

Load Cells



3/2	Introduction	3/37	Compression load cells
3/3	Mounting components	3/37	Overview
3/3	Introduction	3/38	SIWAREX WL270 CP-S SA
3/4	Single point load cells	3/38	- Load cell
3/4	Overview	3/40	- Mounting unit and guide element
3/5	SIWAREX WL260 SP-S AA	3/43	- Pressure piece set and adapter plates
3/5	- Load cell	3/44	SIWAREX WL270 CP-S SB
3/6	SIWAREX WL260 SP-S AB	3/44	- Load cell
3/6	- Load cell	3/46	- Mounting unit
3/7	SIWAREX WL260 SP-S AE	3/47	SIWAREX WL270 CP-S SB
3/7	- Load cell	3/47	- Pressure piece set
3/8	SIWAREX WL260 SP-S SA	3/48	SIWAREX WL270 K-S CA
3/8	- Load cell	3/48	- Load cell
3/10	SIWAREX WL260 SP-S SB	3/53	SIWAREX WL270 K-S CA
3/10	- Load cell	3/53	- Self-aligning bearing
3/12	SIWAREX WL260 SP-S SC		
3/12	- Load cell	3/55	Ring torsion load cell
3/14	Bending beam load cells	3/55	Overview
3/14	Overview	3/56	SIWAREX WL280 RN-S SA
3/15	SIWAREX WL230 BB-S SA	3/56	- Load cell
3/15	- Load cell	3/64	- Self-aligning bearing
3/17	- Mounting unit	3/66	- Elastomer bearing
3/19	- Elastomer bearing	3/68	- Mounting unit and guide element
3/20	- Base plate		
3/21	Shear beam load cells	3/70	Load cell accessories
3/21	Overview	3/70	Junction box SIWAREX JB
3/22	SIWAREX WL230 SB-S SA	3/72	Extension box SIWAREX EB
3/22	- Load cell	3/74	Cables
3/24	- Mounting unit		
3/26	- Base plate with elastomer bearing	3/75	Configuration examples
3/28	SIWAREX WL230 SB-S CA	3/75	Introduction
3/28	- Load cell	3/76	Configuration example 1
		3/77	Configuration example 2
		3/78	Configuration example 3
3/30	Double shear beam load cells		
3/30	Overview		
3/31	SIWAREX WL290 DB-S CA		
3/31	- Load cell		
3/33	- Mounting unit for vehicles		
3/34	S-Type load cells		
3/34	Overview		
3/35	SIWAREX WL250 ST-S SA		
3/35	- Load cell		

Load Cells

Introduction

Overview



Siemens offers load cells in the SIWAREX WL200 series. All load cells are equipped with strain gauges. They are used for static and dynamic weight measurements.

The different load cell series cover rated loads from 0.3 kg (0.661 lb) to 500 t (492.103 tn. L.).

The variety of modules available and their characteristics, including

- predominantly stainless steel for high anti-corrosion protection
- predominantly hermetically sealed housing for use even in hostile or corrosive environments
- compact modules for easy installation

make SIWAREX load cells suitable for virtually all applications in industrial weighing, e.g. hopper scales and bin weighing equipment, platform weighing machines, vehicle scales, hybrid scales etc.

Almost all series have been approved for use with Class III legal-for-trade commercial scales in accordance with EN 45501 and conform to OIML R60.

Of course, load cells can also be supplied for other rated loads, higher accuracy, and/or Ex approval, depending on requirements.

Design

Load cells are sensors that convert a mechanical variable (i.e. weight) into an electrical signal, usually a voltage.

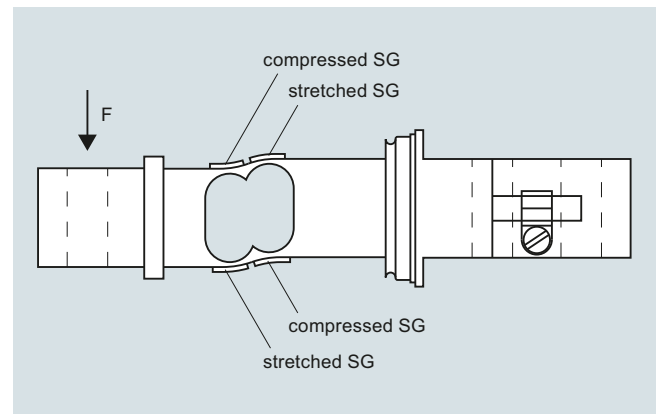
They work with different measuring principles. Siemens load cells in the SIWAREX WL200 series use so-called strain gauges. These are specially formed electrical conductors which are insulated by means of a suitable material. The strain gauges are attached to the basic element, a specially formed spring body, by friction locking.

Under the influence of a weight force F , the spring body is deformed (see schematic presentation) and as a result the strain gauge deforms elastically. Due to the change in the external shape of the strain gauge, the ohmic resistance of its conductor also changes. The top left and bottom right strain gauges are compressed, their resistance films are shortened and the ohmic resistance is reduced accordingly. The top right and bottom left strain gauges are stretched, their resistance films are extended and the ohmic resistance is increased.

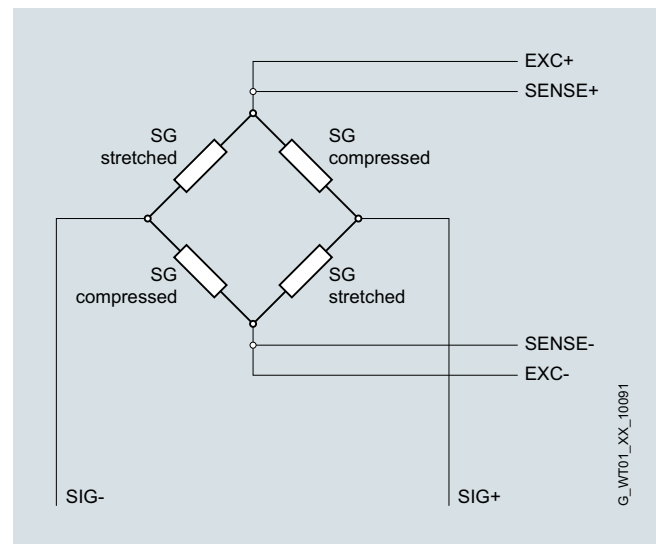
For each load cell, at least four strain gauges are connected together to form a complete Wheatstone bridge. The stretched or compressed strain gauges are connected so that the positive or negative resistance changes are added together to form a total imbalance in the bridge.

On one bridge diagonal, the power voltage is applied (with 6-conductor technique, also the sensor voltage, SENSE) and on the other diagonal, the measured voltage is tapped.

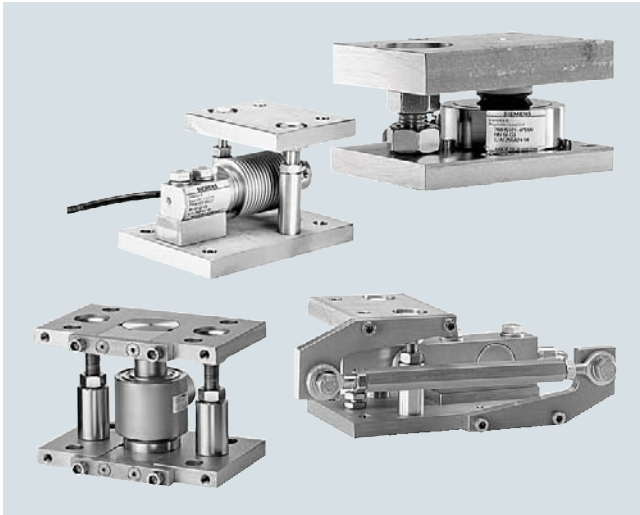
With a constant power voltage (EXC), the measured voltage (SIG) changes proportionally to the introduced load.



Principle of a bending load cell, loaded



Principle of a Wheatstone bridge

Overview

The use of SIWAREX WL200 installation accessories avoids incorrect loading such as eccentric load introduction, torsion torques etc. on the load cells. enables full exploitation of the measuring accuracy of the load cells.

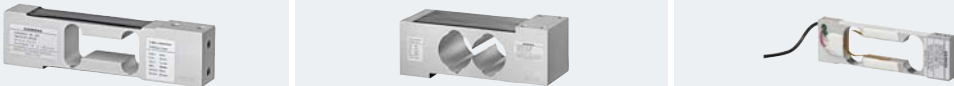
The standardized SIWAREX WL200 installation components are always coordinated precisely to the requirements of the respective load cell design. This ensures that the force to be measured is directed to the load cells in the best possible way.


At the same time the mounting elements simplify the installation of the load cells and increase safety during installation work. The wide variety of mounting components permits implementation of all key applications used with industrial weighing technology. In addition to the mounting components listed below, a wide range of special accessories is available for special requirements.

Load Cells

Single point load cells

Overview

Type	Single point		
Possible applications	Small platform scales, small conveyor scales		
Example picture			
Series	WL260 SP-S AA	WL260 SP-S AB	WL260 SP-S AE
Rated load E_{\max}	3 ... 100 kg (6.61 ... 220.46 lb)	50 ... 500 kg (110.23 ... 1 102.31 lb)	0,3 kg ... 3 kg (0.66 ... 6.61 lb)
Accuracy class	C3 ²⁾	C3 ¹⁾	0.015 %
Max. load cell verification interval (n_{IC})	3 000	3 000	3 000
Min. load cell verification interval (V_{\min})	$E_{\max}/12\,000$	$E_{\max}/10\,000$	k. A.
Supply voltage (U_{sr})	5 ... 12 V	5 ... 12 V	6 ... 12 V
Rated characteristic value	2 mV/V	2 mV/V	0,9 mV/V
Degree of protection	IP65	IP65	IP65
Material	Aluminum	Aluminum	Aluminum
Ex protection according to ATEX (optional)	-	-	-

Type	Single point		
Possible applications	Platform scales, small conveyor scales		
Example picture			
Series	WL260 SP-S SA	WL260 SP-S SB	WL260 SP-S SC
Rated load E_{\max}	5 ... 200 kg (11.02 ... 440.92 lb)	6 ... 60 kg (13.23 ... 132.28 lb)	10 ... 500 kg (22.05 ... 1 102.31 lb)
Accuracy class	C3	C3	C3, C3 MR, C4 MR
Max. load cell verification interval (n_{IC})	3 000	3 000	3 000
Min. load cell verification interval (V_{\min})	$E_{\max}/9\,000$	$E_{\max}/15\,000$	$E_{\max}/10\,000$ with C3 $E_{\max}/20\,000$ with C3 MR $E_{\max}/40\,000$ with C4 MR
Supply voltage (U_{sr})	5 ... 12 V	5 ... 12 V	5 ... 12 V
Rated characteristic value	2 mV/V	2 mV/V	2 mV/V
Degree of protection	IP67	IP68	IP68, IP69K
Material	Stainless steel	Stainless steel	Stainless steel
Ex protection according to ATEX (optional)	II 1 G EX IA IIC T4 II 1 D EX IAD 20 T73GRAD C II 3G EX NL IIC T4	-	-

¹⁾ OIML type approval for SIWAREX WL260 SP-S AB types available soon.

²⁾ Available in C4 with Y = 20 000 upon request.

Load Cells

Single point load cells

SIWAREX WL260 SP-S AA

Load cell

Overview



The load cell is suitable for small platform scales with one load cell (max. platform size 400 x 400 mm (15.75 x 15.75 inch)) as well as for use in medium accuracy weighing machines of Class III with a max. scale verification intervals $n_{\max} = 3000d$.

Design

The load cell is hermetically sealed.

Technical specifications

SIWAREX WL260 SP-S AA

Possible applications	<ul style="list-style-type: none"> Platform scales Small belt scales
Model	Single point load cell
Loads	
Rated load E_{\max}	<ul style="list-style-type: none"> 3 kg (6.61 lb) 5 kg (11.02 lb) 10 kg (22.05 lb) 20 kg (44.09 lb) 50 kg (110.23 lb) 100 kg (220.46 lb)
Minimum initial loading E_{\min}	0% E_{\max}
Maximum working load L_U	150% E_{\max}
Break load L_D	300% E_{\max}
Maximum lateral load L_{Lq}	100% E_{\max}
Measurement characteristic values	
Rated measuring path h_n at E_{\max}	< 0.6 mm (0.05 in)
Rated characteristic value C_n	2.0 ± 0.2 mV/V
Tolerance D_0 of zero signal	$\pm 2\%$ C_n
Maximum scale interval n_{lc}	3 000
Min. load cell verification interval V_{\min}	$E_{\max}/12\ 000$
Combined error F_{comb}	$\pm 0.02\%$ C_n
Repeatability F_v	$\pm 0.017\%$ C_n
Creep error F_{cr}	
• 30 min	$\pm 0.02\%$ C_n
Temperature coefficient	
• Zero signal T_{K0}	0.017% $C_n/5$ K
• Characteristic value T_{KC}	0.014% $C_n/5$ K
Electrical characteristic values	
Recommended reference voltage U_{ref}	5 ... 12 V DC
Input resistance R_e	$409\ \Omega \pm 6\ \Omega$
Output resistance R_a	$350\ \Omega \pm 3\ \Omega$
Insulation resistance R_{is}	5 000 M Ω at 50 V DC

SIWAREX WL260 SP-S AA

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)	Aluminum
Maximum tightening torque of the fixing screws	15 ... 20 Nm
Degree of protection to EN 60529; IEC 60529	IP65

Cable connection

Function	Color
• EXC + (supply +)	red
• EXC - (supply -)	black
• SIG + (measured signal +)	green
• SIG - (measured signal -)	white
• Sense + (sensor line +)	blue
• Sense - (sensor line -)	brown
• Shield	transparent

Certificates and approvals

Accuracy class according to OIML R60	C3
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Selection and ordering data

Article No.

Load cell type WL 260 SP-S AA

7MH5102-

Legal-for-trade according to OIML R60 to 3000d, 3 m connection cable

D 0 0

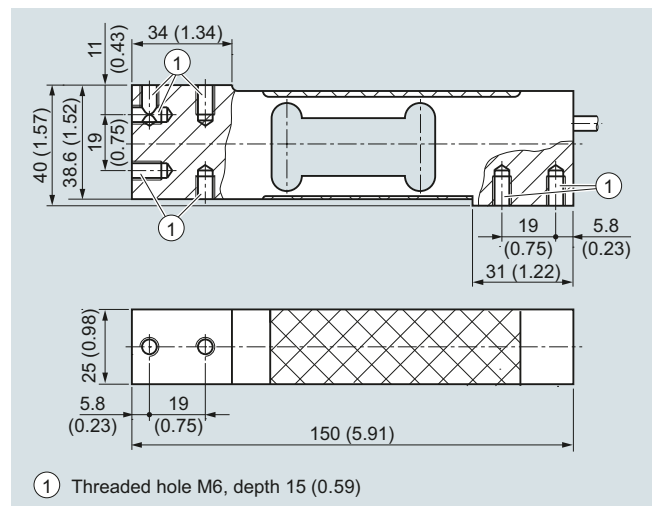
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Rated load

- 3 kg (6.61 lb)
- 5 kg (11.02 lb)
- 10 kg (22.05 lb)
- 20 kg (44.09 lb)
- 50 kg (110.23 lb)
- 100 kg (220.46 lb)

1 K
1 P
2 A
2 G
2 P
3 A

Dimensional drawings



SIWAREX WL 260 SP-S AA load cell, dimensions in mm (inch)

Load Cells

Single point load cells

SIWAREX WL260 SP-S AB

Load cell

Overview



The load cell is suitable for small to medium platform scales with one load cell (max. platform size 600 x 600 mm (23.62 x 23.62 inch)) as well as for use in medium accuracy weighing machines of Class III with a max. verification interval $n_{\max} = 3000$ d.

Design

The load cell is hermetically sealed.

Technical specifications

SIWAREX WL260 SP-S AB

Possible applications	<ul style="list-style-type: none"> Platform scales Conveyor scales
Model	Single point load cell
Loads	
Rated load E_{\max}	<ul style="list-style-type: none"> 50 kg (110.23 lb) 75 kg (165.35 lb) 100 kg (220.46 lb) 150 kg (330.69 lb) 200 kg (440.92 lb) 300 kg (661.37 lb) 500 kg (1 102.31 lb)
Minimum initial loading E_{\min}	0 kg
Maximum working load L_u	150% E_{\max}
Break load L_d	300% E_{\max}
Maximum lateral load L_{lq}	100% E_{\max}
Measurement characteristic values	
Rated measuring path h_n at E_{\max}	< 1.22 mm (0.05 in)
Rated characteristic value C_n	2.0 ± 0.2 mV/V
Tolerance D_0 of zero signal	< $\pm 2\%$ C_n
Maximum scale interval n_{lc}	3 000
Min. scale interval V_{\min}	$E_{\max}/10\,000$
Combined error F_{comb}	$\pm 0.02\%$ C_n
Repeatability F_v	$\pm 0.017\%$ C_n
Creep error F_{cr}	
• 30 min	$\pm 0.02\%$ C_n
Temperature effect	
• Zero signal T_{K0}	0.017% $C_n/5$ K
• Characteristic value T_{KC}	0.014% $C_n/5$ K
Electrical characteristic values	
Recommended input voltage	5 ... 12 V DC
Input resistance R_e	$409\ \Omega \pm 6\ \Omega$
Output resistance R_a	$350\ \Omega \pm 3\ \Omega$
Insulation resistance R_{is}	5 000 M Ω at 50 V DC

SIWAREX WL260 SP-S AB

Connection and ambient conditions

Sensor material (DIN)	Aluminum
Maximum tightening torque of the fixing screws	35 ... 40 Nm
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)
Degree of protection to EN 60529, IEC 60529	IP65

Cable connection

Function	Color
• EXC + (supply +)	Red
• EXC - (supply -)	Black
• SIG + (measured signal +)	Green
• SIG - (measured signal -)	White
• Sense + (sensor cable +)	Blue
• Sense - (sensor cable -)	Brown
• Shield	Transparent

Certificates and approvals

Accuracy class according to OIML R60	C3 ¹⁾
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Selection and ordering data

Article No.

