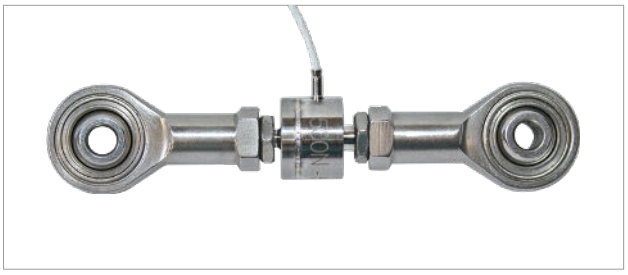
Delivery: ex stock | Warranty: 24 months

Miniature Tension and Compression Load Cell

MODEL **8417**

NEW
Measuring ranges from
0 ... 10 N



With rod ends as accessories

Highlights

- Measuring ranges from 0 ... 10 N up to 0 ... 5 kN
- Very small dimensions
- Low dead weight
- Easy mounting via long fixing threads

Options

- burster TEDS
- Vacuum compatible design
- Rod ends available as add-on part
- Various cable lengths can be ordered

Applications

- Girder assembly
- Tool manufacturing
- Machinery manufacture
- Aviation industry

Product description

Load cell model 8417 measures the tension or compression force between both axially mounted metric exterior threads on the cylindrical sensor housing. Forces are only applied to the threadings, which are especially long, to accommodate counter nuts and must not be affected by external influences such as bending, lateral force or torsion. Any contact with units affixed to the sensor housing - even on the front - must be avoided.

The measurement element is a membrane perpendicular to the axis of the sensor with a strain gage full bridge applied to the inner surface, which requires stable excitation with a rated value of approx. 1 mV/V. The connection cable is led radially out of the housing through a sleeve which is used for strain relief.

Technical Data

8417	–	5010	5020	5050	5100	5200	5500	6001	6002	6005
Measuring range calibrated in N and kN from 0 …		±10 N	±20 N	±50 N	±100 N	±200 N	±500 N	±1 kN	±2 kN	±5 kN
		±2.2 lbs	±4.5 lbs	±11.2 lbs	±22.5 lbs	±45.0 lbs	±112.4 lbs	±225.0 lbs	±450.0 lbs	±1124.0 lbs
Accuracy										
Relative non-linearity*		≤ ±0.5 % F.S.								
Characteristic curve deviation*		≤ ±0.5 % F.S.								
Relative hysteresis		≤ ±0.5 % F.S.								
Temperature effect on zero output		≤ ±0.05 % F.S./K			≤ ±0.075 % F.S./K					
Temperature effect on nominal sensitivity		≤ ±0.05 % F.S./K			≤ ±0.075 % F.S./K					
Electrical value										
Sensitivity nominal		1 mV/V								
Measurement direction		Tension and compression direction. Calibration and positive signal in compression direction. The full-scale output is likely to be different when used in the tension direction.								
Standardization**		0.8 mV/V (±0.25 %), option realized on an circuit board 48 x 7 mm (L x W) at the cable after 1.7 m from sensor or 0.3 m from cable end								
Bridge resistance		350 Ω nominal (deviations are possible)								
Excitation		5 V DC								
Insulation resistance		> 10 MΩ at 45 V								
Environmental conditions										
Nominal temperature range		+15 °C … +70 °C								
Operating temperature range		0 °C … +80 °C								
Mechanical values										
Deflection full scale		max. 60 µm								
Maximum operating force		120 % of capacity								
Overload burst		200 % of capacity								
Dynamic performance		recommended: 50 % of capacity maximum: 70 % of capacity								
Protection class (EN 60529)		IP54								
Other		5010	5020	5050	5100	5200	5500	6001	6002	6005
Material		stainless steel 1.4542								
Natural frequency	[kHz]	0.4	0.8	1	1.2	1.7	2.5	3.0	2.4	2.6
Mass without cable	[g]	3			8				28	

