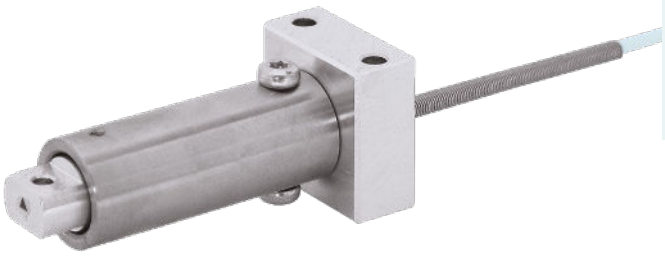
Delivery: ex stock | Warranty: 24 months

Miniature Bending Beam Tension and Compression Load Cell

MODEL **8510**



Highlights

- Measuring ranges from 0 ... 1 N up to 0 ... 20 N, 0 ... 0.224 lbs up to 0 ... 4.4 lbs
- Compact size
- Mechanical bidirectional overload protection
- Easy installation
- Special design upon request

Options

- Non-linearity 0.075 % F.S.
- Standardized nominal sensitivity
- burster TEDS

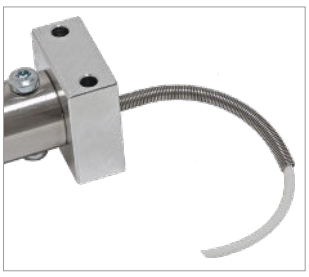
Applications

- Check of switches and buttons (limit-, micro- and toggle-switches)
- Contact coupling and contact decoupling forces
- Recording of frictional forces and spring characteristics
- Research and Development

burster TEDS

Measurement direction

Overload protection



Sensor attachment
Bending protection

Product description

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

Changes in the ohmic resistance of the strain gage fullbridge 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

8510	–	5001	5002	5005	5010	5020
Measuring range calibrated in N from 0 ...		±1 N	±2 N	±5 N	±10 N	±20 N
		±0.224 lbs	±0.449 lbs	±1.124 lbs	±2.248 lbs	±4.496 lbs
Accuracy						
Relative non-linearity*		≤ ±0.2 % F.S.				
Characteristic curve deviation*		≤ ±0.2 % F.S.				
Relative hysteresis		≤ 0.1 % F.S.				
Temperature effect on zero output		0.03 % F.S./K				
Temperature effect on nominal sensitivity		0.03 % F.S./K				
Electrical values						
Sensitivity nominal		1.0 mV/V				
Measurement direction		Tension and compression direction. Load calibration in compression direction (clearly marked by an arrow on the sensor). The full-scale output is likely to be different when used in the tension direction. Positive signal in compression direction.				
Standardization**		option 1.0 mV/V (±0,25 %)				
Bridge resistance		350 Ω nominal (deviations are possible)				
Excitation		max. 3 V DC	max. 5 V DC			
Insulation resistance		> 30 MΩ at 45 V				
Environmental conditions						
Nominal temperature range		+15 °C ... +70 °C				
Operating temperature range		-20 °C ... +80 °C				
Mechanical values						
Deflection full scale		0.15 mm (nominal)				
Maximum operating force***		mechanical stop at approx. 120 % of full scale				
Overload protection		up to 5 N	up to 10 N	up to 15 N	up to 20 N	up to 40 N
Dynamic performance***		recommended: 50 %				
Protection class (EN 60529)		IP20				
Installation						
Intended mounting screws		M3				
Tightening torque mounting screws	[N*m]	0.9 N*m (for steel) / 0.7 N*m (for aluminum)				
Mounting screws		resistance 8.8				
Installation instructions		Two clearance holes designed to accommodate M3 screws are provided for mounting the sensor. On the opposite on the lying side there is a hole for attaching a suitable receptacle for force application. (e.g. a load button or touch finger). For high quality force measurements, lateral forces and moments are avoided.				
Other						
Material		high-strength aluminium, high-grade steel shell				
Natural frequency	[Hz]	100	150	250	300	500
Mass	[g]	50				

* The data in the area 20 % - 100 % of rated load F

** Realized on board in connection cable, 1.7 m from sensor housing or 0.3 m from cable end (temperature range limited to 0 ... 60 °C)

