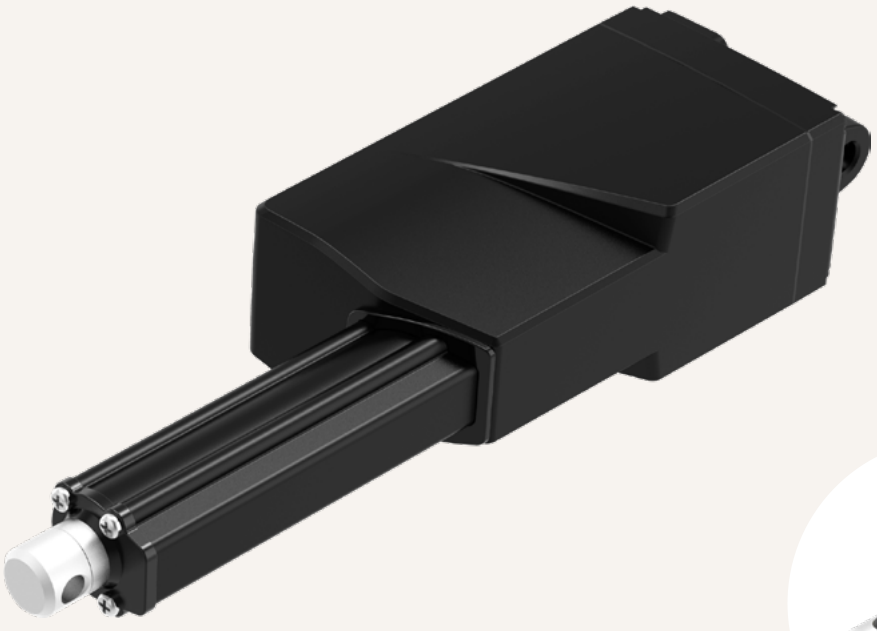
MA5

series



Product Segments

- **Industrial Motion**

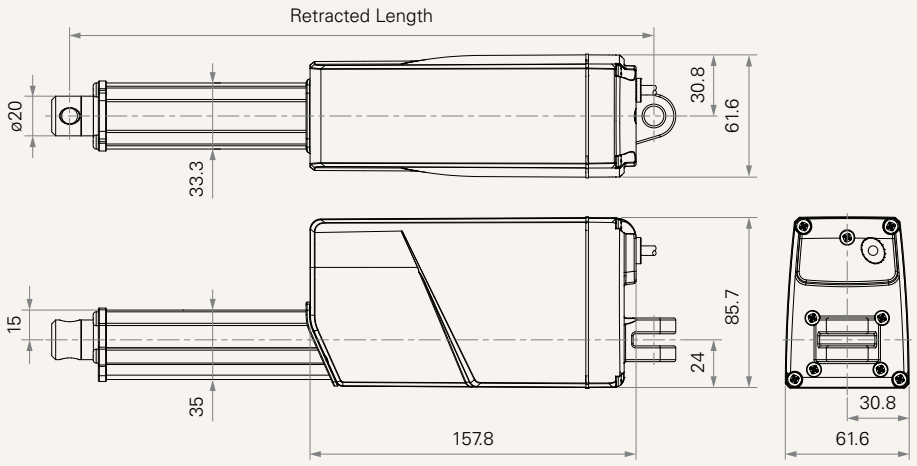
TiMOTION's MA5 electric linear actuator is specifically designed for applications that face harsh working environments and require ruggedness and durability. Its IP69K protection can withstand high-pressure water jets, and the ingress of dust and other solid contaminants. The MA5 can also be customized with various feedback options depending on the application requirements; moreover, it can be equipped with a grease nipple to increase the protection degree and life cycle. Suitable applications for MA5 include agricultural equipment, such as valves, spreaders, harvesters, and grain handlers.