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

** Temperature range for the optional TEDS or standardization board 0 … 60 °C

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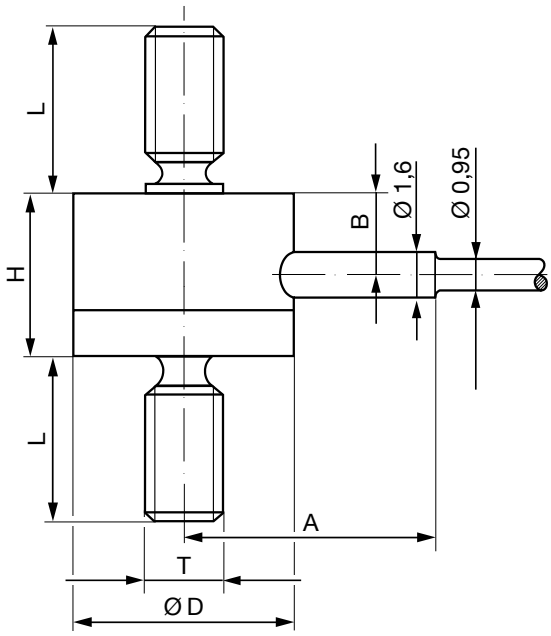
Dimensional drawing **Model 8417**



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Measuring range from 0 ...		±10 N	±20 N	±50 N	±100 N	±200 N	±500 N	±1 kN	±2 kN	±5 kN
Geometry										
Ø D	[mm]	10.0			12.0				20.0	
H	[mm]	7.0			9.0				12.0	
L	[mm]	8.5			9.5				14.0	
A	[mm]	9.2			10.0				14.0	
B	[mm]	2.5			3.65				6.15	
T	[mm]	M3 x 0.5			M4 x 0.7				M6 x 1.0	
General tolerance of dimension		ISO 2768f								

Mounting		
Mounting instructions		The measuring force has to be applied centrically and free from lateral force via the exterior threading into the sensor body. Transverse forces must be kept away from the sensor as they could result in incorrect measurements or damage. In order to ensure that the force sensor is securely fitted in its installation position, it can be locked or glued to the thread. When applying compression force, appropriate means (e.g. attachments) are to be used to prevent buckling. During handling during installation and later during operation, ensure that the cable outlet and sensor connection cable are not subjected to impermissibly high tensile and bending forces. If necessary, additional strain relief should be provided, especially for cases in which the cable is subjected to constant, even slight bending stress due to movement of the sensor.

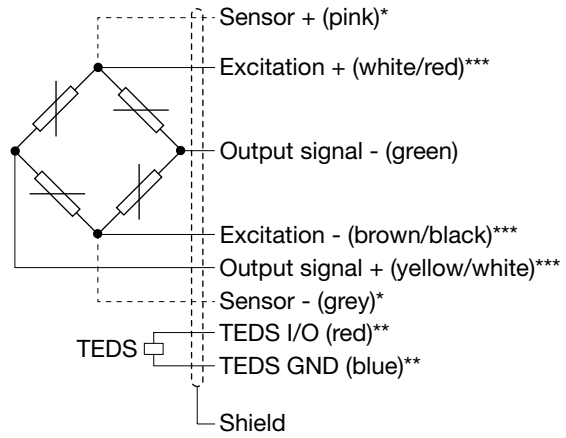
Electrical termination

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
*** cable colors for sensors without printed circuit board

