



## GCA SERIES

### AC Operated Gage Heads

#### SPECIFICATIONS

- ◆ Hermetically sealed housing
- ◆ 25  $\mu$ -inch [0.6  $\mu$ m] repeatability
- ◆ IEC IP68 rating to 1,000 PSI [70 bars]
- ◆ Long strokes up to  $\pm 2$  inches
- ◆ Hardened tool steel contact tip
- ◆ High side load resistance
- ◆ Long cycle life
- ◆ High temperature

The **GCA Series** heavy-duty gage heads enable high performance in environments containing moisture, dirt, and fluid contaminants. Gage heads are spring loaded LVDTs (Linear Variable Differential Transformers) with precision linear bearings.

These robust high-temperature gage heads allow measurements over long strokes up to  $\pm 2$  inches [ $\pm 50.8$ mm]. The spring force is typically 9oz [255 grams] at fully compressed electrical stroke. A removable black-chromed, hardened tool steel tip is threaded (4-48UNF-2A) to the working end. Internal construction prevents the core and shaft from rotating as they move longitudinally. The integral electrical connector (welded) provides for easy installation and allows replacing a damaged cable without sacrificing the sensor. Installation and adjustment are facilitated by an external  $\frac{1}{2}$ -20 mounting thread and the two locknuts supplied with each unit.

Like in most of our LVDTs, the GCA 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.

The ruggedness, long life cycle, and very high reliability of the GCA Series provide a low cost of ownership over the life of the equipment onto which they are installed. The one-piece front end (barrel which contains the bearing assembly), machined from solid stainless steel bar, coupled with a bronze bushing, has far greater resistance to bending forces and side loads compared to other designs. This is particularly important on the longer stroke versions; it reduces the common risk of probe damage/bending during installation or maintenance of industrial equipment. The GCA Series designs also require fewer parts and weld joints, thereby increasing overall structural integrity and reliability.

#### FEATURES

- ◆ All-welded stainless steel construction
- ◆ Resistant to harsh environments
- ◆ MS type connector (MIL-C-5015)
- ◆ High temperature
- ◆ High side loading resistance
- ◆ Long cycle life
- ◆ Calibration certificate supplied with each unit
- ◆ Air extend/spring retract available (Consult factory)

#### APPLICATIONS

- ◆ Factory automation
- ◆ Industrial printing equipment
- ◆ Steel mills
- ◆ Metal thickness gaging
- ◆ High temperature applications
- ◆ Environments requiring hermetically sealed transducers
- ◆ In-process measurements (feedback loop with PLC or CNC controller)

**PERFORMANCE SPECIFICATIONS**

| ELECTRICAL SPECIFICATIONS                |  |               |              |              |             |             |
|--|--|---------------|--------------|--------------|-------------|-------------|
| Parameter                                | GCA 050  | GCA 125       | GCA 250      | GCA 500      | GCA 1000    | GCA 2000    |
| Stroke/gaging range                      | ±0.050 [1.27]  | ±0.125 [3.17] | ±0.25 [6.35] | ±0.50 [12.7] | ±1.0 [25.4] | ±2.0 [50.8] |
| Sensitivity, V/V/inch                    | 4.2  | 2.4           | 1.6          | 1.1          | 0.84        | 0.34        |
| Sensitivity, mV/V/mm                     | 165  | 94.5          | 63.0         | 43.3         | 33.1        | 13.4        |
| Output at stroke ends (*)                | 210mV/V  | 300mV/V       | 400mV/V      | 550mV/V      | 840mV/V     | 680mV/V     |
| Phase shift (nominal)                    | +6°  | +5°           | +5°          | +2°          | +1°         | -1°         |
| Input impedance (PRI)                    | 430 Ω  | 1710 Ω        | 800 Ω        | 900 Ω        | 900 Ω       | 525 Ω       |
| Output impedance (SEC)                   | 950 Ω  | 1820 Ω        | 940 Ω        | 1150 Ω       | 2100 Ω      | 535 Ω       |
| Input voltage                            | 3 VRMS sine wave   |               |              |              |             |             |
| Input frequency range                    | 400Hz to 10kHz   |               |              |              |             |             |
| Test input frequency                     | 2.5kHz   |               |              |              |             |             |
| Non-linearity                            | ±0.25% of FR, maximum  |               |              |              |             |             |
| Repeatability                            | 25 micro-inches [0.06 microns]                                       |               |              |              |             |             |
| Null voltage                             | 0.5% of FRO, maximum   |               |              |              |             |             |
| Frequency response (dynamic)             | 15Hz, 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 |               |              |              |             |             |

