

MA6

series



Product Segments

• Industrial Motion

The MA6 series linear actuator, designed by TiMOTION, offers exceptional water ingress protection, available with up to IP69K(static) ratings. With a maximum push/pull force of 8,000N, the MA6 is a robust yet agile solution for applications requiring heavy-duty performance and exceptional durability. Additionally, the MA6 has an optional T-Smart version. Embedded with a driver board, the MA6 allows for easy integration with a variety of control interfaces, eliminating the need for an external control box.

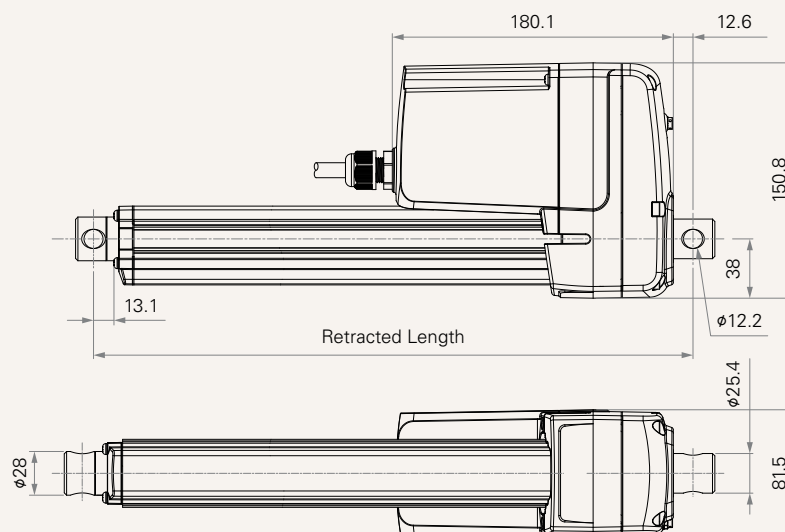
For more information about T-Smart actuators, please click [here](#).

General Features

Max. load	8,000N (push/pull)
Max. speed at max. load	6.2mm/s
Max. speed at no load	64mm/s
Retracted length	≥ Stroke + 162mm
IP rating	IP69K (static)
Stroke	25~1000mm
Output signals	Mechanical Pot., NPN Hall sensor*2, Hall sensor*2 for T-Smart (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

Standard Dimensions
(mm)



Load and Speed

CODE	Load (N)		Self Locking Force (N)	Duty Cycle	Typical Current (A)		Typical Speed (mm/s)	
	Push	Pull			Mechanical Brake	No Load 24V DC	With Load 24V DC	No Load 24V DC
Motor Speed (5100RPM)								
B	1000	1000	1300	25%	3.5	9.0	64.0	50.0
C	2000	2000	2600	25%	3.5	8.0	32.0	25.5
D	4000	4000	5200	25%	3.5	8.0	16.0	12.8
E	8000	8000	10400	25%	3.5	9.0	8.0	6.2

