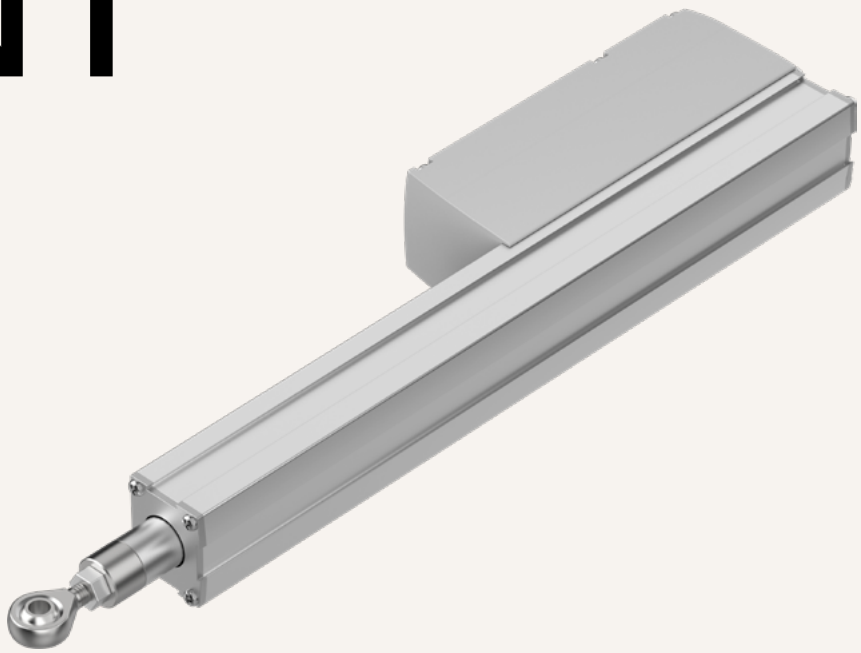
# VN1

series



Product Segments

- **Industrial Motion**

The VN1 series linear actuator was specifically designed for ventilation applications to help remove smoke, heat, and toxic gases from the building quickly in the event of a fire. It was also designed to create a minimum smoke layer in the lower parts of the room. The VN1 is made of high-quality aluminum, suitable for applications like fall-through protection systems and greenhouses.The VN1 is equipped with either a 12V or 24V DC motor. The AC version of the VN1 is equipped with a built-in SMPS which allows the supply of alternating current.

Furthermore, the VN1 has an optional T-Smart version. Embedded with a TiMOTION driver board, the VN1 eliminates the need of an external control box. The VN1 T-Smart version allows for the synchronization of up to 8 actuators with an integrated controller, allowing for coordinated and efficient movement.

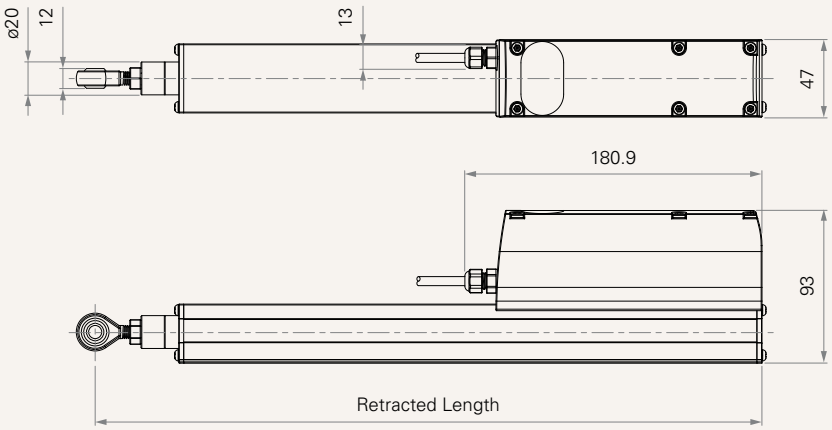
For more information about T-Smart actuators, please click here.

