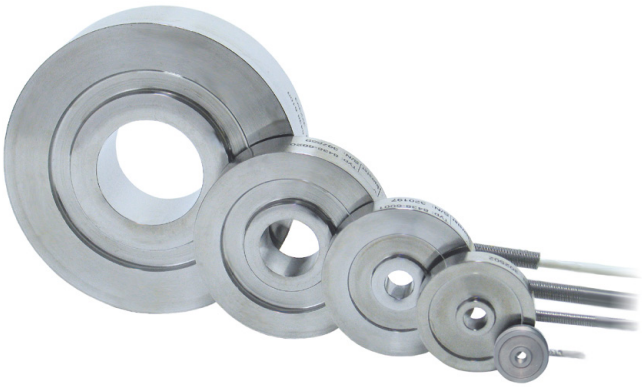
Miniature Ring Load Cell

MODEL **8438**



Highlights

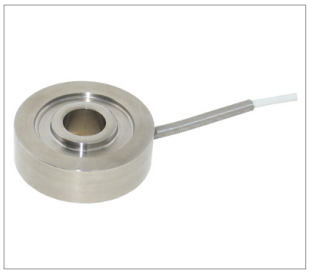
- Measuring ranges from 0 ... 100 N up to 0 ... 200 kN
- Continuous centric internal hole measured to fit
- Flat disc design
- Protection class IP65
- Completely welded sensor body
- Internal thread in the bottom for fixing

Options

- burster TEDS
- Standardization of the nominal sensitivity
- Various cable lengths available
- Customization of geometry possible

Applications

- Force monitoring during riveting
- Measuring contact forces in hydraulic stamps
- Monitoring pulling forces during wire production
- Monitoring of forces in prestressed concrete structure



Medium measuring ranges

Small measuring ranges

Product description

The force to be measured must be introduced axially and perpendicularly to the entire surface of the inner and outer bands of the sensor in the opposite direction. Conversion of the acting force into an electrical output signal is performed by strain gages connected together in a full bridge circuit.

To achieve optimal accuracy, the base of the sensor should rest on a smooth level surface, hardened to at least ≥ 58 HRC with sufficient dimensions. The base cover welded to the surface has a stabilizing effect on the sensor element. Lateral forces must be avoided anyway as they distort the measured results. Tension and bending relief for the sensor cable is to be carried out on the machine side.

Technical Data

8438	–	5100	5200	5500	6001	6002	6005	6010	6020	6050	6100	6200
Measuring range calibrated in N and kN from 0 ...		±100 N	±200 N	±500 N	±1 kN	±2 kN	±5 kN	±10 kN	±20 kN	±50 kN	±100 kN	±200 kN
		±22.5 lbs	±45.0 lbs	±112.4 lbs	±225.0 lbs	±450.0 lbs	±1124.0 lbs	±2.2 klbs	±4.5 klbs	±11.2 klbs	±22.5 klbs	±45.0 klbs
Accuracy												
Relative non-linearity*		≤ 0.5 % F.S.										
Characteristic curve deviation*		≤ 0.5 % F.S.						≤ 0.75 % F.S.			≤ 1 % F.S.	
Relative hysteresis*		≤ 0.5 % F.S.						≤ 0.75 % F.S.			≤ 1 % F.S.	
Temperature effect on zero output		≤ ±0.03 % F.S./K										
Temperature effect on nominal sensitivity		≤ ±0.03 % F.S./K										
Electrical value												
Sensitivity nominal		1.5 mV/V			2 mV/V						1.5 mV/V	
Measurement direction		compression direction. Calibration and positive signal in compression direction.										
Standardization		1 mV/V (±1 %), option realized on board 48 x 7mm (L x B) in the cable after 1.5 m and 1.7 m from the sensor resp. 0.3 m from cable end (±0.25 %)										
Bridge resistance		approx. 350 Ω, nominal										
Excitation		5 V DC										
Insulation resistance		> 10 MΩ										
Environmental conditions												
Nominal temperature range		+15 °C ... +70 °C										
Operating temperature range		0 °C ... +85 °C										
Mechanical values												
Deflection full scale		approx. 60 µm										
Maximum operating force		150 % of capacity										
Overload burst		200 % of capacity										
Dynamic performance		recommended: 50 % of capacity maximum: 70 % of capacity										
Protection class (EN 60529)		IP54									IP65	
Other		5100	5200	5500	6001	6002	6005	6010	6020	6050	6100	6200
Material		1.4542										
Natural frequency	[kHz]	1.2	2	3.7	3.4	5.5	10	15	14	24	22	37
Mass without cable	[g]	16		17	52			66	145		626	660

