

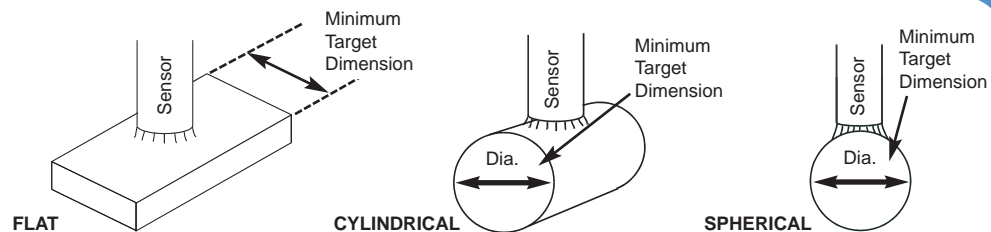
Probe Selection Procedure

Steps

Guidance

1

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



2

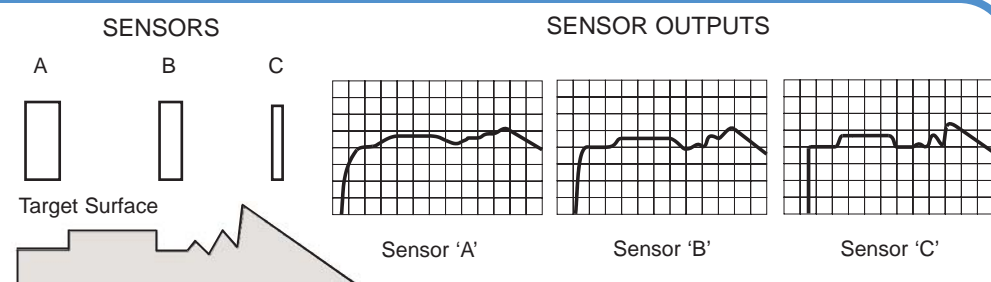
Calculate Maximum Sensor Diameter
(Note: This dimension is less than the minimum target dimension because all of the "spreading" electric field needs to be on the target surface.)

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

3

Determine Optimum Sensor Size - from step 2 answers

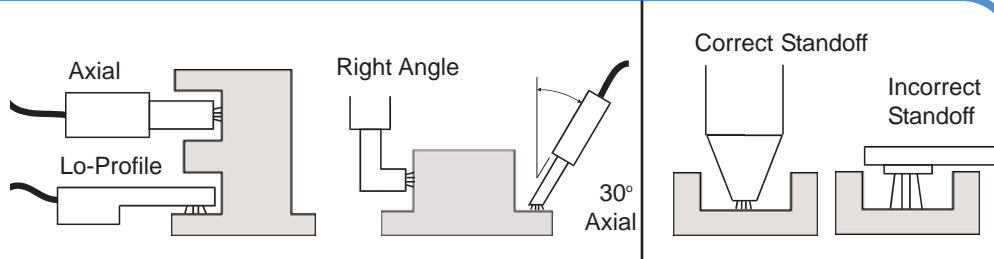
For best overall performance select the **larger** sensor size option. However, smaller sensor sizes may be preferred if surface profile or flatness of a textured surface is being measured, or if measurements are being made near a target edge.



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 ADE gauging module models 5810, 5800 and 5300.

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



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www.adetech.com

Series 5000 Probes

Microsense II Active Capacitive Probes

Summary

ADE 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 ADE 5000 series 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

