

## NanoPZ

# Ultra-High Resolution Actuators



## PZA12 Actuator

Our NanoPZ ultra-high resolution actuators provide exceptional nanometer-scale remote control for manual-positioning stages and opto-mechanical components over large distances, in hard to reach spaces and in hazardous hands-off applications - like high-power laser experiments. NanoPZ's non-rotating tip helps prevent contact surface wear and allows for direct load attachments. Newport's exclusive design and the innovative piezo stepping motor allows a range of motion and stability that ensures 30 nm of motion sensitivity with no loss of position when power is removed. And unlike some other piezo based devices, the NanoPZ design does not rely on varying static and dynamic friction forces which can provide inconsistent performance and premature failure. The NanoPZ incorporates an exclusive piezo micro-stepping motor and ergonomic controls which provide consistent results, superior reliability and unmatched ease-of-use. With all this, plus >0.2 mm/s speed, 50 N load capacity and more quiet operation, it's easy to see why Newport's NanoPZ outperforms the rest.

NanoPZ is compatible with an array of Newport products including: Ultima series optical mounts, GON series goniometers, and ULTRAlign series of linear stages.

## PZA12 Design Details

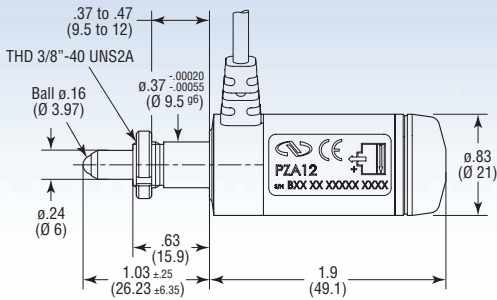
Base Material	Aluminum
Drive Mechanism	Direct-drive non-rotating lead screw, no gear
Feedback	Open loop, no encoder
Limit Switches	Fixed, jam-nut proof hard stops limit max./min. travel
Origin	None
Motor	Non-resonant piezo micro-stepping motor
Average full-step size	Approx. 160 nm depending on load, speed and other parameters, 16 micro-steps per full-step
Cable Length	3 m
Weight [lb (kg)]	0.29 (0.13)

**Preliminary information. Product to be available September 2005. All specifications, drawings and information are still subject of change. For most current information please visit the "New products" section on our website, or contact Newport's technical support group or your Newport representative**

## Key Features

- Highly reliable operation with 30 nm motion sensitivity over 12.7 mm travel
- 10x faster speed (> 0.2 mm/s) and 2x higher load capacity (50 N) than other piezo motor devices
- Non-rotating tip prevents wear and allows for direct load attachments
- User-friendly and highly compatible
- No loss of position with removal of power – ideal for set-and-forget applications





### PZA12 Specifications

Travel Range [in. (mm)]	0.5 (12.7)
Sensitivity	30 nm
Repeatability/Accuracy	Varies depending on application and feedback method
Maximum Speed	0.2 mm/s at full load; Higher speeds possible at lower load
Axial Load Capacity	50 N

### PZC200 Controller

Our PZC200 controller provides convenient and ergonomic one-hand speed-control, and easy to use push button channel control for the PZC-SB switchbox. It comes equipped with a serial RS-485 computer link for computer control of up to 256 units in parallel (RS-485 accessed by using RS-485 to RS-232 converter NSC-CB-485-232-1 plugged into your PC's RS-232 port. For USB use optional SMC-USB RS-232 to USB converter).

### PZC200 Specifications

Number of controlled axes	1 without PZC-SB switchbox 8 with PZC-SB switchbox
Operating modes	1. Local (manual) control mode 2. Remote (computer) control mode
Controls, Local (manual) mode	Rotate knob to adjust speed Select active switchbox channel Toggle between local and remote mode Set current position to zero
Controls, Remote (computer) mode	ASCII commands I/O via RS-485 port
Motion commands	Micro-steps, 1 micro-step equals approx. 10 nm of linear motion of a PZA12 depending on load, speed and other parameters <b>Important: Step size is not repeatable</b>
Mechanical Dimensions (W x D x H) [in. (mm)]	2" x 6" x 2" (50 x 150 x 50)
Weight [lb (kg)]	0.55 (0.250)



PZC200 controller features ergonomic one-hand speed control, up-down buttons for selecting active switchbox channel, RS-485 communication link, and push-button remote control/computer control swap.



PZC-SB switchbox allows control of up to 8 actuators with one PZC200 controller.

### PZC-SB Switchbox

Controls up to 8 NanoPZ actuators from the same PZC200 controller. LEDs indicate which actuator is active, inactive, connected or disabled and two buttons on the PZC200 controller allow you to select the active actuator. (PZC-SB is controllable by PC by using the same RS-485/RS-232 interface of the PZC200).

