

# Tension-Compression Load Cells

**Model 8523**  
**Model 8531**

Code:	8523 EN
Delivery:	ex stock
Warranty:	24 months

CAD data 2D/3D for this sensor:  
Download directly at [www.traceparts.com](http://www.traceparts.com)  
Info: refer to data sheet 80-CAD-EN



- Measuring ranges from 0 ... 20 N to 0 ... 5000 N
- Measuring accuracy up to 0.15 % F.S.
- Material high-strength aluminium
- Standardized nominal characteristic value starting with a measurement range of 0 ... 100 N
- Especially inexpensive

## Application

These sensor series are especially suitable for the measurement of static and semi-static tension and compression measurements. The membrane load cells are designed based on proven principles. Their compact design and very solid construction makes them suitable for use in manufacturing plants as well as in laboratories and testing. Sensor characteristic value is standardized with the exception of model 8523-20/50 N. This makes it possible to replace the measurement amplifier without adjusting it. Furthermore it is possible to connect several load with the same measurement range at the same time by totaling the individual forces.

Applications:

- ▶ Cable force
- ▶ Measurement of bar, rods and framework forces
- ▶ Press-fit processes
- ▶ Balance and test scales
- ▶ Friction forces
- ▶ Withdrawal forces

## Description

The load to be measured is applied either using a load button or an application specific thread part to the load cell via a M8 thread, which is located in the axis of the tension and compression sensors. A strain gauge full bridge is in the sensor element, which converts the applied load into an electrical signal.

The mounting of the load cells is unproblematic due to the three-point support. This reduces the mounting surface requirements.

In order to achieve an optimal measuring result, the force to be measured must be applied to the sensor axially. Lateral forces can be avoided by constructional measures like mounting the load cell on movable bearings, guiding sleeves, etc.

Load buttons (see drawings) enable an optimal appliance of the compression forces to the load cells. The measurement error upon non-axial load application is negligible up to an angle error of 3° due to the sensor's convex surface. The output signal is positive in the calibrated direction of motion (compression force). The characteristic value in the direction of tension can deviate from the calibrated direction of compression by up to 0.3 %.

## Technical Data

Dim. tolerances acc. ISO 2768-f

Order Code	Load Range	Accuracy <sup>1)</sup> [%v.E.]	Sensitivity [mV/V]	ø D [mm]	H [mm]	Natural Frequency [kHz]	Weight [kg]	Wrench Torque for Mounting Screw 12.9
8523-20	0 ... 20 N	≤ ± 0.5	nominal <sup>2)</sup> 1.0	54.5	16	0.5	0.15	3 Nm
8523-50	0 ... 50 N	≤ ± 0.5	nominal <sup>2)</sup> 1.0	54.5	16	0.75	0.15	3 Nm
8523-100	0 ... 100 N	≤ ± 0.5	standardized 1.5 ± 0.5 %	54.5	16	0.80	0.15	3 Nm
8523-200	0 ... 200 N	≤ ± 0.2	standardized 1.5 ± 0.2 %	54.5	16	1.1	0.15	3 Nm
8523-500	0 ... 500 N	≤ ± 0.2	standardized 1.5 ± 0.2 %	54.5	16	2.3	0.15	3 Nm
8531-1000	0 ... 1000 N	≤ ± 0.25	standardized 1.5 ± 0.2 %	89.5	22	1.0	0.35	6 Nm
8531-2000	0 ... 2000 N	≤ ± 0.15	standardized 1.5 ± 0.2 %	99.5	30	1.8	0.35	6 Nm
8531-5000	0 ... 5000 N	≤ ± 0.15	standardized 1.5 ± 0.2 %	99.5	30	3.0	0.35	6 Nm

<sup>1)</sup> The figures specified are the combined value for non-linearity hysteresis and repeatability.

<sup>2)</sup> More or less deviation from stated is possible.

### Electrical values

Bridge resistance (full bridges): foil strain gauges 350 Ω, nominal <sup>2)</sup>

Calibration resistor:  
 model 8523-20 N 150 kΩ ± 0.1 %  
 model 8523-50 N 100 kΩ ± 0.1 %  
 others 80 kΩ ± 0.1 %

The bridge output voltage resulting from a shunt resistor of these values is shown in the calibration certificate.

