

Probe Selection Procedure

Steps

Guidance

1 Identify Target Shape and Minimum Target Dimension
by observing item to be measured and comparing with the guidance illustrations.

2 Calculate Maximum Sensor Diameter
(Note: This dimension is less than the minimum target dimension because all of the "spreading" electric field needs to be on the target surface.)

$$\text{Minimum Target Dimension} \times \left\{ \begin{array}{l} 0.60 \text{ for Flat Target} \\ 0.25 \text{ for Cylindrical Target} \\ 0.20 \text{ for Spherical Target} \end{array} \right\} = \text{Maximum Sensor Diameter}$$

3 Determine Optimum Sensor Size - from step 2 answers
For best overall performance select the **larger** sensor size option. However, smaller sensor sizes may be preferred if surface profile or flatness of a textured surface is being measured, or if measurements are being made near a target edge.

4 Select Probe Style
Axial style is usually preferred, however other styles are available to facilitate target access. Refer to the probe diagrams on the preceding pages.

5 Determine Probe Ordering Information
Use answers 2,3, and 4 above for probe and sensor size. Consult sensor drawings.

Use with Microsense gauging module models 5810, 5800 and 5300.

Note: On special request, probes can be custom designed to suit specific customer needs. Consult the factory.

MicroSense
Microsense LLC.
70 Industrial Ave E.
Lowell, MA. 01852
Main Tel (978)843-7670
Fax (978)856-3375

Microsense LLC(specifications subject to change without notice) REV 092804

www.microsense.net

Series 5000 Probes

Microsense II Active Capacitive Probes

Summary

Microsense Series 5000 Microsense II Probes are capacitive sensors designed to make non-contact, high resolution displacement measurements in high dynamic applications. These applications include measurement of spindles, motors and rotating shafts where high bandwidth, sub-nanometer measurements are required.

The Series 5000 Microsense II Probe family has been designed to accommodate an extensive range of target dimensions and motion envelopes as well as a variety of fixturing and target-access limitations.

This product description is to be used in conjunction with Microsense 5000series gauging modules, including the 5810, 5800 and 5300.



Microsense II System : Series 5000 Probes with Gauging Console

Probe Description

Series 5000 Microsense II Probes are offered in a variety of sizes and shapes. Every probe in this product description is supplied with a 3-meter cable that plugs into the front panel of the mating module or gauge board.

Features

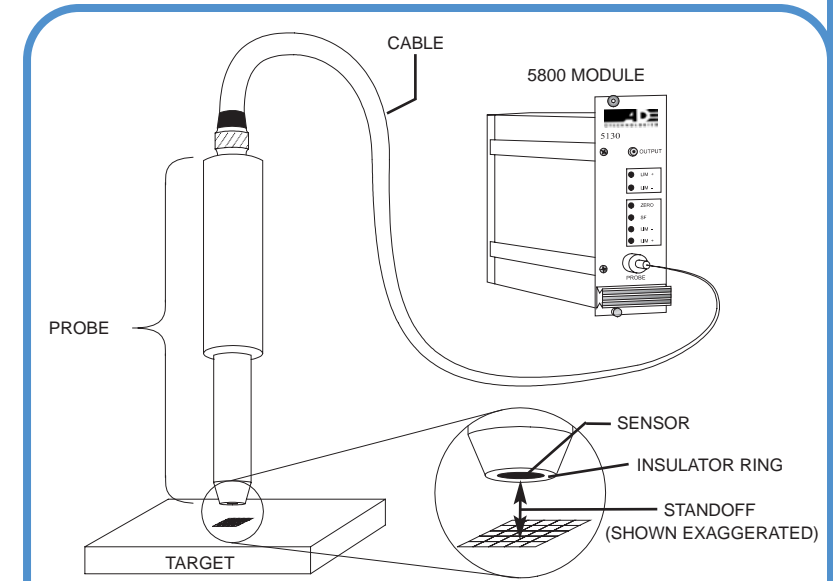
- ▲ Capacitive sensing element
- ▲ Compact
- ▲ Detachable cable
- ▲ Stainless steel housing
- ▲ Wide variety of sizes available

Benefits

- ▲ Non-contact design
- ▲ No probe wear
- ▲ Easily fixtured
- ▲ High resolution - < 1 nanometer
- ▲ High frequency response

Displacement Measurement & Sensing Applications

- ▲ Hard disk drive motor testing
- ▲ High speed air bearing test
- ▲ Spindle runout measurement
- ▲ Rotating shaft test
- ▲ Research & development
- ▲ Vibration analysis
- ▲ Servo control
- ▲ Fast Tool Servo



