Tensile Force Sensors
Models 85081 and 85082

Description
Both load cell types have cylindrical bodies, with a thread at each end for the application of the force. The good figures for linearity, hysteresis and long-term stability are achieved as a result of the special design of the measuring element, on which there is a full-bridge wire strain gauge. The sensors are constructed of stainless steel and are welded to hermetically seal them. The electrical connection has an important effect on the degree of protection of the sensors. Splash-proof protection is achieved here through a high-quality military standard plug-in connector. They are totally sealed by an integrated, waterproof cable connection (optional).

On the model 85081 there is a threaded bolt with an external thread on each side of the cylindrical body. These threaded bolts are integral components of the sensor. On the model 85082, both sides of the cylindrical body have an internal thread.

Application
These load cells have an external or internal thread on both sides and can therefore be used for accurately measuring tensile forces in rods or, using thread eyes, in cables. The robust construction – welded of stainless steel – allows the sensor to be used in many fields such as research, development, test engineering and quality control.

Applications:
- Vehicle and container scales
- Test machines
- Measurements of proportioning and filling level
- Measurement of cable forces and cranes
- Avalanche research
- Oil production

- Measuring ranges from 0 ... 10 kN to 0 ... 1000 kN
- Non-linearity < 0.2% F.S.
- For static and dynamic measurements
- Made of stainless steel
- Welded construction
- Optionally IP68
- Special versions, e.g. for tensile and compressive force, by request
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.

### Electrical values

- Bridge resistance: foil strain gauges \(350 \, \Omega\), nominal*
- Calibration resistor: \(59 \, k\Omega \pm 0.1\%\)
  
  The bridge output voltage caused by a shunt of this value is given in the calibration protocol.
- Reference excitation voltage: \(10 \, V\) DC or AC
- Characteristic: \(2 \, mV/V\), nominal*
- Isolation resistance: > \(5 \, M\Omega\)

* Deviation from the stated value are possible.

### Environmental conditions

- Operation temperature range: \(-55^\circ C \ldots 120^\circ C\)
- Nominal temperature range: \(15^\circ C \ldots 70^\circ C\)
- Influence of temperature to:
  - zero signal \(\pm 0.01\% \, F.S./K\)
  - characteristic \(\pm 0.01\% \, Rdg./K\)

### Mechanical values

- Non-linearity: \(< \pm 0.2 \% \, F.S.\)
- Hysteresis: \(< \pm 0.2 \% \, F.S.\)
- Spread at unchanged mounting position: \(< \pm 0.05 \% \, F.S.\)
- Max. operation force: 150 % of nominal force
- Nominal deflection at nominal force:
  - measurement range \(\leq 0 \ldots 20 \, kN\) approx. \(80 \, \mu m\)
  - measurement range \(\geq 0 \ldots 50 \, kN\) approx. \(100 \, \mu m\)
- Maximum dynamic load:
  - recommended 70 % of nominal load
  - possible 100 % of nominal load

### Design

- The tensile load cells are welded hermetically close. KAPTON is used as an isolation material.

### Material

- stainless steel 17 - 4 PH (similar to 1.4542)

### Dimensions: refer to table and dimensional drawing

### Protection class:

- according to EN 60529 IP64 (IP68 refer to options)

### Electrical connection:

- MIL plug-in connector
  - measurement range \(\leq 0 \ldots 200 \, kN\) 6 pin bajonett connector
  - measurement range \(\geq 0 \ldots 500 \, kN\) 6 pin screw connector

### Wiring of the connector (plug):

- pin A + B excitation positive
- pin C + D excitation negative
- pin E output negative
- pin F output positive

