

MA1

series



Product Segments

• Industrial Motion

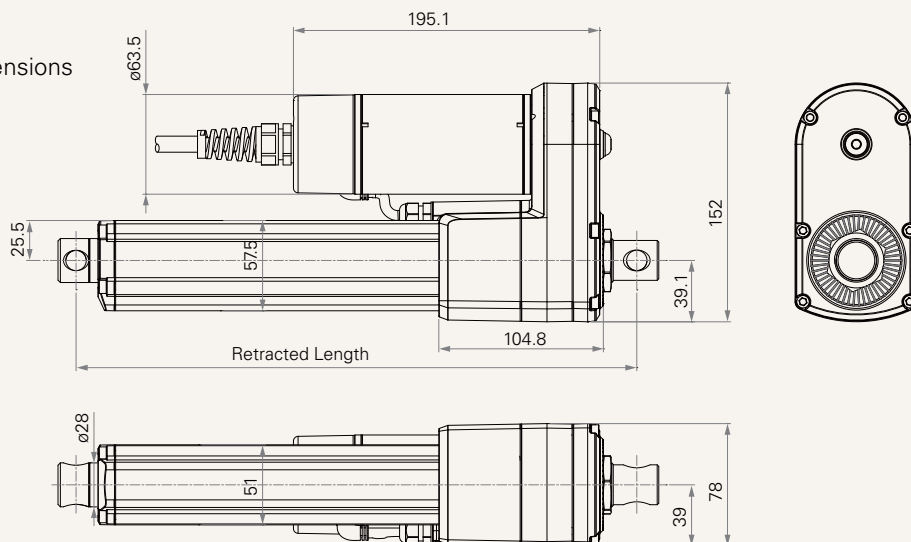
TiMOTION's MA1 series linear actuator is the proven choice for applications requiring a durable, long life solution. Specifically designed for harsh working environments, the MA1 linear actuator is ideal for use in heavy-duty machinery, industrial equipment and off road vehicles. This linear actuator has been certified for applications requiring IP66 dynamic compliance. Available options for the MA1 linear actuator include AC or DC power, ball or acme spindles, mechanical or electrical braking and a load limiting clutch or limit switches.

General Features

| | |
|---|---|
| Spindle | ACME or Ball screw |
| Voltage of motor | 12V DC, 24V DC, 36V DC, 110V AC, or 220V AC |
| Maximum load | 4,500N in push and pull |
| Maximum speed at full load | 48mm/s (Ball screw, DC motor, with 2500N) |
| Stroke | 20~1000mm (ACME screw); 50~800mm (Ball screw) |
| Minimum installation dimension | ≥Stroke+160mm (without POT) |
| Color | Black |
| Certificate | UL73, EMC |
| IP rating | IP69K |
| Operational temperature range | -30°C~+65°C |
| Operational temperature range at full performance | +5°C~+45°C |
| Options | Overload clutch, Hall sensor(s), POT, manual crank function |
| Mechanical or electromagnetic brake | |
| Higher duty cycle (25%), corrosion proof | |

Drawing

Standard Dimensions
(mm)



Load and Speed

| CODE | Load (N) | | Typical Current (A) | | | | Typical Speed (mm/s) | | | | Overload clutch Range (N) |
|--|----------|------|---------------------|----------------|------------------|------------------|----------------------|----------------|------------------|------------------|---------------------------|
| | Push | Pull | No Load 12V DC | No Load 24V DC | With Load 12V DC | With Load 24V DC | No Load 12V DC | No Load 24V DC | With Load 12V DC | With Load 24V DC | |
| ACME Screw, DC Motor (duty cycle 25%) | | | | | | | | | | | |
| B | 1500 | 1500 | 10.0 | 5.0 | 15.4 | 7.7 | 29.5 | 29.5 | 27.0 | 27.0 | 1800~3300 |
| C | 2500 | 2500 | 5.0 | 2.5 | 14.0 | 7.0 | 15.8 | 15.8 | 14.3 | 14.3 | 3000~5500 |

Note

- With a 12V motor, the current is approximately twice the current measured in 24V. With a 36V motor, the current is approximately two-thirds the current measured in 24V; speed will be similar for both voltages.
- Current and speed: Tested average value when extending in push direction.
- Standard stroke: Min. ≥20mm, Max. please refer to below table

| CODE | Load (N) | Max Stroke (mm) |
|----------|----------|-----------------|
| B | 1500 | 1000 |
| C | 2500 | 800 |

| CODE | Load (N) | | Typical Current (A) | | | | Typical Speed (mm/s) | | | | Overload clutch Range (N) |
|--|----------|------|---------------------|----------------|------------------|------------------|----------------------|----------------|------------------|------------------|---------------------------|
| | Push | Pull | No Load 12V DC | No Load 24V DC | With Load 12V DC | With Load 24V DC | No Load 12V DC | No Load 24V DC | With Load 12V DC | With Load 24V DC | |
| Ball Screw, DC Motor (duty cycle 25%) | | | | | | | | | | | |
| A | 2500 | 2500 | 7.0 | 3.5 | 30.0 | 12.5 | 58.5 | 58.5 | 36.5 | 48.0 | 3000~5500 |
| B | 3500 | 3500 | 5.0 | 2.5 | 18.0 | 9.0 | 29.8 | 29.8 | 25.5 | 25.5 | 4200~7700 |
| C | 4500 | 4500 | 4.0 | 2.0 | 13.0 | 6.5 | 16.0 | 16.0 | 14.0 | 14.0 | 5400~9900 |

Note

- With a 12V motor, the current is approximately twice the current measured in 24V. With a 36V motor, the current is approximately two-thirds the current measured in 24V; speed will be similar for both voltages.
- Current and speed: Tested average value when extending in push direction.
- Standard stroke: Min. ≥50mm, Max. please refer to below table

| CODE | Load (N) | Max Stroke (mm) |
|----------|----------|-----------------|
| A | 2500 | 800 |
| B | 3500 | 600 |
| C | 4500 | 600 |

Load and Speed

| CODE | Load (N) | | Typical Current (A) | | | | Typical Speed (mm/s) | | | | Overload clutch Range (N) |
|--|----------|------|---------------------|-----------------|-------------------|-------------------|----------------------|-----------------|-------------------|-------------------|---------------------------|
| | Push | Pull | No Load 110V AC | No Load 220V AC | With Load 110V AC | With Load 220V AC | No Load 110V AC | No Load 220V AC | With Load 110V AC | With Load 220V AC | |
| ACME Screw, AC Motor (duty cycle 25%) | | | | | | | | | | | |
| B | 1500 | 1500 | 1.9 | 0.9 | 2.0 | 1.0 | 26.1 | 22.5 | 23.0 | 21.0 | 1800~3300 |
| C | 2500 | 2500 | 1.9 | 0.9 | 2.0 | 1.0 | 14.1 | 12.0 | 12.8 | 11.2 | 3000~5500 |

