

NanoMax™ 600 Stepper Motor Six-Axis, Parallel Flexure Platform

Patented 6,467,762

Specifications

Travel:

- Stepper Motor Range: 0.16" (4 mm) (X, Y, Z), 6° (θ_x , θ_y , θ_z)
- Optional Piezo Actuators: 30 μ m (X, Y, Z), 1.8 arcmin (θ_x , θ_y , θ_z)

Resolution:

- Stepper Motor Resolution: 20 nm (X, Y, Z), 0.1 arcsec (θ_x , θ_y , θ_z), Tested with Model BSC103 Stepper Motor Driver
- Optional Piezoelectric Actuator: 30 nm (X, Y, Z), 0.1 arcsec (θ_x , θ_y , θ_z)
- Optional Piezoelectric Actuator with Feedback: 10 nm (X, Y, Z), 0.03 arcsec (θ_x , θ_y , θ_z)

General Data

Deck Height

- Mounting Surface of the Moving Top Plate: 4.43" (112.5 mm)
- Accessory Beam Height: 4.92" (125 mm)*

Resonant Frequency:

 With no Load on the Stage >130 Hz (\pm 10%)

Crosstalk:

 Max 20 μ m/mm of Travel (Also Known as Arcuate Motion)

Modular Stepper Motor Drives:

 Hybrid Stepper Motor with 1.8° Step Angle and 23 N·cm of Holding Torque

Load Capacity:

 2.2 lbs (1 kg)

*Measured from the bottom surface of the stage



These motorized NanoMax six-axis platforms combine the high thermal and mechanical stability of our other NanoMax™ 600 series platforms with the automated control offered by outfitting the system with microstepping stepper motors. When controlled by the apt™ Series Stepper Motor System Controllers, they provide fast, automated positioning.

The NanoMax TS series offers inherently low kinematic static friction and virtually zero backlash, except for that associated with the leadscrew of the stepper motors. These features combine to produce an automation tool that is capable of 24/7 operation with a positional resolution of 20 nm that will not degrade in industrial applications. Compared to traditional flexure designs, the mechanical stiffness is an order of magnitude higher. This offers additional resistance against the external forces often encountered in the assembly process. Hence, this stage is ideal for fiber alignment and positioning tasks, particularly those involving multi-channel optical waveguides and complex optical circuits.

For an increased level of automation, we offer two models with internal piezoelectric actuators. One of these two is also offered with displacement sensors that attach directly to the piezoelectric stacks. This added feature increases the resolution by a factor of two and enables closed-loop operation.

The hybrid stepper motors used in the NanoMax™ 600 series platforms have a rotor that consists of 50 individual magnetic teeth ideally suited for micro-stepping applications. Aside from the obvious increase in resolution provided by increasing the steps per revolution from the standard of 200 to 25,600, microstepping also ensures smoother low-speed motion by producing 128 steps per standard 1.8° step, significantly reducing the vibrational noise inherent with the 1.8° steps.

NanoMax™ Stepper-Motor-Based Actuators: Mechanical and Electrical Data

- Step Angle: 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

NanoMax 604: Stepper Motors, No Piezos

ITEM#	METRIC ITEM#	\$	£	€	RMB	DESCRIPTION
MAX604	MAX604/M	\$ 7,175.00	£ 4,974.00	€ 6,371.00	¥ 60,586.00	NanoMax™ 6-Axis Positioning Stage with Stepper Motors

NanoMax 605: Stepper Motors and Piezoelectric Actuators

ITEM#	METRIC ITEM#	\$	£	€	RMB	DESCRIPTION
MAX605	MAX605/M	\$ 11,035.00	£ 7,650.00	€ 9,797.00	¥ 93,180.00	NanoMax™ 6-Axis Positioning Stage, Stepper Motors, & Piezos

NanoMax 606: Stepper Motors, Piezoelectric Actuators, and Displacement Sensors

ITEM#	METRIC ITEM#	\$	£	€	RMB	DESCRIPTION
MAX606	MAX606/M	\$ 13,210.00	£ 9,158.00	€ 11,728.00	¥ 111,546.00	NanoMax™ 6-Axis Stage, Stepper Motors, Piezos, & Sensors