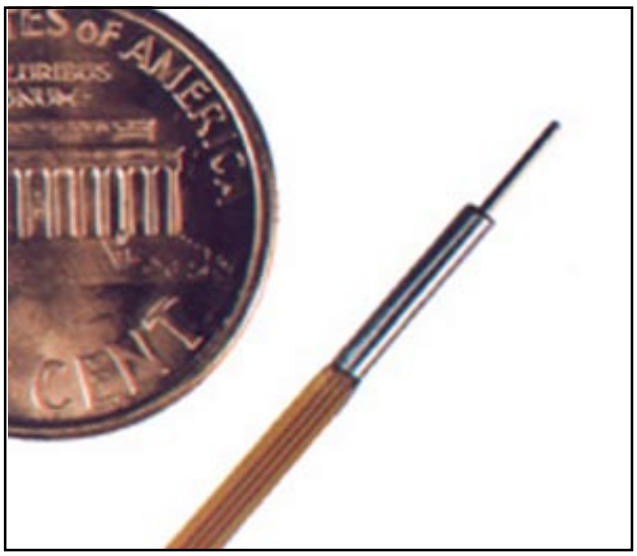
DVRT®

DIFFERENTIAL VARIABLE RELUCTANCE TRANSDUCER

Ideal for critical linear displacement measurements, the DVRT delivers high performance in a tiny package. Advanced materials and electronics have resulted in a rugged, fast, and sensitive instrument, capable of submersion in aqueous environments.



Features of our DVRT's include micron to submicron resolution, linear analog output, flat dynamic response to kHz levels, and very low temperature coefficients. Free-sliding transducer cores are extremely lightweight; and utilize flexible, elastic, biocompatible alloys to provide resistance to kinking and permanent deformation.

A range of stroke lengths and specialized, modular attachments have been developed. Longer stroke lengths provide greater linearity; DVRT's with nonlinearities as low as +/- 0.15% are available. This performance, combined with versatility of design allows the DVRT to meet the needs of a wide variety of applications.

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
- virtual reality sensors
  facial expression, joint movements
- miniature sensors
  force, torque, acceleration

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.

MicroStrain®

How it works

Core position is detected by measuring the coils' differential reluctance, using a sinewave excitation and synchronous demodulator. This differential detection method provides a very sensitive measure of core position, while cancelling out temperature effects.

The transducers' coils and flex circuit leads are sealed in vacuum pumped epoxy, within the stainless steel case. This provides outstanding environmental resistance. The DVRT® has been successfully employed in harsh applications, including immersion in saline and pressurized oil.

Electrical Specifications

(with MicroStrain DVRT Demodulator)

Linear Stroke Lengths	*3 , 6 & 9 mm (std. version)* *1.5 mm (high res. version)*
Nonlinearity	*+/- .75% over 9 mm* *+/- .3% over 5 mm* — Typical for 9 mm stroke
	+/- 1% over 6 mm *+/- .3% over 3 mm* — Typical for 6 mm stroke
	+/- 1.5% over 3 mm *+/- .5% over 1 mm* — Typical for 3 mm stroke
Sensitivity	*2 volts/mm typical*
Signal to noise	*2000 to 1 (with filter 3 dB down at 1 Khz, std.); 600 to 1 (unfiltered)*
Resolution	*1.5 microns (std.)* *.060 microns (high res.)*
Frequency response	*7 Khz (unfiltered)*
Temp. coeff. offset span	*.0029% / degree C* *.030%/ degree C*
Hysteresis	*+/- 1 micron*
Repeatability	*+/- 1 micron*

Mechanical Specifications

Overall length	*2.7 times linear stroke*
Gauge length	*adjustable, 1.5 mm min.*
Outside diameter	*1.5 mm (std. version)* *1.8 mm (high res)*
Housing material	*stainless steel (SS), smooth* *4-40 & 10-32 threaded options*
Attachment method	*SS screws, barbs*
Leadouts	*20 cm, Polyimide Flex*
Strain Relief	*polyimide & urethane*
Connector	*keyed Lemo 4-pin w/ shrink polyolefin covering*
Operating Temperature	*- 55 to 105 C (standard)* -55 to 175 C (optional)
Core weight	*25 milligrams*
Core material	*superelastic NiTi alloy* *00-90 threaded optional*

U.S. Patent No. 4,813,435 and Patents Pending

MicroStrain®

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