Note

- 1 Current and speed: Tested average value when extending in push direction.
- 2 Standard stroke: Min. ≥20mm, Max. please refer to below table

| CODE | Load (N) | Max Stroke (mm) |
|----------|----------|-----------------|
| B | 1500 | 1000 |
| C | 2500 | 800 |

| CODE | Load (N) | | Typical Current (A) | | | | Typical Speed (mm/s) | | | | Overload clutch Range (N) |
|--|----------|------|---------------------|-----------------|-------------------|-------------------|----------------------|-----------------|-------------------|-------------------|---------------------------|
| | Push | Pull | No Load 110V AC | No Load 220V AC | With Load 110V AC | With Load 220V AC | No Load 110V AC | No Load 220V AC | With Load 110V AC | With Load 220V AC | |
| Ball Screw, AC Motor (duty cycle 25%) | | | | | | | | | | | |
| A | 2500 | 2500 | 2.0 | 0.9 | 2.5 | 1.3 | 53.0 | 46.0 | 38.5 | 40.0 | 3000~5500 |
| B | 3500 | 3500 | 1.9 | 0.9 | 2.1 | 1.1 | 27.0 | 23.5 | 22.5 | 21.5 | 4200~7700 |
| C | 4500 | 4500 | 1.9 | 0.9 | 2.0 | 1.0 | 14.5 | 12.0 | 13.0 | 11.5 | 5400~9900 |

Note

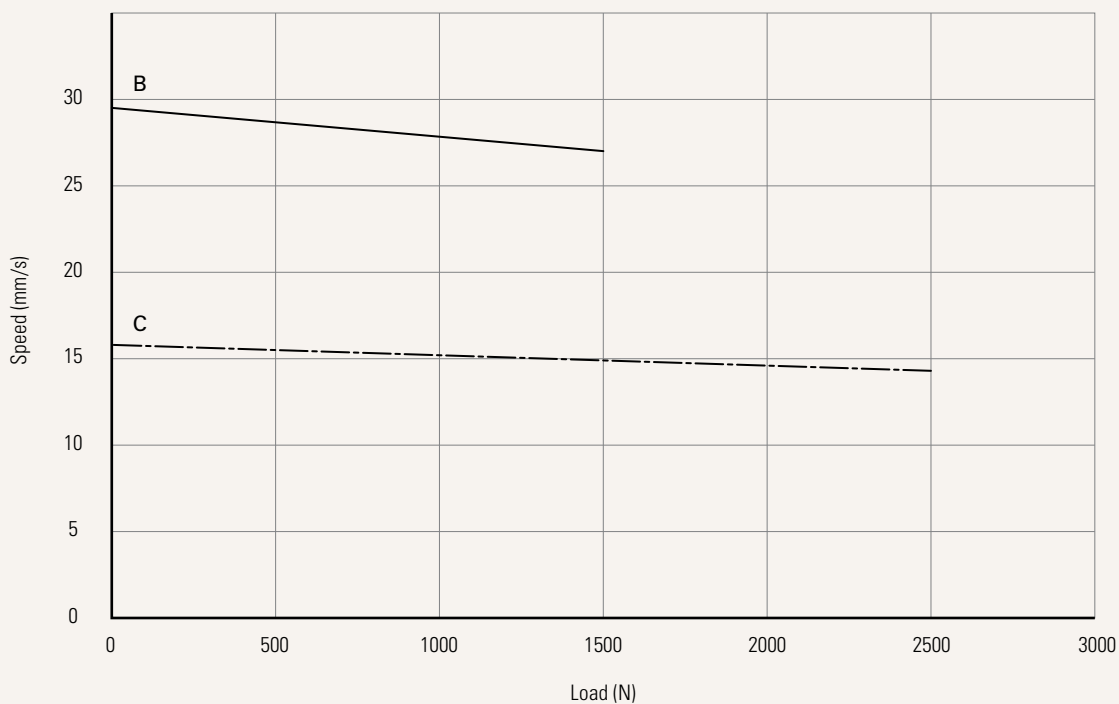
- 1 Current and speed: Tested average value when extending in push direction.
- 2 Standard stroke: Min. ≥50mm, Max. please refer to below table

| CODE | Load (N) | Max Stroke (mm) |
|----------|----------|-----------------|
| A | 2500 | 800 |
| B | 3500 | 600 |
| C | 4500 | 600 |

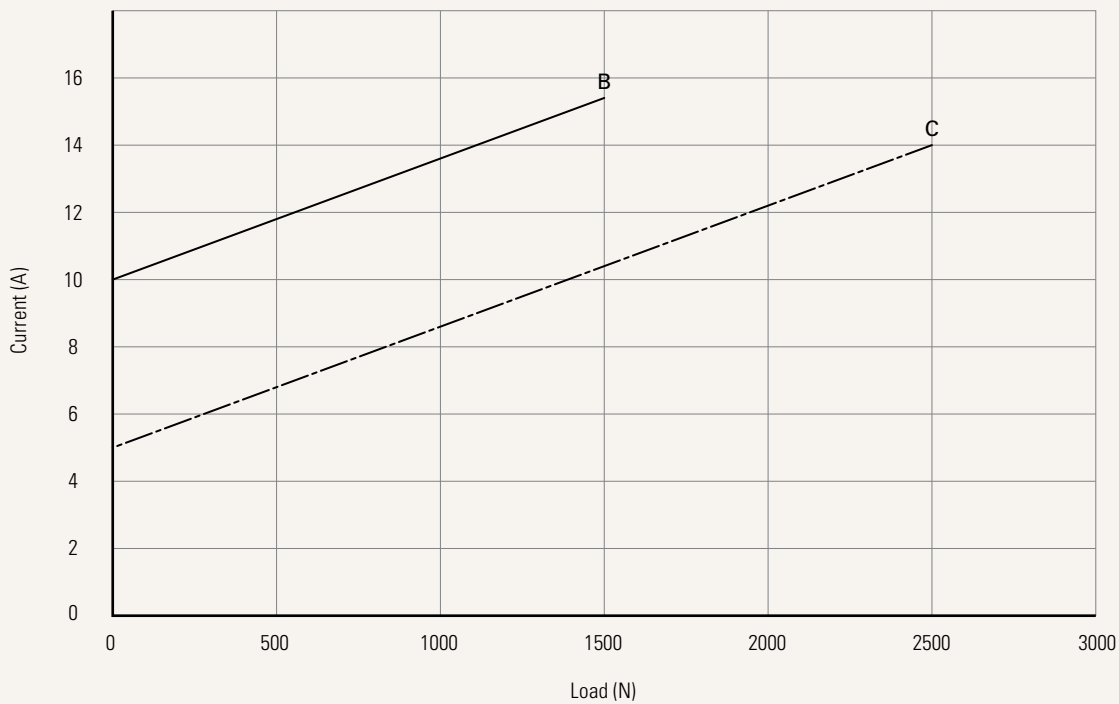
Performance Data (12V DC Motor)

ACME Screw (duty cycle 25%)

