MA4
series

TiMOTION

Product Segments

• Industrial Motion

TiMOTION's MA4 series electric linear actuator was specifically designed for heavy-duty applications and harsh working environments that require durability. The MA4's compact size is suitable for limited installation space but can afford a maximum 3500N force. Applications suitable for the MA4 include agricultural equipment such as fertilizer, seed spreader, harvesters, grain handlers, combines, tractors…etc. Also, commercial and industrial applications include commercial lawn mowers, scrubbers, sweepers, and material handling equipment.

Furthermore, the MA4 has an optional T-Smart (note 1) version, which can work with the PGMA (note 2) to achieve the following functionality:
- Set up the actuator's stroke and speed
- Multiple signal feedbacks support
- Monitor real-time actuator status
- Up to 8 actuator synchronization
- Built-in safety mechanism
- Customized service for BUS required applications (note 3)

Note 1: TiMOTION develops T-Smart functionality. With T-Smart, the actuator has a built-in circuit board with a microprocessor that can operate the actuator without a control box.

Note 2: PGMA is a software program developed by TiMOTION. Users can install this programmer into the laptop and adjust the actuator parameters directly.

**Note 3:** Please contact your local sales department for further assistance.

General Features

Max. load	3,500N (push); 2,000N (pull)
Max. speed at max. load	1.8mm/s
Max. speed at no load	43mm/s
Retracted length	≥ Stroke + 106mm*
IP rating	IP69K
Stroke	20~1000mm
Options	Adjustable reed switch, mechanical POT, Hall sensor(s)
Voltage	12/24V DC; 12/24V DC (thermal control)
Operational temperature range	-40°C~+85°C
Operational temperature range at full performance	+5°C~+45°C

*min. retracted length has to be greater than 213mm

Drawing

Standard Dimensions
(mm)
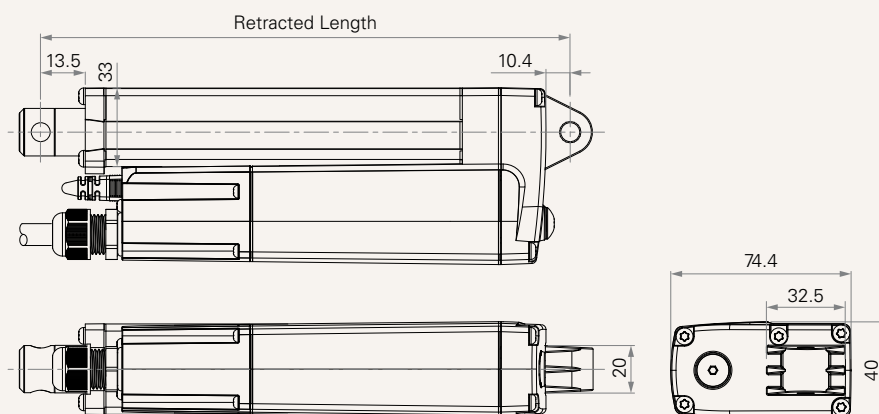
Load and Speed

| 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
Motor Speed (3800RPM, Duty Cycle 25%)							
F	3500	2000	4550	0.8	2.8	3.0	1.8

