

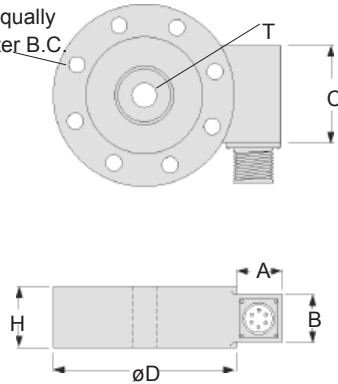
Model 41 Precision Low Profile Load Cell

Order Code AL111

- 5 to 500,000 lb.
- mV/V Output
- Double Diaphragm Design



F Clearance Holes Equally Spaced on G Diameter B.C.
K Diameter thru



Wiring Code

Connector/ Unamplified (Std.)

A	(+) Excitation
B	(+) Excitation
C	(-) Excitation
D	(-) Excitation
E	(-) Output
F	(+) Output

Dimensions

Ranges (lb.)	D (in.)	H (in.)	F#	øG (in.) øK (in.)		T	A (in.)	A* (in.)	B (in.)	B* (in.)	C (in.)
				B.C.	thru						
5; 10; 25	2.50	0.80	6	2.000	0.19	1/4-28 UNF	0.82	2.5	0.75	0.9	1.25
50; 100; 250; 500; 1000	3.00	1.00	6	2.250	0.28	3/8-24 UNF	0.82	2.5	0.75	0.9	1.25
2000; 3000; 4000; 5000	3.50	1.00	6	2.625	0.34	1/2-20 UNF	0.82	2.5	0.75	0.9	1.25
7500; 10,000; 15,000	5.50	1.80	8	4.500	0.40	1-14 UNS	1.25	2.3	1.50	1.5	2.00
20,000; 30,000; 50,000	6.00	1.80	8	4.875	0.53	1 1/2-12 UNF	1.25	2.3	1.50	1.5	2.00
75,000; 100,000	9.00	2.50	12	7.750	0.66	2-12 UN	1.25	2.3	1.50	1.5	2.00
150,000; 200,000	11.00	2.50	12	9.500	0.78	2 1/2-12 UN	1.25	2.3	1.50	1.5	2.00
300,000; 400,000; 500,000	14.00	4.25	12	11.750	1.03	3 1/2-12 UN	1.25	2.3	1.50	1.5	**

* Length of load cell with amplified option (see options chart)

**C" dimension varies on high ranges. Consult Factory

Performance

Load Ranges.....	5 to 500,000 lb.
Non-linearity	
5 to 25 lb.....	+/- 0.2% Full Scale
50 to 500,000 lb.....	+/- 0.1% Full Scale
Hysteresis	
5 to 25 lb.....	+/- 0.1% Full Scale
50 to 500,000 lb.....	+/- 0.08% Full Scale
Non-Repeatability	
5 to 25 lb.....	+/- 0.1% Full Scale
50 to 500,000 lb.....	+/- 0.03% Full Scale
Output (tolerance)	
5 to 25 lb.....	2 mV/V +/- 0.5% Full Scale
50 to 500,000 lb.....	3 mV/V +/- 0.5% Full Scale
Operation.....	Compression/ Tension (note 13)
Resolution.....	Infinite
Standard Calibration.....	5 point calibration: 0%, 50% and 100% of Full Scale in tension only

Environmental

Temperature, Operating.....	-65° to 250° F
Temperature, Compensated.....	60° to 160° F
Temperature, Effect	
Zero.....	0.002% Full Scale/ °F
Span.....	0.002% Full Scale/ °F

Electrical

Strain Gage Type.....	Bonded Foil
Excitation (calibration).....	10 VDC
Insulation Resistance.....	5000 Megohms @ 50 VDC
Bridge Resistance (tolerance).....	350 Ohms (nominal)
Zero Balance (tolerance).....	+/- 1% Full Scale
Shunt Calibration Data.....	Included
Electrical Termination (std)	
5 to 5,000 lb.....	PTIH-10-6P
7,500 to 500,000 lb.....	MS3102A-14S-6P

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Electrical (continued)

Mating Connector (not included)	
5 to 5,000 lb.....	PT06A-10-6S
7,500 to 500,000 lb.....	MS3106A-14S-6S