General Features

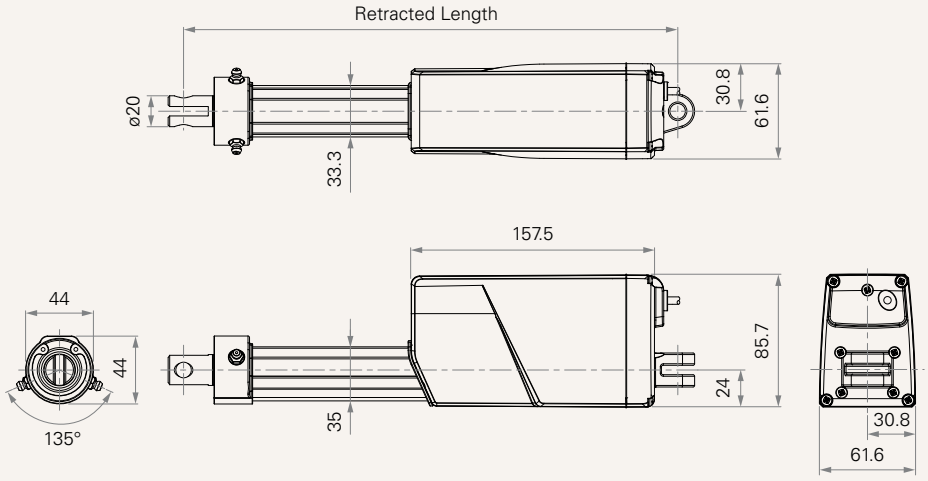
Max. load	3,500N (push); 2,000N (pull)
Max. speed at max. load	2.4mm/s
Max. speed at no load	56.5mm/s
Retracted length	≥ 200mm (depending on chosen options)
IP rating	IP69K
Stroke	20~1000mm
Output signals	Mechanical pot., NPN Hall sensor
Options	Grease chamber
Voltage	12/24/48V DC; 12/24/48V DC (PTC)
Operational temperature range	-25°C~+65°C
Operational temperature range at full performance	+5°C~+45°C

Drawing

Standard Dimensions
(mm)



With Grease Chamber
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 (5200RPM, duty cycle 25%)							
A	250	250	250	1.2	2.3	43.0	36.0
B	500	500	500	1.1	2.3	25.8	23.0
C	1000	1000	1000	1.1	2.3	14.0	11.8
D	1500	1500	1500	1.0	2.2	9.0	8.0
E	2000	2000	2000	1.0	2.2	7.1	6.2
W	500	500	500	1.3	5.0	54.0	35.0
Motor Speed (6600RPM, duty cycle 25%)							
F	250	250	250	1.6	2.8	56.5	45.0
G	500	500	500	1.5	2.8	32.5	28.5
H	1000	1000	1000	1.5	2.8	16.5	14.3
K	1500	1500	1500	1.3	2.8	11.1	10.0
L	2000	2000	2000	1.3	2.8	8.8	7.7
Motor Speed (3800RPM, duty cycle 25%)							
S	3500	2000	3500	0.9	2.8	3.2	2.4
Motor Speed (2200RPM, duty cycle 25%)							
T	2000	2000	2000	0.3	1.2	3.2	2.4

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 TiMOTION control boxes, and there will be around 10% tolerance depending on different models of the control box. (Under no load condition, the voltage is around 32V DC. At rated load, the voltage output will be around 24V DC)

6 Without load, noise level ≤ 78dBA (by TiMOTION test standard, ambient noise level ≤ 36dBA)

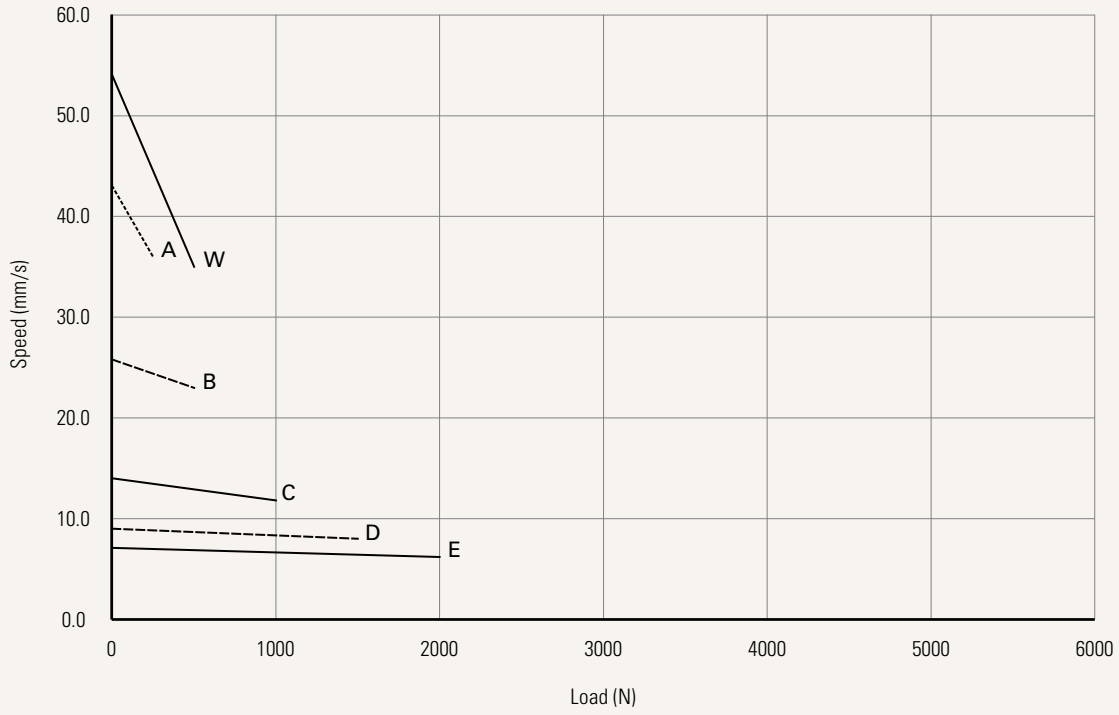
7 Standard stroke: Min. ≥ 20mm, Max. please refer to below table.

