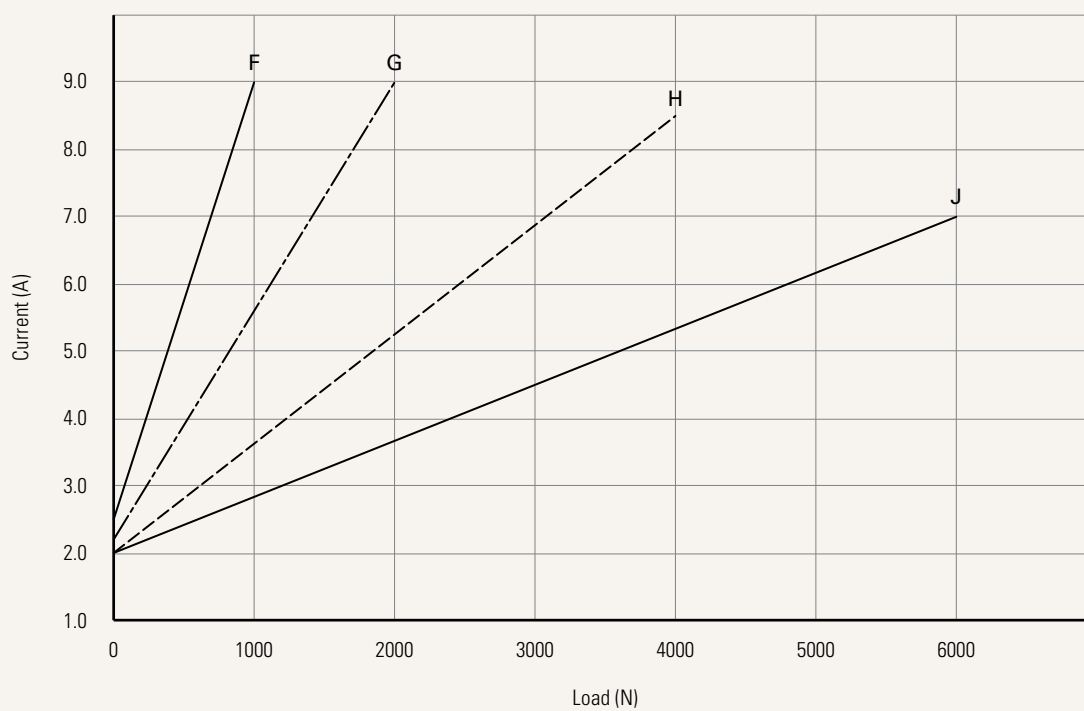
## Performance Data (24V DC Motor)

Motor Speed (5200RPM)

Speed vs. Load



Current vs. Load



### Note

1 The performance data in the curve charts shows theoretical value.

<b>Voltage</b>	1 = 12V DC 2 = 24V DC	3 = 36V DC 5 = 24V DC, thermal control	6 = 12V DC, thermal control 7 = 36V DC, thermal control
<b>Load and Speed</b>	<a href="#">See page 2</a>		
<b>Stroke (mm)</b>			
<b>Retracted Length (mm)</b>	<a href="#">See page 5</a>		
<b>Rear Attachment (mm)</b> <a href="#">See page 6</a>	1 = Aluminum casting, clevis U, slot 8.2, depth 12.5, hole 10.2 2 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 10.2 3 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.8 4 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.2		
<b>Front Attachment (mm)</b> <a href="#">See page 6</a>	1 = Iron inner tube with punched hole, without slot, hole 10.2 2 = Iron inner tube with punched hole, without slot, hole 12.2 3 = Iron inner tube with punched hole, without slot, hole 12.8 4 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 10.2 5 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.2 6 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.8 K = Rod end bearing, hole 12.8		
<b>Direction of Rear Attachment (Counterclockwise)</b> <a href="#">See page 7</a>	1 = 90°	2 = 0°	
<b>Functions for Limit Switches</b> <a href="#">See page 7</a>	1 = Two switches at full retracted/extended positions to cut current 2 = Two switches at full retracted/extended positions to cut current + third one in between to send signal 6 = Two switches at full retracted/extended positions to cut current + send signal		
<b>Reed Sensor on the Outer Tube</b>	0 = Without	1 = One Reed sensor	2 = Two Reed sensors
<b>Output Signals</b>	0 = Without	1 = POT	4 = Hall sensor*1 5 = Hall sensor*2
<b>Connector</b> <a href="#">See page 7</a>	2 = Tinned leads		
<b>Cable Length (mm)</b>	1 = Straight, 500	2 = Straight, 1000	3 = Straight, 1500 4 = Straight, 2000
<b>IP Rating</b>	1 = Without 2 = IP54	3 = IP66 6 = IP66D	8 = IP69K
<b>Manual Drive</b>	0 = Without	1 = With	
<b>T-Smart</b>	0 = Without		

