

Tension Compression Load Cell

MODEL 8435



Highlights

- Measuring ranges from 0 ... 200 N up to 0 ... 5000 N
- Small dimensions
- Inexpensive execution
- Stable anti-kink protection
- Made of high quality stainless steel
- Connecting cable suitable for drag chains

Options

- Pull-plate
- Load introduction button
- burster TEDS
- Various cable lengths available

Applications

- Holding forces on loading machinery
- Automatic assembly equipment on production lines
- Friction force test in laboratory equipment



With load introduction button for measuring ranges up to 2 kN



With pull-plate for measuring ranges up to 2 kN

Product description

The tension and compression load cell model 8435 enables universal and fast installation, requires hardly any installation space and upgrades with technical data that are readily achieved by larger sensors. Due to its excellent price-performance ratio with regard to its mechanical and electrical data, the force sensor finds its place in products that are also manufactured in larger quantities and calculated with a small budget.

This model of load cell uses proven strain gage technology to perform measurements. Strain gages are applied to the sensitive element and connected to form a full bridge. The electrical resistance of this full bridge increases with the load acting on it, so that the bridge supplies an output voltage proportional to the measurement variable. This model allows the force application of two kinds: compression via the load application button and tension via the centric internal thread.

The measurement range of 0 ... 5000 N is supplied exclusively with the integrated load application button. The sensor has to be mounted on a level surface using screws fitted through the three bore holes in the outer ring. To achieve the highest possible measurement accuracy, the sensor should not be subject to lateral forces. A strain-relief and an anti-bend mechanism for the connection cable are integrated in the sensor housing.

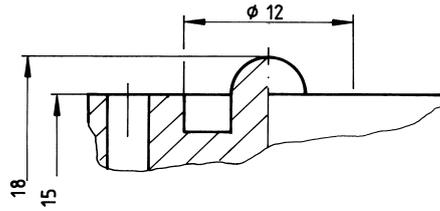
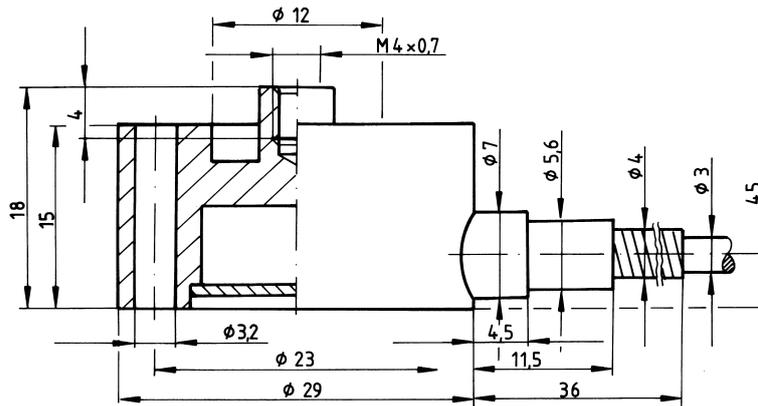
Technical Data

8435	-	5200	5500	6001	6002	6005
Measuring range calibrated in N and kN from 0 ...		±200 N	±500 N	±1 kN	±2 kN	5 kN
		±45.0 lbs	±112.4 lbs	±225.0 lbs	±450.0 lbs	1124.0 lbs
Accuracy						
Relative non-linearity*		≤ ±0.25 % F.S.				
Characteristic curve deviation*		≤ ±0.25 % F.S.				
Relative hysteresis*		≤ ±0.2 % F.S.				
Temperature effect on zero output		≤ ±0.02 % F.S./K				
Temperature effect on nominal sensitivity		≤ ±0.03 % F.S./K				
Electrical value						
Sensitivity nominal		1 mV/V				
Measurement direction		Tension and compression direction. Calibration and positive signal in compression direction.				Compression direction. Calibration in compression 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*				
Excitation		5 V DC				
Insulation resistance		> 30 MΩ at 45 V				
Environmental conditions						
Nominal temperature range		+15 °C ... +70 °C				
Operating temperature range		-30 °C ... +80 °C				
Mechanical values						
Deflection full scale		max. 20 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				
Installation						
Torque	[N*m]	1				
Mounting screws		M3, resistance 12.9				
Installation instructions		The entire bearing area of the sensor must be mounted on a base which is hardened (58 HRC), flat, polished or better lapped. Three clearance holes with a diameter of 3.2 mm at reference diameter 23.0 mm and division 120°. One hole is across from the cable exit.				
Other						
Material		stainless steel 1.4542				
Natural frequency	[kHz]	5	9	14	18	22
Mass without cable	[g]	40				

