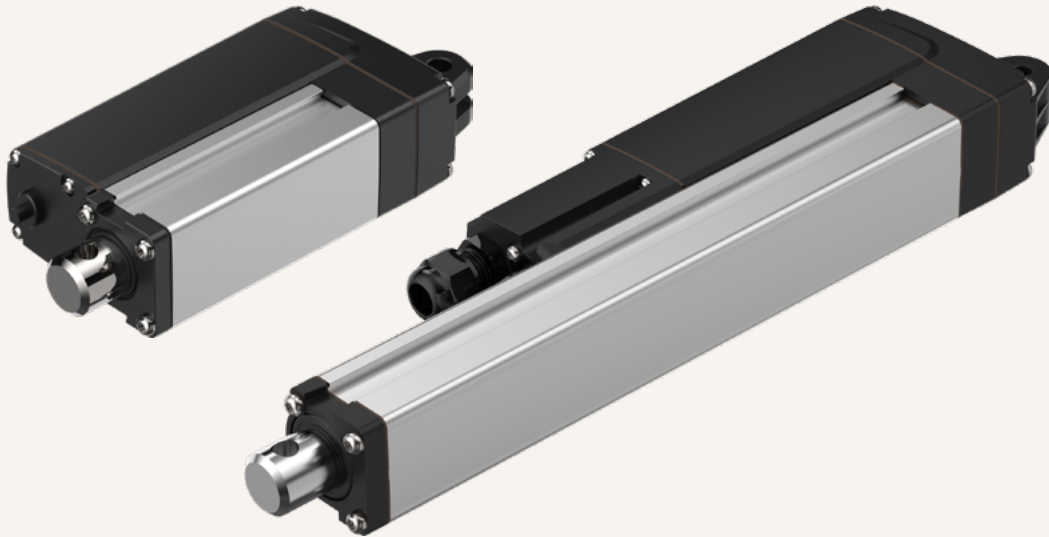


MA4

series



Product Segments

• Industrial Motion

TiMOTION's MA4 series is a compact electric linear actuator, designed to operate effectively in tight spaces. With a range of IP ratings and exceptional durability, the MA4 is a reliable and versatile solution for agricultural, industrial, and commercial applications.

In addition, TiMOTION offers a smaller variant, the MA4-S. Under specific stroke conditions, its minimum retracted length is 70% shorter than standard MA4-N and MA4-T types, making it ideal for extremely limited spaces.

For more information about T-Smart actuators, please click [here](#).

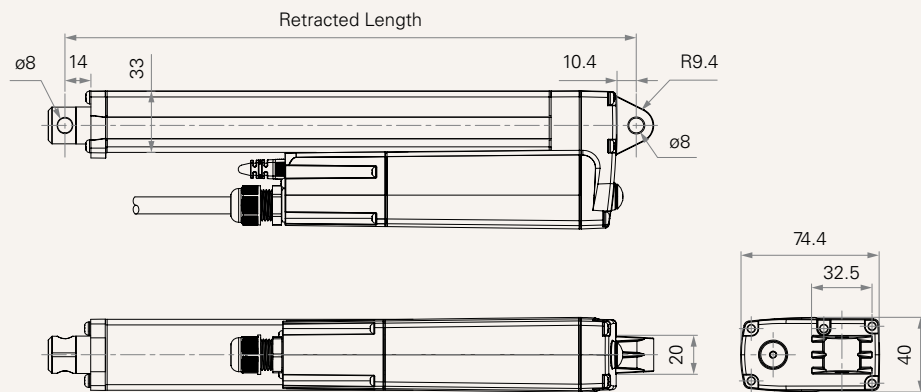
General Features

Max. load	2,500N (push/pull)
Max. speed at max. load	5.1mm/s
Max. speed at no load	43.1mm/s
Retracted length	≥ 215mm (depending on chosen options of MA4-N/-T) ≥ 152mm (depending on chosen options of MA4-S)
IP rating	IP69K (static)
Stroke	25~1000mm
Output signals	Mechanical Pot., Hall sensor * 2 (5-36V input) Hall sensor * 2, signals to embedded PCBA (T-Smart dedicated option)
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	
Protocol support:	Advanced, SAE J1939, Modbus RTU

