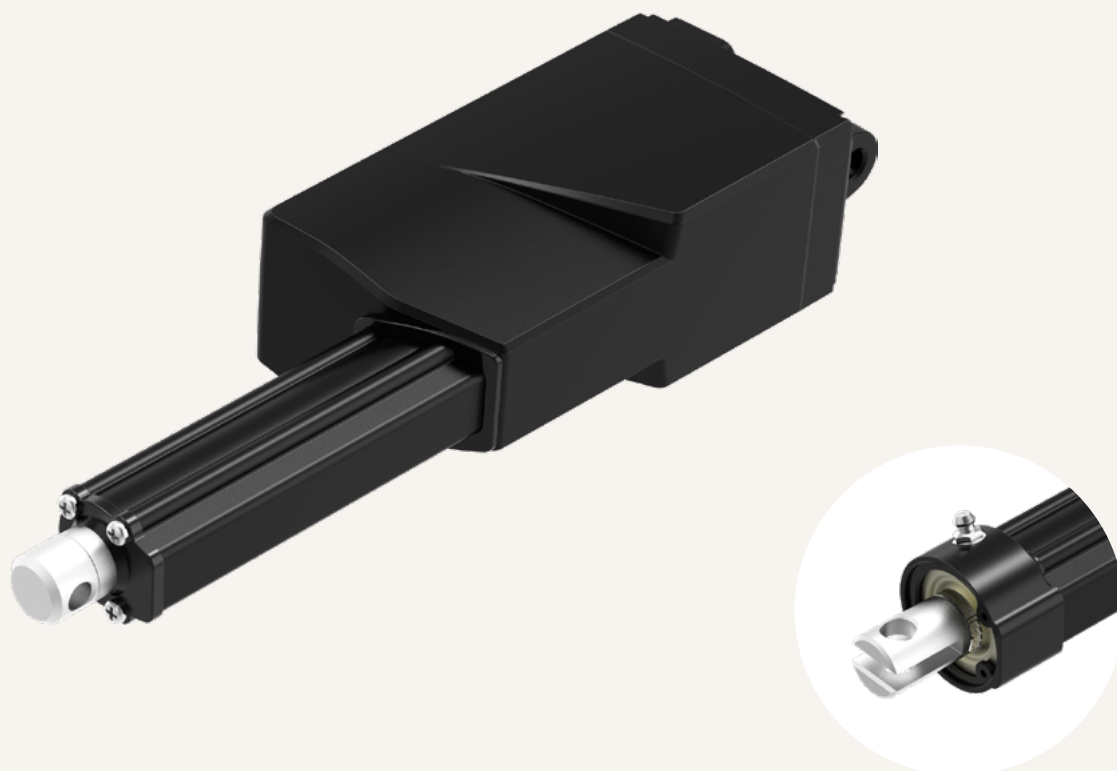


MA5

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.

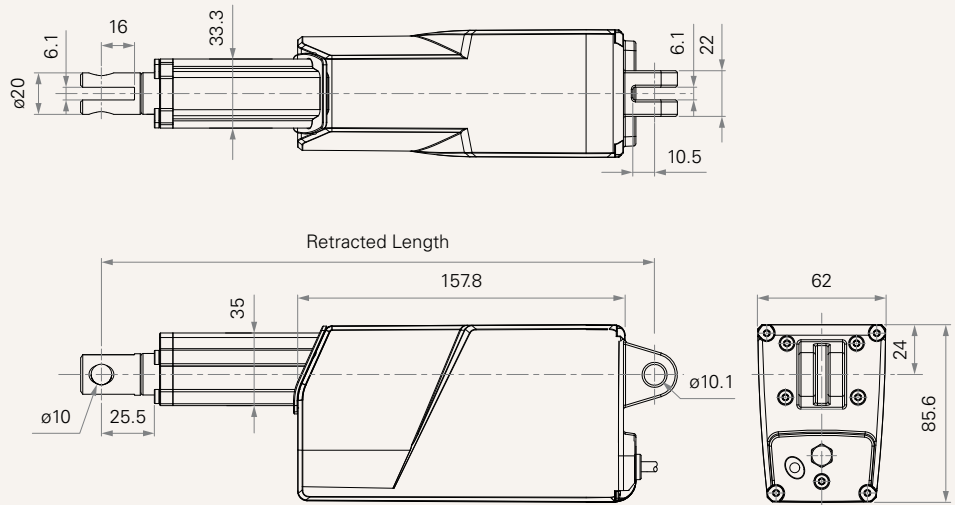
General Features

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., Hall sensor * 2 (5-36V input)
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

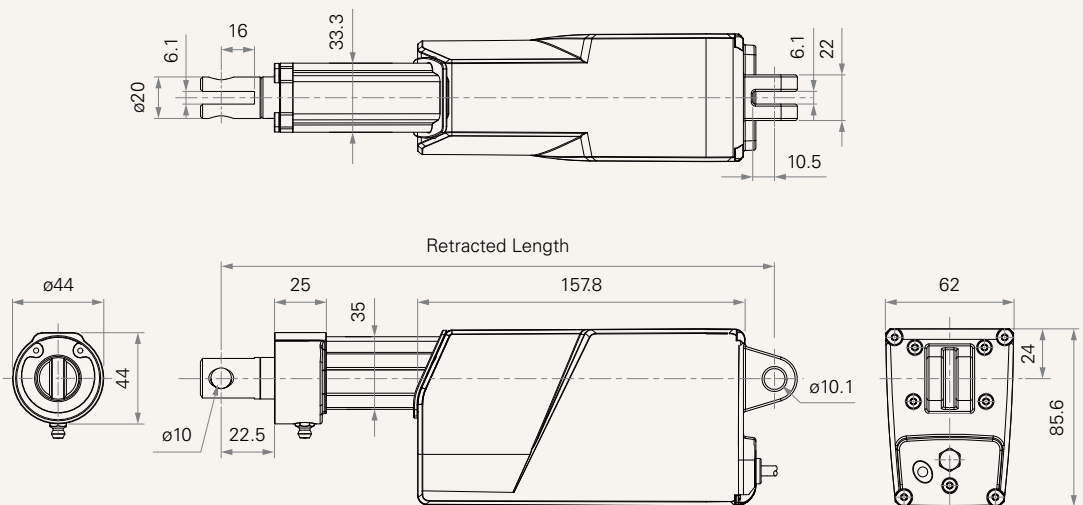
Drawing - Standard Dimensions (mm)

Wiper Set & Grease Nipple

0 = Normal wiper, without grease chamber



1 = Enhanced wiper set, with grease chamber



Load and Speed (12V DC)

