

# Miniature Linear Motion Series · T16



Actuonix's 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 track actuators are a superior alternative to designing your own push/pull mechanisms.

The T16 actuators are complete, self-contained linear motion devices with position feedback for sophisticated position control capabilities, or end of stroke limit switches for simple two position automation. Several gear ratios are available to give you varied speed/force configurations.

The track design makes the T16 significantly shorter than the same stroke length P16, since instead of an extending shaft, a sliding mount is provided. The sliding mount also significantly increases the maximum side load specification.

Premium components in this model include: large sealed stainless steel bearings, planetary gearbox, stainless steel lead screw, and glass re-enforced nylon housing.

## T16 Specifications

Gearing Option	22:1	64:1	256:1
Peak Power Point	40N @26mm/s	80N @9mm/s	250N @2.5mm/s
Peak Efficiency Point	25N @34mm/s	40N @14mm/s	150N @3.4mm/s
Max Speed (no load)	46mm/s	18mm/s	4.8mm/s
Max Force ( < Stall )	50N	90N	300N
Back Drive Force	75N	200N	>500N
Stroke Option	100mm	200mm	300mm
Mass	116 g	138 g	160 g
Repeatability (-P/LAC)	+/- 0.4mm	+/- 0.8mm	+/- 1.2mm
Potentiometer	11kΩ±50%	23kΩ±50%	34kΩ±50%
Feedback Linearity	Less than 2.00%		
Input Voltage	0-15 VDC. Rated at 12VDC.		
Stall Current	1000mA @ 12V		
Operating Temp	-10°C to +50°C		
Audible Noise	62 dB @ 45cm		
Ingress Protection	None		
Mechanical Backlash	0.3mm		
Limit Switches (-S)	Max. Current Leakage: 8uA		
Maximum Static Force	500N		
Maximum Duty Cycle	20%		

## Applications

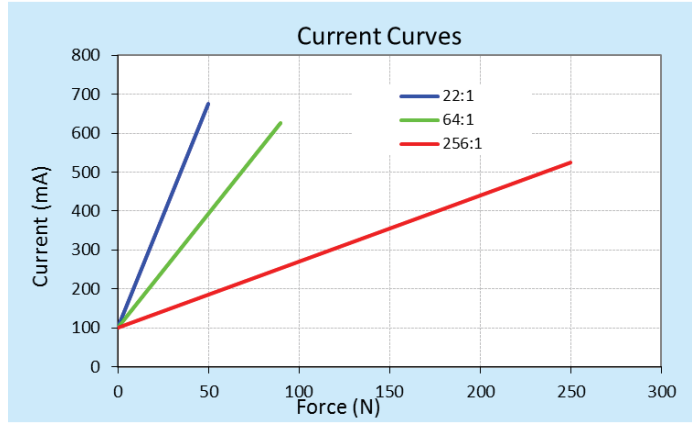
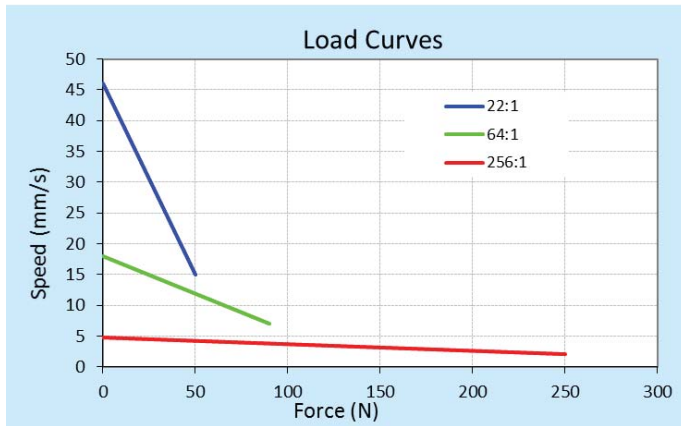
- Robotics
- Consumer appliances
- Toys
- RC vehicles
- Industrial Automation
- Automotive

All data on this sheet is provided for information purposes only and is subject

## Basis of Operation

The T16 is designed to push or pull a load along its full stroke length. The speed of travel is determined by the load and mount angle (See the Load Curves). Actuator speed can be reduced by lowering the drive voltage. When power is removed the actuator will hold its position, unless the applied load exceeds the back drive force. Repeated stalling or stalling for more than a few seconds will shorten the life of the actuator significantly. Actuators should be tested in each specific application to determine their effective life under those loading conditions and environment.

