

Model 73

Precision Fatigue-Rated Low Profile Load Cell



DESCRIPTION

Honeywell's Model 73 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 lbs to 200,000 lbs and achieve a non-linearity of 0.1% full scale. The superior design of these bonded foil, strain gage compression load cells permits a fatigue life of 1 billion cycles (zero to full

scale). Model 73 measures compression only. It must be used on a smooth flat surface to achieve rated specifications. The load button on Model 73 is an integral part of the load cell and cannot be removed or changed. Model 73 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) output
- Stainless steel
- Double diaphragm design
- Enhanced overload capacity
- Intrinsically safe available (2N option only)⁷
- CE approved⁸

Model 73

PERFORMANCE SPECIFICATIONS

Characteristic	Measure
Load ranges ⁹	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
Resolution	Infinite
Standard calibration	5-point calibration, 0 %, 50 %, and 100 % F.S. in compression 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 (nominal)
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 50 lb to 2000 lb (not incl.)	PT06A-10-6S or equiv. (AA111)
Mating connector 3000 to 200000 lb (not incl.)	MS3106A-14S-6S (AA121)

MECHANICAL SPECIFICATIONS

Characteristic	Measure
Maximum allowable load	200 % FS ²
Weight	See table
Material	17-4PH stainless 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		

DEFLECTIONS AND RINGING FREQUENCIES

Capacity (lb)	Deflection @ full scale (in)	Natural ringing frequency (Hz)	Weight g (lb)
50 to 500	0.001	4500	730 [1.6]
1000 to 2000	0.002	8000	952,54 [2.1]
3000 to 10000	0.002	9000	2948,35 [6.5]
15000 to 50000	0.003	10000	2993,70 [6.6]
75000 to 100000	0.004	13000	5443,10 [12.0]
150000 to 200000	0.006	11000	12020,19 [26.5]

WIRING CODES

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

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INTERNAL AMPLIFIERS

Amplifier specifications	Voltage output: Option 2a	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	0 V to 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 BI Output common G Supply return W (+) Output B Shunt cal 1 Br Shunt cal 2	R (+) Supply BI Output common* G Supply return* W (+) Output B Shunt cal 1 Br Shunt cal 2	R (+) Supply BI Output common* G Supply return* W (+) Output B Shunt cal 1 Br Shunt cal 2	R (+) Supply BI Output common* G Supply return* W (+) Output B Shunt cal 1 Br Shunt cal 2	R (+) Supply BI (+) Output W Case ground	R (+) Supply BI (+) Output W Case ground

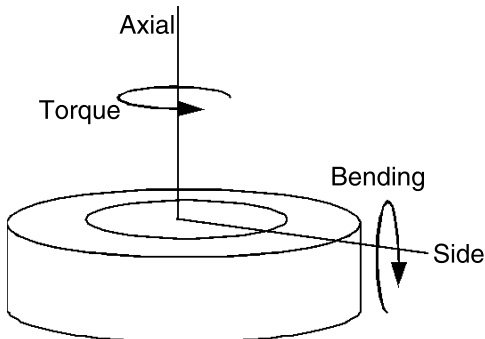
* Black and green wires are internally connected.

** 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 (% FS)	Bending (lb-in)	Torque (lb-ft)
50 to 500	75 %	60 %	35 %
1000 to 2000	45 %	35 %	35 %
3000 to 10000	30 %	30 %	35 %
15000 to 50000	30 %	30 %	25 %
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, 100000, 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 ¹² 1h. 70 °F to 400 °F ¹² 1i. -65 °F to 250 °F ¹² 1j. 0 °F to 50 °C 1k. -20 °C to 85 °C 1m. -25 °C to 110 °C
Internal amplifiers	2b. Four-wire, 0 Vdc to 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) ¹¹	2n (2N) 4 mA to 20 mA (two-wire) intrinsically safe ¹¹ 2t. 0 Vdc to 10 Vdc output 2u. Unamplified, mV/V output
Internal amplifier enhancements	3a. Input/output isolation ¹⁰ 3d. Remote buffered shunt calibration ⁸	
Electrical termination	6a. Bendix PTIH-10-6P (or equivalent), 6-pin (max. 250 °F) 6b. MS connector MS3102E-14S-6P (mates with MS3106E-14S-6S) (max. 160 °F) (ranges 2000 and above) ¹³ 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 ¹²	
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, positive output 9a. 10 point (5 up/5 down) 20 % increments @ 70 °F 9b. 20 point (10 up/10 down) 10 % increments @ 70 °F 9c. ASTM E-74 calibration	
Shock and vibration	44a. Shock and vibration resistance	
Interfaces	53e. Signature calibration ¹² 53t. TEDS IEEE 1451.4 module ⁶	