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

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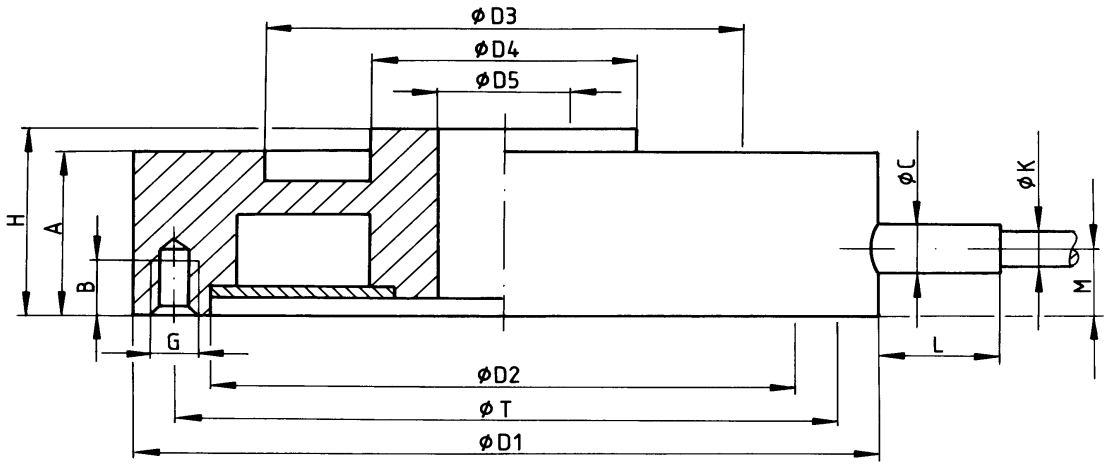
Dimensional drawing **Model 8438**



8438	–	5100	5200	5500	6001	6002	6005	6010	6020	6050	6100	6200
Measuring range from 0 ...		±100 N	±200 N	±500 N	±1 kN	±2 kN	±5 kN	±10 kN	±20 kN	±50 kN	±100 kN	±200 kN
Geometry												
Ø D1	[mm]	28.0			38.0				49.0		78.0	
Ø D2	[mm]	25.0			30.5				41.0		60.0	
Ø D3	[mm]	22.0			25.0				35.0		54.0	
Ø D4	[mm]	9.0			13.5				23.0		42.0	
Ø D5	[mm]	5.5 H8			7.0 H8				15.0 H8		28.0 H8	
A	[mm]	7.0			9.0				15.0		24.0	
H	[mm]	8.0			10.0				16.0		25.0	
Ø C	[mm]	2.2			3.6						5.6	
L	[mm]	8.0									10.0	
Ø K	[mm]	1.9			3.0						5.0	
M	[mm]	2.5			3.0				4.5		6.5	
B	[mm]	-			3.0						5.5	
Ø K	[mm]	-			33.5				45.0		69.0	
G		-			M2.5 x 0.45						M4.0 x 0.7	
General tolerance of dimension		ISO 2768f										

Mounting		
Mounting instructions		Requirements for evenness of the mounting surfaces: 5 µm, Parallelism of the mounting surfaces: 20 µm. Surface hardness: ≥ 58 HRC. Mounting: measuring range ≥ 0 ... 1000 N There are three mounting holes on the lower side of the sensor, equally spaced on T diameter with division 120°, one hole is located directly across the cable exit. This kind of mounting is allowed for compression load only

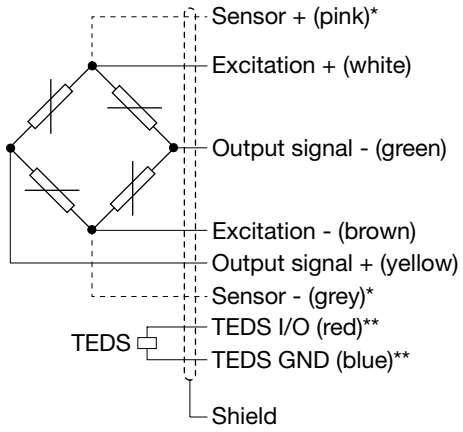
Electrical termination

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

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Electrical termination												
Specifications		shielded, TPE coated, 4 wire cable with bare ends for soldering, drag chain, cable length 1.7 m, with standardization in cable 2.0 m										
Cable fastening		cable cover										
Bending protection		without									anti-kink protection	
Bending radius		≥ 6 mm rigidly laid; ≥ 20 mm moving; at temperatures > -20 °C moving connection cable not approved			≥ 9 mm rigidly laid; ≥ 30 mm moving; at temperatures > -20 °C moving connection cable not approved							
Cable model		PUR cable 2 mm customer length 1.7 m, assembled			PUR cable 3 mm customer length 1.7 m, assembled							

Accessories

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_o, 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® model 9307

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Calibration

Test and calibration certificate		
Included in scope of delivery of 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 5 force steps (20% steps) starting from zero until the reaching the nominal force, for increasing and decreasing compression load under the same installation position.
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 8438		
Optionally available		Calibration certificate with accreditation symbol for load cell 8438. 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 compression load under various installation positions.

Order Code

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

								Delivery ex stock at short notice						
								N	0	0	0	S	0	0	0
8	**4**	**3**	**8**	**–**				**–**			**0**	**S**	**0**	**0**	**0**

■ Nominal sensitivity/not standardized	N	
■ Standardization of the sensitivity to 1.0 mV/V	C	
■ 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
■ 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
■ Non-linearity according to specification		S

* shortened delivery time compared with cable length 3 m and 5 m in one piece

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**

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