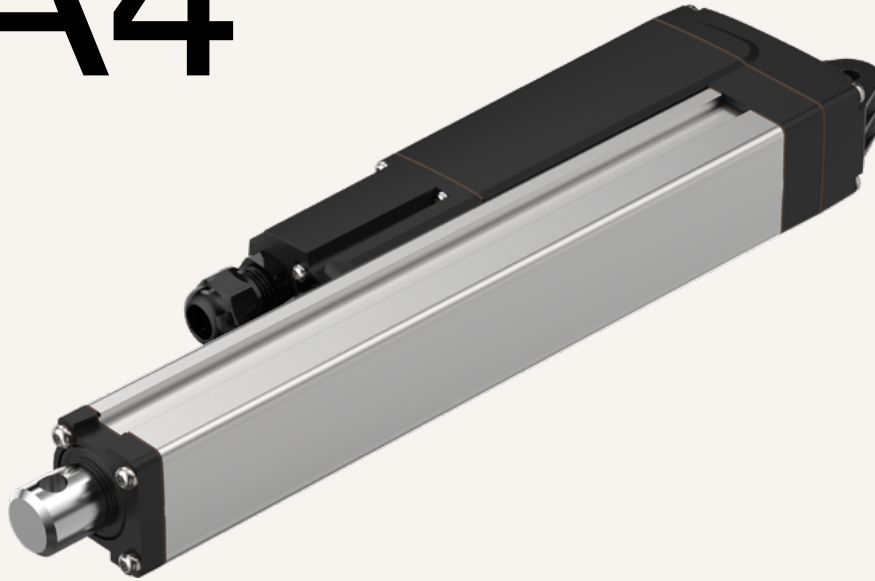


MA4

series



Product Segments

• Industrial Motion

TiMOTION's MA4 series is a compact electric linear actuator, suited for almost any working condition. Furthermore, the MA4 has an optional **T-Smart** version. Embedded with a TiMOTION driver board, the MA4 allows for easy integration with different control interfaces, eliminating the need of an external control box.

The MA4 is available in three T-Smart alternatives:

1)T-Smart Advanced

The T-Smart Advanced alternative allows for synchronization of up to 8 actuators, as well as accurate position feedback through a variety of options (Hall, Hall-Pot., PWM).

2) T-Smart SAE J1939

This alternative provides seamless integration with CAN bus SAE J1939 interfaces, the standardized communication protocol commonly implemented in off-road vehicles and other industrial applications.

3)T-Smart Modbus

Modbus is a serial communication protocol predominantly used in industrial automation and process control. The T-Smart Modbus alternative can be smoothly incorporated into existing industrial systems.

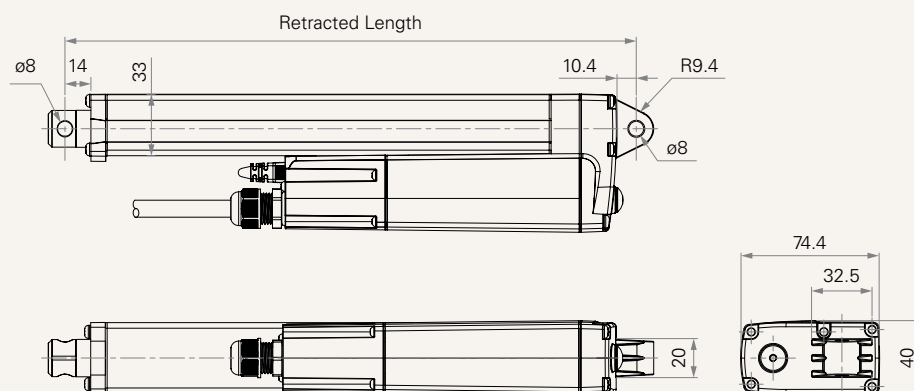
All T-Smart alternatives are compatible with TiMOTION's software program, **PGMA**, providing the user autonomy to adjust parameters such as speed, stroke limits, soft stop, soft start, and much more.