CODE	Load (N)	Max Stroke (mm)
A, F	≤ 250	1000
B, G, W	≤ 750	800
C, H	≤ 1000	600
D, K	≤ 1500	500
E, L, T	≤ 2000	450
S	≤ 3500	300

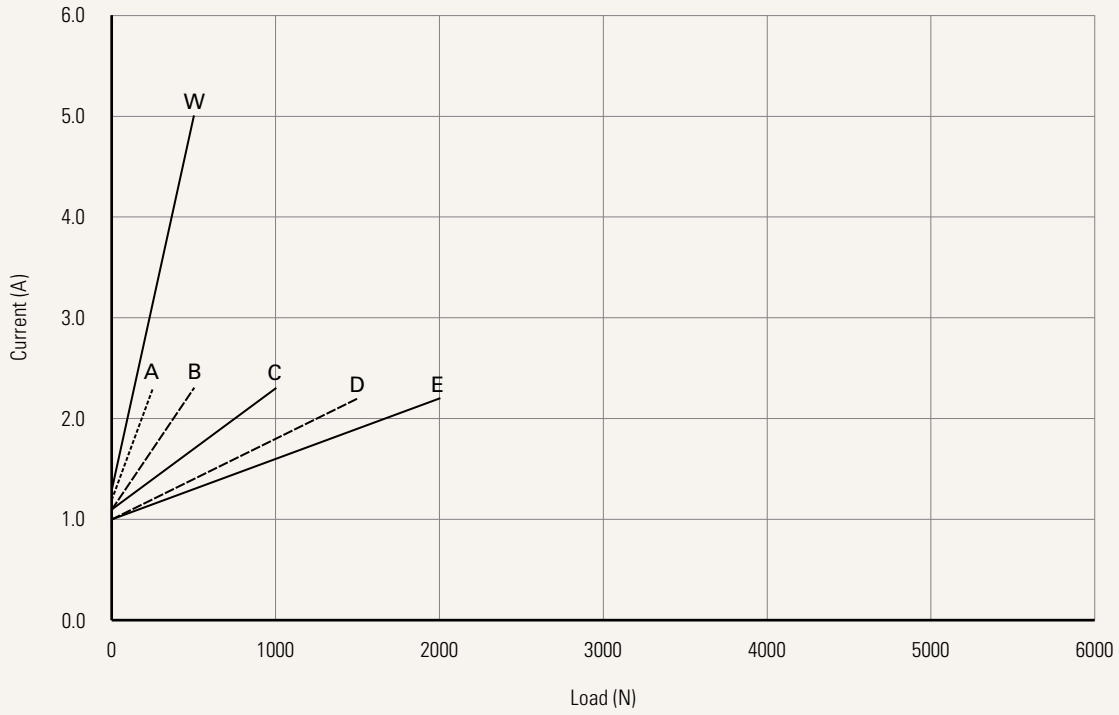
Performance Data (24V DC Motor)

Motor Speed (5200RPM)