CODE	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 (5200RPM, duty cycle 25%)							
A	250	250	250	2.3	4.3	41	38
B	500	500	500	2.2	4.7	29	26
C	1000	1000	1000	2.2	5	14	13.5
D	1500	1500	1500	2.0	5.1	9	8
E	2000	2000	2000	2.0	5.1	7.1	6
W	500	500	500	2.5	8.5	54	35
Motor Speed (6600RPM, duty cycle 25%)							
F	250	250	250	2.8	4.9	55.5	44.2
G	500	500	500	2.7	5.2	31.6	26.5
H	1000	1000	1000	2.6	5.5	16.5	14
K	1500	1500	1500	2.6	5.5	11.1	9.5
L	2000	2000	2000	2.6	5.5	9	7.5
Motor Speed (3800RPM, duty cycle 25%)							
S	3500	2000	3500	1.6	4.8	3.2	2.4
Motor Speed (2200RPM, duty cycle 25%)							
T	2000	2000	2000	0.6	1.2	3.2	2.3

Load and Speed (24V DC)

CODE	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 (5200RPM, duty cycle 25%)							
A	250	250	250	1.2	2.0	43.0	36.0
B	500	500	500	1.1	2.2	25.8	23.0
C	1000	1000	1000	1.1	2.4	14.0	11.8
D	1500	1500	1500	1.0	2.5	9.0	8.0
E	2000	2000	2000	1.0	2.3	7.1	6.2
W	500	500	500	1.2	4.5	54.0	35.0
Motor Speed (6600RPM, duty cycle 25%)							
F	250	250	250	1.6	2.7	56.5	45.0
G	500	500	500	1.5	2.9	32.5	28.5
H	1000	1000	1000	1.5	2.9	16.5	14.3
K	1500	1500	1500	1.3	2.9	11.1	10.0
L	2000	2000	2000	1.3	2.9	8.8	7.7
Motor Speed (3800RPM, duty cycle 25%)							
S	3500	2000	3500	0.8	2.5	3.2	2.4
Motor Speed (2200RPM, duty cycle 25%)							
T	2000	2000	2000	0.3	0.9	3.2	2.4

Note

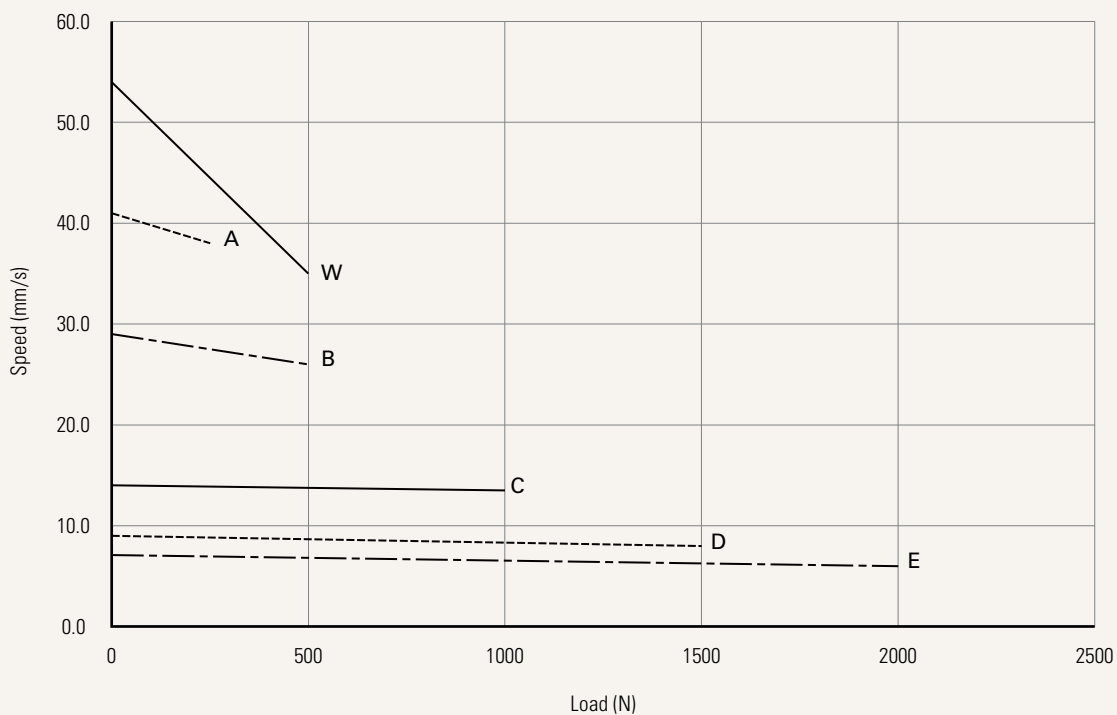
- 1 Please refer to the approved drawing for the final authentic value.
- 2 This self locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
- 3 The current & speed in table are tested when the actuator 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 $\leq 71\sim 83$ dBA (by TiMOTION test standard, ambient noise level ≤ 36 dBA)
- 6 Standard stroke: Min. ≥ 20 mm, 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

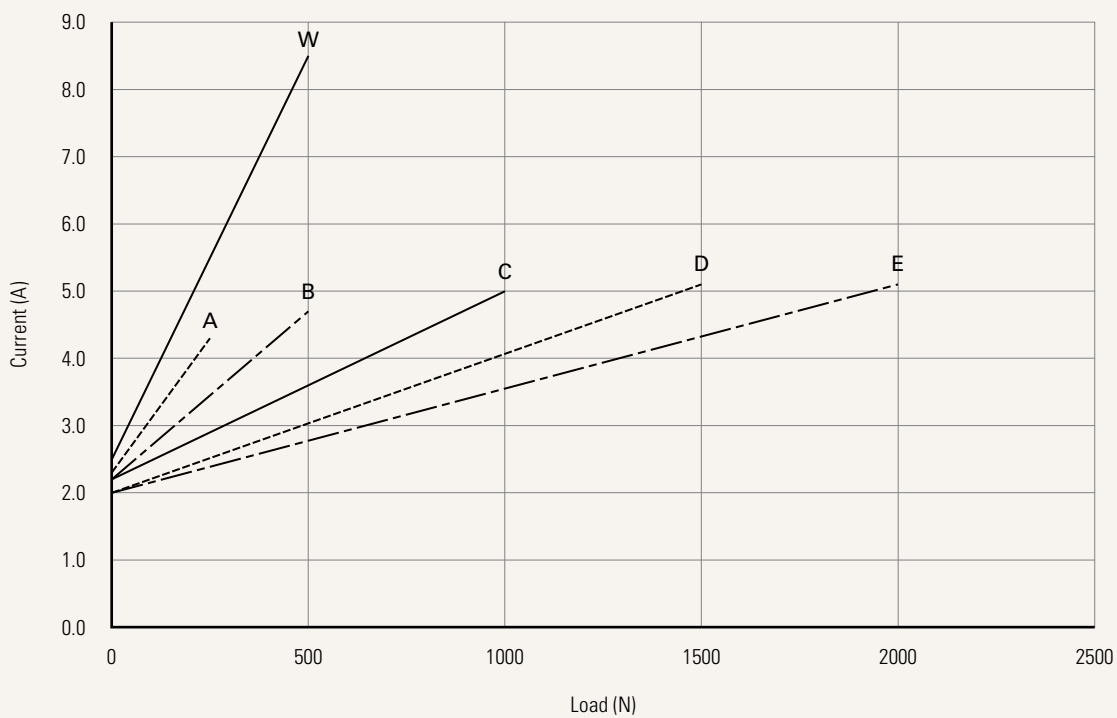
Performance Data (12V DC Motor)