Excitation:

range 0 ... 20 N max. 5 V DC or AC  
 from range 0 ... 50 N max. 10 V DC or AC

### Environmental condition

Temperature operating: - 30 °C ... + 80 °C

Temperature compensated: + 15 °C ... + 70 °C

Temperature effect:

model 8523 ≤ ± 0.01 % F.S./K  
 model 8531 ≤ ± 0.02 % F.S./K

Temperature effect to span: ≤ + 0.02 % Rdg./K

### Mechanical values

Kind of measurement: tension or compression direction  
 (calibrated in compression direction)

Deflection full scale: approx. 80 µm

Overload safe: 130 % of capacity

Overload burst: approx. 300 % of capacity

Dynamic performance: recommended 50 % of capacity,  
 not suitable for large number of load cycles in tension or compression direction.

Casing material: high-grade aluminium, anodized

Natural frequency: see table

Protection class: acc. EN 60529

model 8523 IP52  
 model 8531 IP64

Electrical termination:

Screened, highly flexible cable with free soldered ends, length approx. 2 m, ø 4.5 mm, bending radius > 40 mm. For model 8523 from range 0 ... 100 N the standardization is integrated in the sensor cable (length 7 cm, ø 8 mm, distance from cable end 30 cm).

Wiring code:

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

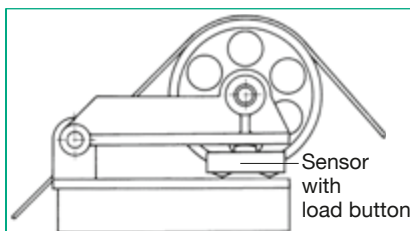
Dimension: see table and dimensions drawing

Weight: see table

Mounting: wrench torque for mounting screws, strength class 12.9 see table

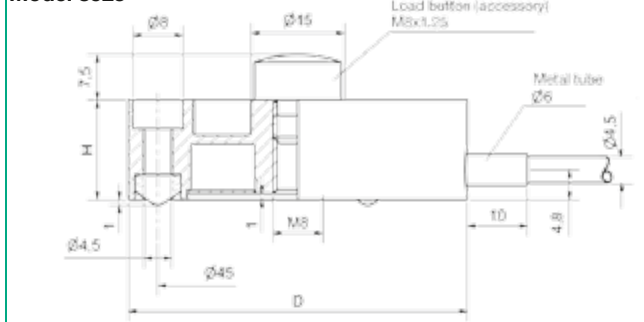
### Application example

A stable joint fastening of the arm protects the load cell against impermissible lateral and torsion forces.

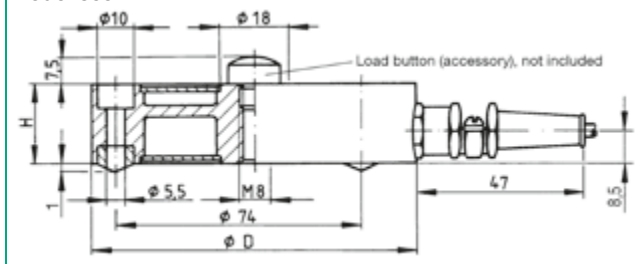


### Dimensional drawing

#### Model 8523



#### Model 8531



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

Compression and tension load cell, range 200 N **Model 8523-200**

### Accessories

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

**Mating connector**, 9 pins, for 9163-V3..., 9235 and 9310 **Model 9900-V209**

Mounting of mating connector to conductor cable for general use in preferential direction

in preferential direction (positive signal for compression)

**Order Code 99004**

Against preferential direction (positive signal for tension)

**Order Code 99007**

**Load button** for introduction of compressive forces polished and induction hardened (not included delivery) **Model 8580-V008**

**Pull plate** for measuring tension and compression forces (on both sides rings can be mounted)

for model 8523 **Model 8590-V002**

for model 8531 range 0...1 kN **Model 8590-V006**

for model 8531 range 0...2 kN and 0...5 kN **Model 8590-V007**

Amplifier, analysis and process control devices e.g. digital indicator 9180, modular amplifier model 9243, DIGIFORCE® 9306 or In-Line-amplifier model 9235 **see section 9 of the catalog.**

### Manufacturer Calibration Certificate (WKS)

Calibration of a load cell or a measurement chain in tensile or compressive direction. Calibration in 20 % steps of measurement range, up and down in installation position.