

MA3

series



Product Segments

• Industrial Motion

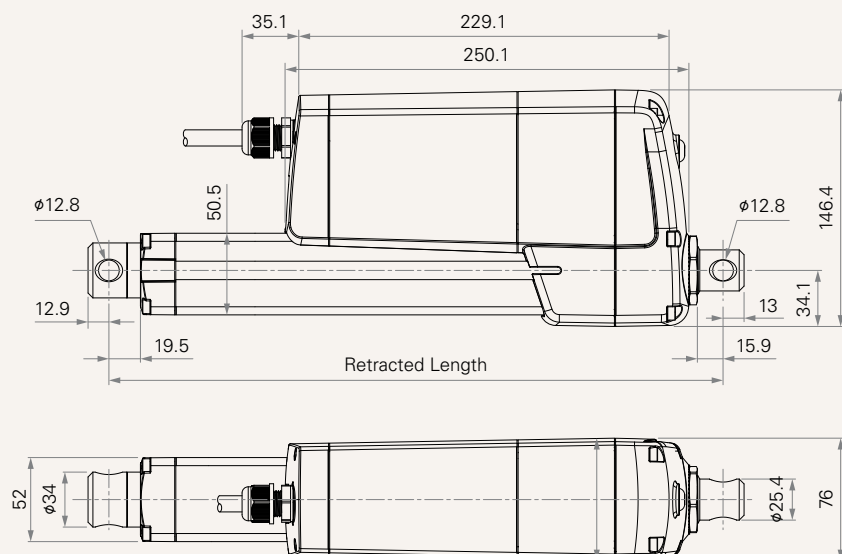
TiMOTION's MA3 was specifically designed for heavy-duty applications and harsh working environments that require durability. Examples of applications suitable for the MA3: Agricultural equipment such as spreaders, harvesters, grain handlers, combines, and tractors. Commercial and industrial applications such as commercial lawn mowers, scrubbers and sweepers, and material handling equipment.

General Features

Max. load	16,000N (push/pull)
Max. speed at max. load	6.2mm/s
Max. speed at no load	172.5mm/s
Retracted length	≥ Stroke + 200mm
IP rating	IP69K
Certificate	UL73, EMC
Stroke	25~1000mm
Output signals	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
Manual drive	

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)								
F	500	500	650	25%	2.5	10.2	172.5	152.0
K	1000	1000	1300	25%	2.5	10.2	86.0	76.0
G	2500	2500	3250	25%	2.5	10.5	43.0	38.0
H	5000	5000	6500	25%	2.5	10.2	21.5	19.0
M	7500	7500	9750	25%	2.5	11.4	14.0	12.4
N	10000	10000	13000	25%	2.5	11.3	10.5	9.3
J	16000	16000	20800	15%	2.5	12.6	7.2	6.2

Note

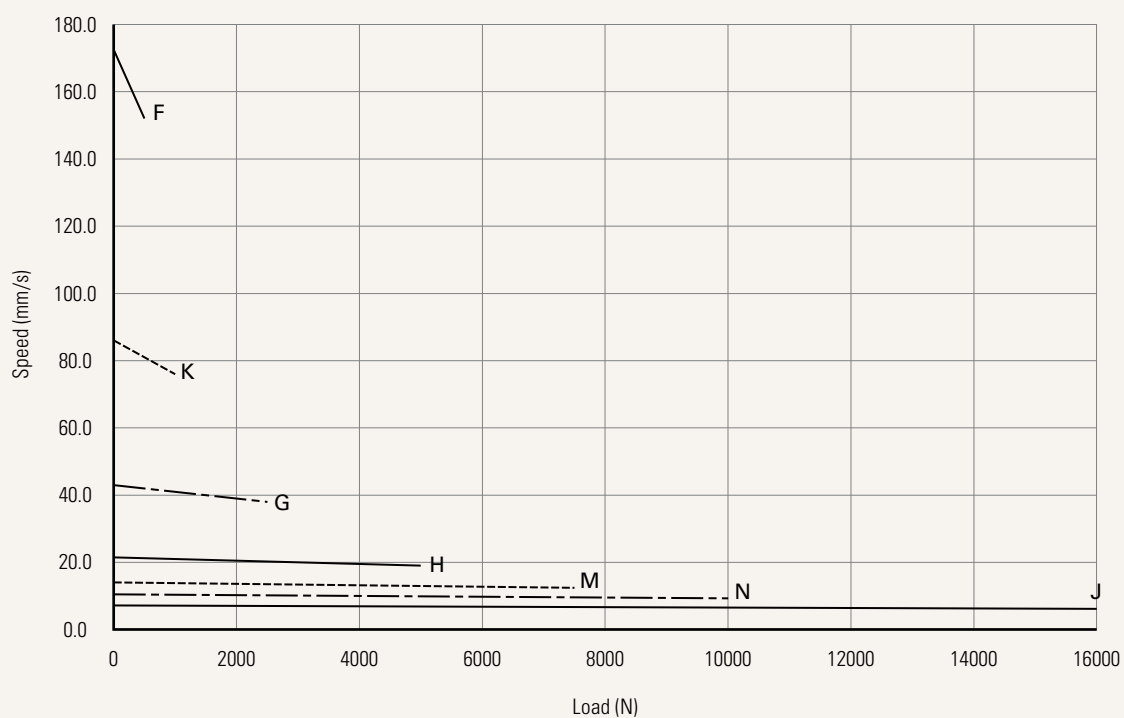
- 1 Please refer to the approved drawing for the final authentic value.
- 2 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
- 3 The current & speed in table are tested with 24V DC motor. 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)
F, K, G	≤ 2500	1000
H	≤ 5000	800
M, N	≤ 10000	600
J	≤ 16000	400

