

## Load Cells

Ring torsion load cells  
SIWAREX WL280 RN-S SA

### Load cell

#### Overview



The ring torsion load cell is particularly suitable for use in container, conveyor, platform and roller table scales.

#### Design

The measurement element is a ring torsion spring made of stainless steel. Two strain-gage spirals (DMS) are applied to the upper and lower faces of the ring respectively. The spring element is deformed by the load acting centrally in the measurement direction. This compresses the strain-gage of the upper face of the ring and extends the strain-gage on the lower face of the ring. This causes a change in the electrical resistance of the force-locked strain-gage, which is detected by means of a bridge circuit.

All load cells with a rated load of up to 13 t (12.79 tn. L.) are equipped with an integral overload protection.

#### Technical specifications

##### SIWAREX WL280 RN-S SA load cells

Possible applications	Container, conveyor, platform and roller table scales		
Model	Ring torsion load cell		
Rated load/maximum load $E_{max}$	<ul style="list-style-type: none"> <li>• 60 kg (132.28 lb)</li> <li>• 130 kg (286.60 lb)</li> <li>• 280 kg (617.29 lb)</li> </ul>	<ul style="list-style-type: none"> <li>• 0.5 t (0.49 tn. L.)</li> <li>• 1 t (0.98 tn. L.)</li> <li>• 2 t (1.97 tn. L.)</li> <li>• 3.5 t (3.45 tn. L.)</li> <li>• 5 t (4.92 tn. L.)</li> <li>• 10 t (9.84 tn. L.)</li> </ul>	<ul style="list-style-type: none"> <li>• 13 t (12.80 tn. L.)</li> <li>• 28 t (27.56 tn. L.)</li> <li>• 60 t (59.05 tn. L.)</li> </ul>
Accuracy class according to OIML R60	C3		
Max. load cell verification intervals $n_{LC}$	3 000		
Min. load cell verification intervals $V_{min}$	$E_{max}/16\ 000$	$E_{max}/17\ 500$	
Minimum application range $R_{min(LC)}$	19 %	17 %	
Combined error $F_{comb}$	$\leq \pm 0.023 \% C_n$		
Repeatability $F_v$	$\leq \pm 0.01 \% C_n$		
Return of zero signal	$\leq \pm 0.0167 \% C_n^{1)}$		
Creep error $F_{cr}$	$\leq \pm 0.0245 \% C_n^{1)}$		
• 30 min	$\leq \pm 0.0053 \% C_n^{1)}$		
• 20 ... 30 min			
Temperature coefficient			
• Zero signal $T_{K0}$	$\leq \pm 0.004 \% C_n/5K$		
• Characteristic value $T_{Kc}$	$\leq \pm 0.004 \% C_n/5K$		
Min. dead load $E_{min}$	$\geq 0 \% E_{max}$		
Safe load limit $L_u$	200 % $E_{max}$	150 % $E_{max}$	
Ultimate load $L_d$	500 % $E_{max}$	300 % $E_{max}$	300 % $E_{max}$
Safe side load $L_{Iq}$	75 % $E_{max}$	100 % $E_{max}$	75 % $E_{max}$
Rated measuring path $h_n$ at $E_{max}$	0.07 mm	0.1 ± 0.02 mm	0.11 ... 0.2 mm
Overload protection	Integrated	Integrated	Integrated at 13 t
Supply voltage $U_{Sr}$ (reference value)	15 V	10 V	15 V
Supply voltage (range)	5 ... 30 V+		
Rated characteristic value $C_n$	1 mV/V	2 mV/V	2 mV/V
Tolerance $D_c$ of characteristic value	Up to 500 kg: 0.01 mV/V from 500 kg: 0.1 mV/V		

