HCA & HCA-RA Series – Hermetically Sealed LVDT

- **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)**

DESCRIPTION

The **HCA/HCA-RA Series** hermetically sealed LVDTs provide premium performance in harsh industrial environments. Impervious to dirt, water, steam and corrosive liquids and vapors compatible with its materials, the HCA/HCA-RA Series 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 including but not limited to high temperature operation (+220°C) and mild radiation resistance (10^{12} NVT total integrated flux; 10^{7} rads Gamma). The HCA/HCA-RA Series 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.

Captive core option: 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 Teflon sleeve allows low-friction travel through the stainless steel boreliner (spool tube). The core rod and the bearing assembly are both field serviceable.

Also see our models with built-in signal conditioning: **HCD** (DC voltage), **HCT-IS** (4-20mA 2-wire loop; CSA/FM Intrinsically Safe) and **HC-485** (RS-485 Digital Series), also available in the –RA (Right Angle) versions.

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

- All-welded stainless steel construction
- Glass sealed, MS type connector (MIL-C-5015)
- Shock and vibration tolerant
- Captive core eases installation (optional)
- Mild radiation resistance (optional)
- 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

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PERFORMANCE SPECIFICATIONS

ELECTRICAL SPECIFICATIONS									
Parameter	**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**	**5000 HCA & HCA-RA**	**10000 HCA & HCA-RA**
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]	±5 [±127]	±10 [±254]
Sensitivity mV/V/.001in mV/V/mm	4.2 [165]	2.4 [95]	1.6 [63]	1.1 [44]	0.84 [34]	0.32 [12.6]	0.20 [8.0]	0.16 [6.4]	0.13 [5.0]
Output at stroke ends, mV/V (*)	210	300	400	550	840	640	600	800	1,300
Phase shift	+6°	+5°	+5°	+2°	+1°	-1°	+1°	-5°	-6°
Input impedance (PRIMARY)	430Ω	1710Ω	800Ω	900Ω	900Ω	525Ω	930Ω	1200Ω	930Ω
Output impedance (SECONDARY)	950Ω	1820Ω	940Ω	1150Ω	2100Ω	535Ω	1040Ω	1640Ω	3000Ω
Linearity, % of FS									
@ 50% stroke	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
@100% stroke (maximum band)	**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	0 .55**	0 .70**	1.00**	/	/
Input voltage	3Vrms sine wave								
Input freq. range	400Hz to 10kHz								
Test frequency	2.5kHz								
Null voltage (max)	0.5% of FSO								

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)