## Retracted Length (mm)

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

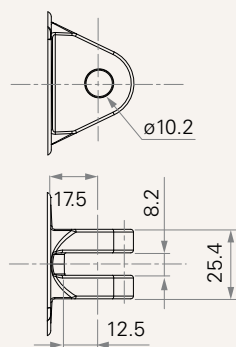
A. Rear/ Front Attachment		
Front Attachment	Rear Attachment	
	1	2, 3, 4
1, 3	+131	+134
2, 4, 5, 6	+161	+164
K	+178	+181

C. Output Signal	
CODE	
0, 4, 5, 6, 7	-
1	+20

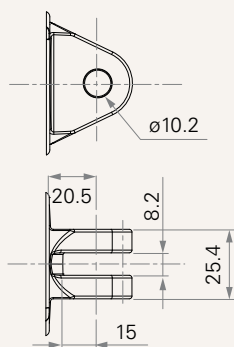
B. Load V.S. Stroke	
Stroke (mm)	Load (N)
25~150	-
151~200	-
201~250	+10
251~300	+20
301~350	+30
351~400	+40
401~450	+50
451~500	+60
501~550	+70
551~600	+80
601~650	+90
651~700	+100
701~750	+110
751~800	+120
801~850	+130
851~900	+140
901~950	+155
951~1000	+160

## Rear Attachment (mm)

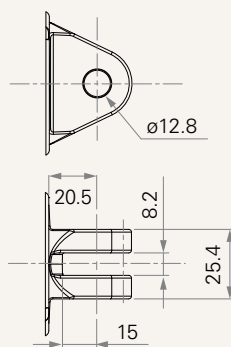
1 = Aluminum casting, clevis U, slot 8.2, depth 12.5, hole 10.2



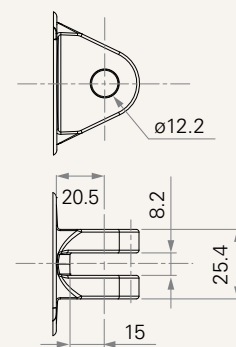
2 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 10.2



3 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.8

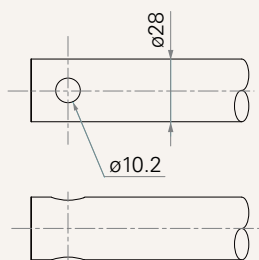


4 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.2

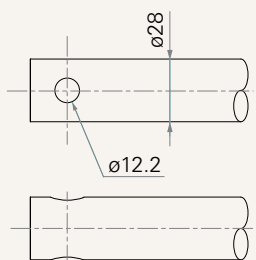


## Front Attachment (mm)

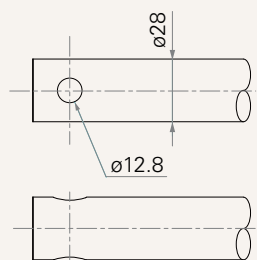
1 = Iron inner tube with punched hole, without slot, hole 10.2