**General Features**

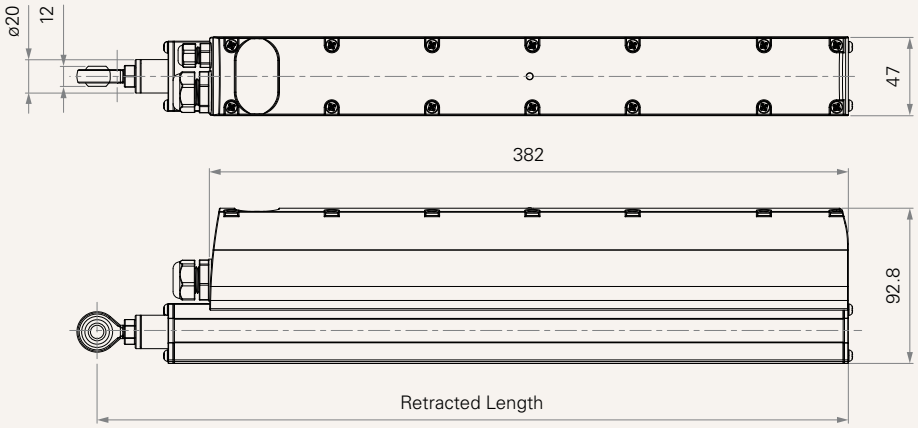
| | |
|---|---|
| Max. load | 3,500N (push); 2,000N (pull) |
| Max. speed at max. load | 3.8mm/s |
| Max. speed at no load | 13mm/s |
| Retracted length | ≥ 187mm (DC version, w/o T-Smart; depending on chosen options);<br>≥ 414mm (AC version, w/o T-Smart; depending on chosen options) |
| IP rating | IP66 (static) |
| Stroke | 20~500mm |
| Output signals | NPN Hall sensor*2,<br>Hall sensor*2, signals to embedded PCBA (T-Smart dedicated option) |
| Options | Safety nut, window seal mechanism, T-Smart |
| Voltage | 12/24V DC; 12/24V DC (PTC);<br>100~240V AC (50Hz) |
| Color | Black, grey |
| Operational temperature range | -15°C~+50°C |
| Operational temperature range at full performance | +5°C~+45°C |
| Protocol support: LIN bus | |

## Drawing

Dimensions
with DC Voltage
(mm)




Dimensions
with AC Voltage
(mm)



## Load and Speed - DC Motor

| CODE | Load (N) | | Self Locking Force (N) | Duty Cycle | 24V DC | | | | | 12V DC | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Typical Current (A) | | Typical Speed (mm/s) | | *T-Smart Usability | Typical Current (A) | | Typical Speed (mm/s) | | *T-Smart Usability |
| | Push | Pull | | | No Load | With Load | No Load | With Load | | No Load | With Load | No Load | With Load | |
| **Motor Speed (5200RPM)** | | | | | | | | | | | | | | |
| **B** | 500 | 500 | 2500 | 10% (2 min. on / 18 min. off) | 1.7 | 2.0 | 7.2 | 7.2 | Y | 3.7 | 4.0 | 7.1 | 6.7 | N |
| **C** | 1000 | 1000 | 3500 | 10% (2 min. on / 18 min. off) | 1.7 | 2.4 | 4.5 | 4.3 | Y | 3.7 | 4.8 | 4.2 | 4.0 | N |
| **D** | 2000 | 2000 | 2500 | 10% (2 min. on / 18 min. off) | 1.7 | 3.5 | 7.2 | 5.8 | N | 3.7 | 8.0 | 7.1 | 5.5 | N |
| **E** | 3500 | 2000 | 3500 | 10% (2 min. on / 18 min. off) | 1.7 | 4.2 | 4.5 | 3.4 | N | 3.7 | 10.0 | 4.2 | 3.1 | N |
| **F** | 1600 | 1600 | 3500 | 10% (2 min. on / 18 min. off) | 1.7 | 3.7 | 9.0 | 8.5 | N | 3.7 | 8.5 | 8.6 | 8.2 | N |

### 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. If choosing the voltage option #U, its performance is as the same as 24V DC motor.

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,12V DC power supply.

6 Without load, noise level ≤ 58 dBA (by TiMOTION test standard, ambient noise level ≤ 36 dBA)

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

| CODE | Load (N) | Max Stroke (mm) |
|---|---|---|
| **E** | ≤ 3500 | 300 |
| **D, F** | ≤ 2000 | 450 |
| **B, C** | ≤ 1000 | 500 |

## Load and Speed - AC Motor

| CODE | Load (N) | | Self Locking Force (N) | Duty Cycle | 220V AC | | | | *T-Smart Usability |
|---|---|---|---|---|---|---|---|---|---|
| | Push | Pull | | | Typical Current (A) | | Typical Speed (mm/s) | | |
| | | | | | No Load | With Load | No Load | With Load | |
| **Motor Speed (5200RPM)** | | | | | | | | | |
| **B** | 500 | 500 | 2500 | 10% (2 min. on / 18 min. off) | 0.60 | 0.6 | 9.6 | 8.2 | Y |
| **C** | 1000 | 1000 | 3500 | 10% (2 min. on / 18 min. off) | 0.60 | 0.6 | 6.0 | 5.1 | Y |
| **D** | 2000 | 2000 | 2500 | 10% (2 min. on / 18 min. off) | 0.60 | 1.0 | 9.6 | 6.4 | N |
| **E** | 3500 | 2000 | 3500 | 10% (2 min. on / 18 min. off) | 0.60 | 1.2 | 6.0 | 3.8 | N |
| **F** | 1600 | 1600 | 3500 | 10% (2 min. on / 18 min. off) | 0.60 | 0.6 | 13.0 | 9.1 | N |

### Note

1 Please refer to the approval drawing for the final authentic value. The load speed is tested during 220 VAC, 50Hz condition.

