



RoHS

FEATURES

- All-welded stainless steel construction
- Glass sealed, MS type connector (MIL-C-5015)
- Shock and vibration tolerant
- Captive core eases installation (optional)
- High temperature version available (200°C)
- Calibration certificate supplied with each unit
- Right angle (HCA-RA) version available

APPLICATIONS

- Harsh industrial environments
- Submersible (with appropriate connector)
- Pressure vessels
- Corrosive liquid and vapor areas (check materials)
- Mild radiation areas
- Turbine valve

HCA & HCA-RA SERIES

Hermetically Sealed AC LVDT

SPECIFICATIONS

- * Hermetically sealed, all welded
- Stainless steel housing
- MS type connector, glass sealed
- Axial or radial electrical connection
- IEC IP68 rating to 1,000 PSI [70 bars]
- Stroke ranges from ± 0.05 to ±10 inches
- AC operation from 400Hz to 10kHz
- Double magnetic shielding
- Through bore design (HCA-RA version)

The **HCA and HCA-RA Series** hermetically sealed LVDTs provide premium performance in harsh industrial environments. Impervious to dirt, water, steam, and corrosive liquids/vapors compatible with its materials, the HCA/HCA-RA all-welded stainless steel construction withstands external pressures up to 1,000 PSI [70 bars]. Double magnetic shielding offers excellent protection from external electromagnetic fields.

The HCA/HCA-RA Series can be configured with a number of standard options. A high temperature operation (200°C) model, HCA-T is also available. The HCA/HCA-RA is compatible with the full line of Measurement Specialties LVDT signal conditioners.

The HCA-RA version adds the convenience of a radial connector termination. This feature decreases the required installation space, while also allowing debris to harmlessly pass through the 'open-ended' bore.

Like in most of our LVDTs, the HCA/HCA-RA 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 vibration and shock.

<u>Captive core option</u>: The HCA/HCA-RA features an optional captive core design that greatly simplifies installation. The core rod and bearing assembly includes a Bronze bearing on the front end for self-alignment, while a PTFE sleeve allows low-friction travel through the stainless steel boreliner (spool tube).

Also see our other hermetically sealed LVDT models with built-in signal conditioning: **HCD** (DC voltage), **HCT** (4-20mA, 2-wire loop) and **HC-485** (RS-485 Digital Series).

PERFORMANCE SPECIFICATIONS

ELECTRICAL SPECIFICATIONS										
Parameter	HCA HCA-RA 050	HCA HCA-RA 125	HCA HCA-RA 250	HCA HCA-RA 500	HCA HCA-RA 1000	HCA HCA-RA 2000	HCA HCA-RA 3000	HCA HCA-RA 4000	HCA HCA -RA 5000	HCA HCA-RA 10000
Stroke range	±0.050 [±1.27]	±0.125 [±3.17]	±0.25 [±6.35]	±0.5 [±12.7]	±1 [±25.4]	±2 [±50.8]	±3 [±76.2]	±4 [±101.6]	±5 [±127]	±10 [±254]
Sensitivity V/V/inch mV/V/mm	4.2 [165]	2.4 [94.5]	1.6 [63.0]	1.1 [43.3]	0.84 [33.1]	0.32 [12.6]	0.20 [7.9]	0.18 [4.6]	0.16 [6.3]	0.13 [5.1]
Output at stroke ends, mV/V (*)	210	300	400	550	840	640	600	720	800	1,300
Phase shift	+6°	+5°	+5°	+2°	+1°	-1°	+1°	+3°	-5°	-6°
Input impedance (PRIMARY)	430Ω	1710Ω	800Ω	900Ω	900Ω	525Ω	930Ω	1000Ω	1200Ω	930Ω
Output impedance (SECONDARY)	950Ω	1820Ω	940Ω	1150Ω	2100Ω	535Ω	1040Ω	580Ω	1640Ω	3000Ω
Non-linearity					±%	of FR				
@100% stroke (maximum)	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	0.30	0.30	0.35	0 .40 (**)	0 .50	/	0 .80	0.90 (**)
@150% stroke	0.50	0.50	0.50	0.55 <i>(**)</i>	0 .55 <i>(**)</i>	0 .70 <i>(**</i>)	1.00 <i>(**)</i>	/	/	/
Input voltage	3 VRMS sine wave									
Input frequency	400Hz to 10kHz									
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 connector	6-pin MS type connector (MIL-C-5015)					
IEC 60529 rating	IP68 to 1,000 PSI [70 bars] with use of proper mating connector plug					