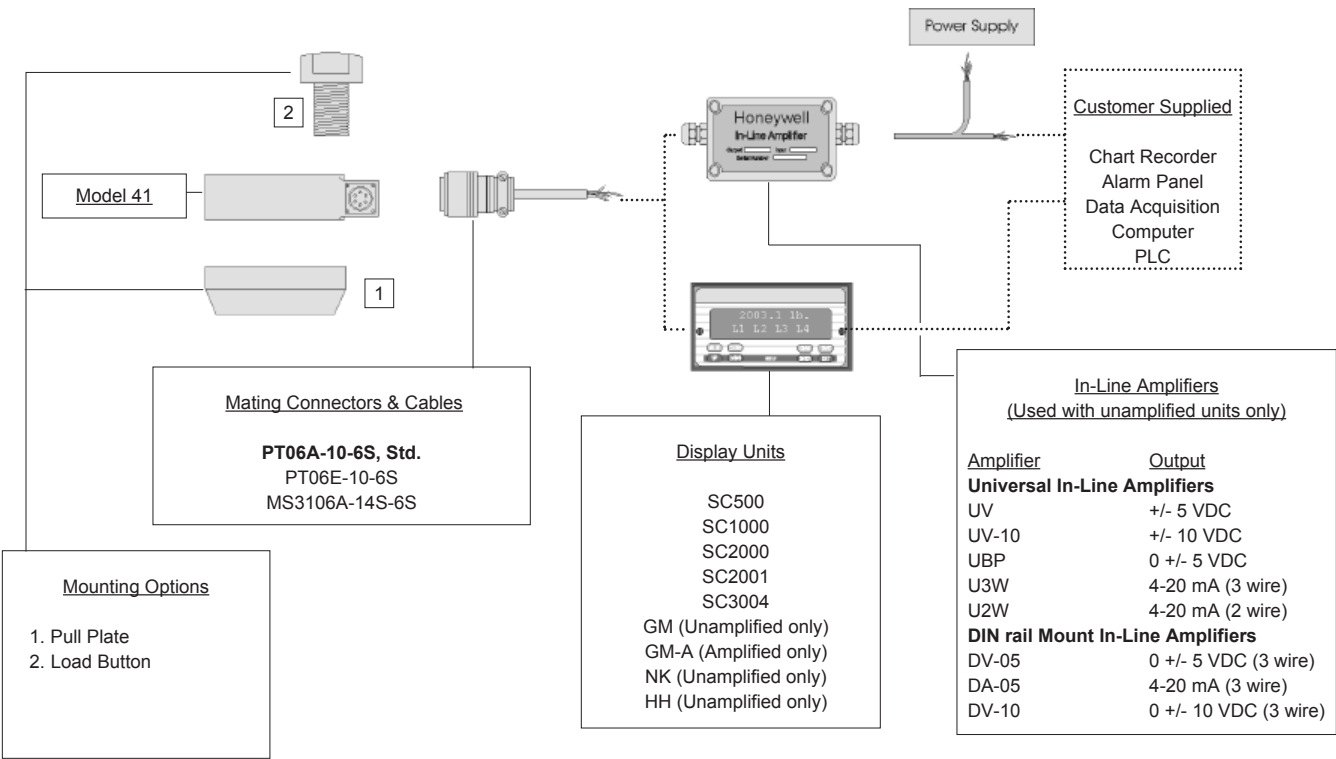
Mechanical

Maximum Allowable Load.....	150% F.S. (note 1)
Weight.....	See table
Material	
Less than 200,000 lb.....	17-4PH Stainless Steel
Greater than or equal to 300,000 lb.....	Carbon Steel
Deflection.....	See table
Natural Frequency.....	See table

Deflections and Ringing Frequencies

Capacity (lb.)	Deflection @ Full Scale (in.)	Natural Ringing Frequency (Hz)	Weight (lbs.)
5 to 25	0.001	2,000	0.8
50 to 1,000	0.002	4,600	1.5
2,000 to 5,000	0.002	10,000	2.0
7,500 to 15,000	0.003	6,000	8.8
20,000 to 50,000	0.004	8,000	11.0
75,000 to 100,000	0.006	5,500	30.9
150,000 to 200,000	0.010	4,500	46.3
300,000 to 500,000	0.010	4,100	130.1

Typical System Diagram



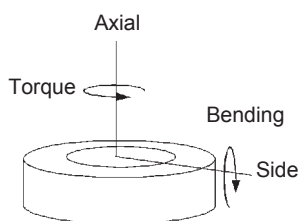
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Range Codes

Range	Range Code	Range	Range Code
5 lb.	AT	10,000 lb.	DV
10 lb.	AV	15,000 lb.	EJ
25 lb.	BL	20,000 lb.	EL
50 lb.	BN	30,000 lb.	EN
100 lb.	BR	50,000 lb.	EP
250 lb.	CN	75,000 lb.	ER
500 lb.	CR	100,000 lb.	ET
1000 lb.	CV	150,000 lb.	FJ
2000 lb.	DL	200,000 lb.	FL
3000 lb.	DN	300,000 lb.	FN
4000 lb.	DP	400,000 lb.	FP
5000 lb.	DR	500,000 lb.	FR
7500 lb.	DT		

Allowable Maximum Loads

(note 2)



Capacity (lb.)	Side Load (lb.)	Bending (lb.-in.)	Torque (lb.-ft.)
5 to 25	50%	40%	25%
50 to 1,000	45%	35%	25%
2,000 to 5,000	30%	25%	25%
7,500 to 30,000	20%	20%	15%
50,000 to 100,000	20%	20%	15%
150,000 to 200,000	20%	20%	15%
300,000	20%	20%	10%
400,000	20%	20%	10%
500,000	20%	20%	10%