### Technical Data

#### Model 85081

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Measuring Range</th>
<th>Tread</th>
<th>(\phi D)</th>
<th>L</th>
<th>Dimensions [mm]</th>
<th>G1 nom.</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>85081-10</td>
<td>0 ... 10 kN</td>
<td>M 14 x 2.0</td>
<td>38.1</td>
<td>66.0</td>
<td>24</td>
<td>19.1</td>
<td>39.9</td>
<td></td>
</tr>
<tr>
<td>85081-20</td>
<td>0 ... 20 kN</td>
<td>M 14 x 2.0</td>
<td>38.1</td>
<td>66.0</td>
<td>24</td>
<td>19.1</td>
<td>39.9</td>
<td></td>
</tr>
<tr>
<td>85081-50</td>
<td>0 ... 50 kN</td>
<td>M 39 x 1.5</td>
<td>63.5</td>
<td>77.5</td>
<td>38</td>
<td>19.1</td>
<td>52.6</td>
<td></td>
</tr>
<tr>
<td>85081-100</td>
<td>0 ... 100 kN</td>
<td>M 39 x 1.5</td>
<td>63.5</td>
<td>77.5</td>
<td>38</td>
<td>19.1</td>
<td>52.6</td>
<td></td>
</tr>
<tr>
<td>85081-200</td>
<td>0 ... 200 kN</td>
<td>M 39 x 1.5</td>
<td>63.5</td>
<td>77.5</td>
<td>38</td>
<td>19.1</td>
<td>52.6</td>
<td></td>
</tr>
<tr>
<td>85081-500</td>
<td>0 ... 500 kN</td>
<td>M 64 x 2.0</td>
<td>88.9</td>
<td>101.6</td>
<td>76</td>
<td>38.1</td>
<td>76.3</td>
<td></td>
</tr>
<tr>
<td>85081-1000</td>
<td>0 ... 1000 kN</td>
<td>M 90 x 4.0</td>
<td>114.3</td>
<td>127.0</td>
<td>102</td>
<td>38.1</td>
<td>89.0</td>
<td></td>
</tr>
</tbody>
</table>

#### Model 85082

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Measuring Range</th>
<th>Tread</th>
<th>(\phi D)</th>
<th>L</th>
<th>Dimensions [mm]</th>
<th>G1 nom.</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>85082-10</td>
<td>0 ... 10 kN</td>
<td>M 14 x 2.0</td>
<td>38.1</td>
<td>108.0</td>
<td>24</td>
<td>9.1</td>
<td>39.9</td>
<td></td>
</tr>
<tr>
<td>85082-20</td>
<td>0 ... 20 kN</td>
<td>M 14 x 2.0</td>
<td>38.1</td>
<td>108.0</td>
<td>24</td>
<td>9.1</td>
<td>39.9</td>
<td></td>
</tr>
<tr>
<td>85082-50</td>
<td>0 ... 50 kN</td>
<td>M 39 x 1.5</td>
<td>63.5</td>
<td>177.8</td>
<td>38</td>
<td>9.1</td>
<td>52.6</td>
<td></td>
</tr>
<tr>
<td>85082-100</td>
<td>0 ... 100 kN</td>
<td>M 39 x 1.5</td>
<td>63.5</td>
<td>177.8</td>
<td>38</td>
<td>9.1</td>
<td>52.6</td>
<td></td>
</tr>
<tr>
<td>85082-200</td>
<td>0 ... 200 kN</td>
<td>M 39 x 1.5</td>
<td>63.5</td>
<td>177.8</td>
<td>38</td>
<td>9.1</td>
<td>52.6</td>
<td></td>
</tr>
<tr>
<td>85082-500</td>
<td>0 ... 500 kN</td>
<td>M 64 x 2.0</td>
<td>114.3</td>
<td>355.6</td>
<td>76</td>
<td>8.1</td>
<td>89.0</td>
<td></td>
</tr>
<tr>
<td>85082-1000</td>
<td>0 ... 1000 kN</td>
<td>M 90 x 4.0</td>
<td>139.7</td>
<td>457.2</td>
<td>102</td>
<td>38.1</td>
<td>101.7</td>
<td></td>
</tr>
</tbody>
</table>

### Accessories

#### for measurement range \(\leq 0 \ldots 200 \, kN\)

- Mating connector (6 pin cable coupling) in scope of delivery
- Connection cable, one end open for soldering, PVC, length 3 m
- Connection cable, suitable to burster desktop devices, PVC, length 3 m
- Connection cable, one side open for soldering, PVC, length 3 m

#### for measurement range \(\geq 0 \ldots 500 \, kN\)

- Mating connector (6 pin cable coupling) in scope of delivery
- Connection cable, one end open for soldering, PVC, length 3 m
- Connection cable, suitable to burster desktop devices, PVC, length 3 m

### Options

- Order Code ...-VxFxxxx
- Extension of the nominal temperature range to 20 °C ... 120 °C
- Option IP68 internal, waterproofed cable connection, length 3 m, approx. ø 6 mm, usable up to 80 °C, instead of a plug-in connector

---

Technical changes reserved. All data sheets at www.burster.com