

Capacitance Sensors for
Ungrounded Targets or
Poorly Grounded Targets

PUSH/PULL PROBES

LOW NOISE

HIGH LINEARITY

HIGH RESOLUTION CUSTOMIZABLE

SUB NANOMETER RESOLUTION



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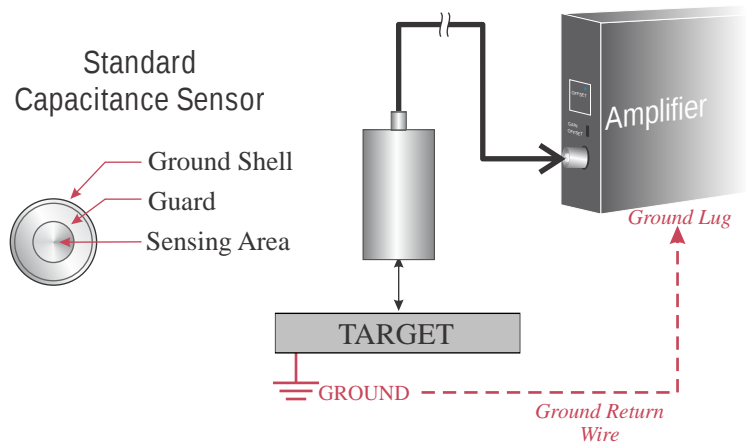
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TWO HIGH PRECISION SENSORS BUILT INTO ONE BODY

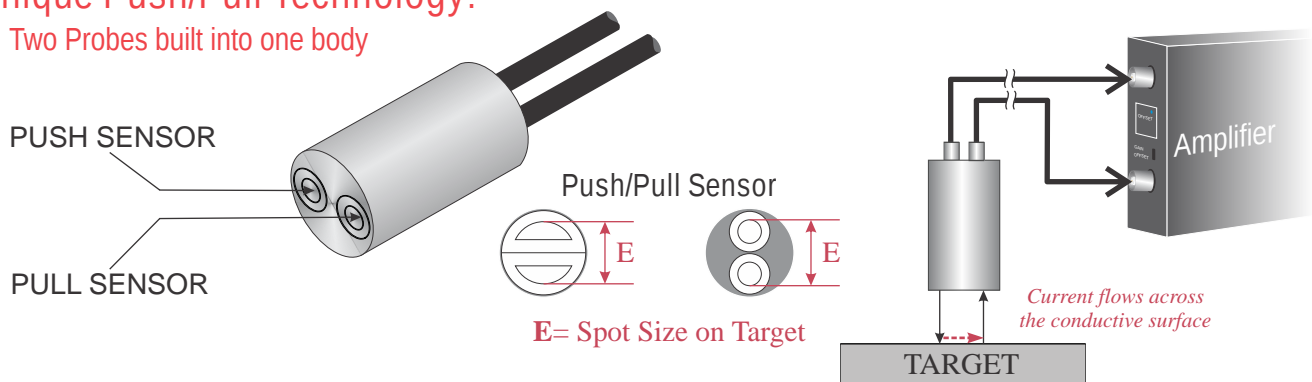
Capacitance Technology:

Standard capacitive sensors require the target to be electrically grounded. Current flows from the probe face to the target and back to the amplifier to complete the circuit. The capacitance between probe and target is proportional to the distance and converted to a 0 - 10V output from the amplifier. The measurement of electrically grounded targets can be, however, affected by changes in the electrical conductivity or ground path of the target.



Unique Push/Pull Technology:

Two Probes built into one body



To eliminate the effects of these variations, MTII developed a unique version of the Accumeasure sensor called the push-pull. In this design each probe consists of two capacitance sensors, built into one probe body. Each sensor is driven at the same voltage, however, there is a 180 degree phase shift between signals. This shift allows the current path to travel across the target surface rather than through the target to ground, eliminating any inaccuracies created by poorly grounded targets. Additionally, highly resistive targets can be measured with this technology allowing capacitance sensors to be used on semi-insulating and semi-conducting targets.

