

# Series Load Cells

## Catalog Number 2530-400

### Features

- Rated capacities from  $\pm 5$  N to  $\pm 50$  kN (0.5 kgf to 5,000 kgf, 1 lbf to 11,250 lbf)
- Compact low profile design frees up valuable vertical testing space
- Operates in tension, compression and reverse stress modes
- Auto recognition and electrical calibration
- Load cells are designed to withstand 150% of rated capacity
- Excellent linearity through tension and compression
- High axial and lateral stiffness
- All load cells comply with the highest applicable testing standards, including ISO DIS 7500/1, EN10002-2, BS1610 (1992) and JIS B7721, B7733

### Description

Instron® load cells are an integral part of the load weighing system of a testing machine. The proprietary design, manufacturing and quality control are done with customer applications in mind. They are certified in accordance with international standards especially for use in materials testing machines.

Interchangeability, along with transducer recognition and single point calibration makes them easy to use. System electronics provide overload protection by stopping the test at 105% of full scale output. They maintain high alignment and are resistant to offset loading throughout the test, even with large size specimens. The cells can withstand up to 150% of the rated capacity allowing the user to zero out the weight of the fixture up to 50% of the rated load cell capacity, and still maintain specified accuracy through the full range.

Instron load cells are tested for accuracy and repeatability on a calibration apparatus traceable to international standards, with an uncertainty of measurements not exceeding one third of the permissible error of the load cell. Accuracy has been found to be equal to or better than 0.025% of the load cell rated output or 0.25% of the indicated load, whichever is greater.

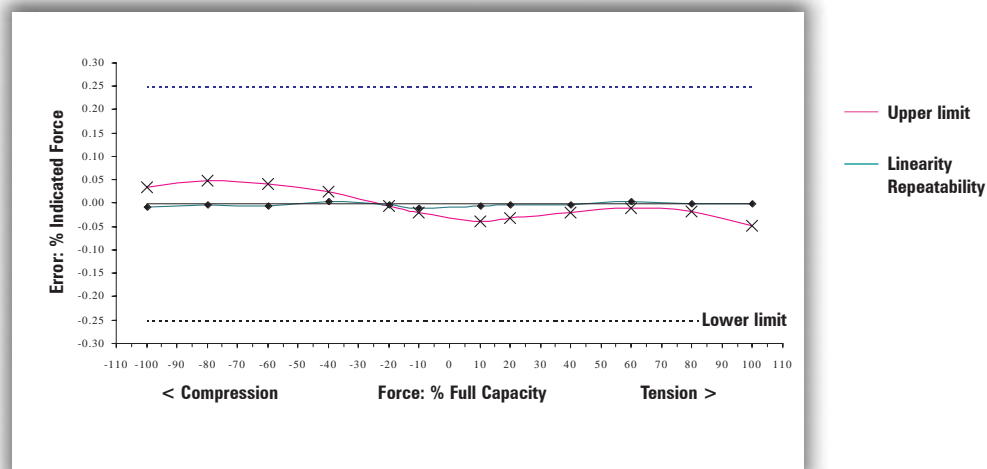
### Principle of Operation

Instron load cells are precision force transducers containing a full bridge of strain gauges bonded to internal load bearing structures. When mechanically stressed the electrical resistance changes on the gauges, thus changing the output signal. This signal is then conditioned for display readouts in accordance with international standards.

The load cell structure has high axial stiffness which reduces stored energy that can transfer to the specimen at break, giving false values. Increased lateral stiffness reduces measurement errors from off axis loading, commonly found when performing compression and flexural tests or where specimens fail by tearing. These load cells are designed to perform tension, compression, and reverse stress modes, eliminating the need to change cells frequently.



▲ 2530-400 series load cell



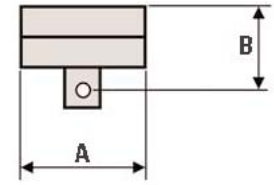
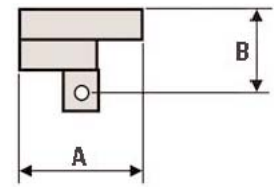
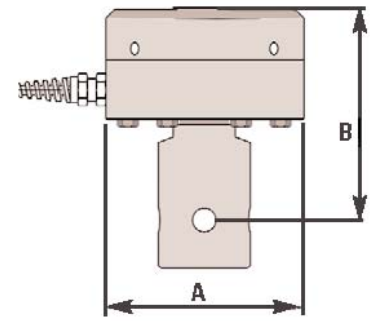
▲ Typical load cell calibration test results