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## Model Selection

The T16 has 3 configuration choices: Stroke, Gear Ratio and Controller. T16 options are identified according to the following model numbering scheme:

### T16-SS-GG-VV-C

Feature	Options
<b>SS:</b> Stroke	<b>100, 200, 300</b> (mm)
<b>GG:</b> Gear reduction ratio (refer to load curves above)	<b>22, 64, 256</b> :1 (lower ratios are faster but push less force, and vice versa)
<b>VV:</b> Voltage	<b>12</b> Volts DC
<b>C:</b> Controller	<b>P</b> Potentiometer Feedback <b>S</b> Limit Switches

## T16 Controller Options

### Option S – End of Stroke Limit Switches

WIRING: (see last page for pin numbering)

- 1 - Red – Motor V+ (12V)
- 2 – Black – Motor V- (Ground)

–S actuators are ideal for manually controlled applications and simple two position automated mechanisms. The –S actuators have limit switches that will turn off power to the motor when the actuator reaches within 0.5mm of the end of stroke. Internal diodes allow the actuator to reverse away from the limit switch. The limit switches cannot be moved once the actuator is manufactured. While voltage is applied to the motor power pins, (1 & 2) the actuator extends. Reverse the polarity and the actuator retracts. This can be accomplished manually with a DPDT switch or relay, or using an H-Bridge. The –S model cannot be used with the LAC control board.

## 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 #8-32 mounting hardware. The cable length is approximately 300mm and connector is a 0.1" pitch female socket connector. The thread in the end of the round aluminum shaft is M8x1.25.

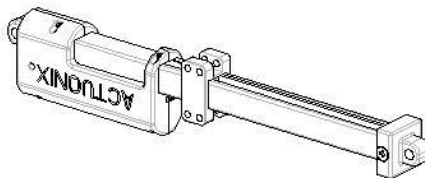
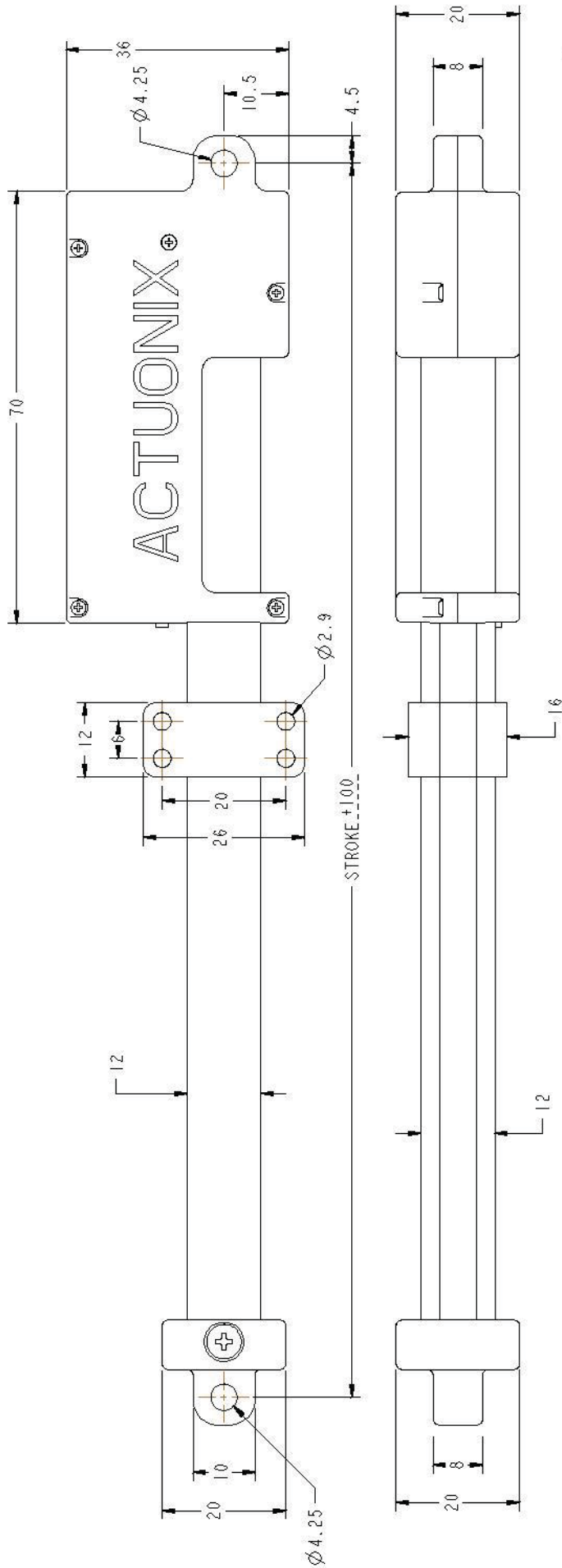
### Option P – Potentiometer Position Feedback