Speed vs. Load



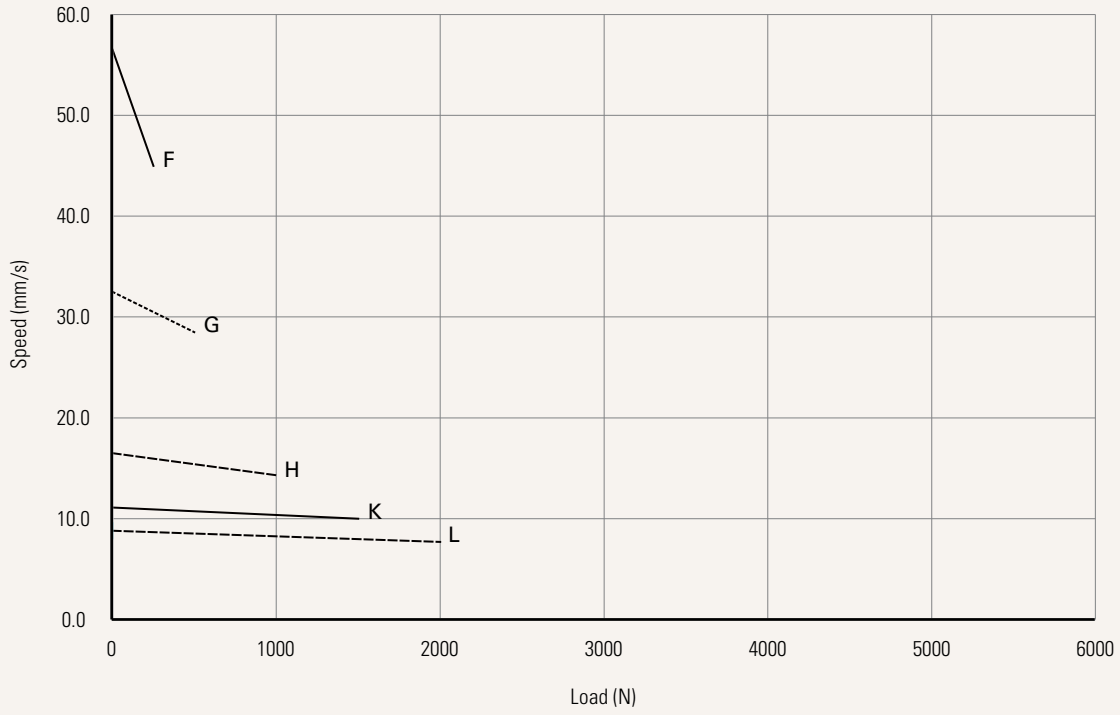
Current vs. Load



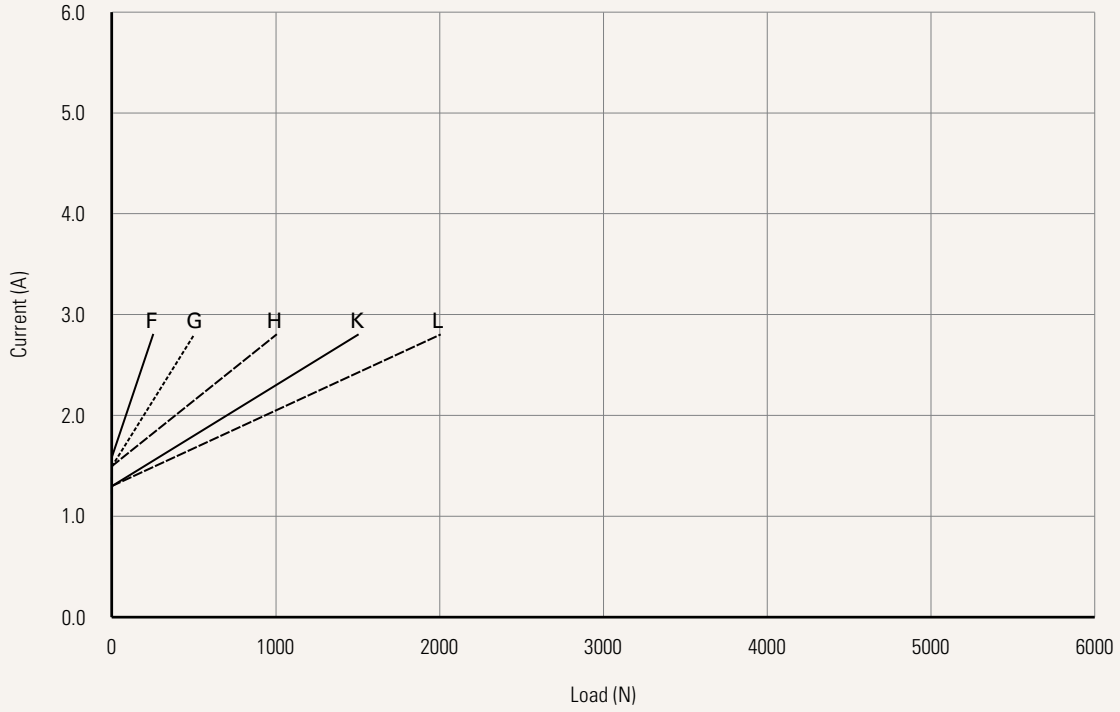
Performance Data (24V DC Motor)

Motor Speed (6600RPM)

