

MA3

series



Product Segments

• Industrial Motion

TiMOTION's MA3 is the most powerful actuator in the MA series that affords a maximum 16000N force (push / pull). It was specifically designed for heavy-duty applications and harsh working environments that require durability. Examples of applications suitable for the MA3: Agricultural equipment such as spreaders, harvesters, grain handlers, combines, and tractors. Commercial and industrial applications such as commercial lawn mowers, scrubbers and sweepers, and material handling equipment.

Furthermore, the MA3 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
- Supports multiple types of signal feedback
- Monitor real-time actuator status
- Up to 8 actuator synchronizations supported
- 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 program into the laptop and adjust the actuator parameters directly.

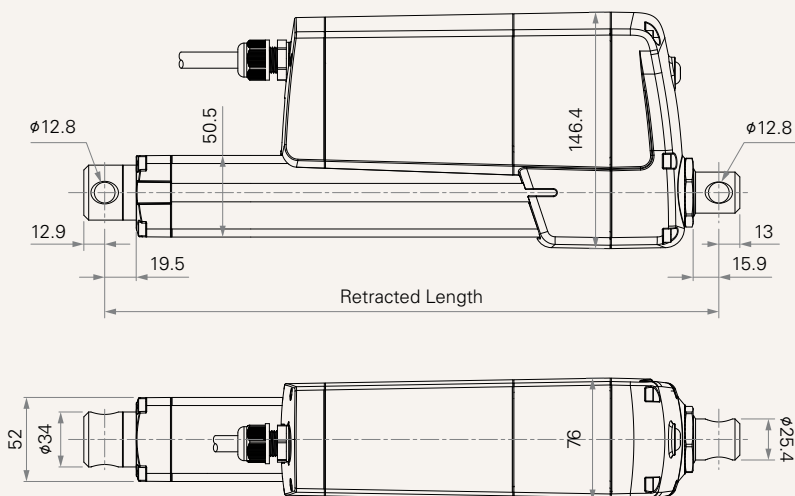
Note 3: Please contact your local sales department for further assistance.

General Features

Max. load	16,000N (push/pull)
Max. speed at max. load	4.8mm/s
Max. speed at no load	172.5mm/s
Retracted length	≥ Stroke + 200mm
IP rating	IP69K
Certificate	UL73, EMC
Stroke	25~1000mm
Options	Hall sensors, POT, Reed switch on the outer tube
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

Drawing

Standard Dimensions
(mm)



Load and Speed

CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)		Duty Cycle
	Push	Pull		Mechanical Brake	No Load 24V DC	With Load 24V DC	No Load 24V DC	
Motor Speed (4100RPM)								
B	1700	1700	2210	2.5	10.1	70.0	52.0	25%
C	6800	6800	8840	2.5	10.5	17.0	12.0	25%
D	10000	10000	13000	2.5	10.1	8.5	6.4	25%
Motor Speed (5100RPM)								
F	500	500	650	2.5	9.5	172.5	130.0	25%
G	2600	2600	3380	2.5	10.3	43.0	29.0	25%
H	4500	4500	5850	2.5	8.8	21.0	18.0	25%
J	16000	16000	20800	2.5	11.0	6.5	4.8	15%

