

## 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  $\pm 0.5$  % 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 <sup>8</sup>	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 <sup>1</sup>
Weight	note <sup>4</sup>
Material	Stainless steel
Deflection full scale	note <sup>4</sup>
Natural frequency	note <sup>4</sup>

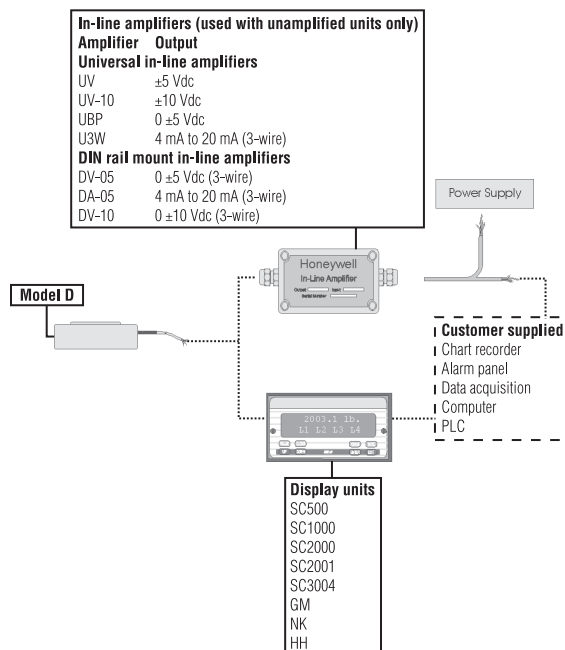
## RANGE CODES

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

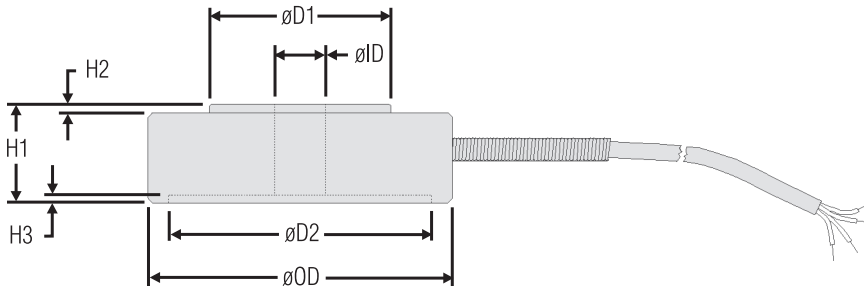
## TYPICAL SYSTEM DIAGRAM



### 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

	<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>	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	
<b>Temperature compensation</b>	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 <sup>3</sup> 1h. 70 °F to 400 °F <sup>3</sup> 1i. -65 °F to 250 °F
<b>Internal amplifiers</b>	2u. Unamplified, mV/V output	
<b>Electrical termination</b>	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 <sup>6</sup>	
<b>Electrical connector orientation</b>	15d. Connector on end of cable <sup>5</sup>	
<b>Load direction</b>	30a. Positive in compression, compression testing only 30c. Negative in compression, compression testing only	
<b>Shock and vibration</b>	44a. Shock and vibration resistance	
<b>Interfaces</b>	53s. Signature calibration <sup>5</sup> (Inline) 53t. TEDS IEEE 1451.4 module <sup>7</sup> (Inline)	

## 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 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.

**Warranty.** Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

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.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

For more information about Sensing and Control products, visit [www.honeywell.com/sensing](http://www.honeywell.com/sensing) or call +1-815-235-6847

Email inquiries to [info.sc@honeywell.com](mailto:info.sc@honeywell.com)

### **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 catalogue 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.**

Sensing and Control  
Automation and Control Solutions  
Honeywell  
1985 Douglas Drive North  
Golden Valley, MN 55422 USA  
+1-815-235-6847  
[www.honeywell.com/sensing](http://www.honeywell.com/sensing)

008649-2-EN IL50 GLO  
December 2008  
Copyright © 2008 Honeywell International Inc. All rights reserved.

# Honeywell