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 220VAC, 50Hz power supply.

5 Without load, noise level ≤ 58 dBA (by TiMOTION test standard, ambient noise level ≤ 36 dBA)

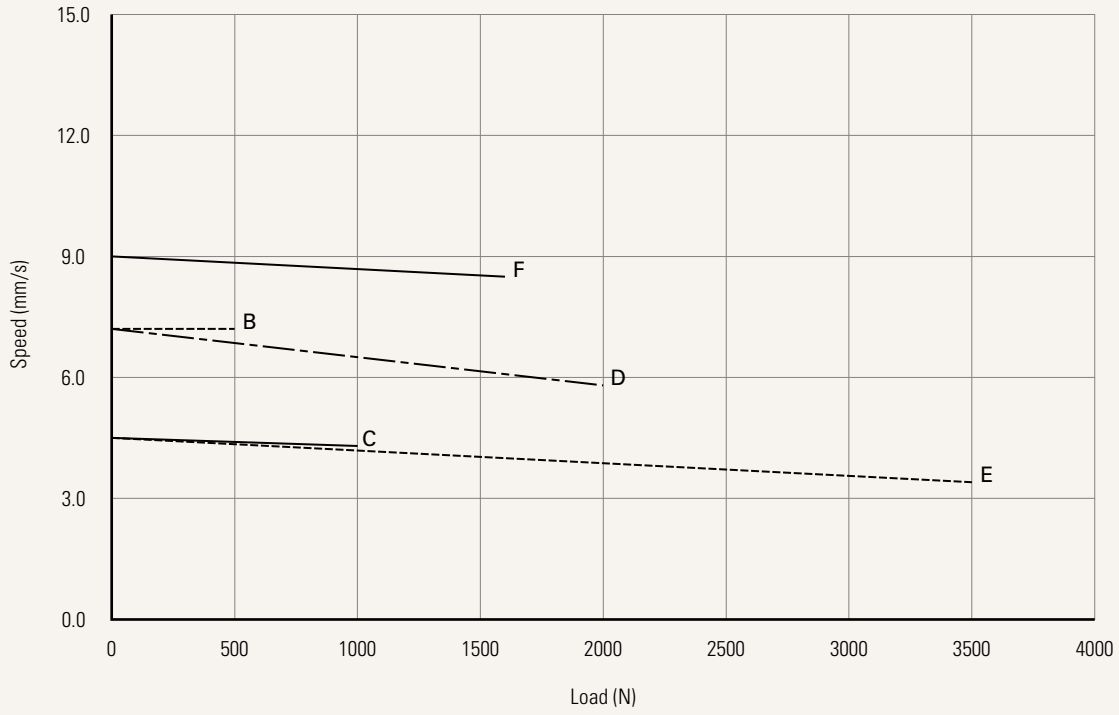
6 Standard stroke: Min. ≥ 20mm, Max. please refer to the table below.

| CODE | Load (N) | Max Stroke (mm) |
|---|---|---|
| **E** | ≤ 3500 | 300 |
| **D, F** | ≤ 2000 | 450 |
| **B, C** | ≤ 1000 | 500 |