Drawing

Normal / T-Smart Dimensions

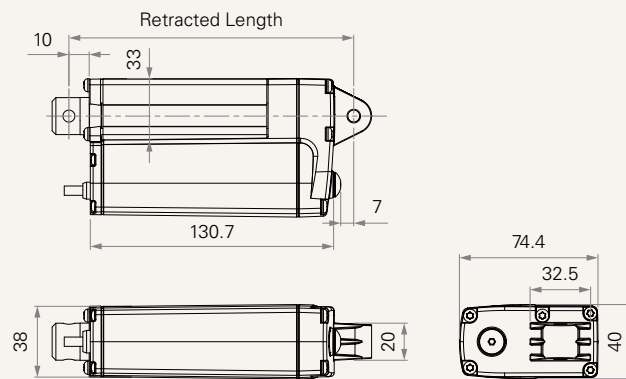
T = 1+1: 1 * cable with cable gland (A1) + Molex 6P socket (P2)
(mm)



Small Version, Normal / Small version, with BUS control Dimensions

1 = Single cable

(mm)



Load and Speed (12V DC)

CODE	Duty Cycle	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Pull		No Load	With Load	No Load	With Load
Motor Speed (6000RPM)								
A	25%	250	250	325	2.0	2.8	46.7	43.1
B	25%	500	500	650	2.0	3.6	29.9	26.3
C	25%	1000	1000	1300	1.8	4.5	15	12.5
D	25%	1500	1500	1950	1.8	4.5	10	8.3
E	25%	2000	2000	2600	1.8	4.5	7.8	6.5
F	25%	2500	2500	3250	1.8	4.9	6.4	5.2

Load and Speed (24V DC)

CODE	Duty Cycle	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Pull		No Load	With Load	No Load	With Load
Motor Speed (6000RPM)								
A	25%	250	250	325	1.0	1.3	43.1	42.2
B	25%	500	500	650	1.0	1.7	28.1	25.8
C	25%	1000	1000	1300	0.8	2.2	14.3	12.0
D	25%	1500	1500	1950	0.8	2.2	9.6	8.2
E	25%	2000	2000	2600	0.8	2.2	7.5	6.3
F	25%	2500	2500	3250	0.8	2.3	6.1	5.1

Note

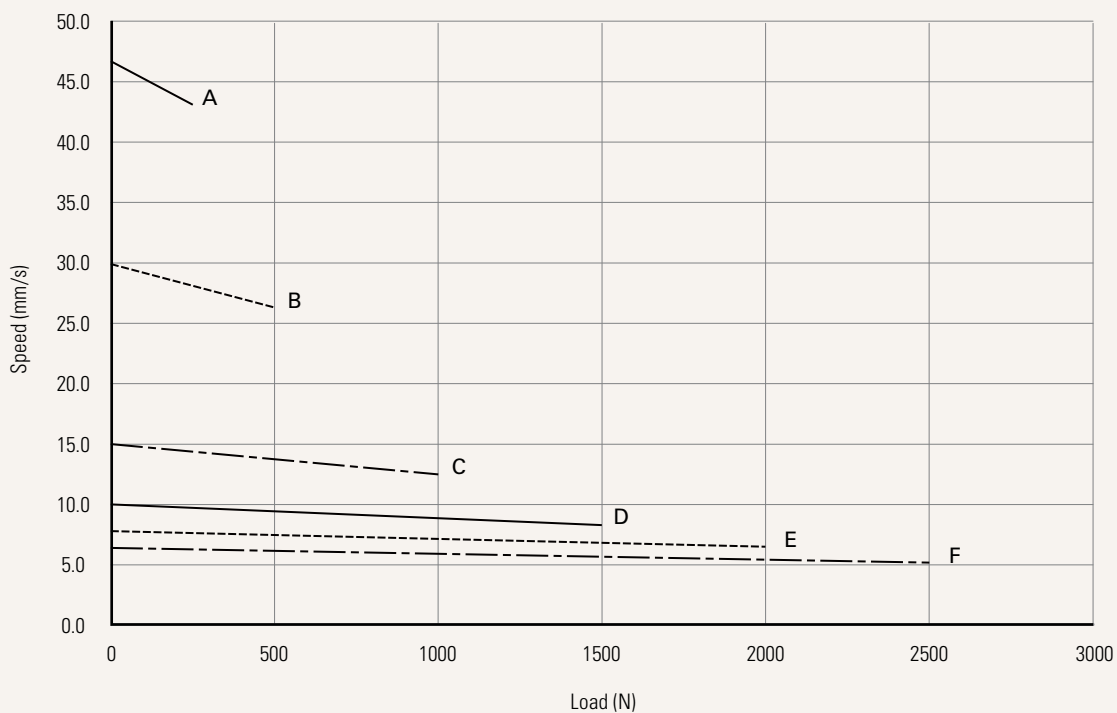
- 1 Please refer to the approved drawing for the final authentic value.
- 2 The current & speed in table are tested with a stable power supply, under ambient temperature 20°C.
- 3 The current & speed in table are tested when the actuator is extending under push load.
- 4 With load, noise level ≤ 80dBA (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
F	≤ 2500	300

