

Model D

Thru-Hole Load Cell



DESCRIPTION

The Model D Donut Shaped Load Cell features a smooth thru-hole design often ideal for applications which require the load structure to pass directly through the cell. Such applications include bolt force measurements, clamping forces, and monitoring overloads. Load ranges as low as 150 grams and as great as 30,000 pounds can be measured within a maximum full

scale non-linearity and hysteresis of ± 0.5 % F.S., respectively. These models are used in compression applications and are available in multiple hole and frame sizes. For optimum performance, these cells must be mounted between load surfaces which are flat and parallel. The Model D miniature load cell is designed to have a minimum thickness.

FEATURES

- 150 g to 30000 lb
- Thru-hole design
- Flexible configuration

Model D

PERFORMANCE SPECIFICATIONS

| Characteristic | Measure |
|--|-------------------|
| Load ranges ⁸ | 150 g to 30000 lb |
| Accuracy | 1 % |
| Linearity (max.) | ±0.5 % full scale |
| Hysteresis (max.) | ±0.5 % full scale |
| Non-repeatability (max.) | ±0.1 % full scale |
| Output (tolerance) 150 g to 1000 g | 20 mV/V (nominal) |
| Output (tolerance) 5 lb to 30000 lb | 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 150 g to 1000 g | 0.01 % full scale/°F |
| Temperature effect, zero 5 lb to 30000 lb | 0.005 % full scale/°F |
| Temperature effect, span 150 g to 1000 g | 0.02 % full scale/°F |
| Temperature effect, span 5 lb to 30000 lb | 0.010 % full scale/°F |

ELECTRICAL SPECIFICATIONS

| Characteristic | Measure |
|---|---------------------|
| Strain gage type 150 g to 1000 g | Semiconductor |
| Strain gage type 5 lb to 30000 lb | Bonded foil |
| Excitation (calibration) 150 g to 1000 g | 5 Vdc |
| Excitation (calibration) 5 lb to 30000 lb | 10 Vdc |
| Insulation resistance | 5000 mOhm @ 50 Vdc |
| Bridge resistance (tolerance) 150 g to 1000 g | 500 ohm (nominal) |
| Bridge resistance (tolerance) 5 lb to 30000 lb | 350 ohm (nominal) |
| Zero balance (tolerance) | ±1 % of full scale |
| Shunt calibration data | Included |
| Electrical termination (std) | Teflon cable (5 ft) |

MECHANICAL SPECIFICATIONS

| Characteristic | Measure |
|------------------------|-----------------------|
| Maximum allowable load | 150 % FS ¹ |
| Weight | note ⁴ |
| Material | Stainless steel |
| Deflection full scale | note ⁴ |
| Natural frequency | note ⁴ |