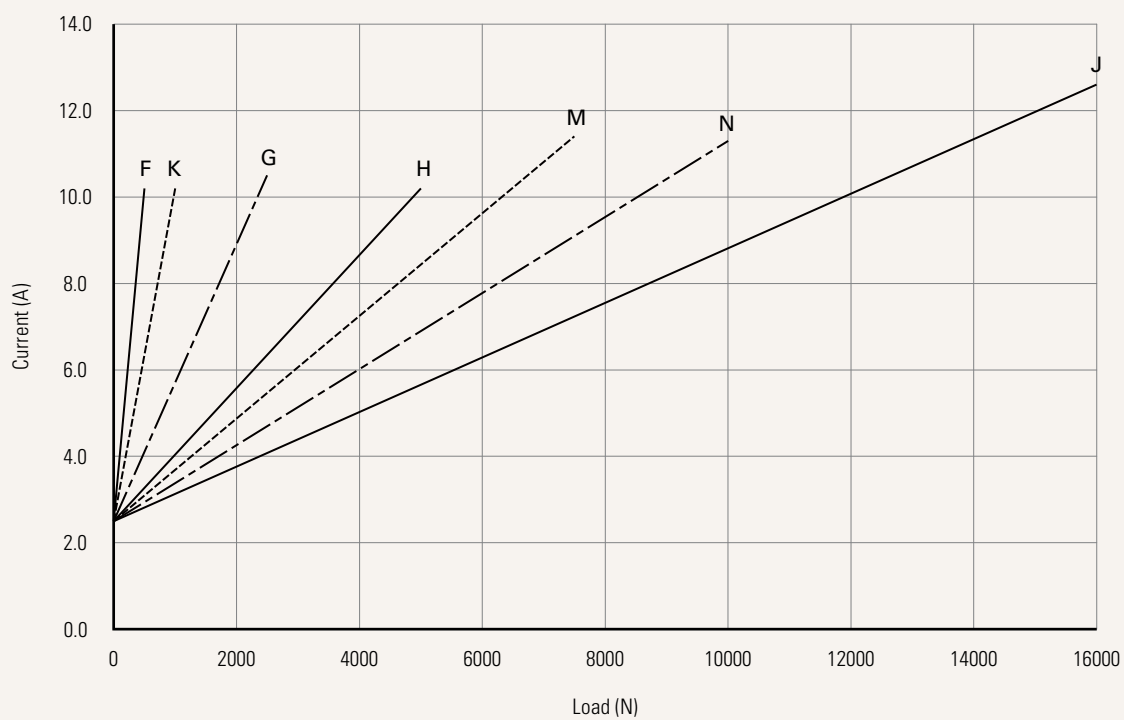
Performance Data (24V DC Motor)

Motor Speed (5100RPM)