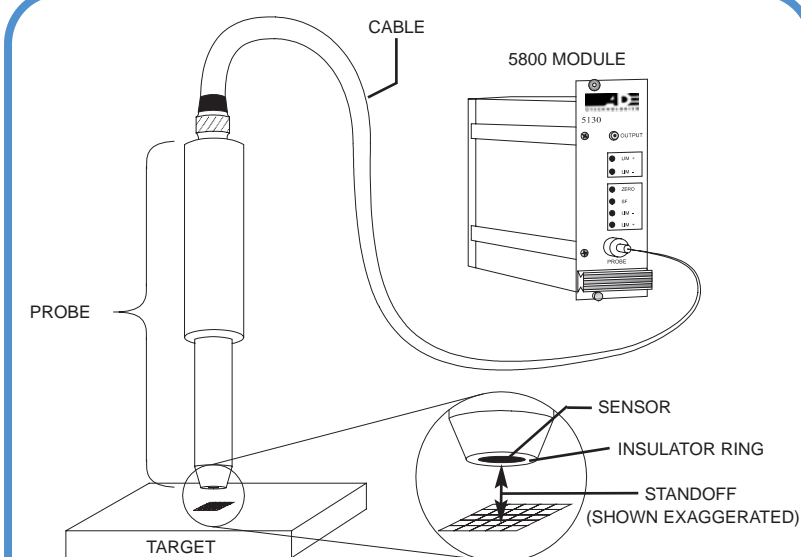
- ▲ Capacitive sensing element
- ▲ Compact
- ▲ Detachable cable
- ▲ Stainless steel housing
- ▲ Wide variety of sizes available

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

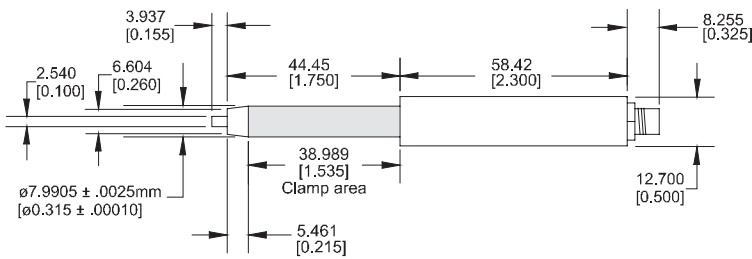


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Axial Probes

Model - 5504

0.5 mm diameter sensor

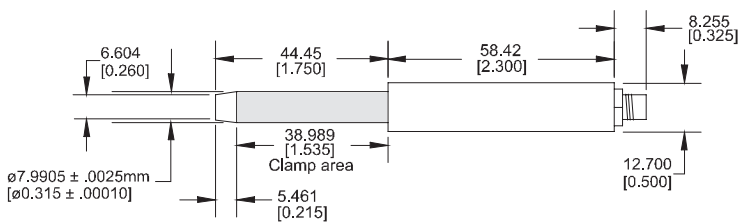


RMS distance noise in nanometers [microinches]*

| Total distance range: 50 µm [2.0 mils] | | | | | Total distance range: 100 µm [4.0 mils] | | | | |
|--|--------------|--------------|---------------|----------------|---|--------------|--------------|---------------|----------------|
| Bandwidth: | <u>1 kHz</u> | <u>5 kHz</u> | <u>20 kHz</u> | <u>100 kHz</u> | Bandwidth: | <u>1 kHz</u> | <u>5 kHz</u> | <u>20 kHz</u> | <u>100 kHz</u> |
| | 0.5 [0.02] | 0.5 [0.02] | 0.7 [0.03] | 1.9 [0.07] | | 1.1 [0.05] | 1.5 [0.06] | 2.2 [0.09] | 6.7 [0.27] |

Model - 5501

1 mm diameter sensor

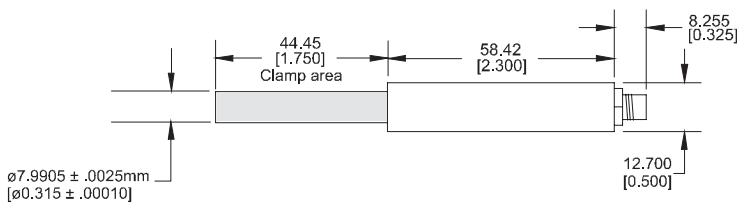


RMS distance noise in nanometers [microinches]*

| Total distance range: 100 μm [4.0 mils] | | | | Total distance range: 250 μm [10.0 mils] | | | | | |
|---|--------------|--------------|---------------|--|------------|--------------|--------------|---------------|----------------|
| Bandwidth: | <u>1 kHz</u> | <u>5 kHz</u> | <u>20 kHz</u> | <u>100 kHz</u> | Bandwidth: | <u>1 kHz</u> | <u>5 kHz</u> | <u>20 kHz</u> | <u>100 kHz</u> |
| | 1.1 [0.05] | 1.1 [0.05] | 1.3 [0.06] | 2.7 [0.12] | | 10.2 [0.40] | 10.3 [0.41] | 10.8 [0.43] | 17.9 [0.70] |