Note

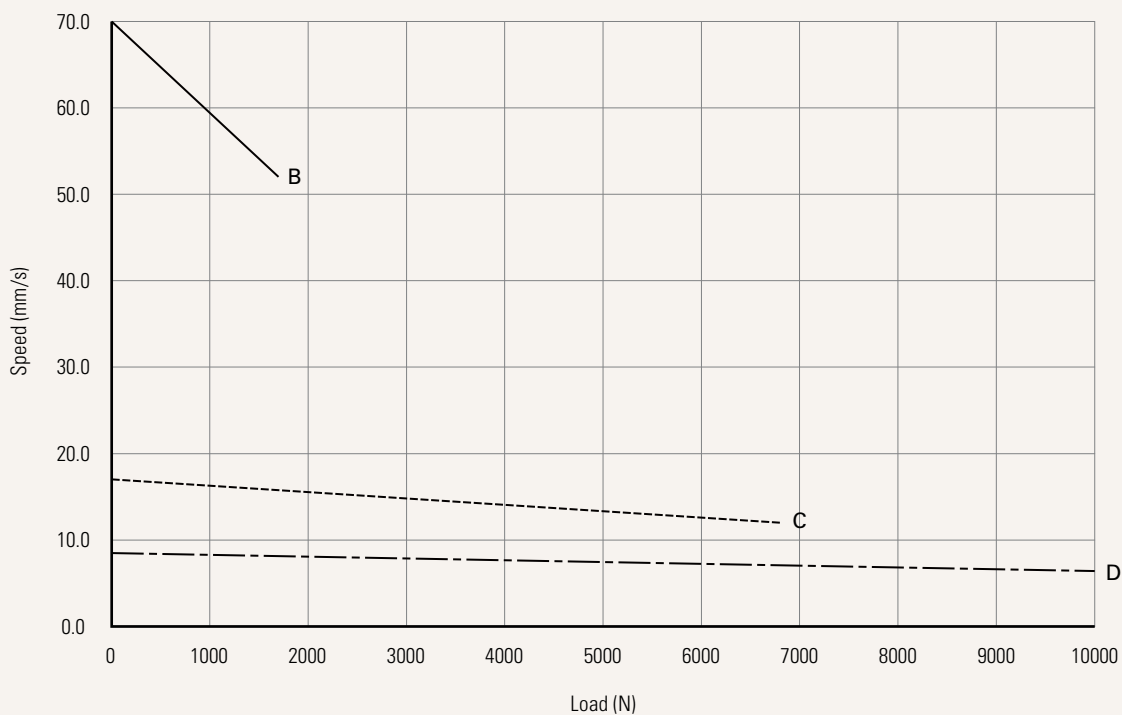
- 1 Please refer to the approved drawing for the final authentic value.
- 2 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
- 3 The current & speed in table are tested with 24V DC motor. With a 12V DC motor, the current is approximately twice the current measured in 24V DC; speed will be similar for both voltages.
- 4 The current & speed in table are tested when the actuator is extending under push load.
- 5 The current & speed in table and diagram are tested with a stable 24V DC power supply.
- 6 Standard stroke: Min. 25mm, Max. please refer to below table.

CODE	Load (N)	Max Stroke (mm)
B, F, G	≤ 2600	1000
H	≤ 4500	800
C	≤ 6800	600
D	≤ 10000	500
J	≤ 16000	450

