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**Special Use Sensors – Linear Displacement Sensors**

**FEATURES**

- Infinite resolution
- True output linearity over the entire measurement range
- Low operating forces
- Excellent stability and temperature compensation

**DESCRIPTION**

Micro-Measurements Linear Displacement Sensors use a fully active 350-ohm strain-gage bridge to sense spindle displacement, giving infinite resolution and excellent linearity. They are compatible with all standard strain-gage instrumentation with bridge excitation from 2 to 10 volts. With a selection of models having full-scale ranges from 1/4 in (5 mm) to 4 in (100 mm), Linear Displacement Sensors feature a unique design that produces maximum operating forces of less than 1 lb (4.4 N). Available with specially designed mounting fixtures, these versatile sensors are ideally suited for use in research, manufacturing and process control applications.

**ACCURACY**

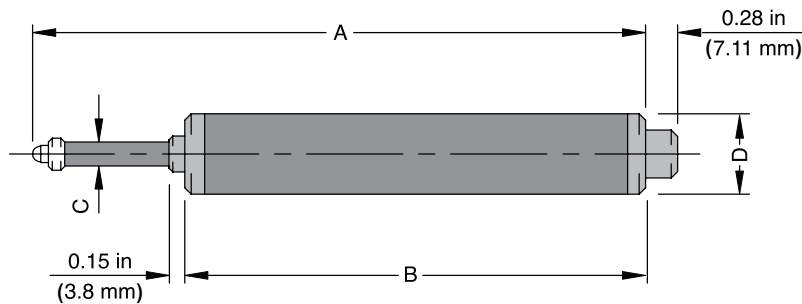
Micro-Measurements Linear Displacement Sensors produce an output voltage proportional to a captive, guided spindle displacement by means of a 350-ohm strain gage bridge with four active arms. This arrangement provides excellent temperature compensation and linearity.



**COMPATIBILITY**

Micro-Measurements Linear Displacement Sensors exhibit the same inherent advantages for linearity, versatility and precision as many other strain-gage-based sensors. As such, they are systems-compatible with a wide range of commonly used sensors for pressure, load, acceleration, vibration, etc. and normally utilize the same instrumentation.

**OUTLINE DIMENSIONS** in inches (millimeters)



| DIMENSION             | MODEL              |                    |                    |                    |                     |
|-----------------------|--------------------|--------------------|--------------------|--------------------|---------------------|
|                       | HS5                | HS10               | HS25               | HS50               | HS100               |
| <b>A</b>              | 4.10 in (104.2 mm) | 4.30 in (109.2 mm) | 5.44 in (138.2 mm) | 8.48 in (215.4 mm) | 14.97 in (380.2 mm) |
| <b>B</b>              | 3.49 in (88.6 mm)  | 3.49 in (88.6 mm)  | 4.08 in (103.6 mm) | 6.11 in (155.2 mm) | 10.47 in (266.0 mm) |
| <b>C</b> <sub>∅</sub> | 0.19 in (4.8 mm)   | 0.19 in (4.8 mm)   | 0.19 in (4.8 mm)   | 0.19 in (4.8 mm)   | 0.24 in (6.0 mm)    |
| <b>D</b> <sub>∅</sub> | 0.69 in (17.4 mm)  | 0.69 in (17.4 mm)  | 0.69 in (17.4 mm)  | 0.69 in (17.4 mm)  | 1.0 in (25.4 mm)    |