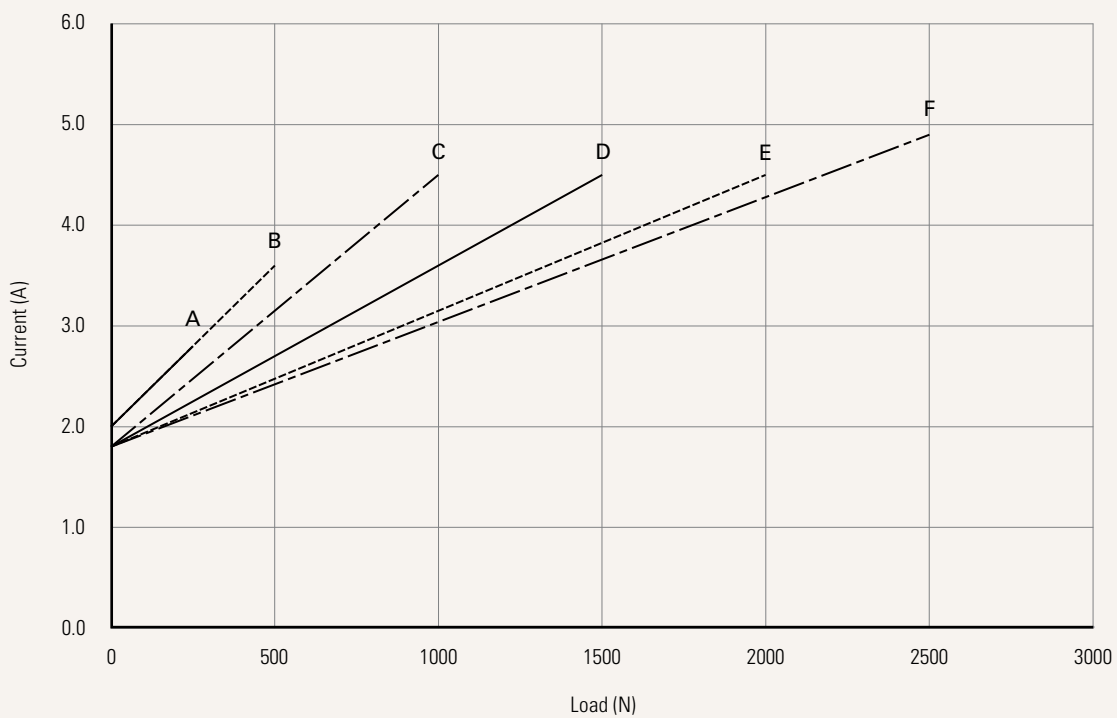
Performance Data (12V DC Motor)

Motor Speed (6000RPM, Duty Cycle 25%)