Speed vs. Load



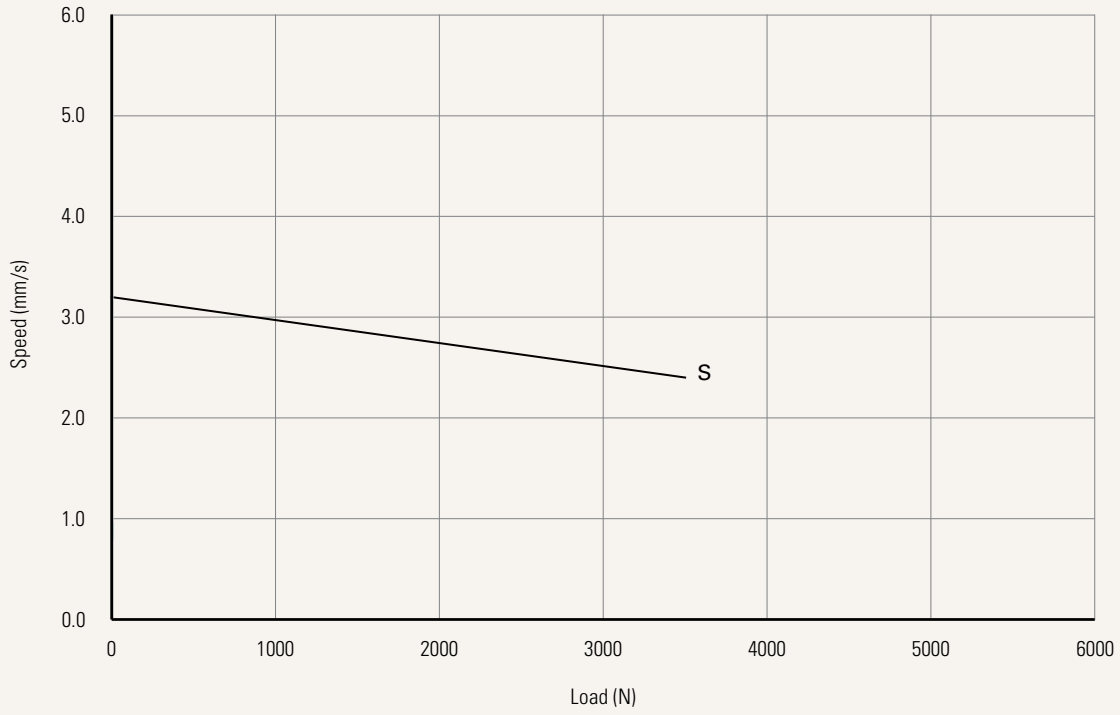
Current vs. Load



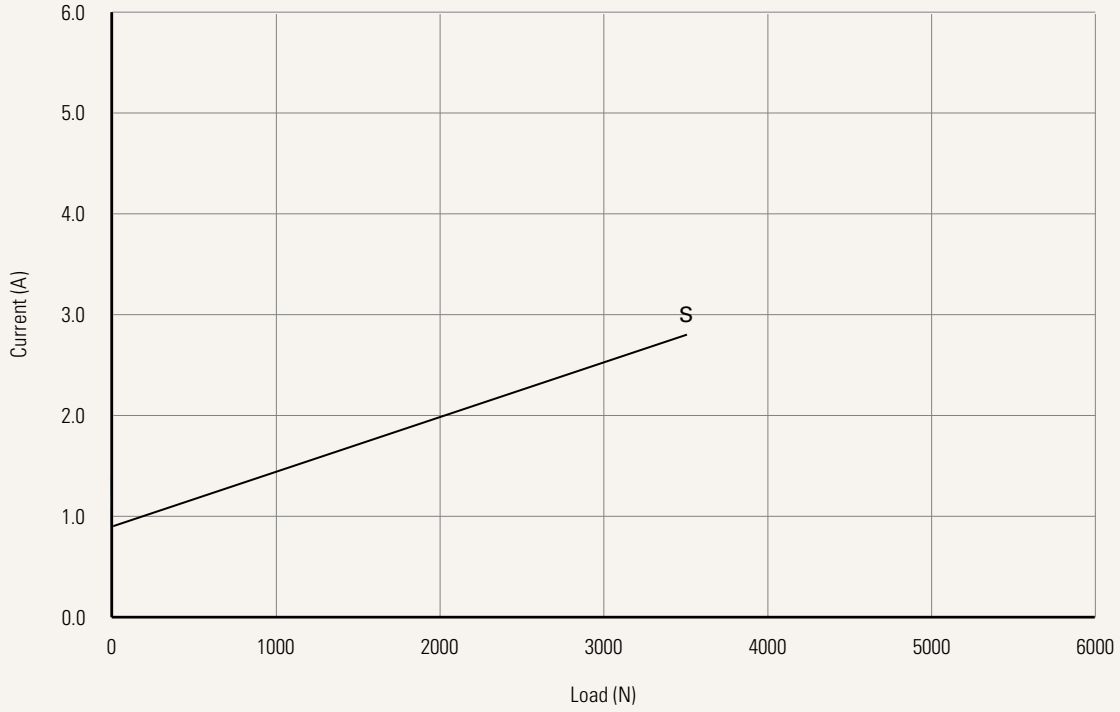
Performance Data (24V DC Motor)

