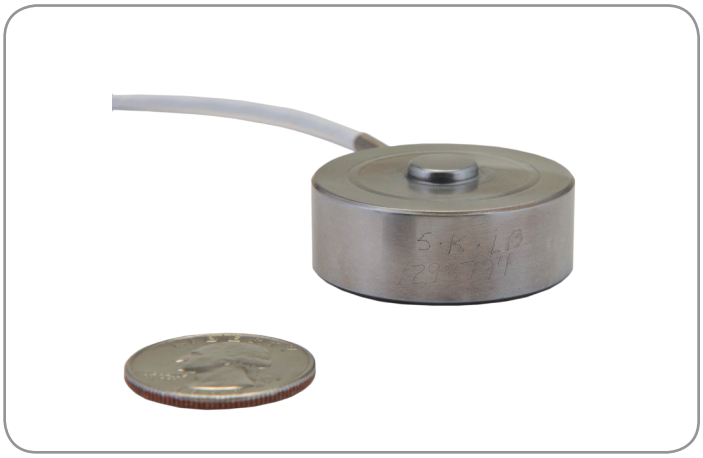
Economical Load Cell

Model 53

008638

Issue 5

Datasheet



DESCRIPTION

The Model 53 load cells are bonded foil strain gage transducers designed for cost efficient production and testing applications (i.e. press calibration). With engineered compression force measurements up to 200 kN / 50k lb, this model achieves a maximum non-linearity of 0.5 % full scale.

Precision gaging techniques and a stainless steel construction provide excellent enhanced stability and reliability under severe operating conditions. This compression-only load cell has an integral load button machined as a key part of the design.

Installation in application is fixed by three tapped holes to provide secure mounting.

VALUE TO CUSTOMERS

- Reliable accuracy of 0.5 %
- Newton and pound force ranges available

FEATURES

- 20 N to 200 kN / 5 lb to 50K lb
- Stainless steel
- Mini footprint
- Button-style design
- mV/V output

POTENTIAL APPLICATIONS

- Press applications
- Weighing
- Sensing for applied load
- Automation process control

PORTFOLIO

From general purpose load cells to fatigue-rated, high performance products, Honeywell offers a comprehensive selection of tension, compression, and universal measurement load cell. Each of our load cells can be customized to meet your needs, whatever your application. To view the entire product portfolio, click here.

Economical Load Cell, Model 53

Table 1. Performance Specifications

Characteristic	Measure
Load ranges	5 lb, 10 lb, 25 lb, 50 lb, 100 lb, 250 lb, 500 lb, 1K lb, 2K lb, 5K lb, 10K lb, 15K lb, 20K lb, 30K lb, 50K lb 20 N, 50 N, 100 N, 200 N, 500 N, 1 kN, 2 kN, 5 kN, 10 kN, 20 kN, 50 kN, 100 kN, 150 kN, 200 kN
Linearity (max.)	±0.5 % full scale
Hysteresis (max.)	±0.3 % full scale
Non-repeatability (max.)	±0.1 % full scale
Output (tolerance)	2 mV/V (nominal)
Operation	Compression
Resolution	Infinite

Table 2. Environmental Specifications

Characteristic	Measure
Temperature, operating	-53 °C to 121 °C [-65 °F to 250 °F]
Temperature, compensated	15 °C to 71 °C [60 °F to 160 °F]
Temperature effect, zero	±0.01 % full scale/°C [±0.005 % full scale/°F]
Temperature effect, span	±0.02 % reading/°C [±0.01 % reading/°F]

Table 3. Electrical Specifications

Characteristic	Measure
Strain gage type	Bonded foil
Excitation (calibration) 20 N to 500 N, 5 lb to 100 lb	5 Vdc
Excitation (calibration) 1000 N to 200 kN, 250 lb to 50K lb	10 Vdc
Insulation resistance	5000 Mohm @ 50 Vdc
Bridge resistance (tolerance)	350 ohm
Zero balance	±3 % full scale
Shunt calibration data	Included
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	
Red	(+) excitation
Black	(-) excitation
Green	(-) output
White	(+) output

Table 6. Range Codes

Range Codes	Range	Range Codes	Range
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**	1 kN
CR	500 lb	**MO**	2 kN
CV	1K lb	**MQ**	5 kN
DL	2K lb	**MR**	10 kN
DR	5K lb	**MS**	20 kN
DV	10K lb	**MT**	50 kN
EJ	15K lb	**MU**	100 kN
EL	20K lb	**ZB**	150 kN
EN	30K lb	**MV**	200 kN
EP	50K lb		