Usage Diagram for Non-Contact Series 5000 Probes

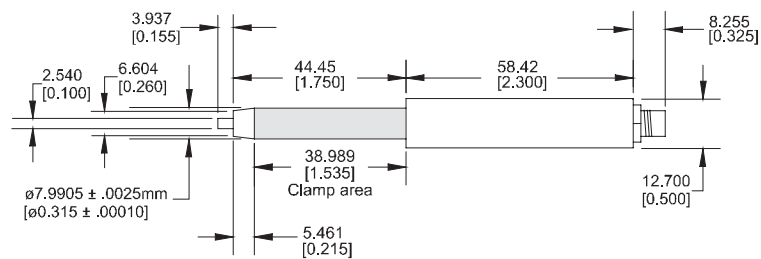
MicroSense

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Axial Probes

Model - 5504

0.5 mm diameter sensor



RMS distance noise in nanometers [microinches]*

Total distance range: 50 μm [2.0 mils]

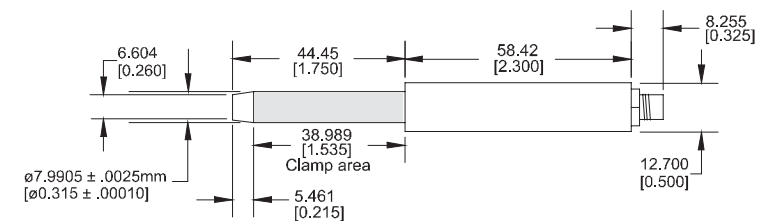
Bandwidth:	1 kHz	5 kHz	20 kHz	100 kHz
	0.5 [0.02]	0.5 [0.02]	0.7 [0.03]	1.9 [0.07]

Total distance range: 100 μm [4.0 mils]

Bandwidth:	1 kHz	5 kHz	20 kHz	100 kHz
	1.1 [0.05]	1.5 [0.06]	2.2 [0.09]	6.7 [0.27]

Model - 5501

1 mm diameter sensor



RMS distance noise in nanometers [microinches]*

Total distance range: 100 μm [4.0 mils]

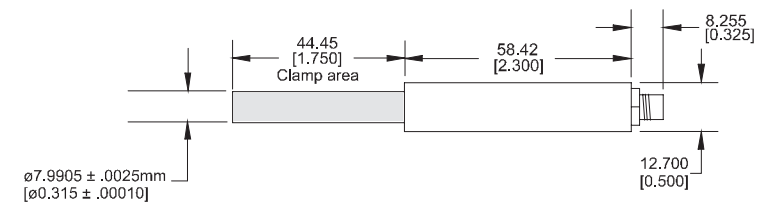
Bandwidth:	1 kHz	5 kHz	20 kHz	100 kHz
	1.1 [0.05]	1.1 [0.05]	1.3 [0.06]	2.7 [0.12]

Total distance range: 250 μm [10.0 mils]

Bandwidth:	1 kHz	5 kHz	20 kHz	100 kHz
	10.2 [0.40]	10.3 [0.41]	10.8 [0.43]	17.9 [0.70]

Model - 5502

2 mm diameter sensor



RMS distance noise in nanometers [microinches]*

Total distance range: 250 μm [10.0 mils]

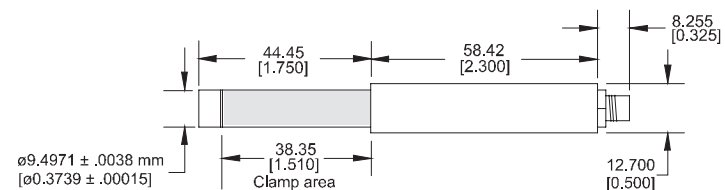
Bandwidth:	1 kHz	5 kHz	20 kHz	100 kHz
	1.7 [0.07]	2.1 [0.09]	2.7 [0.12]	5.8 [0.23]

Total distance range: 500 μm [20.0 mils]

Bandwidth:	1 kHz	5 kHz	20 kHz	100 kHz
	4.6 [0.18]	5.7 [0.23]	7.6 [0.30]	22.3 [0.88]

Model - 5503

5 mm diameter sensor



RMS distance noise in nanometers [microinches]*


Total distance range: 500 μm [20.0 mils]

Bandwidth:	1 kHz	5 kHz	20 kHz	100 kHz
	2.9 [0.12]	2.9 [0.12]	3.4 [0.14]	5.3 [0.21]

Total distance range: 1.0 mm [40.0 mils]

Bandwidth:	1 kHz	5 kHz	20 kHz	100 kHz
	5.7 [0.23]	6.5 [0.26]	9.0 [0.36]	20.1 [0.79]

