

Model 75

Precision Low Profile Load Cell



DESCRIPTION

Honeywell's Model 75 load cells are engineered for applications such as materials or product fatigue testing, which involve an extremely large number of cycles or occasional overload conditions. These fatigue rated load cells have load ranges from 50 lb to 200,000 lbs and achieve a non-linearity of 0.1% full scale. The superior design of these bonded foil, strain gage compression and/or tension load cells permits a fatigue life of 1 billion cycles (zero to full scale).

Model 75 measures tension/compression and must be used on a smooth flat surface to achieve rated specifications. The tension/compression Model 75 is designed with the threaded hole running completely through the center of the cell. Model 75 utilizes two stabilizing diaphragms, which are welded to the sensing member to reduce off-center and side-loading effects.



FEATURES

- 0.10 % accuracy
- 50 lb to 200000 lb
- mV/V output (standard); 4 mA to 20 mA or 0 Vdc to 5 Vdc (optional) outputs
- Stainless steel
- Double diaphragm design
- Enhanced overload capacity
- Intrinsically safe available (2N option only)⁸
- CE approved⁹

Model 75

PERFORMANCE SPECIFICATIONS

| Characteristic | Measure |
|---------------------------|-------------------------------------------------------------------------|
| Load ranges ¹⁰ | 50 lb to 200000 lb |
| Non-linearity | ±0.1 % full scale |
| Hysteresis | ±0.1 % full scale |
| Non-repeatability | ±0.03 % full scale |
| Output (tolerance) | 2 mV/V ±0.5 % full scale |
| Operation | Compression/tension |
| Resolution | Infinite |
| Standard calibration | 5-point calibration, 0 %, 50 %, and 100 % of full scale in tension only |

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 | 0.002 % full scale/°F |
| Temperature effect, span | 0.002 % full scale/°F |

ELECTRICAL SPECIFICATIONS

| Characteristic | Measure |
|------------------------------------------------------|-------------------------------|
| Strain gage type | Bonded foil |
| Excitation (calibration) | 10 Vdc |
| Insulation resistance | 5000 mOhm @ 50 Vdc |
| Bridge resistance (tolerance) | 350 ohm |
| Zero balance (tolerance) | ±1 % full scale |
| Shunt calibration data | Included |
| Electrical termination (std) 50 lb to 2000 lb | PTIH-10-6P |
| Electrical termination (std) 3000 lb to 200000 lb | MS3102E-14S-6P |
| Mating connector (not incl.) 50 lb to 2000 lb | PT06A-10-6S or equiv. (AA111) |
| Mating connector (not incl.) 3000 to 200000 lb | MS3106A-14S-6S (AA121) |

MECHANICAL SPECIFICATIONS

| Characteristic | Measure |
|------------------------|-----------------------------------------|
| Maximum allowable load | 200 % FS ² |
| Weight | See table |
| Material ≤ 100000 lb | 17-4PH stainless steel |
| Material ≥ 125000 lb | Carbon steel |
| Life cycles (approx.) | > 10 ⁸ cycles fully reversed |
| Deflection | See table |
| Natural frequency | See table |

RANGE CODES

| Range Code | Available ranges | Range Code | Available ranges |
|------------|------------------|------------|------------------|
| BN | 50 lb | DV | 10000 lb |
| BR | 100 lb | EJ | 15000 lb |
| CN | 250 lb | EL | 20000 lb |
| CR | 500 lb | EN | 30000 lb |
| CV | 1000 lb | EP | 50000 lb |
| DL | 2000 lb | ER | 75000 lb |
| DN | 3000 lb | ET | 100000 lb |
| DP | 4000 lb | FJ | 150000 lb |
| DR | 5000 lb | FL | 200000 lb |
| DT | 7500 lb | | |

WIRING CODES

| Connector | Unamplified (Std.) |
|-----------|--------------------|
| A | (+) excitation |
| B | (+) excitation |
| C | (-) excitation |
| D | (-) excitation |
| E | (-) output |
| F | (+) output |

DEFLECTIONS AND RINGING FREQUENCIES

| Capacity (lb) | Deflection @ full scale (in) | Natural ringing frequency (kHz) | Weight g [lb] |
|-------------------------|------------------------------|---------------------------------|---------------|
| 50 to 500 | 0.001 | 2.5 | 730 [1.61] |
| 1000 to 2000 | 0.002 | 10 | 900 [1.98] |
| 3000 to 7500 | 0.002 | 8 | 4000 [8.82] |
| 10000 to 20000 | 0.003 | 10 | 5000 [11.02] |
| 30000 to 50000 | 0.003 | 8.2 | 8600 [18.96] |
| 75000 to 100000 | 0.004 | 7.5 | 15000 [33.07] |
| 150000 to 200000 | 0.006 | 4.5 | 21000 [46.3] |