*** The sensor is not designed for a very large number of load change cycles up to the nominal load

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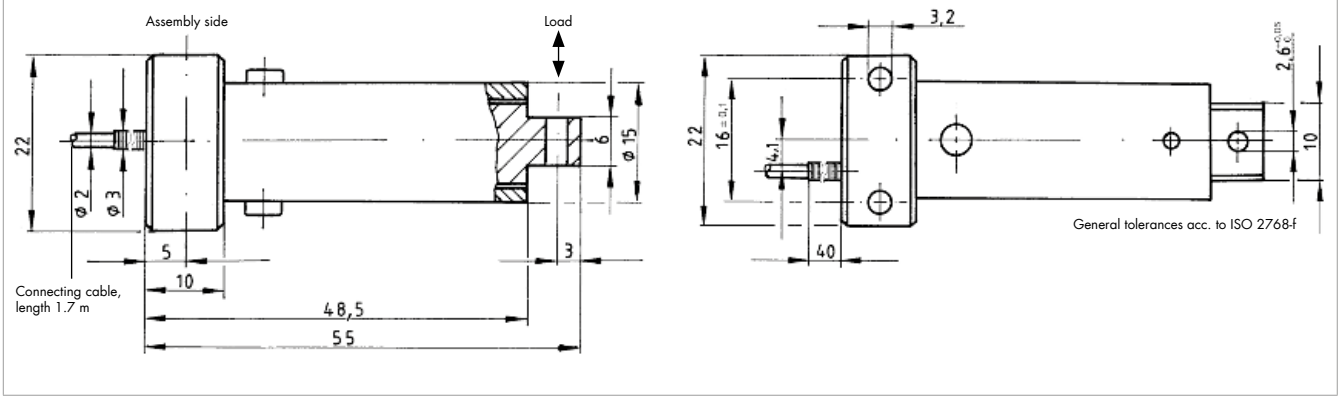
Dimensional drawing – **Measuring ranges from ≤ 0 ... ±20 N | from ≤ 0 ... ±4.4 lbs**



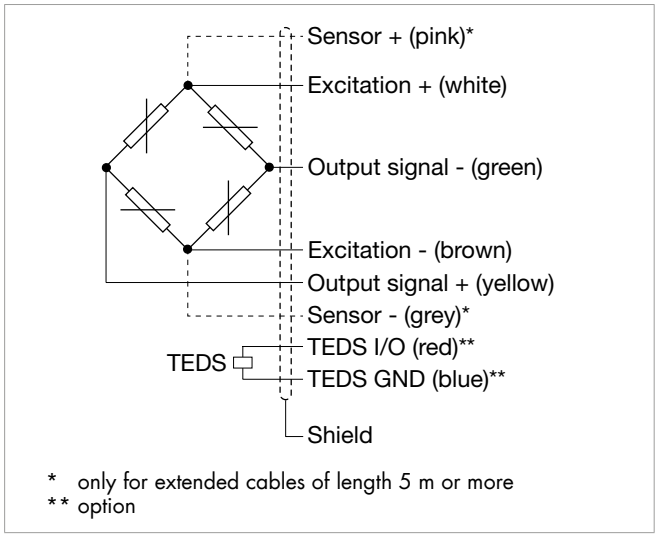
Electrical termination

Output signal

burster load cells are based on a strain-gage Wheatstone bridge. This measurement principle means that the output voltage mV/V is highly dependent on the sensor supply voltage. Our website contains details of suitable instrumentation amplifiers, indicator and display devices and process instruments.

burster TEDS

The "**burster T**ransducer **E**lectronic **D**ata **S**heet" (TEDS) is a memory in which identification data of the sensor, calibration data and other sensor parameters are saved. In conjunction with your own suitable burster device, there is the option of performing a simple adjustment in order to achieve the maximum accuracy of the measuring chain. A simple sensor exchange is thus possible in just a few steps without losing precision.