### PZC-SB Specifications

Actuator output channels	8 (one channel active at a time)
Channel status indication	One tri-color LED per channel
Case dimensions (H x W x D) [in. (mm)]	1.4" x 7.2" x 5.9" (35 x 182 x 151)

## Ordering Information

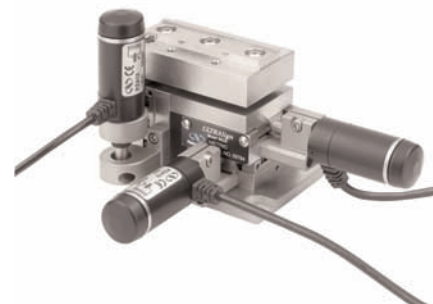
Model	Description
PZA12	NanoPZ actuator, 12.5 mm travel
PZC200	Hand-held controller for PZA12
NSC-PS25	AC power supply for PZC200
NSC-PSC1	1 meter (3 ft) power supply output cable
NSC-PSC3	3 meter (10 ft) power supply output cable
NSC-485-232-I	RS-485-to-RS-232 converter
USB-232	RS-232-to-USB converter
NSC-JB	Junction box to split 1 RS-485 channel into 5 channels
NSC-CB1	1 meter (3 ft) RS-485 cable
NSC-CB3	3 meter (10 ft) RS-485 cable
PZC200-KT	Kit including 1 x PZA12 actuator, 1 x PZC200 controller, 1 x NSC-PC25 power supply, and 1 x NSC-PSC3 power supply cable
PZC-SB	Switchbox allowing one PZC200 to drive up to 8 actuators. Included cables: P/N 41791-01 1.8 m (6 ft) power cable to controller P/N 15769-02 1.8 m (6 ft) driver cable to controller P/N NSC-CB2 1.8 m (6 ft) RS-485 cable to controller



M-RS65 rotation stage equipped with a PZA12 actuator.



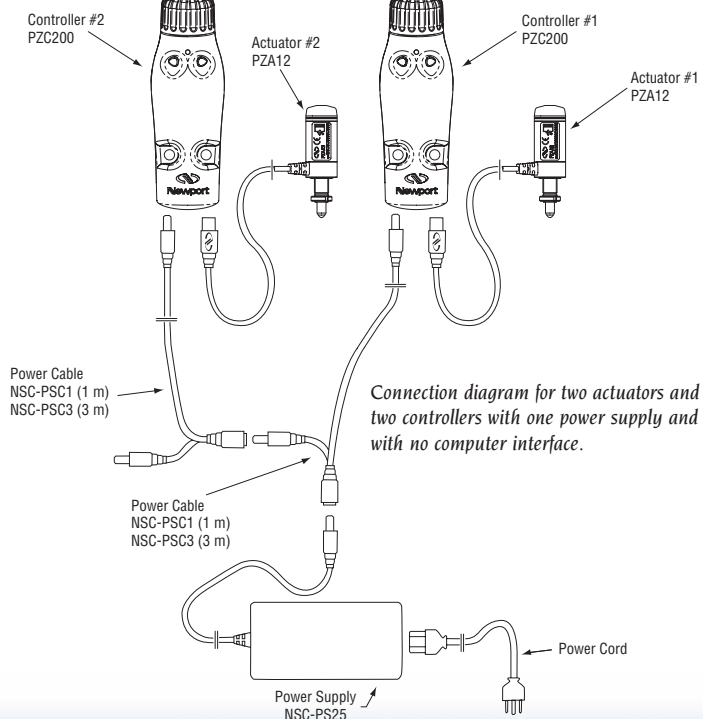
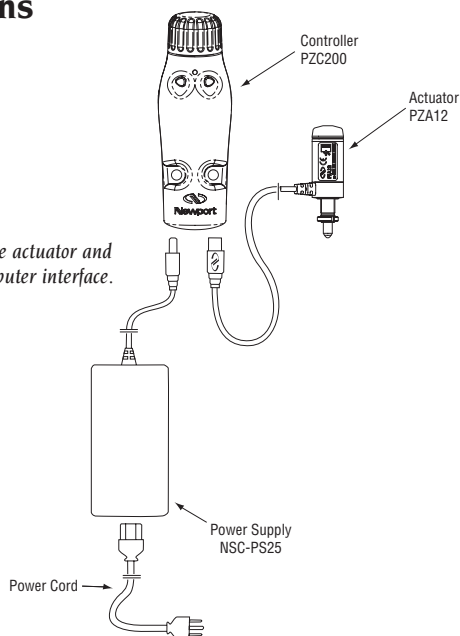
ULTIMA optical mount equipped with PZA12 actuators.