Speed vs. Load



Current vs. Load



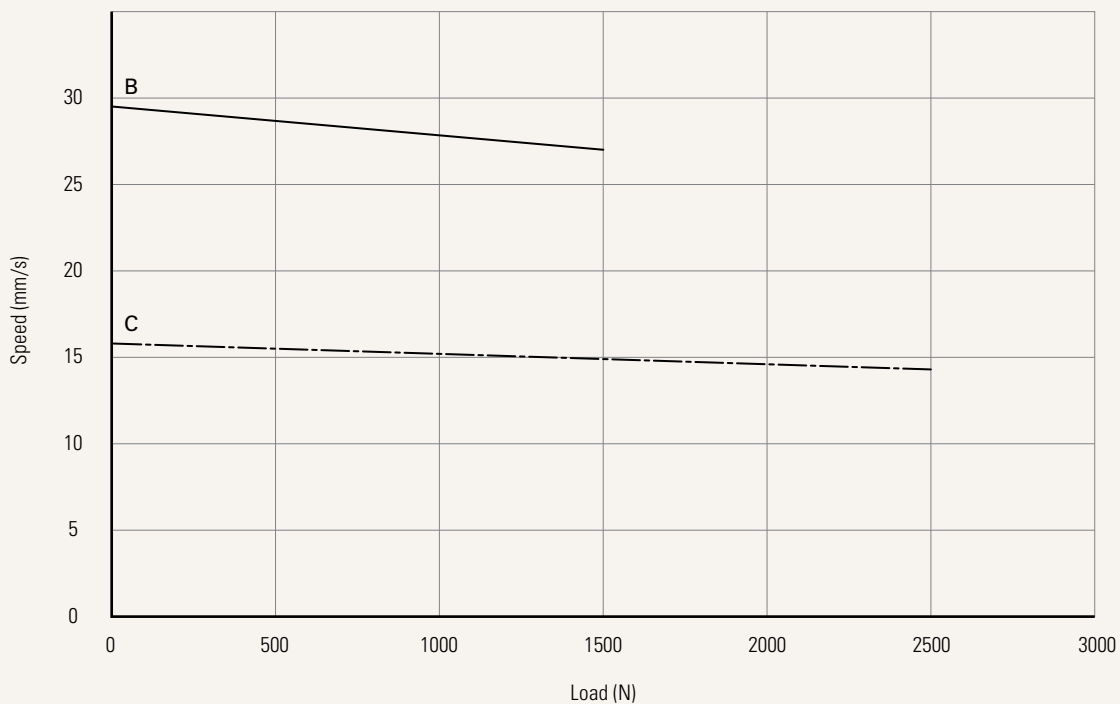
Note

1 The performance data in the curve charts shows theoretical value.

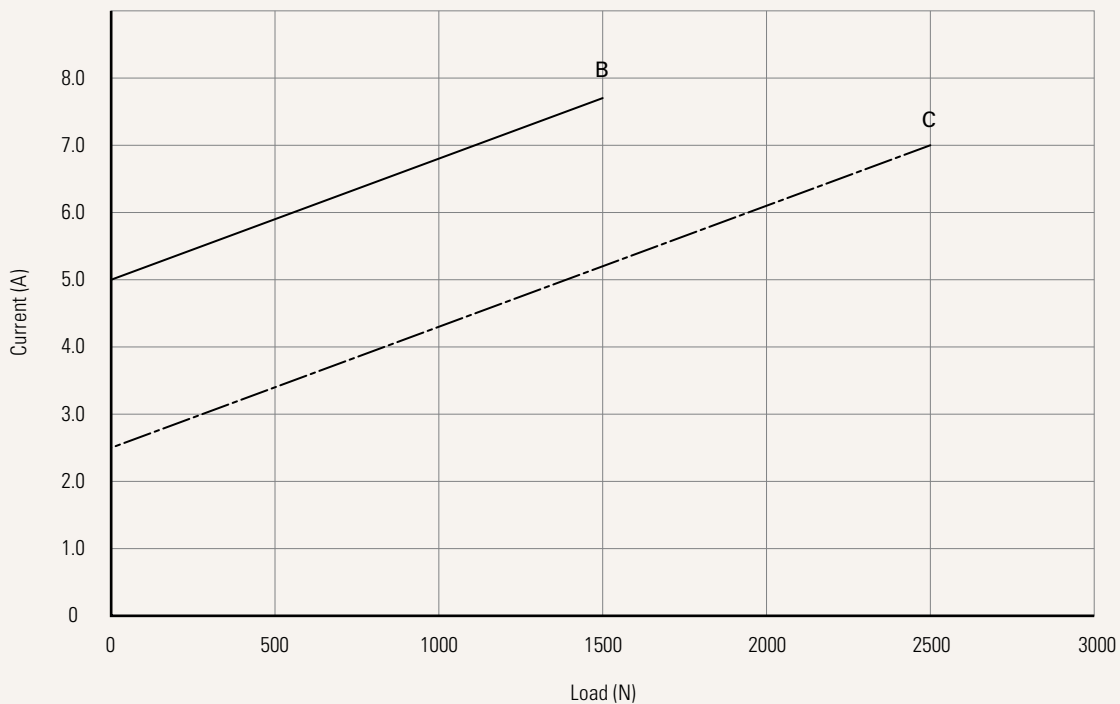
Performance Data (24V DC Motor)

ACME Screw (duty cycle 25%)