Motor Speed (3800RPM)

Speed vs. Load



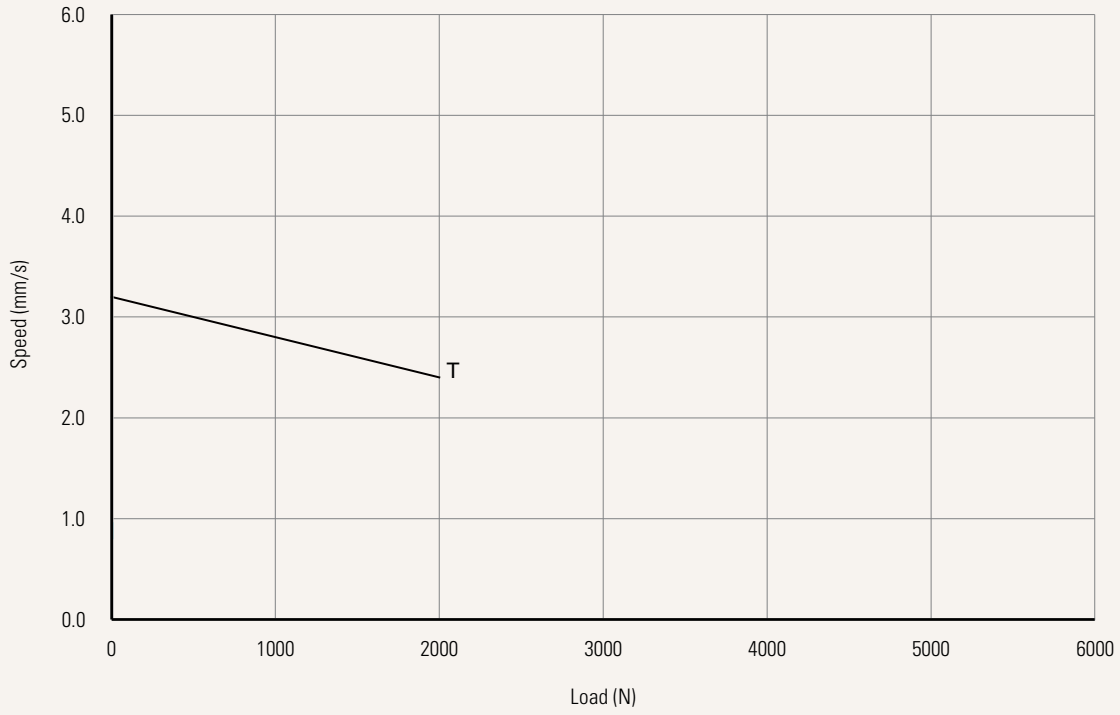
Current vs. Load



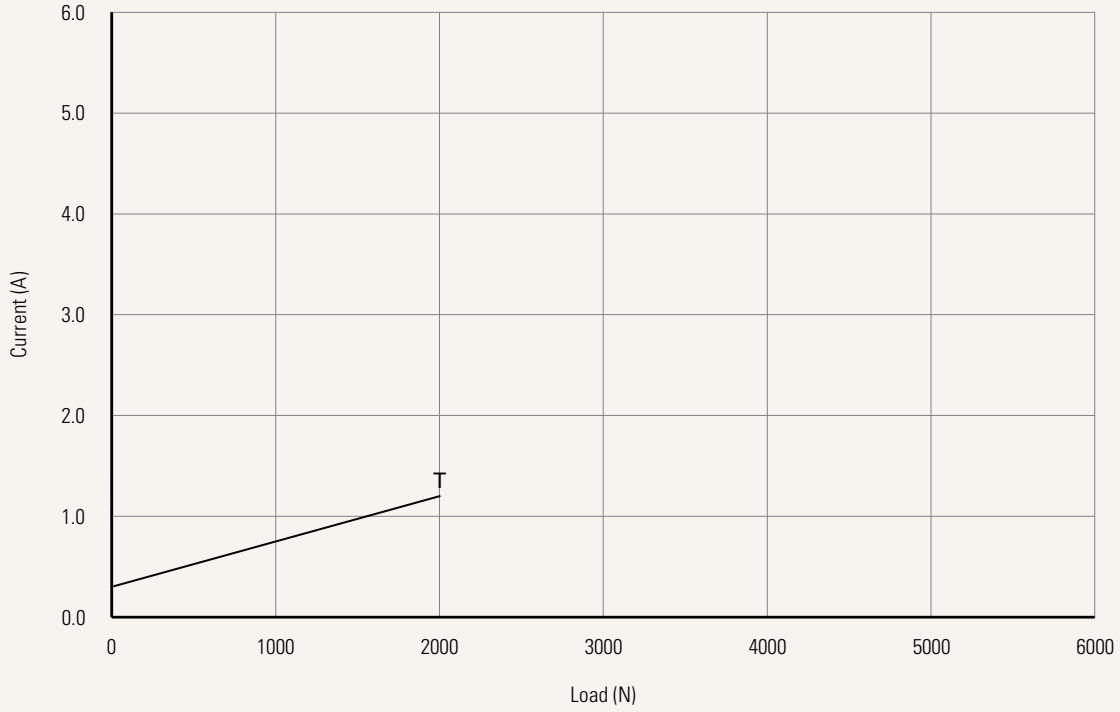
Performance Data (24V DC Motor)