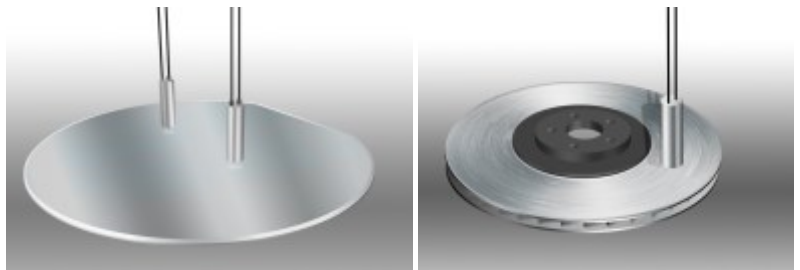


Push/Pull Probes provide better linearity and accuracy than 2 standard capacitance sensors in tandem through precision balanced currents and reduced fringe effects

Additionally, the push/pull amplifier design cancels common mode electrical noise that may be induced in this target. Common mode noise may be encountered in magnetic bearing surfaces, semiconductor wafers, brake rotors and air bearing floating surfaces

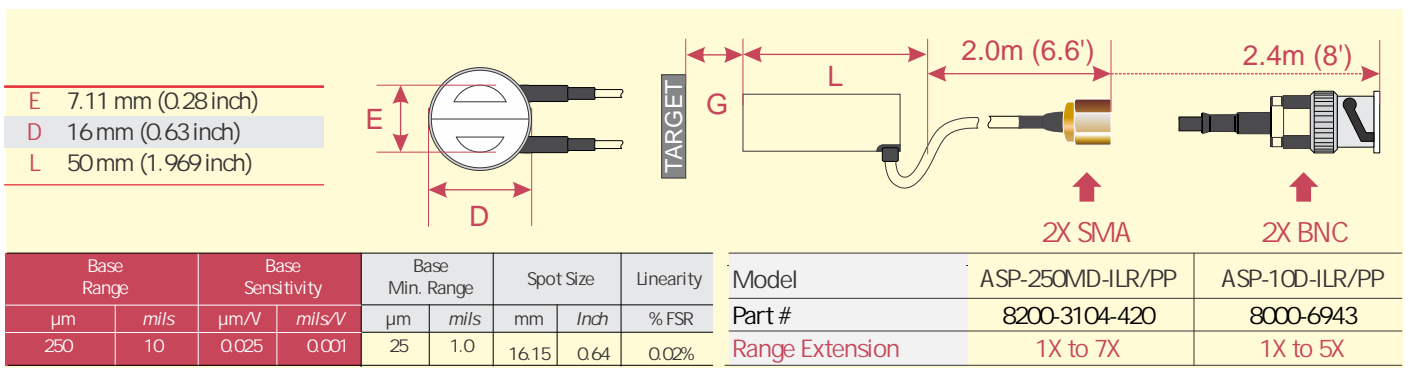
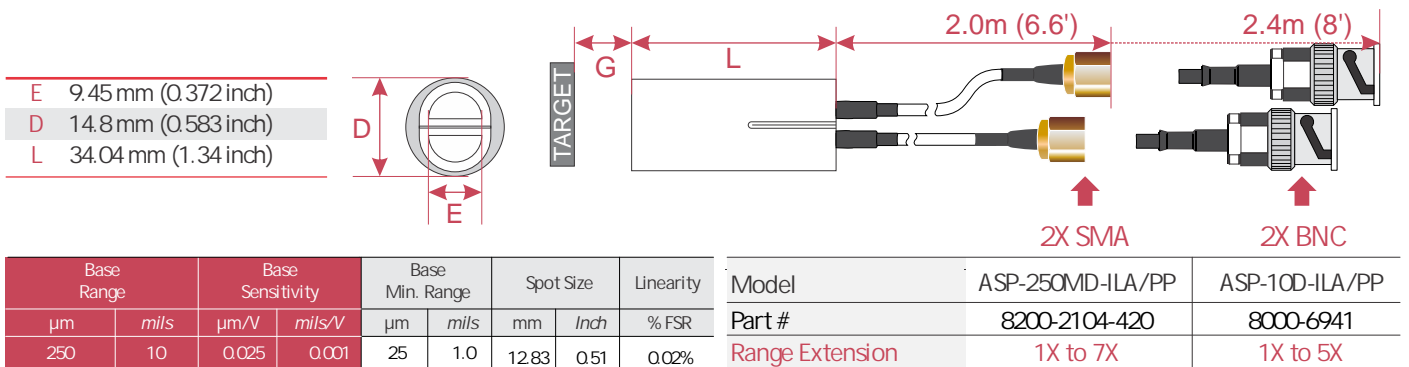
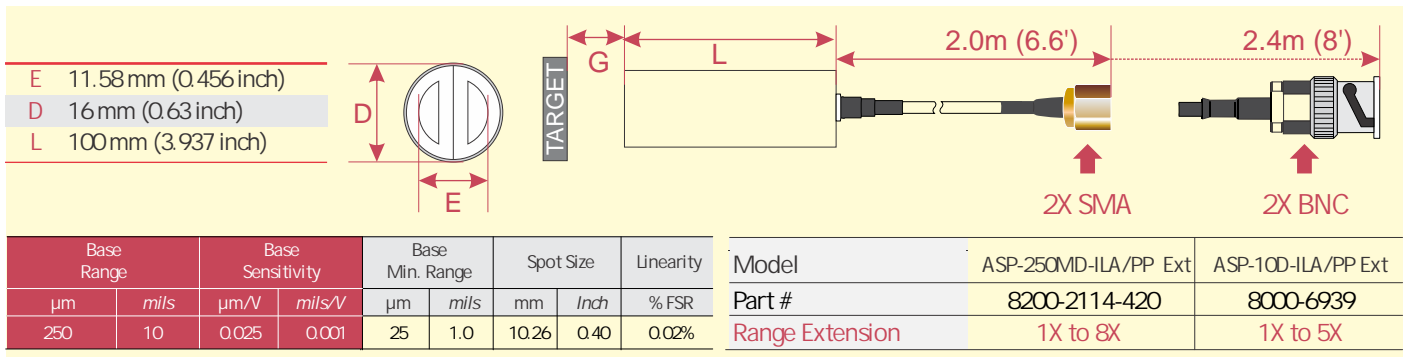
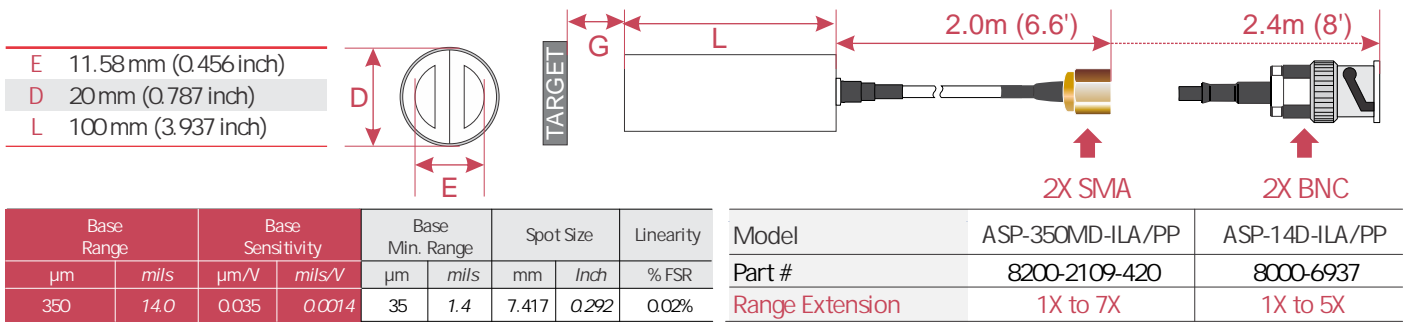
Best for Applications, Such As:

- Semiconductor Thickness
- Sheet Metal Thickness
- Photovoltaic Wafer Thickness
- Automotive Brake Rotor Run-out
- Thickness Variation
- Leveling or Flatness Measurements
- Wafer Mask Alignment

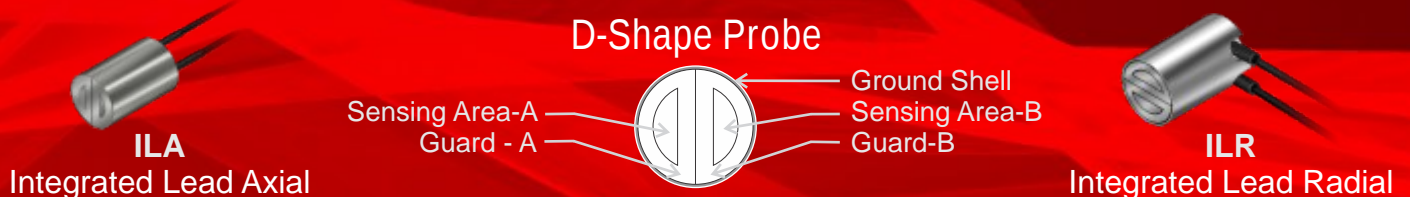


$$\text{Extended Range} = \text{Base Range} \times \text{Range Extension}$$

$$\text{Extended Range Sensitivity} = \text{Base Sensitivity} \times \text{Range Extension}$$

