

Model 41 Precision Low Profile Load Cell



- 5 lb to 500000 lb
- mV/V output
- Double diaphragm design
- Intrinsically safe available (2N option only)¹⁶
- CE approved¹⁷

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 3-wire units) or 80 % (voltage amplified units) of full scale output for quick calibration. Shunt calibration comes standard with internal amplifier option 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. Adding any internal amplifiers on 5 lb to 25 lb ranges will increase delivery time.
7. Option 2n (2N) on 5 to 5000 lb. ranges will typically take 12 weeks for delivery.
8. Option 3d is not available with option 2n (2N) or 2k.
9. Not available with option 1c, 1e, 1f, 1g, 1h or 1i.
10. Consult factory.
11. Availability varies with range, consult factory.
12. Option only pertinent when option 2n (2N) selected.
13. Standard calibration for tension/compression load cells is in tension only.
14. Not available with amplified output.
15. Consult factory for TEDS availability with amplified models.
16. Range dependent; consult factory. Termination dependent; consult factory.
17. Internal amp and termination dependent; consult factory.
18. This unit calibrated to Imperial (non-Metric) units.

How to order: (Quick-ship range/option combinations available. See Web site.)

Combine the order code, range code, and option code. For example:

AL111 **CV** **6h**
Order code Range code Option codes

Order codes

AL111 Model 41 precision low profile load cell

Range codes

Range codes	Range
AT	5 lb
AV	10 lb
BL	25 lb
BN	50 lb
BR	100 lb
CN	250 lb
CR	500 lb
CV	1000 lb
DL	2000 lb
DN	3000 lb
DP	4000 lb
DR	5000 lb
DT	7500 lb

Range codes	Range
DV	10000 lb
EJ	15000 lb
EL	20000 lb
EN	30000 lb
EP	50000 lb
ER	75000 lb
ET	100000 lb
FJ	150000 lb
FL	200000 lb
FN	300000 lb
FP	400000 lb
FR	500000 lb

Specifications

Performance

Load ranges ¹⁸	5 lb to 500000 lb
Non-linearity, 5 lb to 25 lb	±0.2 % full scale
Non-linearity, 50 lb to 500000 lb	±0.1 % full scale
Hysteresis, 5 lb to 25 lb	±0.1 % full scale
Hysteresis, 50 lb to 500000 lb	±0.08 % full scale
Non-repeatability, 5 lb to 25 lb	±0.1 % full scale
Non-repeatability, 50 lb to 500000 lb	±0.03 % full scale
Output (tolerance), 5 lb to 25 lb	2 mV/V ±0.5 % full scale
Output (tolerance), 50 lb to 500000 lb	3 mV/V ±0.5 % full scale
Operation	Compression/tension ¹³
Resolution	Infinite
Standard calibration	5-point calibration: 0 %, 50 % and 100 % of full scale in tension only

Environmental

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

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)	
5 lb to 5000 lb	PTIH-10-6P
7500 lb to 500000 lb	MS3102E-14S-6P
Mating connector (not included)	
5 lb to 5000 lb	PT06A-10-6S or equiv. (AA111)
7500 to 500000 lb	MS3106A-14S-6S (AA121)

Mechanical

Maximum allowable load	150 % FS ¹
Weight	See table
Material	
Less than 200,000 lb	17-4PH stainless steel
Greater than or equal to 300000 lb	Carbon steel
Deflection	See table
Natural frequency	See table



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 (Hz)	Weight (lb)
5 to 25	0.001	2000	0.8
50 to 1000	0.002	4600	1.5
2000 to 5000	0.002	10000	2.0
7500 to 15000	0.003	6000	8.8
20000 to 50000	0.004	8000	11.0
75000 to 100000	0.006	5500	30.9
150000 to 200000	0.010	4500	46.3
300000 to 500000	0.010	4100	130.1

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	0-5 V or ±5 V @ 45 mA	0-10 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 Vdc or 26-32 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 com* G Supply return* W (+) Output B Shunt Cal 1 Br Shunt Cal 2	R (+) Supply Bl Output com* G Supply return* W (+) Output B Shunt Cal 1 Br Shunt Cal 2	R (+) Supply Bl Output com* 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

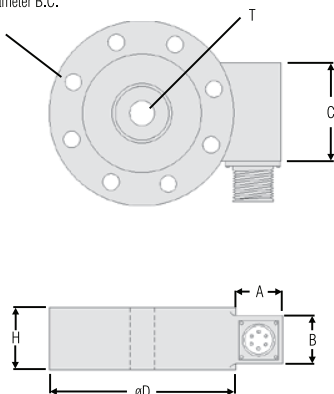
* Black and green wires are internally connected.
 ** Pins B and C are internally connected.
 *** See our Web site for the most up-to-date information regarding intrinsically safe approvals, ref. #008-0547-00.