Table 8. Deflections and Ringing Frequencies

Capacity	Deflection @ full scale	Natural ringing frequency	Weight with cable g [lb]
5 lb/20 N	0,03 mm [0.001 in]	2 KHz	59 [0.13]
10 lb/50 N	0,03 mm [0.001 in]	3 KHz	59 [0.13]
25 lb/100 N	0,03 mm [0.001 in]	16 KHz	62 [0.136]
50 lb/200 N	0,03 mm [0.001 in]	21 KHz	63 [0.138]
100 lb/500 N	0,03 mm [0.001 in]	28 KHz	64 [0.141]
250 lb/1 kN	0,03 mm [0.001 in]	25 KHz	72 [0.158]
500 lb 2 kN	0,03 mm [0.001 in]	32 KHz	72 [0.158]
1000 lb/5 kN	0,03 mm [0.001 in]	42 KHz	75 [0.165]
2000 lb/10 kN	0,03 mm [0.001 in]	53 KHz	77 [0.17]
5000 lb/20 kN	0,03 mm [0.001 in]	34 KHz	140 [0.306]
10K lb/50 kN	0,03 mm [0.001 in]	47 KHz	145 [0.32]
15K lb	0,05 mm [0.002 in]	24 KHz	368 [0.811]
20K lb/100 kN	0,05 mm [0.002 in]	28 KHz	372 [0.820]
30K lb/150 kN	0,05 mm [0.002 in]	33 KHz	377 [0.831]
50K lb/200 kN	0,08 mm [0.003 in]	24 KHz	1270 [2.8]

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Figure 1. Mounting Dimensions: Model 53 (lb)

Ranges lb	ØD1 mm [in]	ØD2 mm [in]		H mm [in]		L mm [in]		A	B mm [in]	ØG mm [in]
		(6E)	(6I)	(6E)	(6I)	(6E)	(6I)			
5 lb to 100 lb	25,4 [1.00]	5,80 [0.23]		15,7 [0.62]		1,3 [0.05]		#4-40 UNC	5,6 [0.22]	19,05 [0.750]
250 lb to 2K lb	31,8 [1.25]	8,1 [0.32]	7,1 [0.28]	9,9 [0.39]	17,8 [0.70]	1,8 [0.07]	1,3 [0.05]	#6-32 UNC	5,1 [0.20]	25,4 [1.000]
3K lb to 10K lb	38,1 [1.50]	10,2 [0.40]		16,0 [0.63]		2,2 [0.09]		#6-32 UNC	5,1 [0.20]	31,75 [1.250]
15K lb to 30K lb	50,8 [2.00]	15,2 [0.60]		25,4 [1.00]		3,0 [0.12]		#6-32 UNC	6,4 [0.25]	41,28 [1.625]
50K lb	76,2 [3.00]	19,8 [0.78]		38,1 [1.5]		4,6 [0.18]		#6-32 UNC	6,4 [0.25]	60,33 [2.375]

Figure 2. Mounting Dimensions: Model 53 (N)

Ranges N	ØD1 mm [in]	ØD2 mm [in]		H mm [in]		L mm [in]		A	B mm [in]	ØG mm [in]
		(6E)	(6I)	(6E)	(6I)	(6E)	(6I)			
20 N to 500 N	25,4 [1.00]	5,80 [0.23]		15,7 [0.62]		1,3 [0.05]		M3 x 0,5	5,6 [0.22]	19,05 [0.750]
1 kN to 10 kN	31,8 [1.25]	8,1 [0.32]	7,1 [0.28]	9,9 [0.39]	17,8 [0.70]	1,8 [0.07]	1,3 [0.05]	M4 x 0,7	5,1 [0.20]	25,4 [1.000]
20 kN to 50 kN	38,1 [1.50]	10,2 [0.40]		16,0 [0.63]		2,2 [0.09]		M4 x 0,7	6,0 [0.24]	32 [1.260]
100 kN to 150 kN	50,8 [2.00]	15,2 [0.60]		25,4 [1.00]		3,0 [0.12]		M4 x 0,7	6,0 [0.24]	41,28 [1.625]
200 kN	76,2 [3.00]	19,8 [0.78]		38,1 [1.5]		4,6 [0.18]		M4 x 0,7	6,0 [0.24]	60,00 [2.362]

