

RoHS

HR SERIES

General Purpose LVDT

SPECIFICATIONS

- **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**

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

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 (200ºC) operation and Mild Radiation Resistance versions are also available *(consult factory)*. The HR Series is compatible with the full line of Macro Sensors 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.

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 *(longer wires optional)*
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

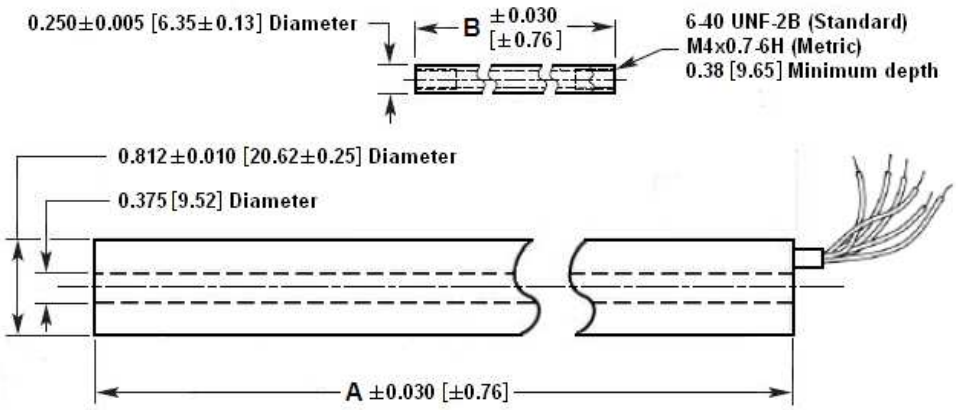
FRO (Full Range Output): Algebraic difference in outputs measured at the ends of the range

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

(**) Requires special reduced core length

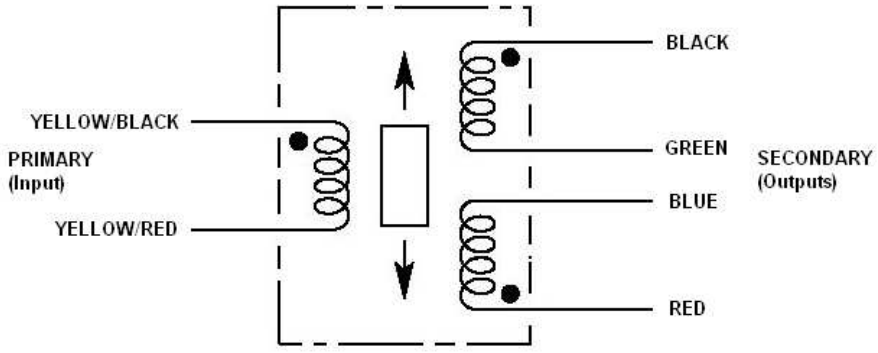
MECHANICAL SPECIFICATIONS

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

ORDERING INFORMATION

Description	Model	Part Number
±0.05 inch LVDT	HR 050	02560389-000
±0.1 inch LVDT	HR 100	02560390-000
±0.2 inch LVDT	HR 200	02560391-000
±0.3inch LVDT	HR 300	02560392-000
±0.5 inch LVDT	HR 500	02560394-000
±1 inch LVDT	HR 1000	02560395-000

Description	Model	Part Number
±2 inch LVDT	HR 2000	02560396-000
±3 inch LVDT	HR 3000	02560398-000
±4 inch LVDT	HR 4000	02560399-000
±5 inch LVDT	HR 5000	02560400-000
±7.5 inch LVDT	HR 7500	02561011-000
±10 inch LVDT	HR 10000	02560401-000

OPTIONS		
5.0 kHz calibration	HR 050, 100, 200 and 500 only	XXXXXXXX-002
Metric threaded core	All models	XXXXXXXX-006
Guided core	All models	XXXXXXXX-010
Small-diameter/low-mass core *(consult factory for mass and dimensions)*	Consult factory	XXXXXXXX-020
10 foot long lead-wires	Consult factory	XXXXXXXX-040

Note: Add multiple option dash numbers together to determine proper ordering suffix
Example: HR 1000, ±1 inch, with 5 kHz calibration and guided core, P/N 02560395-012

ACCESSORIES	
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

ABOUT MACRO SENSORS

Macro Sensors, founded by Howard A. Schaevitz, has more than three hundred man-years of experience in just one thing: the design and manufacture of LVDTs. We believe that you need solutions, not simply products. When you call us, you get the benefit of our experience and our commitment.

Most products listed are in stock for immediate delivery, and we strive to offer the finest customer service in the industry: technical support from people who understand LVDTs and how to apply them to your benefit, and a commitment to excellent pricing, quality products, and deliveries that you can truly rely on. Macro Sensors also has a comprehensive network of representatives and distributors in the U.S. and around the world to provide you with local support.

We manufacture an enormous array of LVDTs, from modified standards to complete custom designs. Our customers consistently tell us it is Macro Sensors? quality and service that keeps them coming back. Let our experience go to work for you.

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