Load cell, type WL260 SP-S AB

7MH5103-

Connecting cable 3 m (9.84 ft)

D 0 0

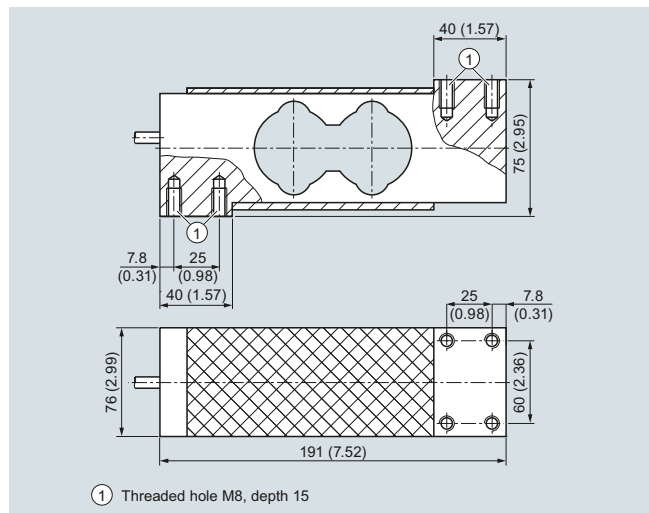
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Rated load

- 50 kg (110.23 lb)
- 75 kg (165.35 lb)
- 100 kg (220.46 lb)
- 150 kg (330.69 lb)
- 200 kg (440.92 lb)
- 300 kg (661.37 lb)
- 500 kg (1 102.31 lb)

2 P
2 S
3 A
3 E
3 G
3 K
3 P

Dimensional drawings



SIWAREX WL 260 SP-S AB load cell, dimensions in mm (inch)

¹⁾ OIML type approval for SIWAREX WL260 SP-S AB available soon.

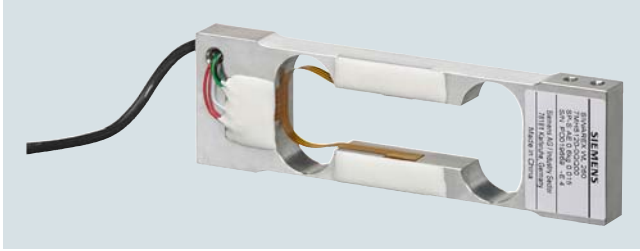
Load Cells

Single point load cells

SIWAREX WL260 SP-S AE

Load cell

Overview



SIWAREX WL260 SP-S AE load cell

The SIWAREX WL260 SP-S AE single point load cell is suitable for the smallest load ranges from 0.3 kg to 3 kg and platform sizes up to 200 mm x 200 mm. The load cell can be used in high resolution scales. The error amounts to a maximum of 0.015% in relation to the rated characteristic value.

Design

The measurement element is a spring body made of aluminum. Due to IP65 degree of protection, the load cell is suitable for cleaning with water jets.

Technical specifications

SIWAREX WL260 SP-S AE	
Possible applications	<ul style="list-style-type: none"> • Small platform scales • Small belt scales
Model	Single point load cell
Loads	
Rated load E_{max}	<ul style="list-style-type: none"> • 0.3 kg (0.66 lb) • 0.6 kg (1.32 lb) • 1 kg (2.20 lb) • 1.2 kg (2.64 lb) • 1.5 kg (3.31 lb) • 3 kg (6.61 lb)
Measurement characteristic values	
Rated measuring path h_n at E_{max}	
• $E_{max} = 0.3$ kg (0.66 lb) and 0.6 kg (1.32 lb)	0.25 mm
• $E_{max} = 1.2$ kg (2.64 lb), 1.5 kg (3.31 lb), 3 kg (6.61 lb)	0.22 mm
Rated characteristic value C_n	0.9 ± 0.1 mV/V
Combined error F_{comb}	$\pm 0.015\% C_n$
Repeatability F_v	$\pm 0.017\% C_n$
Creep error F_{cr}	
• 30 min	$\pm 0.015\% C_n$
Temperature effect	
• Zero signal T_{K0}	$0.03\% C_n/10$ K
• Characteristic value T_{KC}	$0.03\% C_n/10$ K
Electrical characteristic values	
Recommended reference voltage U_{ref}	6 ... 12 V DC
Input resistance R_e	$383 \Omega \pm 6 \Omega$
Output resistance R_a	$351 \Omega \pm 3 \Omega$
Insulation resistance R_{is}	5 000 M Ω at 50 V DC

SIWAREX WL260 SP-S AE

Connection and environmental conditions

Rated temperature range B_{tn}	-10 ... +40 °C (14 ... 104 °F)
Operating temperature range B_{tu}	-20 ... +50 °C (-4 ... 122 °F)
Storage temperature range B_{ts}	-20 ... +50 °C (-4 ... 122 °F)
Sensor material (DIN)	Aluminum
Degree of protection to EN 60529	IP65

Cable connection

Function	Color
• EXC + (supply +)	red
• EXC - (supply -)	black
• SIG + (measured signal +)	green
• SIG - (measured signal -)	white
• Screening	transparent

Selection and ordering data

Article No.

Load cell of the type WL260 SP-S AE

7MH5120-

Connecting cable 0.4 m (14.4 inch)

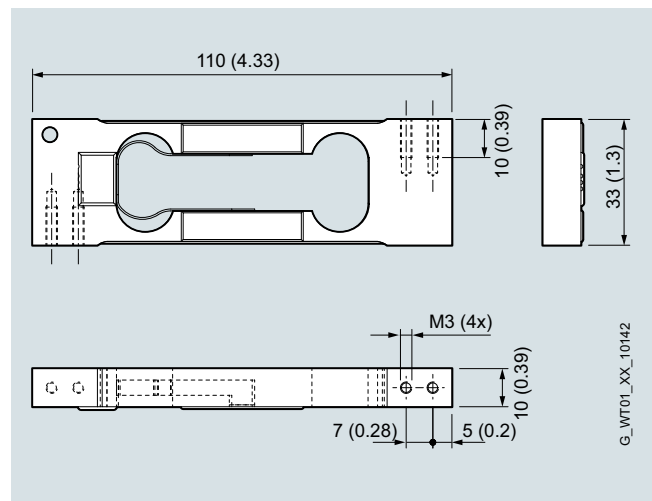
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Rated load

- 0,3 kg (0.66 lb)
- 0,6 kg (1.32 lb)
- 1 kg (2.20 lb)
- 1,2 kg (2.64 lb)
- 1,5 kg (3.31 lb)
- 3 kg (6.61 lb)
- Accuracy class 0.015%

0	K
0	Q
1	A
1	B
1	E
1	K
Q	0
0	0

Dimensional drawings



SIWAREX WL260 SP-S AE Load Cell

Load Cells

Single point load cells

SIWAREX WL260 SP-S SA

Load cell

Overview



The load cell is suitable for small to medium platform scales with one load cell (max. platform size 400 x 400 mm) as well as for use in medium accuracy weighing machines of Class III with a max. scale interval number $n_{\max} = 3000d$.

It is made of stainless steel and therefore also suitable for use in harsh environments.

Design

The load cell is hermetically sealed.

Technical specifications

SIWAREX WL260 SP-S SA

Possible applications	<ul style="list-style-type: none"> Platform scales Small conveyor scales
Model	Single point load cell
Loads	
Rated load E_{\max}	<ul style="list-style-type: none"> 5 kg (11.02 lb) 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)
Minimum initial loading E_{\min}	0% E_{\max}
Maximum working load L_u	150% E_{\max}
Break load L_d	300% E_{\max}
Maximum lateral load L_{lq}	100% E_{\max}
Measurement characteristic values	
Rated measuring path h_n at E_{\max}	0.27 ± 0.05 mm (0.01 ± 0.002 in)
Rated characteristic value C_n	2.0 ± 0.2 mV/V
Tolerance D_0 of zero signal	$< \pm 1\%$ C_n
Maximum scale interval n_{lc}	3 000
Min. load cell verification interval V_{\min}	$E_{\max}/9\ 000$
Combined error F_{comb}	$\pm 0.02\%$ C_n
Repeatability F_v	$\pm 0.017\%$ C_n
Creep error F_{cr}	
• 30 min	$\pm 0.02\%$ C_n
Temperature coefficient	
• Zero signal T_{K0}	0.017% $C_n/5$ K
• Characteristic value T_{Kc}	0.014% $C_n/5$ K

SIWAREX WL260 SP-S SA

Electrical characteristic values

Recommended input voltage	5 ... 12 V DC
Input resistance R_e	$383 \Omega \pm 6 \Omega$
Output resistance R_a	$351 \Omega \pm 3 \Omega$
Insulation resistance R_{is}	5 000 M Ω at 50 V DC

Connection and ambient conditions

Sensor material (DIN)	Stainless steel
Maximum tightening torque of the fixing screws	
• $E_{\max} = 3, 5, 10, 20, 50, 100$ kg (6.61, 11.02, 22.05, 44.09, 110.23, 220.46 lb)	14 Nm
• $E_{\max} = 200$ kg (440.92 lb)	16 Nm
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}	-40 ... +70 °C (-40 ... +158 °F)
Degree of protection to EN 60529, IEC 60529	IP67

Cable connection

Function	Color
• EXC + (supply +)	Green
• EXC - (supply -)	Black
• SIG + (measured signal +)	White
• SIG - (measured signal -)	Red
• Sense + (sensor cable +)	blue
• Sense - (sensor cable -)	yellow
• Shield	Transparent

Certificates and approvals

Accuracy class according to OIML R60	C3
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Selection and ordering data

Article No.

Load cell, type WL260 SP-S SA

7MH5104-

Legal-for-trade according to OIML R60 to 3000d, 1 m connecting cable (3.28 ft)

D 0

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

Rated load

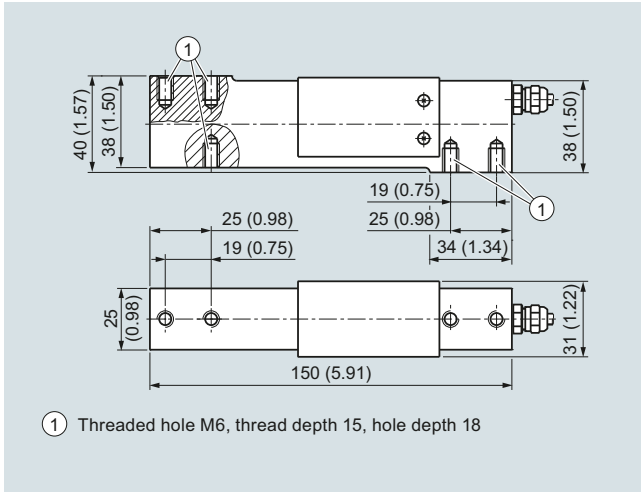
- 5 kg (11.02 lb)
- 10 kg (22.05 lb)
- 20 kg (44.09 lb)
- 50 kg (110.23 lb)
- 100 kg (220.46 lb)
- 200 kg (440.92 lb)

1 P
2 A
2 G
2 P
3 A
3 G

Explosion protection

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

Dimensional drawings



SIWAREX WL 260 SP-S SA load cell, dimensions in mm (inch)

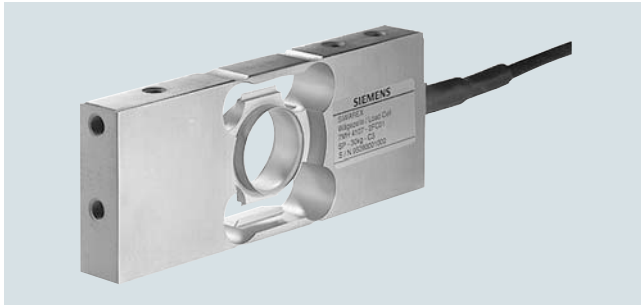
Load Cells

Single point load cells

SIWAREX WL260 SP-S SB

Load cell

Overview



The single point load cell SIWAREX WL260 SP-S SB is excellently suited for use in platform scales with dimensions up to and including 350 x 350 mm (13.78 x 13.78 inch). It is approved for use in Class III commercial scales with maximum divisions of n_{\max} to 3 000d.

Design

The load cell is made of stainless steel and is hermetically sealed. The load cell meets the IP68 degree of protection.

Technical specifications

SIWAREX WL260 SP-S SB

Possible applications

- Platform scales
- Small belt scales

Model Single point load cell

Loads

Rated load E_{\max}	<ul style="list-style-type: none"> • 6 kg (13.23 lb) • 12 kg (26.46 lb) • 30 kg (66.14 lb) • 60 kg (132.28 lb)
Minimum initial loading E_{\min}	0% E_{\max}
Maximum working load L_u	150 % E_{\max}
Ultimate load L_d	300% E_{\max}
Maximum lateral load L_{lq}	100% E_{\max}

Measurement characteristic values

Rated measuring path h_n with	
• $E_{\max} = 6$ kg (13.23 lb)	0.24 ± 0.02 mm (0.009 ± 0.0008 in)
• $E_{\max} = 12$ kg (26.46 lb)	0.19 ± 0.01 mm (0.008 ± 0.0004 in)
• $E_{\max} = 30$ kg (66.14 lb)	0.15 ± 0.01 mm (0.006 ± 0.0004 in)
• $E_{\max} = 60$ kg (132.28 lb)	0.22 ± 0.03 mm (0.009 ± 0.0011 in)
Rated characteristic value C_n	2.0 ± 0.2 mV/V
Tolerance D_0 of zero signal	< ± 2.0% C_n
Maximum scale interval n_{lc}	3 000
Min. interval V_{\min} with	
• $E_{\max} = 6, 12, 30, 60$ kg (13.23, 26.46, 66.14, 132.28 lb)	$E_{\max}/15\ 000$

SIWAREX WL260 SP-S SB

Combined error F_{comb}	≤ ± 0.02% C_n
Repeatability F_v	≤ ± 0.02% C_n
Creep error F_{cr}	
30 min	≤ ± 0.025% C_n
Temperature coefficient	
• Zero signal T_{K0}	0.009% $C_n/10$ °C (50 °F)
• Characteristic value T_{KC}	0.009% $C_n/10$ °C (50 °F)

Electrical characteristic values

Recommended reference voltage U_{ref}	5 ... 12 V DC
Input resistance R_e	400 Ω ± 20 Ω
Output resistance R_a	350 Ω ± 3.5 Ω
Insulation resistance R_{is}	5 000 MΩ at 50 V DC

Connection and environmental conditions

Sensor material (DIN)	Stainless steel
Maximum tightening torque of the fixing screws	10 Nm
Cable connection	

Function

- EXC + (supply +)
- EXC - (supply -)
- SIG + (measured signal +)
- SIG - (measured signal -)
- Sense + (sensor line +)
- Sense - (sensor line -)
- Shield (not connected to housing)

Color

- green
- black
- white
- red
- yellow
- blue
- transparent

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)
Degree of protection according to EN 60529; IEC 60529	IP68

Certificates and approvals

Accuracy class according to OIML R60	C3
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Selection and ordering data

Article No.

Load cell, type WL260 SP-S SB

Capable of calibration according to OIML R60 up to 3 000d, connecting cable 6 m (19.69 ft)

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

Rated load

- 6 kg (13.23 lb)
- 12 kg (26.45 lb)
- 30 kg (66.14 lb)
- 60 kg (132.28 lb)

7MH5117-

D 0 0

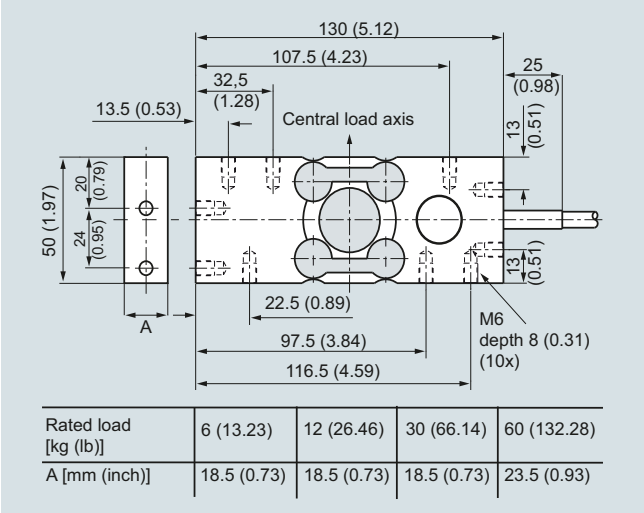
1 Q

2 B

2 K

2 Q

Dimensional drawings



SIWAREX WL260 SP-S SB, dimensions in mm (inch)

Load Cells

Single point load cells

SIWAREX WL260 SP-S SC

Load cell

Overview



The SIWAREX WL260 SP-S SC load cells are designed for use in legal-for-trade platform scales. It is approved for use in Class III commercial scales with maximum divisions of n_{\max} to 4 000d. An C4 MR variant with a Y = 40 000 is available for high-precision applications.

The use of stainless steel and the IP68/IP69K high degree protection make the SIWAREX WL260 SP-S SC highly suitable for use in the food, beverages and tobacco industries or pharmaceutical industry.

Design

The load cell is made of stainless steel and is hermetically sealed.

The platform size can be up to 400 x 400 mm (15.75 x 15.75 inches) for load cells rated for 10 to 50 kg. The platform size can be up to 800 x 800 mm (31.50 x 31.50 inches) for load cells rated for 100 to 500 kg.

