

## Subminiature Load Cell

**Model 8413**

**Model 8414 with overload protection**

Code:	8413 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



- Especially flat design
- Small measuring ranges
- Made of stainless steel
- High resonance frequencies
- Accuracy from < 0.5 % F.S.
- Model 8414 with mechanical overload protection

### Application

These subminiature compression load cells have to be installed very carefully. They must be mounted on a flat and even surface using contact adhesive, wax or a small laminated spring to hold the sensor body down. Preloads which could have a direct impact on the sensor body, and clamping the sensor on its sheath are to be avoided.

The measuring force has to be applied centrally and free from lateral forces which have to be kept away from the sensor using levers or guideways. Mounting must always be performed manually without use of power tools. Overload damage during the mounting process can be passively prevented by electrically connecting the sensor and displaying the force value.

### Description

The subminiature compression load cells are flat, cylindrical discs with covered bottoms. The load application button for receiving the compression forces is an integrated part of the top, which is the sensor's membrane. The strain gauges are applied on the back and wired to a full Wheatstone bridge, which results in voltage output proportional to the load applied.

The connecting cable of the load cell features a covered correction network on a small board. The sensor's temperature compensation is installed here.

Due to its extremely small dimensions, this model is perfect for use in applications with limited space. The small diameters result in high resonance frequencies.

**8413 EN**

## Technical Data

### Model 8413

Order Code	Measuring Range	Dimensions [mm]				Resonance Frequency [kHz]	Nominal Value [mV/V]	Weight without Cable [g]
		Ø D 1	Ø D 2	H 1	H 2			
8413- 2.5	0 ... 2.5 N	9.7	2.3	3.4	2.6	3.0	15	1.2
8413- 5	0 ... 5 N	9.7	2.3	3.4	2.6	4.0	15	1.2
8413- 10	0 ... 10 N	9.7	2.3	3.4	2.6	7.0	1.5	1.2
8413- 20	0 ... 20 N	9.7	2.3	3.4	2.6	11.0	2	1.2
8413- 50	0 ... 50 N	9.7	2.3	3.4	2.6	18.0	2	1.2
8413- 100	0 ... 100 N	9.7	2.3	3.4	2.6	26.0	2	1.2
8413- 200	0 ... 200 N	9.7	2.3	3.4	2.6	40.0	2	1.2
8413- 500	0 ... 500 N	12.7	3.0	3.8	3.3	67.0	2	3.2
8413- 1000	0 ... 1000 N	12.7	3.0	3.8	3.3	85.0	2	3.3
8413- 2000	0 ... 2000 N	19.1	6.4	6.4	5.7	98.0	2	10.3
8413- 5000	0 ... 5000 N	19.1	6.4	6.4	5.7	167.0	2	10.3

### Model 8414 with overload protection

Order Code	Measuring Range	Dimensions [mm]				Resonance Frequency [kHz]	Nominal Value [mV/V]	Weight without Cable [g]
		Ø D 1	Ø D 2	H 1	H 2			
8414- 2.5	0 ... 2.5 N	9.4	2.3	6.4	5.8	3.0	12	3.8
8414- 5	0 ... 5 N	9.4	2.3	6.4	5.8	4.0	12	3.8
8414- 10	0 ... 10 N	9.4	2.3	6.4	5.8	7.0	1	3.8
8414- 20	0 ... 20 N	9.4	2.3	6.4	5.8	11.0	1	3.8
8414- 50	0 ... 50 N	9.4	2.3	6.4	5.8	18.0	1	3.8
8414- 100	0 ... 100 N	9.4	2.3	6.4	5.8	26.0	1	3.8

### Electrical values

Bridge resistance (full bridge):

measuring ranges  $\leq 0 \dots 5$  N semiconductor 500  $\Omega$ , nominal  
measuring ranges  $\geq 0 \dots 10$  N foil 350  $\Omega$ , nominal

Excitation:

5 V DC

Nominal value:

refer to table

Insulation resistance:

$> 5000$  M $\Omega$  by 50 V DC

Shunt calibration resistor:

59 k $\Omega \pm 0.1$  %

The bridge output voltage caused by a shunt of this value is shown in the calibration certificate.

### Environmental conditions

Range of operating temperature: -55  $^{\circ}\text{C}$  ... +120  $^{\circ}\text{C}$

Nominal temperature range: +15  $^{\circ}\text{C}$  ... +70  $^{\circ}\text{C}$

Influence of temperature on zero:  $\leq \pm 0.02$  % F.S./K

Influence of temperature on sensitivity:  $< + 0.02$  % Rdg./K

### Mechanical values

Non-linearity:

measuring ranges  $\leq 0 \dots 5$  N  $< \pm 0.5$  % F.S.  
measuring ranges  $\geq 0 \dots 10$  N  $< \pm 0.25$  % F.S.

Accuracy:

measuring ranges  $\leq 0 \dots 5$  N  $< \pm 0.5$  % F.S.  
measuring ranges  $\geq 0 \dots 10$  N  $< \pm 0.25$  % F.S.

Non-repeatability:

$< \pm 0.1$  % F.S.

Deflection full scale:

measuring ranges  $\leq 0 \dots 5$  N 13  $\mu\text{m}$  ... 38  $\mu\text{m}$   
measuring ranges  $\geq 0 \dots 10$  N 25  $\mu\text{m}$  ... 76  $\mu\text{m}$

Static overload capacity: 150 % of nominal load

Maximum static overload stop: 500 % of nominal load

Dynamic load: recommended 70 % of nominal load  
maximum 100 % of nominal load

Material: stainless steel 17-4 PH (similar to 1.4542)

Electrical connection

Highly flexible teflon isolated with open ends for soldering. Length approx. 1.5 m. Steep board, width approx. 7 mm, length 50 mm, for bridge balance, calibration and temperature compensation approx. 0.6 m away from the sensor body. Cable shielding between sensor and circuit board.

Protecting class: acc. to EN 60529

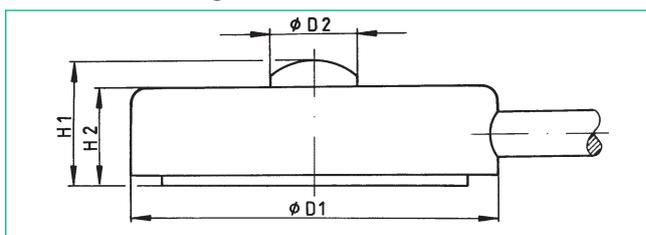
IP54

Wiring code: red excitation voltage positive  
black excitation voltage negative  
green signal output negative  
white signal output positive

Dimensions: refer to table and dimensional drawing

Weight: refer to table

### Dimensional drawing models 8413 and 8414



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

Subminiature load cell, measuring range 0 ... 10 N

**Model 8413-10**

### Accessories

Connector

12 pin, suitable to all burster desktop devices **Model 9941**

9 pin, suitable to model 9235 and DIGIFORCE® model 9310

**Model 9900-V209**

Mounting of mating connector to conductor cable

**Oder Code: 99004**

Only for connection of sensor to SENSORMASTER Model 9163

desktop housing

**Oder Code: 99002**

Amplifiers, sensor supply instruments and process controllers as e.g. digital indicator model 9163, model 9243 or DIGIFORCE® 9306

refer to section 9 of the catalog.

### Option

Standardization of the nominal value only for measuring range  $\geq 0 \dots 10$  N in the connection cable to 1.0 mV/V  $\pm 0.25$  %, **...-V010**

### Manufacturer Calibration Certificate (WKS)

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