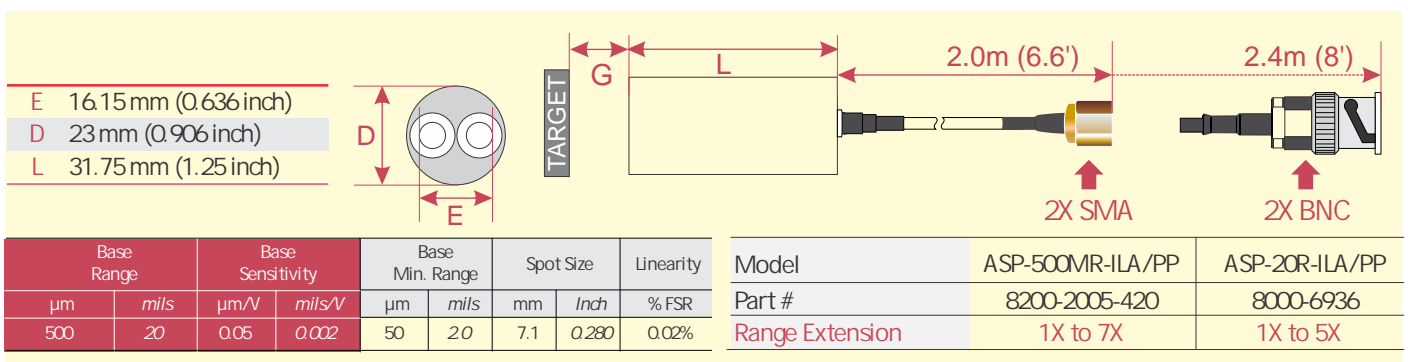
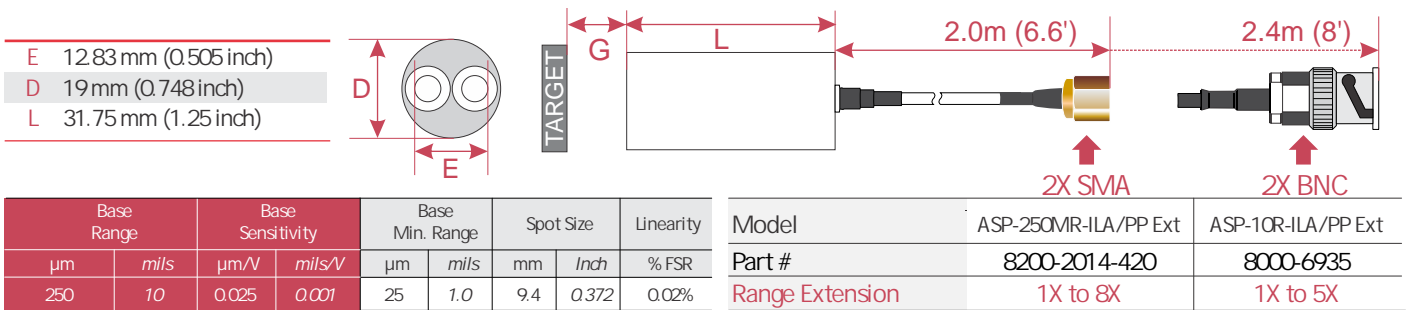
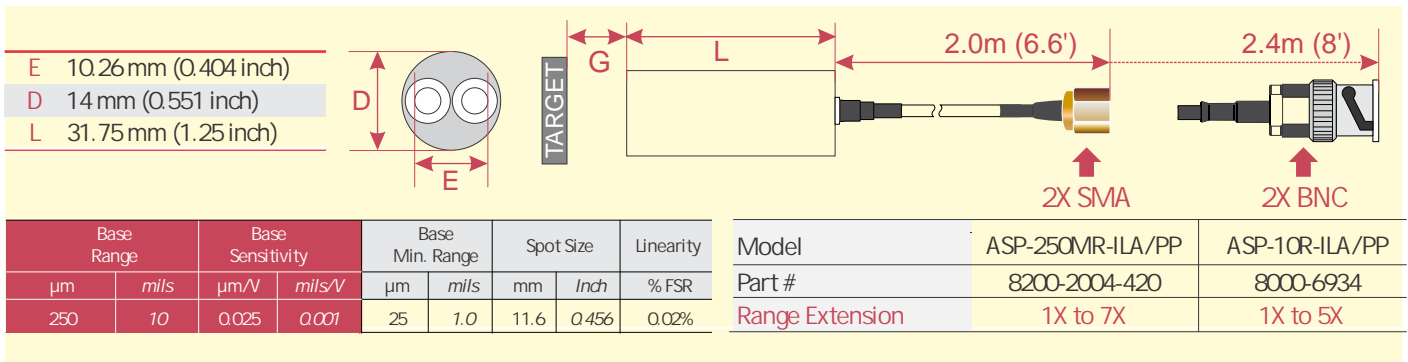
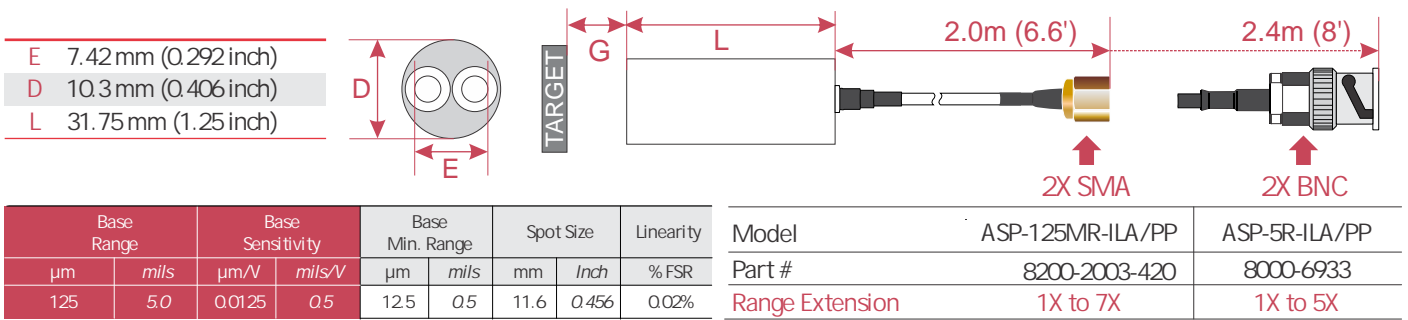


