

## Model 13

### Subminiature Load Cell



#### DESCRIPTION

Model 13 (compression only) subminiature load cell is designed to measure load ranges from 150 g to 1000 lb. With subminiature dimensions, including diameters from 0.38 in to 0.75 in and heights of 0.13 in to 0.25 in, these units are easily incorporated into systems having limited space. Model 13 combines high

frequency response and low deflection to achieve a combined non-linearity and hysteresis of 0.25 % to 0.5 % full scale. A balance module is included in the load cell's lead wire cable for temperature compensation and should not be removed.

#### FEATURES

- 150 g to 1000 lb
- 0.7 % accuracy
- mV/V output
- Subminiature design
- Single diaphragm construction

# Model 13

## PERFORMANCE SPECIFICATIONS

| Characteristic                      | Measure   |
|-------------------------------------|---|
| Load ranges <sup>6</sup>            | 150 g, 250 g, 500 g, 1000 g, 5 lb, 10 lb, 25 lb, 50 lb, 100 lb, 250 lb, 500 lb, 1000 lb |
| Linearity                           | ±0.5 % full scale   |
| Hysteresis                          | ±0.5 % full scale   |
| Non-repeatability                   | ±0.1 % full scale   |
| Tolerance on output 150 g to 500 g  | 15 mV/V (nominal)   |
| Tolerance on output 1000 g          | 1.5 mV/V (nominal)  |
| Tolerance on output 5 lb to 1000 lb | 2 mV/V (nominal)  |
| Operation                           | Compression only  |
| Resolution                          | Infinite  |

## ENVIRONMENTAL SPECIFICATIONS

| Characteristic           | Measure                             |
|--------------------------|-------------------------------------|
| Temperature, operating   | -54 °C to 121 °C [-65 °F to 250 °F] |
| Temperature, compensated | 15 °C to 71 °C [60 °F to 160 °F]    |
| Temperature effect, zero | 0.01 % full scale/°F                |
| Temperature effect, span | 0.02 % reading/°F                   |

## ELECTRICAL SPECIFICATIONS

| Characteristic                                  | Measure  |
|---|--|
| Strain gage type 150 g to 500 g                 | Semiconductor  |
| Strain gage type 1000 g to 1000 lb              | Bonded foil  |
| Excitation (calibration)                        | 5 Vdc  |
| Insulation resistance                           | 5000 mOhm @ 50 Vdc   |
| Bridge resistance (tolerance) 150 g to 500 g    | 500 ohm (nominal)  |
| Bridge resistance (tolerance) 1000 g to 1000 lb | 350 ohm (nominal)  |
| Zero balance (tolerance)                        | ±3 % of full scale (nominal)                                 |
| Shunt calibration data                          | Included   |
| Electrical termination (std)                    | 1,83 m [5 ft] integral cable with balance board <sup>3</sup> |

## MECHANICAL SPECIFICATIONS

| Characteristic          | Measure         |
|-------------------------|-----------------|
| Maximum allowable load  | See table       |
| Weight                  | See table       |
| Material                | Stainless steel |
| Deflection @ full scale | See table       |

## RANGE CODES

| Range codes | Range   |
|-------------|---------|
| <b>AL</b>   | 150 g   |
| <b>AN</b>   | 250 g   |
| <b>AP</b>   | 500 g   |
| <b>AR</b>   | 1000 g  |
| <b>AT</b>   | 5 lb    |
| <b>AV</b>   | 10 lb   |
| <b>BL</b>   | 25 lb   |
| <b>BN</b>   | 50 lb   |
| <b>BR</b>   | 100 lb  |
| <b>CN</b>   | 250 lb  |
| <b>CR</b>   | 500 lb  |
| <b>CV</b>   | 1000 lb |

## WIRING CODES

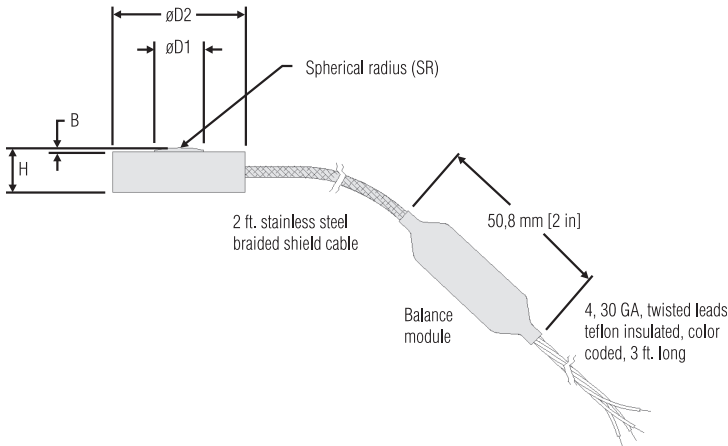
| Cable        | Unamplified    |
|--------------|----------------|
| <b>Red</b>   | (+) excitation |
| <b>Black</b> | (-) excitation |
| <b>Green</b> | (-) output     |
| <b>White</b> | (+) output     |