Speed vs. Load



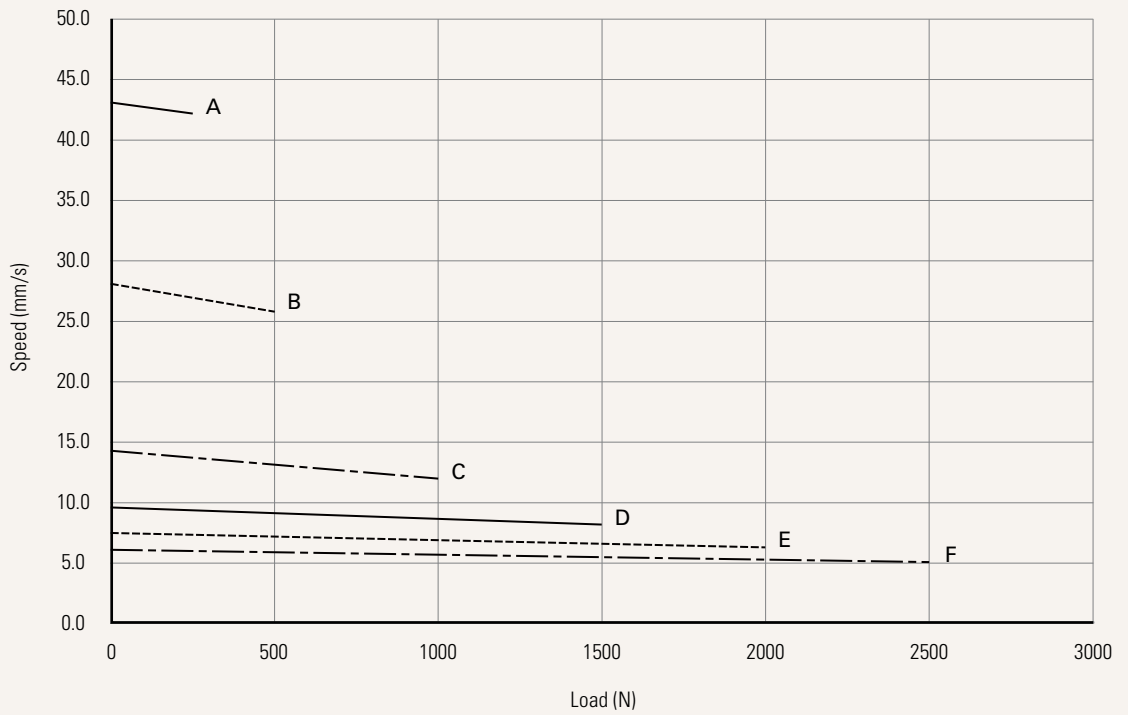
Current vs. Load



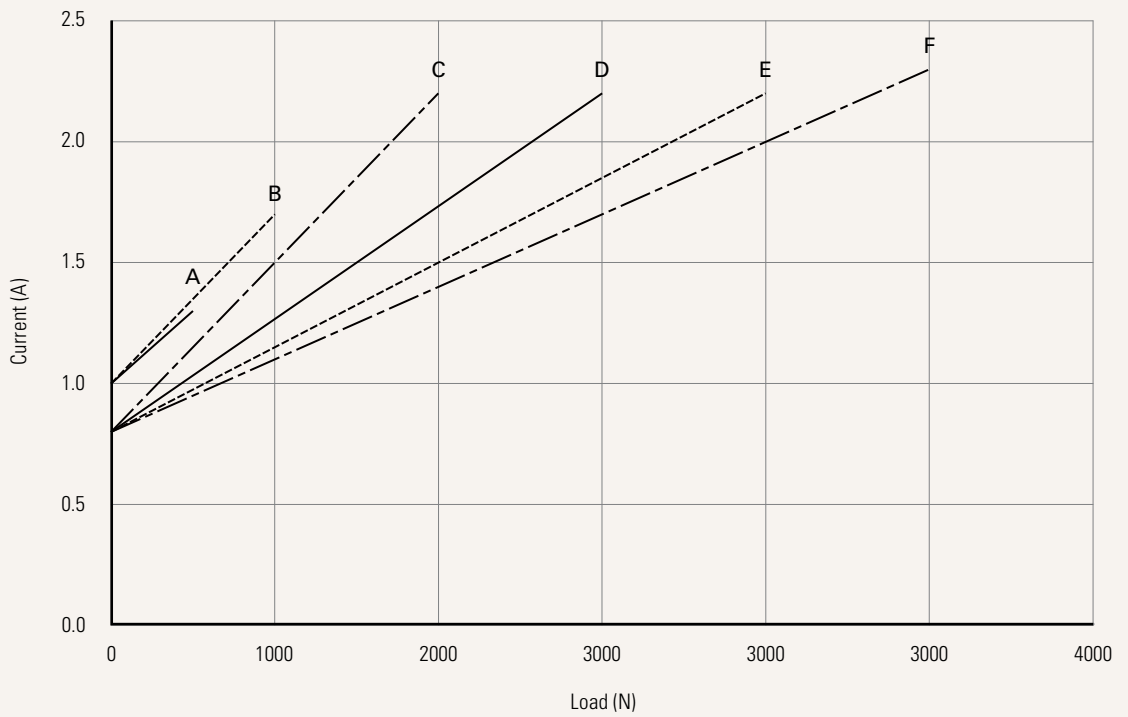
Performance Data (24V DC Motor)

Motor Speed (6000RPM, Duty Cycle 25%)

