

## XS-D Series – High stroke-to-length ratio LVDT



- Excellent stroke-to-length ratio
- Lower weights than standard LVDTs with comparable displacement ranges
- Stroke ranges from  $\pm 1$  to  $\pm 10$  inches
- Shock and vibration tolerant
- Stainless steel housing
- Magnetically shielded
- Imperial or metric threaded core

### DESCRIPTION

The **XS-D Series** LVDTs are specifically designed for measuring relatively large displacements where installation space is limited. The XS-D Series have a substantially greater displacement range than standard LVDTs but without the accompanying increase in body length and weight. Using special coil winding techniques, the XS-D permits linear range measurements of up to 80% of the housing length.

Compact, shock and vibration tolerant, and featuring infinite resolution and repeatability, the XS-D Series are the perfect choice for servo mechanisms, linear potentiometer replacement, or wherever precise displacement measurements are required in space restrictive applications. All models are supplied with a calibration certificate, and are available with either an imperial or metric threaded core. The XS-D Series are compatible with all Measurement Specialties LVDT signal conditioners, controllers and readouts.

Like in most of our LVDTs, the XS-D windings are vacuum impregnated with a specially formulated, high temperature, flexible resin, and the coil assembly is potted inside its housing with a two-component epoxy. This provides excellent protection against hostile environments such as high humidity, vibration and shock.

Measurement Specialties, Inc. (NASDAQ MEAS) offers many other types of sensors and signal conditioners. Data sheets can be downloaded from our web site at: <http://www.meas-spec.com/datasheets.aspx>

MEAS acquired Schaevitz Sensors and the **Schaevitz™** trademark in 2000.

### FEATURES

- Superior stroke-to-length ratio
- Stroke ranges from  $\pm 1$  to  $\pm 10$  inches
- Smooth transfer function
- AISI 400 Series stainless steel housing
- Calibration certificate supplied with all units

### APPLICATIONS

- Servo mechanisms
- Hydraulic actuators
- Linear potentiometer replacement
- Space restrictive installations
- Weight sensitive applications

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## PERFORMANCE SPECIFICATIONS

| ELECTRICAL SPECIFICATIONS            |                      |               |               |               |               |
|--------------------------------------|----------------------|---------------|---------------|---------------|---------------|
| Parameter                            | XS-D 1002            | XS-D 2002     | XS-D 3002     | XS-D 5002     | XS-D 10002    |
| Stroke range                         | ±1 [±25.4]           | ±2 [±50.8]    | ±3 [±76.2]    | ±5 [±127]     | ±10 [±254]    |
| Sensitivity<br>V/V/inch<br>[mV/V/mm] | 0.28<br>[11.0]       | 0.16<br>[6.3] | 0.12<br>[4.7] | 0.13<br>[5.1] | 0.05<br>[2.0] |
| Output at stroke ends (*)            | 0.28mV/V             | 0.32mV/V      | 0.36mV/V      | 0.65mV/V      | 0.50mV/V      |
| Phase shift                          | +30°                 | +25°          | +7°           | +0.5°         | -4°           |
| Input impedance (PRIMARY)            | 175Ω                 | 243Ω          | 266Ω          | 968Ω          | 628Ω          |
| Output impedance (SECONDARY)         | 230Ω                 | 103Ω          | 220Ω          | 532Ω          | 416Ω          |
| Non-linearity                        | ±2.0% of FR, maximum |               |               |               |               |
| Input voltage                        | 3 VRMS sine wave     |               |               |               |               |
| Test input frequency                 | 2.5kHz               |               |               |               |               |
| Input frequency range                | 400Hz to 3kHz        |               |               |               |               |
| Null voltage                         | 0.5% of FRO, maximum |               |               |               |               |

| ENVIRONMENTAL SPECIFICATIONS & MATERIALS |   |
|--|---|
| Operating temperature                    | -65°F to +300°F [-55°C to 150°C]                                    |
| Shock survival                           | 1,000 g (11ms half-sine)  |
| Vibration tolerance                      | 20 g up to 2KHz   |
| Housing material                         | AISI 410 Series stainless steel                                     |
| Electrical connection                    | Six lead-wires, stranded 28 AWG, PTFE insulated, 1 foot [0.3m] long |

**Notes:**

*Dimensions are in inch [mm]*

*All values are nominal unless otherwise noted*

*Electrical specifications are for the test frequency indicated in the table*

*(\*): Unit for output at stroke ends is millivolt per volt of excitation (input voltage)*