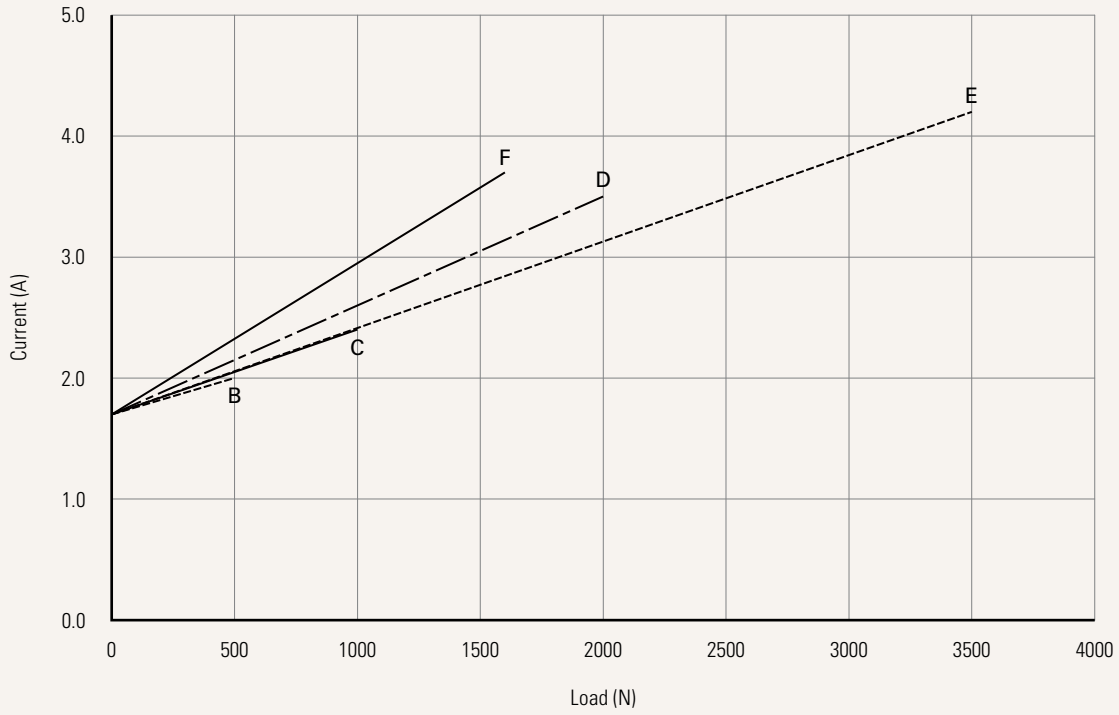
**Performance Data (24V DC Motor)**

Motor Speed (5200RPM)