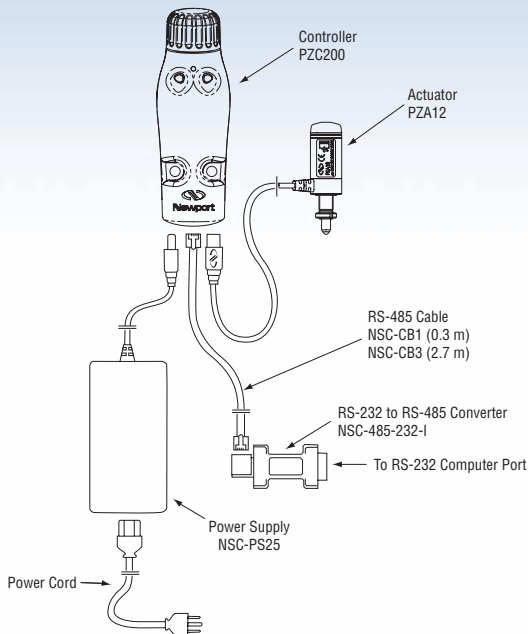
561D-XYZ ULTRAlign™ precision linear stage equipped with PZA12 actuators.

## Configurations

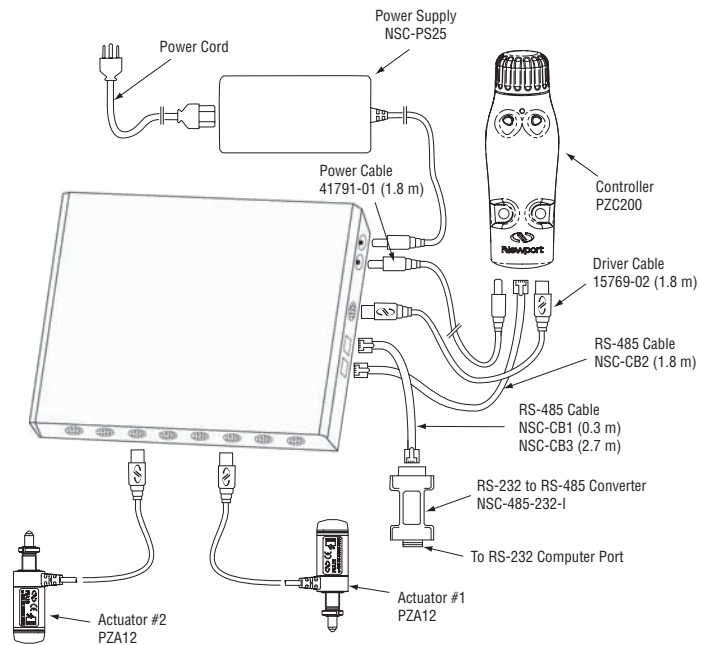
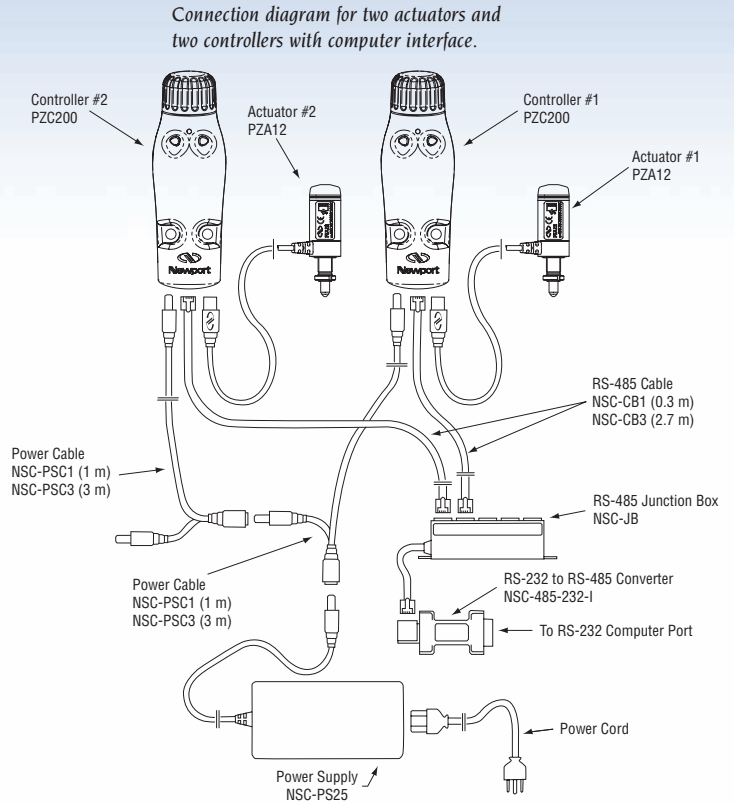
Connection diagram for one actuator and one controller with no computer interface.



Connection diagram for two actuators and two controllers with one power supply and no computer interface.



Connection diagram for one actuator and one controller with computer interface.



Connection diagram for several actuators and one controller with switchbox and with computer interface.



ISO 9001  
FM 27207

Newport Corporation, Irvine, California, has been certified compliant with ISO 9001 by the British Standards Institution.



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