



P8- 50mm Stroke  
Actual Size

# Miniature Linear Motion Series · **P8 STEPPER**

Actuonix Motion Devices unique line of Miniature Linear Actuators enables a new generation of motion-enabled product designs, with capabilities that have never before been combined in a device of this size. These linear stepper actuators are a superior alternative to designing your own push/pull mechanisms.

The P8 stepper actuators are complete, self-contained linear motion devices. Several stroke length options allow these to fit a wide variety of applications.

The brushless stepper design makes the P8-ST one of our longest life actuators.

## P8 Stepper Specifications

Stroke Option	10mm	25mm	50mm	75mm	100mm
Mass	18g	20g	24g	28g	32g
Closed Length hole to hole	45mm	60mm	85mm	110mm	135mm
Maximum Side Load	≈ 0.10 * Maximum Force				
Full Step Size	0.006mm				
Backdrive Force	9N ( <i>no power applied</i> )		30N ( <i>power applied</i> )		
Temperature Rise	80°C Max				
Input Voltage	0-4.2 VDC				
Max Current (per phase)	256mA				
Operating Temperature	-10°C to +40°C				
Audible Noise	< 40 dB @ 45cm low noise settings				
Ingress Protection	IP-54				
Mechanical Backlash	0.1mm				
Inductance (per phase)	4.5mH@1khz				
Resistance (per phase)	15ohm				
Maximum Duty Cycle	100%				

## Applications

- Robotics
- Optics
- Diagnostic Equipment
- Industrial Automation

## Basis of Operation

The P8 stepper is designed to push or pull a load axially along its full stroke length. The speed of travel is determined by the step frequency, and maximum force by the current applied. When power is removed the actuator will hold its position, unless the applied load exceeds the back drive force. Actuators should be tested in each specific application to determine their effective life under those loading conditions and environment.

## Ordering

Small quantity orders can be placed directly online at [www.Actuonix.com](http://www.Actuonix.com). Purchase orders, volume quotes, and custom order requests can be sent to [sales@Actuonix.com](mailto:sales@Actuonix.com). MOQ for custom strokes, cables or connectors is typically 500pcs. Each actuator ships with two mounting brackets and M3 mounting hardware. The cable length is approximately 300mm with actuator mating connector and bared leads.

All data on this sheet is provided for information purposes only and is subject to change. Purchase and use of Actuonix Actuators is subject to our terms and conditions as posted here: <http://www.Actuonix.com/terms.asp>

## Model Selection

P8 stepper options are identified according to the following model numbering scheme:

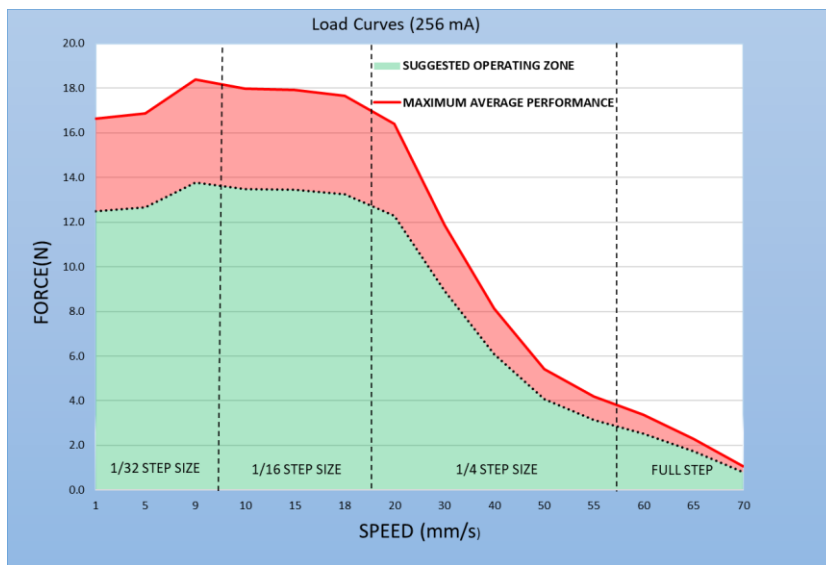
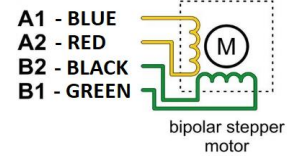
### P8-SS-GG-VV-C