Note

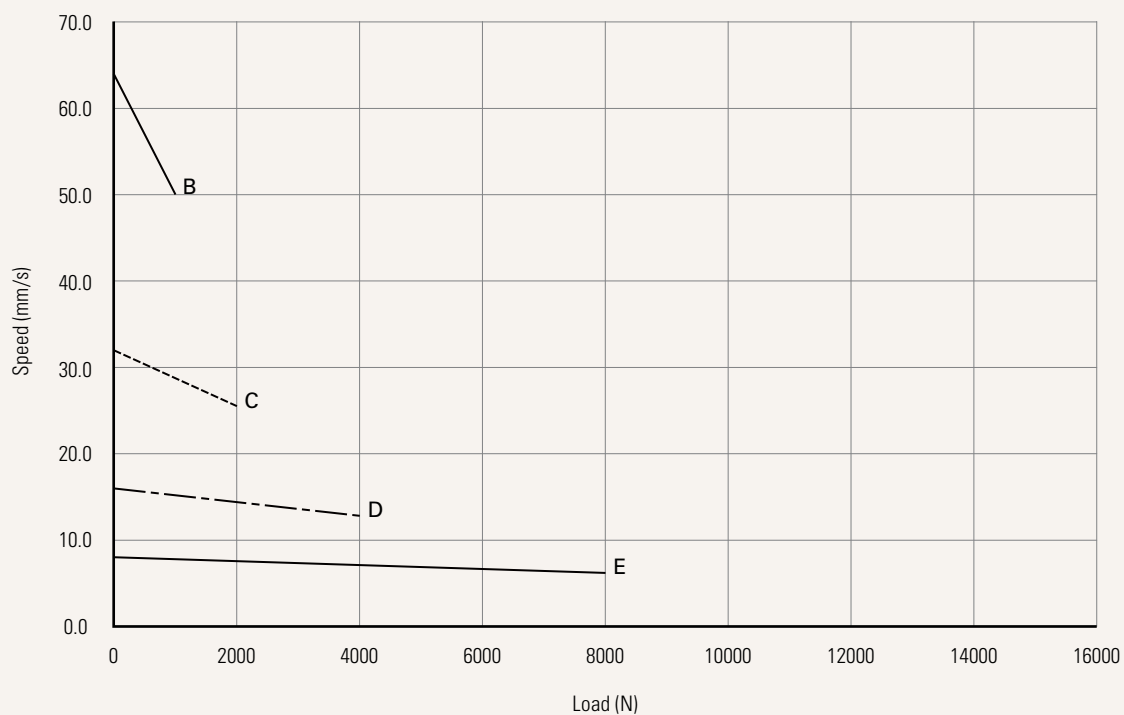
- 1 Please refer to the approved drawing for the final authentic value.
- 2 The current & speed in table are tested with 24V DC motor. With a 12V DC motor, the current is approximately twice the current measured in 24V DC; speed will be similar for both voltages.
- 3 The current & speed in table are tested when the actuator is extending under push load.
- 4 The current & speed in table and diagram are tested with a stable 24V DC power supply.
- 5 Without load, noise level ≤ 78 dB(A) (by TiMOTION test standard, ambient noise level ≤ 36 dB(A)).
- 6 Standard stroke: Min. 25mm, Max. please refer to the table below.

CODE	Load (N)	Max Stroke (mm)
B, C	≤ 2000	1000
D	≤ 4000	700
E	≤ 8000	300

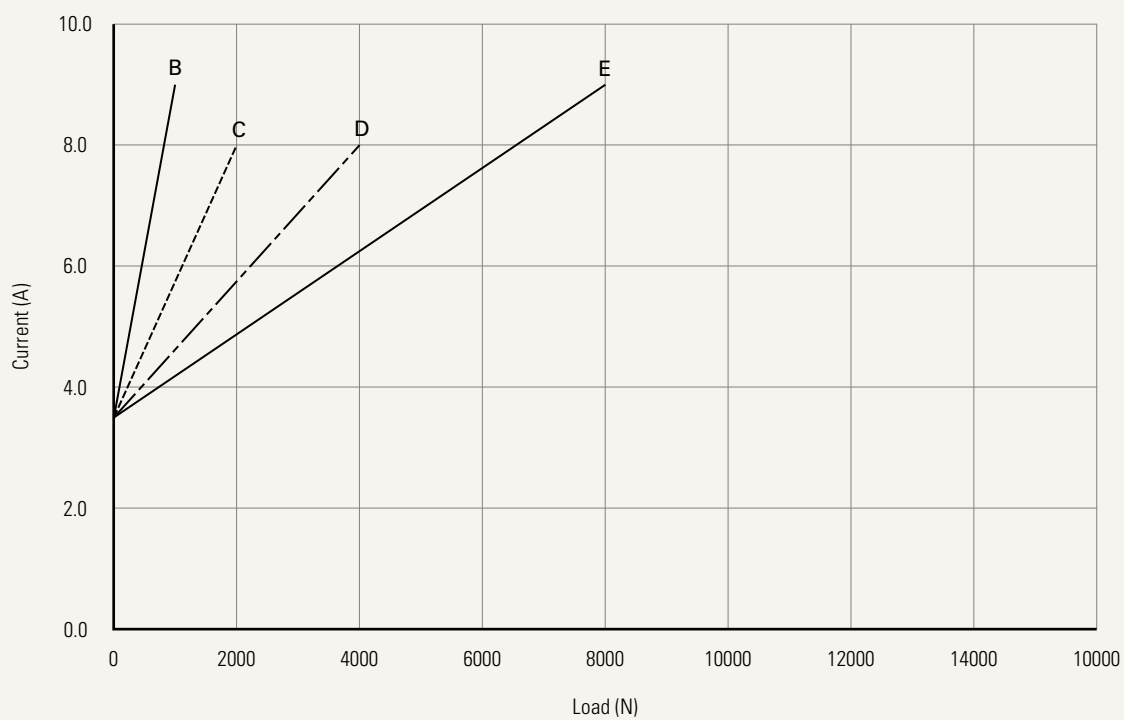
Performance Data (24V DC Motor)