Speed vs. Load



Current vs. Load



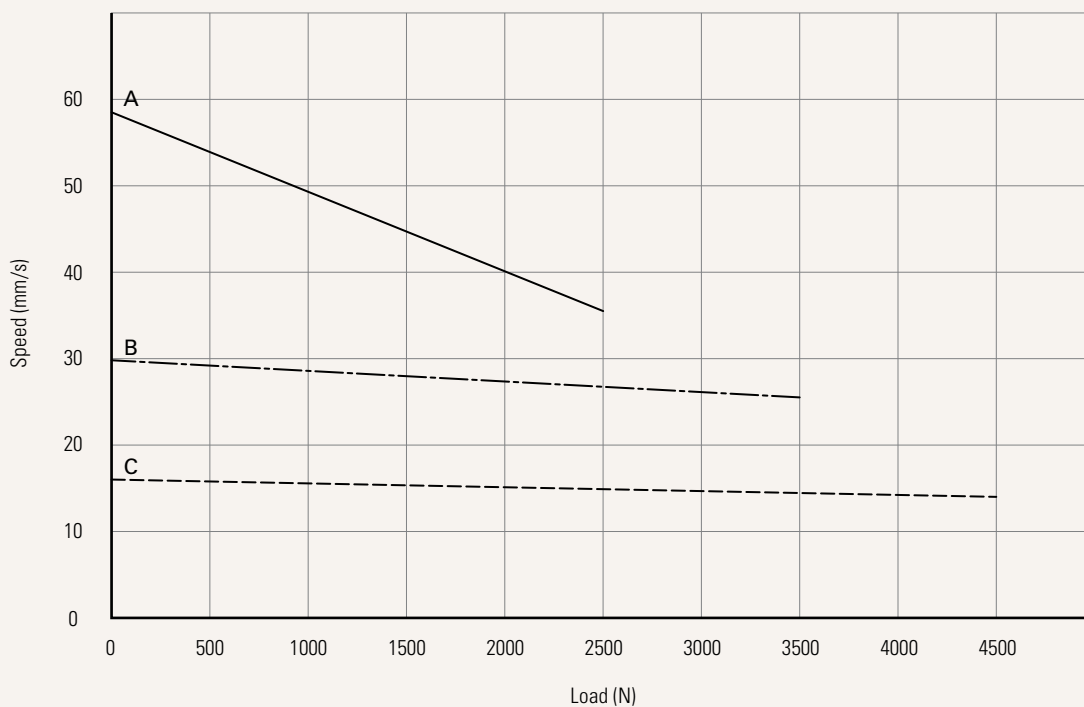
Note

1 The performance data in the curve charts shows theoretical value.

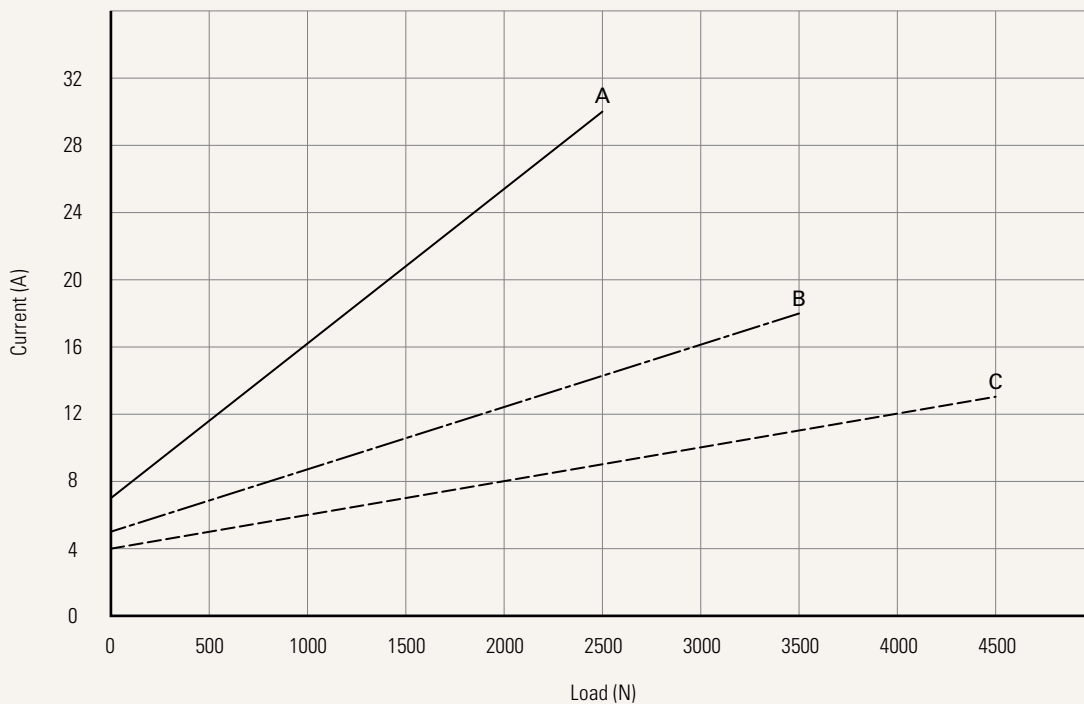
Performance Data (12V DC Motor)

Ball Screw (duty cycle 25%)

Speed vs. Load



Current vs. Load



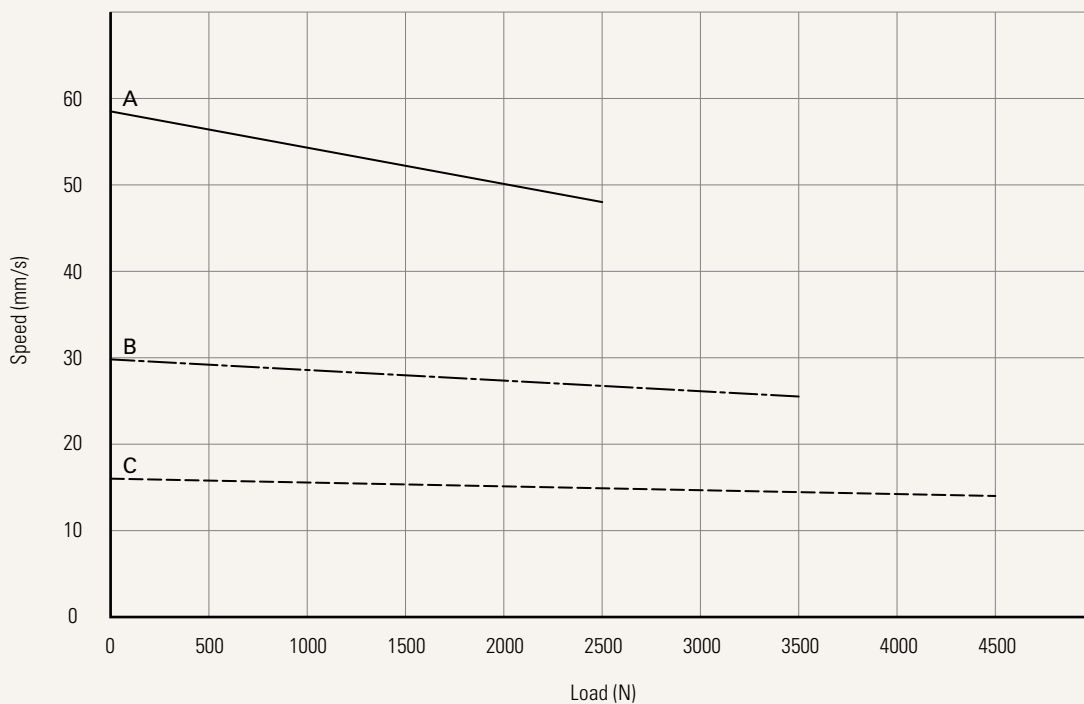
Note

1 The performance data in the curve charts shows theoretical value.

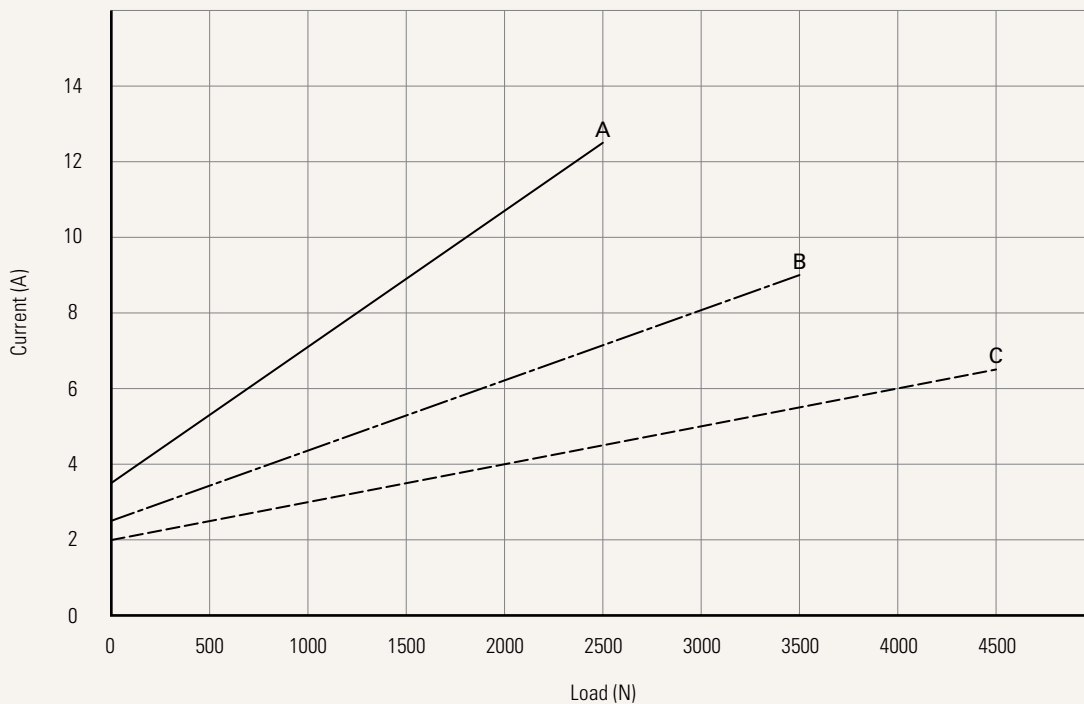
Performance Data (24V DC Motor)

