

Ideal for difficult sensing applications, this transducer can measure displacement & proximity of a metal target without physical contact. The measurement is unaffected by interposed nonmetallic, non-conductive materials, such as polymers and biomaterials.

The stainless shell of the device houses two coils; one for sensing and the other for temperature compensation. The coils and flex circuit leadouts are mounted on a stable PEEK substrate. This assembly is potted in a stainless housing using high grade, vacuum pumped epoxy.



APPLICATIONS

- ▲ automotive, robotic systems
miniature control elements
- ▲ medical biomaterials
tissue deformation, implant micromotion
- ▲ materials science, civil engineering
structural deflections, strain extensometry
- ▲ optical components
linear/angular positioning
- ▲ miniature sensors
force, torque, acceleration

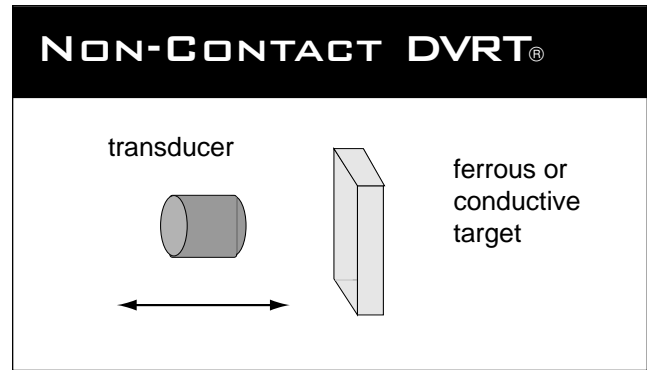
This packaging allows the sensor to be used in application requiring long term immersion in water and saline solutions.

Signal conditioners are provided in multichannel “plug and play” enclosures, including cables and UL approved power supply. Miniature circuit cards are also available for high volume OEM customers. The DVRT comes with an integral strain relieved, flex circuit and connector. As with all MicroStrain products, every device is carefully tested prior to shipment, and calibration data are included with each order.

To place an order, or for more information, call us today at 800-449-DVRT.

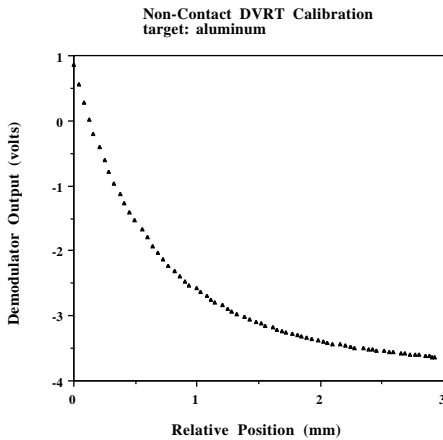
How it works

Two coils within the non-contact DVRT's housing form its sensing and compensation elements. When the face of the transducer is brought in close proximity to a ferrous or highly conductive material, the reluctance of the sense coil is changed, while the compensation coil acts as a reference.



The coils are driven by a high frequency sinewave excitation, and their differential reluctance is measured using a sensitive demodulator. Differencing the two coils outputs provides a sensitive measure of the position signal, while cancelling out variations caused by temperature.

Ferrous targets change the sense coils' reluctance by altering the magnetic circuits permeability; conductive targets (such as aluminum, see graph) operate by the interaction of eddy currents induced in the target's skin with the field around the sense coil.



ELECTRICAL SPECIFICATIONS

(with MicroStrain DVRT Demodulator)

- ▲ Measurement range 25% DVRT body outside diameter
(i.e, 1.6 mm for 1/4-28 UNF-2A)
- ▲ Nonlinearity exponential output
- ▲ Sensitivity 5 volts/mm typical
- ▲ Signal to noise 500 to 1 (w/ filter 3 dB down at 1 KHz, std.)
- ▲ Resolution 2.0 microns (min)
- ▲ Frequency response 7 KHz (unfiltered)
- ▲ Temp. coeff. offset span .0039% / degree C
 .016%/degree C
- ▲ Repeatability +/- 2 microns typical

MECHANICAL SPECIFICATIONS

- ▲ Size Diameter Length
- mm in. mm in.
- 4-40 UNC-2A 2.84 .112 8.4 .33
- 10-32UNF-2A 4.83 .190 19.0 .75
- 1/4-28UNF-2A 6.35 .250 19.0 .75
- 1/2-20UNF-2A 12.70 .500 19.0 .75
- ▲ Housing material 300 series stainless steel
- ▲ Fixturing method threaded stainless nuts
- ▲ Leadouts 20 cm, shielded, teflon insulated
- ▲ Strain Relief Stainless wire reinforced multistrand conductors
- ▲ Connector Lemo 4-pin male w/ shrink polyolefin covering
- ▲ Operating Temperature - 55 to 105 degrees C (std)
 -55 to 200 degrees C (otional)