Motor Speed (5100RPM)

Speed vs. Load



Current vs. Load



MA6 Ordering Key

MA6

Version: 20240621-D

1

Hardware System	N = Normal		T = T-Smart
Voltage	1 = 12V DC 2 = 24V DC	5 = 24VDC, thermal switch 6 = 12VDC, thermal switch	
Load and Speed	See page 2		
Stroke (mm)	See page 2		
Retracted Length (mm)	See page 6		
Rear Attachment (mm) See page 7	1 = #45 Steel, slotless, hole 10.2 2 = #45 Steel, slotless, hole 12.2 3 = #45 Steel, slotless, hole 12.8 4 = #45 Steel, U clevis, slot 8.2, depth 12.5, hole 10.2 5 = #45 Steel, U clevis, slot 8.2, depth 12.5, hole 12.2 6 = #45 Steel, U clevis, slot 8.2, depth 12.5, hole 12.8	7 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 10.2 8 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 12.2 9 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 12.8 B = #SUS 316 Steel, U clevis, slot 8.2, depth 12.5, hole 10.2	
Front Attachment (mm) See page 7-8	1 = #45 Steel, slotless, hole 10.2 2 = #45 Steel, slotless, hole 12.2 3 = #45 Steel, slotless, hole 12.8 7 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 10.2	8 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 12.2 9 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 12.8 B = #SUS 316 Steel, slotless, hole 10.2 K = Rod end bearing, hole 12.8	
Direction of Rear Attachment (Counterclockwise) See page 8	1 = 0°	3 = 90°	
Function of Limit Switches	1 = Two limit switches cut off the actuator at end of stroke 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 (signal type: normally closed) 6 = Two limit switches cut off the actuator and send signal at end of stroke (signal type: normally open) T = Two limit switches send signal at end of stroke to T-Smart (T-Smart dedicated option)		
Adjustable Reed Switch	0 = Without 1 = Reed switch * 1 (normal close) 2 = Reed switch * 2 (normal close) C = Reed switch * 2, Molex 6p (T-Smart dedicated option, normal open)		
Output Signal See page 9-10	0 = Without 1 = Mechanical Pot. N = NPN Hall sensor * 2	T = Hall sensor * 2 for T-Smart (T-Smart dedicated option)	
IP Rating	1 = Without 6 = IP66M	7 = IP67 8 = IP68	9 = IP69K

MA6 Ordering Key

MA6

Version: 20240621-D

7

Cable Exit	1 = Single cable T = 1+1: 1* cable with cable gland + Molex 6P socket (T-Smart dedicated option)			
A1 / P1 Connector (mm)	01 = Tinned leads, unsheathed wire 50, stripped wire 10 See page 8			
A1 / P1 Cable Length (mm)	0500 = 500	1000 = 1000	1500 = 1500	2000 = 2000
P2 Connector (mm)	00 = Without 01 = Tinned leads, unsheathed wire 50, stripped wire 10 (T-Smart dedicated option) 0P = Rubber seal plug (T-Smart dedicated option)			
P2 Cable Length	0000 = Without cable 1000 = 1000 (T-Smart dedicated option)		2000 = 2000 (T-Smart dedicated option)	
P3 Connector (mm)	00 = Without 01 = Tinned leads, unsheathed wire 50, stripped wire 10 (T-Smart dedicated option)			
P3 Cable Length	0000 = Without cable 1000 = 1000 (T-Smart dedicated option)		2000 = 2000 (T-Smart dedicated option)	
Vent Plug	0 = Without		1 = With	
Alternative	N = Normal T = Advanced (proposal: TS18002) J = SAE J1939 (250Kbps, proposal: PF22018)		K = SAE J1939 (500Kbps, proposal: DS23021) S = SAE J1939 (250kbps Secure Version, proposal: PF24032) M = Modbus (proposal: PF22082)	
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. Calculate $A+B+C = Y$
2. Minimum retracted length is $\text{Stroke}+Y$

Note

- ¹ Depending on the attachments, the motor cover might interfere with the customer's device when retracted length is between 225~318mm. Please confirm before placing order.

A.