Motor Speed (5200RPM)

Speed vs. Load



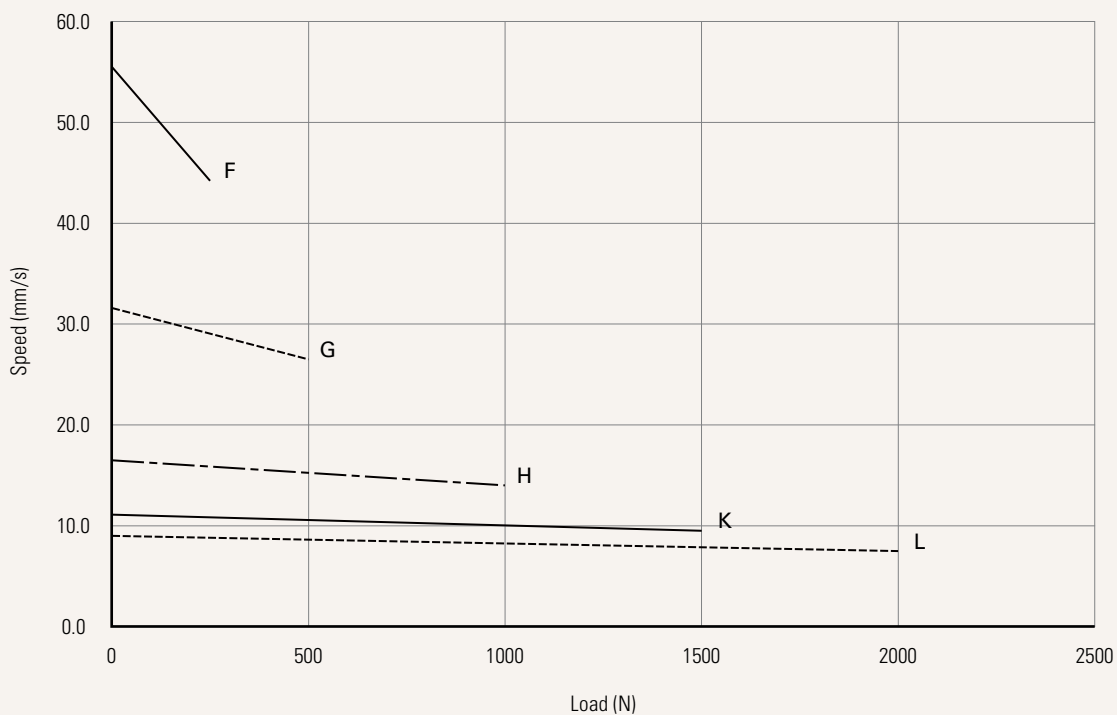
Current vs. Load



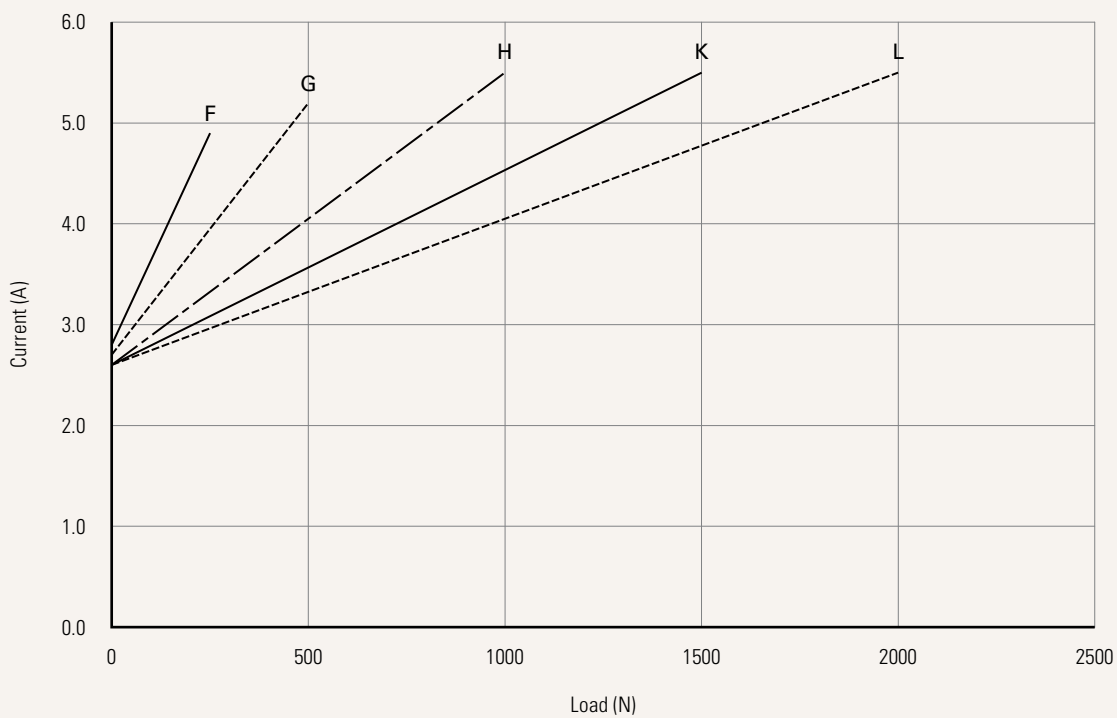
Performance Data (12V DC Motor)

Motor Speed (6600RPM)