Feature	Options
<b>SS:</b> Stroke	<b>10, 25, 50, 75, 100</b>
<b>GG:</b> Gear reduction	<b>49 ( 165:1 Coming Soon)</b>
<b>VV:</b> Voltage	<b>3</b>
<b>C:</b> Controller	<b>ST</b>

## P8 Connector Pin-out

### WIRING:

A1 - BLUE – Motor Coil A +  
 A2 - RED – Motor Coil A -  
 B1 - GREEN – Motor Coil B +  
 B2 - BLACK – Motor Coil B -



**WARNING:** As the applied force approaches the maximum force there is greater risk for missed steps to occur.

## Driver Selection and Settings

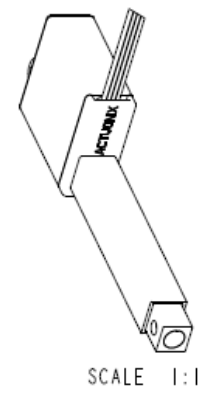
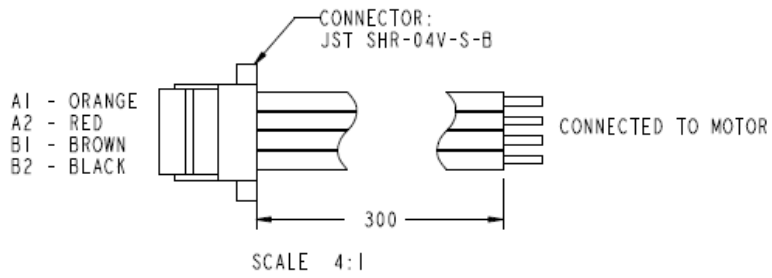
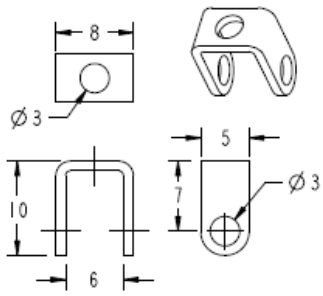
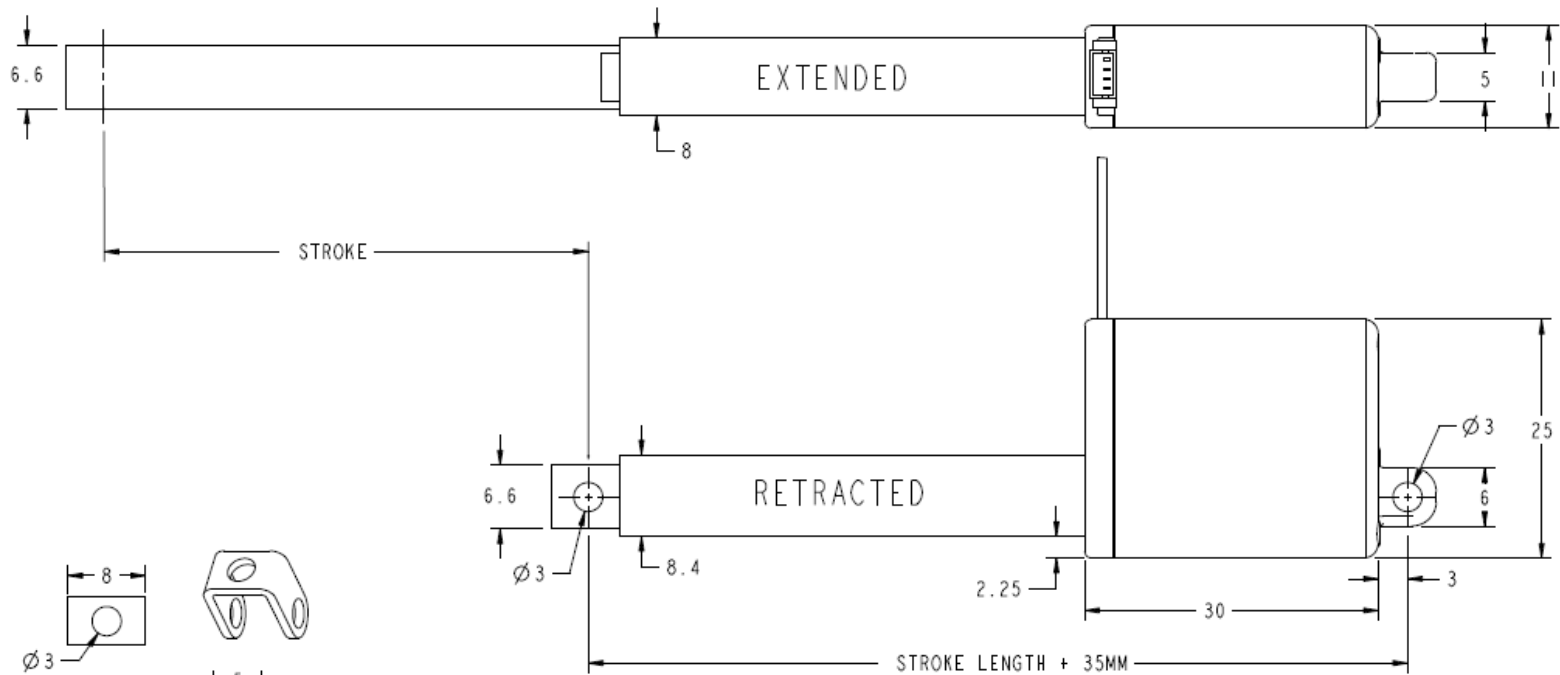
The P8 stepper can be driven by most standard 4 wire stepper drivers. Actuonix offers the Tic T825 USB Multi-Interface Stepper Motor Controller. This driver is easily adjustable so that you can determine the best settings for your application. The controller supports six control interfaces: USB, TTL serial, I<sup>2</sup>C, analog voltage, quadrature encoder, and RC. Refer to the Pololu Tic T825 Datasheet for further driver specific details.