Ball Screw (duty cycle 25%)

Speed vs. Load



Current vs. Load



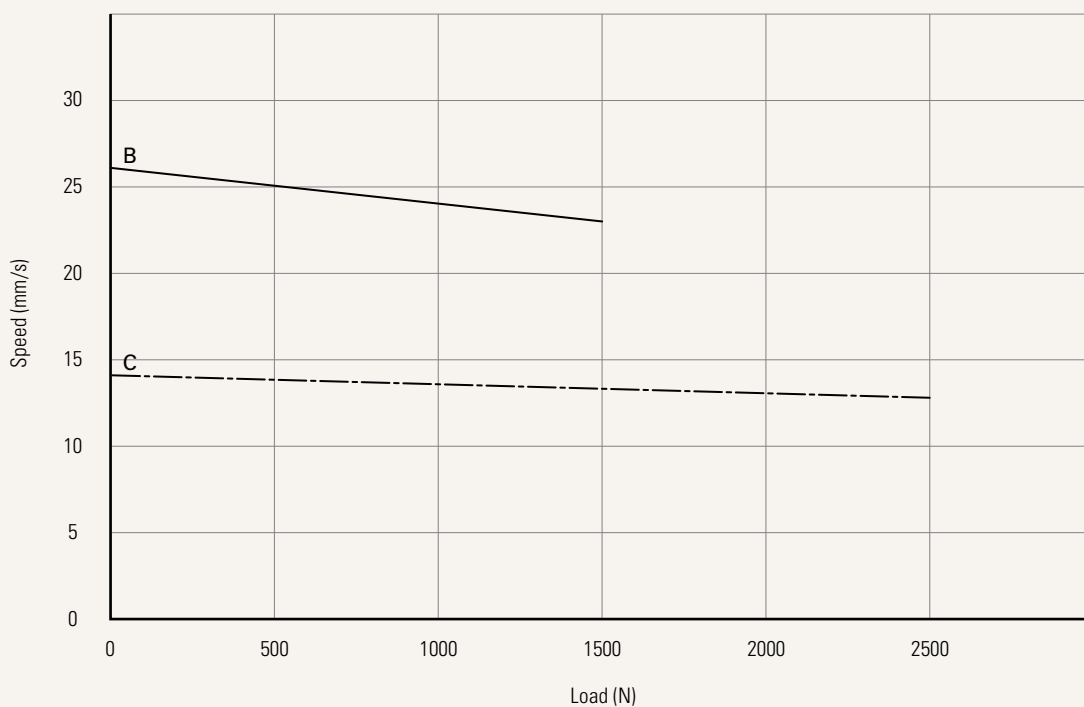
Note

1 The performance data in the curve charts shows theoretical value.

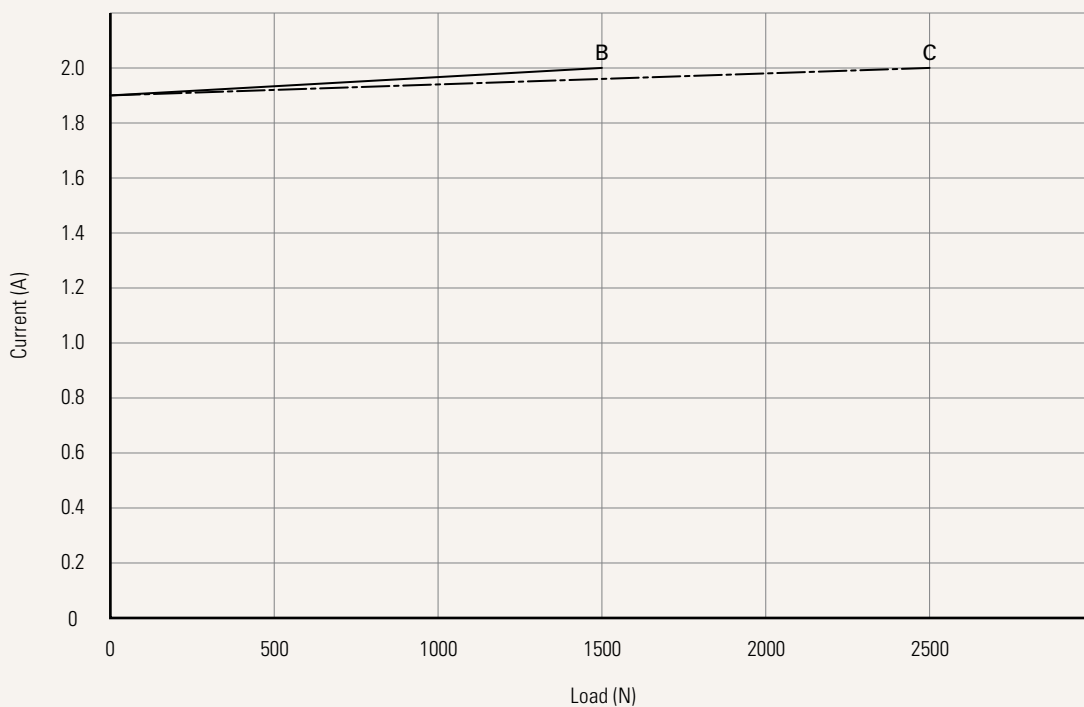
Performance Data (110V AC Motor)

ACME Screw (duty cycle 25%)