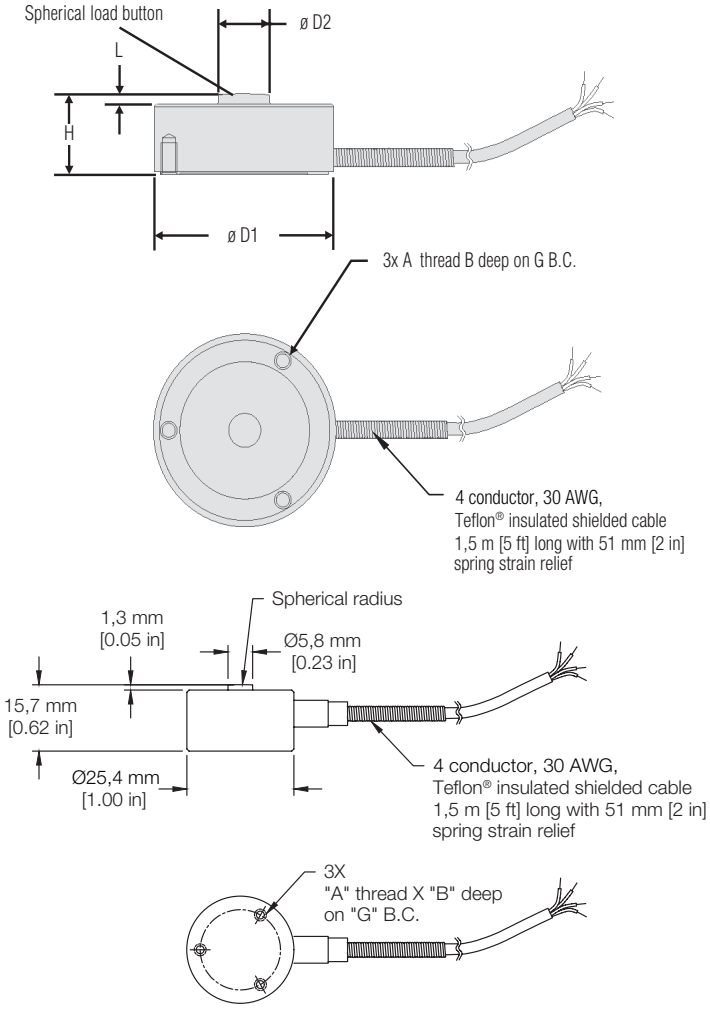

Table 9. Option Codes

	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	5 lb, 10 lb, 25 lb, 50 lb, 100 lb, 250 lb, 500 lb, 1K lb, 2K lb, 5K lb, 10K lb, 15K lb, 20K lb, 30K lb, 50K lb 20 N, 50 N, 100 N, 200 N, 500 N, 1 kN, 2 kN, 5 kN, 10 kN, 20 kN, 50 kN, 100 kN, 150 kN, 200 kN
Temperature compensation	1a. 15° C to 71 °C [60 °F to 160 °F]
Internal amplifiers	2u. Unamplified, mV/V output
Electrical termination	6e. Integral cable: Teflon® 6i. Integral underwater cable (max. 82 °C [180 °F])
Additional point calibration	9a. 10 point (5 up/5 down) 20 % increments @ 20 °C [68 °F]
Electrical interfaces[4]	53s. Phoenix connector and signature calibration module on end of cable 53t. TEDS IEEE 1451.4 module[3]