Front Attach.	Rear Attach.	
	1, 2, 3, 4, 5, 6, B	7, 8, 9
1, 2, 3, B	+162	+165
7, 8, 9	+175	+178
K	+185	+188

B.

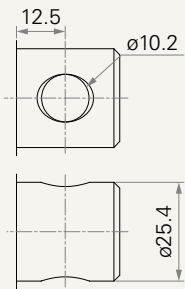
Stroke (mm)	Load & Speed Type (N)
	B, C, D, E
25~150	-
151~200	-
201~250	+10
251~300	+20
301~350	+30
351~400	+40
401~450	+50
451~500	+60
501~550	+70
551~600	+80
601~650	+90
651~700	+100
701~750	+110
751~800	+120
801~850	+130
851~900	+140
901~950	+150
951~1000	+160

C.

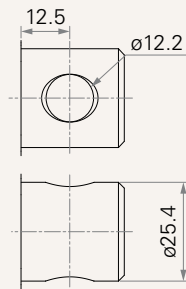
Output Signal	
0, N	-
1	+18

Rear Attachment (mm)

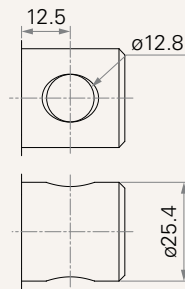
1 = #45 Steel, slotless, hole 10.2



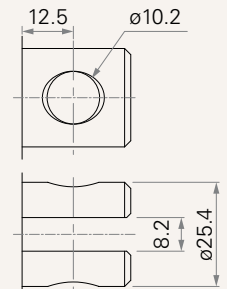
2 = #45 Steel, slotless, hole 12.2



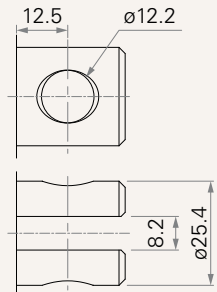
3 = #45 Steel, slotless, hole 12.8



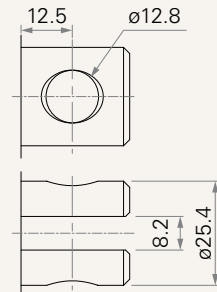
4 = #45 Steel, U clevis, slot 8.2, depth 12.5, hole 10.2



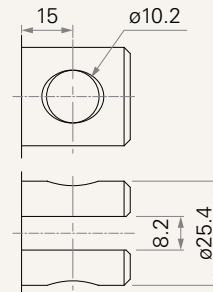
5 = #45 Steel, U clevis, slot 8.2, depth 12.5, hole 12.2



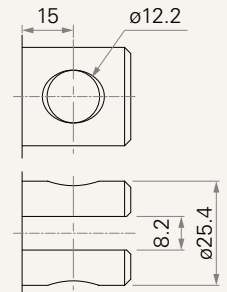
6 = #45 Steel, U clevis, slot 8.2, depth 12.5, hole 12.8



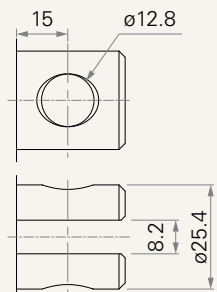
7 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 10.2



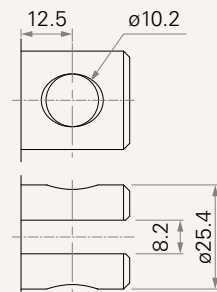
8 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 12.2



9 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 12.8

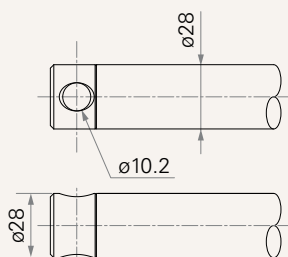


B = #SUS 316 Steel, U clevis, slot 8.2, depth 12.5, hole 10.2

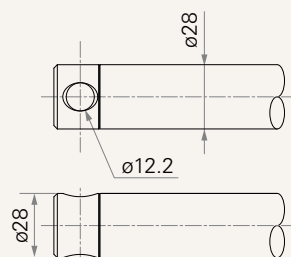


Front Attachment (mm)