Speed vs. Load



Current vs. Load



Type	N = Normal	T = T-Smart	S = Small version, normal
Voltage	1 = 12V DC	2 = 24V DC	
Load & Speed	See page 2		
Stroke (mm)	See page 2		
Retracted Length (mm)	See page 8		
Rear Attachment (mm) See page 9	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 9	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 7 = Stainless Steel 316L, U clevis, slot 6.1, depth 16.0, hole 6.4		8 = Stainless Steel 316L, U clevis, slot 6.1, depth 16.0, hole 8.0 9 = Stainless Steel 316L, U clevis, slot 6.1, depth 16.0, hole 10.0 B = Aluminum, U clevis, slot 6.1, depth 13.0, hole 6.4 C = Aluminum, U clevis, slot 6.1, depth 13.0, hole 8.0 D = Aluminum, U clevis, slot 6.1, depth 13.0, hole 10.0
Direction of Rear Attachment (Counterclockwise) See page 10	1 = 0°	3 = 90°	
Function of Limit Switches See page 11-14	1 = Two limit switches cut off the actuator at EOS 2 = Two limit switches cut off the actuator at EOS + third one in between sends signal 3 = Two limit switches send signal at end of stroke 4 = Two limit switches send signal at end of stroke + third one in-between sends signal		6 = Two limit switches cut off the actuator and send signal at EOS T = Two limit switches send signal at end of stroke to embedded PCBA (T-Smart dedicated option)
External Signal of Actuator	0 = Without 1 = Reed switch * 1, tinned leads (NC, signal to customer control system) 2 = Reed switch * 2, tinned leads (NC, signal to customer control system) 3 = Reed switch * 1, tinned leads (NO, signal to customer control system)		4 = Reed switch * 2, tinned leads (NO, signal to customer control system) C = Reed switch * 2, Molex 6p connector, signals to embedded PCBA
Output Signal See page 11-14	0 = Without 1 = Mechanical Pot. N = Hall sensor * 2 (5-36V input)		T = Hall sensor * 2, signals to embedded PCBA (T-Smart dedicated option)
IP Rating	1 = Without 6 = IP66M	7 = IP67 8 = IP68	9 = IP69K



Cable Exit	T = 1+1: 1* cable with cable gland (A1) + Molex 6P socket (P2)	1 = Single cable
A1/P1 Connector (mm)	01 = Tinned leads, core wire 50, stripped wire 10 See page 10	
A1/P1 Cable Length (mm)	XXXX = Input 4 digital number directly, range 0-5000, multiples of 100 (e.g. 500, enter 0500)	
P2 Connector	0P = Rubber plug	00 = Without
P2 Cable Length (mm)	0000 = Without	
Vent Valve	0 = Without	1 = With
Alternative	N = Normal T = Advanced	M = Modbus A = Customized, proposal number needed
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)

- If type N/T, stroke ≤ 108 mm, minimum retracted length=Y ; stroke ≥ 109 mm, minimum retracted length=stroke +Y; calculate $Y=A+B+C$ (refer to Tables A, B, and C).
 - If type N/T, stroke ≤ 50 mm, minimum retracted length=Y ; stroke ≥ 51 mm, minimum retracted length=stroke +Y; calculate $Y=A+B+C$ (refer to Tables A, B, and C).
- * If stroke ≥ 108 mm , minimum retracted length of type N/T & type S/P will be 5mm different.

A.		
Front Attach.	Type: N/T	Type: S/P
1, 2, 3	+107	+102
4, 5, 6, 7, 8, 9	+120	+115
B, C, D	+111	+106

B.					
Stroke (mm)	Load & Speed Type (N)				
	Type: N/T		Type: S/P		
	A, B	C, D, E, F	A, B	C, D, E, F	
25~108	+110	+108	25~50	+52	+50
109~150	+2	-	51~150	+2	-
151~200	+4	+2	151~200	+4	+2
201~250	+4	+2	201~250	+4	+2
251~300	+4	+2	251~300	+4	+2
301~350	+14	+12	301~350	+14	+12
351~400	+24	+22	351~400	+24	+22
401~450	+34	+32	401~450	+34	+32
451~500	+44	+42	451~500	+44	+42
501~550	+54	+52	501~550	+54	+52
551~600	+64	+62	551~600	+64	+62
601~650	+74	-	601~650	+74	-
651~700	+84	-	651~700	+84	-
701~750	+94	-	701~750	+94	-
751~800	+104	-	751~800	+104	-
801~850	+114	-	801~850	+114	-
851~900	+124	-	851~900	+124	-
901~950	+134	-	901~950	+134	-
951~1000	+144	-	951~1000	+144	-

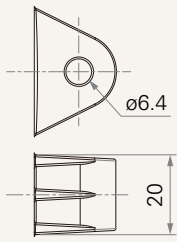
Note

- * The min. RL is the same across the range of strokes.