Speed vs. Load



Current vs. Load



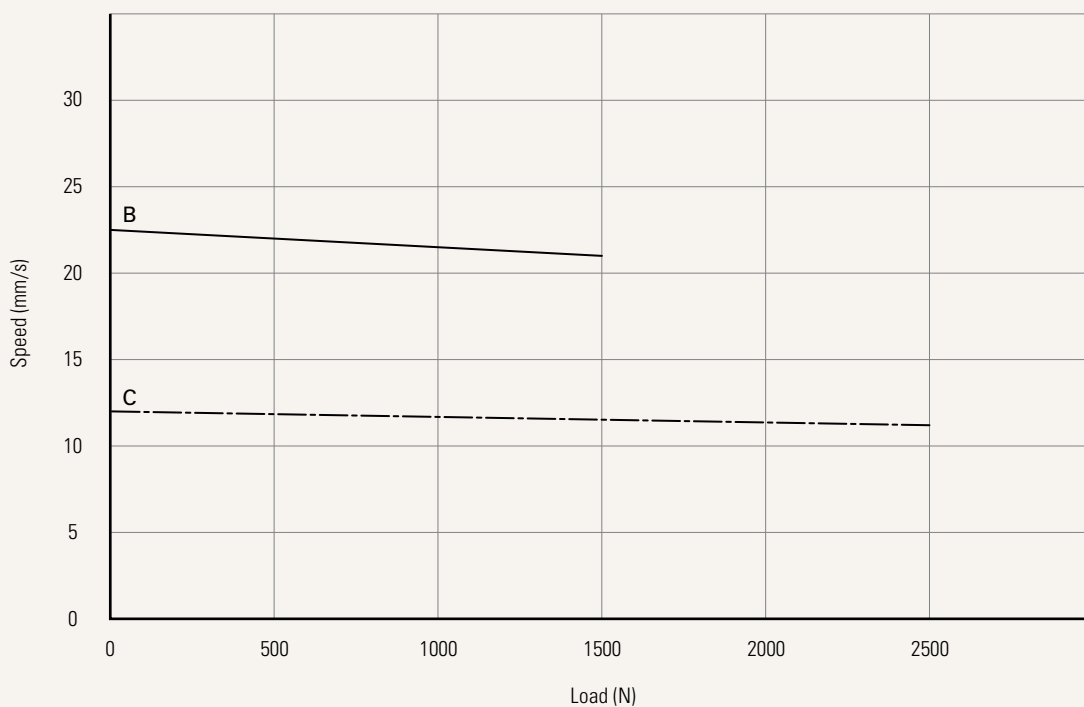
Note

1 The performance data in the curve charts shows theoretical value.

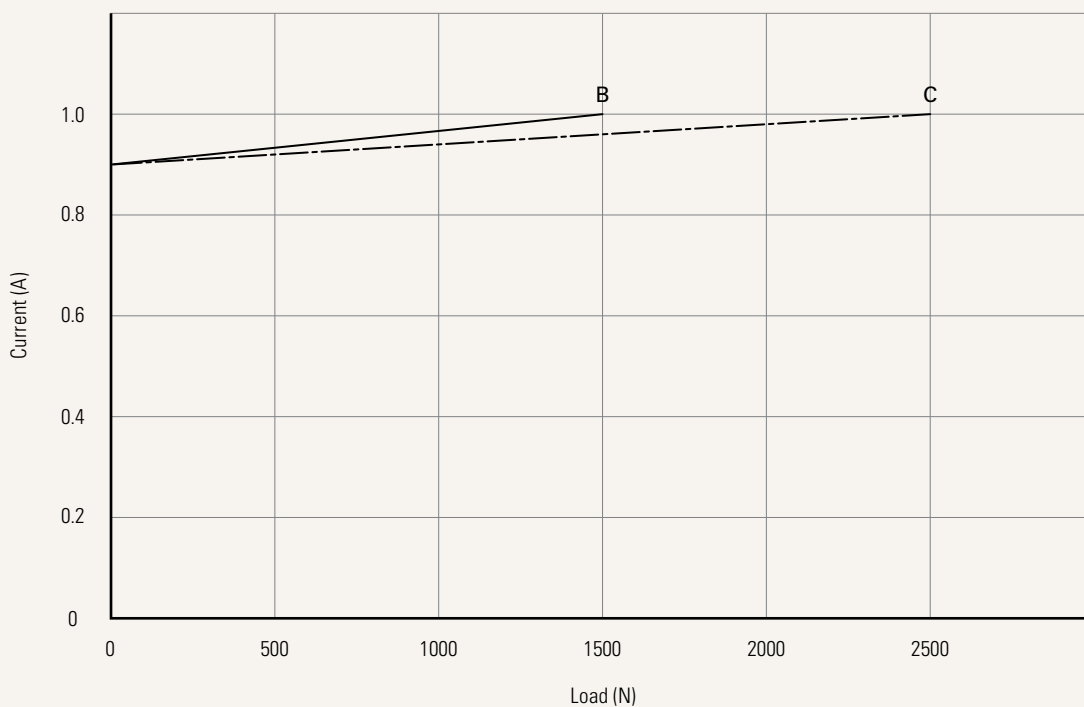
Performance Data (220V AC Motor)

ACME Screw (duty cycle 25%)