<u>Notes</u>

All values are nominal unless otherwise noted

Electrical specifications are for the test frequency indicated in the table

Dimensions are in inch [mm] unless otherwise noted

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

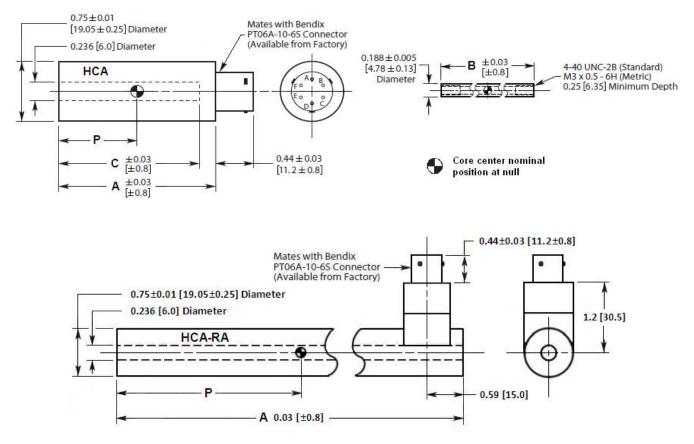
FRO (Full Range Output): Algebraic difference in outputs measured at the ends of the range

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

(**) Requires special reduced core length

MECHANICAL SPECIFICATIONS - NON CAPTIVE CORE (STANDARD)

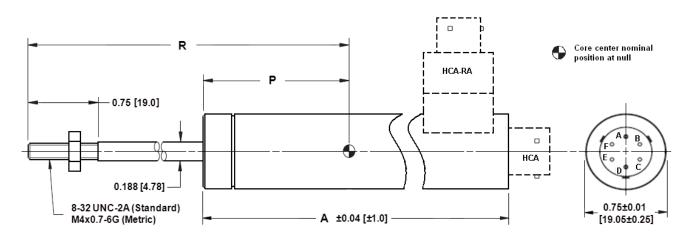
Parameter	HCA	HCA	HCA	HCA	HCA	HCA	HCA	HCA	HCA	HCA
	HCA-RA 050	HCA-RA 125	HCA-RA 250	HCA-RA 500	HCA-RA 1000	HCA-RA 2000	HCA-RA 3000	HCA-RA 4000	HCA-RA 5000	HCA-RA 10000
Body length "A"	1.66	2.50	3.36	5.05	7.29	10.68	15.76	16.17	19.70	33.82
	[42.2]	[63.5]	[85.3]	[128.3]	[185.2]	[271.3]	[400.3]	[410.7]	[500.4]	[859.0]
Core length "B"	0.59	1.10	1.80	3.00	3.80	5.30	6.20	6.20	6.20	12.00
	[15.0]	[27.9]	[45.7]	[76.2]	[96.5]	[134.6]	[157.5]	[157.5]	[157.5]	[304.8]
Bore depth "C"	1.07	1.91	2.77	4.46	6.72	10.20	15.17		19.12	33.23
HCA only	[27.2]	[48.5]	[70.4]	[113.3]	[170.7]	[259.1]	[385.3]		[485.6]	[844.0]
Core center	0.55	0.96	1.39	2.23	3.32	4.91	7.59	7.87	9.56	16.61
at null "P"	[14.0]	[24.4]	[35.3]	[56.6]	[84.3]	[124.7]	[192.8]	[199.9]	[242.8]	[421.9]
HCA body weight	1.20	1.73	2.22	2.93	5.22	5.65	8.33	8.50	10.31	18.57
oz [g]	[34]	[49]	[63]	[83]	[148]	[160]	[236]	[241]	[292]	[526]
HCA-RA body	2.26	2.79	3.28	3.98	6.28	6.70	9.38	9.60	11.35	19.61
weight, oz [g]	[64]	[79]	[93]	[113]	[178]	[190]	[266]	[272]	[322]	[556]
Core weight oz	0.07	0.11	0.14	0.28	0.39	0.46	0.60	0.60	0.60	0.85
[g]	[2]	[3]	[4]	[8]	[11]	[13]	[17]	[17]	[17]	[24]



Dimensions are in inch [mm]