Internal Amplifiers

Amplifier Specifications	Voltage Output Option 2b	Voltage Output Option 2c	Voltage Output Option 2t	Current 3 Wire Option 2j	Current 2 Wire Option 2k	Intrinsically Safe Option 2n (2N)***
Output Signal	+/- 5V	0-5V or +/- 5V @ 45mA	0-10V or +/- 10V @ 45mA	4-20 mA	4-20 mA	4-20 mA
Input Power (Voltage)	+/-15V or 26-32VDC	11-28 VDC	15-28 VDC	22-32 VDC	15-40 VDC	9-28 VDC
Input Power (Current)	45 mA	40 mA	40 mA	65 mA	4-28 mA	4-24 mA
Frequency Response	3000 Hz	3000 Hz	3000 Hz	2500 Hz	300 Hz	2000 Hz
Power Supply Rejection	60 db	60 db	60 db	60 db	60 db	60 db
Operating Temperature	-20° to 185° F	-20° to 185° F	-20° to 185° F	0° to 185° F	0° to 185° F	-20° to 185° F
Reverse Voltage Protection	Yes	Yes	Yes	Yes	Yes	Yes
Short Circuit Protection	Momentary	Momentary	Momentary	Yes	Yes	Yes
Wiring Code: Connector (Std.) (note 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 (note 4) (note 5) (note 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 Sensotec website for most up-to-date information regarding Intrinsically Safe approvals ref. #008-0547-00.

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Options

	Same Day Ship	Fast track manufacture	Build to order	Build from scratch
Load Range	50, 100, 500, 1000, 2000, 5000, 10,000, 20,000, 50,000 lb		5, 10, 25, 250, 3000, 4000, 7500, 15,000, 30,000 lb	75,000, 100,000, 150,000, 200,000, 300,000, 400,000, 500,000 lb
Temperature Compensation	1a. 60° to 160° F	1b. 30° to 130° F 1c. 0° to 185° F 1d. -20° to 130° F 1e. -20° to 200° F 1f. 70° to 250° F 1i. -65° to 250° F 1j. 0° to 50° C 1k. -20° to 85° C 1m. -25° to 110° C	1g. 70° to 325° F 1h. 70° to 400° F	
Internal Amplifiers	2u. Unamplified, mV/V output	2c. 0-5 VDC 2j. 4-20 mA (3-wire) 2t. 0-10 VDC	2b. 4 wire +/- 5 VDC 2k. 4-20 mA (2-wire) 2n(2N). 4-20 mA (2-wire) Intrinsically Safe	
Internal Amp Enhancements			3a. Input/output isolation 3d. Remote Buffered Shunt Calibration (note 8)	
Overload Stops			4a. Overload stops	
Electrical Termination	6a. Bendix PTIH-10-6P-6 pin connector (ranges to 5000 lbs.) 6b. MS3102A-14S-6P connector (ranges 7500 lbs. and up) (note 9)	6e. Integral cable: Teflon 6q. Molded Integral Cable: Polyurethane (note 9) 6f. Integral cable: PVC	6g. Integral cable: Neoprene (note 9) 6h. Integral cable: Silicone 6i. Integral underwater cable (note 9) 6j. 1/2-14 conduit fitting with 5' of 4 conductor PVC cable 6v. Phoenix connector on end of cable	
Shunt Calibration			8a. Precision Internal Resistor (note 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. A.S.T.M. E-74 calibration	
Bridge Resistance			12b. 5,000 ohm (foil)	
Potentiometers			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 & Vibration			44a. Shock and vibration resistance	
Interfaces			53e. Signature Calibration 53t. T.E.D.S. IEEE 1451.4 Module (note 15)	

Supplied as standard



Special Customer Requirements (Consult Factory)

Operating temperature -60° to 400°F
Lightning protection
OEM labels
Case pressure
Radiation resistant
Cable orientation
Fatigue rating
Different cable lengths
Venting
Different materials
Electro-static discharge immunity
Different threads
Special wiring codes

Notes

- Allowable Maximum Loads- Maximum load to be applied without damage (note 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.
- Interconnecting shunt cal. 1 terminal with shunt cal. 2 terminal provides 50% (unamplified units), 75% (4-20mA 3-wire units) or 80% (voltage amplified units) of full scale output for quick calibration. Shunt Calibration comes standard with internal amplifier options 2b, 2c, 2t and 2j.
- 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
- No mating connector necessary for cable option.
- Adding any internal amplifiers on 5 to 25 lb. ranges will increase delivery time.
- Option 2n (2N) on 5 to 5,000 lb. ranges will typically take 12 weeks for delivery.
- Option 3d is not available with option 2n (2N) or 2k.
- Not available with options 1c, 1e, 1f, 1g, 1h or 1i.
- Consult factory.
- Availability varies with range, consult factory.
- Option only pertinent when option 2n (2N) selected.
- Standard calibration for tension/compression load cells is in tension only.
- Not available with amplified output.
- Consult factory for TEDS availability with amplified models.

How to Order

Combine the order code, the range code and the options code.

Sample Code: **AL111** **CV** **6h**
Order Code Range Code Options Code