Technical specifications

SIWAREX WL260 SP-S SC

Possible applications

- Platform scales
- Small conveyor scales

Model

Single point load cell

Loads

Rated load E_{\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)
- 400 kg (881.85 lb)
- 500 kg (1102.31 lb)

Minimum initial loading E_{\min}

0 % E_{\max}

Maximum working load L_u

150 % E_{\max}

Ultimate load L_d

300 % E_{\max}

Maximum lateral load L_{lq}

100 % E_{\max}

SIWAREX WL260 SP-S SC

Measurement characteristic values

Nominal measurement path s_{nom} for

- 10 kg (22.05 lb) 0.03 mm (0.001 inch)
- 20 kg (44.09 lb) 0.08 mm (0.003 inch)
- 50 kg (110.23 lb) 0.15 mm (0.006 inch)
- 100 kg (220.46 lb) 0.12 mm (0.005 inch)
- 200 kg (440.92 lb) 0.15 mm (0.006 inch)
- 300 kg (661.39 lb) 0.18 mm (0.007 inch)
- 400 kg (881.85 lb) 0.17 mm (0.007 inch)
- 500 kg (1102.31 lb) 0.19 mm (0.008 inch)

Rated characteristic value C_n

$2.0 \pm 0.2 \text{ mV/V}$

Tolerance D_0 of zero signal

$< \pm 2.0 \% C_n$

Maximum scale interval n_{lc}

- $e_{\max} = 10, 20, 50, 100, 200, 300, 400, 500 \text{ kg}$ and accuracy classes C3, C3 MR 3 000

- $e_{\max} = 10, 20, 50 \text{ kg}$ and accuracy class C4 MR 4 000

Min. interval V_{\min} with

- $e_{\max} = 10, 20, 50, 100, 200, 300, 400, 500 \text{ kg}$ (22.05, 44.09, 110.23, 220.46, 440.92, 661.39, 881.85, 1102.31 lb) C3: $E_{\max}/10\ 000$
C3 MR: $E_{\max}/20\ 000$
- $e_{\max} = 10, 20, 50 \text{ kg}$ (22.05, 44.09, 110.23 lb) C4 MR: $E_{\max}/40\ 000$

Combined error F_{comb}

$\leq \pm 0.02 \% C_n$

Repeatability F_v

$\leq \pm 0.02 \% C_n$

Creep error F_{cr}

$\leq \pm 0.025 \% C_n$

30 min

Temperature coefficient

- Zero signal T_{K0} 0.014 % $C_n/10\ ^\circ\text{C}$ (50 $^\circ\text{F}$)
- Characteristic value T_{KC} 0.01 % $C_n/10\ ^\circ\text{C}$ (50 $^\circ\text{F}$)

Electrical characteristic values

Recommended reference voltage U_{ref}

5 ... 12 V DC

Input resistance R_i with

- 10, 20, 50 kg (22.05, 44.09, 110.23 lb) $380\ \Omega \pm 15\ \Omega$
- 100, 200, 300, 400, 500 kg (220.46, 440.92, 661.39, 881.85, 1102.31 lb) $350\ \Omega \pm 3.5\ \Omega$

Output resistance R_a

$350\ \Omega \pm 3.5\ \Omega$

Insulation resistance R_{is}

5 000 M Ω at 50 V DC

Load Cells

Single point load cells

SIWAREX WL260 SP-S SC

Load cell

SIWAREX WL260 SP-S SC**Connection and environmental conditions**

Material of the load cell (DIN) Stainless steel

Maximum tightening torque of the fixing screws with

- 10, 20, 50 kg (22.05, 44.09, 110.23 lb) 10 Nm
- 100, 200, 300, 400, 500 kg (220.46, 440.92, 661.39, 881.85, 1102.31 lb) 20 Nm

Function

- EXC + (supply +)
- EXC - (supply -)
- SIG + (measured signal +)
- SIG - (measured signal -)
- Sense + (sensor line +)
- Sense - (sensor line -)
- Shield (not connected to housing)

Color

- red
- black
- green
- white
- blue¹⁾
- yellow¹⁾
- transparent

Rated temperature range B_{in} -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)

Degree of protection according to EN 60529; IEC 60529 IP68, IP69K

Certificates and approvals

Available accuracy classes acc. to OIML R60

- With rated load 10 kg up to 500 kg C3, C3 MR
- With rated load 10 kg, 20 kg, 50 kg C4 MR

Selection and ordering data

Article No.

Load cell, type WL260 SP-S SC

7MH5118-

Capable of calibration according to OIML R60 up to 3 000d, connecting cable 3 m (9.84 ft)

0

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

Rated load**In accuracy class C3**

- 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 (661.91 lb)
- 400 kg (881.85 lb)
- 500 kg (1 102.31 lb)

2 A D 0

2 G D 0

2 P D 0

3 A D 0

3 G D 0

3 K D 0

3 M D 0

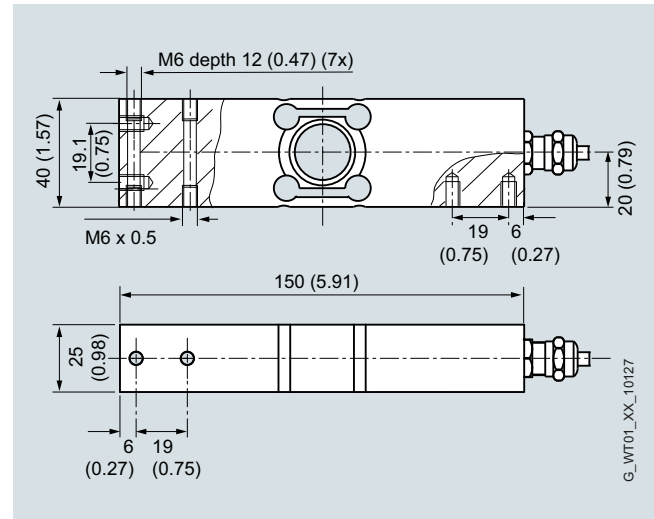
3 P D 0

Options**In accuracy class C3 MR**Capable of calibration according to OIML R60 up to 3 000d and $V_{min} = E_{max}/20\ 000$

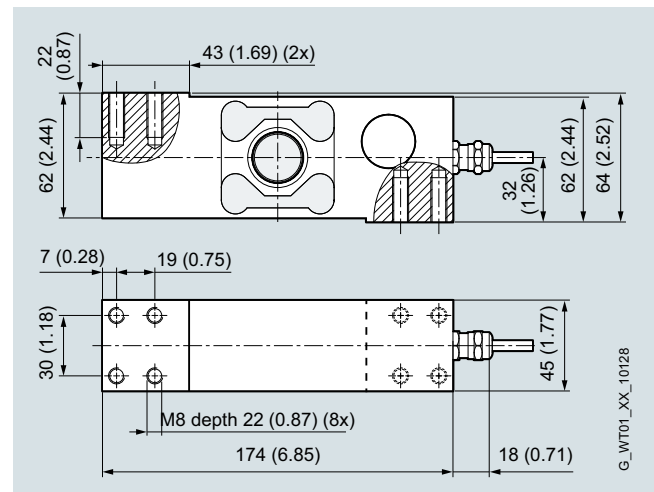
D 5

In accuracy class C4 MRCapable of calibration according to OIML R60 up to 4 000d and $V_{min} = E_{max}/40\ 000$; only for $E_{max} = 10, 20, 50$ kg (22.05, 44.09, 110.23 lb)

E 5

Dimensional drawings

SIWAREX WL260 SP-S SC (10 ... 50 kg / 22.05 ... 110.23 lb), dimensions in mm (inches)




SIWAREX WL260 SP-S SC (100 ... 500 kg / 220.46 ... 1102.31 lb), dimensions in mm (inches)

¹⁾ Only with 10, 20 and 50 kg variants.

Load Cells

Bending beam load cells

Overview

Type	Bending beam
Possible applications	Hopper and belt scales, platform weighing machines
Example picture	
Series	WL230 BB-S SA
Rated load E_{\max}	10 ... 500 kg (22.05 ... 1 102.31 lb)
Accuracy class	C3
Max. load cell verification interval (n_{IC})	3 000
Min. load cell verification interval (V_{\min})	$E_{\max}/15\,000$
Supply voltage (U_{sr})	5 ... 10 V
Rated characteristic value	2 mV/V
Degree of protection	IP68
Material	Stainless steel
Ex protection according to ATEX (optional)	II 1G Ex ia IIC T4 Ta= -20 °C ... +40 °C II 3G Ex nL IIC T4 Ta= -20 °C ... +40 °C II 1D Ex iaD 20 IP6x T 73 °C

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	<ul style="list-style-type: none"> • Hopper scales • Conveyor belt scales • Platform scales
Model	Bending beam load cell
Loads	
Rated load E_{\max}	<ul style="list-style-type: none"> • 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_{\min}	0% E_{\max}
Maximum working load L_u	150% E_{\max}
Break load L_d	300% E_{\max}
Safe lateral load L_{lq}	100% E_{\max}

SIWAREX WL230 BB-S SA

Measurement characteristic values

Rated measuring path h_n at E_{\max}	0.3 mm (0.01 in)
Rated characteristic value C_n	$2.0 \pm 0.02\%$ mV/V
Tolerance D_0 of zero signal	$< \pm 1.0\%$ C_n
Maximum load cell verification interval n_{LC}	3 000 ¹⁾
Min. load cell verification interval V_{\min}	$E_{\max}/15\ 000$
Minimum application range $R_{\min(LC)}$	20%
Combined error F_{comb}	$\leq 0.02\%$ C_n
Repeatability F_v	$\leq 0.017\%$ C_n
Creep error F_{cr}	
30 min	$\leq \pm 0.02\%$ C_n
Temperature coefficient	
• Zero signal T_{K0}	$\leq \pm 0.017\%$ $C_n/5\ K$
• Characteristic value T_{KC}	$\leq \pm 0.014\%$ $C_n/5\ K$

Electrical characteristic values

Recommended reference voltage U_{ref}	5 ... 10 V DC
Input resistance R_e	$460\ \Omega \pm 50\ \Omega$
Output resistance R_a	$350\ \Omega \pm 3.5\ \Omega$
Insulation resistance R_{is}	5 000 M Ω at 50 V DC
Current calibration	Standard

Connection and environmental conditions

Sensor material (DIN)	Stainless steel
Max. tightening torque of the fixing screws	
• $E_{\max} = 10, 20, 50, 100, 200\ \text{kg}$ (22.05, 44.09, 110.23, 220.46, 440.92 lb)	23 Nm ²⁾
• $E_{\max} = 350, 500\ \text{kg}$ (771.62, 1102.31 lb)	70 Nm ²⁾
Function	Color
• EXC + (supply +)	Green
• EXC - (supply -)	Black
• SIG + (measured signal +)	White
• SIG - (measured signal -)	Red
• Shield	Transparent
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)
Degree of protection according to EN 60529; IEC 60529	IP68

Certificates and approvals

Accuracy class according to OIML R60	C3
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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

Load cells type WL230 BB-S SA

Legal-for-trade according to OIML R60 to 3 000d, connecting cable 3 m (9.84 ft)

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, 2, 20, 21, 22

Article No.

7MH5106-

D 0

2 A

2 G

2 P

3 A

3 G

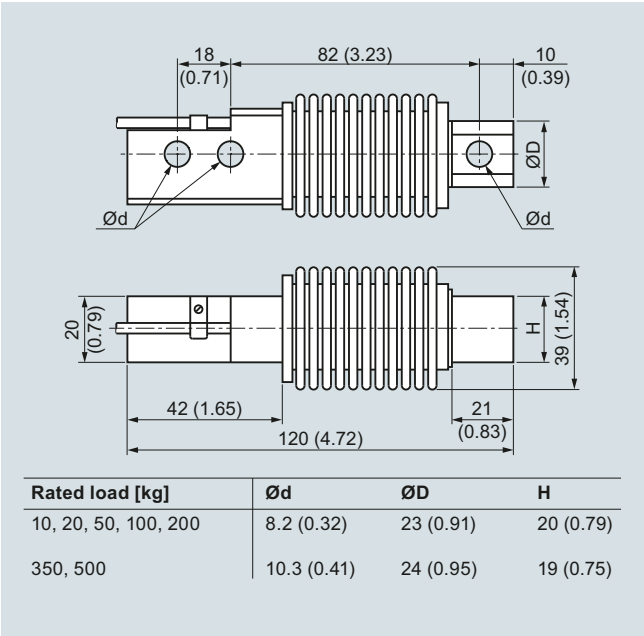
3 L

3 P

0

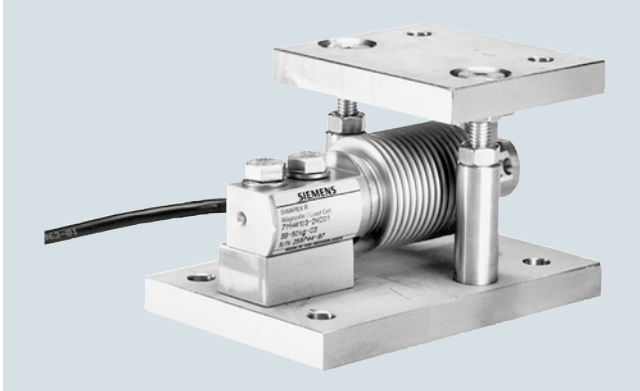
1

Dimensional drawings



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

Overview



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.

Technical specifications

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

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

Selection and ordering data

Article No.

Mounting unit

For load cells of the SIWAREX WL230 BB-S SA series

Material: Stainless steel

for load cells with a rated load of

- 10 ... 200 kg (22.05 ... 440.92 lb)¹⁾²⁾
- 350, 500 kg (771.61, 1 102.3 lb)¹⁾

7MH4133-3DC11**7MH4133-3KC11**

Shims (accessories)

For mounting units of the SIWAREX WL230 BB-S SA series

Material: Stainless steel

For load cells with a rated load of¹⁾

- 10 ... 200 kg (22.05 ... 440.92 lb);
Contents: 16 units, each 0.5 mm thick

7MH5713-3JG00

¹⁾ The load cell is not included in the scope of delivery.

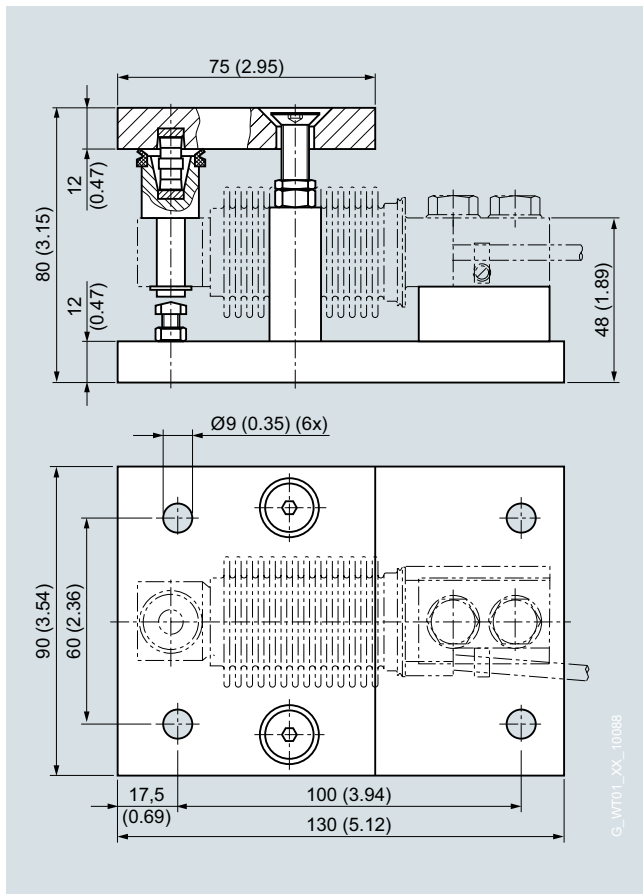
²⁾ It is highly recommendable to use a grounding cable (7MH3701-1AA1) in order to protect the load cell.

Load Cells

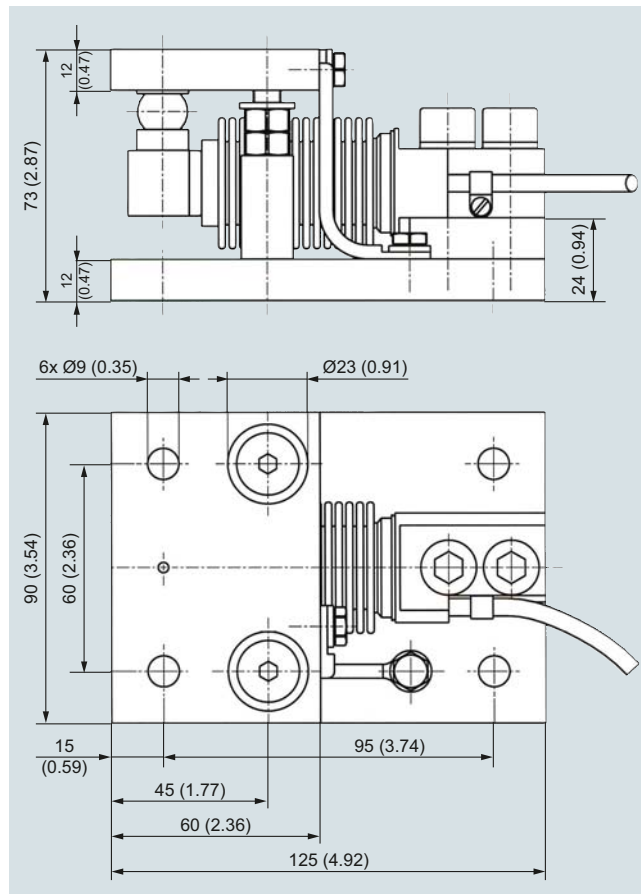
Bending beam load cells
SIWAREX WL230 BB-S SA

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

Elastomeric bearing for load cells of the SIWAREX WL230 BB-S SA series

Rated load	10 ... 200 kg (22.01 ... 440.92 lb)	350, 500 kg (771.62, 1102.31 lb)
Permissible lateral deflection	± 4 mm (0.16 inch)	± 4 mm (0.16 inch)

Selection and ordering data

Article No.