Speed vs. Load



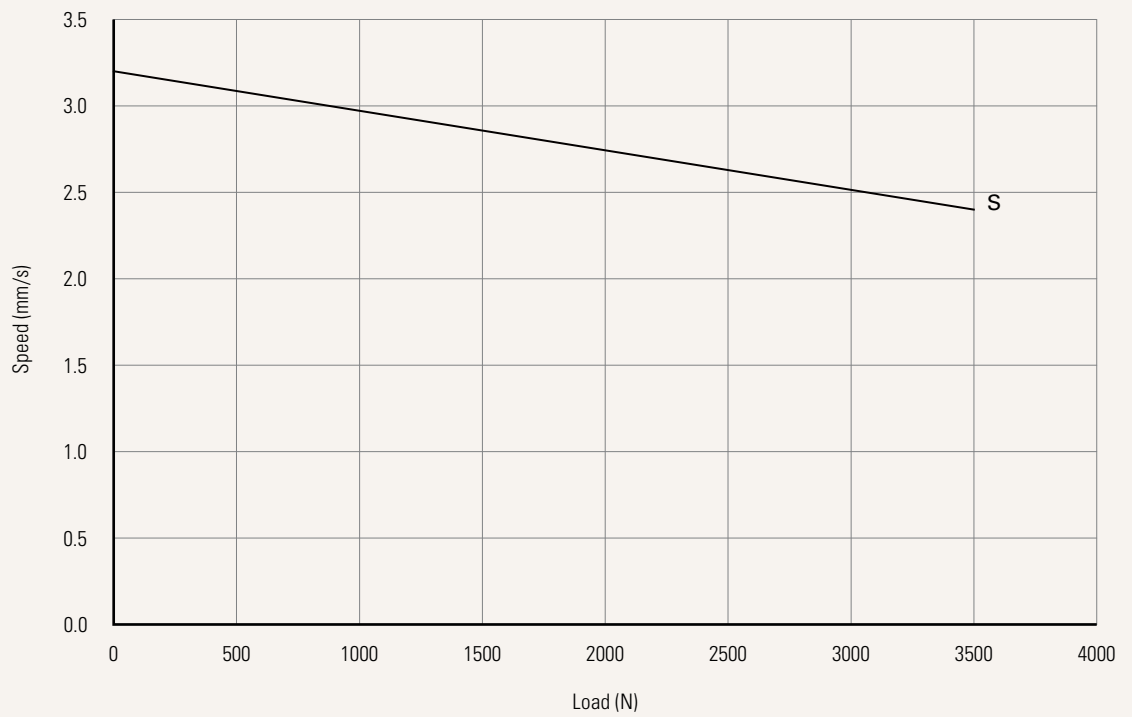
Current vs. Load



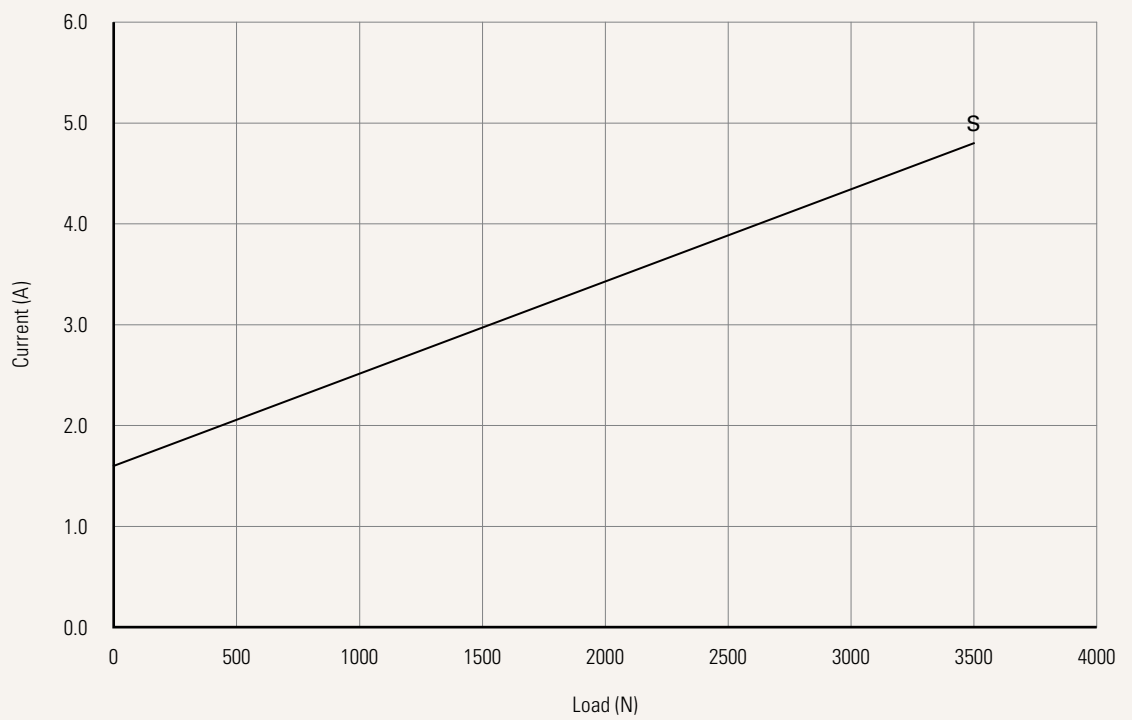
Performance Data (12V DC Motor)

Motor Speed (3800RPM)

