



## XS-D SERIES

High stroke-to-length ratio LVDT

### SPECIFICATIONS

- ◆ Excellent stroke-to-length ratio
- ◆ Lower weights than other 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

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 other 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.

### 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

**PERFORMANCE SPECIFICATIONS**

| <b>ELECTRICAL SPECIFICATIONS</b>     |                      |                  |                  |                  |                   |
|--------------------------------------|----------------------|------------------|------------------|------------------|-------------------|
| <b>Parameter</b>                     | <b>XS-D 1002</b>     | <b>XS-D 2002</b> | <b>XS-D 3002</b> | <b>XS-D 5002</b> | <b>XS-D 10002</b> |
| 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 (*)            | 280mV/V              | 320mV/V          | 360mV/V          | 650mV/V          | 500mV/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 |                  |                  |                  |                   |

| <b>ENVIRONMENTAL SPECIFICATIONS &amp; MATERIALS</b> |   |
|---|---|
| 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 |
| IEC 60529 rating                                    | IP61  |

**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

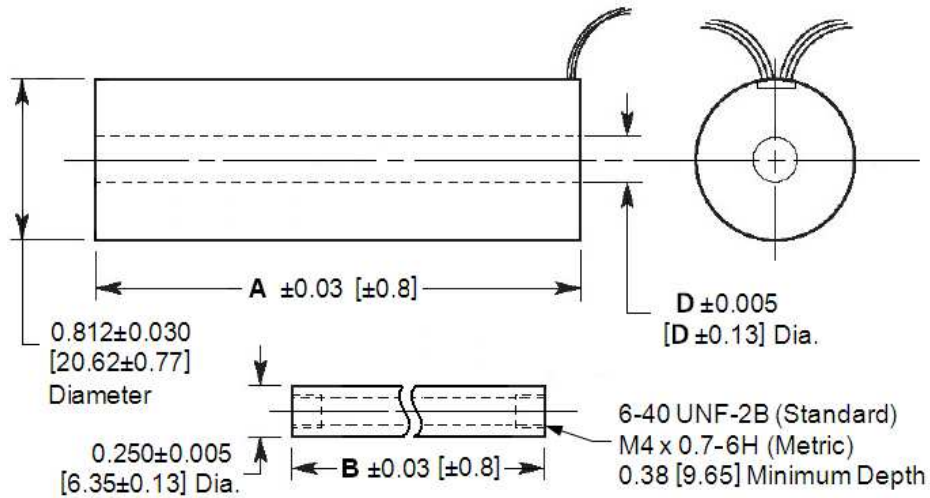
FRO (Full Range Output): Algebraic difference in outputs measured at the ends of the range

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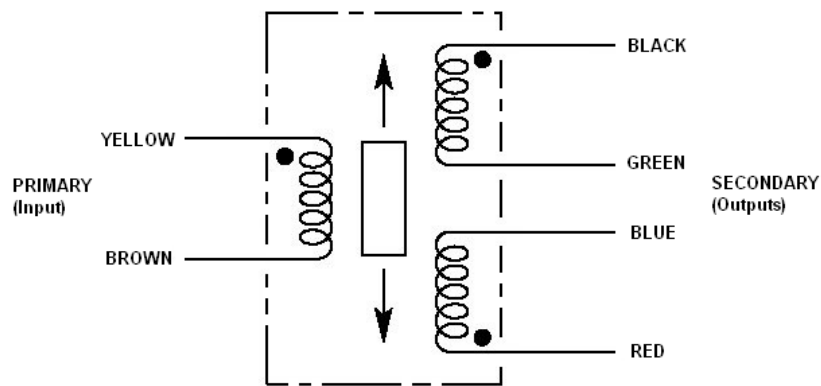
### MECHANICAL SPECIFICATIONS

| 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] | 0.30 [7.62]  | 0.30 [7.62]   | 0.35 [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 |

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