Elastomer bearings

For load cells of the SIWAREX WL230 BB-S SA series

Material: Stainless steel

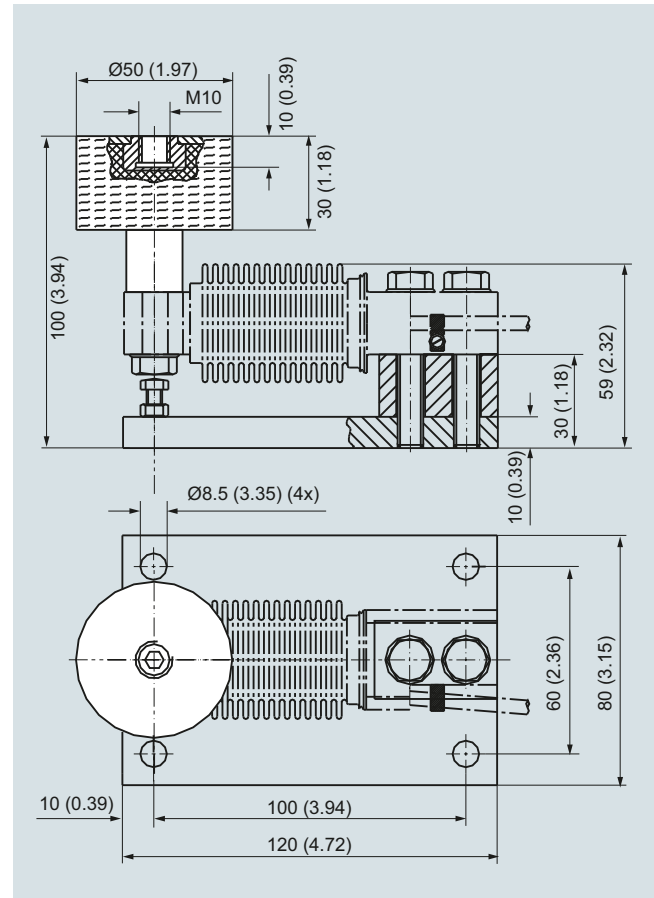
For load cells with a rated load of¹⁾²⁾

- 10 ... 50 kg (22.05 ... 110.23 lb)
- 100 ... 200 kg (220.46 ... 440.92 lb)
- 350, 500 kg (771.61, 1102.31 lb)

7MH4133-2KE11**7MH4133-3DE11**

On request

Dimensional drawings



Elastomer bearings for SIWAREX WL230 BB S SA load cells, 10 ... 200 kg (22.05 ... 440.92 lb), dimensions in mm (inch)

¹⁾ The load cell is not included in the scope of delivery.

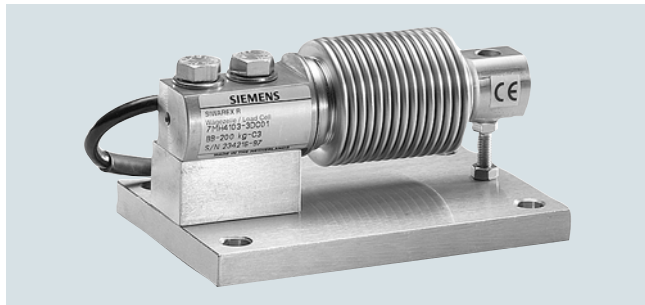
²⁾ It is highly recommendable to use a grounding cable (7MH3701-1AA1) in order to protect the load cell.

Load Cells

Bending beam load cells
SIWAREX WL230 BB-S SA

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.

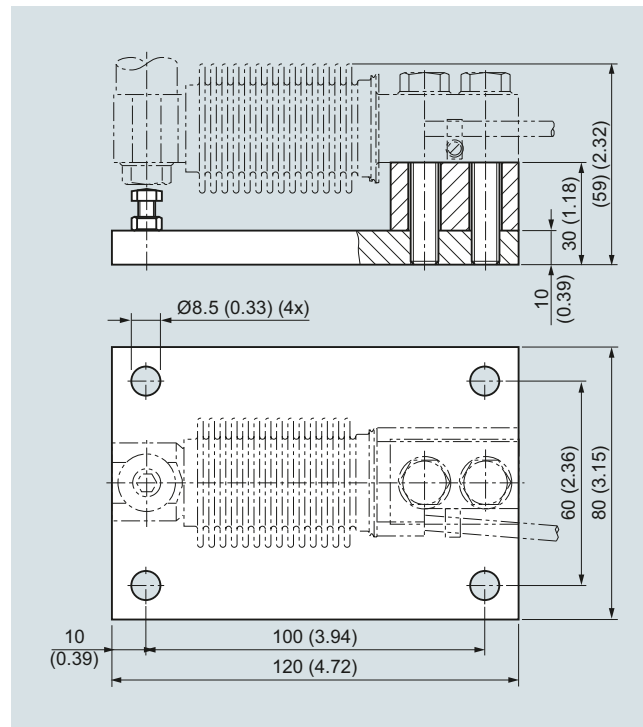
Design

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.

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)

Selection and ordering data

Article No.

Base plate with overload protection

For load cells of the SIWAREX WL230 BB-S SA series

Material: Stainless steel

For load cells with a rated load of¹⁾²⁾

- 10 ... 200 kg (22.05 ... 440.92 lb)
- 350 kg (771.62 lb), 500 kg (1102.31 lb)

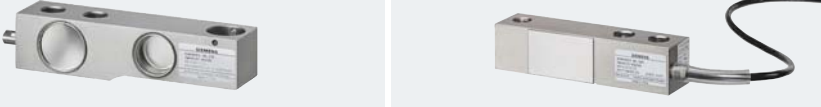
7MH4133-3DG11

7MH4133-3KG11

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.

Overview

Type	Shear beam		
Possible applications	Hopper, belt, and overhead rail scales and platform weighing machines		
Example picture			
Series	WL230 SB-S SA		WL230 SB-S CA
Rated load E_{\max}	500 kg (1 102.31 lb)	1 ... 5 t (0.98 ... 4.92 tn. L.)	100 kg ... 10 t (220.46 lb ... 9.84 tn. L.)
Accuracy class	C3		C3, C4, C5
Max. load cell verification interval (n_{IC})	3 000	3 000	with C3: 3 000 with C4: 4 000 with C5: 5 000
Min. load cell verification interval (V_{\min})	$E_{\max}/10\,000$	$E_{\max}/15\,000$	with C3: 10 000 with C4: 15 000 with C5: 18 000 (3 t ... 10 t / 2.95 ... 9.84 tn. L.) or 20 000 (0,1 t ... 2 t / 0.1 ... 1.97 tn. L.)
Supply voltage (U_{sr})	5 ... 12 V		5 ... 12 V
Rated characteristic value	2 mV/V		3 mV/V
Degree of protection	IP68	IP68	IP67
Material	Stainless steel		Special steel, nickel-plated
Ex protection according to ATEX (optional)	II 1G Ex ia IIC T4 Ta= -20 °C ... +40 °C II 3G Ex nL IIC T4 Ta= -20 °C ... +40 °C II 1D Ex iaD 20 IP6x T 73 °C.		–

Load Cells

Shear beam load cells

SIWAREX WL230 SB-S SA

Load cell

Overview



The shear beam load cell is particularly suitable for implementation in container, overhead rail conveyor and platform scales.

Design

The measuring element is a shear tension spring made of stainless steel to which 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

SIWAREX WL230 SB-S SA

Possible applications	<ul style="list-style-type: none"> • Hopper scales • Conveyor belt scales • Overhead rail scales • Platform scales
Model	Shear beam load cell
Loads	
Rated load/maximum load E_{max}	<ul style="list-style-type: none"> • 0.5 t (0.49 tn. L.) • 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}
Break load L_d	300% E_{max}
Safe lateral load L_{lq}	100% E_{max}
Measurement characteristic values	
Rated measuring path h_n at E_{max}	
• $E_{max} = 500$ kg (0.49 tn. L.)	0.13 mm (0.005 in)
• $E_{max} = 1$ t (0.98 tn. L.)	0.21 mm (0.008 in)
• $E_{max} = 2$ t (1.97 tn. L.)	0.29 mm (0.011 in)
• $E_{max} = 5$ t (4.92 tn. L.)	0.38 mm (0.014 in)
Rated characteristic value C_n	2.0 ± 0.002 mV/V
Tolerance D_0 of zero signal	≤ ± 1.0% C_n
Max. load cell verification intervals n_{LC}	3 000
Min. load cell verification intervals V_{min}	
• $E_{max} = 500$ kg (0.49 tn. L.)	$E_{max}/10\ 000$
• $E_{max} = 1, 2, 5$ t (0.98, 1.97, 4.92 tn. L.)	$E_{max}/15\ 000$
Minimum application range $R_{min(LC)}$	
• $E_{max} = 500$ kg (0.49 tn. L.)	30%
• $E_{max} = 1, 2, 5$ t (0.98, 1.97, 4.92 tn. L.)	20%

SIWAREX WL230 SB-S SA

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
Electrical characteristic values	
Recommended reference voltage U_{ref}	5 ... 12 V DC
Input resistance R_e	1000 ± 10 Ω
Output resistance R_a	1004 ± 5 Ω
Insulation resistance R_{is}	5 000 M Ω 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
Degree of protection according to EN 60529; IEC 60529	IP68
Recommended tightening torque of the fixing screws	
• $E_{max} = 0.5, 1, 2$ t	150 Nm ¹⁾
• $E_{max} = 5$ t	550 Nm ¹⁾
Cable connection	
<u>Function</u>	<u>Color</u>
• EXC +	Green
• EXC -	Black
• SIG +	White
• SIG -	Red
• Shield	Transparent
Certificates and approvals	
Accuracy class according to OIML R60	C3

¹⁾ The tightening torque is to be selected according to the strength class of the screws.

Load Cells

Shear beam load cells
SIWAREX WL230 SB-S SA

Load cell**Selection and ordering data**

Article No.

Load cells type WL230 SB-S SA**7MH5107-**

Legal-for-trade acc. to OIML R60 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.)

D 0

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

Rated load

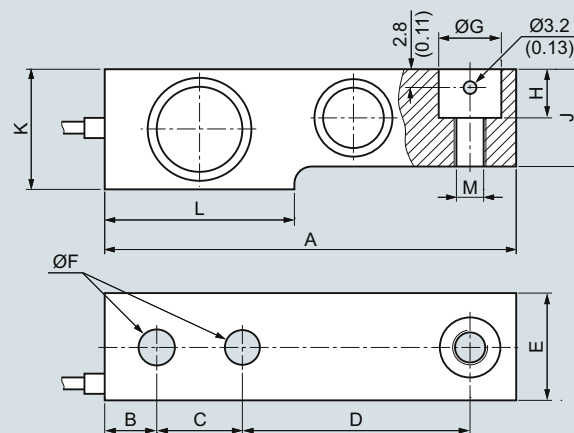
- 500 kg (1 102.31 lb)
- 1 t (0.98 tn. L.)
- 2 t (1.97 tn. L.)
- 5 t (4.92 tn. L.)

**3 P
4 A
4 G
4 P****Explosion protection**

Without

0

Explosion protection for zones 0, 1, 2, 20, 21, 22

1**Dimensional drawings**

Rated load [t]	A	B	C	D	E	ØF
0.5	130 (5.12)	16 (0.63)	25.4 (1.00)	76 (2.99)	32 (1.26)	13 (0.51)
1	130 (5.12)	16 (0.63)	25.4 (1.00)	76 (2.99)	32 (1.26)	13 (0.51)
2	130 (5.12)	16 (0.63)	25.4 (1.00)	76 (2.99)	32 (1.26)	13 (0.51)
5	172 (6.77)	19 (0.63)	38.1 (1.50)	95 (3.74)	38 (1.50)	20.5 (0.81)
Rated load [t]	ØG	H	J	K	L	M
0.5	20.5 (0.81)	14 (0.55)	26 (1.02)	32 (1.26)	57 (2.24)	M12
1	20.5 (0.81)	14 (0.55)	28 (1.10)	32 (1.26)	57 (2.24)	M12
2	20.5 (0.81)	14 (0.55)	32 (1.26)	36 (1.42)	57 (2.24)	M12
5	30.2 (1.89)	20 (0.79)	40 (1.57)	44 (1.73)	76 (2.99)	M20

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

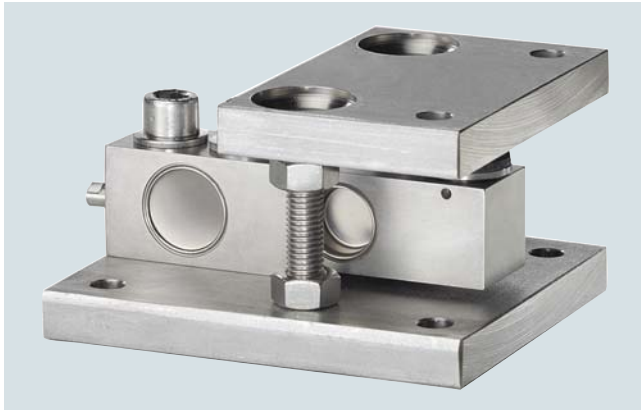
Load Cells

Shear beam load cells

SIWAREX WL230 SB-S SA

Mounting unit

Overview



The self-aligning mounting unit for SIWAREX WL230 SB-S SA load cells is particularly suitable for implementation in container, platform and roller table scales.

Design

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

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 is adjusted so that it is three 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 three millimeters.

Technical specifications

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

Rated load	0.5, 1, 2 t (0.49, 0.98, 1.97 tn. L.)	5 t (4.92 tn. L.)
Maximum lateral deflection with load cell	± 3 mm (0.12 inch)	± 3 mm (0.12 inch)
Lifting path of the top plate	3 mm (0.12 inch)	3 mm (0.12 inch)
Restoring force per millimeter of lateral deflection of the top plate in % of the applied load with load cell	13 %/mm	10%/mm
Permitted supporting load with fixed top plate	25 kN	35 kN
Permitted lifting force on the top plate	25 kN	50 kN
Permitted transverse force on the top plate with fixed top plate	3 kN	5 kN

Selection and ordering data

Article No.

Mounting units

For load cells of the SIWAREX WL230 SB-S SA series

Material: Stainless steel

For load cells with a rated load of:¹⁾²⁾

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

• 500 kg (1 102.31 lb), 1 t (0.98 tn. L.)

• 2 t (1.97 tn. L.)

• 5 t (4.92 tn. L.)

Shims (accessories)

For mounting units of the SIWAREX WL230 SB-S SA series

Material: Stainless steel

For load cells with a rated load of¹⁾²⁾

• 500 kg, 1 t, 2 t (0.49, 0.98, 1.97 tn. L.)
Contents: 16 units, each 0.5 mm thick

• 5 t (4.92 tn. L.)
Contents: 4 units each 0.5 mm thick, 16 units each 1 mm thick

7MH5707-

4 A 0 0

A

G

P

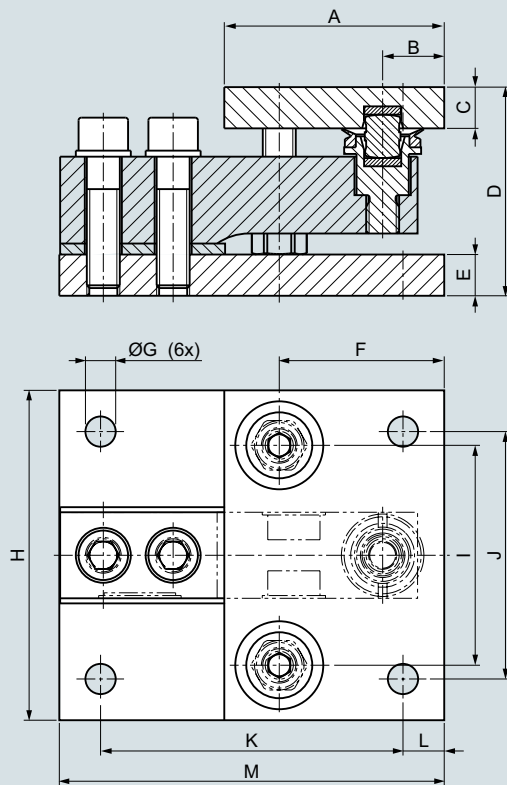
7MH5713-3JG00

7MH5713-4PG00

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



Rated load [t]	A	B	C	D	E	F
0,5 ... 2	80 (3.15)	22.4 (0.88)	15 (0.59)	76 (2.99)	15 (0.59)	60 (2.36)
5	105 (4.13)	31.6 (1.24)	20 (0.79)	108 (4.25)	25 (0.98)	80 (3.15)

Rated load [t]	ØG	H	I	J	K	L	M	s
0,5 ... 2	11 (4.33)	120 (4.72)	80 (3.14)	90 (3.54)	110 (4.33)	15 (0.59)	140 (5.51)	3 (0.12)
5	13.5 (0.53)	150 (5.91)	100 (3.94)	110 (4.33)	145 (5.71)	20 (0.79)	185 (7.28)	3 (0.12)

G_WT01_XX_10092

Mounting unit for SIWAREX WL230 SB-S SA load cells,
dimensions in mm (inch)

Load Cells

Shear beam load cells

SIWAREX WL230 SB-S SA

Base plate with elastomer bearing

Overview



The base plate and the elastomer bearing form a self-centering bearing unit together with the load cells of the SIWAREX WL230 SB-S SA series. It suppresses oscillations and shocks to a certain extent.

Design

Elastomer bearings are rubber-metal composites made of neoprene and stainless steel. Their special design means that lateral movement of the load bearing implement does not result in high transverse force on the load cell.

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

The base plate of stainless steel is used for suitable fixing of the load cell on the base.

The load cell is not included in the scope of delivery of the base plate or elastomer bearing.

Selection and ordering data

Article No.

Base plate

For load cells of the SIWAREX WL230 SB-S SA series

Material: Stainless steel

For load cells with a rated load of: ¹⁾²⁾

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

0,5 ... 1 t (0.49 ... 0.98 tn L.)

2 t (1.97 tn L.)

5 t (4.92 tn L.)

Elastomer bearings

For load cells of the SIWAREX WL230 SB-S SA series

Material: neoprene, stainless steel

For load cells with a rated load of: ¹⁾²⁾

0,5 ... 1 t (0.49 ... 0.98 tn L.)

2 t (1.97 tn L.)

5 t (4.92 tn L.)

