



## 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.

#### 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)

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.

## 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 to10kHz                                                        |               |              |              |             |             |
| 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

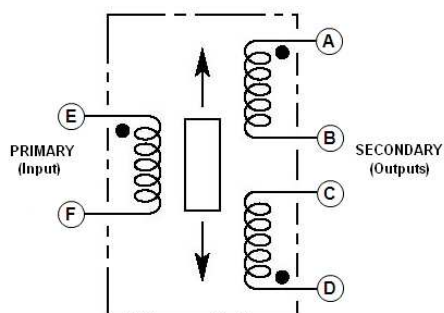
Dimensions are in inch [mm] unless otherwise noted

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

FR: Full Range is the stroke range, end to end;  $FR=2 \times S$  for  $\pm S$  stroke range

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

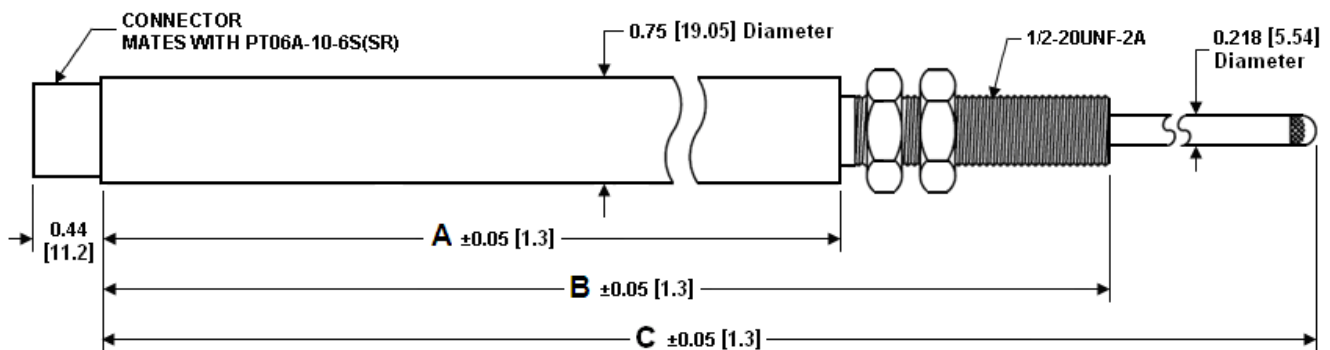
## WIRING INFORMATION



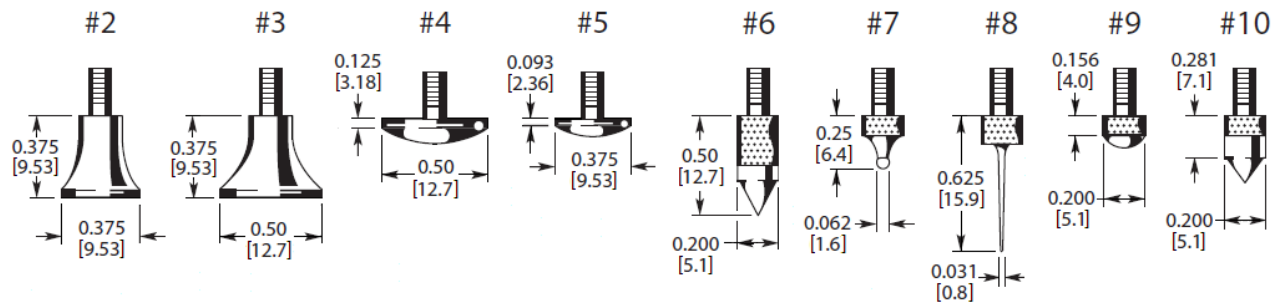
A through F: Connector pin assignments; Connect B to C for differential output

## 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   |              |
| OPTIONS                                                                               |               |                        |                |              |
| Air extend/spring retract gage head <i>(Consult factory)</i>                          |               | All GC Series          | xxxxxxxx-150   |              |
| ACCESSORIES                                                                           |               |                        |                |              |
| Mating connector kit                                                                  |               | PT06A-10-6S(SR)        | 62101011-000   |              |
| Interconnect cable for LVM-110 and LiM 4-20 Signal Conditioners <i>(1)</i>            |               | GCA to Stripped/Tinned | 04290417-000   |              |
| Interconnect cable for IEM-422 Signal Conditioner <i>(1)</i>                          |               | GCA to PTO6A-10-6P     | 04290133-000   |              |
| Interconnect cable for ATA-2001 Signal Conditioner <i>(1)</i>                         |               | GCA to DB-9P           | 04290457-000   |              |
| Interconnect cable for MP-2000 Series Set-Point Controller <i>(1)</i>                 |               | GCA to 05BL5M          | 04290560-000   |              |
| Interconnect cable for LDM-1000/PML-1000 Signal Conditioners, <b>200°C</b> <i>(1)</i> |               | GCA to Stripped/Tinned | 04290595-000   |              |
| Replacement contact tips                                                              | Model         | Part Number            | Model          | Part Number  |
|                                                                                       | 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           |                |              |

### NORTH AMERICA

Measurement Specialties, Inc.,  
a TE Connectivity company  
Tel: 800-522-6752  
Email: [customercare.frm@te.com](mailto:customercare.frm@te.com)

### EUROPE

Measurement Specialties (Europe), Ltd.,  
a TE Connectivity Company  
Tel: 800-440-5100  
Email: [customercare.bevx@te.com](mailto:customercare.bevx@te.com)

### ASIA

Measurement Specialties (China) Ltd.,  
a TE Connectivity company  
Tel: 0400-820-6015  
Email: [customercare.shzn@te.com](mailto:customercare.shzn@te.com)

[TE.com/sensorsolutions](http://TE.com/sensorsolutions)

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**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331