Speed vs. Load



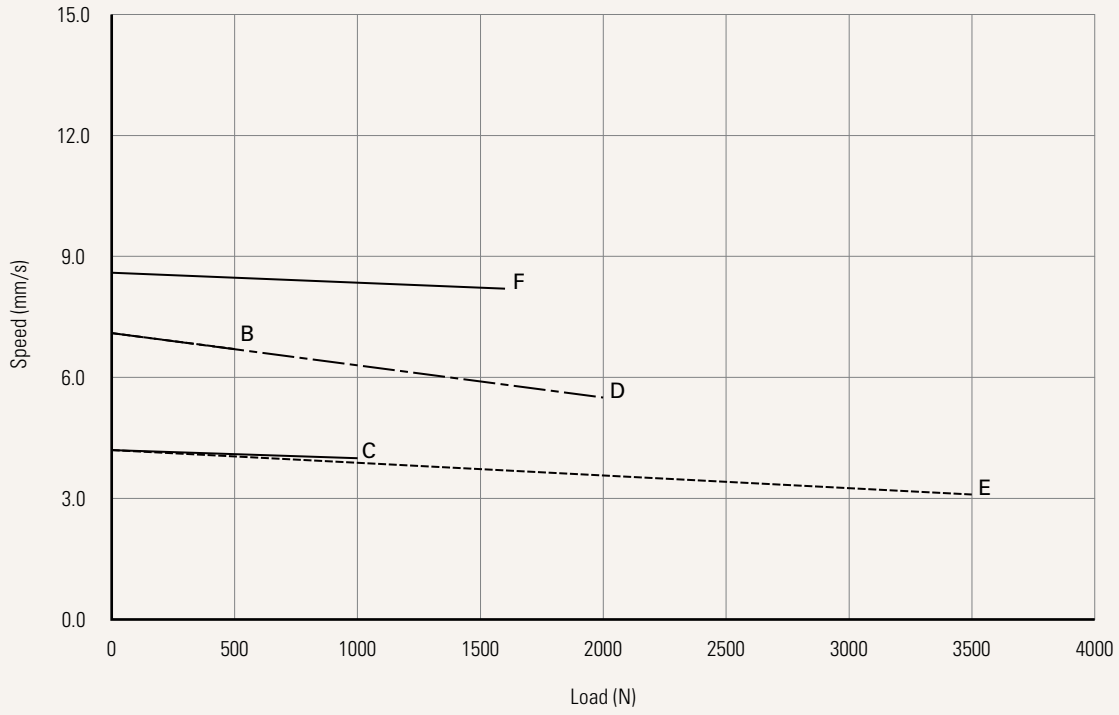

Current vs. Load



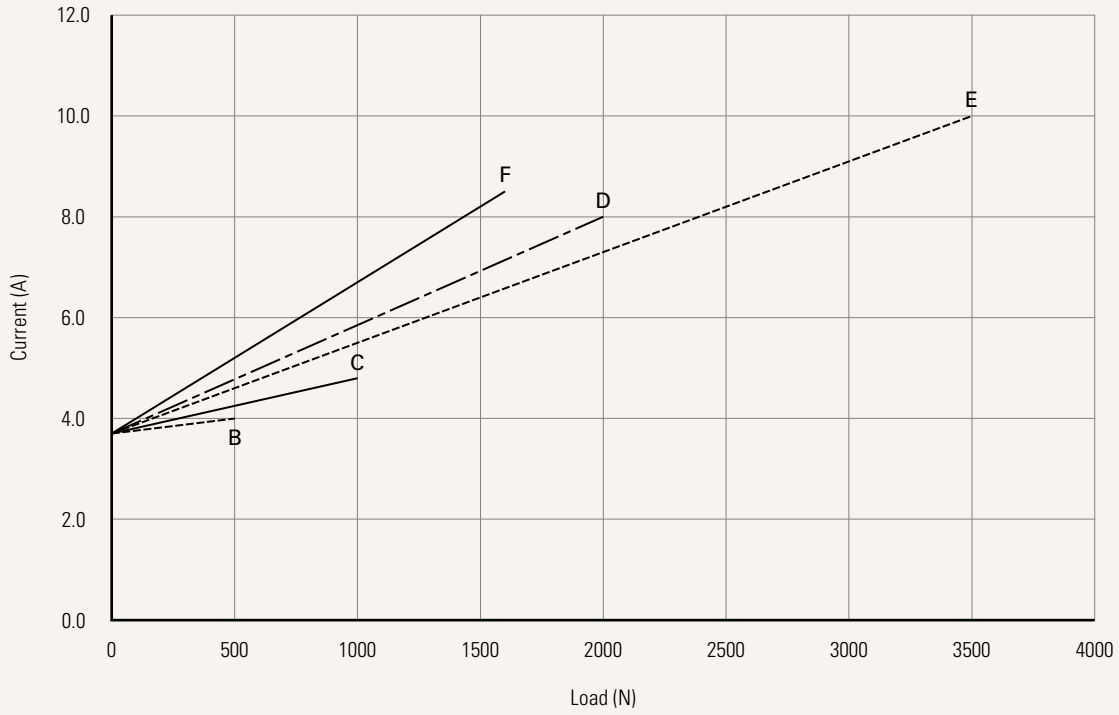
**Performance Data (12V DC Motor)**

Motor Speed (5200RPM)

