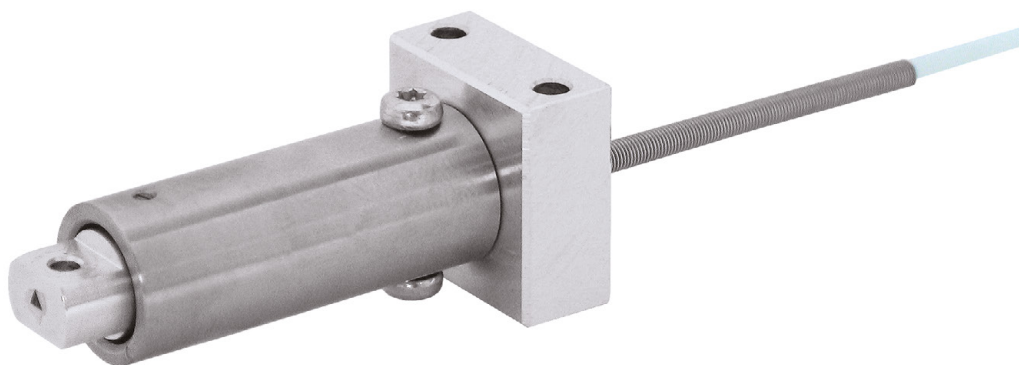


# Miniature Bending Beam Load Cell

## With mechanical overload protection

Model 8510

Code:	8510 EN
Delivery:	ex stock
Warranty:	24 months



- For tension and compression forces
- Small measuring ranges from 0 ... 1 N to 0 ... 20 N
- Mechanical protection against overload up to quintuple range
- Compact size
- Easy installation
- Special design upon request

### Application

The model 8510 bending beam load cell is suitable for measuring small and extremely small applied forces. The mechanical overload protection available for all measuring ranges prevents the sensor from being damaged by excessively high static and quasi-static loads which can occur during measurement and installation.

The sensor can be extended axially, e.g. by a finger, which does not influence the measuring.

Essential application of this sensor include measurement and testing of the following components:

- ▶ Switches (limit-, micro- and toggle-switches)
- ▶ Buttons
- ▶ Contact coupling and contact decoupling forces
- ▶ Frictional forces
- ▶ Spring characteristics
- ▶ Tension of wire and string windings

### Description

The sensor element consists of a double bending beam with applied strain gauges.

Changes in the ohmic resistance of the strain gauge full-bridge caused by applied forces are converted into electrical voltages. The precise value (characteristic value) of the output voltage, resulting from the application of a rated force to the sensor, is specified in the accompanying calibration protocol.

The sensor has to be mounted by two screws on the cable side. The opposite side is meant to receive applied forces (loads).

Once the rated stress or strain is exceeded by 20 %, further deflection of the bending beam is prevented by an integrated, mechanical stop. This protects the sensor element against permanent deformation.

## Technical Data

Order Code	Measuring Range	Overload Protection up to	Natural Frequency [Hz]	Weight [g]
8510-5001	0 ... 1 N	5 N	100	50
8510-5002	0 ... 2 N	10 N	150	50
8510-5005	0 ... 5 N	15 N	250	50
8510-5010	0 ... 10 N	20 N	300	50
8510-5020	0 ... 20 N	40 N	500	50

## Electrical values

Bridge resistance:  
full-bridge, foil type strain gauge 350  $\Omega$ , nominal\*

Excitation:  
measuring range 0 ... 1 N max. 3 V  
measuring range 0 ... 2 N and above max. 5 V

Nominal value: 1 mV/V, nominal\*

Insulation resistance: > 10 M $\Omega$

Calibration resistance: 100 k $\Omega$   $\pm$  0.1 %  
The bridge output voltage resulting by a shunt of this value is specified in the calibration certificate.

\* Deviations from the stated value are possible

## Environmental conditions

Temperature operating: 15  $^{\circ}$ C ... 70  $^{\circ}$ C

Temperature compensated: - 20  $^{\circ}$ C ... 80  $^{\circ}$ C

Temperature effect zero:  $\leq$  0.03 % F.S./K

Temperature effect span:  $\leq$  0.03 % Rdg./K

## Mechanical values

Measurement accuracy:  $\leq \pm$  0.25 % F.S.  
Combined value consisting of non-linearity, hysteresis and non-repeatability in constant installation position.

Measurement type: compression and tension force

Preferential direction of measurement:  
The direction of calibration is indicated by an arrow on the sensor.  
The output voltage will be positive, if a load is given in this direction.