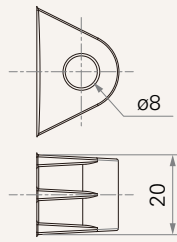
C.	
Output Signal	
0, 4, 5, N, T	-
1	+18

Rear Attachment (mm)

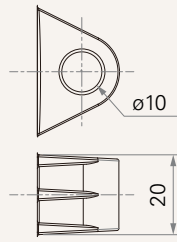
1 = Aluminum, slotless, hole 6.4



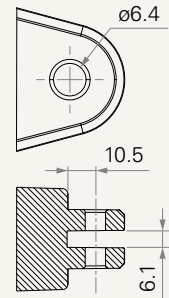
2 = Aluminum, slotless, hole 8.0



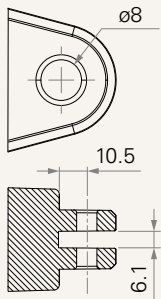
3 = Aluminum, slotless, hole 10.0



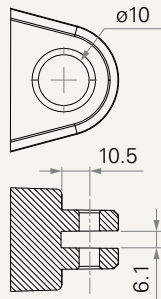
4 = Aluminum, U clevis, slot 6.1, depth 10.5, hole 6.4



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

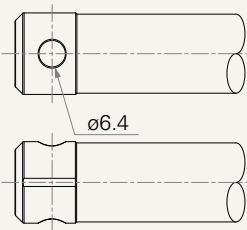


6 = Aluminum, U clevis, slot 6.1, depth 10.5, hole 10.0

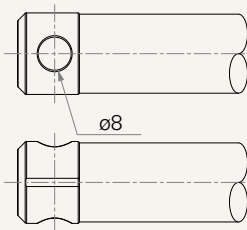


Front Attachment (mm)

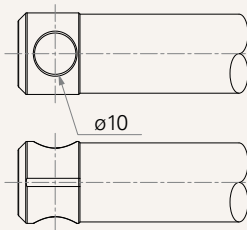
1 = Aluminum, slotless, hole 6.4



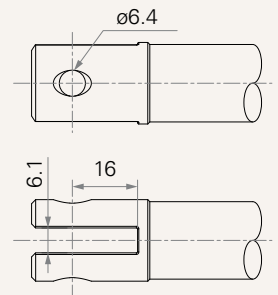
2 = Aluminum, slotless, hole 8.0



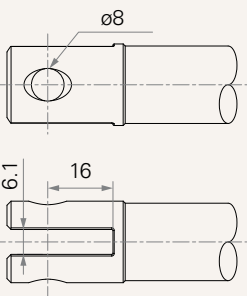
3 = Aluminum, slotless, hole 10.0



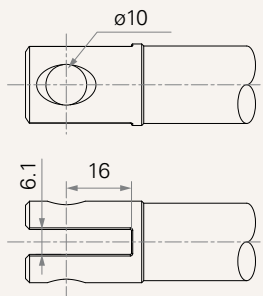
4 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 6.4



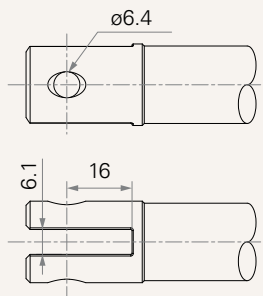
5 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 8.0



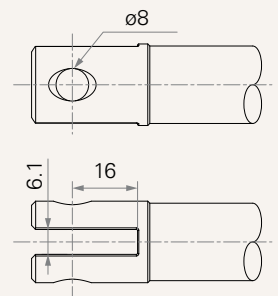
6 = Aluminum, U clevis, slot 6.1, depth 16.0, hole 10.0



7 = Stainless Steel 316L, U clevis, slot 6.1, depth 16.0, hole 6.4

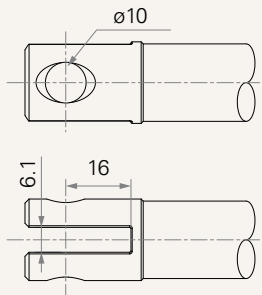


8 = Stainless Steel 316L, U clevis, slot 6.1, depth 16.0, hole 8.0

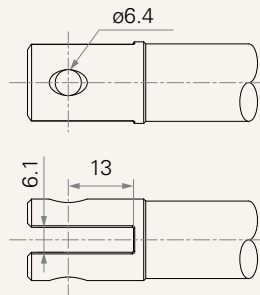


Front Attachment (mm)

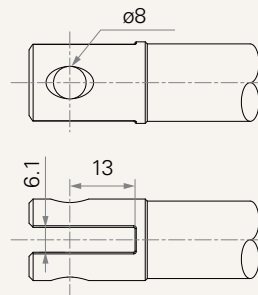
9 = Stainless Steel 316L, U clevis, slot 6.1, depth 16.0, hole 10.0