Speed vs. Load



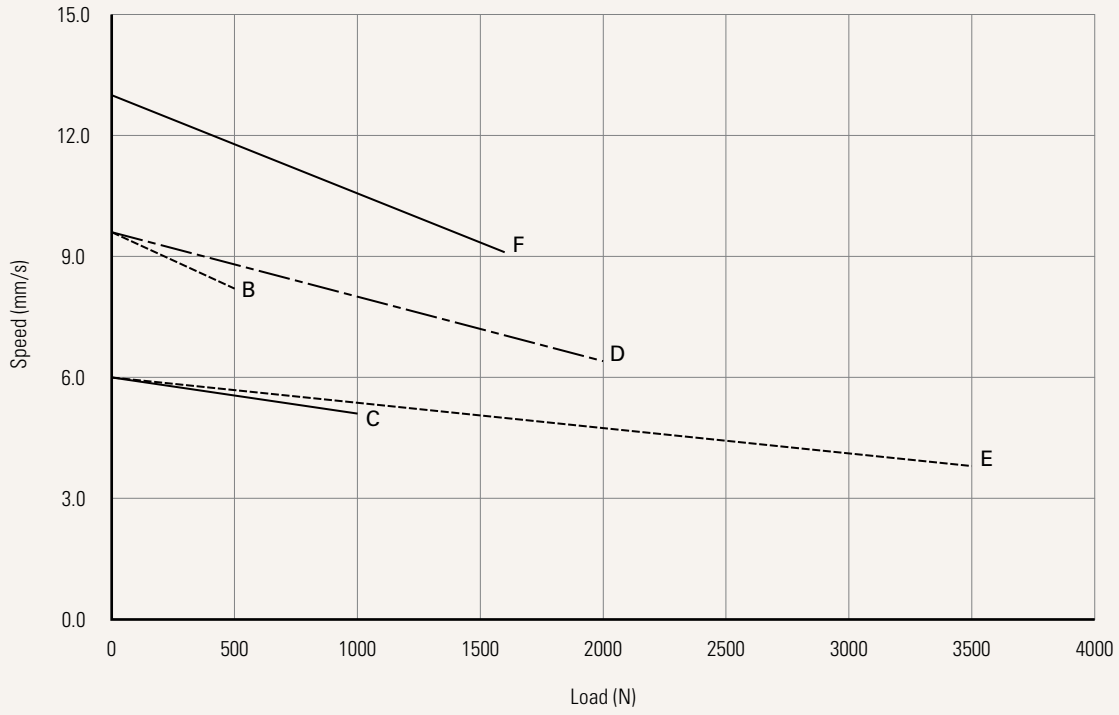

Current vs. Load



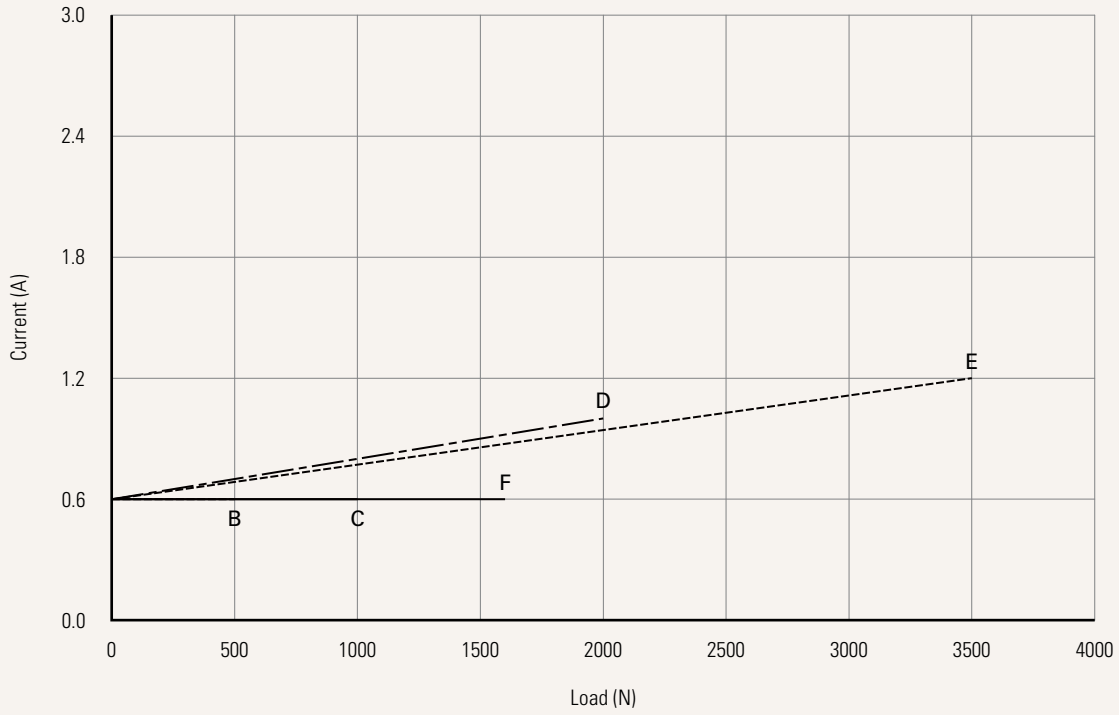
**Performance Data (220V AC Motor)**

Motor Speed (5200RPM)

Speed vs. Load




Current vs. Load



# **VN1** Ordering Key

VN1

Version: 20250121-J

| | | | |
|---|---|---|---|
| **Type** | N = Normal | T = T-Smart | |
| **Voltage** | 1 = 12V DC<br>2 = 24V DC | 5 = 24V DC, PTC<br>6 = 12V DC, PTC | U = 100~240V AC (50 Hz) |
| **Load and Speed** | See page 3-4 | | |
| **Stroke (mm)** | See page 3-4 | | |
| **Retracted Length (mm)** | See page 9 | | |
| **Rear Attachment (mm)** | 0 = Without (must choose outer tube adjustable clamping block) | | |
| **Outer Tube Adjustable Clamping Block**<br>See page 9 | 1 = Hole M8 | 2 = Hole ø8 | |
| **Mounting Bracket** | 0 = Without | | |
| **Front Attachment (mm)**<br>See page 10 | B = Rod end bearing, hole 8.0<br>C = Rod end bearing, hole 10.0<br>1 = Aluminum, slotless, hole 6.4<br>2 = Aluminum, slotless, hole 8.0 | 3 = Aluminum, slotless, hole 10.0<br>7 = Aluminum, U clevis, slot 6.2, depth 16.0, hole 6.4<br>8 = Aluminum, U clevis, slot 6.2, depth 16.0, hole 8.0<br>9 = Aluminum, U clevis, slot 6.2, depth 16.0, hole 10.0 | |
| **Direction of Rear Attachment (Counterclockwise)**<br>See page 10 | 0 = Without (without rear attachment) | 1 = 0° | 3 = 90° |
| **Function of Limit Switches** | 1 = Two micro switches cut off the actuator at end of stroke (EOS)<br>3 = Two micro switches send signal at end of stroke<br>6 = Two micro switches cut off the actuator at EOS + third micro switch at lower limit as window closure indicator | | |
| **Window Seal Mechanism** | 0 = Without | 1 = With | |
| **Special Function of Spindle Subassembly** | 0 = Without | | S = Safety nut (push direction) |
| **Output Signal** | 0 = Without<br>N = NPN Hall sensor*2 | | E = Embedded Hall sensor*2 for T-Smart, no Hall signal output (T-smart dedicated option) |
| **IP Rating** | 1 = Without | 2 = IP54 | 3 = IP66 |
| **Load Type** | T = Push | P = Pull | |
| **Position of Cable Exit** | B = Position B | C = Position C | |
| **P1 Cable Exit** | 00 = DC (without cable)<br>01 = AC (EU), cable color 428C | | 02 = AC (US), cable color 428C |
| **P1 Cable Length (mm)** | 0500 = 500<br>1000 = 1000 | 1500 = 1500<br>2000 = 2000 | 5000 = 5000 |
| **P2 Cable Exit** | 00 = AC normal type (without cable)<br>01 = DC (standard), cable color 428C | | 03 = AC T-Smart specified, cable color 428C |
| **P2 Cable Length (mm)** | 0000 = Without cable<br>0500 = 500 | 1000 = 1000<br>1500 = 1500 | 2000 = 2000<br>5000 = 5000 |
| **Alternative** | N = Normal | P = Parallel | |