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

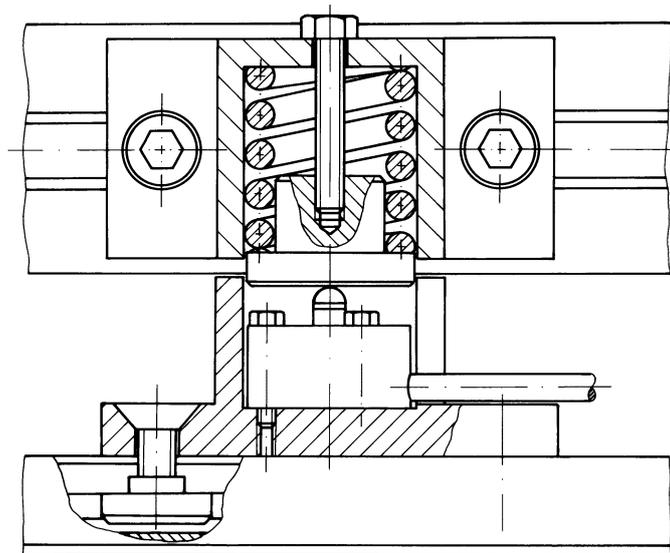
** Temperature range for the optional TEDS or standardization board 0 ... 60 °C

Dimensional drawing - Measuring range 0 ... 5000 N | 1124.0 lbs

Dimensional drawing - Measuring range $\leq 0 \dots 2000 \text{ N}$ | 450.0 lbs

Installation example

Overload of the load cell is impossible due to a suitable spring. When the units are locked the spring will transfer not more load to the cell than the measuring range can cope with.



Electrical termination

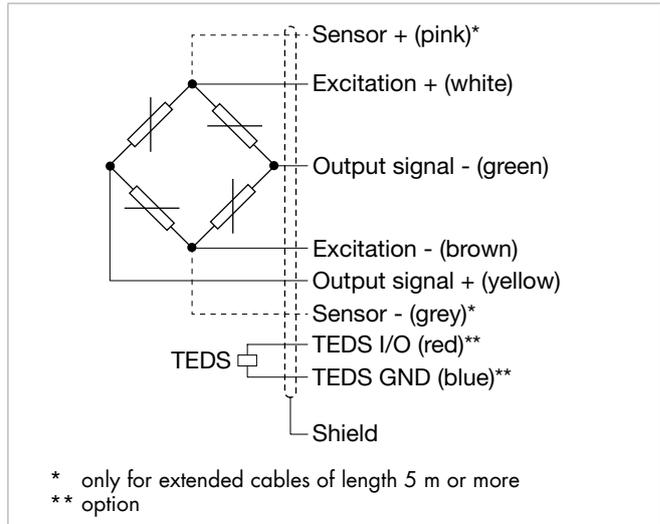
Output signal

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 Transducer Electronic Data Sheet" (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.