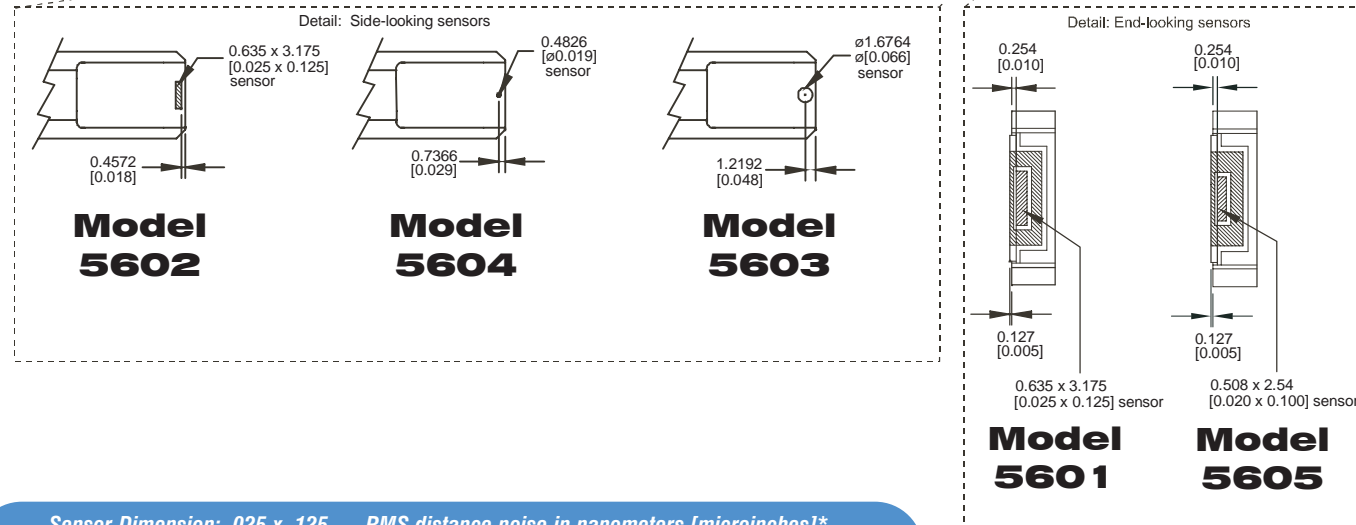
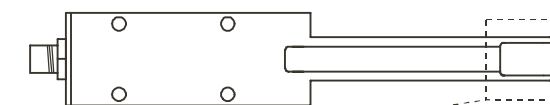
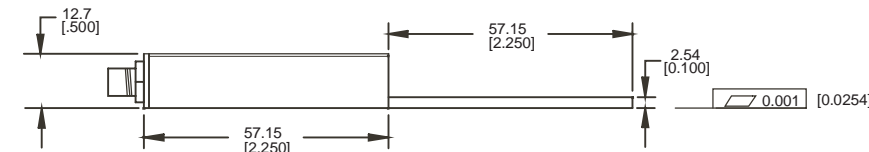
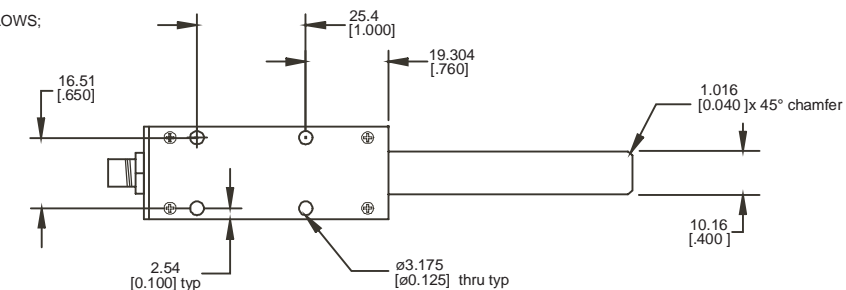
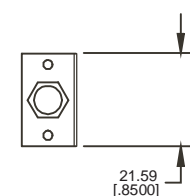


Shaded area  = Recommended clamping area

* at maximum probe-to-target spacing

Blade Probes

NOTES:
DIMENSIONS SHOWN AS FOLLOWS;
MILLIMETERS [INCHES]



Sensor Dimension: .025 x .125 RMS distance noise in nanometers [microinches]*

Total distance range: 100 μm [4.0 mils]

Bandwidth:	1 kHz	5 kHz	20 kHz	100 kHz
	0.7 [0.03]	0.7 [0.03]	0.8 [0.03]	1.6 [0.07]

Total distance range: 250 μm [10.0 mils]

Bandwidth:	1 kHz	5 kHz	20 kHz	100 kHz
	1.5 [0.06]	2.0 [0.08]	3.6 [0.14]	10.7 [0.42]