Speed vs. Load



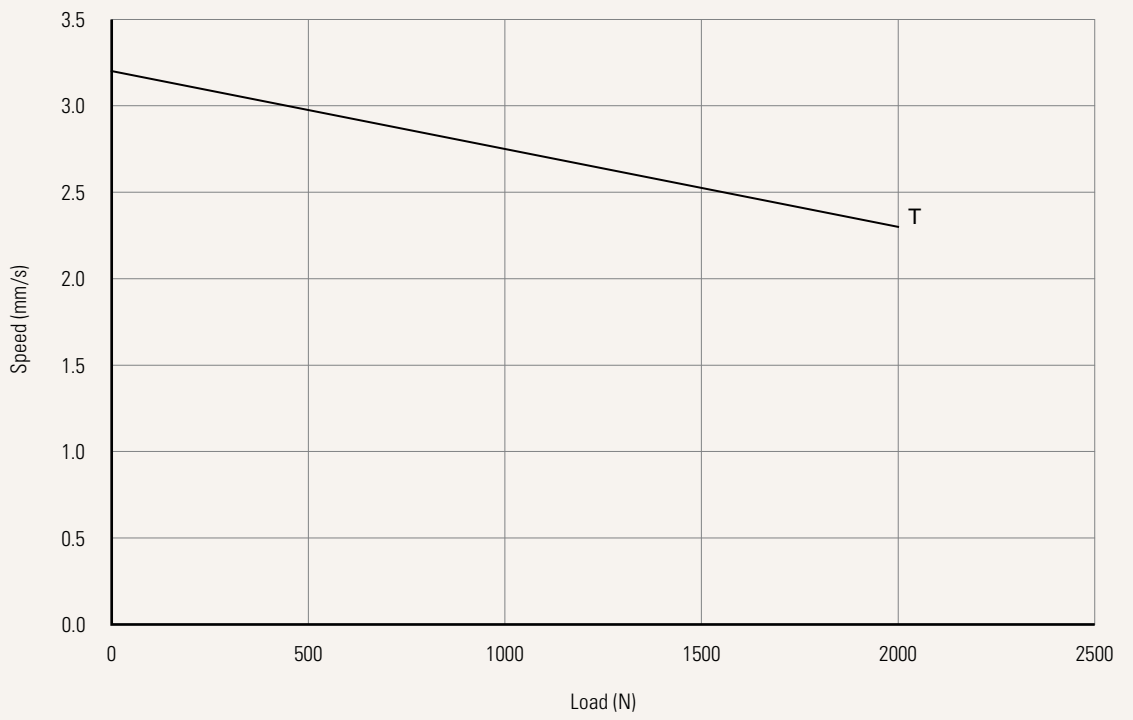
Current vs. Load



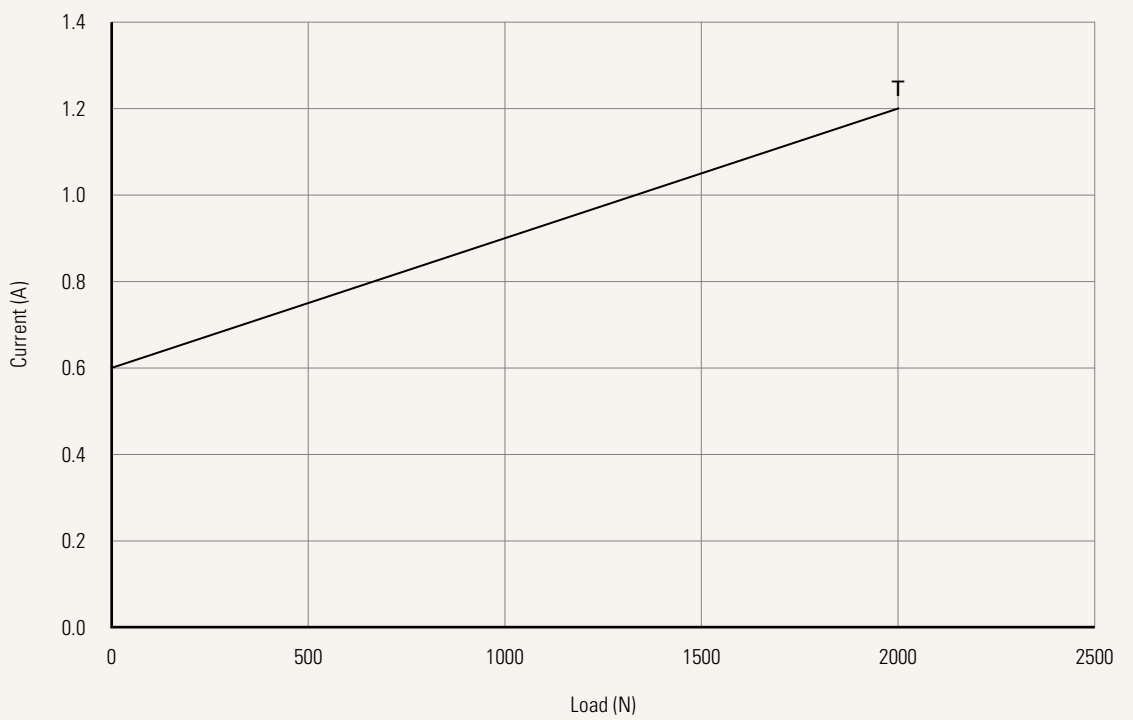
Performance Data (12V DC Motor)

Motor Speed (2200RPM)

Speed vs. Load



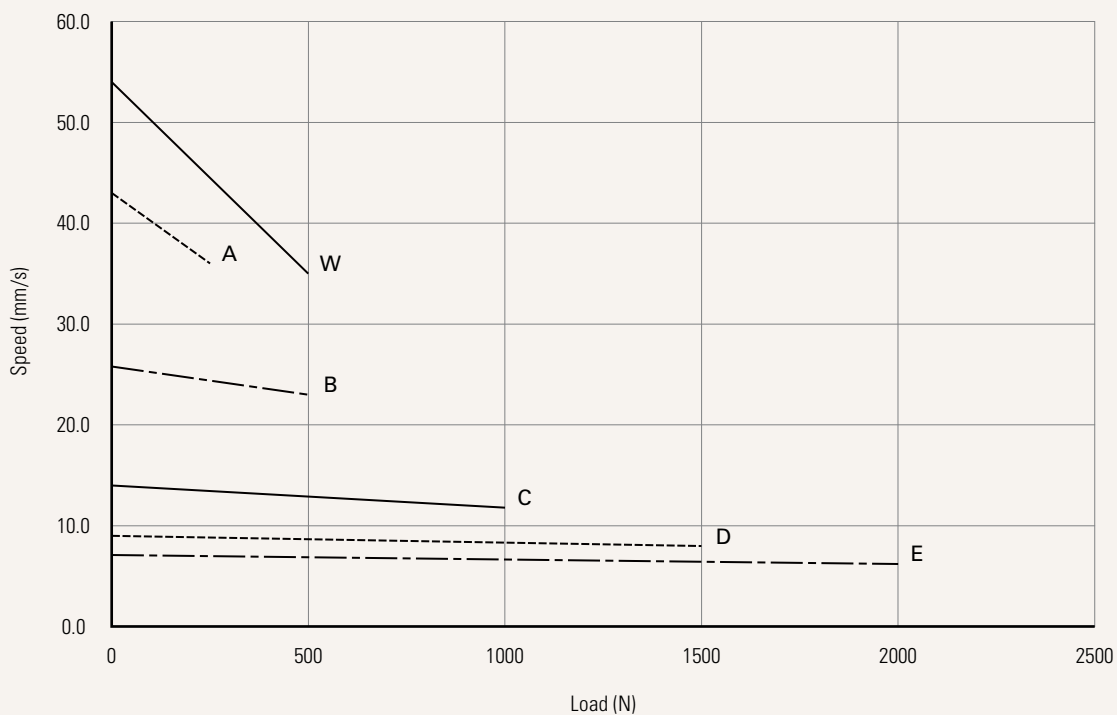
Current vs. Load



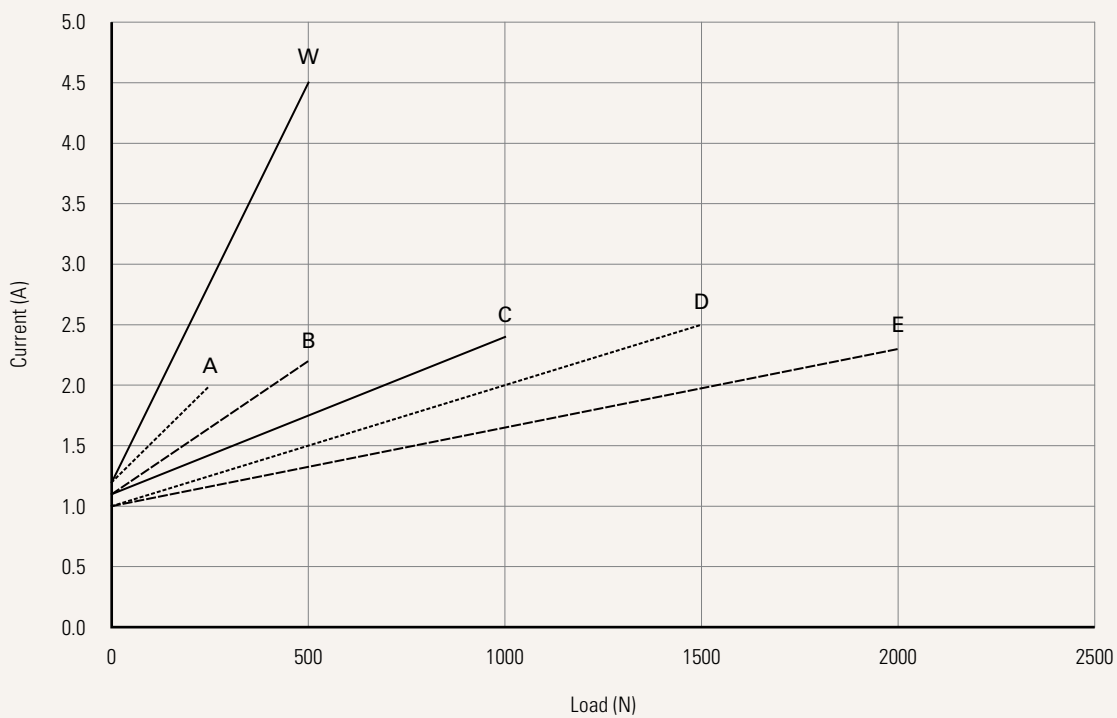
Performance Data (24V DC Motor)

