

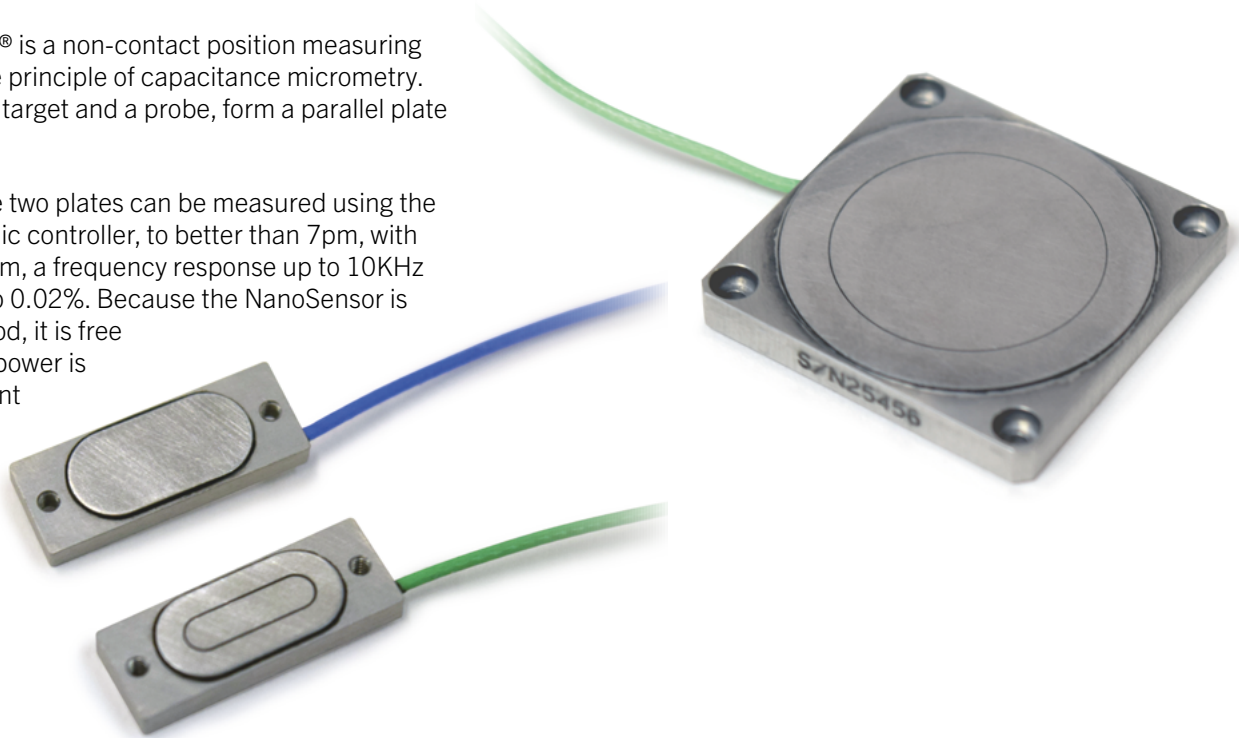
NANOSENSORS – NX SERIES

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

Suggested controllers

The NS-D-6300 or NS-D-6100 are digital 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.

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

Technical specifications

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

Notes

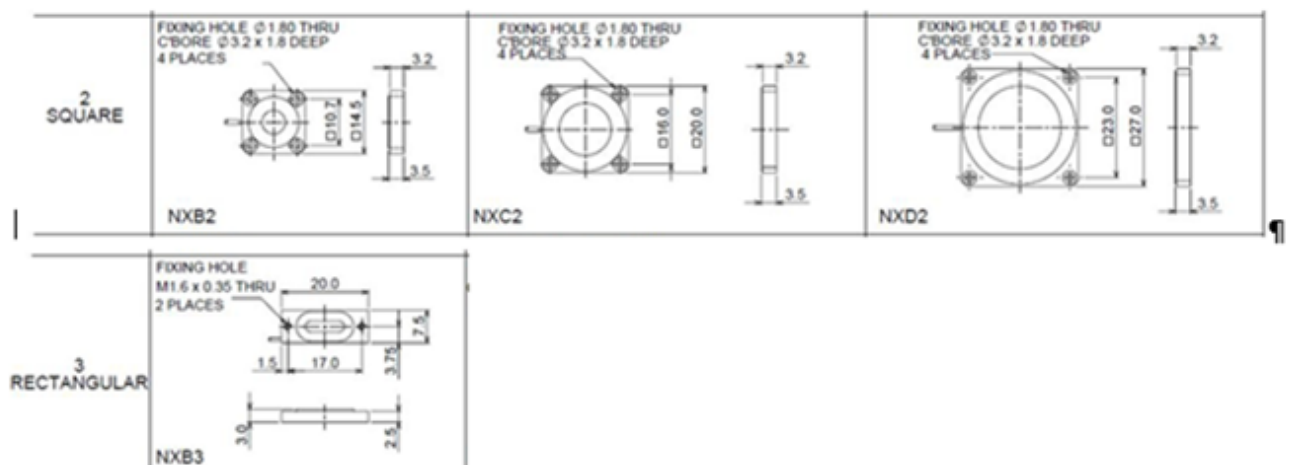
- Aluminium (AL) and Super Invar (SI) material available on all variants. Alternative custom materials, e.g. Stainless Steel or Invar 36 can be used. Please consult Queensgate.
- This is the thickness contribution only. It does not include the area effect.
- Linearity error can be dominated by the parallelism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

Size and shape variants

NXB, ACTIVE AREA 22.6sqmm

NXC, ACTIVE AREA 113sqmm

NXD, ACTIVE AREA 282sqmm



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 such as ceramics with gold coating 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
C	The active area is 113mm ²	B	The active area is 22.5mm ²
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		

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