Motor Speed (2200RPM)

Speed vs. Load



Current vs. Load



MA5 Ordering Key

MA5

Version: 20230802-F

Voltage	1 = 12V DC 2 = 24V DC	4 = 48V DC 6 = 12V DC, PTC	5 = 24V DC, PTC 8 = 48V DC, PTC
Load and Speed	See page 3		
Stroke (mm)	See page 3		
Retracted Length (mm)	See page 9		
Rear Attachment (mm) See page 10	4 = Aluminum, U clevis, slot 6.0, width 10.5, hole 6.4, one piece casting with gearbox 5 = Aluminum, U clevis, slot 6.0, width 10.5, hole 8.0, one piece casting with gearbox		6 = Aluminum, U clevis, slot 6.0, width 10.5, hole 10.1, one piece casting with gearbox
Front Attachment (mm) See page 10	1 = Aluminum, slotless, hole 6.4 2 = Aluminum, slotless, hole 8.0 3 = Aluminum, U clevis, slot 6.0, depth 16.0, hole 10.0		4 = Aluminum, U clevis, slot 6.0, depth 16.0, hole 6.4 5 = Aluminum, U clevis, slot 6.0, depth 16.0, hole 8.0
Direction of Rear Attachment (Counterclockwise) See page 10	1 = 90°	2 = 0°	
Functions for Limit Switches See page 11	1 = Two switches cut off the actuator at end of stroke (EOS) 2 = Two switches cut off the actuator at EOS + in-between third one sends signal 3 = Two switches send signal at EOS 4 = Two switches send signal at EOS + third one in between sends signal		
Output Signals	0 = Without	1 = Mechanical pot.	N = NPN Hall sensor*2
Connector See page 11	1 = DIN 6P, 90° plug	2 = Tinned leads	
Cable Length (mm)	1 = Straight, 300	2 = Straight, 600	3 = Straight, 1000
IP Rating	6 = IP66M	9 = IP69K	
Wiper Set & Grease Nipple	0 = Normal wiper, without grease chamber 1 = Enhanced wiper set, with grease chamber, grease nipple * 1 2 = Enhanced wiper set, with grease chamber, grease nipple * 2 3 = Enhanced wiper set, with grease chamber, without grease nipple		

MA5 Ordering Key Appendix

TiMOTION

Retracted Length (mm)

1. Calculate A+B+C = Y
2. Retracted length needs to ≥ Stroke + Y
3. The total Retacted length calculated must be equal or longer than below minimum value
   (1) When choosing the wiper set #0: And the front attachment is #1, #2, min retracted length ≥ 200mm, And the front attachment is #3, #4, #5, min retracted length ≥ 212mm
   (2) When choosing the wiper set #1, #2, #3: And the front attachment is #1, #2min retracted length ≥ 238mm, And the front attachment is #3, #4, #5min retracted length ≥ 250mm

A. Front Attachment	
1, 2	+112
3, 4, 5	+124

B. Load V.S. Stroke		
Stroke (mm)	Load (N)	
	< 3500	= 3500
20 ~150	-	+5
151~200	+2	+7
201~250	+2	+7
251~300	+2	+7
301~350	+12	+17
351~400	+22	+27
401~450	+32	+37
451~500	+42	+47
501~550	+52	+57
551~600	+62	+67
601~650	+72	+77
651~700	+82	+87
701~750	+92	+97
751~800	+102	+107
801~850	+112	+117
851~900	+122	+127
901~950	+132	+137
951~1000	+142	+147

