

Nanopositioning Piezo Stack Actuators

NPA SERIES



NPA Piezo Stack Actuators are equipped with a highly reliable, multi-layer, low-voltage, piezoelectric transducer stack. They are internally pre-loaded by a mechanical spring and feature high resonant frequencies, making them ideal for high load, dynamic applications.

Sub-Nanometer Positioning Resolution

With positioning resolution as low as 0.05 nm, the NPA Piezo Stack Actuators make ultra-fine adjustments with resolution only limited by the noise of the control electronics.

Ultra-High Load Capacity

NPA Piezo Stack Actuators can generate large forces up to 1000 N which make them particularly useful for machine tools, active vibration isolation, or adaptive mechanics.

Optional Strain-Gauge for Closed-Loop Operation

Closed-loop versions feature high resolution strain-gauge position sensors for highly accurate and repeatable motion which also compensates for actuator creep. The assembly is done as a full Wheatstone bridge and is temperature insensitive. The closed-loop devices can be used in either open or closed-loop control.

Vacuum Compatible Versions

The NPA Piezo Stack Actuators are available in vacuum compatible versions which can be used in vacuum (10-6 Torr) environments.



- Sub-nanometer positioning resolution
- Ultra-high load capacity
- Optional strain-gauge position feedback
- Vacuum compatible versions

SPECIFICATIONS

	NPA25	NPA50	NPA100
Open loop travel range ($\pm 10\%$) ⁽¹⁾ , (μm)	25	50	100
Closed loop travel range ⁽¹⁾⁽²⁾ (μm)	20	40	80
Open loop resolution ⁽³⁾ (nm)	0.05	0.1	0.2
Closed loop resolution ⁽²⁾ (nm)	0.5	1.0	2.0
Typ. Repeatability ⁽²⁾ (nm)	16	20	28
Capacitance ($\pm 20\%$) (μF)	2.5	5.4	9.0
Resonant frequency, unloaded (Hz)	12,000	8,000	3,000
Axial stiffness (N/ μm)	40	20	10
Push/Pull load capacity (N)	1000/150	1000/150	1000/150

¹⁾ Typical value measured with NPC3 and NPC3SG, (-20 V to +130 VDC range).

²⁾ Applies to devices with ending SG in closed-loop control only.

³⁾ Equal to rms noise value measured with NPC3 and NPC3SG controller.

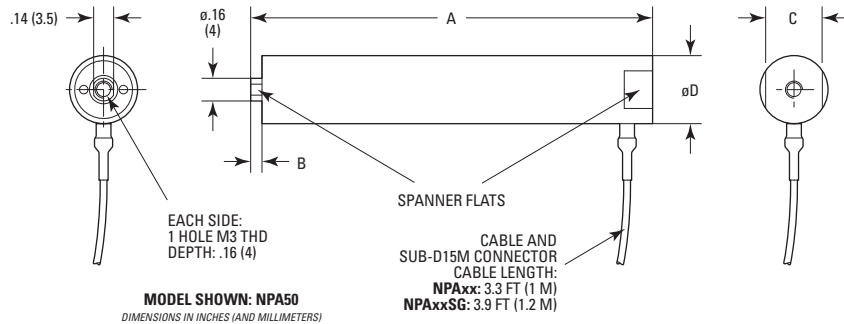
RECOMMENDED CONTROLLERS/DRIVERS

Model	Description
XPS-D	1- to 8-axis universal high-performance motion controller/driver
XPS-DRV11	Universal digital driver card for stepper, DC, brushless and direct motors
XPS-RL	1- to 4-axis universal high-performance motion controller/driver
XPS-DRVP1	NanoPositioning drive module for piezo-stack based products
NPC3	3-channel piezo stack amplifier, open-loop control
NPC3SG	3-channel piezo amplifier, strain-gauge position control

ORDERING INFORMATION

Model	Description
NPA25	Nano-Positioning Piezo Actuator, 25 μ m, Open-loop
NPA25-D	Nano-Positioning Piezo Actuator, 25 μ m, XPS, Open-loop
NPA25SG	Nano-Positioning Piezo Actuator, 25 μ m, Strain-gauge
NPA25SG-D	Nano-Positioning Piezo Actuator, 25 μ m, Strain-gauge, XPS
NPA25SGV6	Vacuum Nano-Positioning Piezo Actuator, 25 μ m, Strain-gauge
NPA25V6	Nano-Positioning Piezo Actuator, 25 μ m, Vacuum, Open-loop
NPA50	Nano-Positioning Piezo Actuator, 50 μ m, Open-loop
NPA50-D	Nano-Positioning Piezo Actuator, 50 μ m, XPS, Open-loop
NPA50SG	Nano-Positioning Piezo Actuator, 50 μ m, Strain-gauge
NPA50SG-D	Nano-Positioning Piezo Actuator, 50 μ m, Strain-gauge, XPS
NPA50SGV6	Vacuum Nano-Positioning Piezo Actuator, 50 μ m, Strain-gauge
NPA50V6	Vacuum Nano-Positioning Piezo Actuator, Open-loop, 50 μ m
NPA100	Nano-Positioning Piezo Actuator, 100 μ m, Open-loop
NPA100-D	Nano-Positioning Piezo Actuator, 100 μ m, XPS, Open-loop
NPA100SG	Nano-Positioning Piezo Actuator, 100 μ m, Strain-gauge
NPA100SG-D	Nano-Positioning Piezo Actuator, 100 μ m, Strain-gauge, XPS
NPA100SGV6	Vacuum Nano-Positioning Piezo Actuator, 100 μ m, Strain-gauge
NPA100V6	Vacuum Nano-Positioning Piezo Actuator, Open-loop, 100 μ m

DIMENSIONS



MODEL	LENGTH "A" FOR:		
	NPA25	NPA50	NPA100
NPAxx	1.73 (44)	2.80 (71)	4.25 (108)
NPAxxSG	1.81 (46)	2.87 (73)	4.29 (109)

MODEL	B	C	D
NPAxx	.04 (1)	.39 (10)	.47 (12)
NPAxxSG	.08 (2)	.47 (12)	.55 ^{+0.008} (14 ^{+0.2})



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