* only for extended cables of length 5 m or more
** option

8510	–	5001	5002	5005	5010	5020
Measuring range from 0 ...		±1 N	±2 N	±5 N	±10 N	±20 N
Electrical termination						
Specifications		highly flexible, oil resistant, drag chains suitable				
Cable fastening		cable cover				
Bending protection		bend protection spring				
Bending radius		three times the diameter for fixed cable, ten times the diameter for cable permanently moving				
Cable model		PUR, Ø = 2.0 mm				

Accessories

Connectors and units

Order Code		
Connectors		
9941		Connectors 12 pin, suitable to all burster desktop units
9900-V209		Connectors 9 pin, suitable to SENSORMASTER, DIGIFORCE® and TRANS CAL
9900-V229		Connectors 9 pin with TEDS
9900-V245		Connectors 8 pin, suitable to ForceMaster
Units		
7281-V0001		Mobile measuring device with strain gage simulator and sensor test (R_i, R_a, Shunt, R_{ISO})
refer to section 9		Sensor electronics, amplifier and process control units like digital indicator model 9180, model 9163, modular amplifier model 9250 or DIGIFORCE® model 9307

Calibration

Test and calibration certificate		
Supplied with the sensor		Amongst other data, includes figures for zero point, full-scale output and calibration offset
Standard factory calibration certificate for load cells or measurement chains (WKS)		
Optionally available		Our standard factory calibration certificate includes 11 measurement points, starting at zero, spread evenly in 20% steps over the full measuring range, for increasing and decreasing load under the same installation conditions. Factory calibrations can be performed in the compression and/or tension direction depending on the sensor type.
Special factory calibration certificate for load cells or measurement chains (WKS)		
On request		We are happy to calibrate sensors and measurement chains to the customer's specification.
German-accredited DAkkS calibration certificate for sensors and measurement chains (DKD)		
Optionally available		Our DAkkS-certified calibration laboratory provides calibration certificates to DIN EN ISO 376. The calibration certificate includes 21 measurement points, starting at zero, spread evenly in 10% steps over the measuring range, for increasing and decreasing load under various installation conditions. DAkkS calibrations can be performed in the compression and/or tension direction depending on the sensor type.

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Order Code

Measuring range	Code				Measuring range
0 ... ±1 N	5	0	0	1	0 ... ±0.224 lbs
0 ... ±2 N	5	0	0	2	0 ... ±0.449 lbs
0 ... ±5 N	5	0	0	5	0 ... ±1.124 lbs
0 ... ±10 N	5	0	1	0	0 ... ±2.248 lbs
0 ... ±20 N	5	0	2	0	0 ... ±4.4 lbs

									Delivery ex stock at short notice					
									N	0	0	0	S	0	0	0
8	**5**	**1**	**0**	**–**					**–**			**0**	**S**	**0**	**0**	**0**

■ Nominal sensitivity/not standardized	N
■ Standardization at 1.0 mV/V ***	C

*** temperature range limited to 0 ... +60 °C

■ Connection cable 1.7 m (Standardization 2 m	0
■ Connection cable 3 m	F
■ Connection cable 5 m	G
■ Connection cable 3 m extended *	L
■ Connection cable 5 m extended * (with sens line)	M

* shortened delivery time compared with cable length 3 m and 5 m in one piece

■ Open cable ends + 6 cm single wires	0
■ 9 pins Sub-D connector model 9900-V209	B
■ 9 pins Sub-D connector model 9900-V209 for 9163-V3xxxx	E
■ 12 pins round connector model 9941 for burster desktop devices	F
■ 9 pins Sub-D connector with burster TEDS model 9900-V229 ***	T
■ 8 pins coupling connector model 9900-V245 for 9110	H

*** temperature range limited to 0 ... +60 °C

■ Non-linearity 0.2 % F.S. **	S
■ Non-linearity 0.075 % F.S. **	L

** The data in the area 20 % - 100 % of rated load F_{nom}

Note

- **Brochure**
  Our brochure **„Load cells for production, automation, R&D and quality assurance"** is available for download on our website. It conatains numerous applications, detailed product specifications and overviews.

- **Product videos**
  Watch our **How-to-do video** at: **www.youtube.com/bursterVideo**

- **CAD data**
  Download via **www.burster.com** or directly at **www.traceparts.com**