General Features

Max. load	2,000N (push/pull)
Max. speed at max. load	6.1mm/s
Max. speed at no load	46.1mm/s
Retracted length	≥ 215mm (depending on chosen options)
IP rating	IP69K
Stroke	25~1000mm
Output signals	Adjustable Reed switch, mechanical Pot., Hall sensor(s), NPN Hall sensors
Options	T-Smart
Voltage	12/24V DC; 12/24V DC (thermal switch)
Operational temperature range	-40°C~+85°C
Operational temperature range at full performance	+5°C~+45°C
Manual drive	

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 (6000RPM, Duty Cycle 25%)							
A	250	250	325	0.8	1.2	46.1	42.6
B	500	500	650	0.8	1.7	29.5	25.8
C	1000	1000	1300	0.8	2.2	14.8	12.2
D	1500	1500	1950	1.0	2.2	9.8	8.2
E	2000	2000	2600	1.0	2.2	7.4	6.1

Note

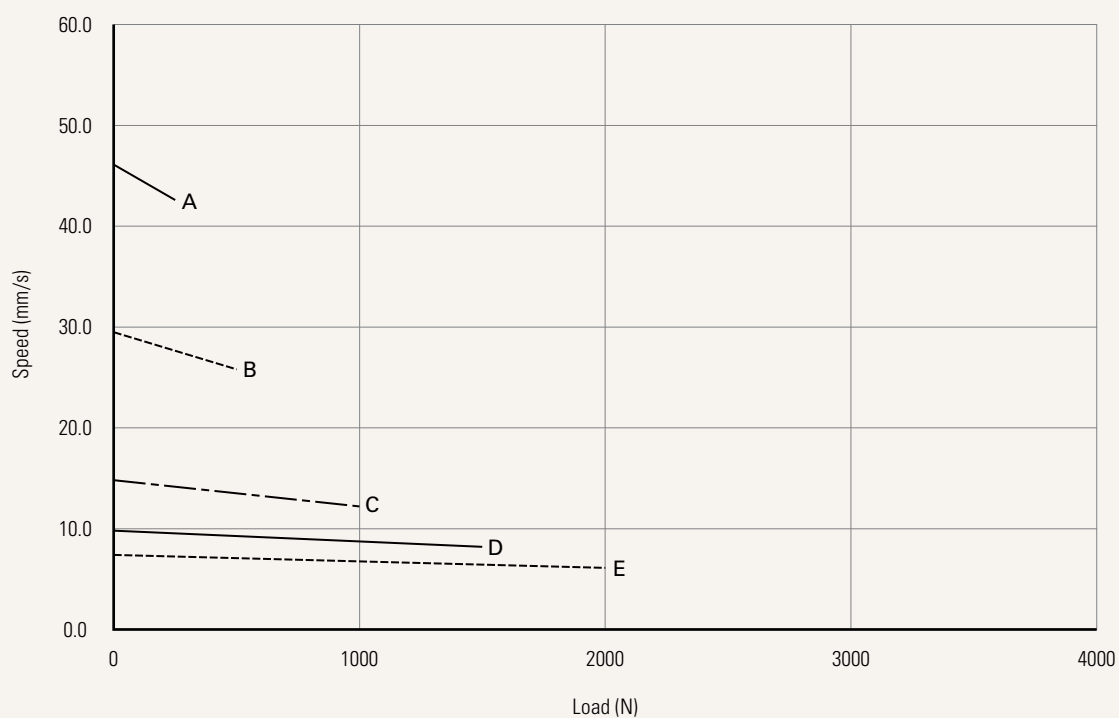
- 1 Please refer to the approved drawing for the final authentic value.
- 2 The current & speed in table are tested with 24V DC motor. With a 12V DC motor, the current is approximately twice the current measured in 24V DC. With a 36V DC motor, the current is approximately two-thirds the current measured 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.
- 3 The current & speed in table are tested when the actuator is extending under push load.
- 4 With load, noise level ≤ 80 dB(A) (by TiMOTION test standard, ambient noise level ≤ 36 dB(A)).
- 5 Standard stroke: Min. 25 mm, Max. please refer to the table below.

