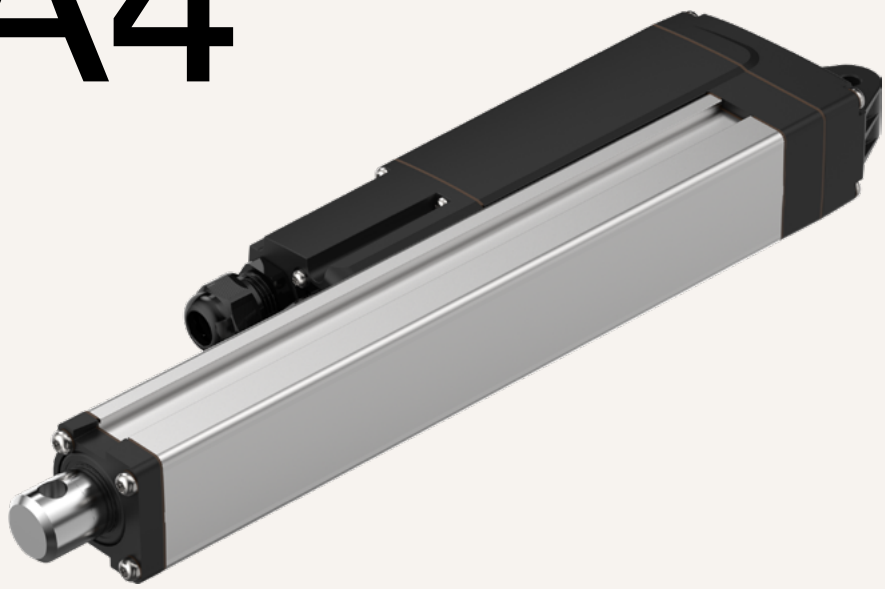
MA4

series



Product Segments

- **Industrial Motion**

TiMOTION's MA4 series is a compact electric linear actuator, suited for almost any working condition. With a high IP rating and extraordinary toughness, the MA4 is a solid and versatile solution for agricultural, industrial and commercial applications.

Furthermore, the MA4 has an optional **T-Smart** version, MA4T. Embedded with a TiMOTION driver board, the MA4T allows for easy integration with different control interfaces, eliminating the need of an external control box.

The MA4T is available in two 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). With exceptional functionality, the T-Smart Advanced alternative is capable of supporting more complex tasks with just one single command.

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.

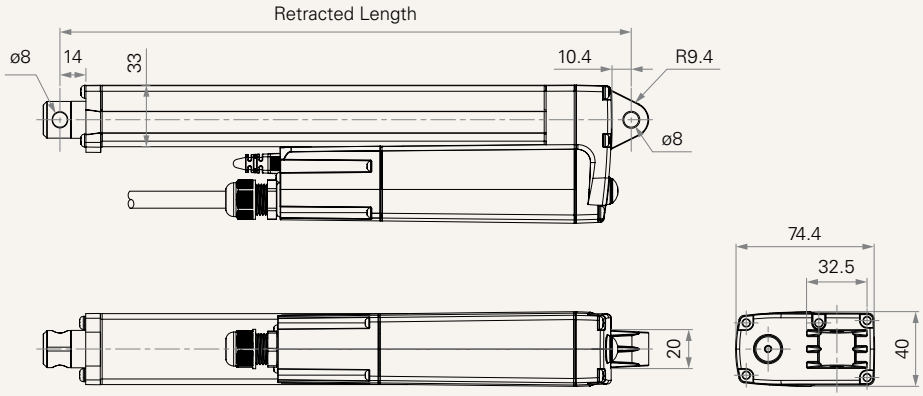
Both T-Smart alternatives of MA4T are compatible with TiMOTION's software program **PGMA**, providing the user autonomy to adjust parameters such as speed, stroke limits, soft stop, soft start, and more. In addition, the PGMA provides real-time status monitoring, and gathers a comprehensive set of usage and performance data.