**Notes:**

All values are nominal unless otherwise noted

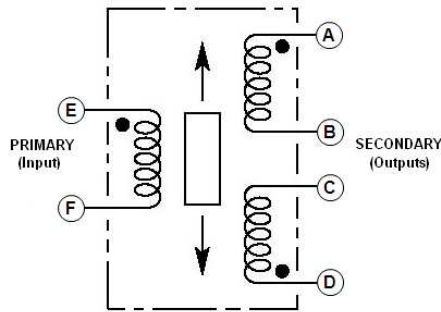
Dimensions are in inch [mm] unless otherwise noted

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

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

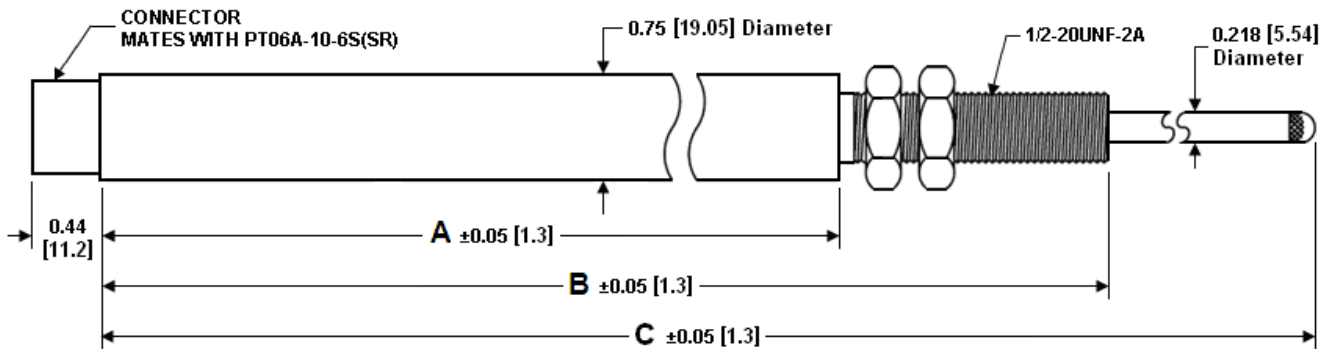
**WIRING INFORMATION**



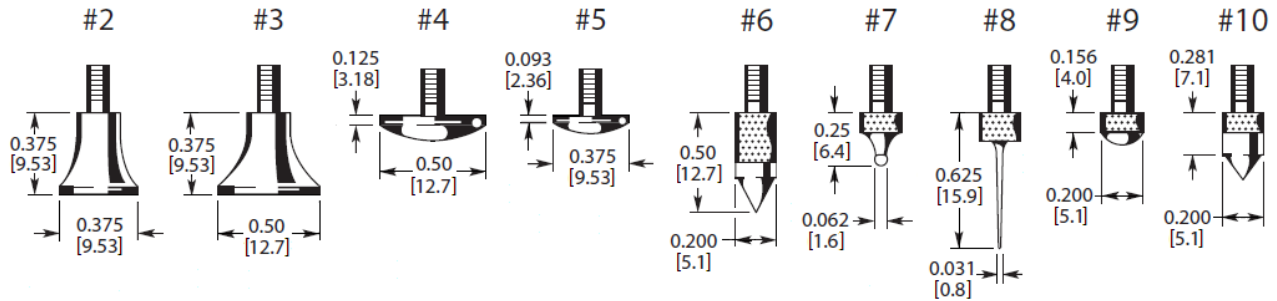
A through F: Connector pin assignments; Connect B to C for differential output