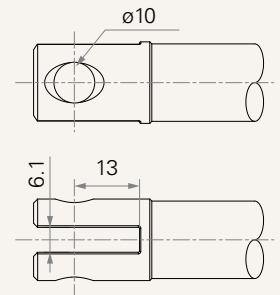
B = Aluminum, U clevis, slot 6.1, depth 13.0, hole 6.4



C = Aluminum, U clevis, slot 6.1, depth 13.0, hole 8.0

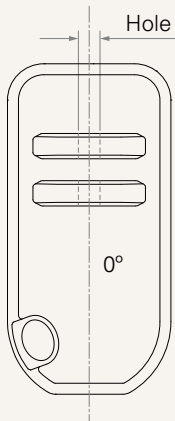


D = Aluminum, U clevis, slot 6.1, depth 13.0, hole 10.0

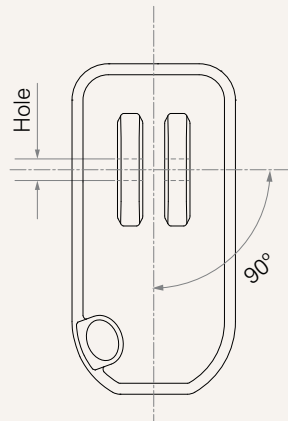


Direction of Rear Attachment (Counterclockwise)

1 = 0°

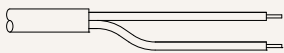


3 = 90°



Connector (mm)

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



Wire Definition

Type: #N, Normal

Port Number	Function of Limit Switches	Wire Color	Wire Gauge (AWG)	Output Signal		
				0. Without	1. Mechanical pot.	5. Hall sensor * 2
A1	1 Two limit switches cut off the actuator at end of stroke	● RD	20	EXT+	EXT+	EXT+
		● BK	20	RET+	RET+	RET+
		● RD	26	X	POT-out	Vcc+
		○ WH	26	X	POT-Vin (5V)	S1
		● BK	26	X	GND	Hall-GND
		● BU	26	X	X	S2
		● BN	26	X	X	X
		● GY	26	X	X	X
		● OG	26	X	X	X
		● VT	26	X	X	X
A1	2 Two limit switches cut off the actuator at EOS + third one in between sends signal	● RD	20	EXT+	EXT+	EXT+
		● BK	20	RET+	RET+	RET+
		● RD	26	X	X	Vcc+
		○ WH	26	3rd LS pin1	3rd LS pin1	S1
		● BK	26	3rd LS pin2	POT-GND	Hall-GND
		● BU	26	X	3rd LS pin2	S2
		● BN	26	X	POT-Vin (5V)	3rd LS pin1
		● GY	26	X	X	X
		● OG	26	X	POT-Vout	3rd LS pin2
		● VT	26	X	X	X
A1	3 Two limit switches send signal at end of stroke	● RD	20	EXT+	EXT+	EXT+
		● BK	20	RET+	RET+	RET+
		● RD	26	LS-COM	LS-COM	Vcc+
		○ WH	26	LS-Upper	LS-Upper	S1
		● BK	26	X	POT-GND	Hall-GND
		● BU	26	LS-Lower	LS-Lower	S2
		● BN	26	X	POT-Vin (+5V)	LS-Upper
		● GY	26	X	X	X
		● OG	26	X	POT-Vout	LS-Lower
		● VT	26	X	X	LS-COM
A1	4 Two limit switches send signal at end of stroke + third one in-between sends signal	● RD	20	EXT+	EXT+	EXT+
		● BK	20	RET+	RET+	RET+
		● RD	26	EOS-COM	EOS-COM	Vcc+
		○ WH	26	LS-Upper	LS-Upper	S1
		● BK	26	3rd LS pin1	3rd LS pin1	Hall-GND
		● BU	26	LS-Lower	LS-Lower	S2
		● BN	26	X	POT-Vin (+5V)	LS-Upper
		● GY	26	X	X	3rd LS pin1
		● OG	26	X	POT-Vout	LS-Lower
		● VT	26	X	POT-GND	LS-COM

