

# Linear Accelerometers

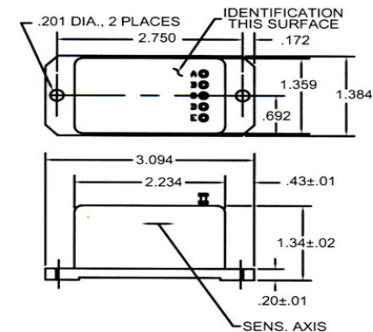
## SA-107AI, SA-107AIHP

The Columbia Models SA-107AI and SA-107AIHP Force Balance Accelerometers are designed with an output circuit configuration made for use in 4-20 mA data transmission systems. The 4-20 mA system is used extensively in industrial installations in order to transmit data over long distances in environments where interference from nearby electrical power lines could be a problem. A single +15 volt supply powers both the sensor and 4-20 mA line driver.

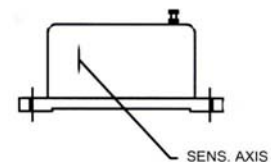
The Model SA-107AI is a low cost device, while the SA-107AIHP incorporates Columbia's patented HP torquer design providing improved accuracy and repeatability in adverse shock environments. Models SA-107BI and SA-107BIHP are similar configurations that provide voltage output in addition to current output. *Consult the factory for customized versions of these sensors.*

Note: Exports of accelerometers from the United States are subject to the licensing requirements of the Export Administration Regulations (EAR) and/or the International Traffic in Arms Regulations (ITAR).

- \* 4 To 20 mA Output
- \* +15 VDC Operation
- \* Low Cost and High Performance



### Z Option – Alternate Sensitive Axis



### I/O Terminal Pin Functions:

| SA-107AI and SA-107AIHP |                               |
|-------------------------|-------------------------------|
| Pin                     | Function                      |
| A                       | +15 VDC Power                 |
| B                       | Power Ground / Current Return |
| C                       | Current Output                |
| D                       | Spare                         |
| E                       | Spare                         |

### Ordering Information:

SA-107AI (+/- X G)

SA-107AIHP (+/- X G)

Standard Accelerometer  
Range +/- X G (Required)

1G Counterbias Option (Ranges ±1G & higher) I<sub>o</sub>

Z Option (See Above)

Y Z  
Y Z

### Specifications

| Operational                    | SA-107AI                                                               | SA-107AIHP          |
|--------------------------------|------------------------------------------------------------------------|---------------------|
| Ranges Available               | ±1 G To ±10 G                                                          | ±0.25 G To ±10 G    |
| Current Output                 | 4 To 20 mA Corresponding to F.S. Range into a Maximum Load of 600 Ohms |                     |
| Excitation                     | +15 ±1 VDC<br>50 mA Max.                                               |                     |
| Output Impedance               | 50 Megohm Typical                                                      |                     |
| Sensitive Axis Alignment       | <0.5°                                                                  |                     |
| Scale Factor Tolerance         | ±1%                                                                    |                     |
| Scale Factor Temp Coefficient  | ±0.02% / Deg C                                                         |                     |
| Zero Bias                      | 12 ±0.05 mA                                                            |                     |
| Null Temp Sensitivity          | ±0.002% F.R./ Deg C                                                    | ±0.001% F.R./ Deg C |
| Frequency Response             | DC To 50 Hz, ±5%                                                       |                     |
| Damping                        | 0.7 ±0.2                                                               |                     |
| Cross Axis Sensitivity         | 0.002 G/G                                                              |                     |
| Non-Linearity                  | ±0.1% F.R.                                                             | ±0.05% F.R.         |
| Hysteresis & Non-Repeatability | ±0.1% F.R.                                                             | ±0.05% F.R.         |
| Threshold & Resolution         | ±0.01% F.R.                                                            | ±0.001% F.R.        |

### Environmental

|                                       |                         |                         |
|---------------------------------------|-------------------------|-------------------------|
| Temperature, Operating                | -40 To +85 Deg C        |                         |
| Temperature, Storage                  | -40 To +85 Deg C        |                         |
| Vibration Survival<br>(2 To 2,000 Hz) | 5 G RMS, 0.5" Disp D.A. | 15 G RMS, 0.5" Disp D.A |
| Shock Survival                        | 125 G, 5 mSec           | 1500 G, 1 mSec          |
| Ambient Pressure                      | 0 To 5 Atmospheres      |                         |
| Humidity                              | 95% R.H.                |                         |

### Physical

|                      |                                                                          |
|----------------------|--------------------------------------------------------------------------|
| Weight               | 5 Oz (141.8 Gm)                                                          |
| Size                 | 3.50 In L x 1.70 In W x 1.40 In H<br>(8.89 cm L x 4.32 cm W x 3.56 cm H) |
| Case Material        | Anodized Aluminum                                                        |
| Sealing              | Environmental                                                            |
| Electrical Interface | 5 Terminal Pins                                                          |



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