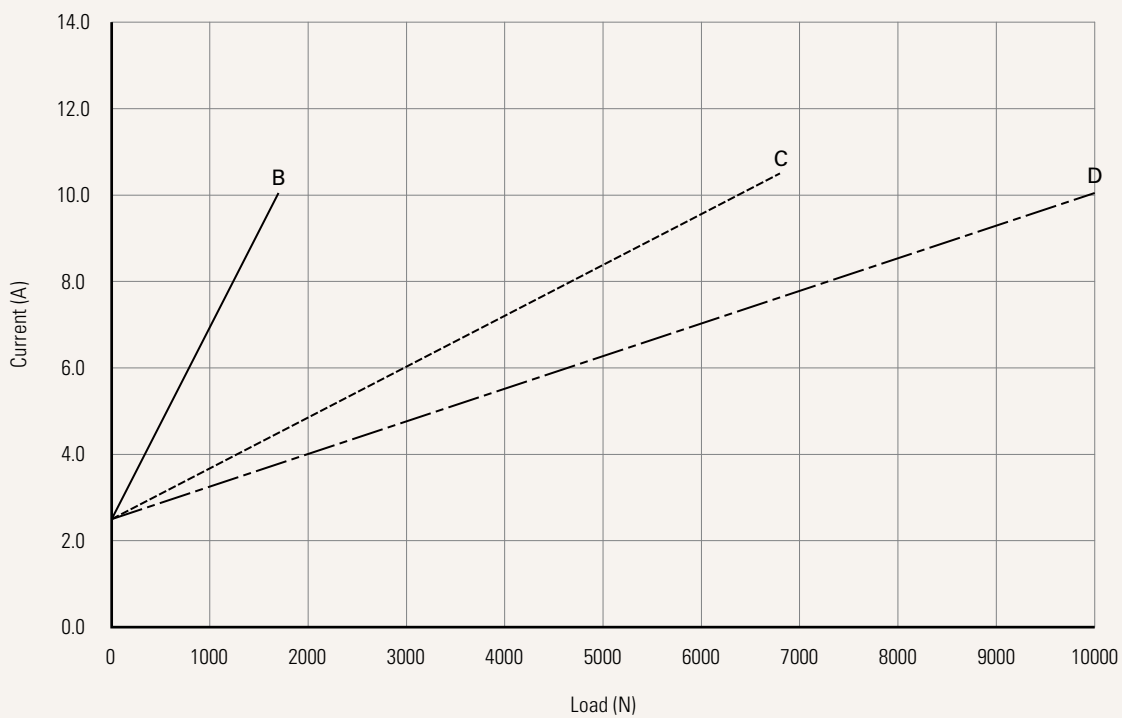
Performance Data (24V DC Motor)

Motor Speed (4100RPM)