CODE	Load (N)	Max Stroke (mm)
A	≤ 250	1000
B	≤ 500	800
C	≤ 1000	600
D	≤ 1500	500
E	≤ 2000	450

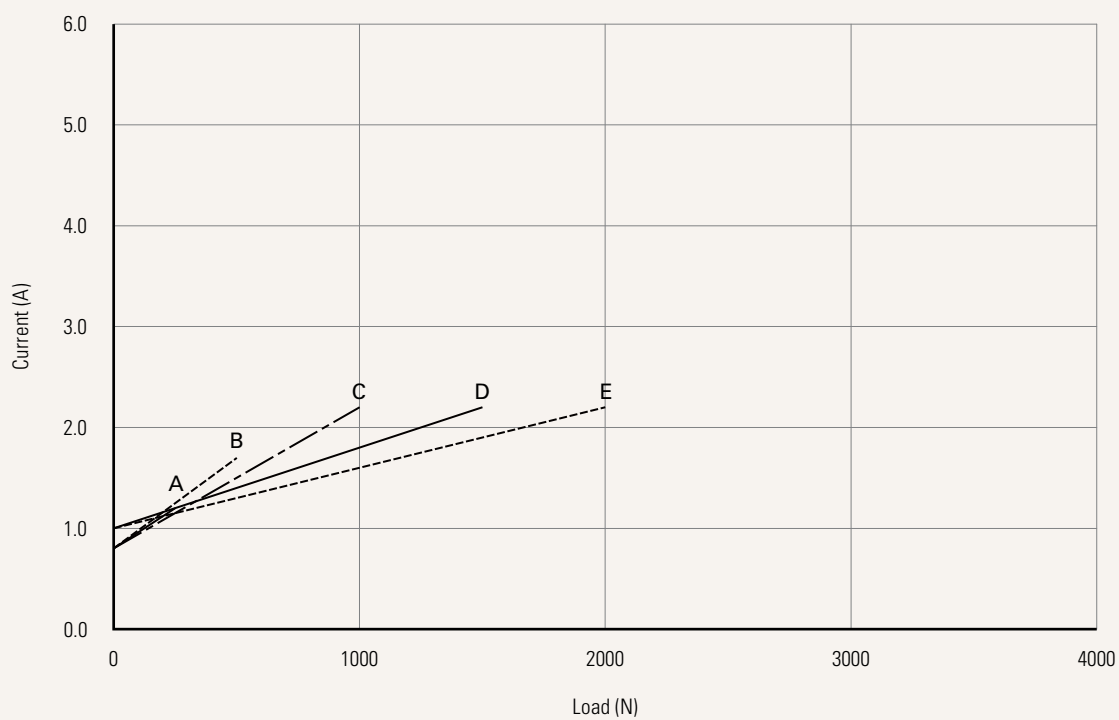
Performance Data (24V DC Motor)

Motor Speed (6000RPM, Duty Cycle 25%)

Speed vs. Load



Current vs. Load



Type	N = Normal		T = T-Smart	
Voltage	1 = 12V DC 2 = 24V DC		6 = 12V DC, thermal switch 5 = 24V DC, thermal switch	
Load & Speed	See page 2			
Stroke (mm)	See page 2			
Retracted Length (mm)	See page 5			
Rear Attachment (mm) See page 6	1 = Aluminum, slotless, hole 6.4 2 = Aluminum, slotless, hole 8.0 3 = Aluminum, slotless, hole 10.0		4 = Aluminum, U clevis, slot 6.1, depth 10.5, hole 6.4 5 = Aluminum, U clevis, slot 6.1, depth 10.5, hole 8.0 6 = Aluminum, U clevis, slot 6.1, depth 10.5, hole 10.0	
Front Attachment (mm) See page 6	1 = Aluminum, slotless, hole 6.4 2 = Aluminum, slotless, hole 8.0 3 = Aluminum, slotless, hole 10.0		4 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 6.4 5 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 8.0 6 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 10.0	
Direction of Rear Attachment (Counterclockwise) See page 7	1 = 0°		3 = 90°	
Function of Limit Switches	1 = Two micro switches cut off the actuator at end of stroke 3 = Two micro switches send signal at end of stroke (signal type: normally closed)			
Adjustable Reed Switch	0 = Without 1 = Reed switch*1, tinned leads		2 = Reed switch*2, tinned leads	
Output Signal See page 8	0 = Without 1 = Mechanical Pot.		4 = Hall sensor*1 5 = Hall sensor*2	N = *NPN Hall sensor*2
IP Rating	1 = Without 6 = IP66M		7 = IP67 8 = IP68	9 = IP69K
Cable Exit	T = Direct cable out, 1+1 type			
A1/P1 Connector (mm) See page 7	01 = Tinned leads, core wire 50, stripped wire 10			
A1/P1 Cable Length (mm)	0500 = 500	1000 = 1000	1500 = 1500	2000 = 2000
P2 Connector	0P = Rubber plug			
P2 Cable Length (mm)	0000 = Without			
Alternative	N = Normal T= Advanced J = SAE J1939 (J1939 default, 250kbps)		K = SAE J1939 (500kbps) M = Modbus	
Packaging (mm²)	0 = Sample packaging C = Standard package, US fumigated pallet (1219*1016) 1 = Standard package, EU fumigated pallet (1200*800) 2 = Standard package, EU fumigated pallet (1500*800) E = Standard package, US plywood pallet (1219*1016) 5 = Standard package, EU plywood pallet (1200*800) 6 = Standard package, EU plywood pallet (1500*800)			