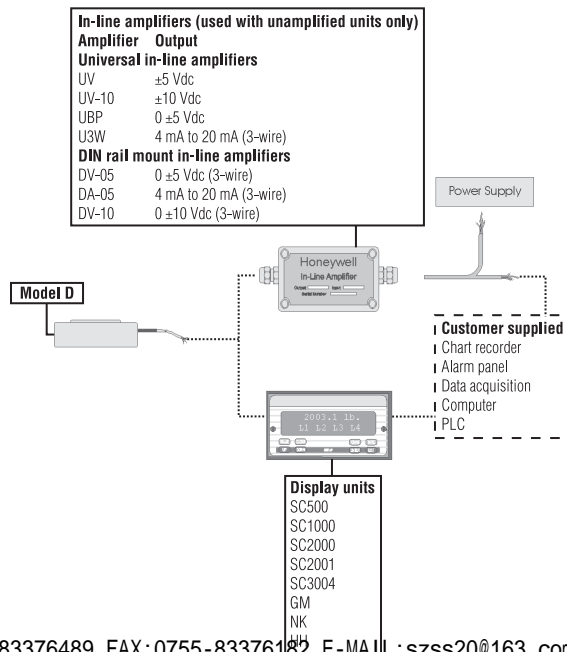
RANGE CODES

| Range Code | Available ranges | Range Code | Available ranges |
|------------|------------------|------------|------------------|
| AL | 150 g | CR | 500 lb |
| AN | 250 g | CV | 1000 lb |
| AP | 500 g | DL | 2000 lb |
| AR | 1000 g | DN | 3000 lb |
| AT | 5 lb | DR | 5000 lb |
| AV | 10 lb | DT | 7500 lb |
| BL | 25 lb | DV | 10000 lb |
| BN | 50 lb | EJ | 15000 lb |
| BR | 100 lb | EL | 20000 lb |
| CN | 250 lb | EN | 30000 lb |

WIRING CODES

| Wire | |
|-------|----------------|
| Red | (+) excitation |
| Black | (-) excitation |
| Green | (-) output |
| White | (+) output |

TYPICAL SYSTEM DIAGRAM

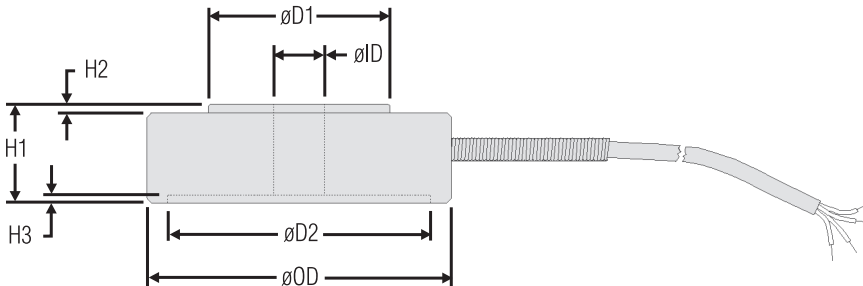


Thru-Hole Load Cell

MOUNTING DIMENSIONS

| Ranges | Order code | ØOD mm [in] | ØID mm [in] | H1 mm [in] | H2 mm [in] | H3 mm [in] | ØD1 mm [in] | ØD2 mm [in] |
|----------------------------|------------|-------------|-------------|--------------|-------------|-------------|--------------|--------------|
| 150, 250, 500, 1000 g | BL912 | 12,7 [0.50] | 2,54 [0.10] | 3,81 [0.15] | 0,51 [0.02] | 0,25 [0.01] | 5,08 [0.20] | 11,43 [0.45] |
| 5, 10 lb | BL912 | 25,4 [1.00] | 5,08 [0.20] | 7,11 [0.28] | 0,76 [0.03] | 0,51 [0.02] | 6,60 [0.26] | 21,59 [0.85] |
| 25, 50, 100 lb | BL912 | 25,4 [1.00] | 5,08 [0.20] | 7,11 [0.28] | 0,76 [0.03] | 0,51 [0.02] | 9,14 [0.36] | 21,59 [0.85] |
| Frame A (100 to 2000 lb) | BL913 | 38,1 [1.50] | See below | 12,7 [0.50] | 1,27 [0.05] | 0,76 [0.03] | 12,7 [0.50] | 30,73 [1.21] |
| Frame B (250 to 10000 lb) | BL914 | 50,8 [2.00] | See below | 16,00 [0.63] | 1,52 [0.06] | 0,76 [0.03] | 22,53 [0.88] | 42,67 [1.68] |
| Frame C (2000 to 30000 lb) | BL915 | 76,2 [3.00] | See below | 25,4 [1.0] | 2,03 [0.08] | 0,76 [0.03] | 43,18 [1.70] | 62,48 [2.46] |

Listed above are four different order codes; BL912, BL913, BL914, BL915. The frame size selection guide below indicates that with a single shell size (outside diameter), different thru holes are available for order codes BL913, BL914 and BL915 (frames A, B, and C, respectively). To choose a product, first select the desired load capacity. Then, if applicable, choose the desired inner diameter and an appropriate frame size. For example, a 250 lb load cell is available in the small frame size (A) with a nominal thru hole size of 1/8 in (P), 3/16 in (Q), 1/4 in (R) or 3/8 in (S) diameter, or in the medium frame size (B) with thru hole sizes up to 5/8 in (V). We manufacture the actual hole dimensions to provide some clearance; for example the 1/8 in (P) dimension, the actual dimension is 0.128 in.



