

Model 31E Low

Low Range Precision Miniature Load Cell



DESCRIPTION

Model 31E low range precision miniature load cells measure both tension and compression load forces of 0.5 N to 5 N. These models are our highest accuracy, rugged miniature load cells. Model 31E's welded, stainless steel construction is designed to eliminate or reduce to a minimum, the effects of off-axis loads. (The internal construction assures excellent long-term stability

for ranges 1000 grams and above.) A modification permits this model to be completely welded for underwater applications. The Model 31E tension/compression load cell has male threads attachments. High accuracies of 0.15 % to 0.25 % full scale are achieved. Each bonded strain gage unit is built of welded 17-4 PH stainless steel for additional ruggedness.

FEATURES

- 0.5 N to 5 N
- mV/V output
- Stainless steel
- Miniature design
- Double diaphragm construction

Model 31E Low

PERFORMANCE SPECIFICATIONS

Characteristic	Measure
Load ranges ⁵	0.5 N, 1.5 N, 2.5 N, 5 N
Linearity	±0.15 % full scale
Hysteresis	±0.15 % full scale
Non-repeatability	±0.1 % full scale
Tolerance on output 0.5 N to 1.5 N	0.1 mV/V max.
Tolerance on output 2.5 N to 5 N	20 mV/V
Operation	Tension/compression ³
Resolution	Infinite

ENVIRONMENTAL SPECIFICATIONS

Characteristic	Measure
Temperature, operating	-53 °C to 121 °C [-65 °F to 250 °F]
Temperature, compensated	15 °C to 70 °C [60 °F to 158 °F]
Storage temperature	-70 °C to 150 °C [-94 °F to 302 °F]
Temperature effect, zero	0.03 % full scale/°C
Temperature effect, span	0.03 % full scale/°C

ELECTRICAL SPECIFICATIONS

Characteristic	Measure
Strain gage type	Semiconductor
Excitation (calibration)	5 Vdc
Insulation resistance	5000 Mohm @ 50 Vdc
Bridge resistance	500 ohm
Zero balance	1 % max.
Electrical termination (std)	Teflon cable (1.5 m [59.06 in])

MECHANICAL SPECIFICATIONS

Characteristic	Measure
Maximum allowable load	20 N ¹
Weight	90 g
Material	17-4 PH stainless steel
Deflection full scale	11 kg/mm
Natural frequency	740 Hz

WIRING CODES

Cable	Unamplified
Red	(+) excitation
Black	(-) excitation
Green	(-) output
White	(+) output

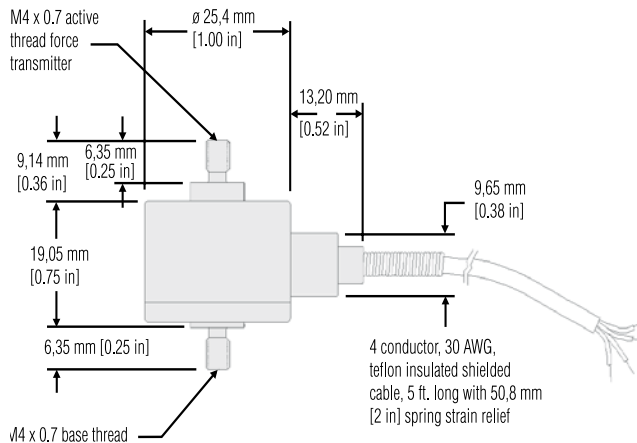
RANGE CODES

Range Codes	Range
000N5	0.5 N
0015N5	1.5 N
002N5	2.5 N
005N0	5 N

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 range	0.5 N, 1.5 N, 2.5 N, 5 N	
Temperature compensation	1a. 15 °C to 70 °C 1j. 0 °C to 50 °C	1k. -20 °C to 85 °C 1m. -25 °C to 110 °C
Internal amplifiers	2u. Unamplified, mV/V output	
Electrical termination	6d. Microtec DR-4S-4H 4 pin 6e. Integral cable: Teflon 6f. Integral cable: PVC 6g. Integral cable: Neoprene (max. 80 °C [176 °F])	6h. Integral cable: Silicone 6i. Integral underwater cable (max. 80 °C [176 °F]) 6v. Phoenix connector on end of cable 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	
Shock and vibration	44a. Shock and vibration resistance	
Interfaces⁴	53e. Signature calibration 53t. TEDS IEEE 1451.4 module	