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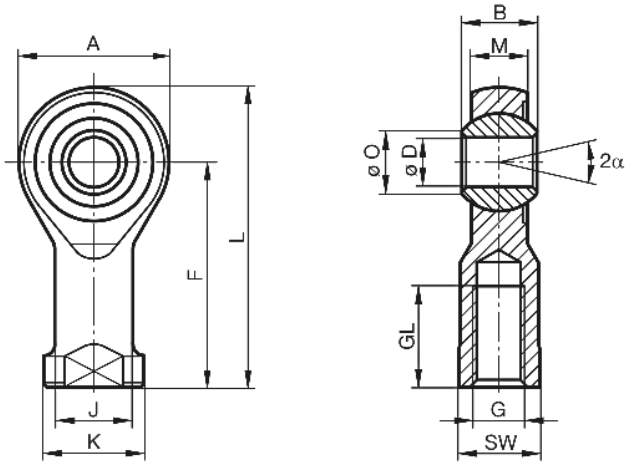
Measuring range from 0 ...		±10 N	±20 N	±50 N	±100 N	±200 N	±500 N	±1 kN	±2 kN	±5 kN
Electrical termination										
Specifications		shielded, PTFE coated, 4 wire cable with bare ends for soldering, cable length 1.7 m with standardization in cable 2.0 m								
Cable fastening		cable cover								
Bending protection		without								
Bending radius		≥ 2.3 mm rigidly laid; ≥ 17 mm moving at temperatures < -20 °C moving connection cable not approved								
Cable model		PTFE								

Accessories

Rod end bearings

- Optimal force introduction
- Compensation of misalignments
- Very high dynamic und static load capacity
- Material: stainless steel
- Temperature range: - 45 °C to + 120 °C
- PTFE insert, maintenance-free
- DIN 648 series K
- Bore holes H7, recommended connection pin: g6
- Inner ring not suitable for permanent rotary operation



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Order code

8591	-	Z04F	Z06F
Compatible for measuring range from 0 ...		100 N ... 1 kN	2 kN and 5 kN
Geometry			
G	[mm]	M4 x 0.7	M6 x 1.0
Ø D	[mm]	4H7	6H7
B	[mm]	7	9
M	[mm]	5.25	6.75
A	[mm]	16	20
F	[mm]	24	30
L	[mm]	31	40
K	[mm]	9.5	13
J	[mm]	7.8	10.0
Ø O	[mm]	6.5	8.9
SW	[mm]	8	11
GL	[mm]	10	12
α	[°]	13	13
Other			
Stat. load factor	[kN]	4	16.7
Dyn. load factor	[kN]	2.3	9.3
Weight	[g]	11	27

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_α, 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®

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 is performed in 20% steps starting from zero until the reaching the nominal force, for increasing and decreasing load with unchanged installation position. Factory calibration can be performed in compression and/or tension direction.
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.
Calibration certificate with accreditation symbol for product group load cell 8417	
Optionally available	Calibration certificate with accreditation symbol for load cell 8417. Calibration is performed on the basis of the accreditation of the calibration laboratory D-K-15141-01-00, for the scope of accreditation listed in the annex to the certificate. The traceability to national standards as well as a wide international recognition (DAkkS as signatory of the Multilateral Agreements of EA, ILAC and IAF) are thus guaranteed. Calibration is performed according to ISO 376 in 10 force steps (10% steps) vstarting from zero until the reaching the nominal force, for increasing and decreasing load under various installation positions.

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Order Code

Measuring range	Code				Measuring range
0 ... ±10 N	5	0	1	0	0 ... ±2.2 lbs
0 ... ±20 N	5	0	2	0	0 ... ±4.5 lbs
0 ... ±50 N	5	0	5	0	0 ... ±11.2 lbs
0 ... ±100 N	5	1	0	0	0 ... ±22.5 lbs
0 ... ±200 N	5	2	0	0	0 ... ±45.0 lbs
0 ... ±500 N	5	5	0	0	0 ... ±112.4 lbs
0 ... ±1 kN	6	0	0	1	0 ... ±225.0 lbs
0 ... ±2 kN	6	0	0	2	0 ... ±450.0 lbs
0 ... ±5 kN	6	0	0	5	0 ... ±1124.0 lbs

									Delivery ex stock at short notice					
									N	0	0	0	S	0	0	0
8	**4**	**1**	**7**	**–**					**–**					**S**	**0**	**0**	**0**

■ Nominal sensitivity/not standardized	N
■ Standardization at 0.8 mV/V	B

■ Connection cable 1.7 m (with standardization in the cable 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 strands	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

■ Calibration and positive output signal for compression load	0
■ Calibration and positive output signal for tension load	E

■ Non-linearity according to specification	S

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**