



## HCD SERIES

### Hermetically Sealed DC LVDT

#### SPECIFICATIONS

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

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  $\pm 15$ VDC supply, these heavy-duty LVDTs deliver an extremely linear, low noise, yet high frequency response  $\pm 10$ 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  $\pm 0.05$  inch [ $\pm 1.27$ mm] up to  $\pm 10$  inches [ $\pm 254$ 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).

#### FEATURES

- ◆ All-welded stainless steel construction
- ◆ Shock and vibration tolerant
- ◆ Low noise,  $\pm 10$ 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<br>[±1.27]  | ±0.125<br>[±3.17] | ±0.25<br>[±6.85] | ±0.5<br>[±12.7] | ±1<br>[±25.4] | ±2<br>[±50.8] | ±3<br>[±76.2] | ±5<br>[±127] | ±10<br>[±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<br>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 (11 ms 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)                                 |
| IEC 60529 rating                         | IP68 to 1,000 PSI [70 bars] with use of proper mating connector plug |

### Notes:

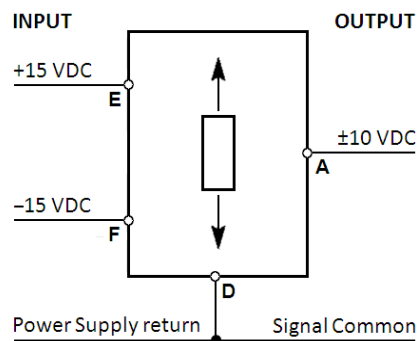
All values are nominal unless otherwise noted

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



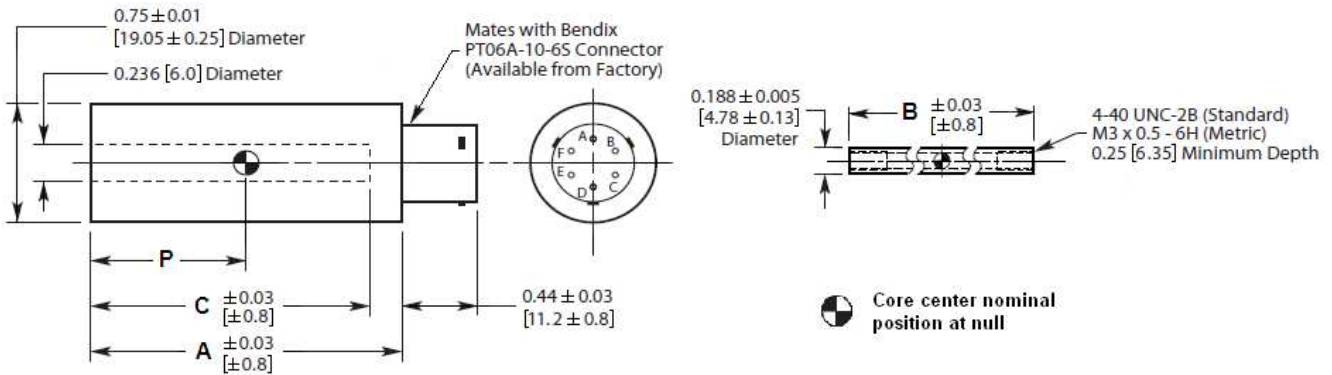
A through F: Connector pin assignments

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### MECHANICAL SPECIFICATIONS – NON CAPTIVE CORE (STANDARD)

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



### MECHANICAL SPECIFICATIONS – CAPTIVE CORE OPTION

| Parameter                     | HCD 050        | HCD 125         | HCD 250         | HCD 500         | HCD 1000        | HCD 2000         | HCD 3000         |
|-------------------------------|----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|
| Main body length "A"          | 2.74<br>[69.6] | 3.57<br>[90.7]  | 4.44<br>[112.8] | 6.13<br>[155.7] | 8.39<br>[213.1] | 11.76<br>[298.7] | 16.96<br>[430.8] |
| Core center at null "P"       | 0.89<br>[22.6] | 1.30<br>[33.0]  | 1.73<br>[43.9]  | 2.57<br>[65.3]  | 3.52<br>[89.4]  | 5.25<br>[133.4]  | 7.93<br>[201.4]  |
| Core rod position at null "R" | 3.78<br>[96.0] | 4.36<br>[110.7] | 4.85<br>[123.2] | 6.04<br>[153.4] | 7.90<br>[200.7] | 10.52<br>[267.2] | 15.27<br>[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]      |