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INTERNAL AMPLIFIERS

| Amplifier specifications | Voltage output: Option 2b | Voltage output: Option 2c | Voltage output: Option 2t | Current three-wire: Option 2j | Current two-wire: Option 2k | Intrinsically safe amp: Option 2n (2N)*** |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Output signal | ±5 V | 0 V to 5 V or ±5 V @ 45 mA | 0 V to 10 V or ±10 V @ 45 mA | 4 mA to 20 mA | 4 mA to 20 mA | 4 mA to 20 mA |
| Input power (voltage) | ±15 V or 26 Vdc to 32 Vdc | 11 Vdc to 28 Vdc | 15 Vdc to 28 Vdc | 22 Vdc to 32 Vdc | 15 Vdc to 40 Vdc | 9 Vdc to 28 Vdc |
| Input power (current) | 45 mA | 40 mA | 40 mA | 65 mA | 4 mA to 28 mA | 4 mA to 24 mA |
| Freq. resp (amp) | 3000 Hz | 3000 Hz | 3000 Hz | 2500 Hz | 300 Hz | 2000 Hz |
| Power supply rej. | 60 db | 60 db | 60 db | 60 db | 60 db | 60 db |
| Operating temp. | -20 °F to 185 °F | -20 °F to 185 °F | -20 °F to 185 °F | 0 °F to 185 °F | 0 °F to 185 °F | -20 °F to 185 °F |
| Reverse voltage protection | Yes | Yes | Yes | Yes | Yes | Yes |
| Short cir. protection | Momentary | Momentary | Momentary | Yes | Yes | Yes |
| Wiring code: connector (std) ⁴ | A (+) Supply B Output common C Supply return D (+) Output E Shunt cal 1 F Shunt cal 2 | A (+) Supply B Output common** C Supply return ** D (+) Output E Shunt cal 1 F Shunt cal 2 | A (+) Supply B Output common** C Supply return** D (+) Output E Shunt cal 1 F Shunt cal 2 | A (+) Supply B Output common** C Supply return** D (+) Output E Shunt cal 1 F Shunt cal 2 | A (+) Supply B No connection C No connection D (+) Output E Case ground F No connection | A (+) Supply B No connection C No connection D (+) Output E Case ground F No connection |
| Wiring code: cable ^{4,5,6} | R (+) Supply Bl Output common G Supply return W (+) Output B Shunt cal 1 Br Shunt cal 2 | R (+) Supply Bl Output common* G Supply return* W (+) Output B Shunt cal 1 Br Shunt cal 2 | R (+) Supply Bl Output common* G Supply return* W (+) Output B Shunt cal 1 Br Shunt cal 2 | R (+) Supply Bl Output common* G Supply return* W (+) Output B Shunt cal 1 Br Shunt cal 2 | R (+) Supply Bl (+) Output W Case ground | R (+) Supply Bl (+) Output W Case ground |

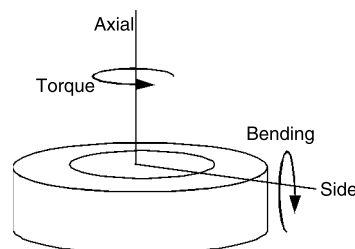
* Black and green wires are internally connected.

** Pins B and C are internally connected.

*** See our Web site (<http://measurementsensors.honeywell.com>) for the most up-to-date information regarding intrinsically safe approvals, ref. #008-0547-00.

ALLOWABLE MAXIMUM LOADS²

| Capacity (lb) | Side load (lb) | Bending (lb-in) | Torque (lb-ft) |
|------------------|----------------|-----------------|----------------|
| 50 to 500 | 75 % | 60 % | 35 % |
| 1000 to 2000 | 45 % | 35 % | 35 % |
| 3000 to 7500 | 30 % | 30 % | 25 % |
| 10000 to 20000 | 30 % | 30 % | 25 % |
| 30000 to 50000 | 30 % | 30 % | 15 % |
| 75000 to 100000 | 30 % | 30 % | 15 % |
| 150000 to 200000 | 30 % | 30 % | 15 % |