Speed vs. Load



Current vs. Load



Version	N = Without T-Smart			
Voltage	1 = 12V DC	2 = 24V DC	6 = 12V DC, thermal control	5 = 24V DC, thermal control
Load & Speed	See page 2			
Stroke (mm)	See page 2			
Retracted Length (mm)	See page 5			
Rear Attachment (mm) See page 6	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 6-7	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 K = Rod end bearing, hole 12.8	
Installation Direction (Counter-Clockwise) See page 7	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 actuator 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 8	0 = Without	1 = Mechanical POT	4 = Hall sensor*1	5 = Hall sensor*2
IP Rating	1 = Without	6 = IP66 (dynamic)	7 = IP67	9 = IP69K
Manual Drive	1 = With			
Brake	S = Mechanical brake			
Cable Exit	1 = Single cable			
P1 Connector See page 7	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 $A+B+C+D = Y$

2. minimum retracted length is Stroke + Y

Important notice:

Depends on the attachments, motor cover might have interference with customer's device when retracted length is in between 225~318mm. Please affirm before placing order.

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)
	F, K, G, H, M, N, 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.

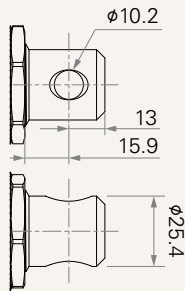
Output Signal	
0, 4, 5	-
1	+18

D.

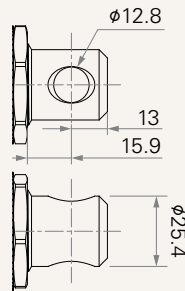
Load and Speed	
K, G, H, M, N, J	-
F	+13

Rear Attachment (mm)

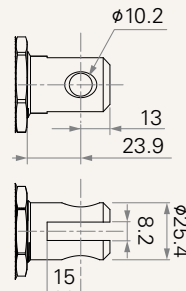
1 = #45 Steel CNC, without slot, hole 10.2



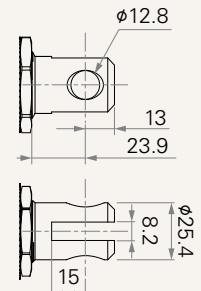
2 = #45 Steel CNC, without slot, hole 12.8



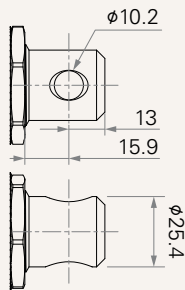
3 = #45 Steel CNC, U clevis, slot 8.2, depth 15, hole 10.2



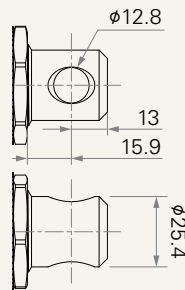
4 = #45 Steel CNC, U clevis, slot 8.2, depth 15, hole 12.8



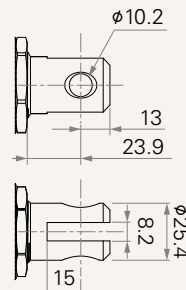
5 = Stainless Steel CNC, without slot, hole 10.2



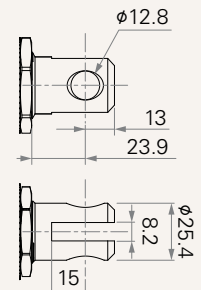
6 = Stainless Steel CNC, without slot, hole 12.8



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

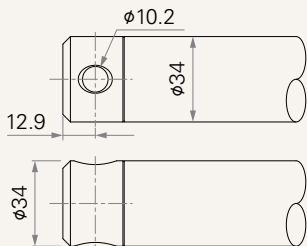


8 = Stainless Steel CNC, U clevis, slot 8.2, depth 15, hole 12.8

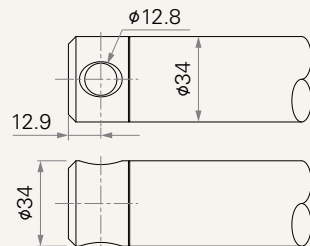


Front Attachment (mm)

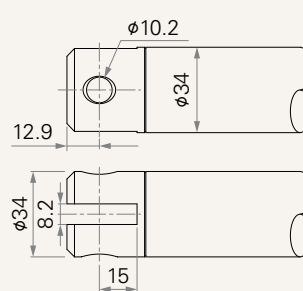
1 = #45 Steel CNC, without slot, hole 10.2