Model - 5502

2 mm diameter sensor

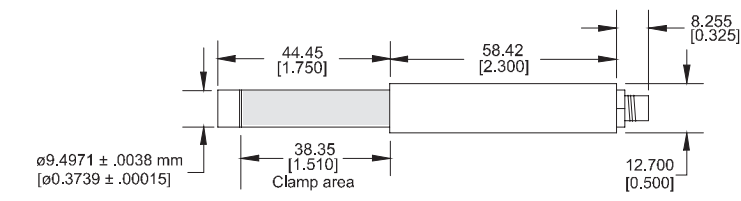


RMS distance noise in nanometers [microinches]*

| Total distance range: 250 μm [10.0 mils] | | | | | Total distance range: 500 μm [20.0 mils] | | | | |
|--|--------------|--------------|---------------|----------------|--|--------------|--------------|---------------|----------------|
| Bandwidth: | <u>1 kHz</u> | <u>5 kHz</u> | <u>20 kHz</u> | <u>100 kHz</u> | Bandwidth: | <u>1 kHz</u> | <u>5 kHz</u> | <u>20 kHz</u> | <u>100 kHz</u> |
| | 1.7 [0.07] | 2.1 [0.09] | 2.7 [0.12] | 5.8 [0.23] | | 4.6 [0.18] | 5.7 [0.23] | 7.6 [0.30] | 22.3 [0.88] |