MOUNTING DIMENSIONS



Model 31E Mid

Mid Range Precision Miniature Load Cell



DESCRIPTION

Model 31E mid range precision miniature load cells measure both tension and compression load forces of 10 N to 50 N. These models are our highest accuracy, rugged miniature load cells. Model 31E's welded, stainless steel construction is designed to eliminate or reduce to a minimum, the effects of off-axis loads. (The internal construction assures excellent long-term stability for ranges 1000 grams and above.) A modification permits this model to be completely welded for underwater

applications. The Model 31E tension/compression load cell has male threads attachments. High accuracies of 0.15 % to 0.25 % full scale are achieved. Each bonded strain gage unit is built of welded 17-4 PH stainless steel for additional ruggedness. All load cells with ranges to 50 N have an electrical balance module in the lead wire (approximately 1 in x .087 in thick). This balance module does not have to be the same temperature as the transducer.

FEATURES

- 10 N to 50 N
- mV/V output
- Stainless steel
- Miniature design

Model 31E Mid

PERFORMANCE SPECIFICATIONS

Characteristic	Measure
Load ranges ⁶	10 N to 5 kN
Linearity 10 N to 1 kN	±0.15 % full scale
Linearity 2 kN to 5 kN	±0.2 % full scale
Hysteresis 10 N to 1 kN	±0.15 % full scale
Hysteresis 2 kN to 5 kN	±0.2 % full scale
Non-repeatability 10 N	±0.1 % full scale
Non-repeatability 2 N to 5 kN	±0.05 % full scale
Tolerance on output 10 N	1.5 mV/V (nominal)
Tolerance on output 2 N to 5 kN	2 mV/V
Operation	Tension/compression ³
Resolution	Infinite

ENVIRONMENTAL SPECIFICATIONS

Characteristic	Measure
Temperature, operating	-55 °C to 120 °C [-67 °F to 248 °F]
Temperature, compensated	15 °C to 70 °C [60 °F to 158 °F]
Storage temperature	-70 °C to 150 °C [-100 °F to 302 °F]
Temperature effect, zero	0.01 % full scale/°C
Temperature effect, span	0.01 % full scale/°C

ELECTRICAL SPECIFICATIONS

Characteristic	Measure
Strain gage type	Bonded foil
Excitation (calibration) 10 N to 20 N	5 Vdc
Excitation (calibration) 50 N to 5 kN	10 Vdc
Insulation resistance	5000 Mohm @ 50 Vdc
Bridge resistance	350 ohm
Zero balance	1 % max.
Electrical termination (std)	Teflon cable (1,5 m [60 in])

MECHANICAL SPECIFICATIONS

Characteristic	Measure
Maximum allowable load	150 % FS ¹
Weight	See table
Material	17-4 PH stainless steel
Deflection full scale	See table
Natural frequency	See table

RANGE CODES

Range codes	Range
010N0	10 N
020N0	20 N
050N0	50 N
100N0	100 N
200N0	200 N
500N0	500 N
01KN0	1 kN
02KN0	2 kN
05KN0	5 kN

WIRING CODES

Cable	Unamplified
Red	(+) excitation
Black	(-) excitation
Green	(-) output
White	(+) output

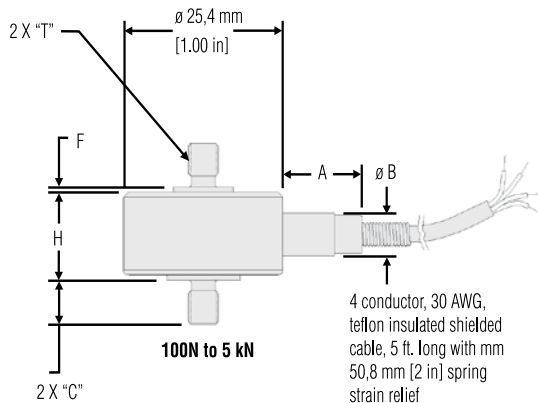
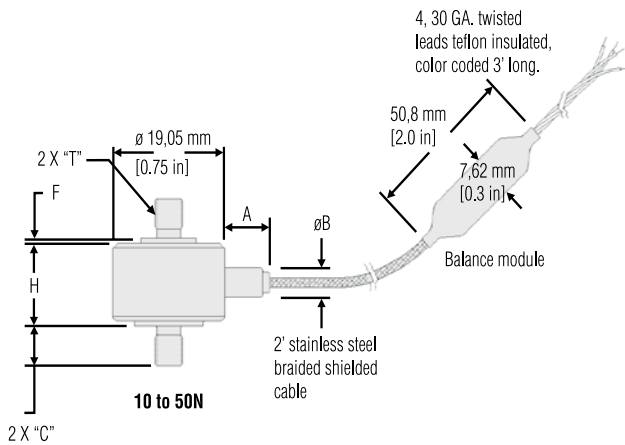
DEFLECTIONS AND RINGING FREQUENCIES

