For current pricing, please see our website.

4 mm Travel NanoMax™ with Stepper Motors (Page 1 of 2)

Features

- Submicron Resolution Stepper Motor Drives
- Optional Piezo Drives
- Flexure Design Ensures Smooth, Continuous Motion
- Compact Design – 62.5 mm (2.46") from the Table to the Moving Deck, and 75 mm (2.95") from the Table to the Optical Axis of the Accessories
- No Kinetic or Static Friction
- Enhanced Long-Term Stability
- Unparalleled Stability

Specifications

- **XYZ Travel:** 0.16" (4 mm)
- **Max Velocity:** 2.5 mm/s
- **Max Acceleration:** 4 mm/s^2
- **Backlash:** <7.0 µm
- **Minimum Achievable Incremental Movement:** 0.06 µm
- **Absolute On-Axis Accuracy:**
  - X-Axis: 43 µm
  - Y-Axis: 66 µm
  - Z-Axis: 278 µm
- **Max Percentage Accuracy:**
  - X-Axis: 4.2%
  - Y-Axis: 4.35%
  - Z-Axis: 10.4%
- **Bidirectional Repeatability:** 0.5 µm
- **Home Location Accuracy:** ±1.5 µm
- **Thermal Stability:** 1 µm/°C
- **On-Axis Load Capacity:** 2.2 lbs (1 kg)
- **Resonant Frequency (±10%):** 375 Hz (No Load), 200 Hz (275 g Load), 150 Hz (575 g Load)
- **Weight:** 2.2 lbs (1 kg)
- **Deck Height:** 2.46" (62.5 mm) from the Bottom Surface of the Moving Platform. The Accessory Beam Height is 2.95" (75 mm) from the Bottom Surface of the Stage
- **Recommended Controller:** BPC203

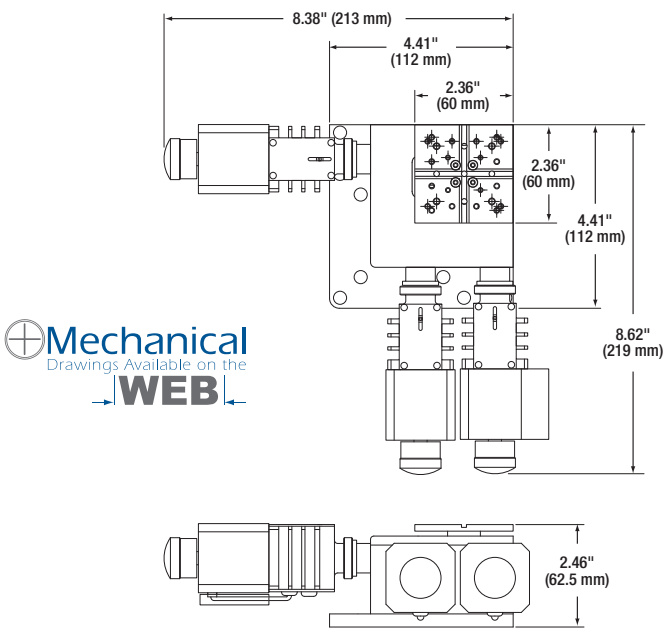
Stepper Motor Specification

- **Step Angle:** 1.8° (50 poles and ±2 phases for 360° Divided by 200, or 1.8°)
- **Step Accuracy:** 5%
- **Rated Phase Current:** 1 A
- **Phase Resistance:** 4.6 Ω
- **Phase Inductance:** 10.6 mH
- **Holding Torque:** 23.1 N·cm
- **Detent Torque:** 1.7 N·cm
- **Operating Temperature:** -20 to 40 °C (Motor Specification Only)

For applications requiring fast precision positioning, the NanoMax™ platforms described on the previous pages are offered here with stepper motor drives. These platforms offer all of the advantages of the patented parallel flexure design, coupled with improved positioning resolution and repeatability, as well as increased speed. A piezo drive optionis also available, either with or without strain gauge feedback.

The DRV001 Stepper Motors used in the MAX343 stage have a rotor that consists of 50 individual magnetic teeth that are ideally suited for micro-stepping applications. Aside from the increase in resolution provided by increasing the steps per revolution from the standard 200 to 25,600 with BSC series controllers, microstepping also ensures smoother low-speed motion by producing 128 steps per standard 1.8° step, which significantly reduces the vibrational noise inherent when using the 1.8° steps. Together this gives the stage a minimum step size of 0.06 µm.

The use of a trapezoidal leadscrew in the stepper motor drive assembly provides a number of benefits over the more common Acme style thread. The benefits include improved durability, lower friction due to improved surface quality, and nearly no backdrive, thus eliminating the need for a braking mechanism.



Mechanical Drawings Available on the WEB

4 mm Travel NanoMax™ with Stepper Motors (Page 2 of 2)

The MAX341 features internal piezoelectric actuators built directly into the body of the platform, providing a 20 µm travel range with a positional resolution of 20 nm. The MAX341 has three strain gauge displacement sensors, providing a voltage signal that is linearly proportional to the displacement of the piezoelectric element. This signal is used to compensate for the hysteresis, creep, and thermal drift that is inherent in all piezoelectric elements. If used with a BPC203, the piezoelectric actuator can be controlled in a closed-loop feedback mode that results in a resolution of 5 nm.

MAX341
Patent 6,467,762

Piezo Specifications on MAX341

- **Piezoelectric XYZ Travel:** 20 µm
- **Piezoelectric Actuator Resolution:** 5 nm
- **Bidirectional Repeatability:** 0.05 µm
- **Absolute On-Axis Accuracy:** 1.0 µm
- **Max Piezoelectric Drive Voltage:** 75 VDC

Note: All measurement related to the performance of the piezoelectric actuators are made with the Thorlabs BPC203 Piezo Driver, which can be found on pages 642 – 643.

Mix-and-Match Drives

Does your application require two stepper motors and one manual drive or some other combination of options? Please see pages 558 – 559 to configure a stage to your specific needs.

Displacement Sensor

The strain gauge displacement sensor, directly attached to the body of the piezoelectric element, provides an analog signal that is proportional to its displacement. When combined with low-noise electronics, the resolution obtained is better than 5 nm.

ITEM #	METRIC ITEM #	$	£	€	RMB	DESCRIPTION
MAX343	MAX343/M	$ 2,345.00	£ 1,688.40	€ 2.040,15	¥ 18,689.65	NanoMax™ Stage with Stepper Motor Drives
MAX341	MAX341/M	$ 3,530.00	£ 2,541.60	€ 3.071,10	¥ 28,134.10	NanoMax™ Stage; Stepper, Piezoeletric Actuator, & Sensor