Speed vs. Load



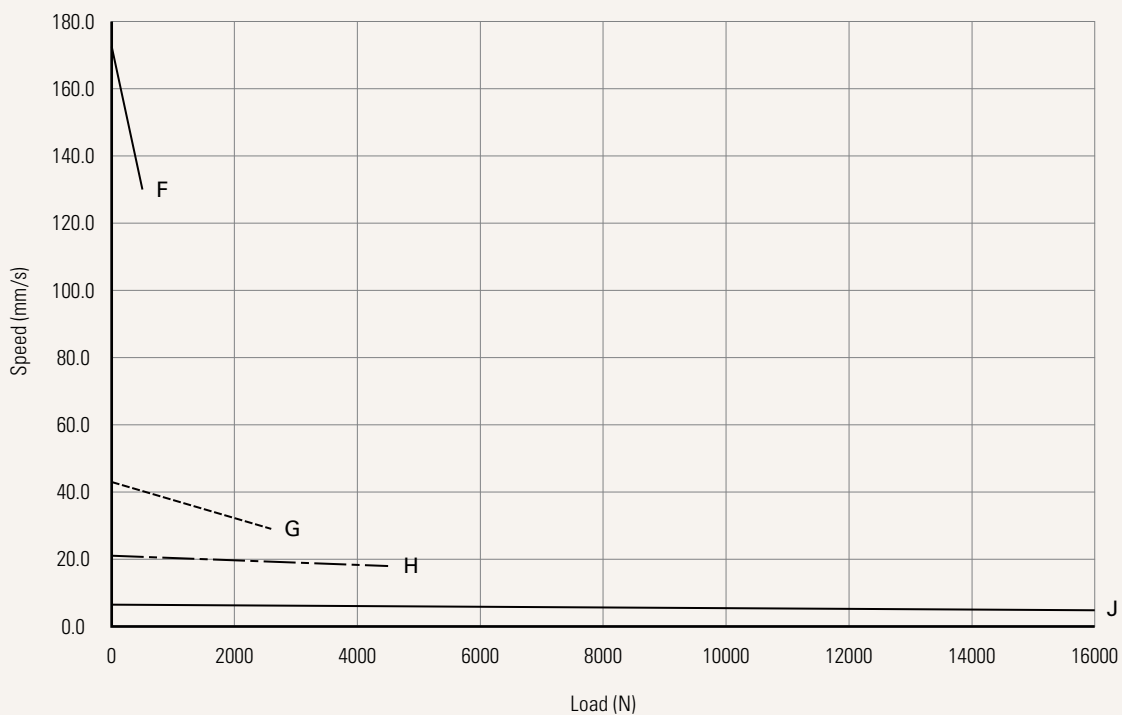
Current vs. Load



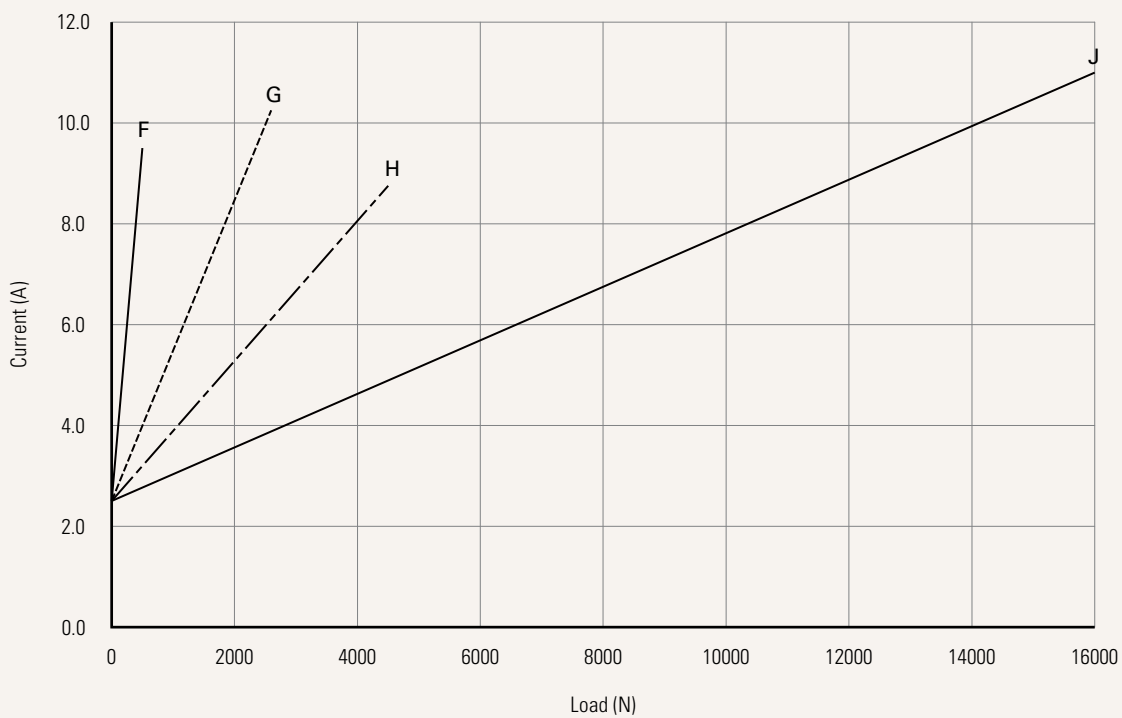
Performance Data (24V DC Motor)

Motor Speed (5100RPM)