Mounting dimensions and characteristics

Ranges lbD	mm [in]H	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]
5, 10, 25	63,5 [2.50]	20,32 [0.80]	44,45 [1.75]	6	50,8 [2.000]	4,83 [0.19]	1/4-28 UNF	20,83 [0.82]	63,5 [2.5]	19,05 [0.75]	22,86 [0.9]	31,75 [1.25]
50, 100, 250, 500, 1000	76,2 [3.00]	25,4 [1.00]	44,45 [1.75]	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]
2000, 3000, 4000, 5000	88,9 [3.50]	25,4 [1.00]	44,45 [1.75]	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]
7500, 10000, 15000	139,7 [5.50]	45,7 [1.80]	45,7 [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]
20000, 30000, 50000	152,4 [6.00]	45,7 [1.80]	45,7 [1.80]	8	123,83 [4.875]	13,46 [0.53]	1 1/2-12 UNF	31,75 [1.25]	58,42 [2.3]	38,1 [1.50]	38,1 [1.5]	50,8 [2.00]
75000, 100000	228,6 [9.00]	63,5 [2.50]	63,5 [2.50]	12	196,85 [7.750]	16,76 [0.66]	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	279,4 [11.00]	63,5 [2.50]	63,5 [2.50]	12	241,3 [9.500]	19,81 [0.78]	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]
300000, 400000, 500000	355,6 [14.00]	107,95 [4.25]	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 [1.5]	**

* Length of load cell with amplified option (see option codes)
 ** C dimension varies on high ranges. Consult factory
 *** H dimension with 2n(2N) amplifier

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



Special requirements (consult factory)

Have a special requirement? New diameter cable, different cable lengths, radiation proof, psi, output options, temperature settings, TEDS IEEE 1451.4 modules, or materials? Consult our factory by calling +1 614-850-5000 (800-848-6564). Customization is key to our test and measurement business. Special outputs, wiring codes, and calibrations are all standard to us.

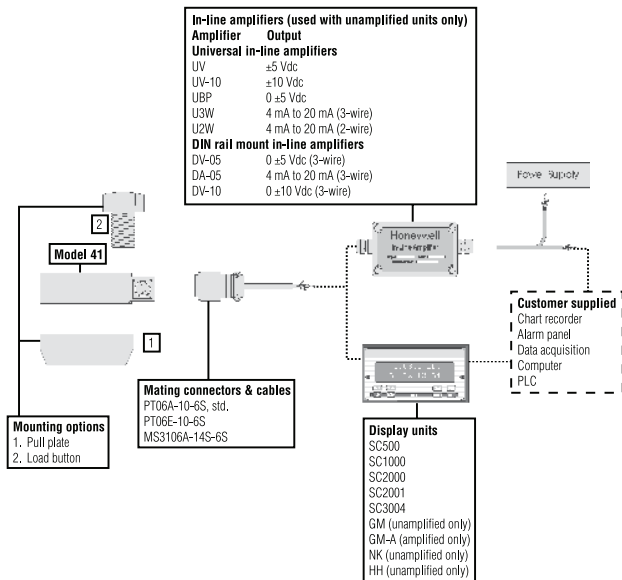
Specifications subject to change.

Questions? Contact us at either 1-800-848-6564, +1 614-850-5000, or our Web site for customized options: (<http://sensing.honeywell.com/TMsensor-help>).

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	5, 10, 25, 50, 100, 250, 500, 1000, 2000, 5000, 3000, 4000, 7500, 10000, 15000, 20000, 30000, 50000, 75000, 100000, 150000, 200000, 300000, 400000, 500000 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 ¹⁴ 1h. 70 °F to 400 °F ¹⁴ 1i. -65 °F to 250 °F ¹⁴	1j. 0 °C to 50 °C 1k. -20 °C to 85 °C 1m. -25 °C to 110 °C
Internal amplifiers¹⁰	2b. 4 wire, ±5 Vdc 2c. 0-5 Vdc output	2j. 4-20 mA (three-wire) output 2k. 4 mA to 20 mA (two-wire) ²⁰	2n (2N). 4 mA to 20 mA (wire) intrinsically safe ²⁰ 2t. 0 Vdc to 10 Vdc	2u. Unamplified, mV/V output
Internal amplifier enhancements	3a. Input/output isolation ¹⁹ 3d. Remote buffered shunt calibration ⁸			
Overload stops	4a. Overload stops			
Electrical termination	6a. Bendix PTIH-10-6P 6-pin (ranges to 5000 lb) 6b. MS3102E-14S-6P (ranges 7500 lb and up) ⁹ 6e. Integral cable: Teflon	6f. Integral cable: PVC 6g. Integral cable: Neoprene ⁹ 6h. Integral cable: Silicone	6i. Integral underwater cable ⁹ 6j. 1/2-14 conduit fitting with 5 ft of 4 conductor PVC cable	6q. Molded integral cable polyurethane ⁹ 6v. Phoenix connector on end of cable
Shunt calibration	8a. Precision internal resistor ¹⁴			
Special calibration	9a. 10 point (5 up/5 down) 20 % increments @ 68 °F 9b. 20 point (10 up/10 down) 10 % increments @ 68 °F 9c. ASTM E-74 calibration			
Bridge resistance	12b. 5000 ohm (foil)			
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 30c. Compression only calibration, negative in compression 30d. Tension and compression calibration, positive in compression			
Bridge type	31a. Dual bridge			
Shock and vibration	44a. Shock and vibration resistance			
Interfaces	53e. Signature calibration ¹⁴ 53t. TEDS IEEE 1451.4 module ¹⁵			

Typical system diagram



Allowable maximum loads²

Capacity (lb)	Side load (lb) Bending	(lb-in) Torque	(lb-ft)
5 to 25	50 %	40 %	25 %
50 to 1000	45 %	35 %	25 %
2000 to 5000	30 %	25 %	25 %
7500 to 30000	20 %	20 %	15 %
50000 to 100000	20 %	20 %	15 %
150000 to 200000	20 %	20 %	15 %
300000	20 %	20 %	10 %
400000	20 %	20 %	10 %
500000	20 %	20 %	10 %