Deflection (full scale): 0.15 mm, nominal

Maximum effective force:  
mechanical stop at approx. 120 % of full scale

Overload limits: see table

Dynamic performance: up to 50 % F.S.  
model 8510 is not qualified for a very large number of loadings.

Material: sensor element: high-strength aluminium;  
housing: high-grade steel shell

Protection class: in accordance to EN 60529 IP20

Weight: see table

Electrical connection: shielded flexible cable,  $\phi$  2 mm,  
length 2 m, bending radius  $\geq$  20 mm,  
with kink-protection sleeve,  $\phi$  3 mm,  
length 40 mm

Wiring code:  
white excitation positive  
brown excitation negative  
yellow signal output positive  
green signal output negative

## Installation Instructions

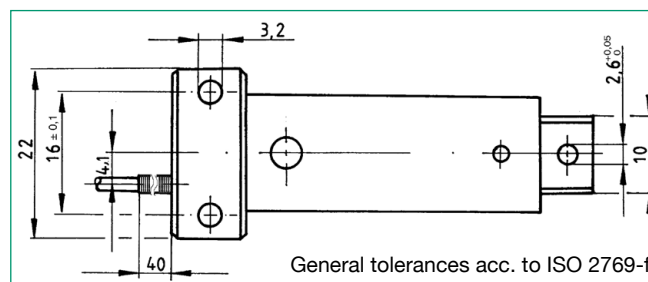
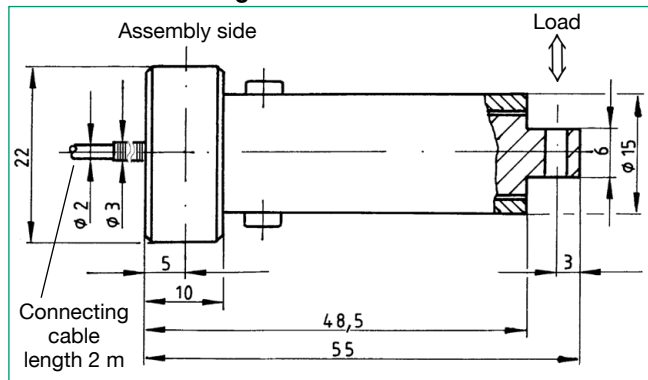
2 clearance holes designed to accommodate M3 screws are provided for mounting the sensor (refer to the drawing).

Forces are exerted on the opposite side. The hole on that side is meant for mounting a suitable force application device (e.g. a load knob).

The correct application of forces is of crucial importance for achieving a high measurement quality. It ensures that the measurement accuracy is not affected by lateral forces or moments.

Lateral forces and moments are produced mainly by eccentric and slanted loads.

## Dimensional drawing model 8510



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

Download via [www.burster.com](http://www.burster.com) or directly at [www.traceparts.com](http://www.traceparts.com). For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

## Order Information

Miniature bending beam load cell measuring range 0 ... 1 N  
**Model 8510-5001**

Miniature bending beam load cell measuring range 0 ... 5 N  
Standardization of the rated characteristic value to 1 mV/V  
**Model 8510-5005-V010**

## Accessories

**Mating connector**, 12 pin for burster desktop units except for 9163  
**Model 9941**

**Mating connector**, 9 pin, for SENSORMASTER and DIGIFORCE<sup>®</sup>  
**Model 9900-V209**

Mounting of mating connector to conductor cable for general use in preferential direction (positive measuring signal in preferential direction)  
**Order Code 99004**

Against preferential direction (positive measuring signal against preferential direction)  
**Order Code 99007**

**Force simulator model 9405 refer to data sheet 76-9405 in section 7.**

(replaces the sensor for checking the amplifier or the indicator)

Supply devices, amplifiers and process monitoring units, such as the digital display model 9180, USB sensor interface model 9206, In-line amplifier model 9235 and module amplifier model 9243  
**refer to section 9 of the catalog.**

## Test and Calibration Certificate

Included in delivery, et al. with specification of zero output, sensitivity and shunt calibration factor.

## Option

Standardization of the rated characteristic value in the connection cable to 1,0 mV/V  $\pm$  0.25 %  
**...-V010**  
(The standardization, length 70 mm, diameter approx. 8 mm, is integrated in the cable, approx. 30 mm before the cable end.)

## Factory Calibration Certificate (WKS)

Calibration of a load cell separately as well as connected to an indicator. Standard is a certificate with 11 points, starting at zero, running up and down in 20% increments covering the complete measuring range for preferential direction. Special calibrations on request. Calculation of costs by base price plus additional costs per point.

**Order Code 85WKS-85...**