Load Bending Beam
Model 8511

Application
Model 8511 bending beam load cells are designed for measuring tension and compression forces. Their high accuracy, low torque sensitivity and very low mounting height make these sensors particularly suitable for use in weighing and dosing technology as well as for laboratory and production use.

Extremely simple force application makes the sensor easy to handle. It offers a very favorable price/performance ratio and can be used universally for static and dynamic measurements.

Examples of application:
► Dosing system
► Load deflection curve
► Tension force measurement for wire or thread winders
► Friction forces
► Cable force
► Withdrawal force, etc

Description
The measuring element of this load cell consists of a double bending beam with strain gauges, the resistance of which changes with the application of force. Upon applying a voltage to the strain gauge bridge, the change in the strain gauge resistance is converted into output voltage, which is directly proportional to the force. The strain gauges and the entire measuring element are protected from water spray by rubber bellows.

To install the load cell, it is securely clamped on the side with 2 bore holes. The tension or compression force to be measured is applied at the other end. Force is applied easily perpendicular to the sensor axis. This serves to prevent falsification of the measured values. The influence on the measuring signal resulting from the increase of load distance on the mounting side (e.g. by a touch finger) is negligible. Overload protection can be realized with little effort using a mechanical stop.
## Technical Data

### Material:
- Aluminium, anodized
- Stainless steel 1.4542

### Design:
- Double bending beam

### Mounting:
- Suitable for an extremely high number of cyclical loads.

### Technical Conditions:
- Temperature operating: -30 °C ... 90 °C
- Temperature compensated: 15 °C ... 70 °C
- Temperature effect zero: ≤ 0.01 % F.S./K
- Temperature effect span: ≤ 0.02 % Rdg./K

### Accuracy:
- See table

### Measuring Type:
- Tension and compression

### Preference of Measurement Direction:
- The direction of calibration is indicated by an arrow on the sensor.

### Deflection:
- See table

### Static Overload Safe:
- 150 % of capacity

### Dynamic Performance:
- Recommended for measurement ranges up to 200 N:
  - 200 N: 1.0 mV/V, nominal
  - 500 N: 1.5 mV/V, nominal

### Isolation Resistance:
- > 30 MΩ

### Shunt Calibration Resistance:
- 100 kΩ ± 0.1 %

### Electrical Values:
- Bridge resistance: full bridge, foil model strain gauge 350 Ω, nominal
- Excitation voltage:
  - up to range 0 ... 20 N: max. 5 V DC
  - over range 0 ... 50 N: max. 10 V DC
- Sensitivity:
  - up to range 0 ... 20 N: 1.0 mV/V, nominal
  - over range 0 ... 50 N: 1.5 mV/V, nominal
- Isolation resistance:
  - > 30 MΩ
- Temperature effect:
  - ≤ 0.01 % F.S./K
- Temperature effect span:
  - ≤ 0.02 % Rdg./K

### Mechanical Values:
- See table

### Weight:
- See table

### Electrical Termination:
- 4 wire screened PVC cable with free soldered ends, diameter 4.5 mm, bending radius ≥ 20 mm.

### Wiring Code:
- White: excitation positive
- Brown: excitation negative
- Yellow: signal output positive
- Green: signal output negative

### Mounting:
- Double bending beam
- Sensor body made of high-strength aluminium, stainless steel 1.4542
- Bellows wear and weather resistance rubber
- Sensor body made of stainless steel 1.4571 (IP54)

### Accessories:
- Mating connector, 12 pins for burster desktop devices Model 9941
- Mating connector, 9 pins for 9163-V3, 9235 and 9310 Model 9900-V209

### Test and Calibration Certificate:
- Included in delivery, et al. with specification of zero output, sensitivity and shunt calibration factor.

### Option:
- Standardization of output integrated part of cable to 1.0 mV/V...-V010

### Factory Calibration Certificate (WKS):
- Calibration of a load cell separately as well as connected to an indicator.
- Order Code 85WKS-85

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## Table: Technical Data

<table>
<thead>
<tr>
<th>Model</th>
<th>Measuring Range [N]</th>
<th>Accuracy* [% F.S.]</th>
<th>Dimensions [mm]</th>
<th>Deflection</th>
<th>Natural Frequency</th>
<th>Weight [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>8511-5005</td>
<td>0 ... 5</td>
<td>≤ ± 0.5</td>
<td>19.5</td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>8511-5010</td>
<td>0 ... 10</td>
<td>≤ ± 0.5</td>
<td>19.5</td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>8511-5020</td>
<td>0 ... 20</td>
<td>≤ ± 0.25</td>
<td>19.5</td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>8511-5050</td>
<td>0 ... 50</td>
<td>≤ ± 0.25</td>
<td>19.5</td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>8511-5100</td>
<td>0 ... 100</td>
<td>≤ ± 0.1</td>
<td>28</td>
<td>15</td>
<td>7.5</td>
<td>20</td>
</tr>
<tr>
<td>8511-5200</td>
<td>0 ... 200</td>
<td>≤ ± 0.1</td>
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<td>15</td>
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<td>20</td>
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<tr>
<td>8511-5500</td>
<td>0 ... 500</td>
<td>≤ ± 0.1</td>
<td>28</td>
<td>15</td>
<td>7.5</td>
<td>20</td>
</tr>
<tr>
<td>8511-6000</td>
<td>0 ... 1000</td>
<td>≤ ± 0.1</td>
<td>28</td>
<td>15</td>
<td>7.5</td>
<td>20</td>
</tr>
<tr>
<td>8511-6000</td>
<td>0 ... 2000</td>
<td>≤ ± 0.1</td>
<td>28</td>
<td>15</td>
<td>7.5</td>
<td>20</td>
</tr>
</tbody>
</table>

* Combined value consisting of non-linearity, hysteresis and non-repeatability in constant installation position.

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### Dimensional Drawing Model 8511

The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.


For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

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### Order Information

- Model 8511-5010: Load bending beam, measuring range 10 N
- Model 8511-5020: Load bending beam, measuring range 20 N, standardization of output 1.0 mV/V
- Model 9900-V209: Mounting of mating connector on sensor cable upon prevalent use of the load cell in preferential direction (positive sensor signal in preferential direction)
- Model 99004: Order Code 99004, opposite to preferential direction (positive sensor signal opposite preferential direction)
- Model 99007: Analysis devices, amplifier and process controller like digital display model 9180, USB sensor interface model 9306, sensor profibus module model 9221, in-line amplifier model 9235 and modulator amplifier model 9243 refer to section 9 of the catalog.

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### Order Code 85WKS-85...