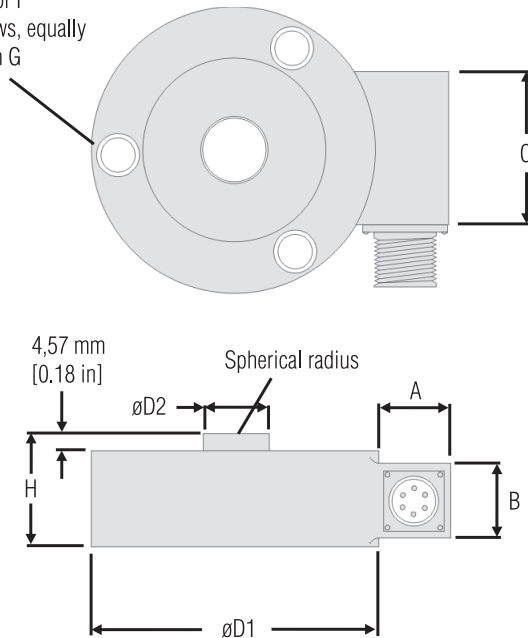
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MOUNTING DIMENSIONS

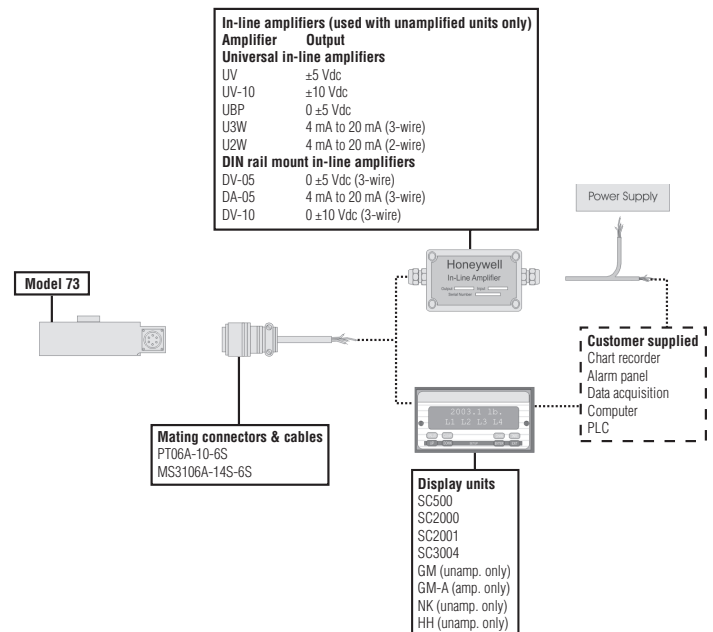
Ranges lb	D1 mm [in]	D2 mm [in]	H mm [in]	ØF type. dia.	G mm [in] B.C.	A mm [in]	A* mm [in]	B mm [in]	B* mm [in]	C mm [in]
50 to 500	76,2 [3.00]	14,22 [0.56]	29,97 [1.18]	1/4	57,15 [2.250]	20,83 [0.82]	63,5 [2.5]	19,05 [0.75]	22,86 [0.9]	31,75 [1.25]
1000 to 2000	88,9 [3.50]	17,53 [0.69]	29,97 [1.18]	5/16	66,68 [2.625]	20,83 [0.82]	63,5 [2.5]	19,05 [0.75]	22,86 [0.9]	31,75 [1.25]
3000 to 10000	114,3 [4.50]	38,1 [1.50]	50,8 [2.00]	3/8	46,27 [3.790]	31,75 [1.25]	58,42 [2.3]	38,1 [1.50]	38,1 [1.5]	50,8 [2.00]
15000 to 50000	114,3 [4.50]	38,1 [1.50]	50,8 [2.00]	3/8	46,27 [3.790]	31,75 [1.25]	58,42 [2.3]	38,1 [1.50]	38,1 [1.5]	50,8 [2.00]
75000 to 100000	139,7 [5.50]	50,8 [2.00]	55,37 [2.18]	3/8	122,22 [4.812]	31,75 [1.25]	58,42 [2.3]	38,1 [1.50]	38,1 [1.5]	50,8 [2.00]
150000 to 200000	190,5 [7.50]	63,5 [2.50]	68,1 [2.68]	3/8	171,45 [6.750]	31,75 [1.25]	58,42 [2.3]	38,1 [1.50]	38,1 [1.5]	50,8 [2.00]

* Length of load cell with amplified option (see option codes)

3 Clearance holes for F socket HD cap screws, equally spaced as shown on G diameter B.C.



TYPICAL SYSTEM DIAGRAM



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NOTES

1. Allowable maximum loads - maximum load to be applied without damage.²
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. 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.
4. 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.
5. No mating connector necessary for cable option.
6. Consult factory for TEDS availability with amplified models.
7. Range dependent; consult factory. Termination dependent; consult factory.
8. Internal amp and termination dependent; consult factory.
9. This unit calibrated to Imperial (non-Metric) units.
10. Input/output isolation only available with voltage output (2b or 2c) amplifier.
11. 5000 ohm bridge required.
12. Cannot be used with amplified option.
13. Cannot be used with options 1c, 1e, 1f, 1g, 1g, or 1i.

Find out more

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