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

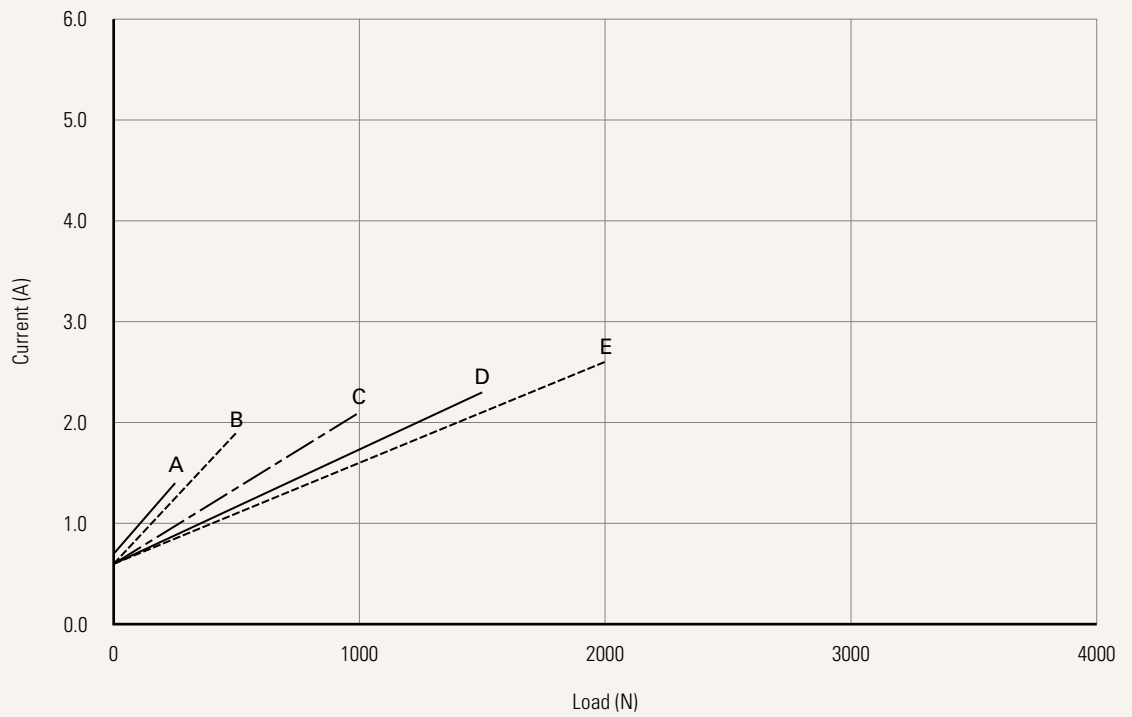| CODE	Load (N)	Max Stroke (mm)
A	≤ 250	1000
B	≤ 500	800
C	≤ 1000	600
D	≤ 1500	500
E	≤ 2000	450
F	≤ 3500	300

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Performance Data (24V DC Motor)

Motor Speed (6000RPM)

Speed vs. Load
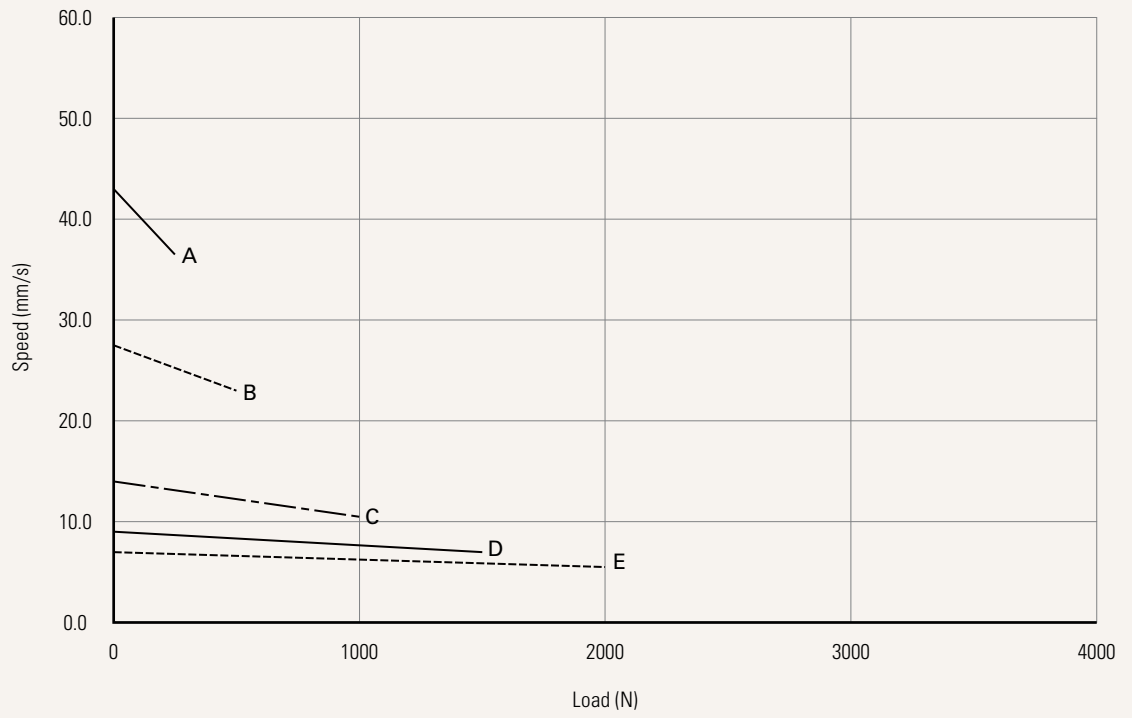
Current vs. Load

Performance Data (24V DC Motor)

Motor Speed (3800RPM)