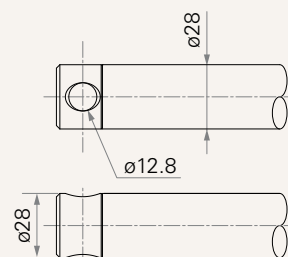
1 = #45 Steel, slotless, hole 10.2



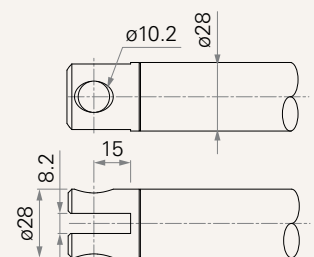
2 = #45 Steel, slotless, hole 12.2



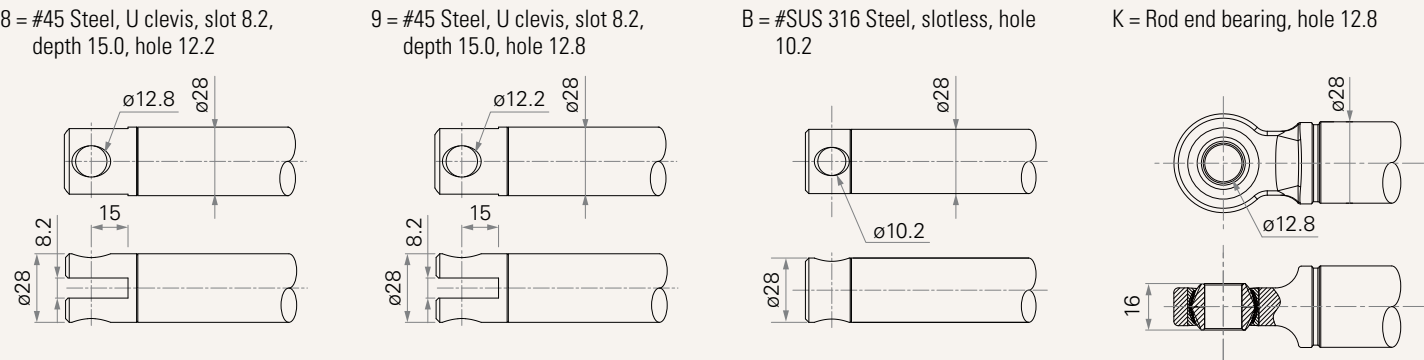
3 = #45 Steel, slotless, hole 12.8



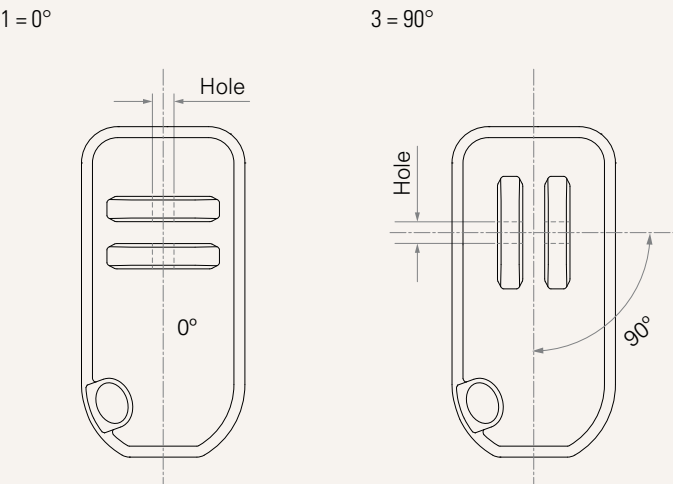
7 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 10.2



Front Attachment (mm)

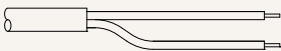


Direction of Rear Attachment (Counterclockwise)



Connector (mm)