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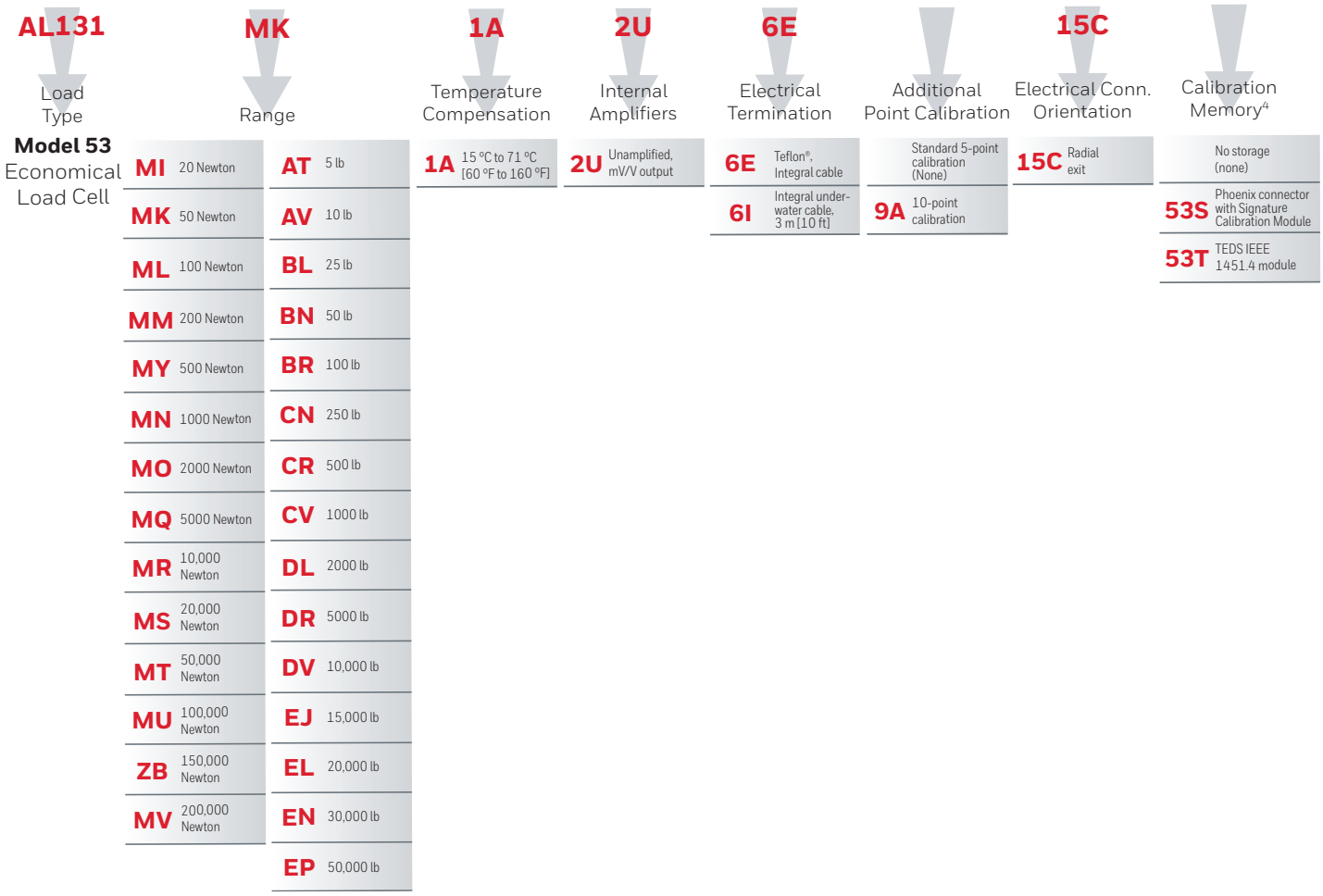
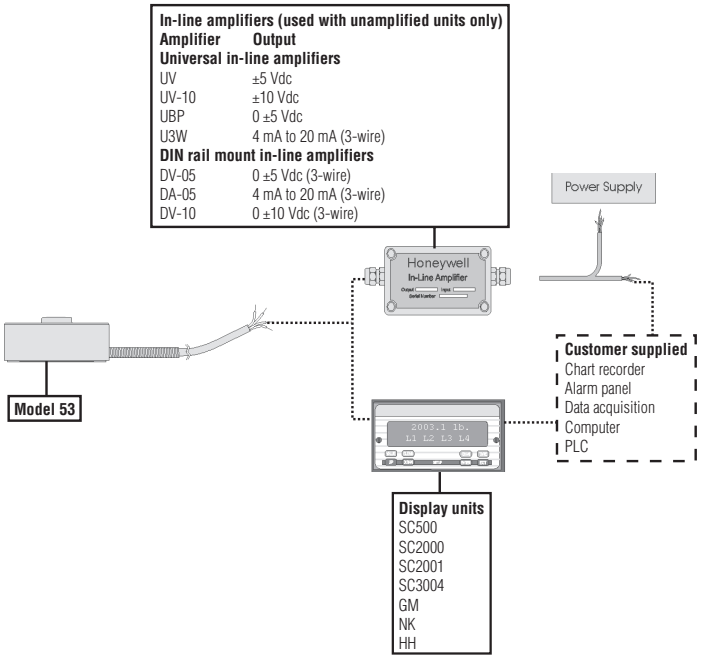
Figure 3. Product Nomenclature



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. TEDS IEEE 1454.4 module installed at end of cable.
4. Maximum operating temperature for options 53S and 53T is 85 °C [185 °F]

Figure 4. Typical System Diagram



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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.

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