| Hole letters | P | Q | R | S | T | V | W | Y | Z |
|--------------|------------|------------|------------|----------|----------|----------|----------|----------|----------|
| ØID (nom) | 1/8 in | 3/16 in | 1/4 in | 3/8 in | 1/2 in | 5/8 in | 3/4 in | 1 in | 1 1/4 in |
| ØID (act) | 0.128 in | 0.193 in | 0.266 in | 0.391 in | 0.532 in | 0.656 in | 0.781 in | 1.032 in | 1.281 in |
| 100 lb | A | A | A | A | NA | NA | NA | NA | NA |
| 250 lb | A or B | A or B | A or B | A or B | B | B | NA | NA | NA |
| 500 lb | A or B | A or B | A or B | A or B | B | B | NA | NA | NA |
| 1000 lb | A or B | A or B | A or B | B | B | B | NA | NA | NA |
| 2000 lb | A, B, or C | A, B, or C | A, B, or C | B or C | B or C | B or C | C | C | C |
| 3000 lb | B or C | B or C | B or C | B or C | B or C | C | C | C | C |
| 5000 lb | B or C | B or C | B or C | B or C | B or C | C | C | C | C |
| 7500 lb | B or C | B or C | B or C | B or C | B or C | C | C | C | C |
| 10000 lb | B or C | B or C | B or C | B or C | B or C | C | C | C | C |
| 15000 lb | C | C | C | C | C | C | C | C | C |
| 20000 lb | C | C | C | C | C | C | C | C | C |
| 30000 lb | C | C | C | C | C | C | C | C | C |

Model D

Thru-Hole Load Cell

OPTION CODES

| | | |
|---|---|---|
| | Many range/option combinations are available in our quick-ship and fast-track manufacture programs. Please see http://sensing.honeywell.com/TMsensor-ship for updated listings. | |
| Load ranges | 150 g, 250 g, 500 g, 1000 g; 5, 10, 25, 50, 100, 250, 500, 1000, 2000, 3000, 5000, 7500, 10000, 15000, 20000, 30000 lb | |
| Temperature compensation | 1a. 60 °F to 160 °F 1b. 30 °F to 130 °F 1c. 0 °F to 185 °F 1d. -20 °F to 130 °F 1e. -20 °F to 200 °F | 1f. 70 °F to 250 °F 1g. 70 °F to 325 °F ³ 1h. 70 °F to 400 °F ³ 1i. -65 °F to 250 °F |
| Internal amplifiers | 2u. Unamplified, mV/V output | |
| Electrical termination | 6e. Integral cable: Teflon (5 ft) 6a. Bendix PTIH-10-6P (or equivalent), 6-pin (max. 250 °F) on end of cable 6v. Phoenix connector on end of cable 6i. Integral underwater cable ⁶ | |
| Electrical connector orientation | 15d. Connector on end of cable ⁵ | |
| Load direction | 30a. Positive in compression, compression testing only 30c. Negative in compression, compression testing only | |
| Shock and vibration | 44a. Shock and vibration resistance | |
| Interfaces | 53s. Signature calibration ⁵ (Inline) 53t. TEDS IEEE 1451.4 module ⁷ (Inline) | |

NOTES

1. Allowable maximum loads – maximum load to be applied without damage.² 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 of 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. Only for ranges greater than or equal to 5 lb.
4. Varies by features selected, consult factory.
5. Be sure to specify electrical termination option 6a or 6v in option code. For custom connector, consult factory.
6. Dimension "H1" may increase with this option, consult factory. Not available with option 1c, 1e, 1f, 1g, 1h, or 1i.
7. Only available with integral cable units.
8. This unit calibrated to Imperial (non-Metric) units.

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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.

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