Speed vs. Load



Current vs. Load



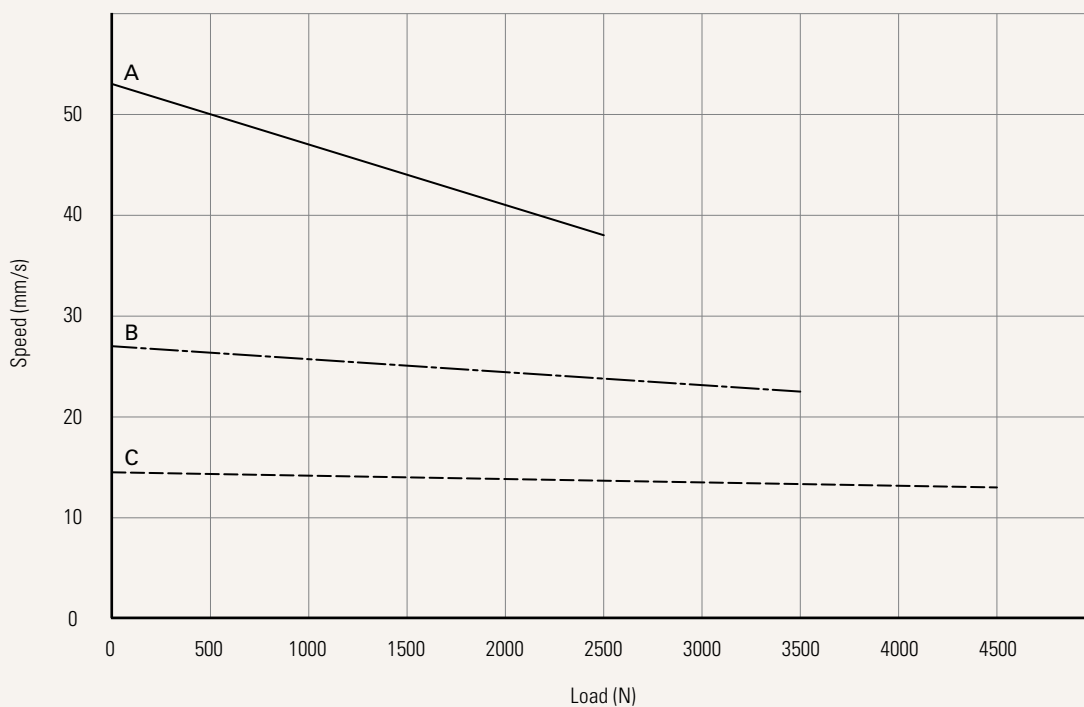
Note

1 The performance data in the curve charts shows theoretical value.

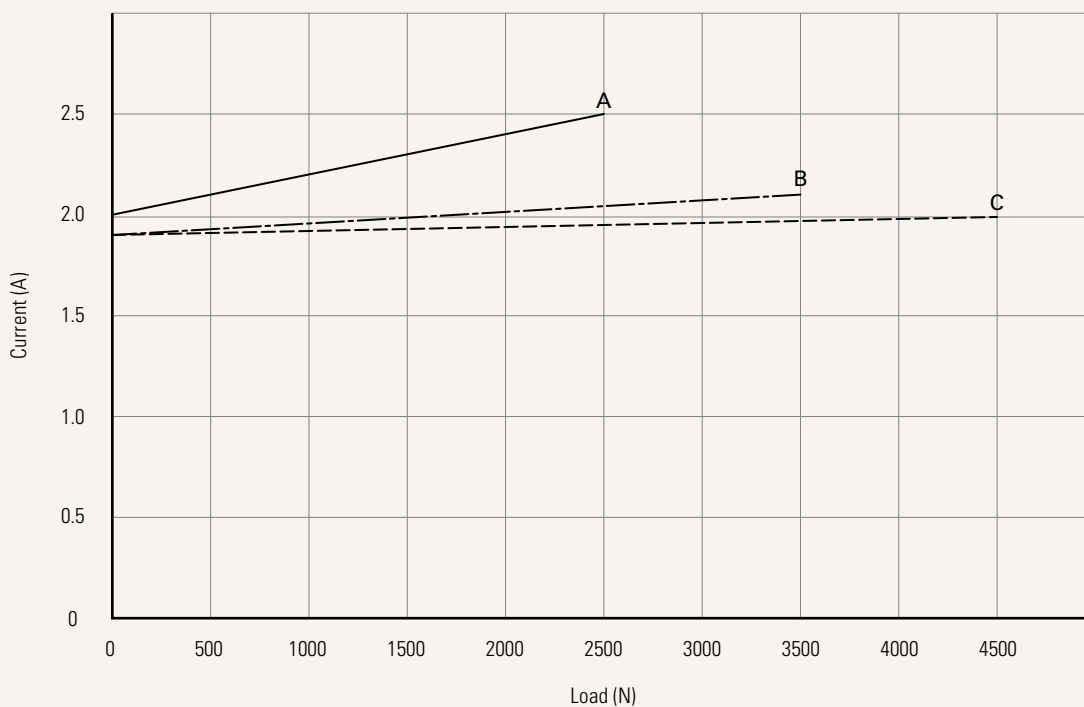
Performance Data (110V AC Motor)

Ball Screw (duty cycle 25%)

Speed vs. Load



Current vs. Load



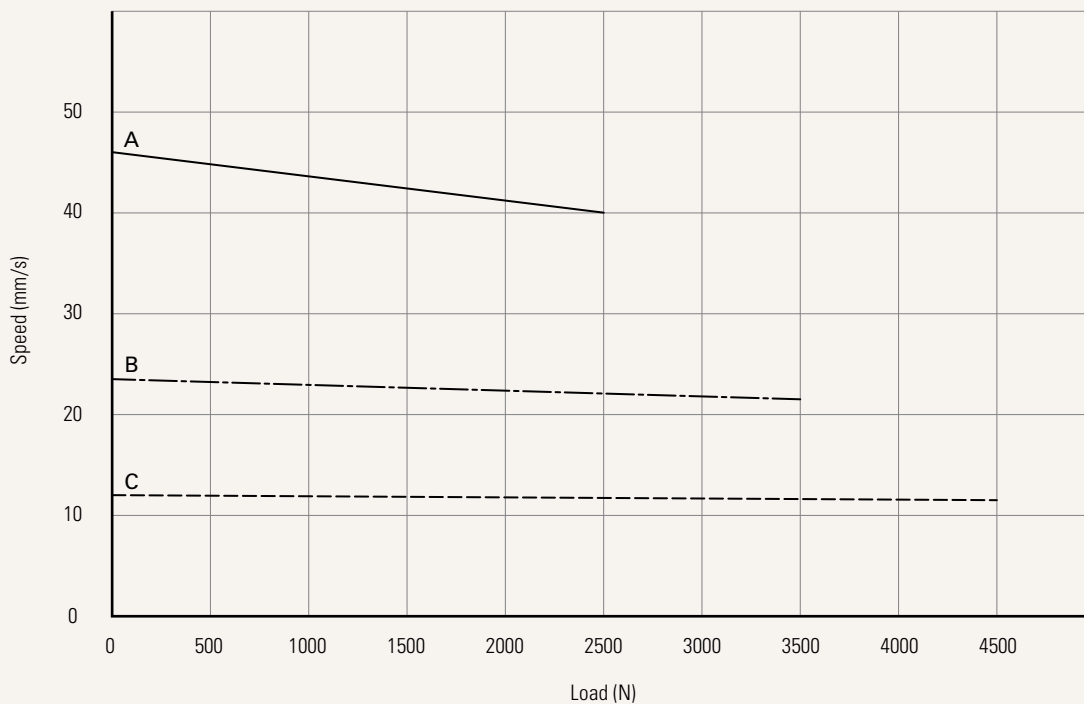
Note

1 The performance data in the curve charts shows theoretical value.

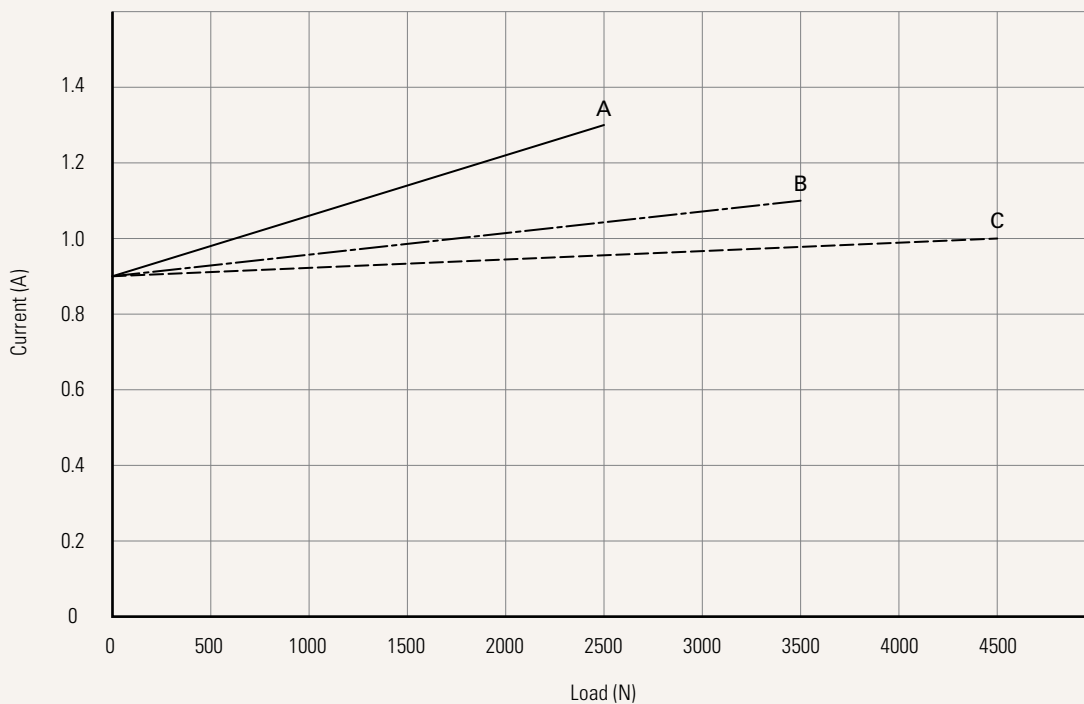
Performance Data (220V AC Motor)

Ball Screw (duty cycle 25%)