Speed vs. Load



Current vs. Load



Version	N = Without T-Smart			
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			
Retracted Length (mm)	See page 6			
Rear Attachment (mm) See page 7	1 = #45 Steel, slotless, hole 10.2 2 = #45 Steel, slotless, hole 12.8 3 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 10.2 4 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 12.8		5 = Stainless Steel, slotless, hole 10.2 6 = Stainless Steel, slotless, hole 12.8 7 = Stainless Steel, U clevis, slot 8.2, depth 15.0, hole 10.2 8 = Stainless Steel, U clevis, slot 8.2, depth 15.0, hole 12.8	
Front Attachment (mm) See page 7-8	1 = #45 Steel, slotless, hole 10.2 2 = #45 Steel, slotless, hole 12.8 3 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 10.2 4 = #45 Steel, U clevis, slot 8.2, depth 15.0, hole 12.8 5 = Stainless Steel, slotless, hole 10.2		6 = Stainless Steel, slotless, hole 12.8 7 = Stainless Steel, U clevis, slot 8.2, depth 15.0, hole 10.2 8 = Stainless Steel, U clevis, slot 8.2, depth 15.0, hole 12.8 K = Rod end bearing, hole 12.8	
Installation Direction (Counter-Clockwise) See page 8	1 = 0°	2 = 45°	3 = 90°	4 = 135°
Functions for Built-in Limit Switches at End of Stroke	1 = Two limit switches cut off the acuator at end of stroke 2 = Two limit 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 9	0 = Without	1 = Mechanical POT	4 = Hall sensor*1	5 = Hall sensor*2
IP Rating	1 = Without	6 = IP66 (dynamic)	9 = IP69K	
Manual Drive	1 = With			
Brake	M = Mechanical brake			
Cable Exit	1 = Single cable			
P1 Connector See page 8	G = Tinned leads			
P1 Cable Length (mm)	0500 = 500	1000 = 1000	1500 = 1500	2000 = 2000
P2 Connector	N = Without			
P2 Cable Length (mm)	0000 = Without			
P3 Connector	N = Without			
P3 Cable Length (mm)	0000 = Without			
Bus Interface	N = Without			

Retracted Length (mm)

1. Calculate $A+B+C=Y$
2. minimum retracted length is $\text{Stroke}+Y$

A.

Front Attach.	Rear Attach.	
	1, 2, 5, 6	3, 4, 7, 8
1, 2, 5, 6	+200	+208
3, 4, 7, 8	+207	+215
K	+225	+233

B.

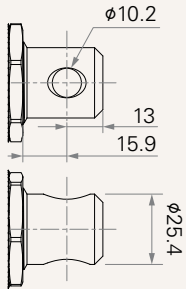
Stroke (mm)	Load & speed type(N)
	B, C, D, F, G, H, J
25~150	-
151~200	-
201~250	+10
251~300	+20
301~350	+30
351~400	+40
401~450	+50
451~500	+60
501~550	+70
551~600	+80
601~650	+90
651~700	+100
701~750	+110
751~800	+120
801~850	+130
851~900	+140
901~950	+150
951~1000	+160

C.

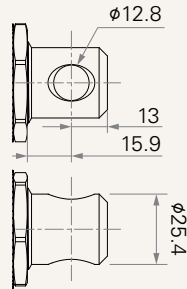
Output Signal	
0, 4, 5	-
1	+18

Rear Attachment (mm)

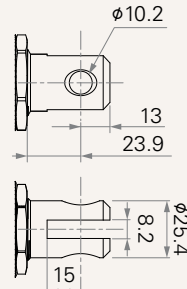
1 = #45 Steel CNC, without slot, hole 10.2



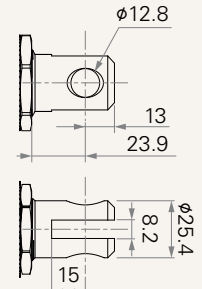
2 = #45 Steel CNC, without slot, hole 12.8



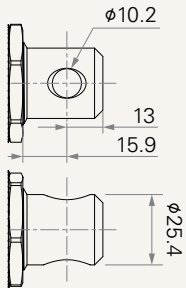
3 = #45 Steel CNC, U clevis, slot 8.2, depth 15, hole 10.2



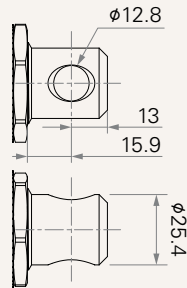
4 = #45 Steel CNC, U clevis, slot 8.2, depth 15, hole 12.8