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OPTION CODES

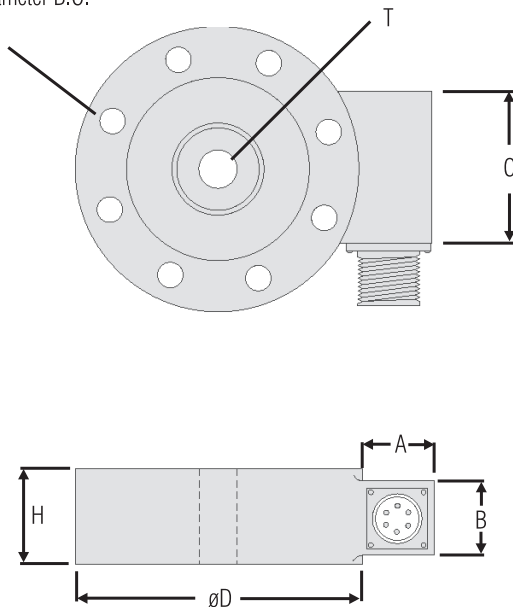
| | Many range/option combinations are available in our quick-ship and fast-track manufacture programs. Please see http://measurementsensors.honeywell.com for updated listings. | |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Load ranges | 50, 100, 250, 500, 1000, 2000, 3000, 4000, 5000, 7500, 10000, 15000, 20000, 30000, 50000, 75000, 150000, 200000 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 ¹³ 1h. 70 °F to 400 °F ¹³ 1i. -65 °F to 250 °F ¹³ 1j. 0 °C to 50 °C 1k. -20 °C to 85 °C 1m. -25 °C to 110 °C |
| Internal amplifiers | 2b. Four wire, ±5 Vdc output 2c. 0 Vdc to 5 Vdc 2j. 4 mA to 20 mA (three-wire) output 2k. 4 mA to 20 mA (two-wire) ¹² | 2n (2N) 4 mA to 20 mA (two-wire) intrinsically safe ¹² 2t. 0 Vdc to 10 Vdc output 2u. Unamplified, mV/V output |
| Internal amplifier enhancements | 3a. Input/output isolation ¹¹ 3d. Remote buffered shunt calibration ⁸ | |
| Electrical termination | 6a. Bendix PTIH-10-6P (ranges to 2000 lb) 6b. MS connector MS3102E-14S-6P (mates with MS3106E-14S-6S) (max. 160 °F) (ranges 2000 lb and above) ¹⁴ 6e. Integral cable: Teflon 6f. Integral cable: PVC | 6g. Integral cable: Neoprene 6h. Integral cable: Silicone 6i. Integral underwater cable 6j. 1/2-14 conduit fitting with 5 ft of 4 conductor PVC cable |
| Shunt calibration | 8a. Precision internal resistor ¹³ | |
| Bridge resistance | 12b. 5000 ohm (foil) (max. 250 °F) | |
| Bridge type | 31a. Dual bridge | |
| Zero and span adjustment | 14a. No access to pots 14b. Top access to pots | |
| Electrical connector orientation | 15a. Horizontal electrical exit port orientation 15b. Vertical electrical exit port orientation 15c. Radial electrical exit port orientation 15d. Connector on end of cable | |
| Special calibration | 30a. Compression only calibration, positive in compression 30b. Tension and compression calibration, positive in tension | |
| Shock and vibration | 44a. Shock and vibration resistance | |
| Interfaces | 53e. Signature calibration ¹³ 53t. TEDS IEEE 1451.4 module ⁷ | |

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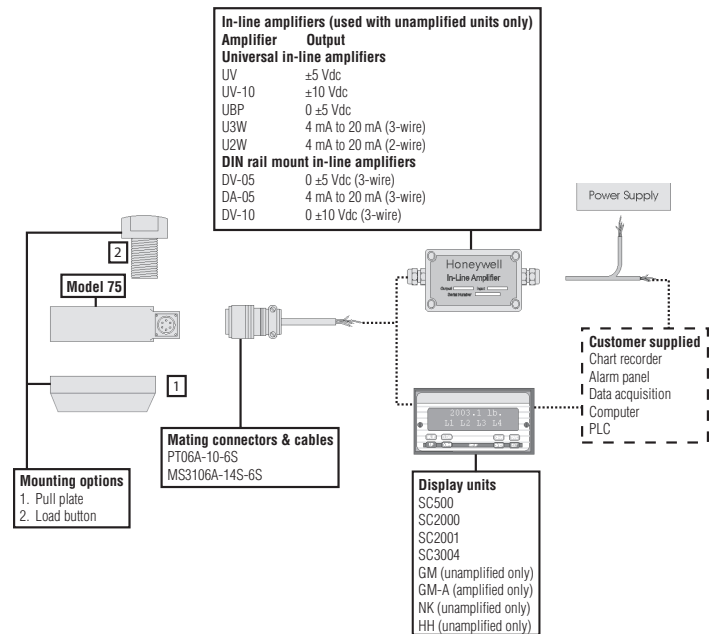
MOUNTING DIMENSIONS

