

Load Bending Beam

Model 8511



- For tension and compression forces
- Measuring ranges from 0 ... 5 N to 0 ... 2000 N
- High linearity up to 0.1 %
- Very low mounting height
- Simple force application
- Material aluminium or stainless steel
- Special design on request

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

Dim. tolerances acc. ISO 2768-f

Model	Measuring Range [N]	Accuracy* [%F.S.]	Dimensions [mm]													Deflection Full Scale [mm]	Natural Frequency [Hz]	Weight [g]
			ø A	B	C	D	E	F	G	ø H	ø K	L	ø M	N				
8511 - 5005	0 ... 5	≤ ± 0.5	19.5	10	5	15	22	6.5	18.5	5.5 ^{E9}	4.5	86.5	28	6	0.15	130	50	
8511 - 5010	0 ... 10	≤ ± 0.5	19.5	10	5	15	22	6.5	18.5	5.5 ^{E9}	4.5	86.5	28	6	0.2	180	50	
8511 - 5020	0 ... 20	≤ ± 0.25	19.5	10	5	15	22	6.5	18.5	5.5 ^{E9}	4.5	86.5	28	6	0.15	150	50	
8511 - 5050	0 ... 50	≤ ± 0.25	19.5	10	5	15	22	6.5	18.5	5.5 ^{E9}	4.5	86.5	28	6	0.15	120	50	
8511 - 5100	0 ... 100	≤ ± 0.1	28	15	7.5	20	29	8.5	20	5.5 ^{E9}	5.5	101	40	8.5	0.3	280	100	
8511 - 5200	0 ... 200	≤ ± 0.1	28	15	7.5	20	29	8.5	20	5.5 ^{E9}	5.5	101	40	8.5	0.2	230	100	
8511 - 5500	0 ... 500	≤ ± 0.1	28	15	7.5	20	29	8.5	20	6.5 ^{E9}	6.5	101	40	8.5	0.2	200	350	
8511 - 6001	0 ... 1000	≤ ± 0.1	28	15	7.5	20	29	8.5	20	6.5 ^{E9}	6.5	101	40	8.5	0.2	180	350	
8511 - 6002	0 ... 2000	≤ ± 0.1	28	15	7.5	20	29	8.5	20	6.5 ^{E9}	6.5	101	40	8.5	0.3	300	350	

* Combined error of non-linearity, hysteresis and non-repeatability

Electrical values

Bridge resistance: full bridge, foil model strain gauge 350 Ω, nominal

Excitation voltage:

up to range 0 ... 20 N
over range 0 ... 50 N

max. 5 V DC
max. 10 V DC

Sensitivity:

up to range 0 ... 20 N
over range 0 ... 50 N

1 mV/V, nominal*
1.5 mV/V, nominal*

Isolation resistance:

> 10 MΩ

Shunt calibration resistance:

100 kΩ ± 0,1 %

The bridge output voltage evoked by a shunt of this value is indicated in the calibration protocol.

* Deviations from the stated values are possible.

Environmental conditions

Temperature operating:

- 20 °C ... 80 °C

Temperature compensated:

15 °C ... 70 °C

Temperature effect zero:

≤ 0.01 % F.S./K

Temperature effect span:

≤ 0.02 % Rdg./K

Mechanical values

Accuracy:

see table

Measurement type:

tension and compression

Preferential direction of measurement:

The direction of calibration is indicated by an arrow on the sensor.
At this load direction, the output voltage is positive.

Deflection, full scale:

see table

Static overload safe:

150 % of capacity

Dynamic performance: recommended

50 % of capacity

Up to measuring range 0 ... 200 kN the load cell is not suitable for an extremely high number of cyclical loads.

Design:

double bending beam

Material:

range ≤ 0 ... 200 N: sensor body made of high-strength aluminium, anodized

range ≥ 0 ... 500 N: sensor body made of stainless steel 1.4542 bellows wear and weather resistance rubber

Protection class:

acc. EN 60529

IP54

Dimension:

see table and dimensions drawing

Weight:

see table

Electrical termination:

4

4 wire screened PVC cable with free soldered ends, length 2 m, diameter 4.5 mm, bending radius ≥ 20 mm. Kink protection is realized by an additional polymer coat, length approx. 30 mm, diameter 5.5 mm

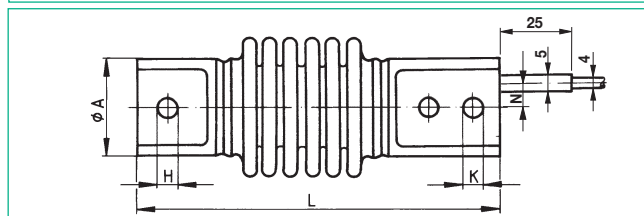
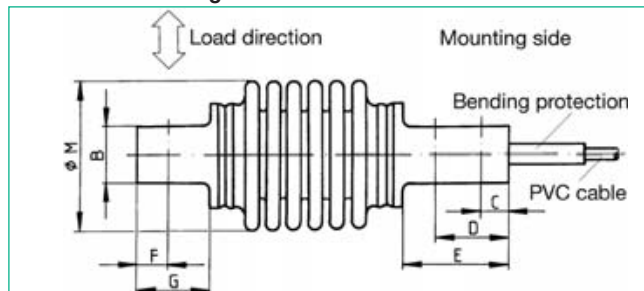
Wiring code:

white excitation positive
brown excitation negative
yellow signal output positive
green signal output negative

Mounting:

Up to measurement range 0 ... 200 N screws of strength class 8.8 necessary, for measurement ranges from 0 ... 500 N screws strength class 12.9.

Dimensional drawing model 8511



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

Download via www.burster.com or directly at www.traceparts.com.
For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

Order Information

Load bending beam, measuring range 10 N

Model 8511-5010

Load bending beam, measuring range 20 N,

standardization of output 1 mV/V

Model 8511-5020-V010

Accessories

Mating connector, 12 pins for burster desktop devices **Model 9941**
Mating connector, 9 pins for 9163-V3, 9235 and 9310

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)

Order Code 99004

opposite to preferential direction (positive sensor signal opposite preferential direction)

Order Code 99007

Analysis devices, amplifier and process controller like digital indicator model 9180, modular amplifier model 9243, USB sensor interface model 9205, sensor profibus module model 9221 or In-Line amplifier model 9235 **see section 9 of the catalog.**

Test and Calibration Protocol

Protocol with traceability certificate and indication of the zero signal, the characteristic and the calibration step is included in scope of delivery.

Option

Standardization of output integrated part of cable

Order Code V010

(refer to order information)

Manufacturer Calibration Certificate (WKS)

Calibration of a sensor or as measuring chain in compressive or/and tensile direction. 20 % steps of measuring range up and down, in installation position.