Wire Definition

Type: #N, Normal

Port Number	Function of Limit Switches	Wire Color	Wire Gauge (AWG)	Output Signal		
				0. Without	1. Mechanical pot.	5. Hall sensor*2
A1	6 Two limit switches cut off the actuator and send signal at EOS	● RD	20	EXT+	EXT+	EXT+
		● BK	20	RET+	RET+	RET+
		● RD	26	X	X	Vcc+
		○ WH	26	LS-Upper	LS-Upper	S1
		● BK	26	LS-Lower	LS-Lower	Hall-GND
		● BU	26	X	POT-Vout	S2
		● BN	26	X	POT-Vin (5V)	LS-Upper
		● GY	26	X	X	LS-Lower
		● OG	26	X	GND	X
		● VT	26	X	X	X
P2	without P2 / Rubber seal plug					

Wire Definition

Type: #S, Small version, normal

Port Number	Function of Limit Switches	Wire Color	Wire Gauge (AWG)	Output Signal		
				0. Without	1. Mechanical pot.	5. Hall sensor * 2
A1	1 Two limit switches cut off the actuator at end of stroke	● RD	20	EXT+	EXT+	EXT+
		● BK	20	RET+	RET+	RET+
		● RD	26	X	POT-out	Vcc+
		○ WH	26	X	POT-Vin (5V)	S1
		● BK	26	X	GND	Hall-GND
		● BU	26	X	X	S2
		● BN	26	X	X	X
		● GY	26	X	X	X
		● OG	26	X	X	X
		● VT	26	X	X	X
A1	2 Two limit switches cut off the actuator at EOS + third one in between sends signal	● RD	20	EXT+		
		● BK	20	RET+		
		● RD	26	X		
		○ WH	26	3rd LS pin1		
		● BK	26	3rd LS pin2		
		● BU	26	X		
		● BN	26	X		
		● GY	26	X		
		● OG	26	X		
		● VT	26	X		
A1	3 Two limit switches send signal at end of stroke	● RD	20	EXT+		
		● BK	20	RET+		
		● RD	26	LS-COM		
		○ WH	26	LS-Upper		
		● BK	26	X		
		● BU	26	LS-Lower		
		● BN	26	X		
		● GY	26	X		
		● OG	26	X		
		● VT	26	X		
A1	4 Two limit switches send signal at end of stroke + third one in-between sends signal	● RD	20	EXT+		
		● BK	20	RET+		
		● RD	26	EOS-COM		
		○ WH	26	LS-Upper		
		● BK	26	3rd LS pin1		
		● BU	26	LS-Lower		
		● BN	26	X		
		● GY	26	X		
		● OG	26	X		
		● VT	26	X		

Wire Definition

Type: #S, Small version, normal

Port Number	Function of Limit Switches	Wire Color	Wire Gauge (AWG)	Output Signal
A1	6 Two limit switches cut off the actuator and send signal at EOS	● RD	20	EXT+
		● BK	20	RET+
		● RD	26	X
		○ WH	26	LS-Upper
		● BK	26	LS-Lower
		● BU	26	X
		● BN	26	X
		● GY	26	X
		● OG	26	X
		● VT	26	X

Type: #T, T-Smart

Port Number	Wire Color	Wire Gauge (AWG)	Alternative			
			T. Advanced	J. SAE J1939 (250K)	K. SAE J1939 (500K)	M. Modbus
A1	● RD	20	VDC+	VDC+	VDC+	VDC+
	● BK	20	VDC-	VDC-	VDC-	VDC-
	● BN	26	Ctrl - Extend	Ctrl - Extend	Ctrl - Extend	Ctrl - Extend
	● GY	26	Ctrl - Retract	Ctrl - Retract	Ctrl - Retract	Ctrl - Retract
	● OG	26	LS-Upper	LS-Upper	LS-Upper	LS-Upper / Hall-Pot. / Hall A
	● VT	26	LS-Lower	LS-Lower	LS-Lower	LS-Lower / PWM / Hall B
	○ WH	26	Hall-Pot. / Hall A / Commu. A	Hall-Pot. / Hall A / Commu. A	Hall-Pot. / Hall A / Commu. A	Commu. A
	● BU	26	PWM / Hall B / Commu. B	PWM / Hall B / Commu. B	PWM / Hall B / Commu. B	Commu. B
	● BK	26	Signal ground	Signal ground	Signal ground	Signal ground
P2	Molex 6p socket for TAD1 / Reed switch assembly					

Type: #P, Small version, with BUS control

Port Number	Wire Color	Wire Gauge (AWG)	Signal
A1 only	● RD	20	VDC+
	● BK	20	VDC-
	● RD	26	Ctrl - Extend
	● BK	26	Ctrl - Retract
	○ WH	26	Commu. A
	● BU	26	Commu. B

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.