# **VN1** Ordering Key Appendix

## Retracted Length (mm)

1. Calculate A+B = Y
2. Retracted length needs to ≥ Stroke+Y, and also ≥ value stated in the table below

The retracted length calculated above must be equal to or longer than the minimum value stated below

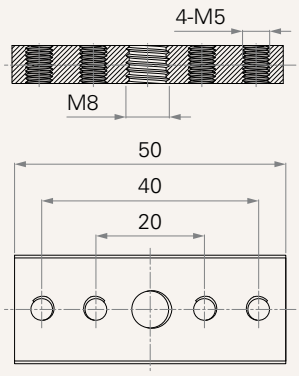
| A. Attachments and Adjustable Clamping Block | |
|---|---|
| **Front Attachment** | Outer Tube Adjustable Clamping Block |
| **B** | +206 |
| **C** | +212 |
| **1, 2, 3** | +169 |
| **7, 8, 9** | +182 |

| B. Stroke (mm) | |
|---|---|
| **20~150** | - |
| **151~200** | +2 |
| **201~250** | +2 |
| **251~300** | +2 |
| **301~350** | +12 |
| **351~400** | +22 |
| **401~450** | +32 |
| **451~500** | +42 |

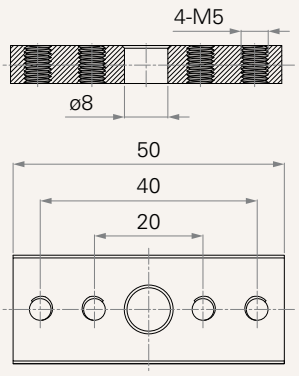
| When Choosing Outer Tube Adjustable Clamping Block | | | | |
|---|---|---|---|---|
| **Voltage** | **DC** | | **AC** | |
| **Type** | Normal | T-Smart | Normal | T-Smart |
| **B** | 218 | 308 | 438 | 438 |
| **C** | 224 | 314 | 444 | 444 |
| **1, 2, 3** | 187 | 277 | 417 | 417 |
| **7, 8, 9** | 194 | 284 | 414 | 414 |