Model - 5503

5 mm diameter sensor

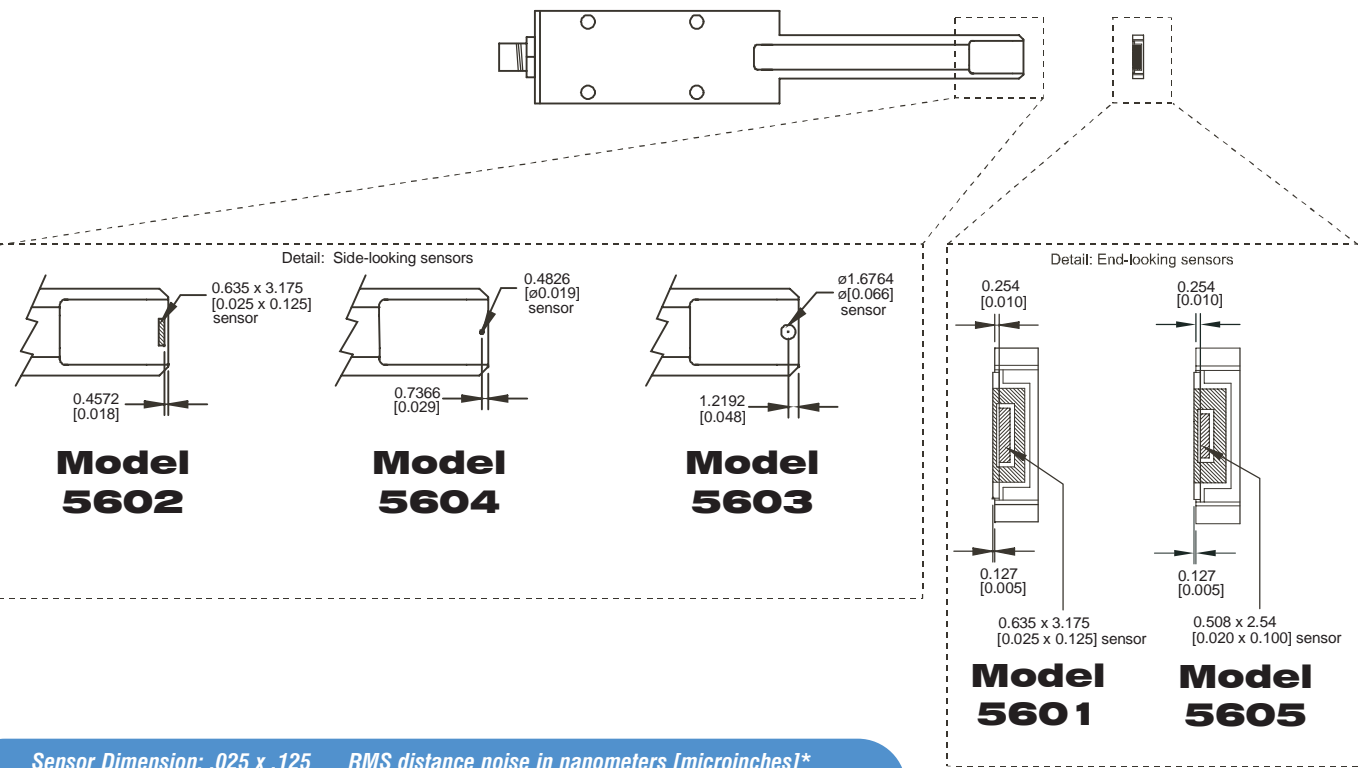
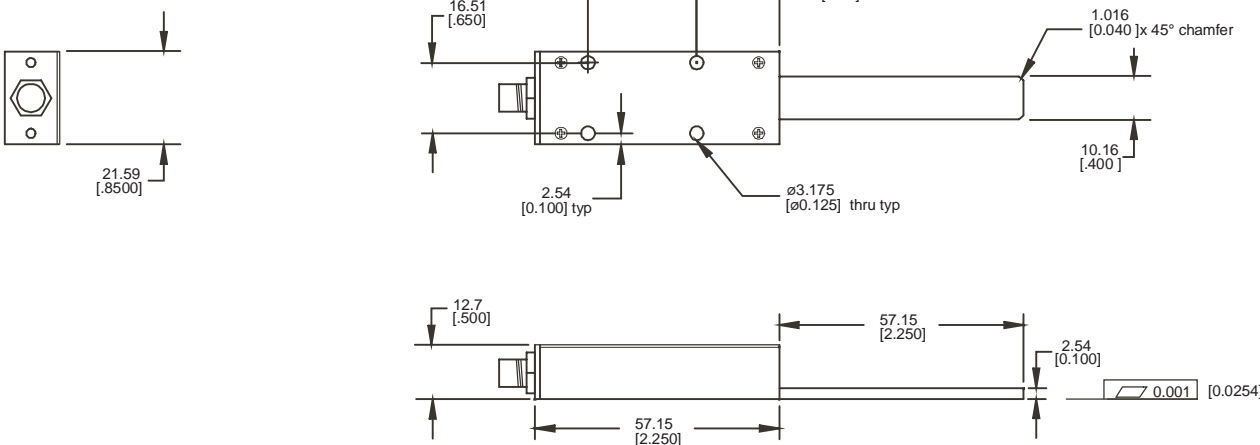


RMS distance noise in nanometers [microinches]*

| Total distance range: 500 µm [20.0 mils] | | | | | Total distance range: 1.0 mm [40.0 mils] | | | | |
|--|--------------|--------------|---------------|----------------|--|--------------|--------------|---------------|----------------|
| Bandwidth: | <u>1 kHz</u> | <u>5 kHz</u> | <u>20 kHz</u> | <u>100 kHz</u> | Bandwidth: | <u>1 kHz</u> | <u>5 kHz</u> | <u>20 kHz</u> | <u>100 kHz</u> |
| | 2.9 [0.12] | 2.9 [0.12] | 3.4 [0.14] | 5.3 [0.21] | | 5.7 [0.23] | 6.5 [0.26] | 9.0 [0.36] | 20.1 [0.79] |

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] | | | | Total distance range: 250 µm [10.0 mils] | | | | | |
|---|-----------------------|-----------------------|------------------------|--|------------|-----------------------|-----------------------|------------------------|-------------------------|
| Bandwidth: | 1 kHz | 5 kHz | 20 kHz | 100 kHz | 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] | | 1.5 [0.06] | 2.0 [0.08] | 3.6 [0.14] | 10.7 [0.42] |



Shaded area = Recommended clamping area

* at maximum probe-to-target spacing