7MH5707-

4 0 0

A B

G B

P B

A C

G C

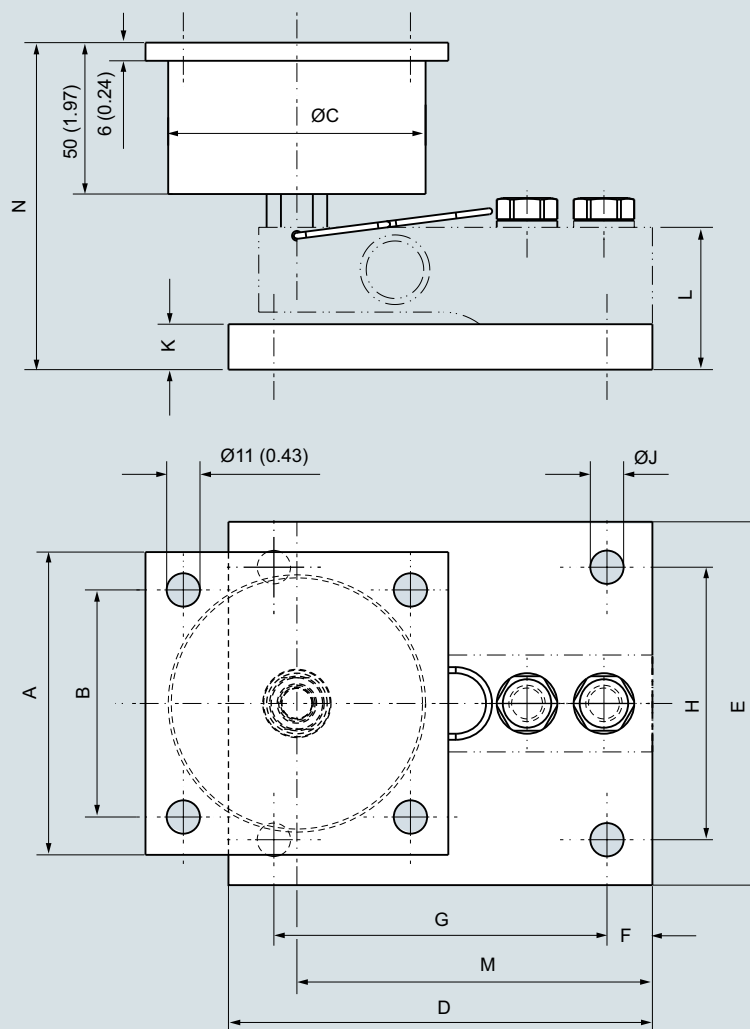
P C

Technical specifications

Base plate with elastomer bearing for SIWAREX WL230 SB-S SA load cells				
Rated load	500 kg (0.49 tn. L.)	1 t (0.98 tn. L.)	2 t (1.97 tn. L.)	5 t (4.92 tn. L.)
Maximum permitted lateral deflection	± 4 mm (0.16 in)	± 4 mm (0.16 in)	± 4 mm (0.16 in)	± 4 mm (0.16 in)
Vertical rigidity	5.9 kN/mm	5.9 kN/mm	29.98 kN/mm	29.98 kN/mm
Horizontal rigidity	0.16 kN/mm	0.16 kN/mm	0.54 kN/mm	0.54 kN/mm
Compression at rated load	0.68 mm (0.037 in)	1.28 mm (0.050 in)	0.62 mm (0.024 in)	1.46 mm (0.057 in)

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

Rated load [t]	A	B	ØC	D	E	F	G
0,5, 1	100 (3.94)	75 (2.95)	85 (3.35)	140 (5.51)	120 (4.72)	15 (0.59)	110 (4.33)
2	120 (4.72)	90 (3.54)	100 (3.94)	140 (5.51)	120 (4.72)	15 (0.59)	110 (4.33)
5	120 (4.72)	90 (3.54)	100 (3.94)	185 (7.28)	150 (5.91)	20 (0.79)	145 (5.71)

Rated load [t]	H	ØJ	K	L	M	N
0,5, 1	90 (3.54)	11 (0.43)	15 (0.59)	47 (1.85)	117.4 (4.62)	108 (4.25)
2	90 (3.54)	11 (0.43)	15 (0.59)	51 (2.01)	117.4 (4.62)	112 (4.41)
5	110 (4.33)	13.5 (0.53)	25 (0.98)	69 (2.72)	153.1 (6.03)	134 (5.28)

G_WT01_XX_10133

Base plate with elastomer bearing for SIWAREX WL230 SB-S SA load cells, dimensions in mm (inch)

Load Cells

Shear beam load cells

SIWAREX WL230 SB-S CA

Load cell

Overview



The SIWAREX WL230 SB-S CA shear beam load cell is made of special nickel-plated steel. The 100 kg (220.46 lb) and 250 kg (551.16 lb) load classes are implemented as bending beams.

The WL230 SB-S CA load cells are especially suited for platform scales and hopper scales where it is easy to introduce the load into the load cell by means of an adjustable foot. The load cell is available in rated loads from 100 kg to 10 t. This means that scales with multiple weighing ranges can be equipped with a single cell type.

Load cells are legal-for-trade according to OIML R60. They are available in accuracy classes C3, C4 and C5.

Design

The measuring element is a spring body made of special steel. Due to the galvanic coating of nickel and the IP67 degree of protection it is suitable for use in harsh environments.

Technical specifications

SIWAREX WL230 SB-S CA				
Possible applications	• Platform scales • Hopper scales			
Model	• Bending beam up to rated load 250 kg (551.16 lb) • Shear beam from rated load 500 kg (1 102.31 lb)			
Loads				
Minimum initial loading E_{\min}	0 kg			
Max. working load L_u	150% E_{\max} .			
Break load L_d	300% E_{\max} .			
Safe lateral load L_{lq}	100% E_{\max}			
Accuracy class OIML R60	OIML C3	OIML C4	OIML C5	
Rated load/maximum load E_{\max} .	100 kg, 250 kg, 500 kg, 1 000 kg, 2 000 kg, 3 000 kg 5 000 kg, 10 000 kg (220.46 lb, 551.16 lb, 1 102.31 lb, 2 204.62 lb, 4 409.25 lb, 6 613.87 lb, 11 023.11 lb, 22 046.23 lb)		100 kg, 250 kg, 500 kg, 1 000 kg, 2 000 kg (220.46 lb, 551.16 lb, 1 102.31 lb, 2 204.62 lb, 4 409.25 lb)	3 000 kg, 5 000 kg, 10 000 kg (6 613.87 lb, 11 023.11 lb, 22 046.23 lb)
Max. load cell verification intervals n_{LC}	3 000	4 000	5 000	
Min. load cell verification intervals V_{\min}	$E_{\max}/10\,000$	$E_{\max}/15\,000$	$E_{\max}/20\,000$	$E_{\max}/18\,000$
Measurement characteristic values				
Combined error F_{comb}	$\leq \pm 0.023\% C_n$	$\leq \pm 0.018\% C_n$	$\leq \pm 0.014\% C_n$	
Recommended supply voltage	5 ... 12 V DC			
Maximum supply voltage	18 V DC			
Rated characteristic value C_n	3.0 ± 0.003 mV/V			
Tolerance D_o of zero signal	$\leq \pm 1.0\% C_n$			
Creep error 30 min F_{cr}	$\leq \pm 0.015\% C_n$			
Electrical characteristic values				
Input resistance R_e	350 ± 3.5 Ω			
Output resistance R_a	350 ± 3.5 Ω			
Insulation resistance R_{is}	≥ 5 000 MΩ at 50 V DC			
Connection and ambient conditions				
Rated temperature range B_{in}	-10 ... +40 °C (14 ... 104 °F)			
Operating temperature range B_{lu}	-35 ... +65 °C (-31 ... 149 °F)			
Storage temperature range B_{is}	-40 ... +80 °C (-40 ... 176 °F)			
Sensor material (DIN)	Steel, nickel-plated			
Degree of protection acc. to EN 60529	IP67			

SIWAREX WL230 SB-S CARated measuring path n at E_{\max}

- 100 kg
- 250 kg
- 500 kg
- 1 t
- 2 t
- 3 t
- 5 t
- 10 t

- 0.17 mm
- 0.15 mm
- 0.32 mm
- 0.63 mm
- 1.2 mm
- 0.9 mm
- 0.6 mm
- 0.8 mm

Recommended tightening torque of the fixing screws

- For M12
- For M18
- For M24

- 75 Nm
- 500 Nm
- 750 Nm

Length of the connecting cable (four-core)

- For rated loads up to 2 t
- For rated loads more than 2 t

- Length 4 m
- Length 6 m

Diameter of the connecting cable

5 mm

Color coding of the connecting cable

Color

- EXC +
- EXC -
- SIG +
- SIG -
- Shield (not connected to the load cell body)

- red
- black
- green
- white
- transparent

ATEX

-

Selection and ordering data

Article No.

Load cell, type SIWAREX WL230 SB-S CA**7MH5121-**

Material: Stahl, vernickelt

0 0

Length of the connecting cable:

4 m for rated load up to 2 t,
6 m for rated load more than 3 t

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

Rated load

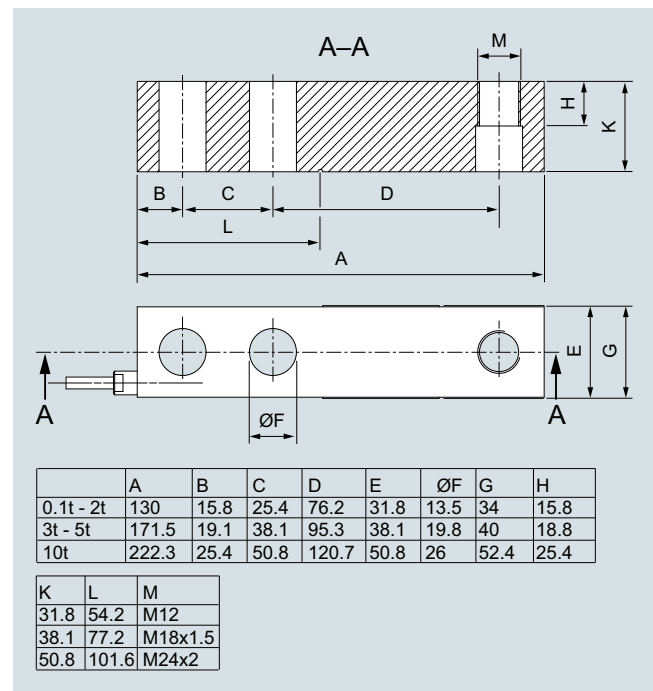
- 100 kg (220.46 lb)
- 250 kg (551.16 lb)
- 500 kg (1 102.31 lb)
- 1 t (0.98 tn. L.)
- 2 t (1.97 tn. L.)
- 3 t (2.95 tn. L.)
- 5 t (4.92 tn. L.)
- 10 t (9.84 tn. L.)

3 A
3 H
3 P
4 A
4 G
4 K
4 P
5 A

Accuracy class according to OIML R60

- C3
- C4
- C5

D
E
F


Dimensional drawings

SIWAREX WL230 SB-S CA load cell

Load Cells

Double shear beam load cells

Overview

Type	Double shear beam
Possible applications	Platform scales, hopper scales, vehicle scales
Example picture	
Series	WL290 DB-S CA
Rated load E_{\max}	13,6 t 34 t (13.39 ... 33.46 tn. L.)
Accuracy class	C3
Max. load cell verification interval (n_{IC})	3 000
Min. load cell verification interval (V_{\min})	$E_{\max}/10\,000$
Supply voltage (U_{sr})	5 ... 12 V
Rated characteristic value	3 mV/V
Degree of protection	IP67
Material	Steel, nickel-plated
Ex protection according to ATEX (optional)	–

Load Cells

Double shear beam load cells

SIWAREX WL290 DB-S CA

Load cell

Overview



The SIWAREX WL290 DB-S CA double shear beam load cell is made of nickel-plated specialty steel.

WL290 DB-S CA load cells are especially suited for large platform and hopper scales. A special mounting unit makes them particularly suitable for assembling scales in vehicles. The double shear beam load cell is installed without oscillation or elastomer force-transmitting mechanisms since transverse forces do not result in the otherwise usual oscillating or deflection effects in the load cell.

Load cells are legal-for-trade according to OIML R60. They are available in accuracy class C3.

Design

The measuring element is a spring body made of special steel. Due to the galvanic coating of nickel and the IP67 degree of protection it is suitable for use in harsh environments.

Technical specifications

SIWAREX WL290 DB-S CA

Possible applications	Platform scales, hopper scales, vehicle scales
Model	Double shear beam
Rated load/maximum load E_{\max}	<ul style="list-style-type: none"> • 13.6 t (13.39 tn. L.) • 18.1 t (17.81 tn. L.) • 22.6 t (22.24 tn. L.) • 27.2 t (26.77 tn. L.) • 34 t (33.46 tn. L.)
Accuracy class according to OIML R60	C3
Max. load cell verification intervals n_{LC}	3 000
Min. scale interval V_{\min}	$E_{\max}/10\,000$
Combined error F_{comb}	$\leq \pm 0.023\% C_n$
Min. dead load E_{\min}	0 kg
Safe load limit L_u	150% E_{\max}
Ultimate load L_d	300% E_{\max}
Recommended supply voltage	5 ... 12 V DC
Maximum supply voltage	18 V DC
Rated measuring path h_n at E_{\max}	0.5 mm
• $E_{\max} = 13.6\text{ t (13.39 tn. L.)}, 18.1\text{ t (17.81 tn. L.)}$	0.6 mm
• $E_{\max} = 27.2\text{ t (26.77 tn. L.)}$	0.5 mm
• $E_{\max} = 34\text{ t (33.46 tn. L.)}$	
Rated characteristic value C_n	$3.0 \pm 0.008\text{ mV/V}$
Tolerance D_0 of zero signal	$\leq \pm 1.0\% C_n$
Creep error 30 min F_{Cr}	$\leq \pm 0.015\% C_n$
Input resistance R_i	$700 \pm 7\ \Omega$
Output resistance R_a	$703\ \Omega \pm 4\ \Omega$
Insulation resistance R_{is}	$\geq 5\,000\text{ M}\Omega$ at 50 V DC
Rated temperature range B_{tn}	-10 ... +40 °C (14 ... 104 °F)
Operating temperature range B_{tu}	-35 ... +60 °C (-31 ... 140 °F)
Storage temperature range B_{ts}	-40 ... +80 °C (-40 ... 176 °F)
Sensor material (DIN)	Steel, nickel-plated
Degree of protection according to EN 60529; IEC 60529	IP67
Cable connection	
Length of the connecting cable (four-core)	9 m (30 ft)
Diameter of the connecting cable	8 mm
Color coding of the connecting cable	<u>Color</u>
• EXC +	Red
• EXC -	Black
• SIG +	Green
• SIG -	White
• Shield (not connected to the load cell body)	Transparent
ATEX	-

Load Cells

Double shear beam load cells
SIWAREX WL290 DB-S CA

Load cell

Selection and ordering data

Article No.

SIWAREX WL290 DB-S CA load cell

7MH5122-

Material: Steel, nickel-plated

0 0

Length of the connecting cable: 9 m (30 ft)

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

Rated load

- 13,6 t (13.39 tn. L.)
- 18 t (17.81 tn. L.)
- 23 t (22.24 tn. L.)
- 27 t (26.77 tn. L.)
- 34 t (33.46 tn. L.)

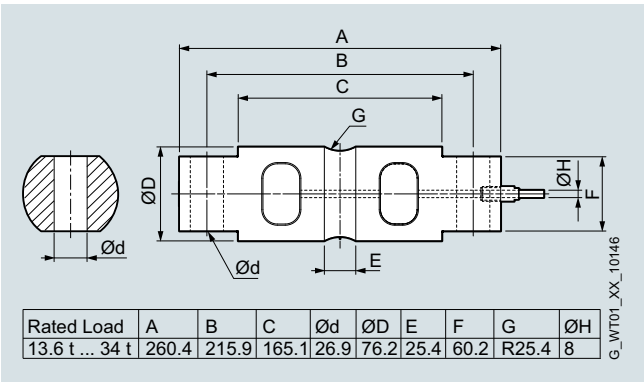
5 D
5 F
5 G
5 J
5 L

Accuracy class C3 acc. to OIML R60

C3

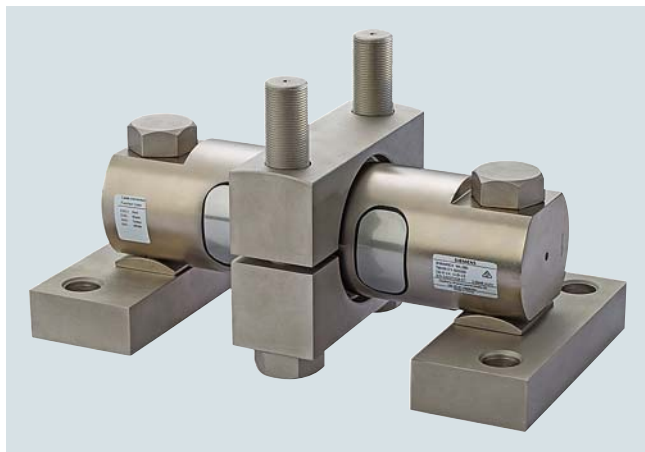
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Dimensional drawings



SIWAREX WL290 DB-S CA load cell (dimensions in mm)

A	B	C	d	D	E	F	G	H
260.4	215.9	165.1	26.9	76.2	25.4	60.2	25.4	8

Overview

SIWAREX WL290 DB-S CA load cell with mounting unit

The mounting unit for the SIWAREX WL290 DB-S CA load cells makes setting up platform and hopper scales easy and safe. Since the load cell is securely bolted onto the bearing plates, it is particularly suitable for use in scales in vehicles. The mounting unit transmits the force directly into the load cell and absorbs any lateral and lifting forces which occur. The mounting unit covers load cell rated loads from 13.6 to 34 t (13.39 to 33.46 tn. L.).

Design

The load cell is bolted onto the bearing plates. A two-part bearing collar is used to connect the load bearer to the load cell, firmly and without play. The bearing collar transfers the weight force centered into the load cell.

Since all connections are tight, possible acceleration forces, caused for example by a container on a vehicle, are directed to the chassis from the load cell and mounting unit. Additional latching mechanisms are not required. Due to the zero play mounting of the load cell no wear can occur, making any maintenance measures superfluous.

Technical specifications**Installation unit for load cells of the SIWAREX WL290 DB-S CA series**

Rated load	13.6 ... 34 t (13.39 ... 33.46 tn. L.).
Maximum lateral deflection	0 mm
Lifting path of top plate	0 mm
Permissible lateral force	20 kN
Permissible lifting force	35 kN
Tightening torque of mounting bolts for load cells	650 Nm
Tightening torque of mounting bolts for clamp collars	650 Nm
Material	Steel, nickel-plated

Selection and ordering data

Article No.

