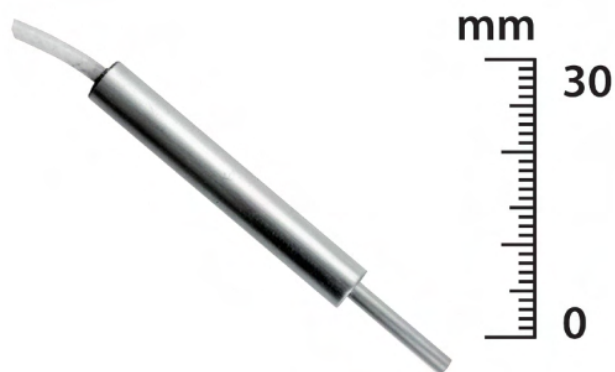


S- DVRT®

Subminiature Displacement Sensor

Ideal for linear control and precision measurement applications, the Subminiature DVRT® provides fast response and rugged packaging. The Subminiature DVRT® features micron resolution, linear analog output, flat dynamic response to kHz levels, and very low temperature coefficients. Its free sliding transducer core is lightweight, strong, and corrosion resistant. Cores are precision ground to insure a close sliding fit within the open bore of the stainless-steel lined DVRT® body. This precision allows the DVRT® to achieve extremely high repeatability. The sensing head is capable of total submersion in aqueous environments.



Features & Benefits

High Performance

- sub-micron resolution with large stroke/size ratio
- frictionless design for robust use over millions of cycles
- suitable for use in harsh fluids and environments
- high dynamic range for difficult measurements

Ease of Use

- 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

Core position is detected by measuring the coils' differential reluctance using a sine wave 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 Teflon® cables 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 short term immersion in saline and pressurized oil.

Units available for long term immersion, corrosive and high pressure environments can be custom built to meet such requirements. LORD MicroStrain®'s desktop consoles and in-line signal conditioners provide the Subminiature DVRT® with plug and play housing, power, analog output, LCD display, RS-232 output and software. A range of modular positioning attachments and custom strokes are also available.

Specifications

Electrical Specifications

Obtained using DEMOD-DVRT® and DVRT® with 800 Hz lowpass filter at constant temperature

Linear Stroke Lengths	4, 8, 24, 38 mm (standard resolution) 6 mm (high resolution) 500 µm or less (nano resolution)
Accuracy	± 1.0 % using straight line ± 0.1 % using polynomial
Sensitivity	DEMOD® output / sensor range
Signal to noise	4200 to 1 (with filter 3 dB down at 800 Hz, standard resolution), 466 to 1 (unfiltered)
Resolution	1.0 µm for 4 mm stroke 2.0 µm for 8 mm stroke 6.0 µm for 24 mm stroke 9.5 µm for 38 mm stroke 0.6 µm for high resolution version 125 nm for nano resolution version (up to 10 nm resolution is possible with customized sensor range and electronics)
Frequency response	800 Hz standard, 20 KHz optional
Temperature coefficient	offset 0.002% / °C (typical) span 0.030% / °C (typical)
Hysteresis	± 1 micron
Repeatability	± 1 micron

Mechanical Specifications

Overall body length	18.5 mm for 4 mm stroke 34.5 mm for 8 mm stroke 81 mm for 24 mm stroke 110 mm for 38 mm stroke 34.5 mm for high res version 34.5 mm for nano version
Outside diameter	4.76 mm (3/16 inch)
Housing material	300 stainless steel, smooth; 5/16 - 24 UNF threaded 400 stainless steel (optional); M8x1.25-6g threaded 400 stainless steel (optional)
Attachment method	optional: magnetic mounting block, threaded body, clamping collar
Leadouts	45 cm multistrand, shielded, stainless steel reinforced teflon insulated cable
Connector	keyed 4 pin Lemo, polyolefin relief
Operating temperature	-55 to 175 °C
Core weight	500 µm: 0.04 g, 4 mm: 0.04 g, 6 mm: 0.04 g, 24 mm: 1.62 g, 38 mm: 1.67 g
Core material	stainless steel
Cable diameter	0.070 "

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