Capacity (lb)	Deflection at full scale (in)	Ringling frequency (Hz)	Weight (g)
10 N to 50 N	0,02 mm [0.0008 in]	3000 Hz	21 g
100 N to 500 N	0,02 mm [0.0008 in]	10000 Hz	63 g
1 kN to 5 kN	0,03 mm [0.001 in]	12000 Hz	80 g

Mid Range Precision Miniature Load Cell

MOUNTING DIMENSIONS

Ranges (lb)	T	H (in)	C (in)	F (in)	A (in)	B (in)
10 N, 20 N, 50 N	M4 x 0.7	11,43 mm [0.45 in]	6,35 mm [0.25 in]	1,27 mm [0.05 in]	7,87 mm [0.31 in]	4,83 mm [0.19 in]
100 N, 200 N, 500 N	M5 x 0.8	13,21 mm [0.52 in]	6,35 mm [0.25 in]	0,76 mm [0.03 in]	12,7 mm [0.50 in]	6,35 mm [0.25 in]
1kN, 2kN, 5kN	M6 x 1	13,21 mm [0.52 in]	9,65 mm 0.38 in	0,76 mm 0.03 in	12,7 mm [0.50 in]	6,35 mm [0.25 in]



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 range	10, 20, 50, 100, 200, 500 N; 1, 2, 5kN	
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 1h. 70 °F to 400 °F 1i. -65 °F to 250 °F 1j. 0 °C to 50 °C 1k. -20 °C to 85 °C 1m. -25 ° to 110 °C
Internal amplifiers	2u. Unamplified, mV/V output	
Electrical termination	6a. Bendix PTIH-10-6P - 6 pin (max. 250 °F) ⁵ 6d. Microtec DR-4S-4H 4 pin 6e. Integral cable: Teflon 6f. Integral cable: PVC	6g. Integral cable: Neoprene (max. 80 °C) 6h. Integral cable: Silicone 6i. Integral underwater cable (max. 180 °F) 6v. Phoenix connector on end of cable
Special calibration	9a. 10 point (5 up/5 down) 20 % increments @ 20 °C 9b. 20 point (10 up/10 down) 10 % increments @ 20 °C	
Special calibration	30a. Compression only calibration, positive in compression 30b. Tension and compression calibration, positive in tension 30c. Compression only calibration, negative in compression	
Shock and vibration	44a. Shock and vibration resistance	
Interfaces⁴	53e. Signature calibration ⁷ 53t. TEDS IEEE 1451.4 module	

Model 31E High

High Range Precision Miniature Load Cell



DESCRIPTION

Model 31E high range precision miniature load cells measure both tension and compression load forces of 10 kN to 50 kN. These models are our highest accuracy, rugged miniature load cells. Model 31E's welded, stainless steel construction is designed to eliminate or reduce to a minimum, the effects of off-axis loads. (The internal construction assures excellent long-

term stability for ranges 1000 grams and above.) A modification permits this model to be completely welded for underwater applications. The Model 31E tension/compression load cell has male threads attachments. High accuracies of 0.15 % to 0.25 % full scale are achieved. Each bonded strain gage unit is built of welded 17-4 PH stainless steel for additional ruggedness.

