

831x Picomotor Actuators

Closed Loop Picomotor™ Piezo Linear Actuators

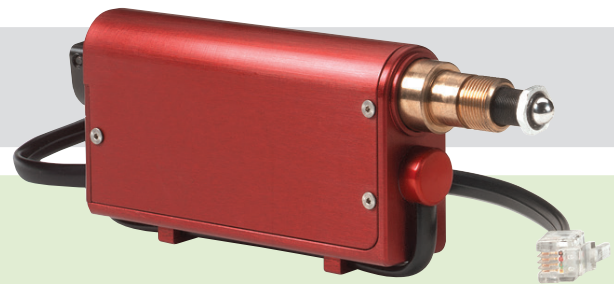


The 8310CE Closed-loop Picomotor actuator or the 8311 Compact Closed-loop Picomotor actuator combined with the 8743-CL Closed-loop intelligent Picomotor motion controller/driver are ideal for applications where closed-loop control and absolute position calibration is required. 8310 with its integrated rotary encoder and forward and reverse limit switches, offers the best attributes of the standard Picomotor actuator—<30-nm resolution, >5 lbs (22 N) of force along with set-and-forget long-term stability—with the added benefits of exceptional accuracy and $\pm 1\text{-}\mu\text{m}$ bi-directional repeatability over the entire half-inch travel range. The 8311 has similar capabilities, except with its smaller form factor and manual knob, it doesn't have the limit switches.

Choose between operating the 8310CE or 8311 in closed-loop mode where it can hold a set position, or command it to move a specified distance. Either way, when the actuator reaches its target location, the controller will adjust the motor to the precise requested encoder count and then stop motion. Even if you keep the servo loop enabled, the motor will only move in response to any system disturbances which cause rotation of the screw. Because the inherent resolution of the motor is finer than the resolution of the encoder, zero count encoder error is always achieved. You can query the encoder to determine the rotation of the screw at any time.

Product Features

- Built-in rotary encoder for closed-loop operation
- Forward/reverse limit switches (8310CE)
- <30 nm minimum incremental motion
- 22 N axial load capacity
- Set-and-forget long-term stability
- Easy-to-use flexible motion controller/driver
- Easy integration with standard sized 0.375-inch shank



Applications & Benefits

- Exceptional accuracy
- Absolute position calibration
- Move between positions with high accuracy
- Can be used with optical mounts and translation stages

With 8743-CL you can control two 8310CE, two 8311 or one of each making it possible to build a system incorporating multiple closed-loop Picomotor actuators at the same time on the same control network.

The closed-loop Picomotor actuator can be integrated into most of our optomechanical mounts and is compatible with our translation stages. Please call us for more information on customized orders.