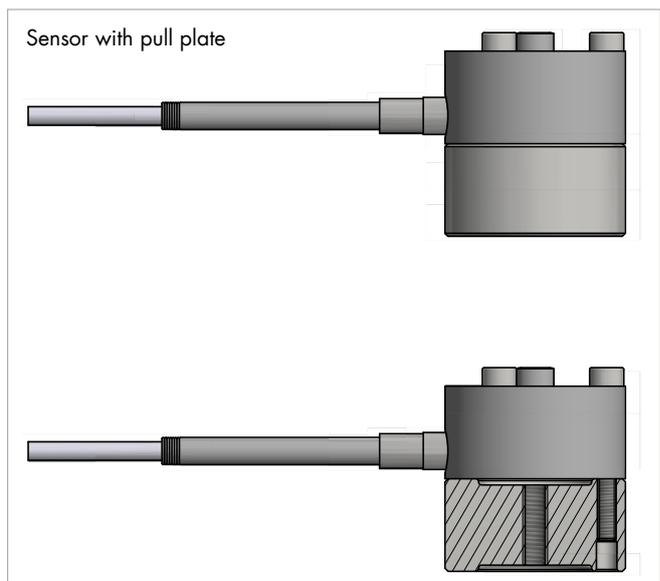


8435	-	5200	5500	6001	6002	6005
Measuring range from 0 ...		±200 N	±500 N	±1 kN	±2 kN	5 kN
Electrical termination						
Specifications		shielded, TPE coated, 4 wire cable, drag chain, cable length 1.7 m, with standardization in cable 2.0 m				
Cable fastening		adapter for cable holder				
Bending protection		anti-kink protection				
Bending radius		≥ 9 mm rigidly laid; ≥ 30 mm moving; at temperatures > -30 °C moving connection cable not approved				
Cable model		PUR cable 3 mm customer length 1.7 m, assembled				

Accessories

Pull plates

A pull plate extends the range of potential uses of tension & compression load cells to measuring tensile loads in moving assemblies (cable tension or forces in joints). The pull plate is fastened by its outer flange to the sensor's flange. Customized threaded parts or even rod end bearings can be fitted in the central threaded hole. Once fitted, the pull plates form part of the sensor. Sensor and plate are calibrated as a unit and are supplied only as a pre-assembled combination. Bolts of strength 12.9 are required for fitting the pull plates.

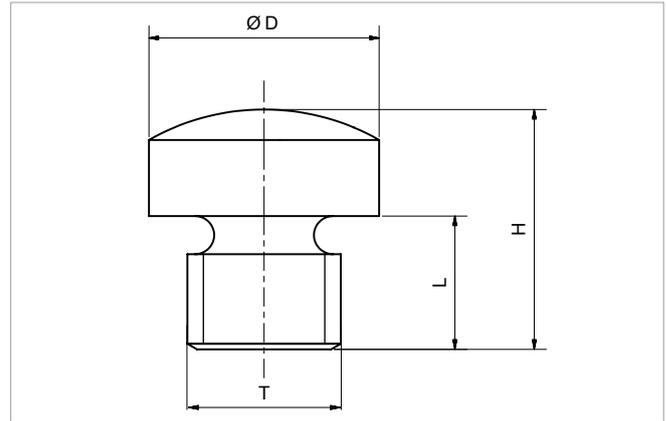


Order code

8590-V001	----	5200	5500	6001	6002
Compatible for measuring range from 0 ...		±200 N	±500 N	±1 kN	±2 kN
Geometry					
Central blind threaded hole T		M4 x 0.7			
Tightening torque mounting screws	[N*m]	1			
Mounting screws		3 x M3 x 25, resistance 12.9			
Mass	[g]	69			

Load buttons

Load buttons are used when purely compressive forces are meant to be applied to the load cell and when direct coupling to the surrounding mechanical structure via the central threaded hole in the sensor is not required/possible. The domed surface of the load button minimizes angle errors for loads applied at an angle of up to 3°. The compressive force must be applied to the button via a flat and hardened contact surface. The optimum hardness is 60 HRC or more.

**Order code**

8580-V004	----	5200	5500	6001	6002
Compatible for measuring range from 0 ...		±200 N	±500 N	±1 kN	±2 kN
Geometry					
Ø D	[mm]	6			
H	[mm]	6,3			
L	[mm]	3,5			
T		M4 x 0.7			
Other					
Material		1.2842, HRC 60			

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})
7270	Mobile measuring device TRANS CAL basic
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. Depending on the sensor model, factory calibrations 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 8435	
Optionally available	Calibration certificate with accreditation symbol for load cell 8435. 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.

Order Code

Measuring range	Code				Measuring range
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	3	5	-					-				0	S		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								
■ Non-linearity according to specification														S				
■ No option																0		
■ Pull plate (sensors 200 N ... 2 kN)																5		