**Overview**

The bending beam load cell is particularly suitable for use in small-scale container and platform scales.

**Design**

The measuring element is a double bending beam made of stainless steel to which 4 strain gauges are applied.

The strain gauges are arranged so that two are stretched and two are compressed.

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**

### SIWAREX WL230 BB-S SA

#### Possible applications
- Hopper scales
- Conveyor belt scales
- Platform scales

#### Model
- Bending beam load cell

#### Loads
- **Rated load** $E_{\text{max}}$
  - 10 kg (22.05 lb)
  - 20 kg (44.09 lb)
  - 50 kg (110.23 lb)
  - 100 kg (220.46 lb)
  - 200 kg (440.92 lb)
  - 300 kg (661.39 lb)
  - 350 kg (771.62 lb)
  - 500 kg (1102.31 lb)

- **Minimum initial loading** $E_{\text{min}}$
  - 0% $E_{\text{max}}$

- **Maximum working load** $L_u$
  - 150% $E_{\text{max}}$

- **Break load** $L_{\text{br}}$
  - 300% $E_{\text{max}}$

- **Safe lateral load** $L_{\text{lq}}$
  - 100% $E_{\text{max}}$

#### SIWAREX WL230 BB-S SA

**Measurement characteristic values**
- Rated measuring path $h_n$ at $E_{\text{max}}$
  - 0.3 mm (0.01 in)
- Rated characteristic value $C_n$
  - 2.0 ± 0.02% mV/V
- Tolerance $D_C$ of zero signal
  - $\leq 1.0\% C_n$
- Maximum load cell verification interval $n_{LC}$
  - 3 000$^1$
- Minimum load cell verification interval $V_{\text{min}}$
  - $E_{\text{max}}/15 000$
- Minimum application range $R_{\text{min(LC)}}$
  - 20%
- Combined error $F_{\text{comb}}$
  - $\leq 0.02\% C_n$
- Repeatability $F_r$
  - $\leq 0.017\% C_n$
- Creep error $F_c$
  - 30 min
  - $\leq 0.02\% C_n$
- Temperature coefficient
  - Zero signal $T_{K0}$
  - $\leq 0.017\% C_n/S K$
  - Characteristic value $T_{Kc}$
  - $\leq 0.014\% C_n/S K$

**Electrical characteristic values**
- Recommended reference voltage $U_{\text{ref}}$
  - 5 ... 10 V DC
- Input resistance $R_i$
  - 460 $\Omega$ ± 50 $\Omega$
- Output resistance $R_o$
  - 350 $\Omega$ ± 3.5 $\Omega$
- Insulation resistance $R_{\text{is}}$
  - 5 000 M$\Omega$ at 50 V DC
- Current calibration
  - Standard

#### Connection and environmental conditions
- Sensor material (DIN)
  - Stainless steel
- Max. tightening torque of the fixing screws
  - $E_{\text{max}} =$ 10, 20, 50, 100, 200 kg
    - (22.05, 44.09, 110.23, 220.46, 440.92 lb)
  - $E_{\text{max}} =$ 350, 500 kg
    - (771.62, 1102.31 lb)

- **Function**
  - EXC + (supply +)
    - Green
  - EXC - (supply -)
    - Black
  - SIG + (measured signal +)
    - White
  - SIG - (measured signal -)
    - Red
  - Shield
    - Transparent

- **Rated temperature range** $B_{\text{tn}}$
  - -10 ... +40 °C (14 ... 104 °F)
- **Operating temperature range** $B_{\text{tu}}$
  - -35 ... +65 °C (-31 ... +149 °F)
- **Storage temperature range** $B_{\text{ts}}$
  - -35 ... +65 °C (-31 ... +149 °F)
- **Degree of protection according to EN 60529, IEC 60529**
  - IP68

#### Certificates and approvals
- Accuracy class according to OIML R60
  - C3

---

1) Higher accuracy class available on request
2) The tightening torque is to be selected according to the strength class of the screws.
Load Cells
Bending beam load cells
SIWAREX WL230 BB-S SA