Specifications

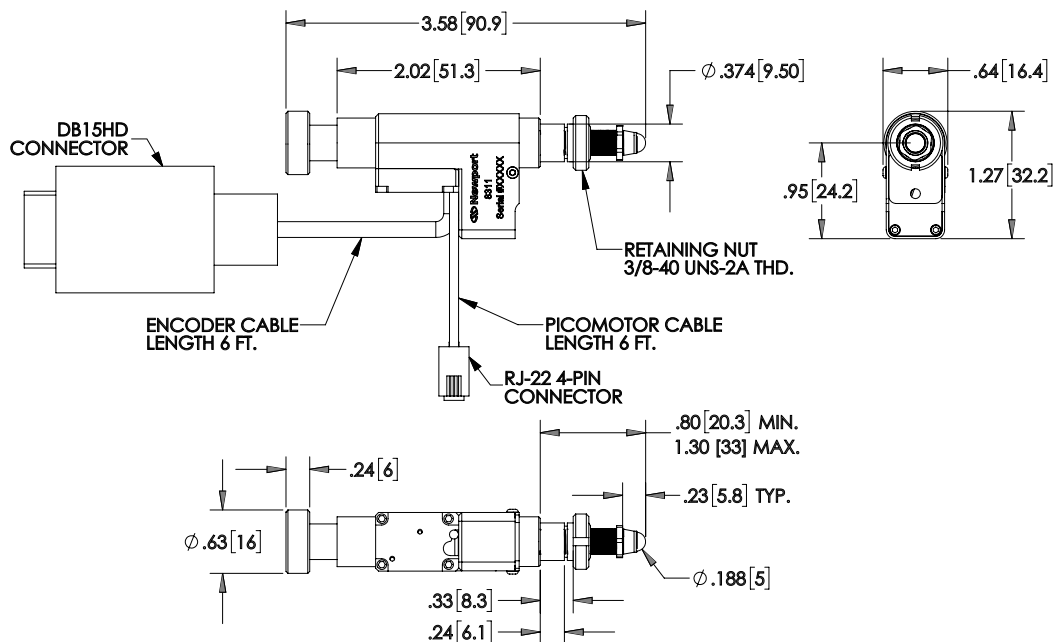
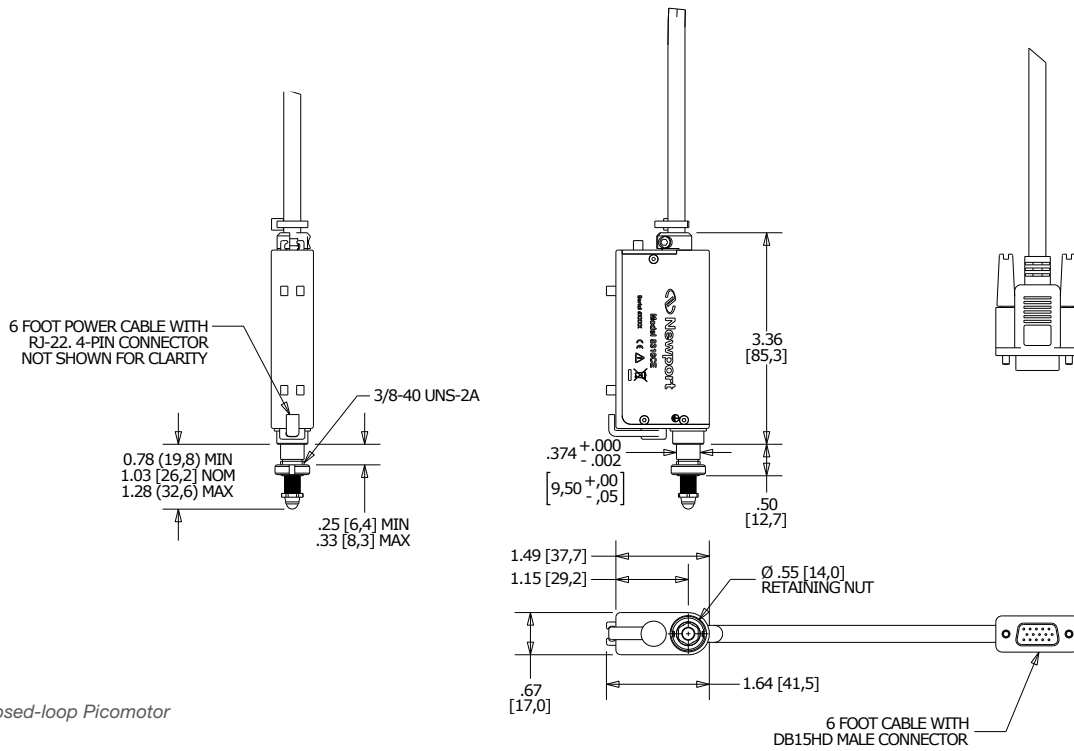
	8310CE	8311
Bi-Directional Repeatability	±1 µm Over Full Travel (from either direction)	N/A
Uni-Directional Repeatability	±0.5 µm Over Full Travel (from same direction)	
Speed (@ 2 kHz pulse rate)	1.2 mm/min (20 µm/s typical)	
Closed loop Settling Time	<100 ms with 8743-CL Controller	
Closed loop Steady-State Error	0 counts with 8743-CL Controller	
Encoder Resolution	52.9 nm per encoder count ⁽¹⁾	49.6 nm per encoder count ⁽²⁾
Limit Switches: Foreward/Reverse	Yes/Yes	No/No
Connector Type: One Each	15-Pin High-Density D-sub and 4-Pin RJ-22	
Survival Temperature Range (non-operating)	-30 to +85 °C	
Mounting	0.375" (9.5 mm) Shank	
Linear Travel	0.50" (12.7 mm)	
Minimum Incremental Motion	<30 nm	
Angular Resolution	<0.6 mrad	
Maximum Load	5 lbs (22 N)	
Torque	2.5 oz-in (0.018 N·m)	
Operating Temperature	10–40 °C	
Lifetime	1 Billion Steps ⁽³⁾	
Cable Length	6 Feet, Both Cables	

1) The encoder resolution is 1500 cycles per revolution, and with quadrature encoding this results in 6000 counts per revolution. With the 80-pitch (80 turns per inch) screw sets used in the Model 8310CE, this results in an encoder resolution of 52.9 nm per encoder count

2) The encoder resolution is 6400 counts per revolution. With the 80-pitch (80 turns per inch) screw sets used in the Model 8311, this results in an encoder resolution of 49.6 nm per encoder count.

3) Lifetime is tested by cycling actuator out 1 mm of travel range and back pushing a 5 lb load.

Dimensional Drawing



Order Information

8310CE	Closed-loop Picomotor actuator
8311	Compact Closed-loop Picomotor actuator
8743-CL	2-axis closed-loop intelligent motion controller/driver
8745-PS	Power Supply, 8742 and 8743-CL Controller/Driver, 12V