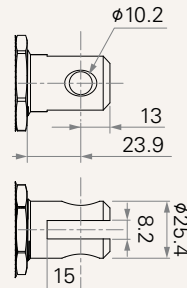
5 = Stainless Steel CNC, without slot, hole 10.2



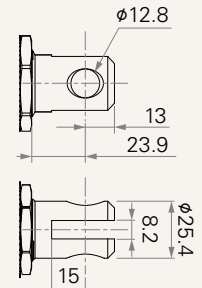
6 = Stainless Steel CNC, without slot, hole 12.8



7 = Stainless Steel CNC, U clevis, slot 8.2, depth 15, hole 10.2

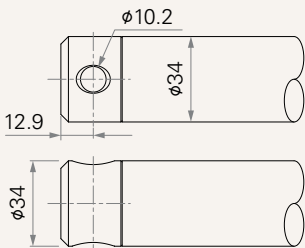


8 = Stainless Steel CNC, U clevis, slot 8.2, depth 15, hole 12.8

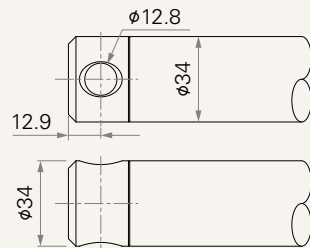


Front Attachment (mm)

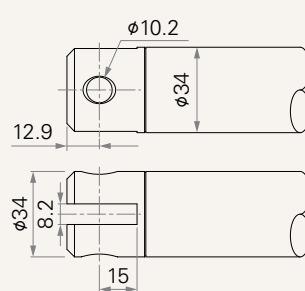
1 = #45 Steel CNC, without slot, hole 10.2



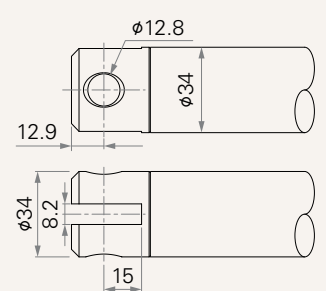
2 = #45 Steel CNC, without slot, hole 12.8



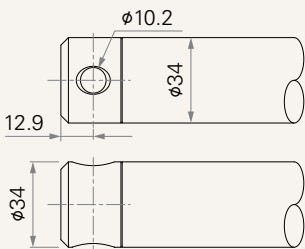
3 = #45 Steel CNC, U clevis, slot 8.2, depth 15, hole 10.2



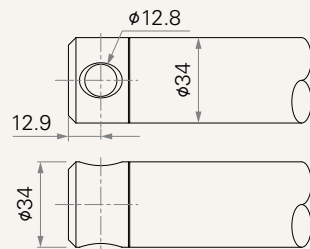
4 = #45 Steel CNC, U clevis, slot 8.2, depth 15, hole 12.8



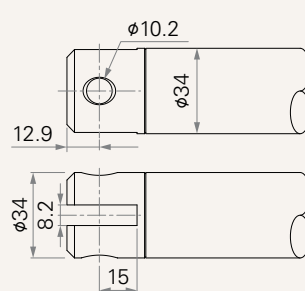
5 = Stainless Steel CNC, without slot, hole 10.2



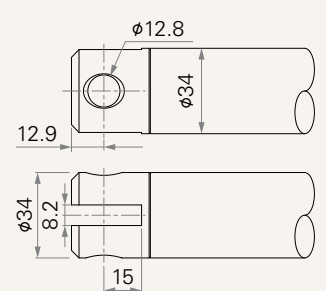
6 = Stainless Steel CNC, without slot, hole 12.8