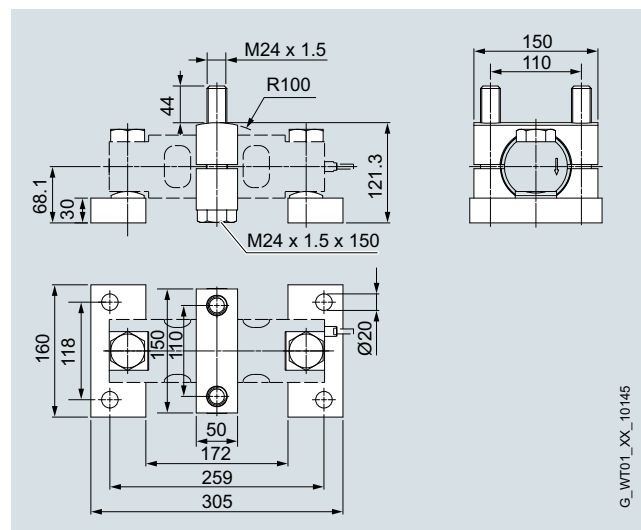
Mounting unit

for SIWAREX WL290 DB-S CA series load cells

Material: Steel, nickel-plated

for load cells with a rated load of ¹⁾

- 13,6 ... 34 t (13.39 ... 33.46 tn. L.)

7MH5722-5LA11**Dimensional drawings**


Mounting unit for SIWAREX WL290 DB-S CA load cell

¹⁾ The load cell is not included in the scope of delivery

Load Cells

S-Type load cells

Overview

Type	S-Type		
Possible applications	Tension and pressure applications, suspended scales, container weighers, hybrid scales		
Example picture			
Series	WL250 ST-S SA		
Rated load E_{\max}	50 ... 100 kg (110.23 ... 220.46 lb)	0,25 ... 2,5 t (0.25 ... 2.46 tn. L.)	5 ... 10 t (4.92 ... 9.84 tn. L.)
Accuracy class	C3		
Max. load cell verification interval (n_{IC})	3 000		
Min. load cell verification interval (V_{\min})	$E_{\max}/7\ 000$	$E_{\max}/10\ 000$	$E_{\max}/12\ 000$
Supply voltage (U_{sr})	5 ... 12 V		
Rated characteristic value	3 mV/V		
Degree of protection	IP67		
Material	Stainless steel		
Ex protection according to ATEX (optional)	II 1G Ex ia IIC T4 Ta= -20 °C ... +40 °C II 3G Ex nL IIC T4 Ta= -20 °C ... +40 °C II 1D Ex iaD 20 IP6x T 73 °C.		

Overview



The load cell is ideal for use in tank weighing, hybrid scales or suspended container weighing. It is made of stainless steel and therefore also suitable for use in harsh environments.

The SIWAREX WL250 ST-S SA is suitable for both s-type tension and compression loads. The preferred direction of measurement is tension, with factory calibration for the load cells. For compression applications, adherence to the characteristic values and error limits cannot be guaranteed.

Design

The measuring element is hermetically encapsulated and has a calibrated output current.

Technical specifications

SIWAREX WL 250 ST-S SA

Possible applications	<ul style="list-style-type: none"> Voltage and pressure applications Suspended scales Container weighers Hybrid scales
Model	S-Type
Rated load E_{\max}	<ul style="list-style-type: none"> 50 kg (110.23 lb) 100 kg (220.46 lb) 250 kg (551.16 lb) 500 kg (1 102.31 lb) 1 t (0.98 tn. L.) 2.5 t (2.46 tn. L.) 5 t (4.92 tn. L.) 10 t (9.84 tn. L.)
Accuracy class according to OIML R60	C3
Max. load cell verification intervals n_{LC}	3 000
Min. load cell verification intervals V_{\min}	
<ul style="list-style-type: none"> $E_{\max} = 50, 100$ kg $E_{\max} = 0.25, 0.5, 1, 2.5$ t $E_{\max} = 5, 10$ t 	$E_{\max}/7000$ $E_{\max}/10\,000$ $E_{\max}/12\,000$
Combined error F_{comb}	$\pm 0.02\% C_n$
Repeatability F_v	$\pm 0.02\% C_n$
Creep error F_{cr}	
<ul style="list-style-type: none"> 30 min 	$\pm 0.02\% C_n$

SIWAREX WL 250 ST-S SA

Temperature effect	
<ul style="list-style-type: none"> Zero signal T_{K0} Characteristic value T_{KC} 	0.017 % $C_n/5$ K 0.014 % $C_n/5$ K
Min. dead load E_{\min}	0 kg
Safe load limit L_u	150 % E_{\max}
Ultimate load L_d	300 % E_{\max}
Safe side load L_{lq}	100 % E_{\max}
Rated measuring path h_n	
<ul style="list-style-type: none"> $E_{\max} = 50, 100$ kg $E_{\max} = 250, 500$ kg $E_{\max} = 1$ t $E_{\max} = 2.5, 5$ t $E_{\max} = 10$ t 	0.18 mm 0.24 mm 0.37 mm 0.8 mm 0.57 mm
Rated characteristic value C_n	3.0 ± 0.008 mV/V
Tolerance D_0 of zero signal	$\pm 1.0\% C_n$
Input resistance R_e	$430\ \Omega \pm 4\ \Omega$
Output resistance R_a	$350\ \Omega \pm 3.5\ \Omega$
Insulation resistance R_{is}	5 000 M Ω at 50 V DC
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
Maximum tightening torque for fixing screws	
<ul style="list-style-type: none"> $E_{\max} = 50, 100$ kg $E_{\max} = 250, 500$ kg, 1 t $E_{\max} = 2.5, 5$ t $E_{\max} = 10$ t 	25 Nm 75 Nm 450 Nm 1 450 Nm
Degree of protection to EN 60529; IEC 60529	IP67

Cable connection

Function	Color
• EXC + (supply +)	Red
• EXC - (supply -)	Black
• SIG + (measured signal +)	Green
• SIG - (measured signal -)	White
• Screening	Transparent

Load Cells

S-Type load cells

SIWAREX WL250 ST-S SA

Load cell

Selection and ordering data

Article No.

Load cells type WL250 ST-S SA

7MH5105-

Legal-for-trade according to OIML R60 up to 3 000d, connecting cable 6 m (19.69 ft)

D 0

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

Rated load

- 50 kg (110.23 lb)
- 100 kg (220.46 lb)
- 250 kg (551.16 lb)
- 500 kg (tn. L..31 lb)
- 1 t (0.98 tn. L.)
- 2,5 t (2.46 tn. L.)
- 5 t (4.92 tn. L.)
- 10 t (9.84 tn. L.)

2 P
3 A
3 H
3 P
4 A
4 H
4 P
5 A

Explosion protection

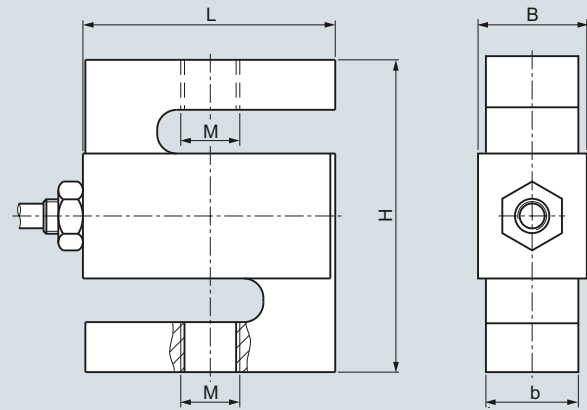
Without

0

Explosion protection for zones 0, 1, 2, 20, 21, 22

1

Dimensional drawings






Rated load [kg]	L	H	b	B	M
50 ... 100	50.8 (2.00)	60.96 (2.40)	11.68 (0.46)	15.06 (0.59)	M8
250 ... 500	50.8 (2.00)	60.96 (2.40)	18.03 (0.71)	21.41 (0.84)	M12

Rated load [t]	L	H	b	B	M
1	50.8 (2.00)	60.96 (2.40)	24.38 (0.96)	27.76 (1.09)	M12
2.5	76.2 (3.00)	99.06 (3.90)	24.38 (0.96)	27.76 (1.09)	M20 x 1.5
5.0	74.68 (2.94)	99.06 (3.90)	30.74 (1.21)	34.12 (1.34)	M20 x 1.5
10	112.78 (4.44)	177.8 (7.00)	42.93 (1.69)	46.31 (1.82)	M30 x 2

SIWAREX WL 250 ST-S SA load cell, dimensions in mm (inch)

Overview

Type	Compression cell		
Possible applications	Bin weighing equipment and hopper and vehicle scales		
Example picture			
Series	WL270 CP-S SA	WL270 CP-S SB	WL270 K-S CA
Rated load E_{\max}	0,5 ... 50 t (0.49 ... 49.21 tn. L.)	100 t (98.42 tn. L.)	2,8 ... 500 t (2.76 ... 492.10 tn. L.)
Accuracy class	C3 ¹⁾	C3	0,1 %
Max. load cell verification interval (n_{IC})	3 000	3 000	(not legal-for-trade)
Min. load cell verification interval (V_{\min})	$E_{\max}/10\,000$	$E_{\max}/12\,000$	(not legal-for-trade)
Supply voltage (U_{Sr})	5 ... 12 V	5 ... 12 V	6 ... 12 V
Rated characteristic value	2 mV/V	2 mV/V	1,5 mV/V
Degree of protection	IP68	IP68	IP65
Material	Stainless steel	Stainless steel	Steel, painted
Ex protection according to ATEX (optional)	II 1G Ex ia IIC T4 Ta= -20 °C ... +40 °C II 3G Ex nL IIC T4 Ta= -20 °C ... +40 °C II 1D Ex iaD 20 IP6x T 73 °C.	II 1G Ex ia IIC T4 Ta= -20 °C ... +40 °C II 3G Ex nL IIC T4 Ta= -20 °C ... +40 °C II 1D Ex iaD 20 IP6x T 73 °C.	-

¹⁾ 0.5 t (0.49 tn. L.), 1 t (0.98 tn. L.), 2 t (1.97 tn. L.) and 5 t (4.92 tn. L.) versions are not legal-for-trade.

Load Cells

Compression load cells SIWAREX WL270 CP-S SA

Load cell

Overview



The compression load cell is particularly suitable for implementation in container, hopper and vehicle scales.

Design

The measuring element is a solid cylinder made of stainless steel to which 4 strain gauges are applied.

The load which acts centrally in the measuring direction causes the spring bodies and therefore the friction-locked strain gauges to be elastically deformed. This generates a measuring signal voltage that is proportional to the load.

Technical specifications

SIWAREX WL270 CP-S SA	
Possible applications	Vehicle scales, overhead rail scales, hopper scales
Model	Compression load cell
Rated load/maximum load E_{\max}	<ul style="list-style-type: none"> • 0.5 t (0.49 tn. L.) • 1 t (0.98 tn. L.) • 2 t (1.97 tn. L.) • 5 t (4.42 tn. L.) • 10 t (9.84 tn. L.) • 20 t (19.68 tn. L.) • 30 t (29.53 tn. L.) • 50 t (49.21 tn. L.)
Accuracy class according to OIML R60	C3 ¹⁾
Max. load cell verification intervals n_{lc}	3 000
Min. load cell verification intervals V_{\min}	$E_{\max}/10\,000$
Minimum application range $R_{\min(lc)}$	30%
Combined error F_{comb}	$\pm 0.02\% C_n$
Repeatability F_v	Not applicable
Creep error F_{cr}	
• 30 min	$\pm 0.023\% C_n$
Temperature effect	
• Zero signal T_{K0}	$0.023\% C_n/5\text{ K}$
• Characteristic value T_{Kc}	$0.017\% C_n/5\text{ K}$
Min. dead load E_{\min}	0 kg
Safe load limit L_u	$150\% E_{\max}$

SIWAREX WL270 CP-S SA

Ultimate load L_d	$150\% E_{\max}$
Safe side load L_{lq}	$75\% E_{\max}$
Rated measuring path h_n at E_{\max}	0.5 mm
Recommended supply voltage (range)	5 ... 12 V DC
Rated characteristic value C_n	$2.0 \pm 0.02\text{ mV/V}$
Tolerance D_0 of zero signal	$\leq \pm 1.0\% C_n$
Input resistance R_e	$700\ \Omega \pm 7\ \Omega$
Output resistance R_a	$700\ \Omega \pm 7\ \Omega$
Insulation resistance R_{is}	5 000 M Ω at 50 V DC
Rated temperature range B_{tn}	-10 ... +40 °C (-14 ... 104 °F)
Operating temperature range B_{lu}	-35 ... +65 °C (-31 ... 149 °F)
Storage temperature range B_{ts}	-35 ... +65 °C (-31 ... 149 °F)
Sensor material	Stainless steel
Degree of protection according to EN 60529; IEC 60529	IP68

Cable connection

Function	Color
• EXC + (supply +)	red
• EXC - (supply -)	black
• SIG + (measured signal +)	green
• SIG - (measured signal -)	white
• Screening	transparent

Selection and ordering data

Article No.

Load cells type WL270 CP-S SA

7MH5108-

Legal-for-trade according to OIML R60 to 3000d, 15 m connecting cable (49.21 ft)

D 0

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

Rated load

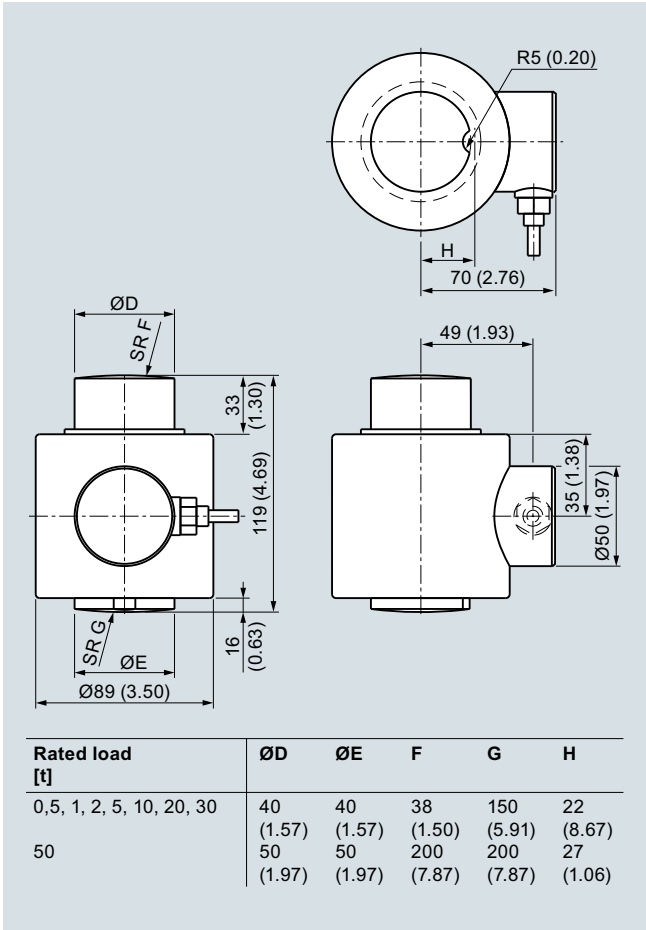
0,5 t (0.49 tn. L.) ¹⁾	3 P
1 t (0.98 tn. L.) ¹⁾	4 A
2 t (1.97 tn. L.) ¹⁾	4 G
5 t (4.92 tn. L.) ¹⁾	4 P
10 t (9.84 tn. L.)	5 A
20 t (19.68 tn. L.)	5 G
30 t (29.63 tn. L.)	5 K
50 t (49.21 tn. L.)	5 P

Explosion protection

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

¹⁾ SIWAREX WL270 CP-S SA 0.5 t, 1 t, 2 t and 5 t are not approved for legal-for-trade operation.

Dimensional drawings



SIWAREX WL270 CP-S SA load cell, dimensions in mm (inch)

Load Cells

Compression load cells
SIWAREX WL270 CP-S SA

Mounting unit and guide element

Overview



The self-aligning mounting unit for SIWAREX WL270 CP-S SA load cells is particularly suitable for implementation in container, platform, vehicle and roller table scales. The guide elements prevent containers, for example, from moving sideways due to an external lateral force. The guide elements can be mounted on one or both sides of the mounting unit.

Design

The mounting unit comprises a base plate and a top plate, two pressure pieces and two countersunk screws. A highly flexible grounding cable between the top and base plate conducts any fault currents past the load cell. On both sides of the base and top plate, there are threaded holes for the later flange-fitting of guide elements.

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 is adjusted so that it is three 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.

The load cell can be inserted into the mounting unit together with the two thrust pads. Load cell and thrust pad are secured with clamping washers.

The load cell can be inserted in the scale before installing the mounting unit. In the same way, it is possible to insert the load cell after installation in the mounting unit.

After the mounting unit has been mounted in the scale, the load bearing element is ideally 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 three millimeters in all directions. The countersunk screws prevent the load bearing implement from being lifted off or toppling off.

Using the mounting unit as an installation aid results in optimum alignment of the load cells. This is essential for the load cells to perform at their best in terms of accuracy.

For maintenance or troubleshooting purposes the load cell can be relieved again by screwing up the hex nuts. After loosening the clamping washers, it can then easily be replaced.

Guide elements are used if the lateral movement of a load bearing element is to be prevented. Lateral movements can be initiated by agitator start-up in a container, by braking or accelerating forces in a roller conveyor, or through forces exerted by the wind on outdoor silos.

A guide element consists of two flanges and one clamping screw. The clamping screw is adjusted to the correct length. The guide element is attached to the operational mounting unit. A guide element can be mounted on the front or rear of the mounting unit. If necessary, two guide elements can be used in parallel in order to double the transferrable lateral force.

In the case of scales with four load cells, only three mounting units may be equipped with guide elements.

Shims are used to compensate for angular errors and delays in the lugs. If more than three load cells are used, the shims are also used to adjust the height of the lugs.

Technical specifications

Mounting unit for load cells of the SIWAREX WL270 CP-S SA series

Rated load	0.5, 1, 2, 5, 10, 20, 30 t (0.49, 0.98, 1.97, 5.92, 9.84, 19.68, 29.53 tn. L.)	50 t (49.21 tn. L.)
Maximum lateral deflection with load cell	± 3 mm (0.12 inch)	± 3 mm (0.12 inch)
Lifting path of the top plate	3 mm (0.12 inch)	3 mm (0.12 inch)
Restoring force per millimeter of lateral deflection of the top plate in % of the applied load with load cell	0.5%/mm	2%/mm
Permitted supporting load with fixed top plate	70 kN	70 kN
Permitted lifting force on the top plate	70 kN	70 kN
Permitted transverse force on the top plate with fixed top plate	30 kN	30 kN

Stainless steel guide elements

Size	Values with rated load				
	0.5 t ... 1 t	2 t ... 5 t	10 t ... 20 t	30 t	50 t
Permitted transverse force ¹⁾	2.5 kN	5 kN	10 kN	15 kN	25 kN

Selection and ordering data

Article No.