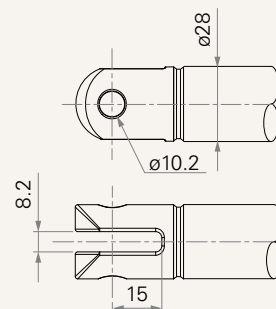
3 = Iron inner tube with punched hole, without slot, hole 12.2



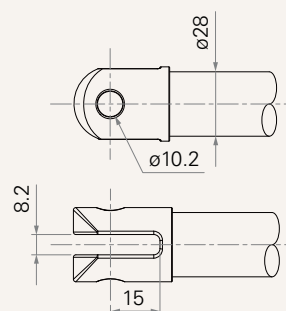
3 = Iron inner tube with punched hole, without slot, hole 12.8



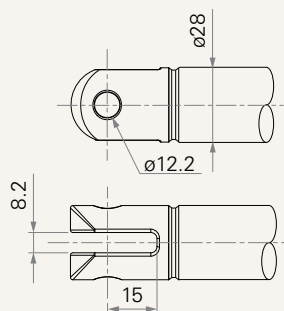
4 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 10.2 (IP66D, IP69K)



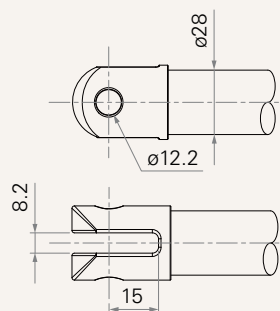
4 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 10.2 (Without IP, IP54)



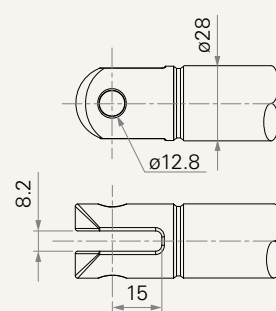
5 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.2 (IP66D, IP69K)



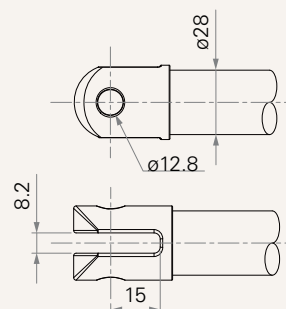
5 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.2 (Without IP, IP54)



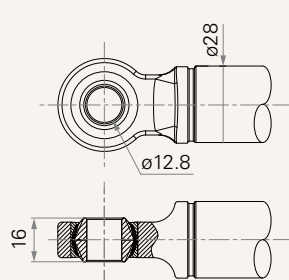
6 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.8 (IP66D, IP69K)



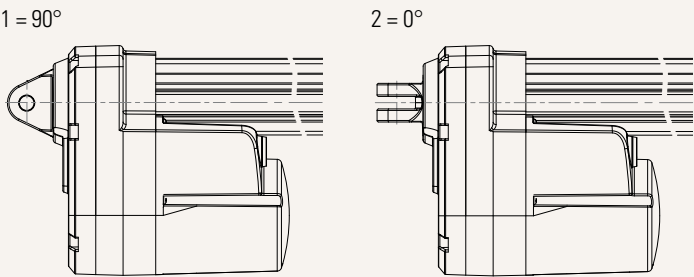
6 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.8 (Without IP, IP54)









K = Rod end bearing, hole 12.8



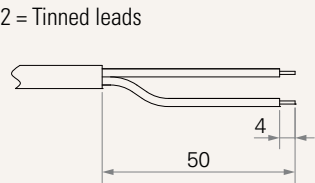
Direction of Rear Attachment (Counterclockwise)



Functions for Limit Switches

Wire Definitions						
CODE	 (Green)	 (Red)	 (White)	 (Black)	 (Yellow)	 (Blue)
1	extend (VDC+)	N/A	N/A	N/A	retract (VDC+)	N/A
2	extend (VDC+)	N/A	middle switch pin B	middle switch pin A	retract (VDC+)	N/A
6	extend (VDC+)	N/A	upper limit switch	lower limit switch	retract (VDC+)	N/A

Connector



Terms of Use

The user is responsible for determining the suitability of TiMOTION products for a specific application. TiMOTION products are subject to change without prior notice.