

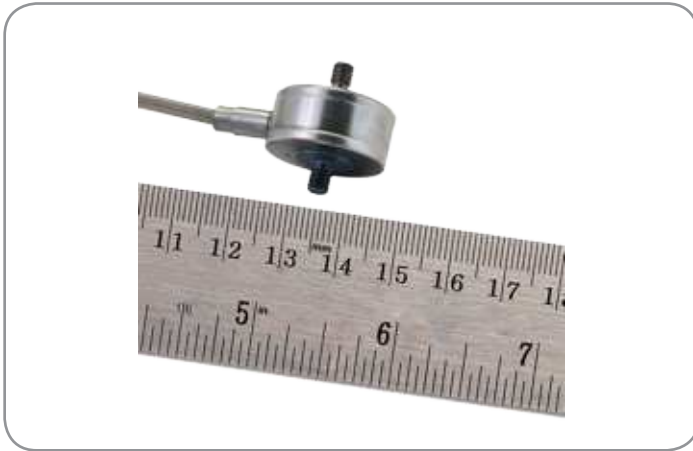
Mid Range Precision Miniature Load Cells

Model 31 Mid

008630

Issue 2

Datasheet



DESCRIPTION

The Model 31 mid range, precision miniature load cells measure both tension and compression with options covering 10N to 5 kN / 1000 g to 1000 lb.

The Model 31 is a durable miniature load cell with capability of high accuracies of 0.15 % to 0.2 % full scale. Welded, stainless steel construction is designed to minimize or eliminate the effects of off-axis loads.

Each bonded strain gage unit is built of welded 17-4 PH stainless steel for additional durability. This, combined with a reliable internal design provides enhanced long-term stability.

Further optional modification can permit this model to be completely welded for potential use in underwater applications.

VALUE TO CUSTOMERS

- Enhanced accuracy of 0.15 % to 0.2 %
- Newton, gram, and pound force ranges available

FEATURES

- 10 N to 5 kN / 1000 g to 1000 lb
- mV/V output
- Stainless steel
- Male thread attachments
- Miniature design

POTENTIAL APPLICATIONS

- Cable tension
- Industrial process control
- Medical control systems
- Medical equipment testing
- Pharmaceutical process or product control
- Semiconductor/electronics testing
- Aerospace testing

PORTFOLIO

Honeywell's miniature and subminiature load cells are designed to fit into systems and applications with limited space or tight clearances. Constructed of rugged stainless steel for precise measurements and excellent long term stability and reliability under harsh operating conditions, these load cells are designed to eliminate or reduce to a minimum the effect of off-axis loads. To view the entire product portfolio, click [here](#).

Mid Range Precision Miniature Load Cells, Model 31 Mid

Table 1. Performance Specifications

Characteristic		Measure
Load ranges		10 N, 20 N, 50 N, 100 N, 200 N, 500 N, 1 kN, 2 kN, 5 kN 1000 g, 5 lb, 10 lb, 25 lb, 50 lb, 100 lb, 250 lb, 500 lb, 1000 lb
Non-Linearity	10 N to 1 kN, 1000 g to 250 lb	±0.15 % full scale
	2 kN to 5 kN, 500 lb to 1000 lb	±0.2 % full scale
Hysteresis	10 N to 1 kN, 1000 g to 250 lb	±0.15 % full scale
	2 kN to 5 kN, 500 lb to 1000 lb	±0.2 % full scale
Non-repeatability	10 N, 1000 g	±0.1 % full scale
	20 N to 5 kN, 5 lb to 1000 lb	±0.05 % full scale
Output (tolerance)	10 N, 1000 g	1 mV/V nominal
	20 N to 5 kN, 5 lb to 1000 lb	2 mV/V nominal
Operation	Tension/compression ³	
Resolution	Infinite	

Table 2. Environmental Specifications

Characteristic	Measure
Temperature, operating	-55 °C to 125 °C [-67 °F to 257 °F]
Temperature, compensated	15 °C to 71 °C [60 °F to 160 °F]
Storage temperature	-73 °C to 148 °C [-100 °F to 300 °F]
Temperature effect, zero	±0.01 %FS/°C [±0.005 %FS/°F]
Temperature effect, span	±0.01 % reading/°C [±0.005 % reading/°F]

Table 3. Electrical Specifications

Characteristic	Measure
Strain gage type	Bonded foil
Excitation (calibration)	5 Vdc ≤ 50 N/10 lb 10 Vdc ≥ 100 N/25 lb
Insulation resistance	5000 Mohm @ 50 Vdc
Bridge resistance	350 ohm
Zero balance	±1 %FS max.
Electrical termination (std)	Teflon® cable (1,5 m [5 ft])