Mounting units

For load cells of the SIWAREX WL270 CP-S SA series

Material: Stainless steel

For load cells with a rated load of²⁾

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

- 0.5, 1, 2, 5, 10, 20, 30 t
(0.49, 0.98, 1.97, 5.92, 9.84, 19.68, 29.53 tn. L.)
- 50 t (49.21 tn. L.)

Guide element (optional)

For mounting units of the SIWAREX WL270 CP-S SA series

Material: Edelstahl

For load cells with a rated load of

- 0.5... 1 t (0.49 ... 0.98 tn. L.);
Permitted transverse force: 2,5 kN
- 2 ... 5 t (1.97 ... 5.92 tn. L.);
Permitted transverse force: 5 kN
- 10 ... 13 t (9.84 ... 12.79 tn. L.);
Permitted transverse force: 10 kN
- 30 t (29.53 tn. L.);
Permitted transverse force: 15 kN
- 50 t (49.21 tn. L.);
Permitted transverse force: 25 kN

Shims (accessories)

For mounting units of the SIWAREX WL270 CP-S SA series

Material: Stainless steel

For load cells with a rated load of²⁾

- 0.5 ... 50 t (1.97 ... 29.53 tn. L.);
Contents: 4 units, each 0.5 mm; 20 units, each 1 mm

7MH5708-
5 A 0 1
K
P
7MH5708-
E 0 0
4 A
4 P
5 G
5 K
5 P
7MH5708-
5 G 0 0
P

¹⁾ The values apply to one guide element.

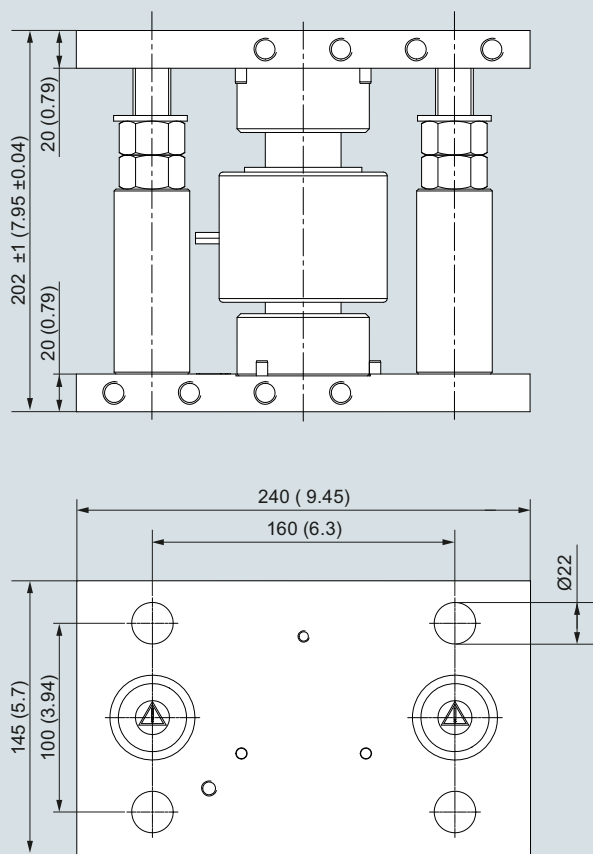
²⁾ The load cell and the guide elements are not included in the scope of delivery

Load Cells

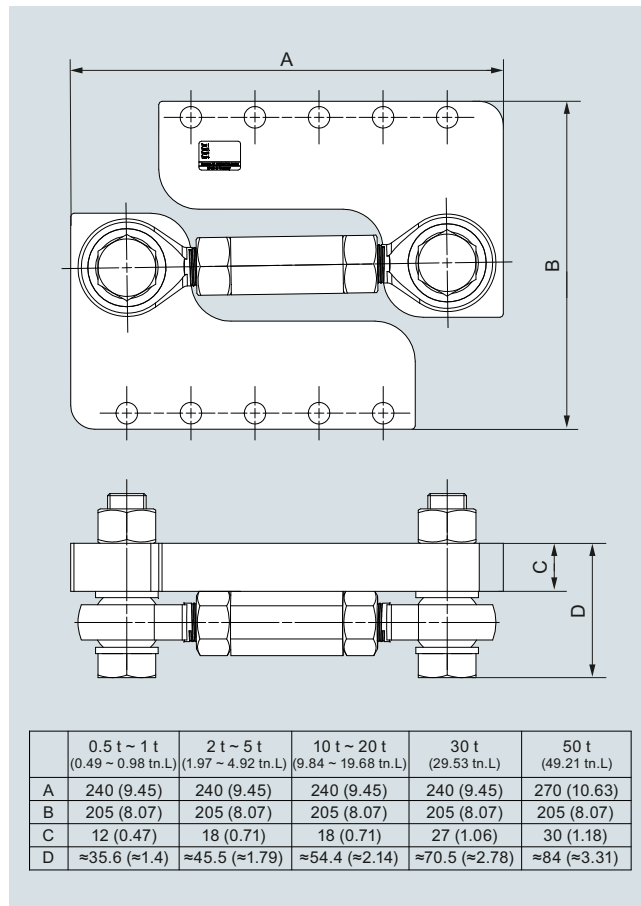
Compression load cells
SIWAREX WL270 CP-S SA

Mounting unit and guide element

Dimensional drawings



Mounting unit for SIWAREX WL270 CP-S SA load cells, dimensions in mm (inches)



Guide element for SIWAREX WL270 CP-S SA load cells, dimensions in mm (inches)

Load Cells

Compression load cells

SIWAREX WL270 CP-S SA

Pressure piece set and adapter plates

Overview



In combination with a pressure piece set and adapter plate the SIWAREX WL270 CP-S SA produces a self-centering self-aligning bearing. This unit is particularly suitable for installation in container, hopper and vehicle scales.

Design

The pressure piece set consists of an upper and lower pressure piece. Together with the load cell the pressure piece set forms a self-centering unit with integrated torsion guard. Two adapter plates serve to hold the pressure pieces and round off the unit into a self-aligning bearing. The adapter plates can be bolted by means of the existing holes directly to the load bearing implement.

The self-centering, self-aligning bearing thus formed allows the load bearing implement to follow horizontal displacements (e.g. due to temperature fluctuations). In this case the construction of the self-aligning bearing creates a restoring force which is dependent on the size of the displacement and the applied load.

If the load bearing implement is displaced by more than 3 mm in the lateral direction, measures for restricting sideways play must be provided in the construction of the load bearing implement (e.g. stops or guide elements). Lifting of the load support must be prevented by suitable measures provided in the construction of the load bearing implement.

The load cell must be ordered separately.

The adapter plate package item consists of one unit.

Technical specifications

Pressure piece set for the individual installation of load cells of the SIWAREX WL270 CP-S SA series

Rated load	0.5, 1, 2, 5, 10, 20, 30 t (0.49, 0.98, 1.97, 5.92, 9.84, 19.68, 29.53 tn. L.)	50 t (49.21 tn. L.)
Maximum lateral deflection with load cell	± 3 mm (0.12 inch)	± 3 mm (0.12 inch)
Restoring force per millimeter of lateral deflection of the top plate in % of the applied load with load cell	0.5 %/mm	2 %/mm

Selection and ordering data

Article No.

Pressure piece set¹⁾

For the individual installation of load cells from the SIWAREX WL270 CP-S SA series

Material: Stainless steel

For load cells with a rated load of:²⁾³⁾

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

• 0.5, 1, 2, 5, 10, 20, 30 t
(0.49, 0.98, 1.97, 5.92, 9.84, 19.68, 29.53 tn. L.)

• 50 t (49.21 tn. L.)

Adapter plate

Adapter for SIWAREX WL270 CP-S SA
The package item consists of one plate.

Material: Stainless steel

For load cells with a rated load of:²⁾³⁾

0.5 ... 50 t (0.49 ... 49.21 tn. L.)

7MH5708-

5 D 0 0

K

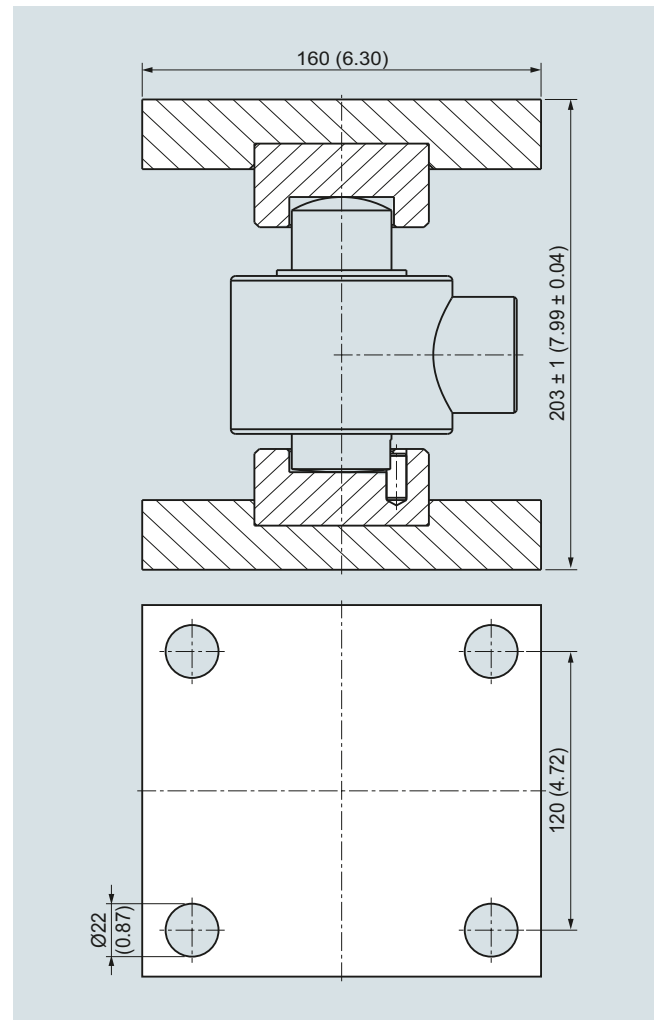
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7MH5708-

5 B 0 0

P

Dimensional drawings



Pressure piece set and adapter plates for SIWAREX WL270 CP-S SA load cells (mounting condition), dimensions in mm (inch)

¹⁾ The principles of general mechanical engineering and safety must be observed.

²⁾ It is highly recommendable to use a grounding cable (7MH3701-1AA1) in order to protect the load cell.

³⁾ The load cell is not included in the scope of delivery.

Load Cells

Compression load cells SIWAREX WL270 CP-S SB

Load cell

Overview



The compression load cell is particularly suitable for implementation in container, hopper and vehicle scales.

Design

The measuring element is a solid cylinder made of stainless steel to which 4 strain gauges are applied.

The load which acts centrally in the measuring direction causes the spring bodies and therefore the friction-locked strain gauges to be elastically deformed. This generates a measuring signal voltage that is proportional to the load.

Technical specifications

SIWAREX WL270 CP-S SB

Possible applications	Container weighers
Model	Compression load cell
Rated load/maximum load E_{\max}	100 t
Accuracy class according to OIML R60	C3
Max. load cell verification intervals n_{LC}	3 000
Min. scale intervals V_{\min}	
• $E_{\max} = 100$ t	$E_{\max}/9\,000$
Minimum application range $R_{\min(LC)}$	33%
Combined error F_{comb}	$\pm 0.02\% C_n$
Repeatability F_v	$\pm 0.02\% C_n$
Creep error F_{cr}	
• 30 min	$\pm 0.023\% C_n$
Temperature effect	
• Zero signal T_{K0}	$0.023\% C_n/5\text{ K}$
• Characteristic value T_{Kc}	$0.017\% C_n/5\text{ K}$
Min. dead load E_{\min}	0 kg
Safe load limit L_u	$150\% E_{\max}$
Ultimate load L_D	$300\% E_{\max}$
Safe side load L_{Iq}	$10\% E_{\max}$
Rated measuring path h_n at E_{\max}	0.36 mm
Recommended supply voltage (range)	5 ... 12 V DC

SIWAREX WL270 CP-S SB

Rated characteristic value C_n	$2.0 \pm 0.02\text{ mV/V}$
Tolerance D_0 of zero signal	$\leq \pm 1.0\% C_n$
Input resistance R_e	$700\ \Omega \pm 7\ \Omega$
Output resistance R_a	$700\ \Omega \pm 7\ \Omega$
Insulation resistance R_{is}	5 000 M Ω at 50 V DC
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	Stainless steel
Degree of protection according to EN 60529; IEC 60529	IP68

Cable connection

Function	Color
• EXC + (supply +)	green
• EXC - (supply -)	black
• SIG + (measured signal +)	white
• SIG - (measured signal -)	red
• Sense + (sensor line +)	yellow
• Sense - (sensor line -)	blue
• Screening	transparent

Selection and ordering data

Article No.

Load cells type WL270 CP-S SB

7MH5110-

Legal-for-trade according to OIML R60 to 3000d,
20 m connecting cable

D 0

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

Rated load

100 t (98.42 tn. L.)

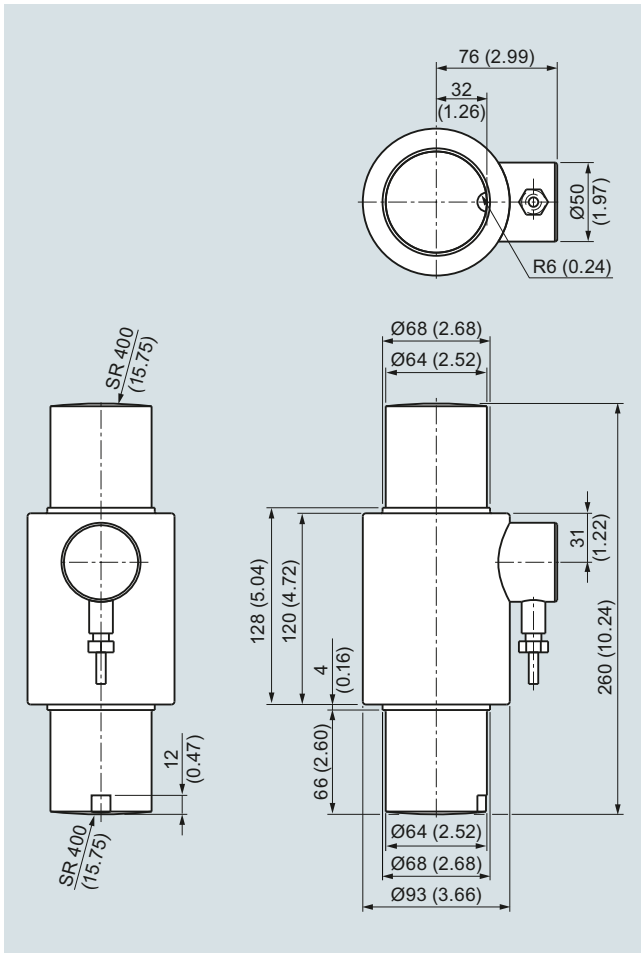
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Explosion protection

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

0
1

Dimensional drawings



SIWAREX WL 270 CP-S SB load cell, dimensions in mm (inch)

Load Cells

Compression load cells
SIWAREX WL270 CP-S SB

Mounting unit

Overview



The self-centering compact mounting unit for SIWAREX WL270 CP-S SA load cells is particularly suitable for implementation in container scales.

Design

The compact mounting unit comprises a base plate and a top plate, two pressure pieces, two clamping pieces and two centering sleeves. There are threaded holes in the base plate and top plate for the subsequent flange-fitting of guide elements.

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

Two pressure pieces are used to mount the load cell. They are fastened flush with the head plate and base plate using the clamping pieces.

In this state the compact 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 into the compact mounting unit. Then the complete unit is installed in the scales. As the result, the load bearing implement and the mounting units are aligned. The load cells are not yet loaded.

Finally the load bearing implement is lowered by undoing two hex nuts under the centering sleeves. 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 compact mounting unit permits sideways displacement of the top plate, and hence of the load bearing implement, by up to eight millimeters in all directions. Two countersunk screws prevent the load bearing implement from being lifted off or toppling off.

Using the compact mounting unit as an installation aid results in optimum alignment of the load cells. This is essential for the load cells to perform at their best in terms of accuracy.

For maintenance or troubleshooting purposes the load cell can be relieved again by screwing up the hex nuts. Replacement of the load cell is then easy after the clamping pieces are released.

Technical specifications

Mounting unit for load cells of the SIWAREX WL270 CP-S SB series

Rated load	100 t (98.42 tn. L)
Maximum lateral deflection with load cell	± 8 mm (0.12 inch)
Lifting path of the top plate	3 ... 5 mm (0.12 ... 0.20 inch)
Restoring force per millimeter of lateral deflection of the top plate in % of the applied load with load cell	0.5 %/mm
Permitted supporting load with fixed top plate	140 kN
Permitted lifting force on the top plate	140 kN
Permitted transverse force on the top plate with fixed top plate	50 kN

Selection and ordering data

Article No.