Motor Speed (5200RPM)

Speed vs. Load



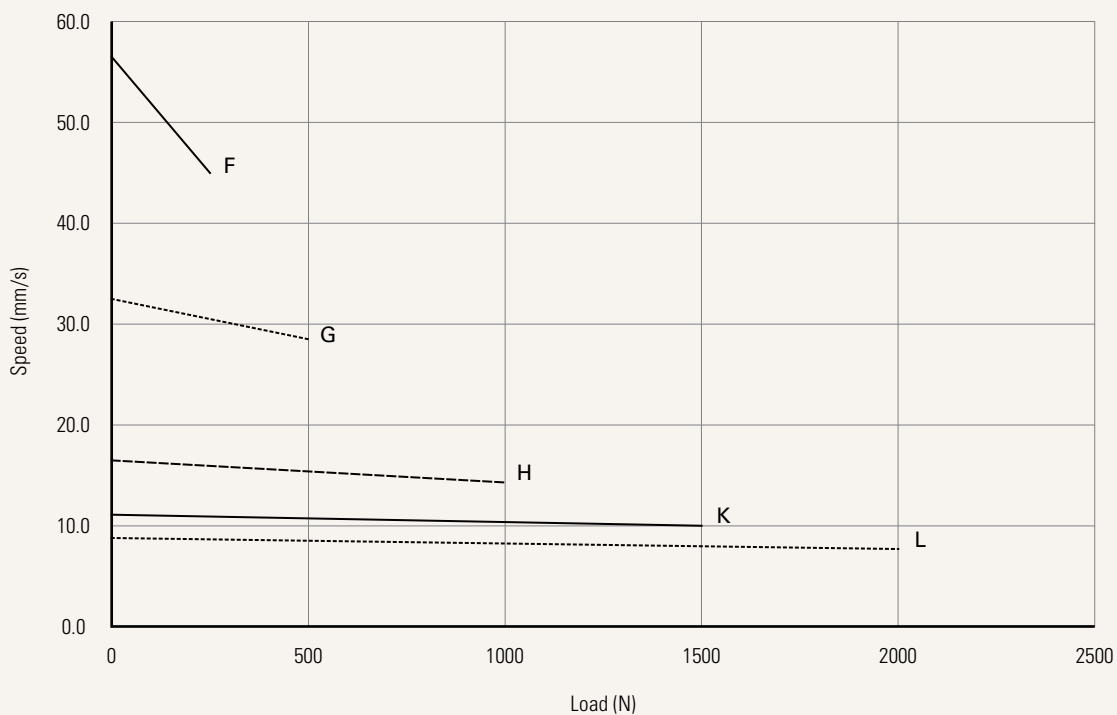
Current vs. Load



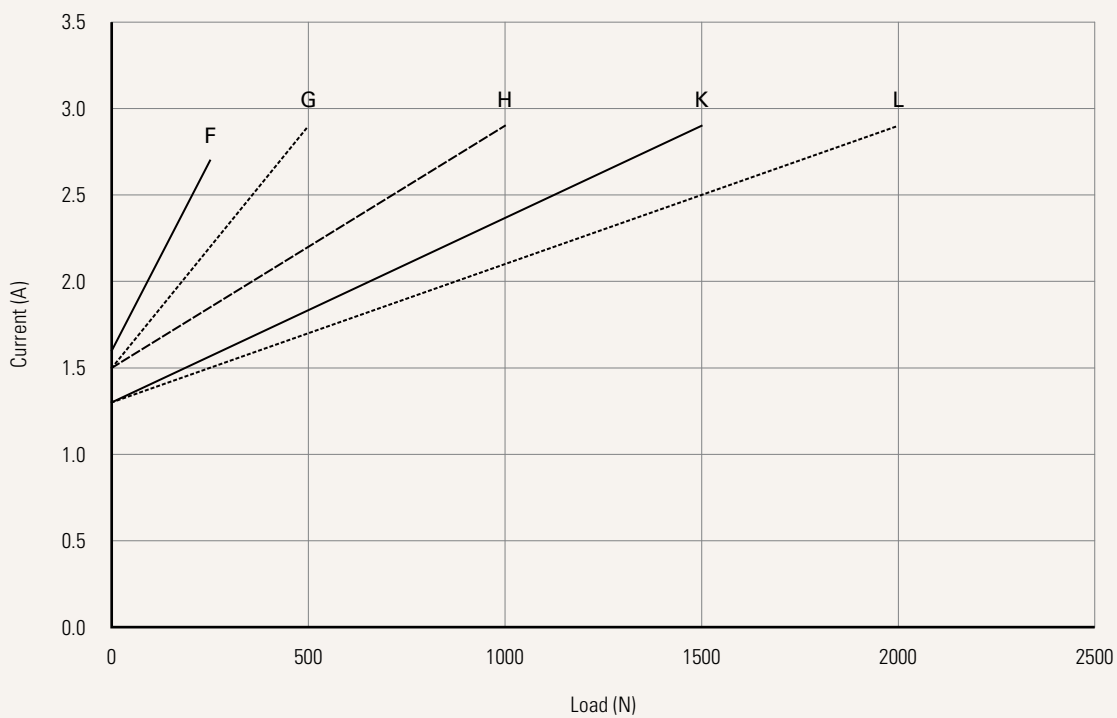
Performance Data (24V DC Motor)

Motor Speed (6600RPM)