## DEFLECTIONS AND RINGING FREQUENCIES

| Capacity (lb) | Deflection at full scale (10 <sup>-3</sup> in) | Weight          | Weight with cable | Max. allowable load <sup>1</sup> (% FS) |
|---------------|--|-----------------|-------------------|---|
| 150 g         | 0.06   | 1 g [0.002 lb]  | 9 g [0.019 lb]    | 500                                     |
| 250 g         | 0.06   | 1 g [0.002 lb]  | 9 g [0.019 lb]    | 500                                     |
| 500 g         | 0.08   | 1 g [0.002 lb]  | 9 g [0.019 lb]    | 500                                     |
| 1000 g        | 0.05   | 1 g [0.002 lb]  | 9 g [0.019 lb]    | 150                                     |
| 5 lb          | 0.5  | 1 g [0.002 lb]  | 9 g [0.019 lb]    | 150                                     |
| 10 lb         | 0.4  | 1 g [0.002 lb]  | 9 g [0.019 lb]    | 150                                     |
| 25 lb         | 0.4  | 1 g [0.002 lb]  | 9 g [0.019 lb]    | 150                                     |
| 50 lb         | 0.4  | 1 g [0.002 lb]  | 9 g [0.019 lb]    | 150                                     |
| 100 lb        | 0.4  | 3 g [0.006 lb]  | 11 g [0.024 lb]   | 150                                     |
| 250 lb        | 0.5  | 3 g [0.006 lb]  | 11 g [0.024 lb]   | 150                                     |
| 500 lb        | 0.5  | 10 g [0.022 lb] | 18 g [0.039 lb]   | 150                                     |
| 1000 lb       | 0.6  | 10 g [0.022 lb] | 18 g [0.039 lb]   | 150                                     |

### MOUNTING DIMENSIONS

| Ranges                                     | D1                | D2                | H                 | B                  | SR                |
|--|-------------------|-------------------|-------------------|--------------------|-------------------|
| 150, 250, 500,<br>1000 g; 5, 10, 25, 50 lb | 2,29 mm [0.09 in] | 9,65 mm [0.38 in] | 3,3 mm [0.13 in]  | 0,69 mm [0.027 in] | 6,35 mm [0.25 in] |
| 100, 250 lb                                | 3,05 mm [0.12]    | 12,7 mm [0.50 in] | 3,81 mm [0.15 in] | 0,51 mm [0.020 in] | 12,7 mm [0.50 in] |
| 500 lb, 1000 lb                            | 6,35 mm [0.25 in] | 19,05 mm [0.75]   | 6,35 mm [0.25 in] | 0,64 mm [0.025 in] | 12,7 mm [0.50 in] |



### OPTION CODES

|                                 | Many range/option combinations are available in our quick-ship and fast-track manufacture programs. Please see <a href="http://sensing.honeywell.com/TMsensor-ship">http://sensing.honeywell.com/TMsensor-ship</a> for updated listings. |   |
|---------------------------------|--|---|
| <b>Load range</b>               | 150, 250, 500 g,<br>1000 g; 5, 10, 25, 50, 100, 250, 500, 1000 lb  |   |
| <b>Temperature compensation</b> | 1a. 60 °F to 160 °F<br>1b. 30 °F to 130 °F<br>1c. 0 °F to 185 °F<br>1d. -20 °F to 200 °F   | 1e. -20 °F to 200 °F<br>1j. 0 °C to 50 °C<br>1k. -20 °C to 85 °C<br>1m. -25 ° to 110 °C |
| <b>Internal amplifiers</b>      | 2u. Unamplified, mV/V output   |   |
| <b>Overload stops</b>           | 4a. Overload stops   |   |
| <b>Electrical termination</b>   | 5 ft integral cable with balance board <sup>3</sup><br>6v. Phoenix connector on end of cable<br>15d. Connector on end of cable   |   |
| <b>Special calibration</b>      | 9a. 10 point (5 up/5 down) 20 % increments @ 68 °F<br>9b. 20 point (10 up/10 down) 10 % increments @ 68 °F   |   |
| <b>Shock and vibration</b>      | 44a. Shock and vibration resistance  |   |

### TYPICAL SYSTEM DIAGRAM



## NOTES

1. Allowable maximum loads – maximum load to be applied without damage.<sup>2</sup> Loads described allow for 100 % full scale axial loading with the bending loads specified. Torque loading maximum is without axial or other load. For any other combination, consult factory.
2. Without damage - loading to this level will not cause excessive zero shift or performance degradation. The user must consider fatigue life for long term use and structural integrity. All structurally critical applications (overhead loading, etc.) should always be designed with safety redundant load paths.
3. A small, 2 in circuit board is included in the cable, 2 ft from the load cell. Do not remove this board.
4. Only for ranges greater-than-or-equal-to 1000 g.
5. Specifications may vary with this option.
6. This unit calibrated to Imperial (non-Metric) units.

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While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

### **WARNING** **PERSONAL INJURY**

- DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

### **WARNING** **MISUSE OF DOCUMENTATION**

- The information presented in this datasheet is for reference only. DO NOT USE this document as product installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

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