

HR Series – General Purpose LVDT



- High Reliability
- Large core-to-bore clearance
- Stroke ranges from ± 0.05 to ± 10 inches
- AC operation from 400Hz to 5kHz
- Stainless steel housing
- Imperial or metric threaded core
- Many options and accessories

DESCRIPTION

The **HR Series** general purpose LVDTs provide the optimum performance required for a majority of applications. The large 1/16 inch [1.6mm] bore-to-core radial clearance provides for ample installation misalignments and therefore reduces the application costs. Featuring a high output voltage and a broad operating frequency range, these versatile and highly reliable LVDTs deliver worry-free and precise position measurements.

Available in a variety of stroke ranges from ± 0.05 to ± 10 inches, the HR Series can be configured with a number of standard options including guided core, small diameter/low mass core. High temperature (200°C) operation and Mild Radiation Resistance versions are also available (*consult factory*). The HR Series is compatible with the full line of Measurement Specialties LVDT signal conditioners.

Like in most of our LVDTs, the HR 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

- 0.25% linearity (100% stroke)
- Large 1/16" core-to-bore clearance
- Shock and vibration tolerant
- Electromagnetic/electrostatic shielding
- High temperature (220°C) version available
- Calibration certificate supplied with each unit

APPLICATIONS

- Process control
- Factory automation
- Materials testing
- Metrology
- Applications with large misalignments
- General industrial

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PERFORMANCE SPECIFICATIONS

| ELECTRICAL SPECIFICATIONS | | | | | | | | | | | | |
|--------------------------------------|----------------------|-----------------|-----------------|-----------------|-----------------|----------------|---------------|---------------|----------------|---------------|------------------|---------------|
| Parameter | HR 050 | HR 100 | HR 200 | HR 300 | HR 500 | HR 1000 | HR 2000 | HR 3000 | HR 4000 | HR 5000 | HR 7500 | HR 10000 |
| Stroke range | ±0.05 [±1.27] | ±0.1 [±2.54] | ±0.2 [±5.08] | ±0.3 [±7.62] | ±0.5 [±12.7] | ±1 [±25.4] | ±2 [±50.8] | ±3 [±76.2] | ±4 [±101.6] | ±5 [±127] | ±7.5 [±190.5] | ±10 [±254] |
| Sensitivity V/V/inch [mV/V/mm] | 5.8 [228] | 4.2 [165] | 2.5 [98.4] | 1.3 [51.2] | 0.7 [27.6] | 0.39 [15.4] | 0.23 [9.1] | 0.25 [9.8] | 0.20 [7.9] | 0.14 [5.5] | 0.13 [5.1] | 0.07 [2.8] |
| Output at stroke ends, mV/V (*) | 290 | 420 | 500 | 390 | 350 | 390 | 460 | 750 | 800 | 700 | 975 | 700 |
| Phase shift | -1° | -5° | -4° | -11° | -1° | -3° | +5° | +11° | +1° | +3° | +1° | -5° |
| Input impedance (PRIMARY) | 430Ω | 1070Ω | 1150Ω | 1100Ω | 460Ω | 460Ω | 330Ω | 315Ω | 275Ω | 310Ω | 260Ω | 550Ω |
| Output impedance (SECONDARY) | 4000Ω | 5000Ω | 4000Ω | 2700Ω | 375Ω | 320Ω | 300Ω | 830Ω | 400Ω | 400Ω | 905Ω | 750Ω |
| Non-linearity | ±% of FR | | | | | | | | | | | |
| @ 50% stroke | 0.10 | 0.10 | 0.10 | 0.10 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | / | 0.15 |
| @100% stroke (maximum) | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| @125% stroke | 0.25 | 0.25 | 0.25 | 0.35 | 0.35 | 1.00 | 0.50 (**) | 0.50 (**) | 0.50 (**) | 1.00 (**) | / | 1.00 (**) |
| @150% stroke | 0.50 | 0.50 | 0.50 | 0.50 | 0.75 | 1.30 (**) | 1.00 (**) | 1.00 (**) | 1.00 (**) | / | / | / |
| Input voltage | 3 VRMS sine wave | | | | | | | | | | | |
| Input frequency | 400Hz to 5kHz | | | | | | | | | | | |
| Test frequency | 2.5kHz | | | | | | | | | | | |
| 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 400 Series stainless steel |
| Electrical connection | Six lead-wires, 28 AWG stranded Copper, PTFE insulated, 1 foot [30cm] long (<i>longer wires optional</i>) |
| 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

