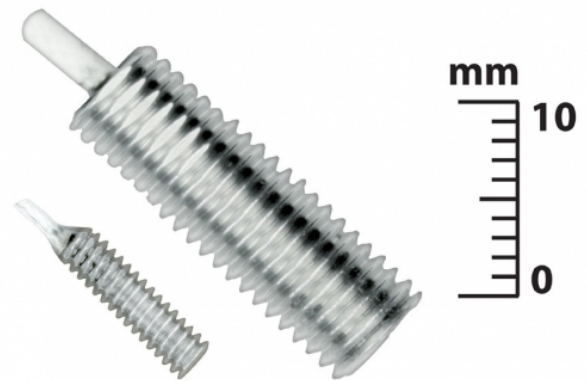


NC- DVRT®

Non-Contact Displacement Sensor

Ideal for difficult sensing applications, the Non-Contact DVRT® is designed to measure the displacement and 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 Teflon® cable are mounted on a stable PEEK substrate. This assembly is potted into the stainless housing using high-grade, vacuum-pumped epoxy and includes integral strain relief. This packaging allows the sensor to be used in applications requiring long-term immersion in water and saline solutions.



Features & Benefits

High Performance

- sub-micron resolution with large stroke/size ratio
- high dynamic range for difficult measurements

Ease of Use

- non-contact position measurement
- plug and play usability
- easily customized to suit specific requirements
- signal conditioning options for any application

Applications

- Process Control for Production-Line Monitoring
- Miniature Position Control Elements
- Linear & Angular Motion Control
- Measuring Strain and Deflection in Materials and Structures
- Dimensional Gauging for Quality Control

System Overview

Sensor Design

Two coils within the Non-Contact DVRT® housing form its sensing and compensation elements. When the face of the transducer is brought into close proximity to a ferrous or highly conductive 'target' 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 sine wave excitation and their differential reluctance is measured using a synchronous 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 circuit's permeability; conductive targets (such as aluminum) operate by the interaction of eddy currents induced in the target's skin with the field around the sense coil.

LORD MicroStrain®'s desktop consoles and in-line signal conditioners provide the Non-Contact DVRT® with plug and play housing, power, analog output, LCD display, RS-232 output and software. Custom ranges are available on request.

Specifications

Electrical Specifications (Obtained using DEMOD-DVRT® and DVRT® with 800 Hz lowpass filter at constant temperature)

Product NC-DVRT-1.0 NC-DVRT-2.5	Stroke length 1.0 mm 2.5 mm
Accuracy	±0.2 to ±1% with polynomial calibration
Sensitivity	DEMOD output/sensor range
Signal to noise	standard - 1000 to 1with filter 3dB down at 800 Hz
Resolution	dependent upon displacement area
Frequency response	800 Hz standard, 20 KHz optional
Temperature coefficient	offset 0.0039%/°C (typical) span 0.016%/°C (typical) dependent on target material
Hysteresis	±2 microns (typical)
Repeatability	±2 µm (typical) at constant temperature

Mechanical Specifications

Size NC-DVRT®-1.0 NC-DVRT®-2.5	diameter x length (thread) 4.83 mm x 19.0 mm (10-32 UNF-2A) 12.70 mm x 19.0 mm (½-20 UNF 2A)
Housing material	300 series stainless steel
Attachment method	threaded stainless nuts (excluding NC-DVRT-5.0)
Leadouts	45 cm, shielded, teflon insulated, stainless wire reinforced, multistrand conductors
Connector	keyed 4-pin Lemo, polyolefin relief
Operating temperature	-55 to 175 °C
Cable diameter	0.036 " to 0.070 "

Contact us for information on custom designs suitable for immersion, corrosive and high pressure environments.

