

Load Cells

Shear beam load cells
SIWAREX WL230 SB-S SA

Load cell

Overview



The shear beam load cell is particularly suitable for use in hopper, overhead rail and platform scales.

Design

The measuring element is a shear tension spring made of stainless steel to which the strain gauges are applied. The strain gauges are arranged at 45° to the longitudinal axis on the side of the spring body and are therefore subject to shear forces. Under the influence of the load acting in the measuring direction, the spring bodies and therefore the friction-locked strain gauges are elastically deformed. This generates a measuring signal voltage that is proportional to the load.

Technical specifications

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Possible applications	<ul style="list-style-type: none"> Hopper scales Belt scales Overhead rail scales Platform scales
Type of construction	Shear beam load cell
Loads	
Rated load/maximum load E_{max}	<ul style="list-style-type: none"> 500 kg (1 102.31 lb) 1 t (0.98 tn. l.) 2 t (1.97 tn. l.) 5 t (4.92 tn. l.)
Minimum initial loading E_{min}	0 kg
Max. working load L_u	150% E_{max}
Breaking load L_d	300% E_{max}
Safe side load L_{iq}	100% E_{max}
Measurement characteristic values	
Deflection h_n at	
• $E_{max} = 500$ kg (1 102.31 lb)	0.13 mm
• $E_{max} = 1$ t (0.98 tn. l.)	0.21 mm
• $E_{max} = 2$ t (1.97 tn. l.)	0.29 mm
• $E_{max} = 5$ t (4.92 tn. l.)	0.38 mm
Rated characteristic value C_n	2.0 ± 0.002 mV/V
Tolerance D_0 of zero signal	≤ ± 1.0% C_n
Max. scale interval n_{LC}	3 000
Min. scale interval V_{min} at	
• $E_{max} = 500$ kg (1 102.31 lb)	$E_{max}/10\ 000$
• $E_{max} = 1 \dots 5$ t (0.98 ... 4.92 tn. l.)	$E_{max}/15\ 000$
Minimum application range $R_{min(LC)}$ at	
• $E_{max} = 500$ kg (1 102.31 lb)	30%
• $E_{max} = 1 \dots 5$ t (0.98 ... 4.92 tn. l.)	20%
Combined error F_{comb}	± 0.02% C_n
Repeatability F_v	± 0.02% C_n
Creep error F_{cr}	
• 30 min	≤ ± 0.02% C_n
Temperature coefficient	
• Zero signal t_{k0}	0.023% $C_n/5$ K
• Characteristic value t_{kc}	0.017% $C_n/5$ K

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Electrical characteristic values

Recommended reference voltage U_{ref}	5 ... 12 V DC
Input resistance R_e	1 000 ± 10 Ω
Output resistance R_a	1 004 ± 5 Ω
Insulation resistance R_{is}	5 000 MΩ at 50 V DC

Connection and environmental conditions

Rated temperature range B_{Tn}	-10 ... +40 °C (14 ... 104 °F)
Operating temperature range B_{Tu}	-35 ... +65 °C (-31 ... +149 °F)
Storage temperature range B_{Ts}	-35 ... +65 °C (-31 ... +149 °F)
Sensor material (DIN)	Stainless steel EN 1.4542
Degree of protection according to EN 60529; IEC 60529	IP68

Recommended tightening torque of the fixing screws

• $E_{max} = 500$ kg ... 2 t (1 102.31 lb ... 1.97 tn. l.)	150 Nm ¹⁾
• $E_{max} = 5$ t (4.92 tn. l.)	550 Nm ¹⁾

Cable connection

Function	Color
• EXC + (supply +)	Green
• EXC - (supply -)	Black
• SIG + (measured signal +)	White
• SIG - (measured signal -)	Red
• Shield (not connected to the load cell body)	Transparent

Certificates and approvals

Accuracy class according to OIML R-60	C3
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¹⁾ The tightening torque is to be selected according to the strength class of the screws.

Selection and ordering data

Article No.

Load cell, type WL230 SB-S SA

Legal-for-trade according to OIML R-60 up to 3 000d, connecting cable 3 m (9.84 ft) at 500 kg (1 102.31 lb) up to 1 t (0.98 tn. l.), connecting cable 6 m (19.68 ft) at 2 t (1.97 tn. l.) up to 5 t (4.92 tn. l.).

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

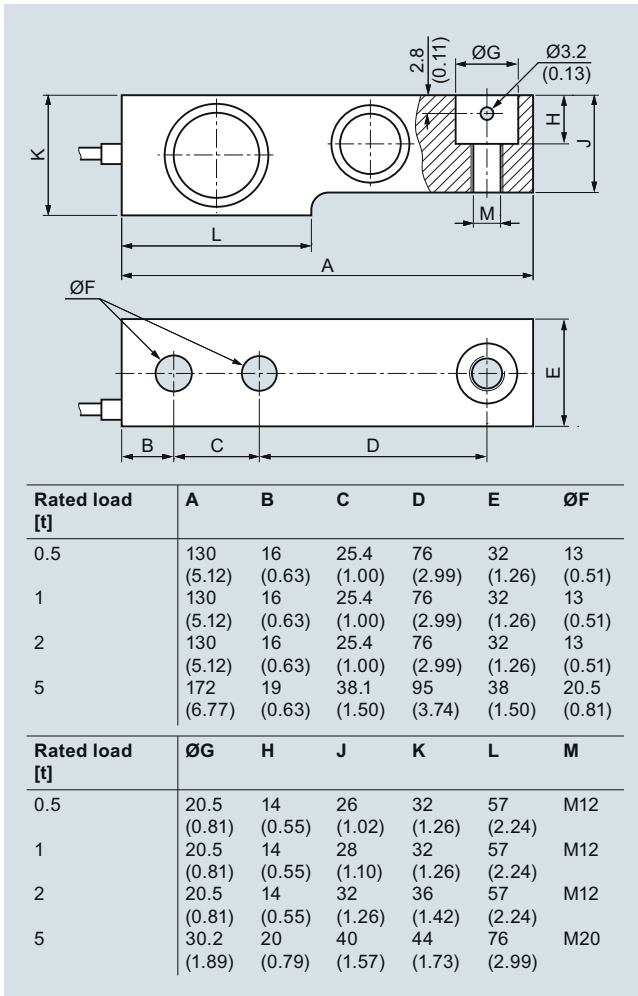
Rated load

• 500 kg (1 102.31 lb)	3 P
• 1 t (0.98 tn. l.)	4 A
• 2 t (1.97 tn. l.)	4 G
• 5 t (4.92 tn. l.)	4 P

Explosion protection

Without	0
Explosion protection for zones 0, 1, 2, 20, 21, 22	1

Dimensional drawings



SIWAREX WL230 SB-S SA load cell, dimensions in mm (inch)