## Special Use Sensors—Linear Displacement Sensors

| <b>SPECIFICATIONS</b>                  |                                                                              |                  |                             |                 |                 |
|----------------------------------------|------------------------------------------------------------------------------|------------------|-----------------------------|-----------------|-----------------|
| <b>PARAMETERS</b>                      | <b>MODEL</b>                                                                 |                  |                             |                 |                 |
|                                        | <b>HS5</b>                                                                   | <b>HS10</b>      | <b>HS25</b>                 | <b>HS50</b>     | <b>HS100</b>    |
| <b>Displacement Range*</b>             | 0.25 in (6.5 mm)                                                             | 0.5 in (11.2 mm) | 1 in (26 mm)                | 2 in (51.5 mm)  | 4 in (102 mm)   |
| <b>Weight</b>                          | 0.31 lb (140 g)                                                              | 0.31 lb (140 g)  | 0.33 lb (150 g)             | 0.44 lb (200 g) | 1.10 lb (500 g) |
| <b>Spring Force*</b>                   | 0.44 lb (200 g)                                                              | 0.55 lb (250 g)  | 0.55 lb (250 g)             | 0.66 lb (300 g) | 0.77 lb (350 g) |
| <b>Excitation</b>                      | 2 to 10 V, AC or DC                                                          |                  |                             |                 |                 |
| <b>Frequency Response*</b>             | 5-mm displacement: 100 Hz; 100-mm displacement: 10 Hz                        |                  |                             |                 |                 |
| <b>Rated (F.S.) Output*</b>            | 4.5 mV/V                                                                     | 5.3 mV/V         | 7.0 mV/V                    | 3.6 mV/V        | 5.2 mV/V        |
| <b>Nonlinearity (Best-Fit Method)*</b> | 0.35% FS                                                                     | 0.35% FS         | 0.35% FS                    | 0.35% FS        | 0.35% FS        |
| <b>Resolution</b>                      | Infinite                                                                     |                  |                             |                 |                 |
| <b>Bridge Resistance (Nominal)</b>     | 350 ohms bridge, 100k ohms zero balance                                      |                  |                             |                 |                 |
| <b>Temperature Range</b>               | +15 to +140°F (-10 to +60°C)                                                 |                  |                             |                 |                 |
| <b>Temperature Coefficient (%FS)*</b>  | Zero <0.006%/°F (<0.01%/°C)                                                  |                  | Span <0.006%/°F (<0.01%/°C) |                 |                 |
| <b>Termination</b>                     | 0.18 in PVC 7/0.008 (4.5 mm PVC 7/0.2), 4-core shielded, 6.6 ft (2.2 m) long |                  |                             |                 |                 |
| <b>Electrical Connections</b>          | Input: Red+ Black- ; Output: Green+ White-                                   |                  |                             |                 |                 |

\* Typical figures: actual values subject to calibration

| <b>FATIGUE LIFE</b>                |                             |             |             |             |             |
|------------------------------------|-----------------------------|-------------|-------------|-------------|-------------|
| <b>MODEL</b>                       | <b>DISPLACEMENT (NCHES)</b> |             |             |             |             |
|                                    | <b>0.25</b>                 | <b>0.50</b> | <b>1.00</b> | <b>2.00</b> | <b>4.00</b> |
| <b>Cycles to Failure (Nominal)</b> |                             |             |             |             |             |
| <b>HS5</b>                         | 5.00E+04                    |             |             |             |             |
| <b>HS10</b>                        | 5.00E+05                    | 5.00E+04    |             |             |             |
| <b>HS25</b>                        | 5.00E+06                    | 5.00E+05    | 5.00E+04    |             |             |
| <b>HS50</b>                        | 5.00E+06                    | 5.00E+06    | 5.00E+06    | 5.00E+05    |             |
| <b>HS100</b>                       | 5.00E+06                    | 5.00E+06    | 5.00E+06    | 5.00E+05    | 5.00E+04    |
| <b>Signal (mV/V)</b>               |                             |             |             |             |             |
| <b>HS5</b>                         | 4.50                        |             |             |             |             |
| <b>HS10</b>                        | 2.65                        | 5.30        |             |             |             |
| <b>HS25</b>                        | 1.75                        | 3.50        | 7.00        |             |             |
| <b>HS50</b>                        | 0.45                        | 0.90        | 1.80        | 3.60        |             |
| <b>HS100</b>                       | 0.32                        | 0.65        | 1.30        | 2.60        | 5.20        |

\* Please note that recommended displacements are indicated by shading



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