Load cell

Selection and ordering data

<table>
<thead>
<tr>
<th>Load cells type WL230 BB-S SA</th>
<th>Article No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal-for-trade according to OIML R60 to 3 000d, connecting cable 3 m (9.84 ft)</td>
<td>7MH5106-</td>
</tr>
</tbody>
</table>

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

Rated load
- 10 kg (22.05 lb)
- 20 kg (44.09 lb)
- 50 kg (110.23 lb)
- 100 kg (220.46 lb)
- 200 kg (440.92 lb)
- 350 kg (771.62 lb)
- 500 kg (1 102.31 lb)

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

Dimensional drawings

SIWAREX WL230 BB-S SA load cell, dimensions in mm (inch)
The self-aligning mounting unit for SIWAREX WL230 BB-S SA load cells is particularly suitable for implementation in small-scale container, platform and roller table scales.

### Design

The mounting unit comprises a base plate and a top plate, a self-aligning bolt, two countersunk screws and overload protection.

The top plate is aligned and fixed above the base plate with the two countersunk screws. This results in a stable unit. The height of the top plate can be adjusted so that it is two millimeters above the installation height with load cell.

In this state the mounting unit serves as an installation aid and can be used as a dummy for light installation jobs.

Prior to installation, the load cell is inserted with the self-aligning bolt into the mounting unit. Then the complete unit is installed in the scales. As the result, the load bearing implement and the installation units are aligned. The load cells are not yet loaded.

Finally the load bearing implement is lowered by undoing two hex nuts under the top plate. The weight now rests on the load cells.

In this state the load cell and the pressure pieces together form a self-centering unit. The mounting unit permits sideways displacement of the top plate, and hence of the load bearing implement, by up to 1.5 mm (0.06 in.).

The overload protection is set so that the load cell cannot be loaded beyond the limit load.

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### Technical specifications

#### Mounting unit for load cells of the SIWAREX WL230 BB-S SA series

<table>
<thead>
<tr>
<th>Rated load</th>
<th>10 ... 200 kg (22.01 ... 440.92 lb)</th>
<th>350, 500 kg (771.62, 1102.31 lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible lateral deflection:</td>
<td>± 2 mm (0.08 inch)</td>
<td>± 2.5 mm (0.10 inch)</td>
</tr>
<tr>
<td>Lifting path of the top plate</td>
<td>2 ... 2.5 mm (0.08 ... 0.10 inch)</td>
<td>3 ... 3.5 mm (0.12 ... 0.14 inch)</td>
</tr>
<tr>
<td>Max. lateral force</td>
<td>1.7 kN</td>
<td>2.5 kN</td>
</tr>
<tr>
<td>Max. lifting force</td>
<td>2.5 kN</td>
<td>2.5 kN</td>
</tr>
</tbody>
</table>

---

#### Selection and ordering data

<table>
<thead>
<tr>
<th>Mounting unit</th>
<th>Article No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>For load cells of the SIWAREX WL230 BB-S SA series</td>
<td>7MH4133-3DC11</td>
</tr>
<tr>
<td>Material: Stainless steel for load cells with a rated load of</td>
<td>7MH4133-3KC11</td>
</tr>
<tr>
<td>• 10 ... 200 kg (22.05 ... 440.92 lb)(^{(1)}) (^{(2)})</td>
<td></td>
</tr>
<tr>
<td>• 350, 500 kg (771.61, 1 102.3 lb)(^{(1)})</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shims (accessories)</th>
<th>Article No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>For mounting units of the SIWAREX WL230 BB-S SA series</td>
<td>7MH5713-3JG00</td>
</tr>
<tr>
<td>Material: Stainless steel for load cells with a rated load of</td>
<td></td>
</tr>
<tr>
<td>• 10 ... 200 kg (22.05 ... 440.92 lb); Contents: 16 units, each 0.5 mm thick</td>
<td></td>
</tr>
</tbody>
</table>

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\(^{(1)}\) The load cell is not included in the scope of delivery.