General Features

Max. load	2,000N (push/pull)
Max. speed at max. load	5.5mm/s
Max. speed at no load	43mm/s
Retracted length	≥ 215mm (depending on chosen options)
IP rating	IP69K
Stroke	25~1000mm
Output signals	Adjustable Reed switch, mechanical Pot., Hall sensor(s)
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	0.7	1.4	43.0	36.5
B	500	500	650	0.6	1.9	27.5	23.0
C	1000	1000	1300	0.6	2.1	14.0	10.5
D	1500	1500	1950	0.6	2.3	9.0	7.0
E	2000	2000	2600	0.6	2.6	7.0	5.5

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 ≤ 78dBA (by TiMOTION test standard, ambient noise level ≤ 36dBA).

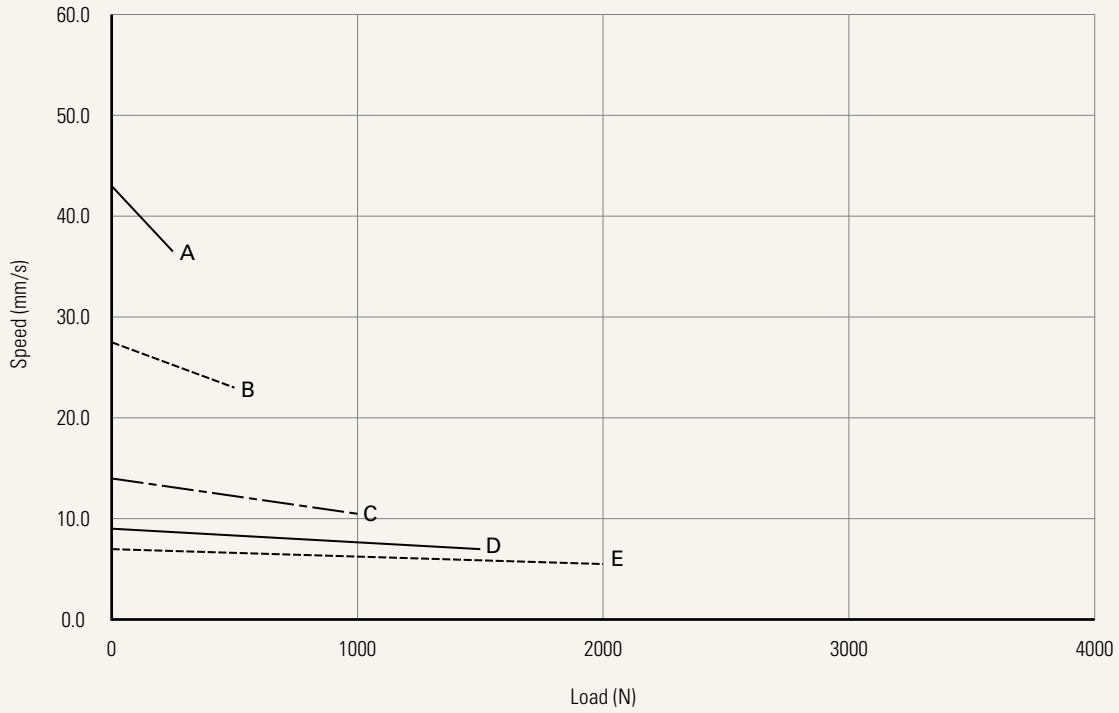
5 Standard stroke: Min. 25 mm, Max. please refer to the table below.