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

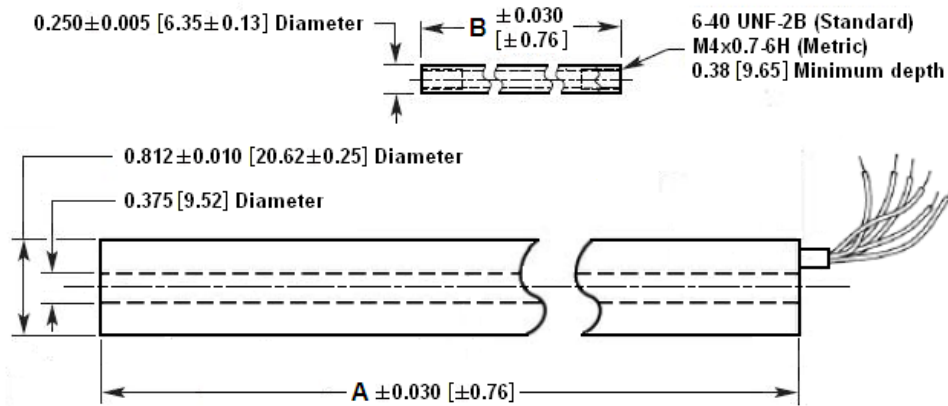
(*) Unit for output at stroke ends is millivolt per volt of excitation (input voltage)

(**) Requires special reduced core length

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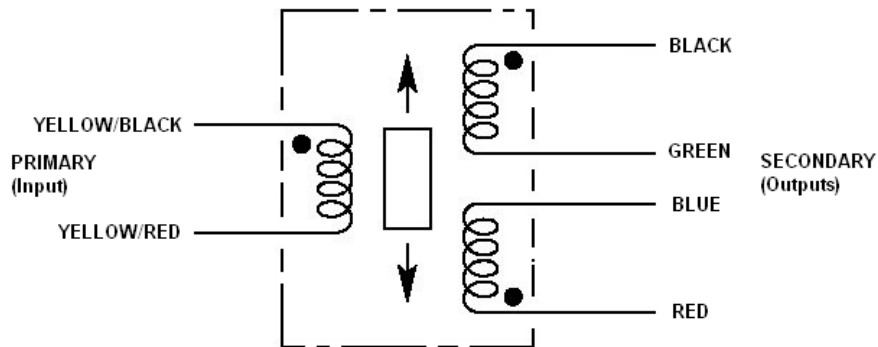
MECHANICAL SPECIFICATIONS

| Parameter | HR 050 | HR 100 | HR 200 | HR 300 | HR 500 | HR 1000 | HR 2000 | HR 3000 | HR 4000 | HR 5000 | HR 7500 | HR 10000 |
|------------------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|------------------|
| Body length "A" | 1.13 [28.7] | 1.81 [46.0] | 2.50 [63.5] | 3.22 [81.8] | 5.50 [139.7] | 6.63 [168.4] | 10.00 [254] | 12.82 [325.6] | 15.64 [397.3] | 17.88 [454.2] | 24.09 [611.9] | 30.85 [783.6] |
| Core length "B" | 0.80 [20.3] | 1.3 [33.0] | 1.65 [41.9] | 1.95 [49.5] | 3.45 [87.6] | 4.00 [101.6] | 5.30 [134.6] | 5.60 [142.2] | 7.00 [177.8] | 7.00 [177.8] | 7.00 [177.8] | 8.50 [215.9] |
| Body weight, oz [g] | 1.13 [32] | 1.69 [48] | 2.12 [60] | 2.72 [77] | 3.85 [109] | 4.45 [126] | 5.93 [168] | 7.94 [225] | 10.41 [295] | 11.99 [340] | 16.16 [458] | 20.46 [580] |
| Core weight, oz [g] | 0.14 [4] | 0.21 [6] | 0.28 [8] | 0.35 [10] | 0.64 [18] | 0.74 [21] | 0.95 [27] | 0.99 [28] | 1.27 [36] | 1.27 [36] | 1.27 [36] | 1.52 [43] |



Dimensions are in inch [mm]

WIRING INFORMATION



Connect blue (BLU) to green (GRN) for differential output