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## Catalog Number 2530-400

### Specifications

Catalog Number	Maximum Capacity	Frame Fitting	Loadstring Fitting	Diameter (A)	Effective Length (B)
2530-445 <sup>1</sup>	±50 kN (5,000 kgf, 11,250 lbf)	M16	0.5 in clevis pin (Type Df)	107 mm (4.2 in)	141.2 mm (5.6 in)
2530-444 <sup>1</sup>	±30 kN (3,000 kgf, 6,750 lbf)	M16	0.5 in clevis pin (Type Df)	107 mm (4.2 in)	141.2 mm (5.6 in)
2530-443 <sup>1</sup>	±10 kN (1,000 kgf, 2,250 lbf)	M16	6 mm clevis pin (Type Of)	107 mm (4.2 in)	97.5 mm (3.8 in)
2530-405 <sup>1</sup>	±5 kN (500 kgf, 1,125 lbf)	M10	6 mm clevis pin (Type Of)	85 mm (3.3 in)	54 mm (2.1 in)
2530-418 <sup>1</sup>	±2 kN (200 kgf, 450 lbf)	M10	6 mm clevis pin (Type Of)	85 mm (3.3 in)	54 mm (2.1 in)
2530-426 <sup>1</sup>	±1 kN (100 kgf, 225 lbf)	M10	6 mm clevis pin (Type Of)	85 mm (3.3 in)	54 mm (2.1 in)
2530-416 <sup>1</sup>	±500 N (50 kgf, 112 lbf)	M10	6 mm clevis pin (Type Of)	85 mm (3.3 in)	54 mm (2.1 in)
2530-427 <sup>1,2</sup>	±100 N (10 kgf, 22 lbf)	M10	2.5 mm clevis pin (Type OOf)	85 mm (3.3 in)	48 mm <sup>3</sup> (1.9 in)
2530-437 <sup>1,2</sup>	±50 N (5 kgf, 11 lbf)	M10	2.5 mm clevis pin (Type OOf)	85 mm (3.3 in)	48 mm (1.9 in)
2530-428 <sup>1,2</sup>	±10 N (1 kgf, 2 lbf)	M10	2.5 mm clevis pin (Type OOf)	85 mm (3.3 in)	48 mm (1.9 in)
2530-439 <sup>1,2</sup>	±5 N (0.5 kgf, 1 lbf)	M10	2.5 mm clevis pin (Type OOf)	85 mm (3.3 in)	48 mm (1.9 in)



▲ Load cell dimensions

#### Notes:

1. Each load cell includes a clevis pin and securing clip
2. These load cells include an adapter to convert to a 6 mm clevis pin connection
3. The 6 mm conversion adapter adds 17 mm to the B dimension

### Specifications

<b>Linearity</b>	< ±0.25% of reading over a range of 1% to 100% of load cell static rating
<b>Repeatability</b>	< 0.25% of reading over a range of 1% to 100% of load cell static rating
<b>Zero Error</b>	The residual indicated force after removing a series of forces is not greater than ±0.05% full rated output
<b>Hysteresis</b>	0.1% of full rated output
<b>Zero Recovery</b>	0.1% of reading over 3 minutes
<b>Sensitivity</b>	1.6 mV/V to 2.4 mV/V at static rating
<b>Zero Balance</b>	< ±10% of rated output up to 100 N and < ±5% of rated output for 500 N and above
<b>Overload</b>	150% static rating without permanent zero shift 300% static rating without mechanical failure
<b>Deflection</b>	0.1 mm at full static rating
<b>Load Reversal Zero Shift</b>	< ±0.50% of full rated output (tension to compression)
<b>Compensated Temperature Range</b>	Temperature range 0 °C to 50 °C
<b>Temperature Effect on Zero</b>	< ±0.002% rated output per °C
<b>Temperature Effect on Sensitivity</b>	< ±0.002% of rated output per °C

#### Notes:

1. It is important to note that most other transducer manufacturers specify linearity of their load cells as a percentage of the full rated output (% FRO). This can be misleading when using lower ranges (i.e. 1% capacity). A load cell rated at 0.05% FRO could show a reading error of 5% at this low point.



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