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

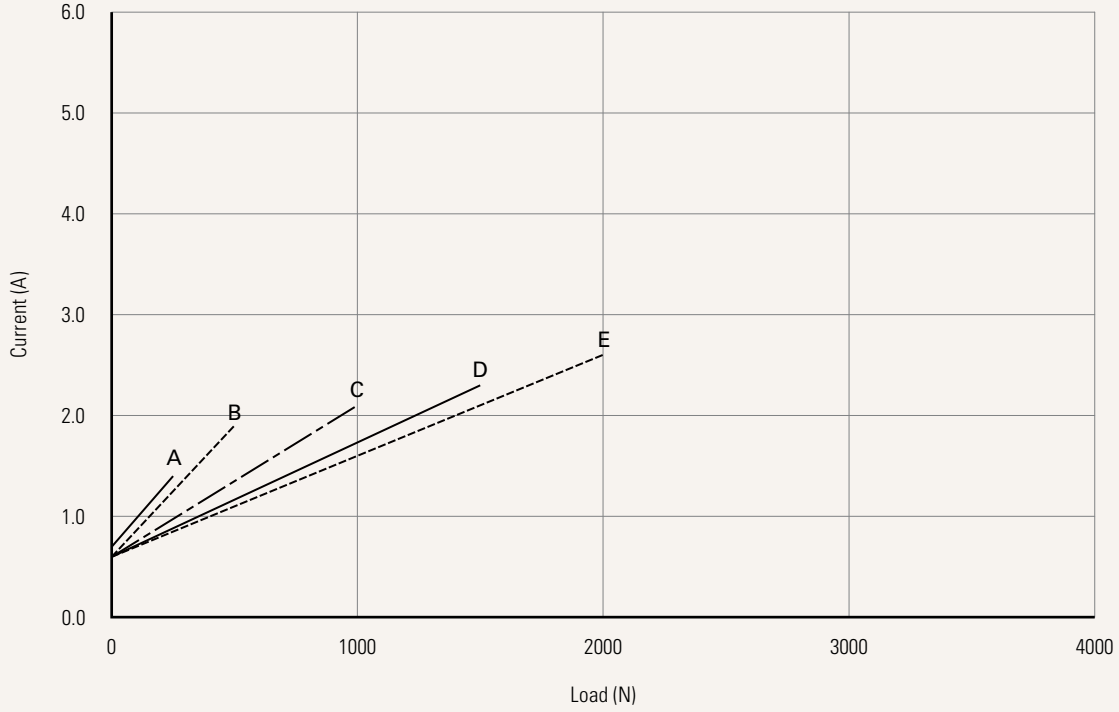
Performance Data (24V DC Motor)

Motor Speed (6000RPM, Duty Cycle 25%)

Speed vs. Load



Current vs. Load



MA4 Ordering Key

MA4

Version: 20230301-E

Hardware System	N = Without driver board	T = Standard driver board		
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 2 = 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
IP Rating	1 = Without 6 = IP66M	7 = IP67 8 = IP68	9 = IP69K	
Cable Exit	T = Direct cable out, 1+1 type			
A1 Connecter (mm) See page 7	01 = Tinned leads, unsheathed wire 50, stripped wire			
A1 Cable Length (mm)	0000 = Without cable 0500 = 500	1000 = 1000 1500 = 1500	2000 = 2000	
P2 Connector	0P = Rubber plug			
P2 Cable Length (mm)	0000 = Without cable			
Bus Interface	C = CAN bus			
Packaging (mm^2)	0 = Sample packaging C = Standard package, US fumigated pallet (1219*1016^2) 1 = Standard package, EU fumigated pallet (1200*800^2) 2 = Standard package, EU fumigated pallet (1500*800^2) E = Standard package, US plywood pallet (1219*1016^2) 5 = Standard package, EU plywood pallet (1200*800^2) 6 = Standard package, EU plywood pallet (1500*800^2)			

MA4 Ordering Key Appendix

Retracted Length (mm)

1. If stroke ≤ 108mm, 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 ≥ 109mm, 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

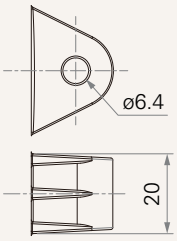
C.

Output Signal	
0, 4, 5, T	-
1	+18

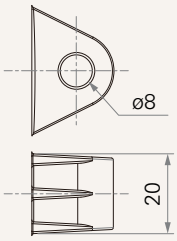
MA4 Ordering Key Appendix

Rear Attachment (mm)

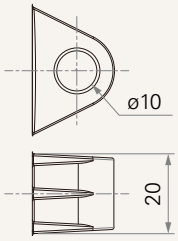
1 = Aluminum, slotless, hole 6.4



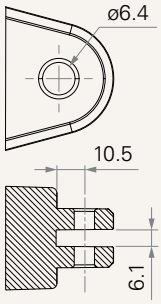
2 = Aluminum, slotless, hole 8.0



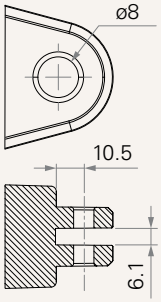
3 = Aluminum, slotless, hole 10.0



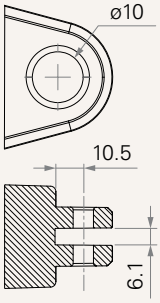
4 = Aluminum, U clevis, slot 6.1, depth 10.5, hole 6.4