## Outer Tube Adjustable Clamping Block

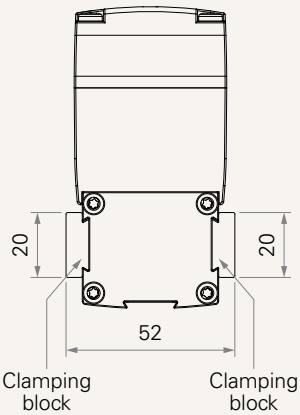
1 = Hole M8




2 = Hole ø8



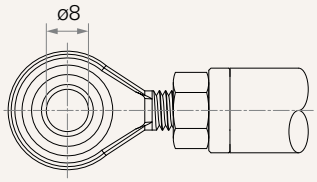

Clamping block Assembly dimension



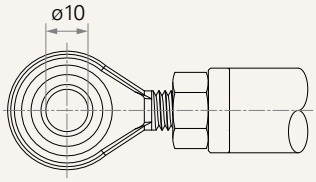
# **VN1** Ordering Key Appendix

## Front Attachment (mm)

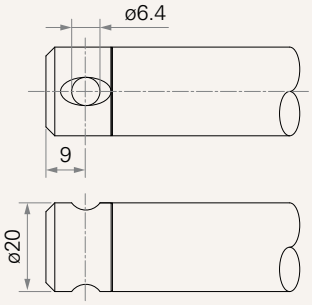
B = Rod end bearing, hole 8.0



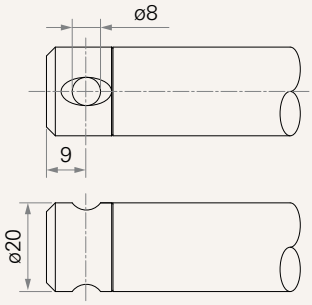

C = Rod end bearing, hole 10.0



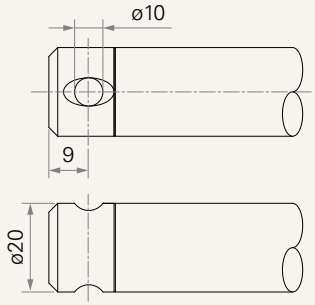

1 = Aluminum, slotless, hole 6.4



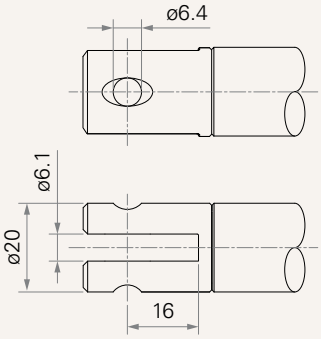

2 = Aluminum, slotless, hole 8.0



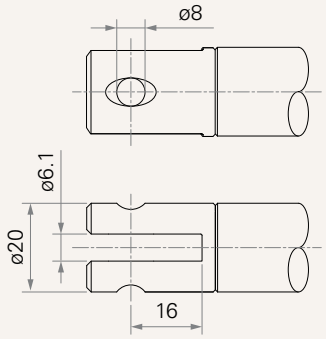

3 = Aluminum, slotless, hole 10.0



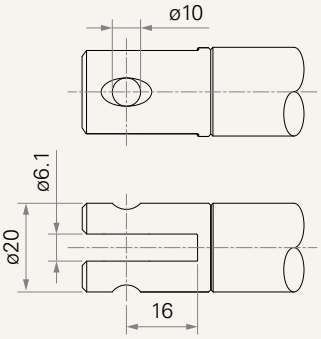

7 = Aluminum, U clevis, slot 6.2, depth 16.0, hole 6.4




8 = Aluminum, U clevis, slot 6.2, depth 16.0, hole 8.0

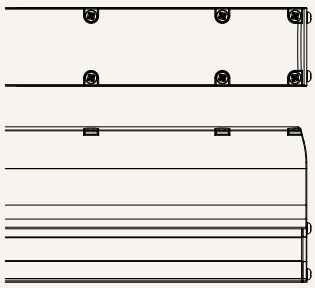



9 = Aluminum, U clevis, slot 6.2, depth 16.0, hole 10.0

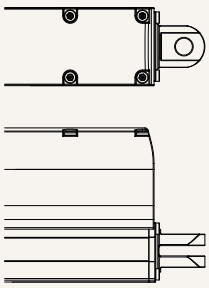



## Direction of Rear Attachment (Counterclockwise)

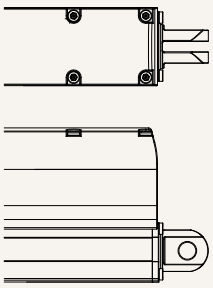
0 = Without (without rear attachment)



1 = 0°



3 = 90°



## 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.

# **VN1** PGVN Ordering Key

VN1

Version: 20250121-J

| | | | |
|---|---|---|---|
| **System** | 1 = Single application | 5 = Sync, 5 actuators in system | |
| | 2 = Sync, 2 actuators in system | 6 = Sync, 6 actuators in system | |
| | 3 = Sync, 3 actuators in system | 7 = Sync, 7 actuators in system | |
| | 4 = Sync, 4 actuators in system | 8 = Sync, 8 actuators in system | |
| **Virtual Upper Limit** | Full stroke, Standard defult value | | |
| **Virtual Lower Limit** | 0000, standard defult value | | |
| **Deceleration Before Virtual Upper Limit** | 0 = No deceleration, standard defult value | | |
| **Deceleration Before Virtual Lower Limit** | 0 = No deceleration, standard defult value | | |
| **Overcurrent Protection** | P = Cut current for over current protection, extend and retract over current protection value are standard defult value | | |
| **Extending Speed** | 0 = PWM output 100%, standard defult value | 7 = PWM output 70% | |
| | 9 = PWM output 90% | 6 = PWM output 60% | |
| | 8 = PWM output 80% | 5 = PWM output 50% | |
| **Retracting Speed** | 0 = PWM output 100%, standard defult value | 7 = PWM output 70% | |
| | 9 = PWM output 90% | 6 = PWM output 60% | |
| | 8 = PWM output 80% | 5 = PWM output 50% | |
| **Soft Start - Extending** | 1 = 1 second, standard defult value | 2 = 2 seconds | 3 = 3 seconds |
| **Soft Start - Retracting** | 1 = 1 second, standard defult value | 2 = 2 seconds | 3 = 3 seconds |