Notes

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

FS: Full Scale is 2X for ±X stroke

FSO: Full Scale Output is the output at X position for ±X stroke

******** *Requires special reduced core length*

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

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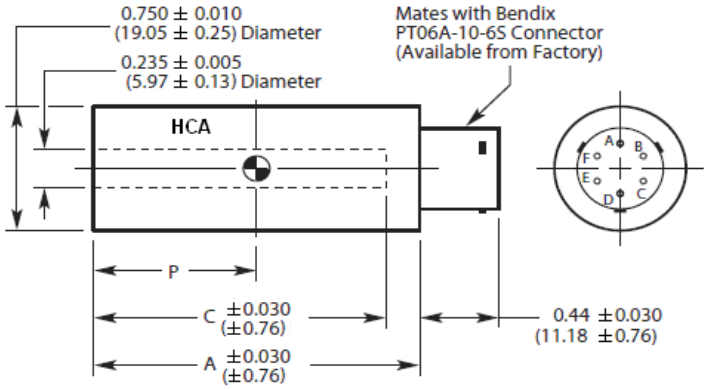
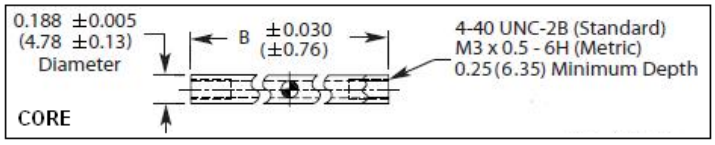
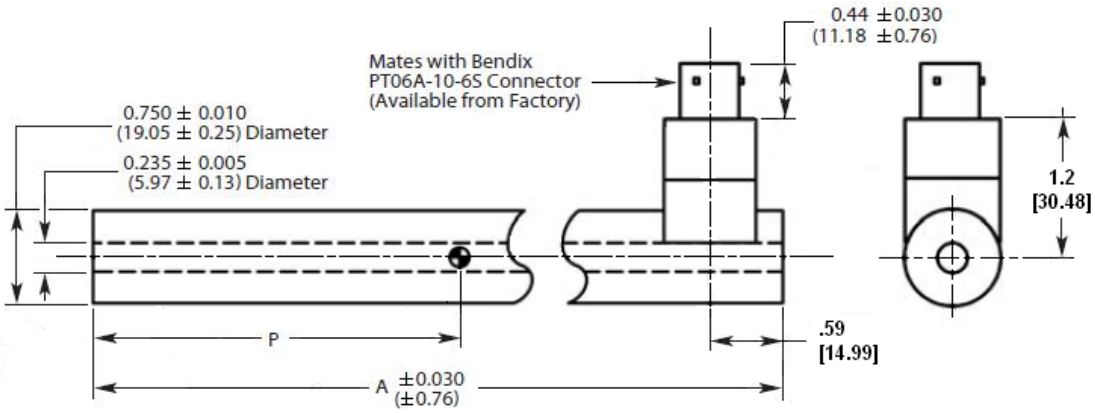
MECHANICAL SPECIFICATIONS, NON-CAPTIVE CORE

	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	5000 HCA & HCA-RA	10000 HCA & HCA-RA
Body length “A”	1.66 [42.2]	2.50 [63.5]	3.36 [85.3]	5.05 [128.3]	7.29 [185.2]	10.68 [271.3]	15.76 [400.3]	19.70[500.4]	33.82[859.0]
Core length “B”	0.59 [15.0]	1.10 [27.9]	1.80 [45.7]	3.00 [76.2]	3.80 [96.5]	5.30 [134.6]	6.20 [157.5]	6.20 [157.5]	12.00 [304.8]
Bore depth “C” (**HCA** only)	1.07 [27.2]	1.91 [48.5]	2.77 [70.4]	4.46 [113.3]	6.72 [170.7]	10.20 [259.1]	15.17 [385.3]	19.12 [485.6]	33.23 [844.0]
Core center at null “P”	0.55 [14.0]	0.96 [24.4]	1.39 [35.3]	2.23 [56.6]	3.32 [84.3]	5.05 [128.3]	7.59 [192.8]	9.56 [242.8]	16.61 [421.9]
Body weight **HCA**, oz [g]	1.20 [34]	1.73 [49]	2.22 [63]	2.93 [83]	5.22 [148]	5.65 [160]	8.33 [236]	10.31 [292]	18.57 [526]
Body weight **HCA-RA**, oz [g]	2.26 [64]	2.79 [79]	3.28 [93]	3.98 [113]	6.28 [178]	6.70 [190]	9.38 [266]	11.35 [322]	19.61 [556]
Core weight, oz [g]	0.07 [2]	0.11 [3]	0.14 [4]	0.28 [8]	0.39 [11]	0.46 [13]	0.49 [14]	0.60 [17]	0.85 [24]