Speed vs. Load

Current vs. Load

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MA4 Ordering Key

MA4

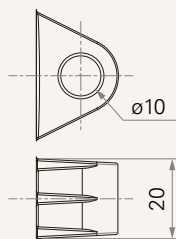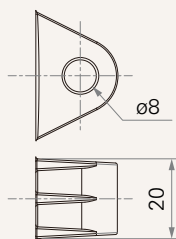|			
Version	N = Without T-Smart	T = T-Smart advanced	
Voltage	1 = 12V DC 2 = 24V DC	5 = 12V DC, thermal cutoff 6 = 24V DC, thermal cutoff	
Load & Speed	See page 2		
Stroke (mm)	See page 2		
Installation Length (mm)	See page 6		
Rear Attachment (mm) See page 7	1 = Aluminum, slotless, hole 6.4mm 2 = Aluminum, slotless, hole 8.0mm 3 = Aluminum, slotless, hole 10.0mm	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 7	1 = Aluminum, slotless, hole 6.4mm 2 = Aluminum, slotless, hole 8.0mm 3 = Aluminum, slotless, hole 10.0mm	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	
Installation Direction (Counter-Clockwise) See page 8	1 = 0°	3 = 90°	
Functions for Built-in Limit Switches at End of Stroke	1 = Two limit switches cut off the acutator at end of stroke 2 = Two limit switches send signal at end of stroke (signal type: normally closed) T = Dedicated option for T-Smart (Two limit switches send signal at end of stroke to T-Smart PCBA)		
Adjustable Reed Switch	0 = Without 1 = One reed switch with C = One reed switch for T-Smart	2 = Two reed switch with tinned leads D = Two reed switch for T-Smart	
Position Feedback See page 9	0 = Without 1 = Mechanical POT	4 = Hall sensor*1 5 = Hall sensor*2	T = Dedicated option for T-Smart
IP Rating	1 = Without	6 = IP66 (dynamic)	9 = IP69K
Cable Exit	T = 1+1: 1* cable with cable gland + Molex 6P socket		
P1 Connecter See page 8	G = tinned leads		
P1 Cable Length	0000 = Without cable 0500 = 500	1000 = 1000 1500 = 1500	2000 = 2000
P2 Connecter	P = Dummy plug		
P2 Cable Length	0000 = Without cable 0500 = 500	1000 = 1000 1500 = 1500	2000 = 2000
Bus Interface	1 = Without	2 = CAN bus	

MA4 Ordering Key Appendix

Retracted Length (mm)

1. If stroke ≤ 106mm, minimum retracted length refer to the chart below

2. If Stroke ≥ 107mm, Calculate A+B+C=Y

3. Minimum retracted length is Stroke+Y

Front Attach.	Rear Attach.	
	1, 2, 3	4, 5, 6
1, 2, 3	213	213
4, 5, 6	226	226

A.

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

B.

Stroke (mm)	
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	+150
951~1000	+160

C.

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

MA4 Ordering Key Appendix

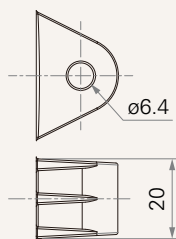**Rear Attachment (mm)**

1 = Aluminum, slotless, hole 6.4mm

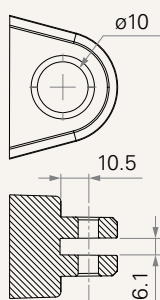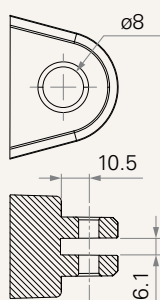ø6.4
20

2 = Aluminum, slotless, hole 8.0mm

ø8
20

3 = Aluminum, slotless, hole 10.0mm

ø10
20

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

ø6.4
10.5
6.1

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

ø8
10.5
6.1

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

ø10
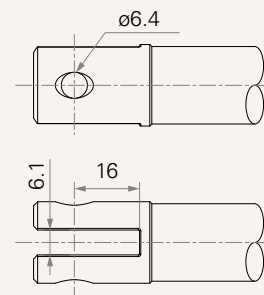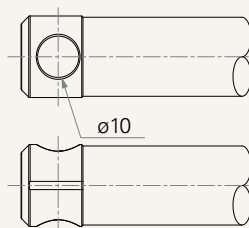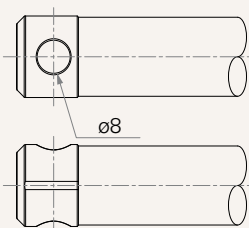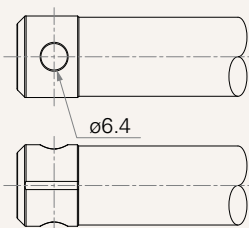10.5
6.1