Retracted Length (mm)

1. If stroke $\leq 108\text{mm}$, minimum retracted length refer to the chart below

Front Attach.	Rear Attach.	
	1, 2, 3	4, 5, 6
1, 2, 3	+215	+215
4, 5, 6	+228	+228

2. If Stroke $\geq 109\text{mm}$, Calculate $A+B+C=Y$

3. Minimum retracted length is Stroke+Y

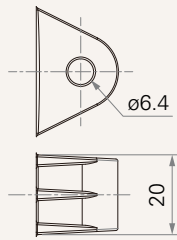
A.		
Front Attach.	Rear Attach.	
	1, 2, 3	4, 5, 6
1, 2, 3	+106	+106
4, 5, 6	+119	+119

B.	
Stroke (mm)	Load & Speed Type (N)
	A, B, C, D, E
25~150	-
151~200	+2
201~250	+2
251~300	+2
301~350	+12
351~400	+22
401~450	+32
451~500	+42
501~550	+52
551~600	+62
601~650	+72
651~700	+82
701~750	+92
751~800	+102
801~850	+112
851~900	+122
901~950	+132
951~1000	+142

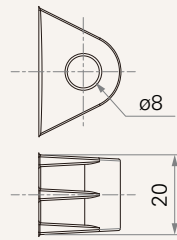
C.	
Output Signal	
0, 4, 5, N, T	-
1	+18

Rear Attachment (mm)

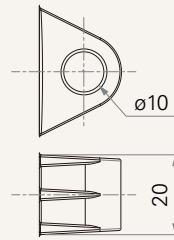
1 = Aluminum, slotless, hole 6.4



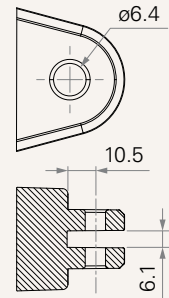
2 = Aluminum, slotless, hole 8.0



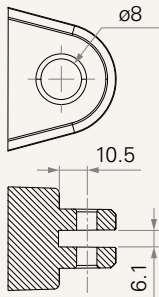
3 = Aluminum, slotless, hole 10.0



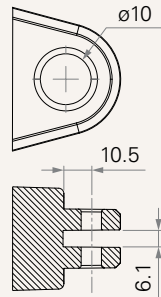
4 = Aluminum, U clevis, slot 6.1, depth 10.5, hole 6.4



5 = Aluminum, U clevis, slot 6.1, depth 10.5, hole 8.0

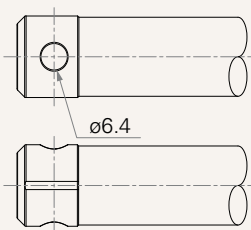


6 = Aluminum, U clevis, slot 6.1, depth 10.5, hole 10.0

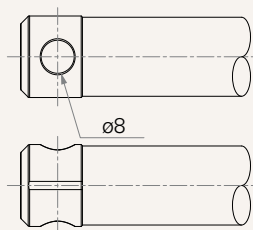


Front Attachment (mm)