\(^{(2)}\) It is highly recommendable to use a grounding cable (7MH3701-1AA1) in order to protect the load cell.
Load Cells
Bending beam load cells
SIWAREX WL230 BB-S SA

Mounting unit

Dimensional drawings

Mounting unit for SIWAREX WL230 BB-S SA load cells, 10 ... 200 kg, dimensions in mm (inches)

Mounting unit for SIWAREX WL230 BB-S SA load cells, 350 and 500 kg, dimensions in mm (inches)
### Overview

The self-centering elastomer bearing for load cells of the SIWAREX WL230 BB-S SA series is the ideal load introduction element for scales without guide elements. It serves to damp vibrations and shocks.

### Design

Elastomer bearings are rubber-metal composites made of neoprene and stainless steel. They ensure large spring excursions (i.e. a high degree of damping) despite small dimensions.

If the load support is displaced by more than 4 mm (0.16 in.) in the horizontal direction, measures for restricting sideways play (e.g. stops) must be provided in the construction of the load bearing implement.

In combination with the base plate and integral overload protection, it is ensured that the load cell is not damaged by static overloading with vertical forces of up to 5 kN.

The load cell and the base plate are not included in the scope of delivery of the elastomer bearing.

### Technical specifications

<table>
<thead>
<tr>
<th>Elastomeric bearing for load cells of the SIWAREX WL230 BB-S SA series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated load</strong></td>
</tr>
<tr>
<td><strong>Permissible lateral deflection</strong></td>
</tr>
</tbody>
</table>

### Selection and ordering data

<table>
<thead>
<tr>
<th>Elastomer bearings</th>
</tr>
</thead>
<tbody>
<tr>
<td>For load cells of the SIWAREX WL230 BB-S SA series</td>
</tr>
<tr>
<td>Material: Stainless steel</td>
</tr>
<tr>
<td>For load cells with a rated load of(^1)(^2)</td>
</tr>
<tr>
<td>- 10 ... 50 kg (22.05 ... 110.23 lb)</td>
</tr>
<tr>
<td>- 100 ... 200 kg (220.46 ... 440.92 lb)</td>
</tr>
<tr>
<td>- 350, 500 kg (771.61, 1102.31 lb)</td>
</tr>
</tbody>
</table>

1) The load cell is not included in the scope of delivery.
2) It is highly recommendable to use a grounding cable (7MH3701-1AA1) in order to protect the load cell.

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Load Cells
Bending beam load cells
SIWAREX WL230 BB-S SA

Base plate

Overview

The base plate with integral overload protection for load cells of the SIWAREX WL230 BB-S SA series ensures easy, correct installation of the load cell.

Design

The integrated overload protection ensures that the load cell is not damaged by static overloading with vertical forces of up to 5 kN.

The load cells can be installed on the base plate and aligned even before final installation of the scales. This ensures that the permissible spring excursion of the load cell is precisely set, up to contact with the overload protection.

The load cell is not included in the scope of delivery of the base plate with overload protection.

Selection and ordering data

<table>
<thead>
<tr>
<th>Base plate with overload protection</th>
<th>Article No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>For load cells of the SIWAREX WL230 BB-S SA series</td>
<td>7MH4133-3DG11</td>
</tr>
<tr>
<td>Material: Stainless steel</td>
<td>7MH4133-3KG11</td>
</tr>
<tr>
<td>For load cells with a rated load of(^1)(^2)</td>
<td></td>
</tr>
<tr>
<td>- 10 ... 200 kg (22.05 ... 440.92 lb)</td>
<td></td>
</tr>
<tr>
<td>- 350 kg (771.62 lb), 500 kg (1102.31 lb)</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) The load cell is not included in the scope of delivery
\(^2\) It is highly recommendable to use a grounding cable (7MH3701-1AA1) in order to protect the load cell.

Dimensional drawings

Elastomer bearing and base plate with overload protection for SIWAREX WL230 BB-S SA load cells, 10 ... 200 kg (22.05 ... 440.92 lb), dimensions in mm (inch)