Table 4. 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

Table 5. Wiring Codes

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

Table 6. Range Codes

Range Codes	Range	Range Codes	Range
AR	1000 g	MH	10 N
AT	5 lb	MI	20 N
AV	10 lb	MK	50 N
BL	25 lb	ML	100 N
BN	50 lb	MM	200 N
BR	100 lb	MY	500 N
CN	250 lb	MN	1000 N
CR	500 lb	MO	2000 N
CV	1000 lb	MQ	5000 N

Table 7. Deflections and Ringing Frequencies

Capacity	Deflection at full scale	Ringing frequency	Weight
10 N to 50 N 1000 g to 10 lb	0,03 mm [0.001 in]	3 KHz	21 g
100 N to 500 N 20 lb to 100 lb	0,03 mm [0.001 in]	10 KHz	63 g
1 kN to 5 kN 250 lb to 1000 lb	0,04 mm [0.0015 in]	12 KHz	80 g

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Table 8. Mounting Dimensions

Ranges	Thread	H	C	F
1000 g, 5 lb, 10 lb	#6-32 UNC	12,5 mm [0.49 in]	6,4 mm [0.25 in]	1,2 mm [0.05 in]
10 N, 20 N, 50 N	M4 x 0.7			
25 lb, 50 lb, 100 lb	#10-32 UNF	15,4 mm [0.61 in]	6,4 mm [0.25 in]	2,3 mm [0.09 in]
100 N, 200 N, 500 N	M5 x 0.8			
250 lb, 500 lb, 1000 lb	1/4-28 UNF	14,1 mm [0.56 in]	9,5 mm [0.38 in]	0,8 mm [0.03 in]
1 kN, 2 kN, 5 kN	M6 x 1.0			

Figure 1. Mounting Dimensions for 10 N to 50 N / 1 kg to 10 lb (6AM termination required)

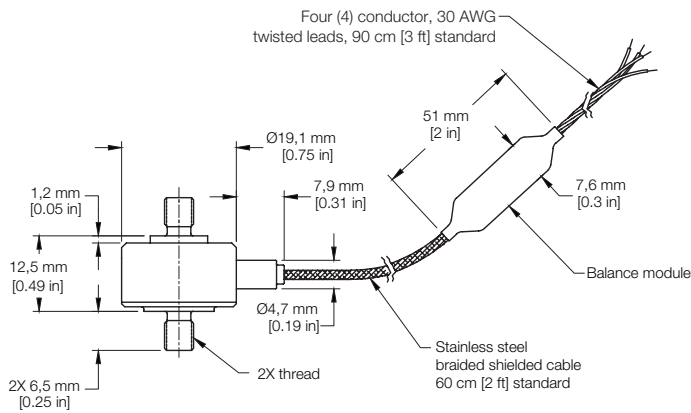


Figure 2. Mounting Dimensions for 100 N to 5 kN / 25 lb to 1000 lb (6E termination required)

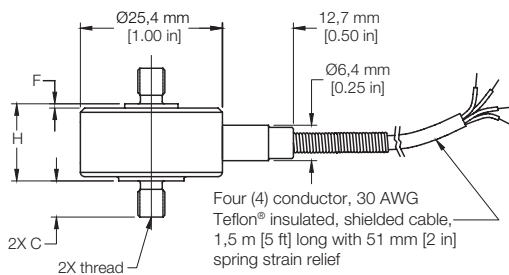


Table 9. Option Codes

	Many range/option combinations are available in our quick-ship and fast-track manufacture programs. Please click here for updated listings.
Load range	1000 g, 5 lb, 10 lb, 25 lb, 50 lb, 100 lb, 250 lb, 500 lb, 1000 lb, 10 N, 20 N, 50 N, 100 N, 200 N, 500 N, 1000 N, 2000 N, 5000 N
Temperature compensation	1a. 15 °C to 71 °C [60 °F to 160 °F] 1c. -18 °C to 85 °C [0 °F to 185 °F] 1h. 21 °C to 204 °C [70 °F to 400 °F] ⁴
Internal amplifiers	2u. Unamplified, mV/V output
Electrical termination	6am. Integral cable: Teflon® with balance module 6e. Integral cable: Teflon® 6i. Integral underwater cable 3 m [10 ft] (82 °C [180 °F] max.) ⁵
Additional point calibration	9a. 10 point (5 up/5 down) 20 % increments @ 20 °C
Electrical connector orientation	15c. Radial electrical exit port orientation
Special calibration	30a. Compression only calibration, positive in compression 30b. Tension and compression calibration, positive in tension 30d. Tension and compression calibration, positive in compression
Mounting interfaces⁶	(none) UN thread 32b. M4 x 0.7 32c. M5 x 0.8 32d. M6 x 1
Electrical Interfaces⁷	53s. Phoenix connector with Signature Calibration module 53t. TEDS IEEE 1451.4 module ⁸