Speed vs. Load



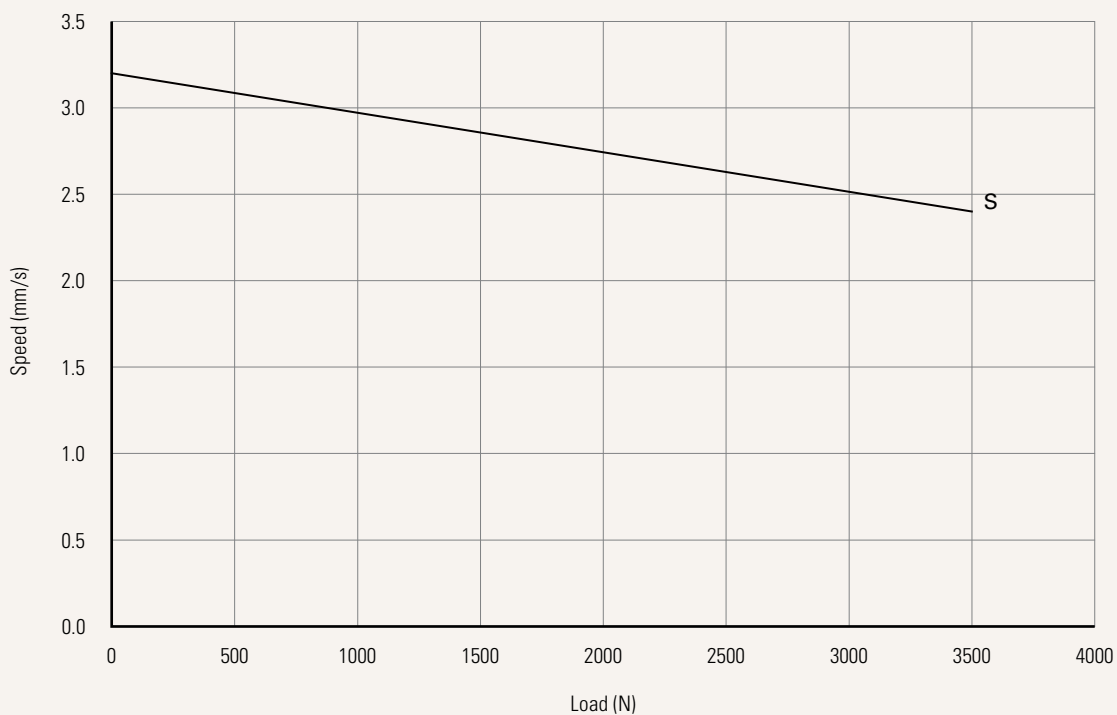
Current vs. Load



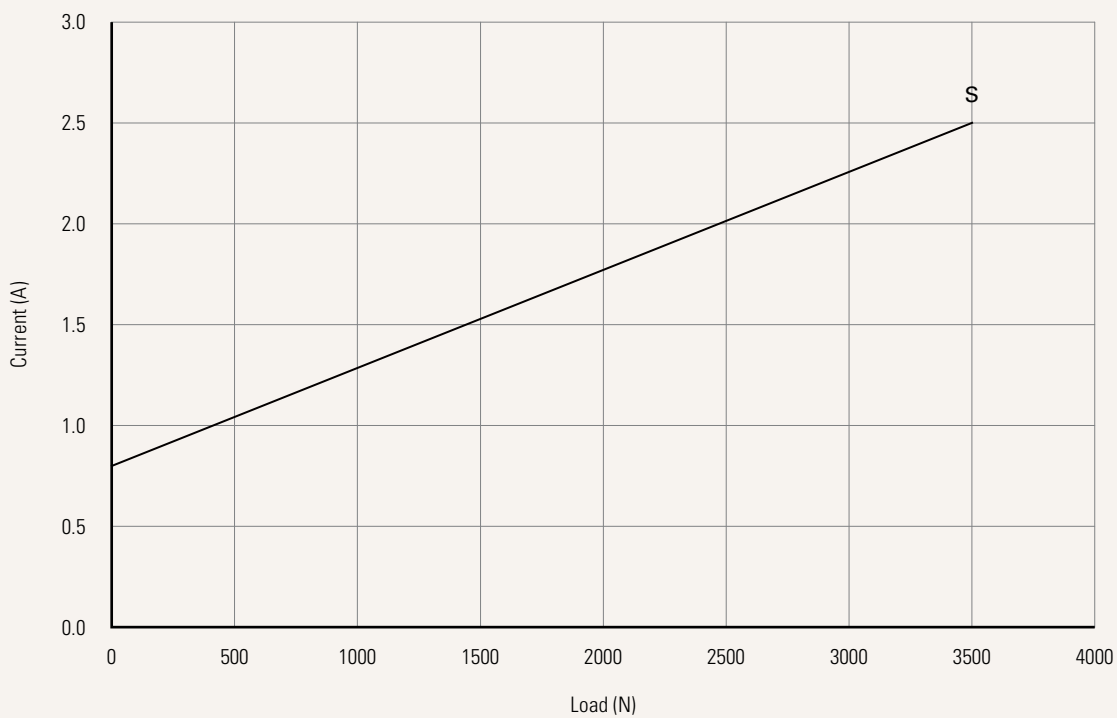
Performance Data (24V DC Motor)

Motor Speed (3800RPM)