7 = Stainless Steel CNC, U clevis, slot 8.2, depth 15, hole 10.2

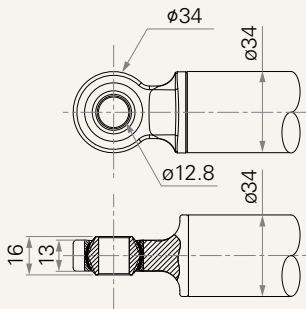


8 = Stainless Steel CNC, U clevis, slot 8.2, depth 15, hole 12.8



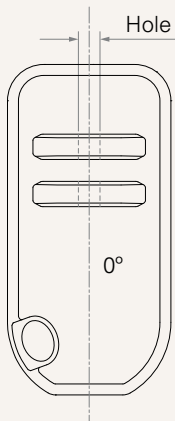
Front Attachment (mm)

K = Rod end bearing, hole 12.8

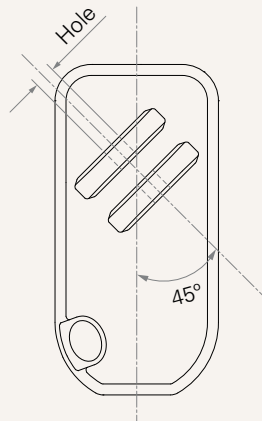


Installation Direction (Counter-Clockwise)

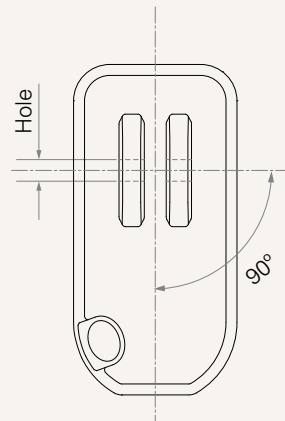
1 = 0°



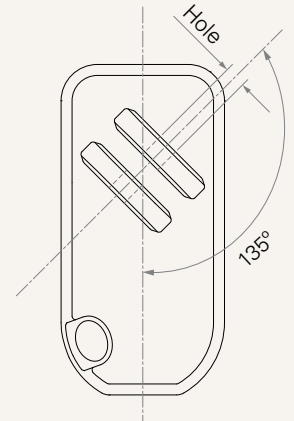
2 = 45°



3 = 90°

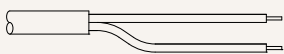


4 = 135°



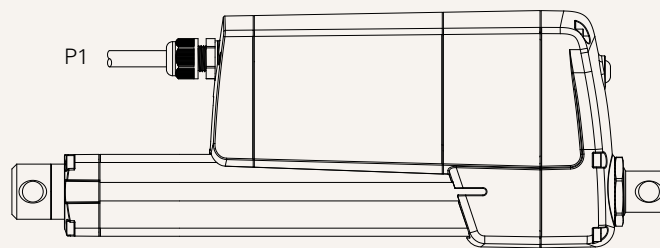
P1 Connector

G = tinned leads



Output Signals

Wire Definitions			Wire Gauge (AWG)	Output Signal Code				
				0. Without	1. POT	4. Hall sensor*1	5. Hall sensor*2	
without T-Smart	P1	Limit Switches Cut Off the Acuator	● Red	14	extend+	extend+	extend+	extend+
			● Black	14	retract+	retract+	retract+	retract+
			● Red	20	-	V-out	+5V	+5V
			○ White	20	-	V-in	S1	S1
			● Blue	20	-	-	-	S2
			● Black	20	-	GND	GND	GND
			● Brown	20	-	-	-	-
			● Orange	20	-	-	-	-
			● Purple	20	-	-	-	-
without T-Smart	P1	Limit Switches Send Signal	● Red	14	extend+	extend+	extend+	extend+
			● Black	14	retract+	retract+	retract+	retract+
			● Red	20	COM	COM	+5V	+5V
			○ White	20	EOS-extended	EOS-extended	S1	S1
			● Blue	20	EOS-retracted	EOS-retracted	-	S2
			● Black	20	-	GND	GND	GND
			● Brown	20	-	V-in	EOS-extended	EOS-extended
			● Orange	20	-	V-out	EOS-retracted	EOS-retracted
			● Purple	20	-	-	COM	COM



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.