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

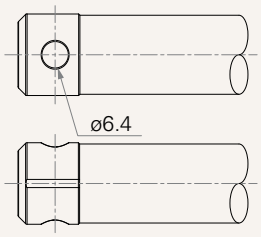


6 = Aluminum, U clevis, slot 6.1, depth 10.5, hole 10.0

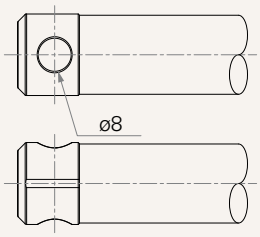


Front Attachment (mm)

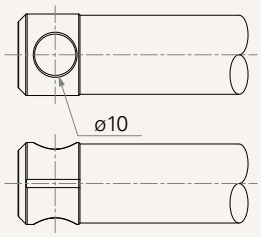
1 = Aluminum, slotless, hole 6.4



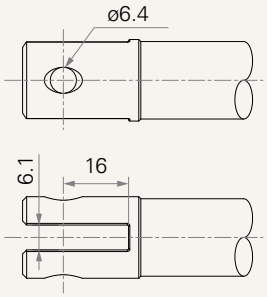
2 = Aluminum, slotless, hole 8.0



3 = Aluminum, slotless, hole 10.0



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



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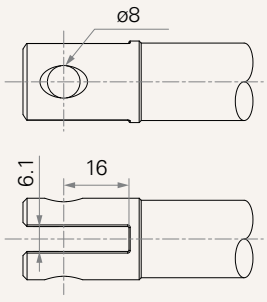
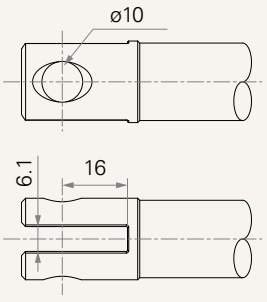
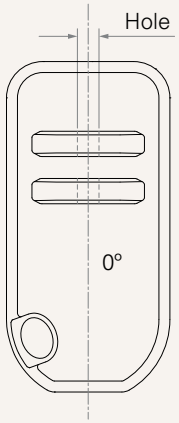


6 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 10.0

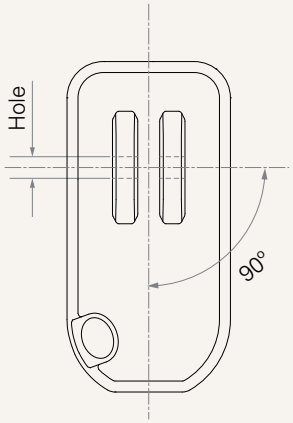


Direction of Rear Attachment (Counterclockwise)

1 = 0°

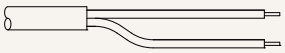


3 = 90°



Connector (mm)

01 = Tinned leads, unsheathed wire
50, stripped wire



MA4 Ordering Key Appendix

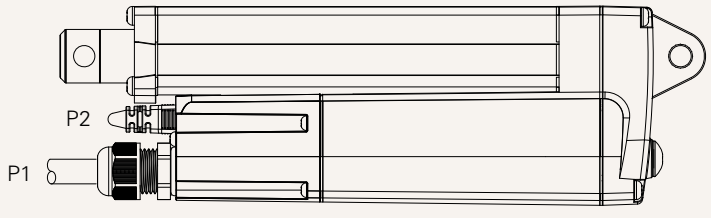
Wire Definition

Without T-Smart

Port Number	Function of Limit Switches	Wire Color	Wire Gauge (AWG)	Position Feedback			
				0. Without	1. Pot.	4. Hall sensor*1	5. Hall sensor*2
P1	2 micro switches cut off the actuator	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	2 micro switches send signal	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		



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