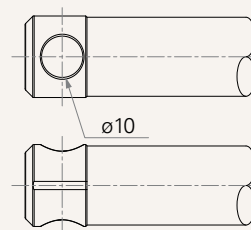
1 = Aluminum, slotless, hole 6.4



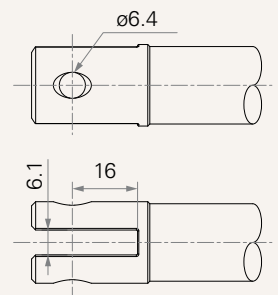
2 = Aluminum, slotless, hole 8.0



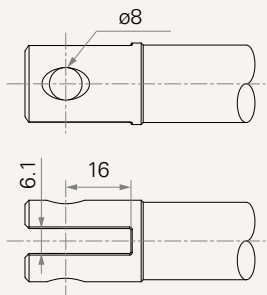
3 = Aluminum, slotless, hole 10.0



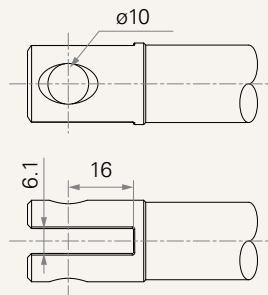
4 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 6.4



5 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 8.0



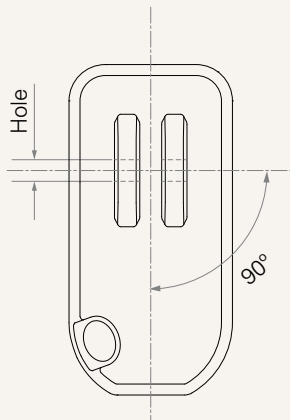
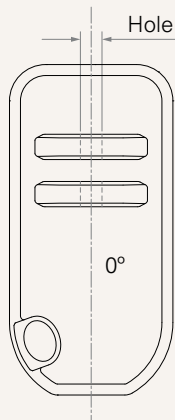
6 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 10.0



Direction of Rear Attachment (Counterclockwise)

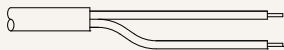
1 = 0°

3 = 90°



Connector (mm)

01 = Tinned leads, core wire 50,
stripped wire 10



Wire Definition

Normal							
Port Number	Function of Limit Switches	Wire Color	Wire Gauge (AWG)	Position Feedback			
				0. Without	1. Mechanical pot.	4. Hall sensor*1	5. Hall sensor*2
P1	Two Micro Switches Cut Off The Actuator at EOS	RD	20	EXT+	EXT+	EXT+	EXT+
		BK	20	RET+	RET+	RET+	RET+
		RD	26	-	V-out	+5V	+5V
		WH	26	-	V-in	S1	S1
		BU	26	-	-	-	S2
		BK	26	-	GND	GND	GND
		BN	26	-	-	-	-
		OG	26	-	-	-	-
		VT	26	-	-	-	-
P1	Two Micro Switches Send Signal at EOS	RD	20	EXT+	EXT+	EXT+	EXT+
		BK	20	RET+	RET+	RET+	RET+
		RD	26	COM	COM	+5V	+5V
		WH	26	EOS-extended	EOS-extended	S1	S1
		BU	26	EOS-retracted	EOS-retracted	-	S2
		BK	26	-	GND	GND	GND
		BN	26	-	V-in	EOS-extended	EOS-extended
		OG	26	-	V-out	EOS-retracted	EOS-retracted
		VT	26	-	-	COM	COM
T-Smart							
Port Number		Wire Color	Wire Gauge (AWG)	T-Smart			
P1		RD	20	V DC+			
		BK	20	V DC-			
		BN	26	Ctrl EXT			
		GY	26	Ctrl RET			
		OG	26	EOS-extended			
		YE	26	EOS-retracted			
		BK	26	Signal ground			
		WH	26	S1/POT/CAN+			
		BU	26	S2/PWM/CAN-			
P2	Molex 6p socket for TAD1 / Reed switch assembly						

