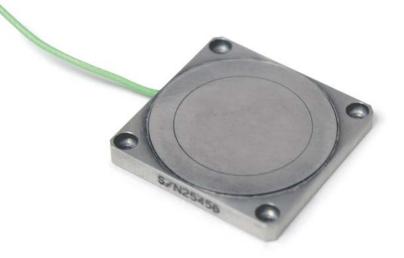


## NanoSensors - NX Series

Nanopositioning Sensors





NX NanoSensor for the ultimate in position monitoring.

The NX NanoSensor® is a non-contact position measuring system based on the principle of capacitance micrometry. Two sensor plates, a target and a probe, form a parallel plate capacitor.

The spacing of these two plates can be measured using the appropriate electronic controller, to better than 7pm, with a range up to 1.25mm, a frequency response up to 10KHz and linearity down to 0.02%. Because the NanoSensor is a non-contact method, it is free from hysteresis. No power is dissipated at the point of measurement.

#### **Key features**

- Sub nanometre position resolution
- Zero hysteresis
- Linearity error down to 0.02%
- Bandwidth from 50Hz up to 10kHz
- High thermal stability construction (Super invar, zerdur and ceramic options available)
- UHV, Radiation, Cryogenic, Nonmagnetic, etc. Variants.

#### **Typical applications**

- · Precision manufacturing
- Metrology
- Deformation measurements
- Stain measurement (used on space station robotic arm and hand)
- Stage control
- Materials testing
- Microscopy
- Active optics
- Precision beam steering

#### Suggested controllers

The NS2000 or the NS-A-4101 are single channel standalone

electronic modules for driving the NX NanoSensor® series. Either controller can be synchronised to allowing multiple units to be operated together without interference.

#### Key benefits

- Very sensitive to atomic scale changes in position Precision measurement to picometres
- Tuneable to meet application requirements
- Repeatable measurement
- High Accuracy
- Choice of materials to minimise position drift
- for a wide range of applications and to suit a broad range of environmental challenges.



# NanoSensors - NX Series

Nanopositioning Sensors

#### **Technical specification**

Parameter		Value						Units	Comments
Static physical									
Variant Active area Material		NXB Series		NXC Series		NXD Series			
		22.5		113		282		mm²	
		AL	SI	AL	SI	AL	SI		Note 1
Dynamic physical (Ty	pical values)								
Thermal drift		230	3	230	3	230	3	nm K <sup>-1</sup>	Note 2
Short range –S (10pF)	Range	20		100		250		μm	
	Nominal scale factor	2		10		25		μm/V	
	Noise	<0.001		<0.005		<0.013		nmrms Hz-1/2	
	Linearity error	<0.08		<0.05		<0.06		%	Note 3
Long range –L (2pF)	Range	100		500		1,250		μm	
	Nominal scale factor	10		50		125		μm/V	
	Noise	<0.015		<0.075		<0.188		nmrms Hz-1/2	
	Linearity error	<0.08		<0.03		<0.06		%	Note 3
Operating temperature	Controller	+10 to +50					°C		
	Sensor	+10 to +50					°C		
Storage temperature		0 to +70						°C	
Relative humidity		5 to 95 (non-condensing)						%	
Operating pressure -UHV			10-9					Т	Note 4

#### Notes

- 1. Aluminium (AL) and Super Invar (SI) material available on all variants. Alternative custom materials, e.g. Stainless Steel or Invar 36 can be used. Please consult Queensgate.
- 2. This is the thickness contribution only. It does not include the area effect.
- 3. Linearity error can be dominated by the parallelism of the sensor faces; particularly for short range sensors. Linearity for type 4 compact sensors will have an order of magnitude higher non-linearity.
- 4. Vacuum sensors should be baked out at 100 °C for two days prior to installation for best vacuum compatibility.



NanoSensors – NX Series Nanopositioning Sensors

### **Ordering information**

The NX NanoSensors are available in three sizes, the standard variant is square with a choice of super invar or aluminium. Round variants are available as a custom product and the a rectangular variant of size B is also available.

The size is indicated by letters, B (Smallest) to D (Largest).

The larger the sensor the longer the range.

The shape is indicated by numbers, 2 (Square) and 3 (Rectangular).

The shape does not affect performance.

All NX series sensors are available in Aluminum and Super Invar (0.3ppm K-1).

The round Super Invar sensor has an optional magnetic base.

Alternative materials can be considered as custom products. please consult Queensgate at Prior Scientific.

#### **Example order codes**

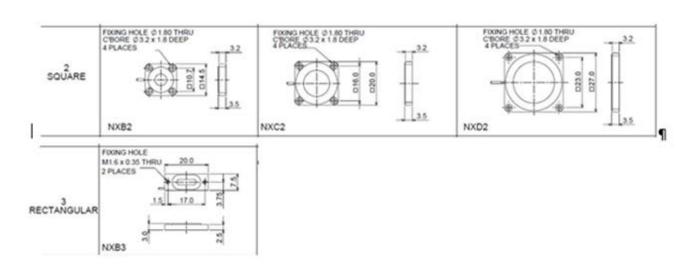
NXC2-SI-UHV		NXB3-AL			
NX	Specifies an NX capacitance sensor	NX	Specifies an NX capacitance sensor		
С	The active area is 113mm2	В	The active area is 22.5mm2		
2	Square shape 20mm diameter, 5mm thick	3	Rectangular shape 20 x 7.5 x 3.0mm		
SI	The sensor will be made of Super Invar and come with magnetic mounting	AL	The sensor will be made of Aluminium		
UHV	The sensor will be UHV compatible				

## Size and shape variants

NXB, ACTIVE AREA 22.6sqmm

NXC, ACTIVE AREA 113sqmm

NXD, ACTIVE AREA 282sqmm





#### WORLDWIDE DISTRIBUTION



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