

HCD Series – Hermetically Sealed DC LVDT



- Hermetically sealed, all welded
- Stainless steel housing
- High level ± 10 VDC output
- Stroke ranges from ± 0.05 to ± 10 inches
- Shock and vibration tolerant
- MS style connector
- IEC IP68 rating to 1,000 PSI [70 bars]
- Captive core option

DESCRIPTION

The **HCD Series** hermetically sealed DC operated LVDTs are the perfect choice for high performance measurements in environments containing moisture, dirt, and fluid contaminants. Operating on a nominal ± 15 VDC supply, these heavy-duty LVDTs deliver an extremely linear, low noise, yet high frequency response ± 10 VDC output.

The integral electrical connector (welded, glass-sealed MS type) provides for easy installation and allows replacing a damaged cable without sacrificing the sensor.

The HCD is available in stroke ranges of ± 0.05 inch [± 1.27 mm] up to ± 10 inches [± 254 mm], and with a number of standard options including imperial or metric threaded core, guided core and captive core.

Like in most of our LVDTs, the HCD 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.

Captive core option: The HCD features an optional captive core design (available for most models) 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). The core rod and the bearing assembly are both field serviceable.

Also see our other LVDT models with built-in signal conditioning: **DC-EC** (\pm DC voltage), **DC-SE** (single-ended DC voltage), **HC-485** (RS485 Digital Series) and the **HCT** (4-20mA, 2-wire loop).

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>

*Measurement Specialties acquired Schaevitz Sensors and the **Schaevitz™** trademark in 2000.*

FEATURES

- All-welded stainless steel construction
- Shock and vibration tolerant
- Low noise, ± 10 VDC output
- Double magnetic shielding
- MS type connector (MIL-C-5015)
- Calibration certificate supplied with each unit

APPLICATIONS

- Harsh industrial environments
- Pressurized installations up to 1,000 psi
- Paper processing mills
- Roller gap position feedback
- Automated test systems
- X-Y Positional Feedback

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PERFORMANCE SPECIFICATIONS

| ELECTRICAL SPECIFICATIONS | | | | | | | | | |
|------------------------------------|--|-------------------|------------------|-----------------|---------------|---------------|---------------|--------------|---------------|
| Parameter | HCD 050 | HCD 125 | HCD 250 | HCD 500 | HCD 1000 | HCD 2000 | HCD 3000 | HCD 5000 | HCD 10000 |
| Stroke range | ±0.050 [±1.27] | ±0.125 [±3.17] | ±0.25 [±6.85] | ±0.5 [±12.7] | ±1 [±25.4] | ±2 [±50.8] | ±3 [±76.2] | ±5 [±127] | ±10 [±254] |
| Sensitivity, VDC/inch | 200 | 80 | 40 | 20 | 10 | 5 | 3.3 | 2.0 | 1.0 |
| Sensitivity, VDC/mm | 7.87 | 3.15 | 1.575 | 0.787 | 0.394 | 0.197 | 0.130 | 0.079 | 0.0394 |
| Frequency response Hertz @ -3db | 500 | 500 | 500 | 200 | 200 | 200 | 200 | 200 | 200 |
| Input voltage | +/-15VDC | | | | | | | | |
| Input current | ±25mA | | | | | | | | |
| Output @ stroke ends | +/-10VDC (Output is positive when the core is displaced from null towards the connector) | | | | | | | | |
| Non-linearity | ±0.25% of FR, maximum | | | | | | | | |
| Output ripple | 25mVRMS, maximum | | | | | | | | |
| Stability | 0.125% of FSO | | | | | | | | |
| Output impedance | 1 Ohm | | | | | | | | |

| ENVIRONMENTAL SPECIFICATIONS & MATERIALS | |
|--|--|
| Operating temperature | +32°F to +160°F [0°C to +70°C] |
| Survival temperature | -65°F to +200°F [-55°C to +95°C] |
| Shock survival | 250 g (11ms half-sine) |
| Vibration tolerance | 10 g up to 2kHz |
| Housing material | AISI 400 Series stainless steel |
| Electrical connector | 6-pin MS type connector (MIL-C-5015) |
| NEMA IEC 60529 rating | IP68 to 1,000 PSI [70 bars] with use of proper mating connector plug |

Notes:

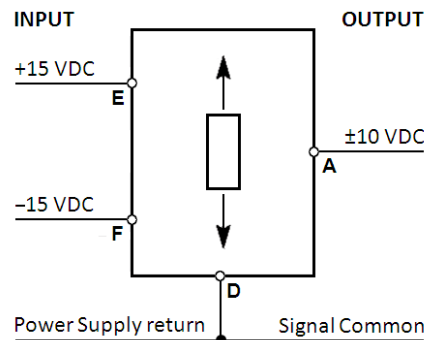
All values are nominal unless otherwise noted

Dimensions are in inch [mm] unless otherwise noted

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

FSO (Full Scale Output): Largest absolute value of the outputs measured at the ends of the range

WIRING INFORMATION

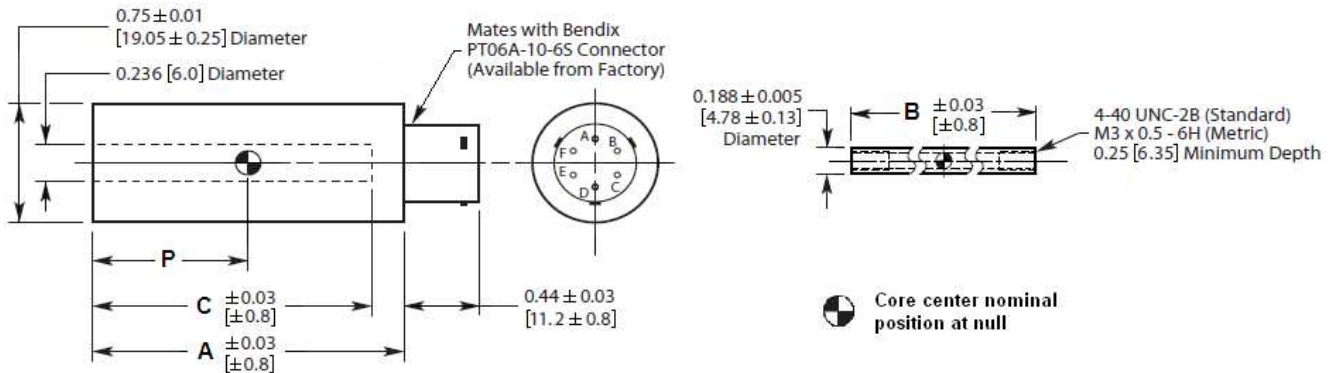


A through F: Connector pin assignments

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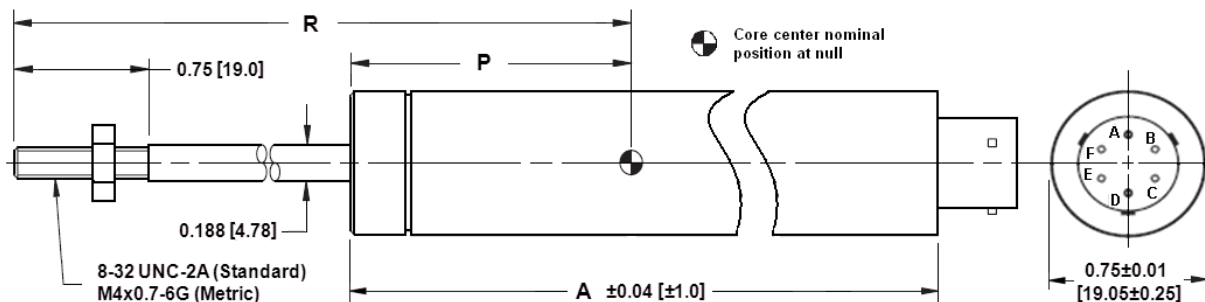
MECHANICAL SPECIFICATIONS – NON CAPTIVE CORE (STANDARD)