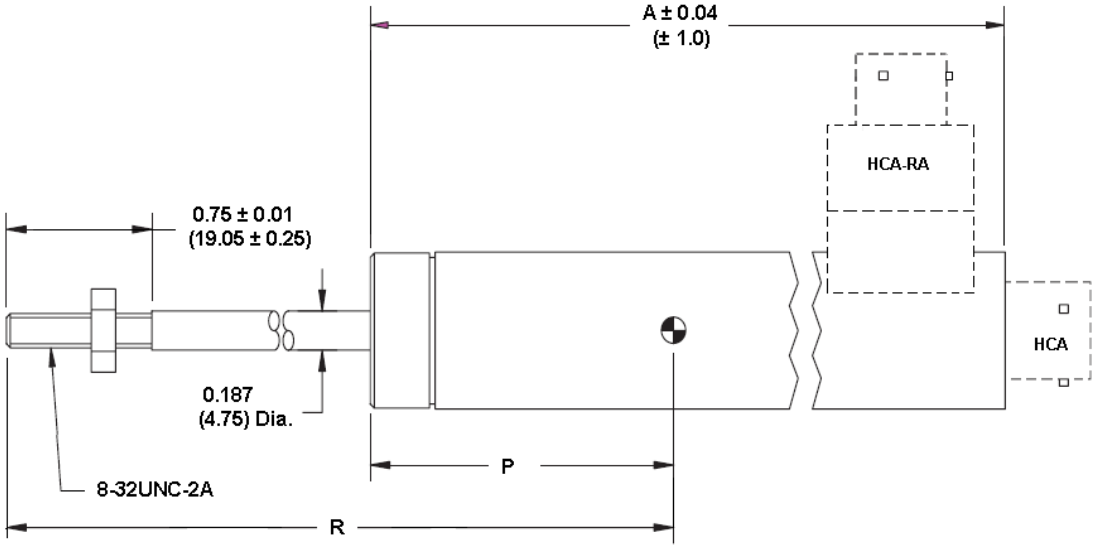


Dimensions are in inches (mm)

HCA & HCA-RA Series – Hermetically Sealed LVDT

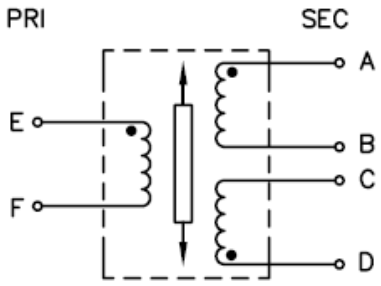
MECHANICAL SPECIFICATIONS, WITH CAPTIVE CORE

Parameter	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
Body length “A”	2.00 [50.8]	2.84 [72.1]	3.70 [94.0]	5.39 [136.9]	7.63 [193.8]	11.02 [279.9]	16.10 [408.9]
Center of core position at null “P”	0.89 [22.6]	1.30 [33.0]	1.73 [43.9]	2.57 [65.3]	3.66 [93.0]	5.39 [136.9]	7.93 [201.4]
Core rod position at null “R”	3.70 [94.0]	4.28 [108.7]	4.75 [120.6]	6.04 [153.4]	7.90 [200.7]	10.52 [267.2]	15.27 [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 inches (mm)

WIRING SCHEMATIC



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

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ORDERING INFORMATION

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

OPTIONS FOR HCA AND HCA-RA		
Description	**Comments**	**Dash Number**
5.0 KHz calibration	050 HCA/HCA-RA through 500 HCA/HCA-RA only	XXXXXXXX-002
10 KHz calibration		XXXXXXXX-003
Metric threaded core	All	XXXXXXXX-006
Guided core	All	XXXXXXXX-010
Small-diameter/low-mass core ***(consult factory for mass and dimensions)***	Consult factory	XXXXXXXX-020
Mild radiation resistance	All	XXXXXXXX-080
Captive core	050 HCA/HCA-RA through 3000 HCA-RA only	XXXXXXXX-200
220°C option	Consult factory	**Consult factory**

Note:
Add multiple option dash numbers together to determine proper ordering suffix
Example: 1000 HCA-RA, ±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	Fits all models	04560950-000
Mating connector kit	PT06A-10-6S(SR)	62101011-000
10 ft shielded cable with wired mating connector (Inquire for other lengths)	HCA/HCA-RA cable assy	04290417-000
Interconnect cable assembly for ATA-2001 Signal Conditioner	HCA/HCA-RA to 9 PIN D	04290457-000
Interconnect cable assembly for LVM-110 & LiM 4-20 Signal Conditioners	HCA/HCA-RA TO LiM/LVM	04290417-000
Interconnect cable assembly for MP2000 Series Set-Point Controller	HCA/HCA-RA to 05BL5M	04290560-000

Note:
Refer to our " Accessories for LVDT's" brochure for our LVDT signal conditioning instrumentation and other accessories

HCA & HCA-RA Series – Hermetically Sealed LVDT

TECHNICAL CONTACT INFORMATION

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