Speed vs. Load



Current vs. Load



Note

1 The performance data in the curve charts shows theoretical value.

| | | | |
|--|--|--|---|
| Spindle Type | A = ACME Screw | B = BALL Screw | |
| Voltage | 1 = 12V DC 2 = 24V DC | 3 = 36V DC 4 = 110V AC 60Hz | 5 = 220V AC 50Hz |
| Load and Speed | See page 2 | See page 3 | |
| Stroke (mm) | | | |
| Retracted Length (mm) | See page 2 | | |
| Rear Attachment (mm) | 1 = #45 Steel CNC, without slot, hole 13 See page 14 | | |
| Front Attachment (mm) | 1 = #45 Steel CNC, without slot, hole 13 See page 14 | | |
| Direction of Rear Attachment (Counterclockwise) | 1 = 90° (Standard) | 2 = 0° See page 14 | |
| Functions for Limit Switches | 0 = Without (Needs to choose overload clutch) 1 = Two switches at full retracted/extended positions to cut current 2 = Two switches at full retracted/extended positions to send signal See page 15 | | |
| Overload Clutch | 0 = Without | 1 = With (Standard) | |
| Mechanical Brake | 0 = Without | 1 = With (Ball Screw's standard option) See page 14 | |
| Electromagnetic Brake | 0 = Without (Standard) | 1 = With See page 15 | |
| IP Rating | 6 = IP66D | 8 = IP69K | |
| Manual Drive | 0 = Without | 1 = With | |
| Output Signals | 0 = Without | 1 = POT | 5 = Hall sensors*2 See page 13 |
| Connector | 1 = Tinned leads | | |
| Cable Length (mm) | 1 = Straight, 500 | | |

Retracted Length (mm)

1. Calculate $A+B+C+D = Y$
2. Retracted length needs to \geq Stroke + Y

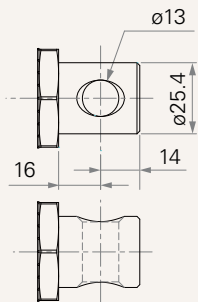
| A. Type | | | | |
|----------------|----------|----------|----------|----------|
| | ACME, DC | Ball, DC | ACME, AC | Ball, AC |
| | +160 | +201 | +160 | +201 |

| B. Mechanical Brake | | | | |
|----------------------------|----------|----------|----------|----------|
| | ACME, DC | Ball, DC | ACME, AC | Ball, AC |
| 0 | - | - | - | - |
| 1 | +36 | +40 | +36 | +40 |
| 5 | - | - | +36 | +40 |

| B. Mechanical Brake | | | | |
|----------------------------|----------|----------|----------|----------|
| | ACME, DC | Ball, DC | ACME, AC | Ball, AC |
| 0 | - | - | - | - |
| 1 | +35 | - | +35 | - |

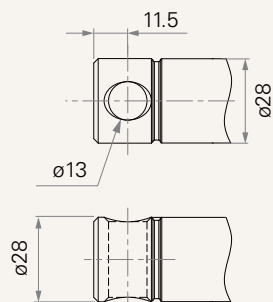
Rear Attachment (mm)

1 = #45 Steel CNC, without slot, hole 13



Front Attachment (mm)

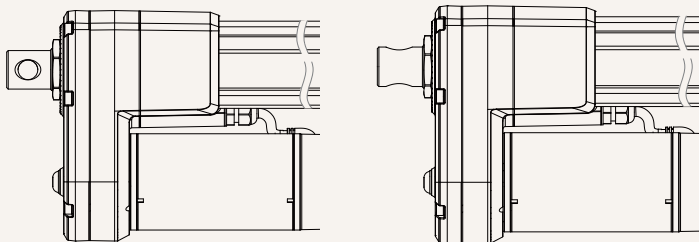
1 = #45 Steel CNC, without slot, hole 13



Direction of Rear Attachment (Counterclockwise)

1 = 90° (Standard)

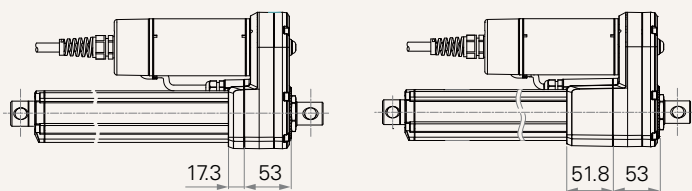
2 = 0°



Mechanical Brake

0 = Without

1 = With (Ball Screw's standard option)

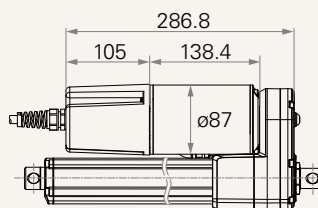
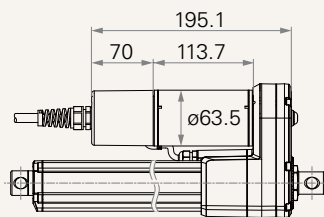
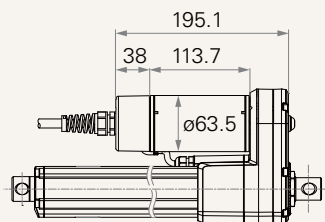


Electromagnetic Brake

0 = Without (DC)

1 = With (DC)

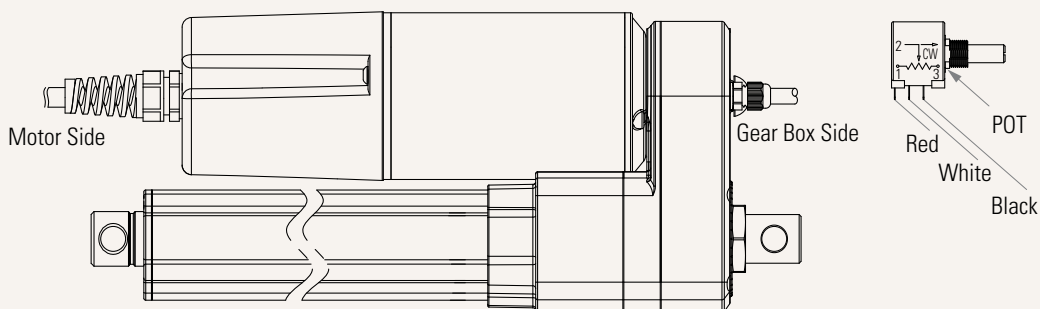
0 = Without (AC)



Functions for Limit Switches

Motor Type

| Motor Type | Motor Side | Color | AWG | Output Signal Code | | | | |
|---------------|---------------|----------|------------|--------------------|----------|-----------|-----------|----------|
| | | | | 0. Without | 1. POT | 4. 1 Hall | 5. 2 Hall | |
| DC Motor | Motor Side | Black | 26 | - | - | GND | GND | |
| | | Blue | 26 | - | - | - | S2 | |
| | | White | 26 | - | - | S1 | S1 | |
| | | Red | 26 | - | - | +5V | +5V | |
| | | Red | 14 | Stretch+ | Stretch+ | Stretch+ | Stretch+ | |
| | Black | 14 | Rereact+ | Rereact+ | Rereact+ | Rereact+ | | |
| | Gear Box Side | Red | 26 | - | Pin1 | - | - | |
| | | White | 26 | - | Pin2 | - | - | |
| | | Black | 26 | - | Pin3 | - | - | |
| | | DC Motor | Motor Side | Black | 18 | Rereact+ | Rereact+ | Rereact+ |
| Grey | | | | 18 | Stretch+ | Stretch+ | Stretch+ | Stretch+ |
| Brown | 18 | | | PCBA+ | PCBA+ | PCBA+ | PCBA+ | |
| Blue | 18 | | | Neutral | Neutral | Neutral | Neutral | |
| Green/Yellow | 18 | | | GND | GND | GND | GND | |
| Gear Box Side | Red | | 20 | - | Pin1 | +5V | +5V | |
| | White | | 20 | - | Pin2 | S1 | S1 | |
| | Blue | | 20 | - | - | - | S2 | |
| | Black | | 20 | - | Pin3 | GND | GND | |



Terms of Use

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