FEATURES

- 10 kN to 50 kN
- mV/V output
- Stainless steel
- Miniature design
- Stabilized column construction

Model 31E High

PERFORMANCE SPECIFICATIONS

Characteristic	Measure
Load ranges ⁵	10 kN, 20 kN, 50 kN
Linearity	±0.2 % full scale
Hysteresis	±0.2 % full scale
Non-repeatability	±0.05 % full scale
Tolerance on output	2 mV/V
Operation	Tension/compression ³
Resolution	Infinite

ENVIRONMENTAL SPECIFICATIONS

Characteristic	Measure
Temperature, operating	-55 °C to 120 °C [-67 °F to 248 °F]
Temperature, compensated	15 °C to 70 °C [60 °F to 158 °F]
Storage temperature	-70 °C to 150 °C [-100 °F to 302 °F]
Temperature effect, zero	0.01 % full scale/°C
Temperature effect, span	0.01 % full scale/°C

ELECTRICAL SPECIFICATIONS

Characteristic	Measure
Strain gage type	Bonded foil
Excitation (calibration)	5 Vdc
Insulation resistance	5000 Mohm @ 50 Vdc
Bridge resistance	350 ohm
Zero balance	1 % max.
Electrical termination (std)	Teflon cable (1,5 m [60 in])

MECHANICAL SPECIFICATIONS

Characteristic	Measure
Maximum allowable load	150 % FS ¹
Weight	See table
Material	17-4 PH stainless steel
Deflection full scale	See table
Natural frequency	See table

WIRING CODES

Cable	Unamplified
Red	(+) excitation
Black	(-) excitation
Green	(-) output
White	(+) output

RANGE CODES

Range codes	Range
10KN0	10 kN
20KN0	20 kN
50KN0	50 kN

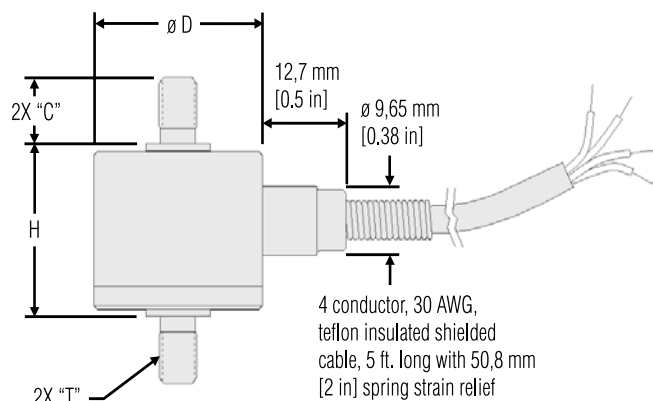
DEFLECTIONS AND RINGING FREQUENCIES

Capacity (lb)	Deflection at full scale	Ringling frequency (Hz)	Weight
10 kN	0,02 mm [0.0007 in]	26000 Hz	60 g [0.132]
20 kN	0,03 mm [0.0001 in]	21000 Hz	125 g [0.276]
50 kN	0,03 mm [0.0001 in]	17000 Hz	250 g [0.551]

High Range Precision Miniature Load Cell

MOUNTING DIMENSIONS

Ranges (lb)	T	ØD	C	H
10	M10 x 1.5	25,4 [1.0]	18,3 [0.72]	12,7 [0.5]
20	M12 x 1.5	31,8 [1.25]	23,9 [0.94]	16,0 [0.63]
50	M20 x 1.5	35,1 [1.38]	27,9 [1.1]	22,3 [0.88]



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 range	10 kN, 20 kN, 50 kN
Temperature compensation	1a. 60 °F to 160 °F 1k. -20 °C to 85 °C 1j. 0 °C to 50 °C 1m. -25 ° to 110 °C
Internal amplifiers	2u. Unamplified, mV/V output
Electrical termination	6e. Integral cable: Teflon 6h. Integral cable: Silicone 6d. Microtec DR-4S-4H 4 pin 6i. Integral underwater cable (max. 180 °F) 6f. Integral cable: PVC 6v. Phoenix connector on end of cable 6g. Integral cable: Neoprene (max. 180 °F)
Bridge resistance	12a. 1000 ohm (foil) 12b. 5000 ohm (foil)
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
Shock and vibration	44a. Shock and vibration resistance
Interfaces	53e. Signature calibration ⁶ 53t. TEDS IEEE 1451.4 module ⁴

ALTHEN reserves the right to vary the foregoing details without prior notice



ALTHEN GmbH Mess- und Sensortechnik

Frankfurter Strasse 150 - 152
65779 Kelkheim / Germany

phone: +49 (0)6195 70060
fax: +49 (0)6195 700666

sales@althensensors.com
www.althensensors.com