Ground shell must be grounded to amplifier ground for proper performance

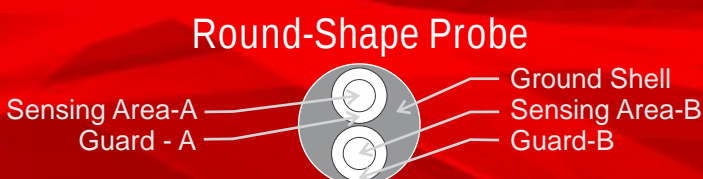


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NOTE:



- Probe resolution is approximately 0.00000085 Hz FSR.
- Noise increases proportionally to range extension selected.
- As range extension increases, linearity decreases. (i.e. X2 range extension will decrease resolution by 2X.
- Increasing the averaging function will decrease noise but also decrease the amplifier's bandwidth (consult users manual) .
- Increasing the probe's cable length will also increase system noise and decrease resolution

Compatible with the following MTI Capacitance Amplifiers

Accumeasure™ 500

Choose Probes with **BNC Connectors**

Analog Output Benchtop Capacitance
Modular System with AS-562 Amplifiers



Accumeasure™ AS-562

Choose Probes with **BNC Connectors**

Analog Output OEM Board



Accumeasure™ D series

Choose Probes with **SMA Connectors**

Digital Output Capacitance Amplifier

Optional Accessories

Product #	Product Description	Model Name
8000-6899-412	90 Ω Low Noise Extension Cable 1.2 meters (4 feet) length	BNC-M to BNC-M Extension Cable
8000-6899-424	2.4meters (8 feet) length	
8000-6899-436	3.6 meters (12 feet) length	
8000-6891-410	Special Low Noise Probe Extension Cables 1 meter (3.3 feet) length	SMA-M to SMA-F Extension Cable
8000-6891-420	2 meters (6.5 feet) length	
8000-6891-440	4 meters (13.1 feet) length	
8000-6952	Probe Calibrator	KD-CH4D
2100-2104	BNC Adapter to join two Extension Cables	BNC-F to BNC-F Adapter
8000-6892-503	Converter cable for BNC Probes to Digital Output Amplifiers	BNC-F to SMA-M Cable
8000-6890	Converter for SMA probes to Analog Output Amplifiers	SMA-F to BNC-M Adapter
2100-1876A	BNC Bulkhead Feedthru	BNC-F to BNC-F Adapter
8000-6257	SMA Bulkhead Feedthru	SMA-M to SMA-F Adapter

xxx-M = Male Type Connector
xxx-F = Female Type Connector

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