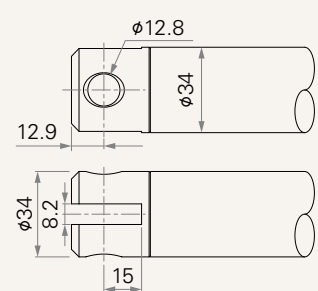
2 = #45 Steel CNC, without slot, hole 12.8



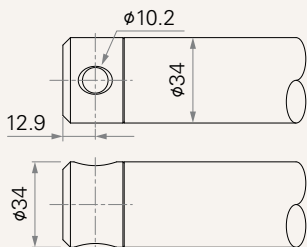
3 = #45 Steel CNC, U clevis, slot 8.2, depth 15, hole 10.2



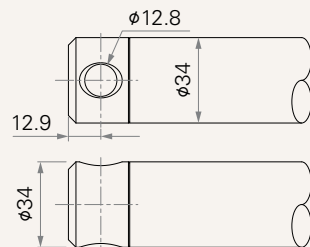
4 = #45 Steel CNC, U clevis, slot 8.2, depth 15, hole 12.8



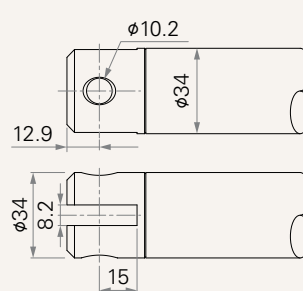
5 = Stainless Steel CNC, without slot, hole 10.2



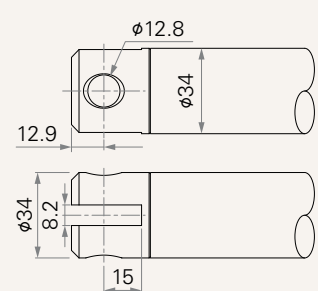
6 = Stainless Steel CNC, without slot, hole 12.8



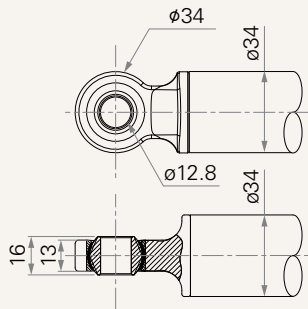
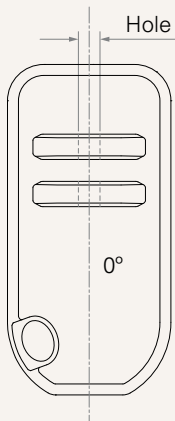
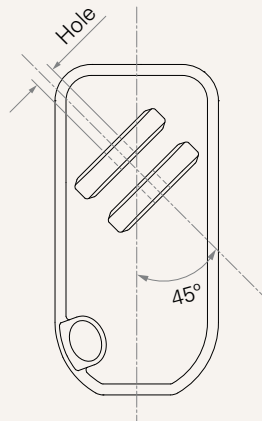
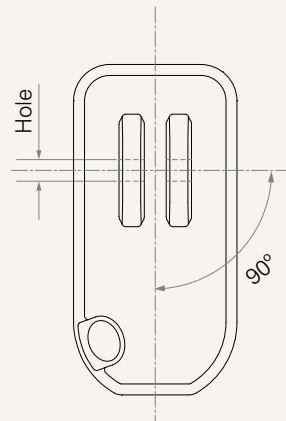
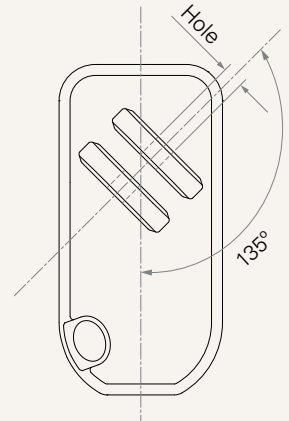
7 = Stainless Steel CNC, U clevis, slot 8.2, depth 15, hole 10.2



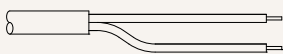
8 = Stainless Steel CNC, U clevis, slot 8.2, depth 15, hole 12.8



K = Rod end bearing, hole 12.8


$$1 = 0^0$$
 $2 = 45^\circ$  $3 = 90^\circ$  $4 = 135^\circ$ 

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 Acutator	 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