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



Wire Definition

Normal						
Port Number	Function of Limit Switches	Wire Color	Wire Gauge (AWG)	Output Signal		
				0. Without	1. Mechanical Pot.	N. Hall sensor*2
A1	1. Two Micro Switches Cut Off the Actuator	● RD	14	EXT+	EXT+	EXT+
		● BK	14	RET+	RET+	RET+
		● RD	20	-	V-out	+5V
		○ WH	20	-	V-in	S1
		● BK	20	-	GND	GND
		● BU	20	-	-	S2
		● BN	20	-	-	-
		● GY	20	-	-	-
		● OG	20	-	-	-
		● VT	20	-	-	-
	2. Two Micro Switches Cut Off the Actuator + 3rd Micro Switch	● RD	14	EXT+	EXT+	EXT+
		● BK	14	RET+	RET+	RET+
		● RD	20	-	-	+5V
		○ WH	20	pin1 of 3rd switch	pin1 of 3rd switch	S1
		● BK	20	pin2 of 3rd switch	GND	GND
		● BU	20	-	pin2 of 3rd switch	S2
		● BN	20	-	V-in	pin1 of 3rd switch
		● GY	20	-	-	-
		● OG	20	-	V-out	pin2 of 3rd switch
		● VT	20	-	-	-
	3. Two Micro Switches Send Signal	● RD	14	EXT+	EXT+	EXT+
		● BK	14	RET+	RET+	RET+
		● RD	20	COM	COM	+5V
		○ WH	20	EOS-extended	EOS-extended	S1
		● BK	20	-	GND	GND
		● BU	20	EOS-retracted	EOS-retracted	S2
		● BN	20	-	V-in	EOS-extended
		● GY	20	-	-	-
		● OG	20	-	V-out	EOS-retracted
		● VT	20	-	-	COM
	6. Two Limit Switches Cut Off the Actuator and Send Signal at End of Stroke (Signal Type: Normally Open)	● RD	14	EXT+	-	-
		● BK	14	RET+	-	-
		● RD	20	-	-	-
		○ WH	20	EOS-extended	-	-
		● BK	20	EOS-retracted	-	-
		● BU	20	-	-	-
		● BN	20	-	-	-
		● GY	20	-	-	-
		● OG	20	-	-	-
		● VT	20	-	-	-

* Limit switch #6 could not choose Pot. or Hall sensors. Please raise a new function proposal if needed.

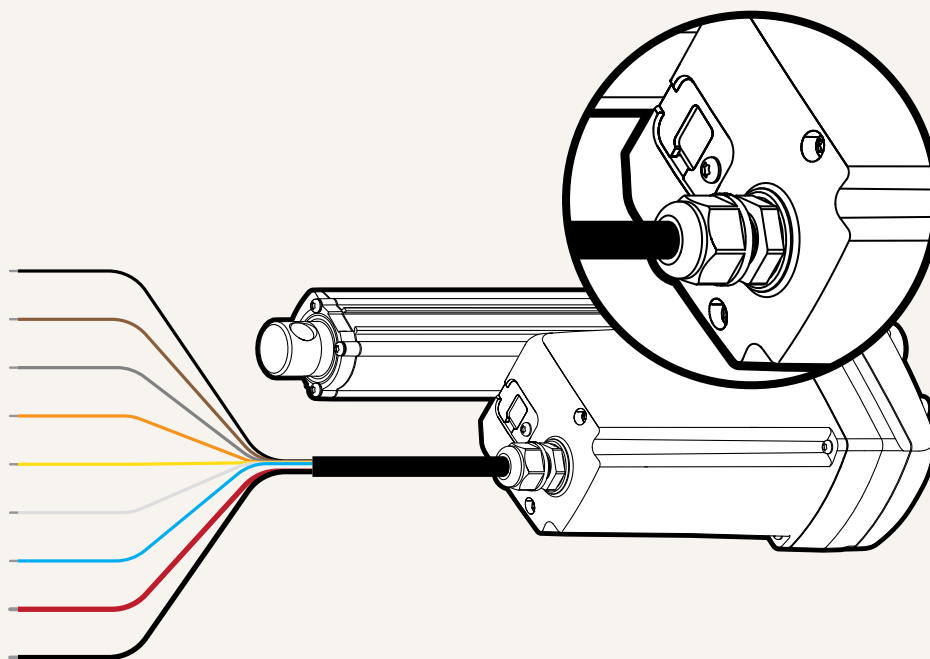
Wire Definition

#T_Smart

Direct Cable Out, 1+1 Type: Military Connector (A1) + Molex 6P Connector (P2) (T-Smart Dedicated Option)

Port	Wire Color	AWG	Signal
A1	RD	14	+Vcc
	BK	14	Power ground
	BN	20	Ctrl - Extend
	GY	20	Ctrl - Retract
	OG	20	EOS-extended
	YE	20	EOS-retracted
	WH	20	Hall-Pot./ Hall A/ Commu. A
	BU	20	PWM/ Hall B/ Commu. B
	BK	20	Signal ground
P2	RD	20	For programming or wireless accessories.
	WH	20	
	BU	20	
	BK	20	
	BN	20	
	GY	20	

* Control motor movement: when Vcc wire is short circuit with Ctrl-Extend / Ctrl-retract wire.



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.