| | HCD 050 | HCD 125 | HCD 250 | HCD 500 | HCD 1000 | HCD 2000 | HCD 3000 | HCD 5000 | HCD 10000 |
|----------------------------|----------------|----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|
| Main body length "A" | 2.40 [61.0] | 3.23 [82.0] | 4.10 [104.1] | 5.79 [147.1] | 8.05 [204.5] | 11.42 [290.1] | 16.62 [422.1] | 20.45 [519.4] | 34.57 [878.1] |
| Core length "B" | 0.75 [19.1] | 1.25 [31.8] | 2.0 [50.8] | 3.0 [76.2] | 3.8 [96.5] | 5.3 [134.6] | 6.2 [157.5] | 6.2 [157.5] | 12.0 [304.8] |
| Bore depth "C" | 1.90 [48.3] | 2.73 [69.3] | 3.60 [91.4] | 5.29 [134.4] | 7.55 [191.8] | 10.92 [277.4] | 16.10 [408.9] | 19.95 [506.7] | 34.03 [864.4] |
| Core center at null "P" | 0.55 [14.0] | 0.96 [24.4] | 1.39 [35.3] | 2.23 [56.6] | 3.18 [80.8] | 4.91 [124.7] | 7.59 [192.8] | 9.56 [242.8] | 16.61 [421.9] |
| Weight, body oz [gram] | 1.41 [40] | 1.77 [50] | 2.19 [62] | 2.93 [83] | 4.24 [120] | 6.14 [174] | 8.33 [236] | 10.38 [294] | 18.57 [526] |
| Weight, core oz [gram] | 0.07 [2] | 0.11 [3] | 0.18 [5] | 0.28 [8] | 0.35 [10] | 0.53 [15] | 0.64 [18] | 0.64 [18] | 0.85 [24] |



MECHANICAL SPECIFICATIONS – CAPTIVE CORE OPTION

| | HCD 050 | HCD 125 | HCD 250 | HCD 500 | HCD 1000 | HCD 2000 | HCD 3000 |
|----------------------------------|----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|
| Main body length "A" | 2.74 [69.6] | 3.57 [90.7] | 4.44 [112.8] | 6.13 [155.7] | 8.39 [213.1] | 11.76 [298.7] | 16.96 [430.8] |
| Core center at null "P" | 0.89 [22.6] | 1.30 [33.0] | 1.73 [43.9] | 2.57 [65.3] | 3.52 [89.4] | 5.25 [133.4] | 7.93 [201.4] |
| Core rod position at null "R" | 3.78 [96.0] | 4.36 [110.7] | 4.85 [123.2] | 6.04 [153.4] | 7.90 [200.7] | 10.52 [267.2] | 15.27 [387.9] |
| Weight, oz [gram] | 2.19 [62] | 2.65 [75] | 3.14 [89] | 4.06 [115] | 5.61 [159] | 7.87 [223] | 10.63 [301] |



Dimensions are in inch [mm]

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ORDERING INFORMATION

| Description | Model | Part Number | Description | Model | Part Number |
|------------------|----------|--------------|---------------|-----------|--------------|
| ±0.050 inch LVDT | HCD 050 | 02560440-000 | ±2 inch LVDT | HCD 2000 | 02560445-000 |
| ±0.125 inch LVDT | HCD 125 | 02560441-000 | ±3 inch LVDT | HCD 3000 | 02560446-000 |
| ±0.25 inch LVDT | HCD 250 | 02560442-000 | ±5 inch LVDT | HCD 5000 | 02560447-000 |
| ±0.5 inch LVDT | HCD 500 | 02560443-000 | ±10 inch LVDT | HCD 10000 | 02560448-000 |
| ±1 inch LVDT | HCD 1000 | 02560444-000 | | | |

OPTIONS

| Option Description | Model | Part Number |
|---|------------------------------|--------------|
| Metric threaded core (Non-captive) or connecting rod (Captive core) | All | XXXXXXXX-006 |
| Guided core | Available on | XXXXXXXX-010 |
| Small-diameter/low-mass core (<i>consult factory for mass & dimensions</i>) | non-captive core models only | XXXXXXXX-020 |
| Captive core | HCD 050 thru 3000 only | XXXXXXXX-200 |

Note: Add multiple option dash numbers together to determine proper ordering suffix
Example: HCD 1000, ±1 inch, with captive core and metric threaded connecting rod, P/N 02560444-206

ACCESSORIES

| Accessory Description | Model | Part Number |
|--|------------------------|--------------|
| Dual rail DC power supply (±15VDC) | Model PSD 40-15 | 02291339-000 |
| 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 |
| Cable with wired mating connector | HCD to Stripped/Tinned | 04290583-000 |

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

Refer to our "[Accessories for LVDTs](#)" data sheet for our LVDT signal conditioning instrumentation and other accessories.

TECHNICAL CONTACT INFORMATION

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|---|--|---|
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