

## Linear Position Sensors Offer Shortened Body Length, Environmental Resistance Ideal for Hydraulic Applications

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... Position feedback devices are commonly implemented in hydraulic applications for monitoring the performance accuracy of actuators and cylinders to improve operational efficiencies. The environment in which the embedded sensor must survive can be problematic. The hydraulic fluid is under high pressures and temperatures and the actuators and cylinders typically live in environments where heavy shock and or vibration are present.

Macro Sensors offers the HSTA and HSTAR Series of LVDT-based linear position sensors that offer both the environmental resistance and short stroke sensor body length ideal to perform in cylinder applications where sensor length and survival in harsh environments are critical.

While linear position sensors were once considered too long for hydraulic applications, the development of new winding techniques, such as computerized layer winding and improved microprocessing, has considerably reduced the length of the linear position sensor body compared to its measurable stroke length. In fact, for short stroke actuators and cylinders (less than 6"), Macro Sensors linear position sensors can be much shorter than a magnetostrictive sensor.

Hermetically sealed, these 3/4 inch (19 mm) diameter, AC-operated linear position sensors can survive and thrive in high temperatures of 200 degrees C and withstand high shocks and vibration. Coil windings are sealed against hostile environments to IEC standard IP-68. Other significant features:

- Offered with either an axial (HSTA) or radial (HSTAR) connector, units can have a through bore for the fluid to pass or can seal the fluid in the RAM. The radial connector makes the installed length of the HSTAR LVDTs at least 2" shorter than comparable units with an axially mounted connector for easier installation in tight spaces.
- Accessible from both ends, the linear position sensors can be easily cleaned of grit, dirt, dust or other contaminants for greater reliability and longer life.
- Available in ranges of  $\pm 0.050$  inch ( $\pm 1.25$  mm) to  $\pm 10.0$  inches ( $\pm 250$  mm), the HSTA and HSTAR Series sensors feature the high resolution, excellent repeatability, and low hysteresis associated with LVDT (Linear Variable Differential Transformer) technology, as well as the highest sensitivity consistent with good linearity. The maximum linearity error for any of these sensors is  $\pm 0.25\%$  of full range output using a statistically best-fit straight line derived by the least squares method.

Macro Sensors offers custom designs for higher temperatures and pressure resistance, smaller diameters and connector options.

HSTA and HSTAR Series LVDTs operate properly with any conventional differential input LVDT signal conditioner. Ranges of 1.00 inches or greater will also work with ratiometric LVDT signal conditioning. Macro Sensors offers a full line of LVDT signal conditioners that will deliver optimum performance from any HSTA and HSTAR Series linear position sensor.

Macro Sensors' extensive line of LVDT-based linear and rotary sensors are used for linear position measurement and feedback in a variety of industrial applications including factory automation, motion control systems, metal fabricating, automotive assembly as well as power plants, gas/steam turbines. Incorporated in 1994, the Company offers more than 200 years of cumulative design and manufacturing experience by its key staff in serving its OEM and end-user international customer base. On June 1, 2005, Macro Sensors was acquired by AST, manufacturer of state-of-the-art (Micro Electro Mechanical Structures) MEMS-based pressure sensors, transducers, and transmitters. Common applications of AST sensor products are in industrial OEM, hydraulic systems, fuel cells, medical gases, HVAC/R, refrigeration, oil & gas exploration/production, and off-road vehicles. For more information on AST products and technology, visit the AST website

at [www.astensors.com](http://www.astensors.com).

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