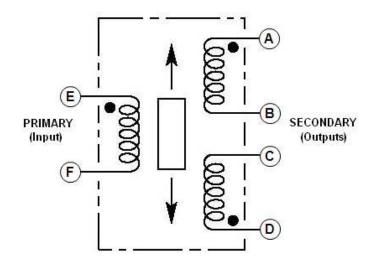
MECHANICAL SPECIFICATIONS – CAPTIVE CORE OPTION

Parameter	HCA/HCA- RA 050	HCA/HCA- RA 125	HCA/HCA- RA 250	HCA/HCA- RA 500	HCA/HCA-RA 1000	HCA/HCA- RA 2000	HCA/HCA- RA 3000
Body length "A"	2.00	2.84	3.70	5.39	7.63	11.02	16.10
	[50.8]	[72.1]	[94.0]	[136.9]	[193.8]	[279.9]	[408.9]
Core center at null "P"	0.89	1.30	1.73	2.57	3.66	5.39	7.93
	[22.6]	[33.0]	[43.9]	[65.3]	[93.0]	[136.9]	[201.4]
Core rod position at null "R"	3.70	4.28	4.75	6.04	7.90	10.52	15.27
	[94.0]	[108.7]	[120.6]	[153.4]	[200.7]	[267.2]	[387.9]
Weight, oz [grams]	1.98 [56]	2.61[74]	3.14 [89]	4.06 [115]	6.63 [188]	7.37 [209]	10.62 [301]



Dimensions are in inch [mm]

WIRING INFORMATION



A through F: Connector pin assignments Connect B to C for differential output

ORDERING INFORMATION

Description	HCA Model	Part Number
±0.050 inch LVDT	HCA 050	02560413-000
±0.125 inch LVDT	HCA 125	02560414-000
±0.25 inch LVDT	HCA 250	02560415-000
±0.5 inch LVDT	HCA 500	02560416-000
±1 inch LVDT	HCA 1000	02560417-000
±2 inch LVDT	HCA 2000	02560418-000
±3 inch LVDT	HCA 3000	02560419-000
±4 inch LVDT	HCA 4000	72560000-000
±5 inch LVDT	HCA 5000	02560420-000
±10 inch LVDT	HCA 10000	02560421-000

OPTIONS							
Description	Comments	Part Number					
5.0 kHz calibration	HCA/HCA-RA 050 through	XXXXXXXX-002					
10 kHz calibration	HCA/HCA-RA 500 only	XXXXXXXX-003					
Metric threaded core (Non-captive) or connecting rod (Captive core)	All	XXXXXXXX-006					
Guided core	Available on	XXXXXXXX-010					
Small-diameter/low-mass core (consult factory for mass and dimensions)	non-captive core models only	XXXXXXXX-020					
Captive core	HCA/HCA-RA 050 through HCA-RA 3000 only	xxxxxxx-200					

Note: Add multiple option dash numbers together to determine proper ordering suffix Example: HCA-RA 1000, ±1 inch, right angle connector model, with captive core and 5 kHz calibration, P/N 0256417-702

ACCESSORIES FOR HCA AND HCA-RA							
Description	Comments	Part Number					
Core connecting rod, 6 inches long, 4-40 threads		05282946-006					
Core connecting rod, 12 inches long, 4-40 threads		05282946-012					
Core connecting rod, 24 inches long, 4-40 threads		05282946-024					
Core connecting rod, 36 inches long, 4-40 threads		05282946-036					
Core connecting rod, 6 inches long, M3x0.5 metric threads		05282977-006					
Core connecting rod, 12 inches long, M3x0.5 metric threads		05282977-012					
Mounting block		04560950-000					
Mating connector kit	PT06A-10-6S(SR)	62101011-000					
Interconnect cable for LVM-110 and LiM 4-20 Signal Conditioners (1)	HCA/HCA-RA to Stripped/Tinned	04290417-000					
Interconnect cable for IEM-422 Signal Conditioner (1)	HCA/HCA-RA to PTO6A-10-6P	04290133-000					
Interconnect cable for ATA-2001 Signal Conditioner (1)	HCA/HCA-RA to DB-9P	04290457-000					
Interconnect cable for MP-2000 Series Set-Point Controller (1)	HCA/HCA-RA to 05BL5M	04290560-000					
Interconnect cable for LDM/PML-1000 Signal Conditioners, 200°C (1)	HCA/HCA-RA to Stripped/Tinned	04290595-000					

(1) All cables are shielded, 10 foot long, and rated 80°C [176°F] operating unless otherwise noted. Consult factory for other lengths.

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