Speed vs. Load



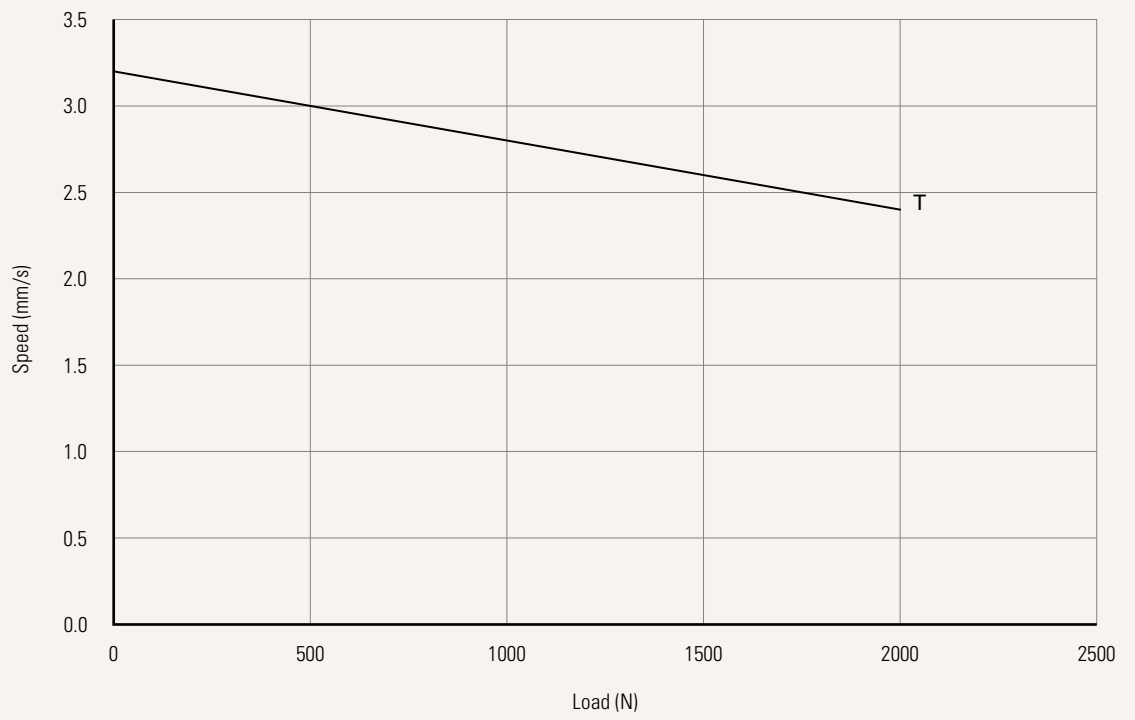
Current vs. Load



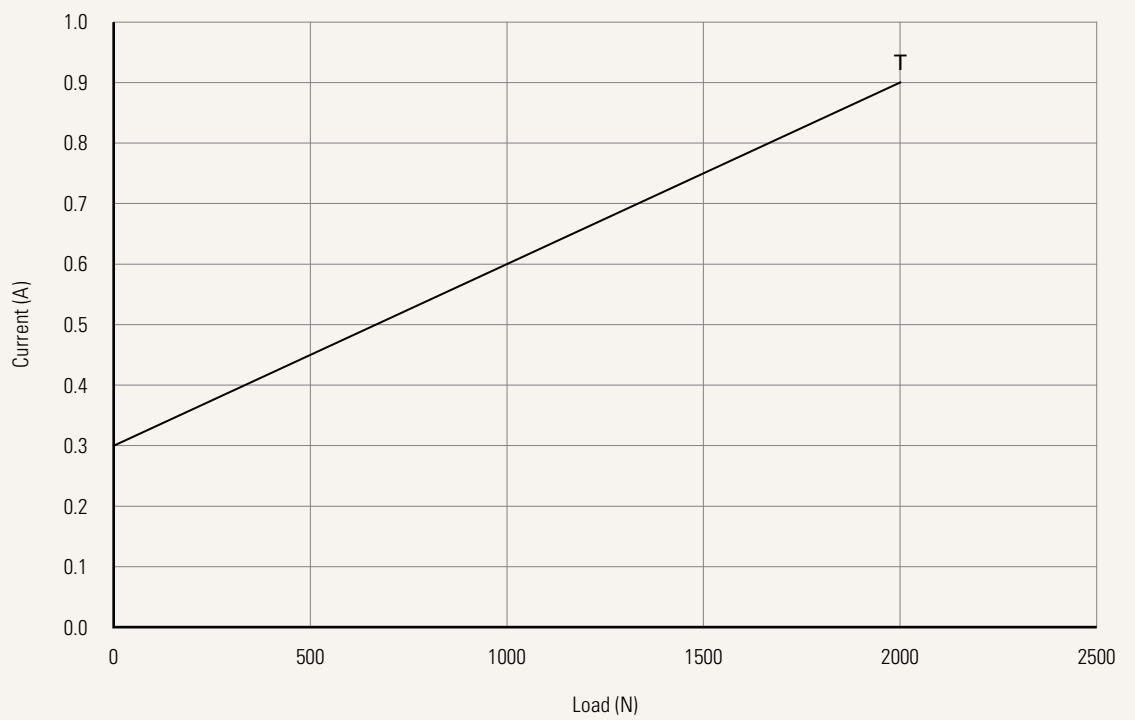
Performance Data (24V DC Motor)

Motor Speed (2200RPM)

Speed vs. Load



Current vs. Load



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 3-4		
Stroke (mm)	See page 4		
Retracted Length (mm)	See page 14		
Rear Attachment (mm) See page 15	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 15	1 = Aluminum, slotless, hole 6.4 2 = Aluminum, slotless, hole 8.0 6 = Aluminum, slotless, hole 10.0	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 16	1 = 90°	2 = 0°	
Functions for Limit Switches	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 = Hall sensor * 2 (5-36V input)	
Connector See page 16	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 See page 2	0 = Standard 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 Note: no grease injected in chamber by factory default, contact RD if specific request needed		

Retracted Length (mm)

1. Calculate $A+B+C = Y$
2. Retracted length needs to \geq Stroke + Y
3. The total Retracted 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 \geq 200mm, And the front attachment is #3, #4, #5, min retracted length \geq 212mm
 - (2) When choosing the wiper set #1, #2, #3: And the front attachment is #1, #2 min retracted length \geq 238mm, And the front attachment is #3, #4, #5 min retracted length \geq 250mm

A. Front Attachment

1, 2, 6	+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. Output Signals

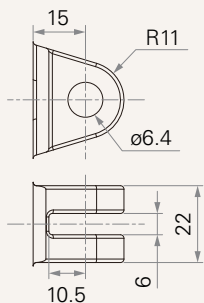
0, N	-
1	+30

D. Wiper Set & Grease Nipple

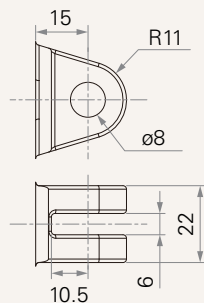
0	-
1, 2, 3	+10

Rear Attachment (mm)

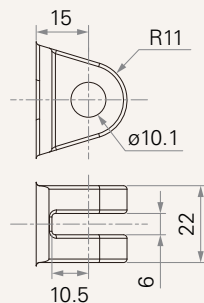
4 = Aluminum, U clevis, slot 6.0, width 10.5, hole 6.4, one piece casting with gearbox



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

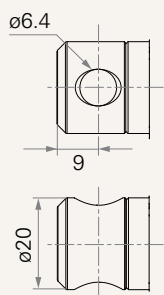


6 = Aluminum, U clevis, slot 6.0, width 10.5, hole 10.1, one piece casting with gearbox

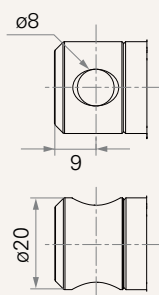


Front Attachment (mm)

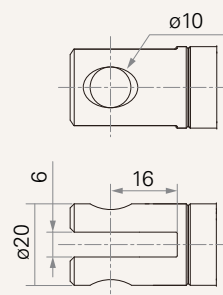
1 = Aluminum, slotless, hole 6.4



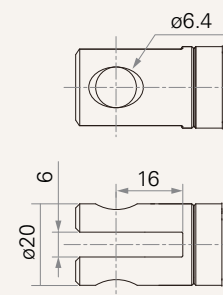
2 = Aluminum, slotless, hole 8.0



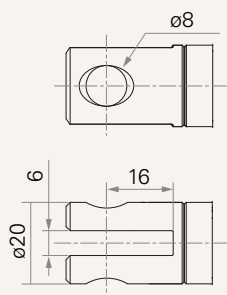
3 = Aluminum, U clevis, slot 6.0, depth 16.0, hole 10.0



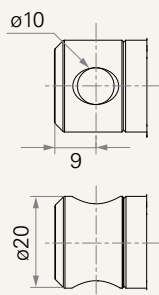
4 = Aluminum, U clevis, slot 6.0, depth 16.0, hole 6.4



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



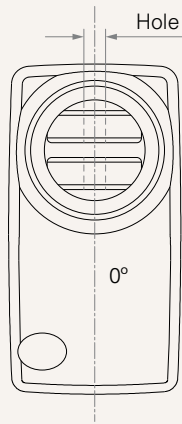
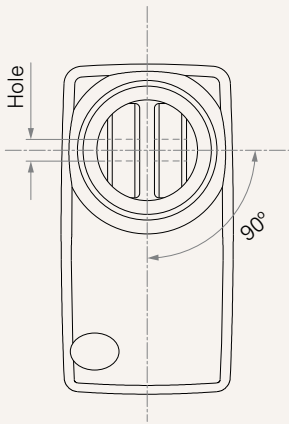
6 = Aluminum, slotless, hole 10



Direction of Rear Attachment (Counterclockwise)

1 = 90°

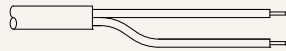
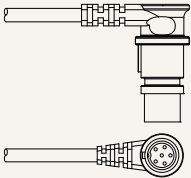
2 = 0°



Connector

1 = DIN 6P, 90° plug

2 = Tinned leads



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.