Front Attachment (mm)

1 = Aluminum, slotless, hole 6.4mm
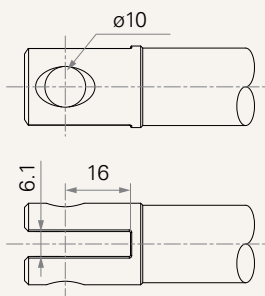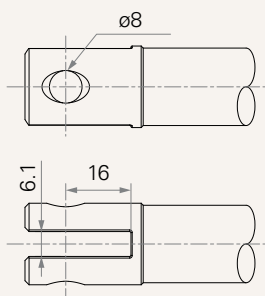
ø6.4

2 = Aluminum, slotless, hole 8.0mm

ø8

3 = Aluminum, slotless, hole 10.0mm

ø10

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

ø6.4
6.1
16

5 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 8.0
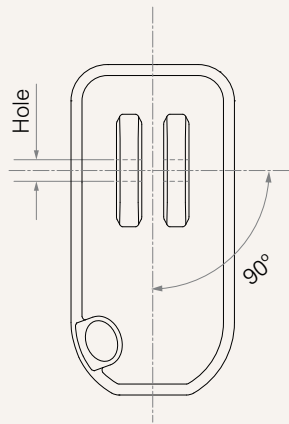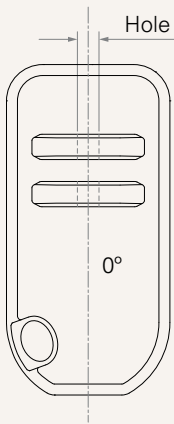
ø8
6.1
16

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

ø10
6.1
16

Installation Direction (Counter-Clockwise)

1 = 0°   3 = 90°

Hole

0°

Hole

90°

P1 Connecter

G = tinned leads

Output Signals

Wire Definitions				Wire Gauge (AWG)	Output Signal Code			
					0. Without	1. POT	4. 1 Hall	5. 2 Hall
without T-Smart	P1	Limit Switches Cut Off the Acutator	🔴 Red	20	Red+, Black- : actuator extend			
			⚫ Black	20	Red-, Black+ :actuator retract			
			🔴 Red	26	-	V-out	+5V	+5V
			⚪ White	26	-	+5V	S1	S1
			🔵 Blue	26	-	GND	-	S2
			⚫ Black	26	-	-	GND	GND
			🟤 Brown	26	-	-	-	-
			🟠 Orange	26	-	-	-	-
			🟣 Purple	26	-	-	-	-
without T-Smart	P1	Limit Switches Send Signal	🔴 Red	20	Red+, Black- : actuator extend			
			⚫ Black	20	Red-, Black+ :actuator retract			
			🔴 Red	26	COM	COM	+5V	+5V
			⚪ White	26	EOS-extended	EOS-extended	S1	S1
			🔵 Blue	26	EOS-retracted	EOS-retracted	-	S2
			⚫ Black	26	-	GND	GND	GND
			🟤 Brown	26	-	+5V	EOS-extended	EOS-extended
			🟠 Orange	26		V-out	EOS-retracted	EOS-retracted
			🟣 Purple	26	-	-	COM	COM

Wire Definitions				Wire Gauge (AWG)	
T-Smart	P1	T-Smart	🔴 Red	20	V DC+
			⚫ Black	20	V DC-
			🟤 Brown	26	Ctrl EXT
			⚪ Gray	26	Ctrl RET
			🟠 Orange	26	EOS-extended
			🟡 Yellow	26	EOS-retracted
			⚫ Black	26	Common
			⚪ White	26	Hall S1 / POT / CAN+
			🔵 Blue	26	Hall S2 / PWM / CAN-
T-Smart	P2	T-Smart		Molex 6p socket for TAD1 / Reed switch assembly	
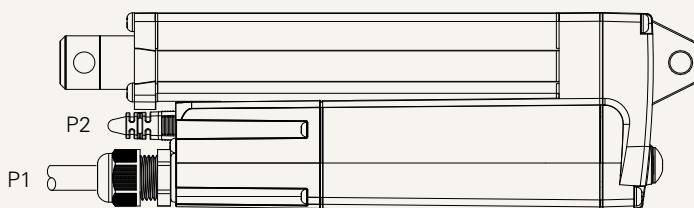
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