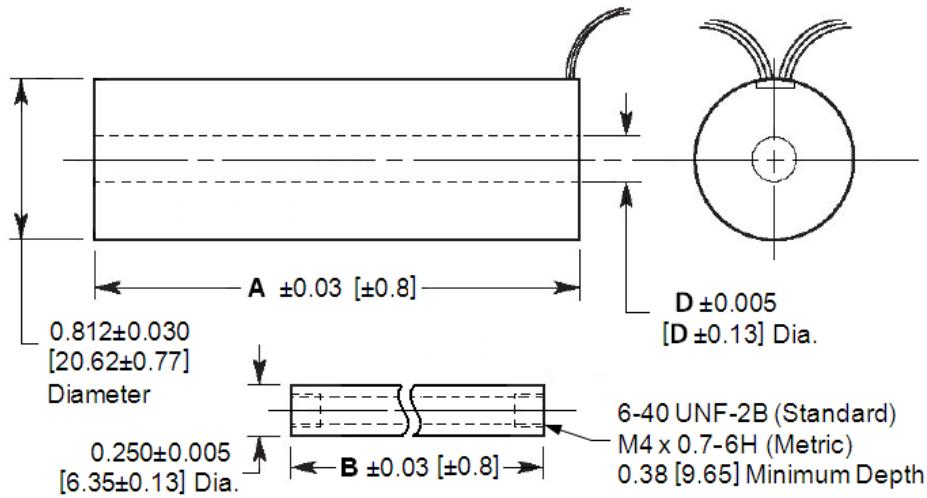
*FR: Full Range is the stroke range, end to end; FR=2xS for ±S stroke range*

*FRO (Full Range Output): Algebraic difference in outputs measured at the ends of the range*

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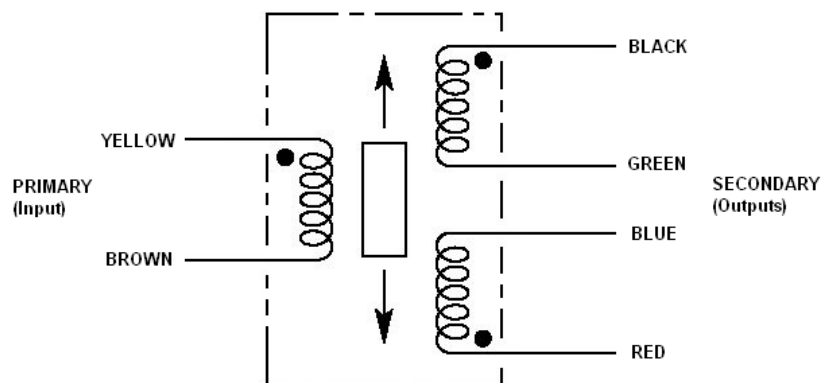
## MECHANICAL SPECIFICATIONS

| Parameter            | XS-D 1002    | XS-D 2002    | XS-D 3002    | XS-D 5002     | XS-D 10002    |
|----------------------|--------------|--------------|--------------|---------------|---------------|
| Main body length "A" | 2.57 [65.2]  | 5.76 [146.3] | 7.50 [190.5] | 12.52 [318.0] | 25.06 [636.5] |
| Core length "B"      | 0.45 [11.4]  | 1.50 [38.1]  | 1.25 [31.8]  | 2.40 [61.0]   | 4.00 [101.6]  |
| Bore diameter "D"    | 0.265 [6.73] | 0.265 [6.73] | 0.300 [7.62] | 0.300 [7.62]  | 0.350 [8.89]  |
| Body weight, oz [g]  | 2.3 [65]     | 4.1 [115]    | 4.9 [140]    | 7.6 [215]     | 16.6 [470]    |
| Core weight, oz [g]  | 0.09 [2.5]   | 0.28 [8.0]   | 0.24 [6.8]   | 0.44 [12.5]   | 0.88 [25.0]   |



Dimensions are in inches [mm]

## WIRING INFORMATION



Connect Green to Blue for differential output

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## ORDERING INFORMATION

| Description   | Model     | Part Number  |
|---------------|-----------|--------------|
| ±1 inch LVDT  | XS-D1002  | 02560567-000 |
| ±2 inch LVDT  | XS-D2002  | 02560568-000 |
| ±3 inch LVDT  | XS-D3002  | 02560569-000 |
| ±5 inch LVDT  | XS-D5002  | 02560571-000 |
| ±10 inch LVDT | XS-D10002 | 02560572-000 |

| OPTIONS   |       |              |
|---|-------|--------------|
| Description                                     | Model | Part Number  |
| Metric threaded core option (M4x0.7-6H threads) | All   | XXXXXXXX-006 |

| ACCESSORIES  |              |
|--|--------------|
| Description  | Part Number  |
| Core connecting rod, 6 inches long, 6-40 threads           | 05282947-006 |
| Core connecting rod, 12 inches long, 6-40 threads          | 05282947-012 |
| Core connecting rod, 24 inches long, 6-40 threads          | 05282947-024 |
| Core connecting rod, 36 inches long, 6-40 threads          | 05282947-036 |
| Core connecting rod, 6 inches long, M4x0.7 metric threads  | 05282978-006 |
| Core connecting rod, 12 inches long, M4x0.7 metric threads | 05282978-012 |
| Mounting block   | 04560952-000 |

Refer to our "[Accessories for LVDTs](#)" data sheet for our LVDT signal conditioning instrumentation and other accessories.

## TECHNICAL CONTACT INFORMATION

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|---|--|---|
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