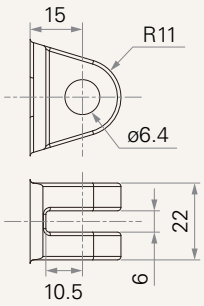
C. Ouput Signals	
0, N	-
1	+30

D. Wiper Set & Grease Nipple	
0	-
1, 2, 3	+10

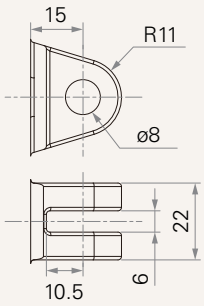
MA5 Ordering Key Appendix

Rear Attachment (mm)

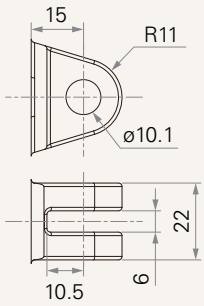
4 = Aluminum, U clevis, slot 6.0, width 10.5, hole 6.4, one piece casting with gearbox



5 = Aluminum, U clevis, slot 6.0, width 10.5, hole 8.0, one piece casting with gearbox

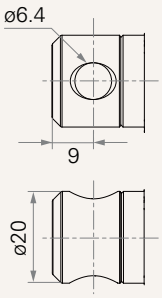


6 = Aluminum, U clevis, slot 6.0, width 10.5, hole 10.1, one piece casting with gearbox

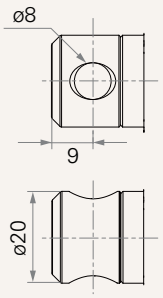


Front Attachment (mm)

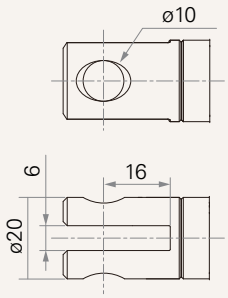
1 = Aluminum, slotless, hole 6.4



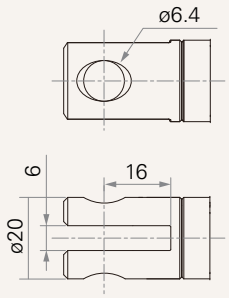
2 = Aluminum, slotless, hole 8.0



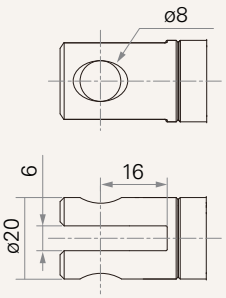
3 = Aluminum, U clevis, slot 6.0, depth 16.0, hole 10.0



4 = Aluminum, U clevis, slot 6.0, depth 16.0, hole 6.4

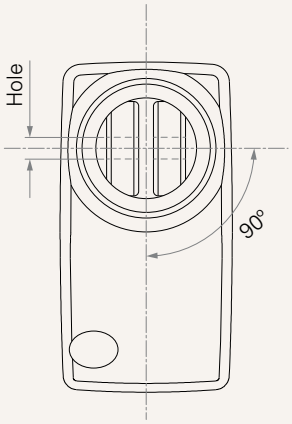


5 = Aluminum, U clevis, slot 6.0, depth 16.0, hole 8.0

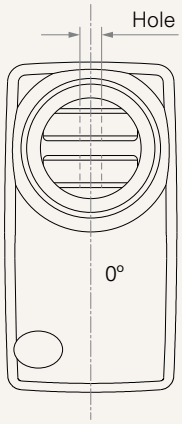


Direction of Rear Attachment (Counterclockwise)

1 = 90°



2 = 0°



MA5 Ordering Key Appendix

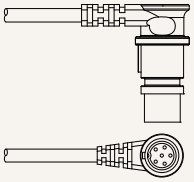
Functions for Limit Switches

Wire Definitions

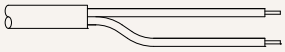
CODE	Pin					
	1 (Green)	2 (Red)	3 (White)	4 (Black)	5 (Yellow)	6 (Blue)
1	extend (VDC+)	N/A	N/A	N/A	retract (VDC+)	N/A
2	extend (VDC+)	N/A	middle switch pin B	middle switch pin A	retract (VDC+)	N/A
3	extend (VDC+)	common	upper limit switch	N/A	retract (VDC+)	lower limit switch
4	extend (VDC+)	common	upper limit switch	medium limit switch	retract (VDC+)	lower limit switch

Connector

1 = DIN 6P, 90° plug



2 = Tinned leads



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