

## Model 53

### Low Cost Load Cell



#### DESCRIPTION

Model 53 load cells are bonded foil strain gage transducers designed for cost efficient production and testing applications (i.e. press calibration). Engineered compression force measurements up to 50K lb., this model achieves a maximum non-linearity of 0.5 % full scale. Precision gaging techniques and a stainless steel construction provides excellent long-

term stability and reliability under severe operating conditions. The Model 53 compression-only load cell has an integral load button machined as part of the load cell. The Model 53 must be mounted on a smooth flat surface for proper operation. Three tapped holes are provided for mounting.

#### FEATURES

- 5 lb to 50K lb
- Stainless steel
- Mini footprint
- Button-style design
- mV/V output

# Model 53

## PERFORMANCE SPECIFICATIONS

| Characteristic           | Measure           |
|--------------------------|-------------------|
| Load ranges <sup>5</sup> | 5 lb to 50K lb    |
| Linearity (max.)         | ±0.5 % full scale |
| Hysteresis (max.)        | ±0.3 % full scale |
| Non-repeatability (max.) | ±0.1 % full scale |
| Output (tolerance)       | 2 mV/V (nominal)  |
| Operation                | Compression       |
| 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 | ±0.005 % full scale/°F              |
| Temperature effect, span | ±0.01 % full scale/°F               |

## ELECTRICAL SPECIFICATIONS

| Characteristic                               | Measure                    |
|--|----------------------------|
| Strain gage type                             | Bonded foil                |
| Excitation (calibration)<br>5 lb to 100 lb   | 5 Vdc                      |
| Excitation (calibration)<br>250 lb to 50K lb | 10 Vdc                     |
| Insulation resistance                        | 5000 Mohm @ 50 Vdc         |
| Bridge resistance (tolerance)                | 350 ohm (nominal)          |
| Zero balance (tolerance)                     | ±3 % full scale            |
| Shunt calibration data                       | Included                   |
| Electrical termination (std)                 | Teflon cable 1.83 m [5 ft] |

## MECHANICAL SPECIFICATIONS

| Characteristic         | Measure                       |
|------------------------|-------------------------------|
| Weight                 | See table                     |
| Material               | 17-4 PH stainless steel       |
| Maximum allowable load | 150 % full scale <sup>1</sup> |
| Deflection full scale  | See table                     |
| Natural frequency      | See table                     |

## WIRING CODES

| Cable | Unamplified    |
|-------|----------------|
| Red   | (+) excitation |
| Black | (-) excitation |
| Green | (-) output     |
| White | (+) output     |

## RANGE CODES

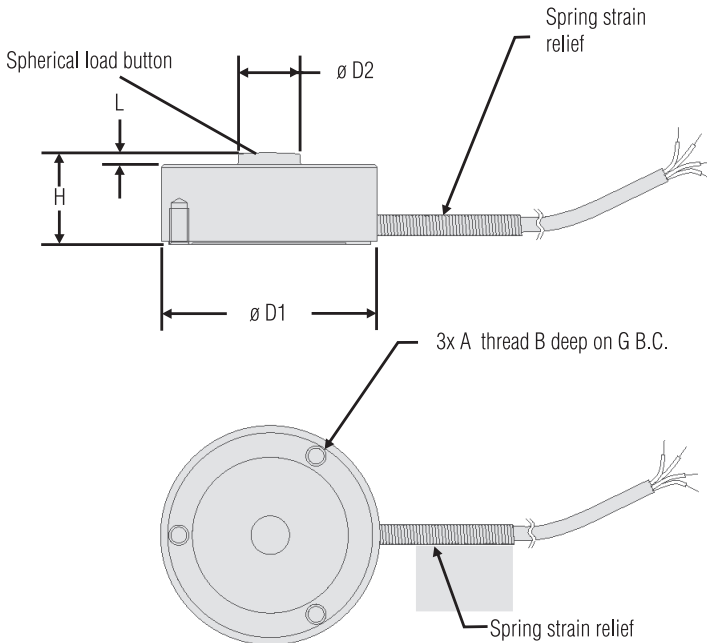
| Range Code | Available ranges | Range Code | Available ranges |
|------------|------------------|------------|------------------|
| AT         | 5 lb             | DN         | 3000 lb          |
| AV         | 10 lb            | DP         | 4000 lb          |
| BL         | 25 lb            | DR         | 5000 lb          |
| BN         | 50 lb            | DT         | 7500 lb          |
| BR         | 100 lb           | DV         | 10K lb           |
| CN         | 250 lb           | EJ         | 15K lb           |
| CR         | 500 lb           | EL         | 20K lb           |
| CV         | 1000 lb          | EN         | 30K lb           |
| DL         | 2000 lb          | EP         | 50K lb           |