For reliable operation it is suggested that the applied force fall between 50%-75% of maximum force for a given speed.

For quiet and smooth operation at low speeds we recommend a micro step setting. At medium speeds the full step setting (1), will provide an improvement in maximum load, while still minimizing audible noise. At high speeds we recommend Full Step with limited acceleration and deceleration (Ramp the frequency of your step control signal). Without adequate ramping, the actuator will not move. Note: Ramped Micro step settings can also be used at higher speeds, however this will reduce the maximum force.

To save power on light load applications, you can reduce the constant current setting below the rated value. For higher loads you can increase current beyond the rated value, however your duty cycle may need to be reduced to keep the motor within the acceptable temperature range. Note: Exceeding datasheet rated values can reduce motor life, and is not covered by our warranty.

Microstepping can be used to increase resolution, however there will be some non-linearity between microsteps, and reduced holding force.



ALL DIMENSIONS IN MM

NAME	STROKE LENGTH	GEAR RATIO
P8_ST_10MM	10MM	50:1
P8_ST_25MM	25MM	165:1
P8_ST_50MM	50MM	
P8_ST_75MM	75MM	
P8_ST_100MM	100MM	

SIZE	SCALE	PART NUMBER	REV
B	2:1	P8 STEPPER DATASHEET	A
FILE	P8_ST_50MM	SHEET 1	OF 1



Actuonix Motion Devices Inc.  
Unit 201-1753 Sean Heights  
Saanichton, BC Canada  
V8M 0B3

1 (206) 347-9684 Phone  
1 (888) 225-9198 Toll Free  
1 (206) 347-9684 Fax

sales@actuonix.com  
www.actuonix.com

All data on this sheet is provided for information purposes only and is subject to change. Purchase and use of Actuonix Actuators is subject to our terms and conditions as posted here: <http://www.Actuonix.com/terms.asp>