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Tolerance $D_0$ of zero signal	$\leq \pm 1.0 \% C_n$		
Input resistance $R_e$	60 kg: 1260 $\Omega \pm 100 \Omega$ 130 kg: 1260 $\Omega \pm 100 \Omega$ 280 kg: 1260 $\Omega \pm 250 \Omega$	1100 $\Omega \pm 100 \Omega$	13 t: 1200 $\Omega \pm 100 \Omega$ 28 t: 1075 $\Omega \pm 100 \Omega$ 60 t: 1350 $\Omega \pm 200 \Omega$
Output resistance $R_a$	1020 $\Omega \pm 0.5 \Omega$	1025 $\Omega \pm 25 \Omega$	13 t: 1000 $\Omega \pm 0.5 \Omega$ 28 t: 930 $\Omega \pm 0.5 \Omega$ 60 t: 1175 $\Omega \pm 0.5 \Omega$
Insulation resistance $R_{is}$	$\geq 5\,000\text{ M}\Omega$	$\geq 5\,000\text{ M}\Omega$	$\geq 5\,000\text{ M}\Omega$
Rated temperature range $B_{rn}$	-10 ... +40 °C (14 ... 104 °F)		
Operating temperature range $B_{tu}$	-35 ... +70 °C (-31 ... 158 °F)		
Storage temperature range $B_{ts}$	-50 ... +90 °C (-58 ... 194 °F)		
Sensor material (DIN)	Stainless steel, mat. no. 14542		
Degree of protection according to EN 60529; IEC 60529	IP66/68		
Recommended tightening torque of the fixing screws	8 Nm	14 Nm (0.5 ... 5 t) 10 Nm (10 t)	-
Current calibration <sup>2)</sup>	Standard		
Ex protection to ATEX (optional)	II 1 G Ex ia IIC T4 Ga II 1 D Ex ia IIIC T73 °C Da II 3 G Ex ic IIC T4 Gc II 3 G Ex nA IIC T4 Gc II 3 G Ex tc IIIC T63 °C Dc		

**Cable connection**

Function	Color
• EXC +	pink
• EXC -	gray
• SIG +	brown
• SIG -	white
• Screening	transparent

**Selection and ordering data**

		Article No.
<b>SIWAREX WL280 RN-S SA load cell</b>		<b>7MH5113-</b>
Stainless steel, low mounting height, IP66/68 accuracy class C3 according to OIML R60		<b>D 0</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Rated load</b>	<b>Cable length</b>	
• 60 kg (132.28 lb)	3 m (9.84 ft)	<b>2 Q</b>
• 130 kg (286.60 lb)	3 m (9.84 ft)	<b>3 D</b>
• 280 kg (617.29 lb)	3 m (9.84 ft)	<b>3 J</b>
• 500 kg (1 102.31 lb)	3 m (9.84 ft)	<b>3 P</b>
• 1 t (0.98 tn. L.)	3 m (9.84 ft)	<b>4 A</b>
• 2 t (1.97 tn. L.)	6 m (19.68 ft)	<b>4 G</b>
• 3,5 t (3.44 tn. L.)	6 m (19.68 ft)	<b>4 L</b>
• 5 t (4.92 tn. L.)	6 m (19.68 ft)	<b>4 P</b>
• 10 t (9.84 tn. L.)	15 m (49.21 ft)	<b>5 A</b>
• 13 t (12.79 tn. L.)	15 m (49.21 ft)	<b>5 D</b>
• 28 t (27.56 tn. L.)	15 m (49.21 ft)	<b>5 J</b>
• 60 t (59.05 tn. L.)	15 m (49.21 ft)	<b>5 Q</b>
<b>Explosion protection</b>		
None		<b>0</b>
Explosion protection for zones 1, 2, 20, 21, 22		<b>1</b>

<sup>1)</sup> For rated temperature -10 ... +40 °C (14 ... 104 °F)

<sup>2)</sup> Current calibration: rated characteristic value and output resistance are adjusted so that the output current is calibrated within 0.05 % of a reference value. This makes it easier to connect several load cells in parallel.