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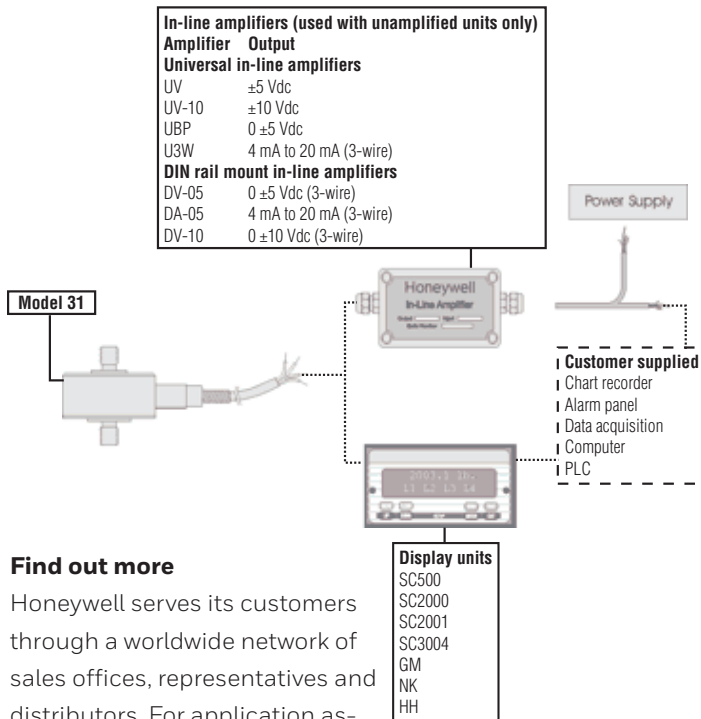
Figure 3. Product Nomenclature

	AL311	MH	1A	2U	6AM		15C		32B	
	Load Type	Range	Temperature Compensation	Internal Amplifiers	Electrical Termination	Additional Point Calibration	Electrical Conn. Orientation	Special Calibration ³	Mounting Threads ⁶	Calibration Memory ⁷
Model 31 Mid Precision Miniature Load Cell	MH	10 Newton	1A 15 °C to 71 °C [60 °F to 160 °F]	2U Unamplified, mV/V output	6AM Teflon*, Integral cable with balance module	Standard 5-point calibration (None)	15C Radial exit	Tension only (none)	UN thread (none)	No storage (none)
	MI	20 Newton	1C -18 °C to 85 °C [0 °F to 185 °F]		6E Teflon*, Integral cable	9A 10-point calibration		30A Compression only (+)	32B M4 x 0.7	53S Phoenix connector with Signature Calibration Module
	MK	50 Newton	1H 21 °C to 204 °C [70 °F to 400 °F]		6I Integral under-water cable, 3 m [10 ft]			30B Tension (+) and Compression (-)	32C M5 x 0.8	53T TEDS IEEEE 1451.4 module
	ML	100 Newton						30D Tension (-) and Compression (+)	32D M6 x 1	
	MM	200 Newton								
	MY	500 Newton								
	MN	1000 Newton								
	MO	2000 Newton								
	MQ	5000 Newton								
	AR	1000 g								
	AT	5 lb								
	AV	10 lb								
	BL	25 lb								
	BN	50 lb								
	BR	100 lb								
	CN	250 lb								
	CR	500 lb								
CV	1000 lb									

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 or long term use and structural integrity. All structurally critical applications (overhead loading, etc.) should always be designed with safety redundant load paths.
3. Standard calibration for tension/compression load cells is in tension only.
4. Consult factory for extended operation above 125 °C [257 °F].
5. Option 6i may increase the load cell height and/or diameter. Consult factory.
6. See Figures 1 and 2 to match the mounting interface option with the range code.
7. Maximum operating temperature for options 53s and 53t is 85 °C [185 °F].
8. TEDS IEEE 1451.4 module installed at end of cable.

Figure 4. Typical System Diagram



Find out more

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Honeywell Safety and Productivity Solutions

9680 Old Bailes Road
Fort Mill, SC 29707
honeywell.com

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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.

Failure to comply with these instructions could result in death or serious injury.

⚠ WARNING MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective.

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