

# Ultra-Miniature Load Cell

## Model 8416

Code:	8416 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



**NEW**  
now measuring ranges  
from 0 ... 20 N

- Inexpensive
- Measuring ranges from 0 ... 20 N to 0 ... 5 kN
- Dragchain cable
- Option standardization the nominal sensitivity
- Option temperature compensated range -20 °C ... 90 °C

### Application

Due to their extremely compact design, these load cells can be used wherever static or dynamic load forces have to be measured in very tight spaces.

Model 8416 is perfect for use in micro-technology and just as suitable for measuring tasks in the research and development sector.

Typical applications for these ultra-miniature compression load cells include

- ▶ Equipment construction
- ▶ Production lines
- ▶ Measuring and control equipment
- ▶ Testing systems
- ▶ Handling gear
- ▶ Universal testing machines, etc.

### Description

The ultra-miniature compression load cell model 8416 is a flat, circular disc, the bottom of which is sealed with a cover. The load application button for receiving the compression forces is an integrated part of the sensor.

The sensor element inside the body carries a strain gauge full bridge which outputs voltage directly proportional to the measurement variable upon application of force.

The short nominal measurement distance of the ultra-miniature compression load cells due to their design provides a high degree of rigidity. If needed, the nominal characteristic value can be standardized in the sensor connection cable. This allows for quick and easy interchange or simultaneous connection of several sensors to a single evaluation unit.

**Technical Data**

Order Code	Measuring Range	Dimensions [mm]					Resonance Frequency [kHz]
		ø D1	ø D2	ø D3	H1	H2	
8416-5020	0 ... 20 N	10.6	3	7.6	4.5	5	6
8416-5050	0 ... 50 N	10.6	3	7.6	4.4	5	6
8416-5100	0 ... 100 N	10.6	3	7.6	4.5	5	6
8416-5200	0 ... 200 N	10.6	3	7.6	4.5	5	20
8416-5500	0 ... 500 N	10.6	3	7.6	5.5	6	18
8416-6001	0 ... 1000 N	10.6	3	7.6	6.5	7	30
8416-6002	0 ... 2000 N	10.6	3	7.6	6.5	7	45
8416-6005	0 ... 5000 N	12.6	3	7.6	6.5	7.5	80

**Electrical values**

Bridge resistance:  
 measuring range ≤ 0 ... 50 N      500 Ω, nominal\*  
 measuring range ≥ 0 ... 100 N      350 Ω, nominal\*  
 Excitation:      5 V DC  
 Nominal sensitivity:  
 measuring range ≤ 0 ... 50 N      5 ... 30 mV/V, nominal\*  
 measuring range ≥ 0 ... 100 N      0.8 mV/V, nominal\*  
 Insulation resistance:      > 10 MΩ

\*Deviations from the stated value are possible.

**Environmental conditions**

Nominal temperature range:  
 measuring range ≤ 0 ... 50 N      + 15 °C ... + 60 °C  
 measuring range ≥ 0 ... 100 N      + 15 °C ... + 70 °C  
 Operating temperature:      0 °C ... + 80 °C  
 Influence of temperature on zero:  
 measuring range ≤ 0 ... 50 N      ≤ ± 0.5 % F.S./10 K  
 measuring range ≥ 0 ... 100 N      ≤ ± 0.3 % F.S./10 K  
 Influence of temperature on sensitivity:  
 measuring range ≤ 0 ... 50 N      ≤ ± 0.5 % Rdg./10 K  
 measuring range ≥ 0 ... 100 N      ≤ ± 0.3 % Rdg./10 K

**Mechanical values**

Non-linearity:      < 0.5 % F.S.  
 Hysteresis:      0.25 % F.S.  
 Non-repeatability on unchanged mounting position:      < 0.1 % F.S.  
 Deflection:      approx. 20 µm  
 Static overload safe:      150 % of capacity  
 Dynamic performance:  
 recommended      50 % of capacity  
 maximum      70 % of capacity

Material:      High-grade stainless steel 1.4542

Electrical connection:  
 Measuring range ≤ 0 ... 50 N shielded, TPE coated cable with bare ends for soldering, length approx. 2 m, bending radius ≥ 30 mm; circuit board (70 x 8 mm) with balancing resistors 30 cm away from the cable's end  
 Measuring range ≤ 0 ... 100 N shielded, dragchain TPE coated cable with bare ends for soldering, length approx. 2 m, bending radius ≥ 10 mm

Protection class:      acc. to EN 60529      IP54

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

Dimensions:      refer to table and scale drawing

General tolerance of dimensioning:      acc. to ISO 2768-f

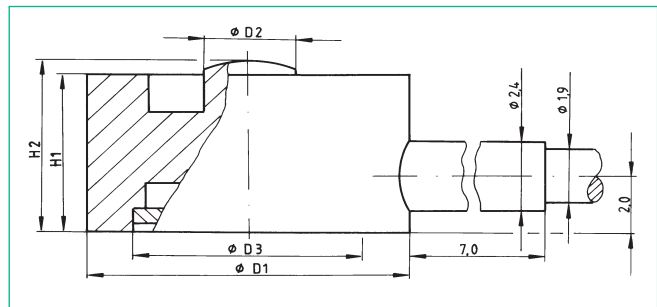
Weight:      approx. 10 g without cable

**Mounting Instructions**

The measuring force is to be applied centrally and free from lateral force. To prevent contact at just a few points, ensure that the sensor is installed on a flat surface. The sensor can be secured using silicon, wax or an adhesive for example. Do not subject the sensor to lateral clamping forces as these would result in measurement errors. When handling and installing the sensor, ensure that the cable outlet and sensor cable are not subjected to excessively high tensile or lateral forces. Strain relief may be necessary.

**A-Tech Instruments Ltd.**

**Dimensional drawing model 8416**



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**

Ultra-miniature compression load cell, measuring range 0 ... 200 N

**Model 8416-5200**

**Accessories**

Mounting of mating connector to conductor cable      **Model 99004**

Mating connector      **Model 9941**

12 pins, to all burster table housings

9 pins, to model 9235 and model 9310      **Order Code: 9900-V209**

Mounting of a connector to the sensor cable for main usage

in preferential direction (positive signal for tensile load)      **Order Code: 99004**

Only for connection of 8415 to SENSORMASTER model 9163

desktop version      **Order Code: 99002**

Amplifiers, sensor supplying instruments and process controllers as e.g. digital measuring indicator for strain gauges model 9180, model 9163, modular amplifier model 9243

refer to section 9 of the catalog.

**Option**

Standardization of the sensitivity in the sensor connection cable, only for measuring ranges > 0 ... 100 N to 0.8 mV/V ± 0,25 %      **...-V008**

Extension of temperature compensated range for measuring ranges ≥ 0 ... 100 N to -20 °C ... 90 °C      **...-V401**

**Manufacturer Calibration Certificate (WKS)**

Calibration of the load cell separately as well as connected to an indicator is available. Calculation consists of basic costs and additional costs per measuring point. Please mention the requested points. Standard is an 11 point run in 20 % increments up and down.