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
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**

8413 EN

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 centrically 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.

Technical Data

Model 8413

Order Code	Measuring Range	Dimensions [mm] Ø D 1	Ø D 2	H 1	H 2	Resonance Frequency [kHz]	Nominal Value [mV/V]	Weight without Cable [g]
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] Ø D 1	Ø D 2	H 1	H 2	Resonance Frequency [kHz]	Nominal Value [mV/V]	Weight without Cable [g]
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 ≤ 0 ... 5 N semiconductor 500 Ω, nominal
measuring ranges ≥ 0 ...10 N foil 350 Ω, nominal

Excitation: 5 V DC

Nominal value: refer to table

Insulation resistance: > 5000 MΩ by 50 V DC

Shunt calibration resistor: 59 kΩ ± 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 °C ... + 120 °C

Nominal temperature range: + 15 °C ... + 70 °C

Influence of temperature on zero: ≤ ± 0.02 % F.S./K

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

Mechanical values

Non-linearity:
measuring ranges ≤ 0 ... 5 N < ± 0.5 % F.S.
measuring ranges ≥ 0 ...10 N < ± 0.25 % F.S.

Accuracy:
measuring ranges ≤ 0 ... 5 N < ± 0.5 % F.S.
measuring ranges ≥ 0 ...10 N < ± 0.25 % F.S.

Non-repeatability: < ± 0.1 % F.S.

Deflection full scale:
measuring ranges ≤ 0 ... 5 N 13 µm ... 38 µm
measuring ranges ≥ 0 ...10 N 25 µm ... 76 µm

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.

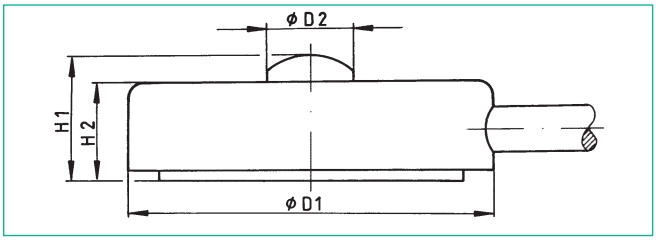
Protecting class: acc. to EN 60529 IP54

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 or directly at 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 ≥ 0 ... 10 N in the connection cable to 1.0 mV/V ± 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.