**MECHANICAL SPECIFICATIONS**

| Parameter                              | GCA 050   | GCA 125       | GCA 250      | GCA 500       | GCA 1000      | GCA 2000      |
|--|---|---------------|--------------|---------------|---------------|---------------|
| Stroke/gaging range                    | ±0.050 [1.27]   | ±0.125 [3.17] | ±0.25 [6.35] | ±0.5 [12.7]   | ±1 [25.4]     | ±2 [50.8]     |
| Pre-travel                             | 0.26 [6.6]  | 0.35 [8.9]    | 0.15 [3.8]   | 0.18 [4.6]    | 0.07 [1.8]    | 0.10 [2.5]    |
| Over-travel (minimum)                  | 0.15 [3.8]  | 0.15 [3.8]    | 0.15 [3.8]   | 0.90 [22.9]   | 0.15 [3.8]    | 0.00          |
| Main body length "A"                   | 1.91 [48.5]   | 2.75 [69.9]   | 3.61 [91.7]  | 5.30 [134.6]  | 7.56 [192.0]  | 10.89 [276.6] |
| Overall body length "B"                | 3.28 [83.31]  | 4.12 [104.7]  | 4.98 [126.5] | 8.29 [210.6]  | 10.55 [268.0] | 16.37 [415.8] |
| Plunger length "C"<br>(fully extended) | 4.33 [110.0]  | 5.14 [130.6]  | 6.02 [152.9] | 10.76 [273.3] | 13.01 [330.5] | 20.94 [531.9] |
| Weight, Ounce                          | 2.2 oz  | 2.9 oz        | 3.2 oz       | 5.0 oz        | 7.5 oz        | 13.0 oz       |
| Weight, Gram                           | 62 G  | 82 G          | 91 G         | 142 G         | 213 G         | 339 G         |
| Spring force                           | Typically 9oz [255 grams] at fully compressed electrical stroke |               |              |               |               |               |



**REPLACEMENT/OPTIONAL CONTACT TIPS**



*Dimensions are in inch [mm]*

**ORDERING INFORMATION**

| Description   | Model                  | Part Number        |                |                    |
|---|------------------------|--------------------|----------------|--------------------|
| ±0.050 inch gage head   | GCA 050                | 02350499-000       |                |                    |
| ±0.125 inch gage head   | GCA 125                | 02350500-000       |                |                    |
| ±0.25 inch gage head  | GCA 250                | 02350501-000       |                |                    |
| ±0.5 inch gage head   | GCA 500                | 02350502-000       |                |                    |
| ±1 inch gage head   | GCA 1000               | 02350503-000       |                |                    |
| ±2 inch gage head   | GCA 2000               | 02350614-000       |                |                    |
| <b>OPTIONS</b>  |                        |                    |                |                    |
| Air extend/spring retract gage head <i>(Consult factory)</i>            | All GC Series          | XXXXXXXX-150       |                |                    |
| <b>ACCESSORIES</b>  |                        |                    |                |                    |
| Mating connector kit  | PT06A-10-6S(SR)        | 62101011-000       |                |                    |
| Interconnect cable for LVM-110 and LiM 4-20 Signal Conditioners (1)     | GCA to Stripped/Tinned | 04290417-000       |                |                    |
| Interconnect cable for IEM-422 Signal Conditioner (1)                   | GCA to PTO6A-10-6P     | 04290133-000       |                |                    |
| Interconnect cable for ATA-2001 Signal Conditioner (1)                  | GCA to DB-9P           | 04290457-000       |                |                    |
| Interconnect cable for MP-2000 Series Set-Point Controller (1)          | GCA to 05BL5M          | 04290560-000       |                |                    |
| Interconnect cable for LDM-1000/PML-1000 Signal Conditioners, 200°C (1) | GCA to Stripped/Tinned | 04290595-000       |                |                    |
| Replacement contact tips  | <b>Model</b>           | <b>Part Number</b> | <b>Model</b>   | <b>Part Number</b> |
|   | Contact Tip 2          | 67010005-000       | Contact Tip 7  | 67010009-000       |
|   | Contact Tip 3          | 67010006-000       | Contact Tip 8  | 67010010-000       |
|   | Contact Tip 4          | 67010002-000       | Contact Tip 9  | 67010001-000       |
|   | Contact Tip 5          | 67010007-000       | Contact Tip 10 | 67010011-000       |
|   | Contact Tip 6          | 67010008-000       |                |                    |

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