## DEFLECTIONS AND RINGING FREQUENCIES

| Capacity (lb) | Deflection @ full scale (in) | Natural ringing frequency (Hz) | Weight with cable g [lb] |
|---------------|------------------------------|--------------------------------|--------------------------|
| 5             | 0.001                        | 2000                           | 59 [0.13]                |
| 10            | 0.001                        | 3000                           | 59 [0.13]                |
| 25            | 0.001                        | 16K                            | 62 [0.136]               |
| 50            | 0.001                        | 21K                            | 63 [0.138]               |
| 100           | 0.001                        | 28K                            | 64 [0.141]               |
| 250           | 0.001                        | 25K                            | 72 [0.158]               |
| 500           | 0.001                        | 32K                            | 72 [0.158]               |
| 1000          | 0.001                        | 42K                            | 75 [0.165]               |
| 2000          | 0.001                        | 53K                            | 77 [0.17]                |
| 3000          | 0.001                        | 27K                            | 137 [0.30]               |
| 4000          | 0.001                        | 31K                            | 138 [0.304]              |
| 5000          | 0.001                        | 34K                            | 140 [0.306]              |
| 7500          | 0.001                        | 41K                            | 142 [0.313]              |
| 10K           | 0.001                        | 47K                            | 145 [0.32]               |
| 15K           | 0.002                        | 24K                            | 368 [0.811]              |
| 20K           | 0.002                        | 28K                            | 372 [0.820]              |
| 30K           | 0.002                        | 33K                            | 377 [0.831]              |
| 50K           | 0.003                        | 24K                            | 1270 [2.8]               |

### MOUNTING DIMENSIONS

| Ranges lb                   | D1 mm [in]   | D2 mm [in]   | H mm [in]    | L mm [in]   | A in      | B mm [in]   | G mm [in]     |
|-----------------------------|--------------|--------------|--------------|-------------|-----------|-------------|---------------|
| 5, 10, 25, 50, 100          | 25,4 [1.00]  | 5,33 [0.21]  | 15,75 [0.62] | 1,27 [0.05] | #4-40 UNC | 5,59 [0.22] | 19,05 [0.750] |
| 250, 500, 1000, 2000        | 31,75 [1.25] | 8,13 [0.32]  | 9,91 [0.39]  | 1,78 [0.07] | #6-32 UNC | 6,35 [0.25] | 25,4 [1.000]  |
| 3000, 4000, 5000, 7500, 10K | 38,1 [1.50]  | 10,16 [0.40] | 16,0 [0.63]  | 2,03 [0.08] | #6-32 UNC | 6,35 [0.25] | 31,75 [1.250] |
| 15K, 20K, 30K               | 50,8 [2.00]  | 15,24 [0.60] | 25,4 [1.00]  | 3,05 [0.12] | #6-32 UNC | 6,35 [0.25] | 41,28 [1.625] |
| 50K                         | 76,2 [3.00]  | 19,81 [0.78] | 38,1 [1.50]  | 4,57 [0.18] | #6-32 UNC | 6,35 [0.25] | 60,33 [2.375] |



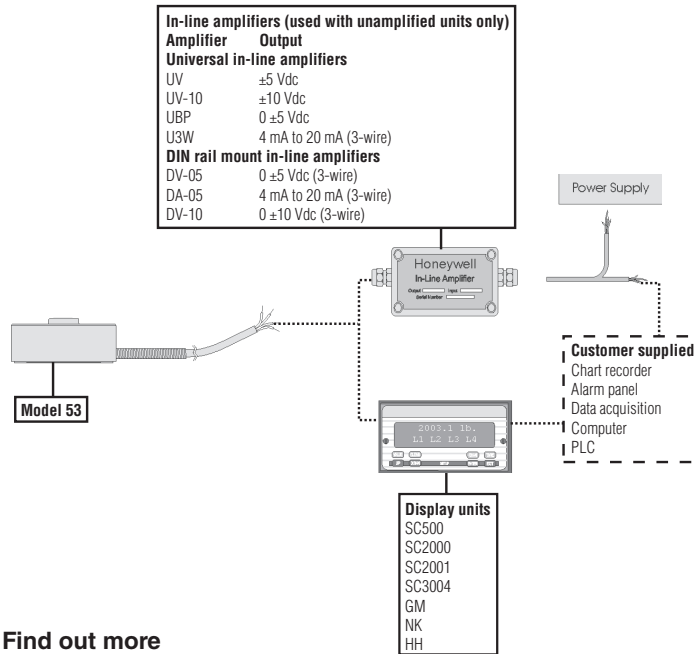
### OPTION CODES

|                                 |   |  |
|---------------------------------|---|--|
|                                 | <b>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> |  |
| <b>Load ranges</b>              | 5, 10, 25, 50, 100, 250, 500, 1000, 2000, 3000, 4000, 5000, 7500, 10K, 15K, 20K, 30K, 50K 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 130 °F<br>1e. -20 °F to 200 °F<br>1f. 70 °F to 250 °F   | 1g. 70 °F to 325 °F<br>1h. 70 °F to 400 °F<br>1i. -65 °F to 250 °F<br>1j. 0 °C to 50 °C<br>1k. -20 °C to 85 °C<br>1m. -25 °C to 110 °C |
| <b>Internal amplifiers</b>      | 2u. Unamplified, mV/V output  |  |
| <b>Electrical termination</b>   | 6d. Microtec DR-4S-4H 4-pin<br>6e. Integral cable: Teflon<br>6f. Integral cable: PVC<br>6g. Integral cable: Neoprene  | 6h. Integral cable: Silicone<br>6i. Integral underwater cable <sup>3</sup><br>6v. Phoenix 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   |  |
| <b>Interfaces</b>               | 53e. Signature calibration <sup>6</sup><br>53t. TEDS IEEE 1451.4 module <sup>4</sup>  |  |

## NOTES

1. Allowable maximum loads – maximum load to be applied without damage.<sup>2</sup>
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. Dimension "H" may increase with option 6i. Consult factory. Maximum temperature is 180 °F.
4. TEDS available with integral cable units only.
5. This unit calibrated to Imperial (non-Metric) units.
6. Signature calibration only available as inline module.

## TYPICAL SYSTEM DIAGRAM



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