WIRING: (see last page for pin numbering)

- 1 - Orange – Feedback Potentiometer negative reference rail
- 2 - Purple – Feedback Potentiometer wiper
- 3 - Red – Motor V+ (12V)
- 4 - Black – Motor V- (Ground)
- 5 - Yellow – Feedback Potentiometer positive reference rail

–P actuators are suited to automatically controlled positioning systems, but they can also be driven manually. The –P actuators have no built in controller, but do provide an analog position feedback signal that can be input to an external closed loop controller. While voltage is applied to the motor power pins, (3 & 4) the actuator extends. Reverse the polarity and the actuator retracts. This can be accomplished manually with a DPDT switch or relay, or using an H-Bridge circuit. Position of the actuator stroke can be monitored by providing any stable low and high reference voltage on pins 1 & 5, then reading the position signal on pin 2. The voltage on pin 2 will vary linearly between the two reference voltages in proportion to the position of the actuator stroke.

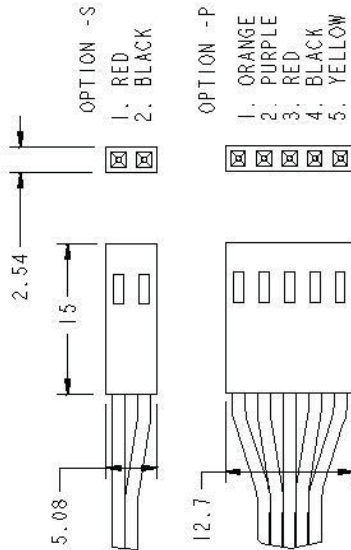
The T16 –P actuator can be used as a linear servo by connecting the actuator to an external controller such as the LAC board offered by Actuonix. This control board reads the position signal from the T16, compares it with your input control signal then commands the actuator to move via an on-board H-bridge circuit. The LAC allows any one of the following control inputs: Analog 0-3.3V or 4-20mA, or Digital 0-5V PWM, 1-2ms Standard RC, or USB. The RC input effectively transforms your T16 into a linear servo, which is a direct replacement for any common hobby servo used in RC toys and robotics. Refer to the LAC datasheet for more details.



SCALE 1:2

NOTES:

- 1) CARRIAGE MOUNTING HOLES FIT M3 HARDWARE
- 2)  $\phi 4.25$  MOUNTING HOLES WILL FIT M4 OR UN #8 SIZE SCREWS
- 3) STANDARD LEAD WIRE LENGTH IS 300MM, 26AWG STRANDED RIBBON WIRE. CONNECTORS ARE 2.54MM PITCH FEMALE HEADER CONNECTORS



CABLE CONNECTOR OPTIONS

SIZE	SCALE	PART NUMBER	REV
B	3:2	T16 DIMENSIONS	A
FILE	T16_100MM	SHEET	1 OF 1



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