| Ranges lb | D mm [in] | H mm [in] | F # | ØG mm [in] B.C. | ØK mm [in] thru | T | A mm [in] | A* mm [in] | B mm [in] | B* mm [in] | C mm [in] |
|-----------------|---------------|---------------|-----|-----------------|-----------------|-------------|--------------|-------------|--------------|-------------|--------------|
| 50 to 500 | 76,2 [3.00] | 25,4 [1.00] | 6 | 57,15 [2.250] | 7,11 [0.28] | 3/8-24 UNF | 20,83 [0.82] | 63,5 [2.5] | 19,05 [0.75] | 22,86 [0.9] | 31,75 [1.25] |
| 1000 to 2000 | 88,9 [3.50] | 25,4 [1.00] | 6 | 66,68 [2.625] | 8,64 [0.34] | 1/2-20 UNF | 20,83 [0.82] | 63,5 [2.5] | 19,05 [0.75] | 22,86 [0.9] | 31,75 [1.25] |
| 3000 to 7500 | 139,7 [5.50] | 45,72 [1.80] | 8 | 114,3 [4.500] | 10,16 [0.40] | 1-14 UNS | 31,75 [1.25] | 58,42 [2.3] | 38,1 [1.50] | 38,1 [1.5] | 50,8 [2.00] |
| 10000 to 20000 | 152,4 [6.00] | 45,72 [1.80] | 8 | 123,83 [4.875] | 13,46 [0.53] | 1 1/2-12 UN | 31,75 [1.25] | 58,42 [2.3] | 38,1 [1.50] | 38,1 [1.5] | 50,8 [2.00] |
| 30000 to 50000 | 190,5 [7.50] | 50,8 [2.00] | 8 | 152,4 [6.00] | 19,81 [0.78] | 2-12 UN | 31,75 [1.25] | 58,42 [2.3] | 38,1 [1.50] | 38,1 [1.5] | 50,8 [2.00] |
| 75000 to 100000 | 228,6 [9.0] | 63,5 [2.50] | 12 | 196,85 [7.75] | 16,76 [0.66] | 2 1/2-12 UN | 31,75 [1.25] | 58,42 [2.3] | 38,1 [1.50] | 38,1 [1.5] | 50,8 [2.00] |
| 150000, 200000 | 355,6 [14.00] | 107,95 [4.25] | 12 | 298,45 [11.750] | 26,16 [1.03] | 3 1/2-8 UN | 31,75 [1.25] | 58,42 [2.3] | 38,1 [1.50] | 38,1 [1.50] | ** |

F Clearance holes equally spaced on G diameter B.C.
K diameter thru



TYPICAL SYSTEM DIAGRAM



NOTES

1. C dimension varies on high ranges. Consult factory.
2. Allowable maximum loads - maximum load to be applied without damage.³
3. 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.
4. Interconnecting shunt cal. 1 terminal with shunt cal. 2 terminal provides 50 % (unamplified units), 75 % (4 mA to 20 mA three-wire units) or 80 % (voltage amplified units) of full scale output for quick calibration. Shunt calibration comes standard with internal amplifier option 2a, 2b, 2c, 2t and 2j.
5. O=Orange; Y=Yellow; B=Blue; Bl=Black; R=Red; Br=Brown; W=White; G=Green. Color specifying cable and number or letter specifying connector.
6. No mating connector necessary for cable option.
7. Consult factory for TEDS availability with amplified models.
8. Range dependent; consult factory. Termination dependent; consult factory.
9. Internal amp and termination dependent; consult factory.
10. This unit calibrated to Imperial (non-Metric) units.
11. Input/output isolation only available with voltage output (2b or 2c) amplifiers.
12. 5000 ohm bridge required.
13. Cannot be used with amplified option.
14. Cannot be used with options 1c, 1e, 1f, 1g, 1h, or 1i.

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- 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.

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WARNING

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