Compact mounting units

for load cells of the SIWAREX WL270 CP-S SB series

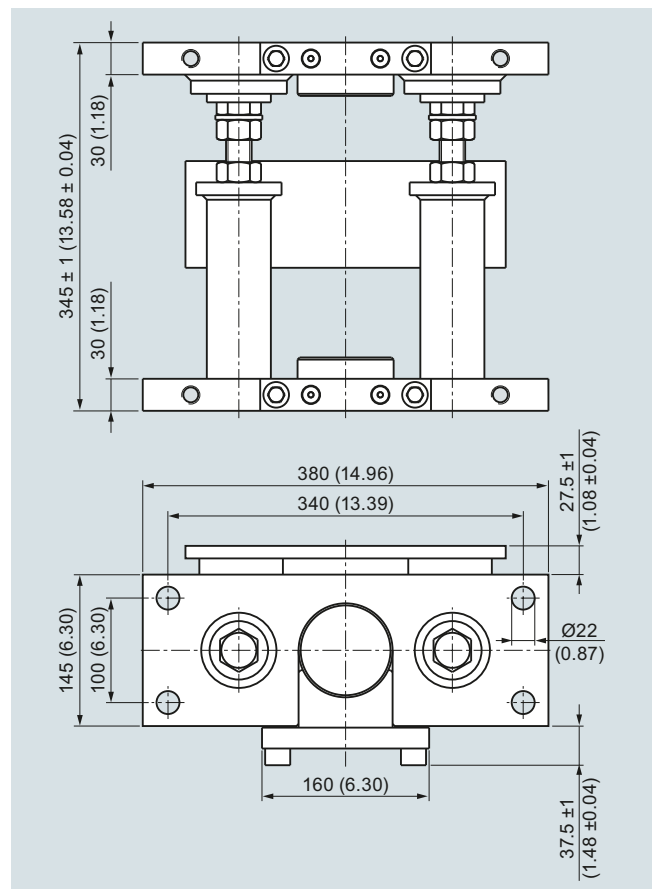
Material: Stainless steel

for load cells with a rated load of:¹⁾²⁾

100 t (98.42 tn. L.)

7MH5710-6AA00

Dimensional drawings



Compact mounting unit for SIWAREX WL270 CP-S SB load cells (mounting condition), dimensions in mm (inch)

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.

Overview



In combination with a pressure piece set, the SIWAREX WL270 CP-S SA load cell produces a self-centering self-aligning bearing. This unit is particularly suitable for installation in container, hopper and vehicle scales.

Design

The pressure piece set consists of an upper and lower pressure piece. Together with the load cell the pressure piece set forms a self-centering unit with integrated torsion guard.

The self-centering, self-aligning bearing thus formed allows the load bearing implement to follow horizontal displacements (e.g. due to temperature fluctuations). In this case the construction of the self-aligning bearing creates a restoring force which is dependent on the size of the displacement and the applied load.

If the load support is laterally displaced by more than 8 mm (0.32"), the design of the load support must include measures for restricting sideways play (e.g. stops or guide elements). Lifting of the load support must be prevented by suitable measures provided in the construction of the load bearing implement.

The load cell must be ordered separately.

Technical specifications

Pressure piece set for the individual installation of load cells of the SIWAREX WL270 CP-S SB series

Rated load	100 t (98.42 tn. L.)
Maximum lateral deflection with load cell	± 8 mm (0.12 inch)
Restoring force per millimeter of lateral deflection of the top plate in % of the applied load with load cell	0.5 %/mm

Selection and ordering data

Article No.

Pressure piece set¹⁾

For the individual installation of load cells from the SIWAREX WL270 CP-S SB series

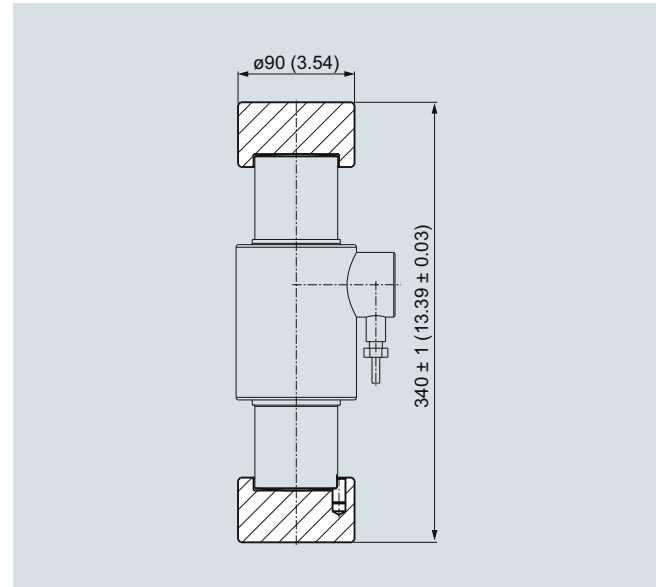
Material: Stainless steel

For load cells with a rated load of²⁾³⁾

100 t (98.42 tn. L.)

7MH5710-6AD00

Dimensional drawings



Pressure piece for SIWAREX WL270 CP-S SB load cells, dimensions in mm (inch)

¹⁾ The principles of general mechanical engineering and safety must be observed.

²⁾ It is highly recommendable to use a grounding cable (7MH3701-1AA1) in order to protect the load cell.

³⁾ The load cell is not included in the scope of delivery.

Load Cells

Compression load cells
SIWAREX WL270 K-S CA

Load cell

Overview



The compression force load cell is particularly suitable for use in container and bin weighing equipment.

Design

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

The load which acts centrally in the measuring direction elastically deforms the spring body and thus the force-fitted strain gauges. This generates a measuring signal voltage that is proportional to the load. The load cell's rated measuring path depends on the rated load and is between 0.23 and 3.11 mm (0.01 and 0.12 in).

An enclosure made from painted steel protects the strain gauge from environmental influences. The load cell is fitted with a heat-resistant cable as standard.

Heavy load versions

Heavy load versions with a rated load of 350 and 500 t (344.47 and 492.10 tn. L.) are available for extreme requirements.

Option: Two measuring circuits for your plant safety

In especially sensitive applications such as cranes, enhanced safety is required. This is also true of measurement plants. Using double bridges in load cells achieves the equivalent of a redundant configuration. Both measuring bridges supply consistent measured values. If one bridge fails, the other takes over.

This option can be ordered for all load classes from 13 t (12.79 tn. L.).

Technical specifications

SIWAREX WL270 K-S CA

Possible applications	<ul style="list-style-type: none"> • Container weighers • Bin weighing equipment
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Type of construction	Compression load cell
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Loads

Rated load E_{\max}	<ul style="list-style-type: none"> • 2.8 t (2.76 tn. L.) • 6 t (5.91 tn. L.) • 13 t (12.79 tn. L.) • 28 t (27.56 tn. L.) • 60 t (59.05 tn. L.) • 130 t (127.95 tn. L.) • 280 t (275.58 tn. L.) • 350 t (344.47 tn. L.) • 500 t (492.10 tn. L.)
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Minimum initial loading E_{\min} 0% E_{\max}

Maximum working load L_u 120% E_{\max}

Breaking load L_d 300% E_{\max}

Maximum lateral load L_{lq} 10% E_{\max}

SIWAREX WL270 K-S CA

Measurement characteristic values

Rated measuring path h_n at E_{\max}	
• 2.8 t (2.76 tn. L.)	0.23 mm (0.009 in)
• 6 t (5.91 tn. L.)	0.38 mm (0.015 in)
• 13 t (12.79 tn. L.)	0.54 mm (0.02 in)
• 28 t (27.56 tn. L.)	0.82 mm (0.03 in)
• 60 t (59.05 tn. L.)	1.19 mm (0.05 in)
• 130 t (127.95 tn. L.)	1.81 mm (0.07 in)
• 280 t (275.58 tn. L.)	2.66 mm (0.10 in)
• 350 t (344.47 tn. L.)	2.73 mm (0.11 in)
• 500 t (492.10 tn. L.)	3.11 mm (0.12 in)
Rated characteristic value C_n	1.5 mV/V
Tolerance D_0 of zero signal	$\leq \pm 1.5\% C_n$
Tolerance D_c of characteristic value	$\pm 0.5\%$
Combined error F_{comb}	$\leq \pm 0.1\%$
Variability F_v	$\leq \pm 0.1\%$
Creepage error F_{cr}	
30 min	$\leq \pm 0.06\%$
Temperature coefficient	
• Zero signal T_{K0}	$\leq \pm 0.25\% C_n/5K$
• Characteristic value T_{Kc}	$\leq \pm 0.25\% C_n/5K$

SIWAREX WL270 K-S CA		SIWAREX WL270 K-S CA	
Electrical characteristic values		Connection and environmental conditions	
Recommended reference voltage U_{ref}	6 ... 12 V DC	Sensor material (DIN)	Steel, painted
Supply voltage U_{sr} (reference value)	6 V	<u>Function</u>	<u>Color</u>
Input resistance R_e		• EXC + (supply +)	red
• 2.8, 6, 13, 28, 60, 130, 280 t (2.76, 5.91, 12.79, 27.56, 59.05, 127.95, 275.58 tn. L.)	275 $\Omega \pm 50 \Omega$	• EXC - (supply -)	white
• 350, 500 t (344.47, 492.10 tn. L.)	840 $\Omega \pm 30 \Omega$	• SIG + (measured signal +)	black
Output resistance R_a		• SIG - (measured signal -)	blue
• 2.8, 6, 13, 28, 60, 130, 280 t (2.76, 5.91, 12.79, 27.56, 59.05, 127.95, 275.58 tn. L.)	245 $\Omega \pm 0.2 \Omega$	• Shield	transparent
• 350, 500 t (344.47, 492.10 tn. L.)	703 $\Omega \pm 5 \Omega$	Rated temperature range B_{tn}	-10 ... +40 °C (14 ... 104 °F)
Insulation resistance R_{is}	$\geq 5000 M\Omega$	Operating temperature range B_{tu}	-20 ... +70 °C (-4 ... +158 °F)
		Storage temperature range B_{ts}	-30 ... +70 °C (-22 ... +158 °F)
		Degree of protection according to EN 60529; IEC 60529	IP66
		Accuracy class	0.1%

SIWAREX WL270 K-S CA, high temperature versions	-30 ... +150 °C (-22 ... +238 °F)	150 ... 180 °C (238 ... 356 °F)	180 ... 250 °C (356 ... 482 °F)
Rated characteristic value C_n	1,5 \pm 0,02 mV/V	1,5 \pm 0,1 mV/V	1,5 \pm 0,1 mV/V
Tolerance D_o of zero signal	$\leq \pm 1,0 \% C_n$	$\leq \pm 1,5 \% C_n$	$\leq \pm 3 \% C_n$
Measurement characteristic values			
Combined error F_{comb}	$\leq \pm 0,3 \%$	$\leq \pm 0,5 \%$	$\leq \pm 5 \%$
Repeatability F_v	$\leq \pm 0,3 \%$	$\leq \pm 0,5 \%$	$\leq \pm 5 \%$
Creepage error F_{cr}			
30 min	$\leq \pm 0,3 \%$	$\leq \pm 0,4 \%$	$\leq \pm 4 \%$
Temperature coefficient			
• Zero signal T_{K0}	$\leq \pm 0,25 \% C_n/5 K$	$\leq \pm 0,25 \% C_n/5 K$	$\leq \pm 0,5 \% C_n/5 K$
• Characteristic value T_{KC}	$\leq \pm 0,25 \% C_n/5 K$	$\leq \pm 0,5 \% C_n/5 K$	$\leq \pm 0,5 \% C_n/5 K$
Electrical characteristic values			
Input resistance R_e			
• 2.8, 6, 13, 28, 60, 130, 280 t (2.76, 5.91, 12.79, 27.56, 59.05, 127.95, 275.58 tn. L.)	275 $\Omega \pm 7 \Omega$	275 $\Omega \pm 15 \Omega$	275 $\Omega \pm 15 \Omega$
• 350, 500 t (344.47, 492.10 tn. L.)	840 $\Omega \pm 30 \Omega$	840 $\Omega \pm 30 \Omega$	840 $\Omega \pm 30 \Omega$
Output resistance R_a			
• 2.8, 6, 13, 28, 60, 130, 280 t (2.76, 5.91, 12.79, 27.56, 59.05, 127.95, 275.58 tn. L.)	245 $\Omega \pm 0,5 \Omega$	245 $\Omega \pm 1 \Omega$	245 $\Omega \pm 1 \Omega$
• 350, 500 t (344.47, 492.10 tn. L.)	703 $\Omega \pm 5 \Omega$	703 $\Omega \pm 5 \Omega$	703 $\Omega \pm 5 \Omega$
Insulation resistance R_{is}	$\geq 5000 M\Omega$		
Connection and environmental conditions			
Rated temperature range B_{tn}	-30 ... +180 °C (-22 ... +356 °F)		
Operating temperature range B_{tu}	-30 ... +250 °C (-22 ... +482 °F)		
Storage temperature range B_{ts}	-30 ... +250 °C (-22 ... +482 °F)		

Load Cells

Compression load cells
SIWAREX WL270 K-S CA

Load cell

Selection and ordering data

SIWAREX WL270 K-S CA load cell

Accuracy class 0.1%
Heat-resistant connecting cable¹⁾

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

Rated load

- 2,8 t (2.76 tn. L.)
- 6 t (5.91 tn. L.)
- 13 t (12.79 tn. L.)
- 28 t (27.56 tn. L.)
- 60 t (59.05 tn. L.)
- 130 t (127.95 tn. L.)
- 280 t (275.58 tn. L.)
- 350 t (244.47 tn. L.)
- 500 t (492.10 tn. L.)

Cable length

- 6 m (19.68 ft)
- 6 m (19.68 ft)
- 15 m (49.21 ft)
- 15 m (49.21 ft)
- 15 m (49.21 ft)
- 20 m (65.62 ft)
- 20 m (65.62 ft)
- 25 m (65.62 ft)
- 25 m (65.62 ft)

Article No.

7MH5114-

L

J

Q

D

J

Q

D

J

Q

D

J

L

P

Article No.

7MH5114-

L

J

Q

D

J

Q

D

J

Q

D

J

L

P

SIWAREX WL270 K-S CA load cell

Accuracy class 0.1%
Heat-resistant connecting cable¹⁾

Explosion protection

None

Explosion protection for zones 2, 22

Options

Double bridge²⁾

Load cell, redundant design, without explosion protection

High temperature²⁾

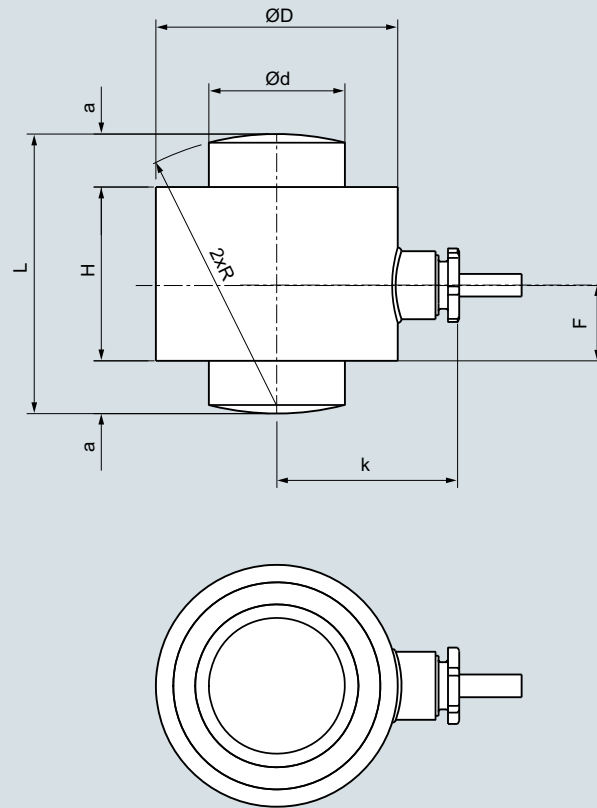
Temperature range -30 °C ... +250 °C (-22 °F ... +482 °F), accuracy varies over temperature range, cables and components designed for temperature range, without explosion protection.

Double bridge and high temperature²⁾

Redundant design load cell, temperature range -30 °C ... +250 °C (-22 °F ... +482 °F), accuracy varies over temperature range, cables and components designed for temperature range, without explosion protection.

¹⁾ Heat-resistant cable: -60 ... +180 °C (-76 ... +356 °F). The cable for high temperatures versions is heat resistant to 250 °C (238 °F).

²⁾ Can be ordered from 13 t (12.79 tn. L.).

Dimensional drawings


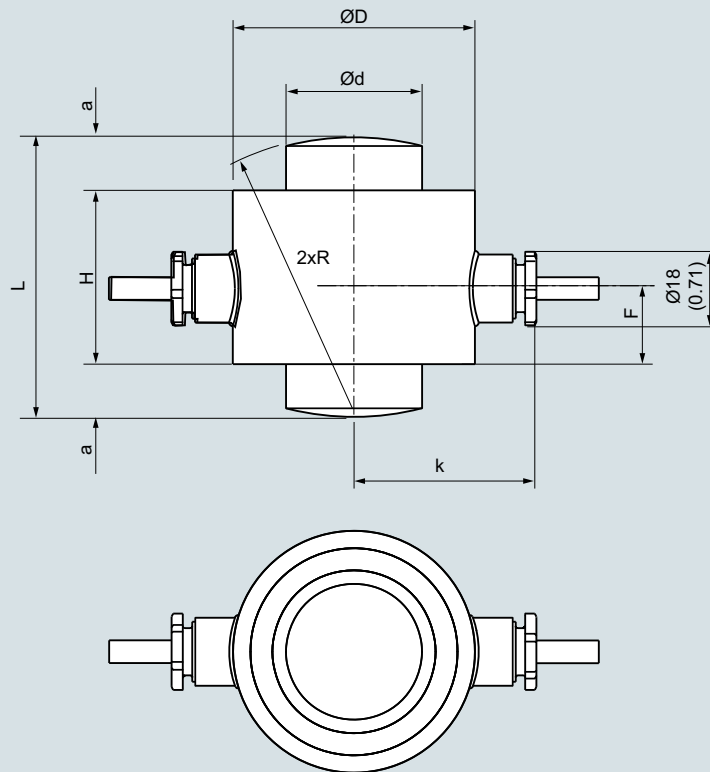
Rated load [t (tn. L.)]	a	ød	øD	F	H	k	L	R
2,8, 6 (2.76, 5.91)	8 (0.31)	16.7 (0.65)	45 (1.77)	20 (0.59)	40 (1.57)	40,5 (1.59)	56 (2.2)	50 (1.96)
13 (12.79)	12 (0.47)	24,5 (0.96)	55 (2.16)	20 (0.59)	44 (1.73)	45,5 (1.79)	68 (2.67)	66 (2.6)
28 (27.56)	14 (0.55)	36 (1.41)	64 (2.51)	20 (0.59)	46 (1.81)	50 (1.89)	74 (2.91)	72 (2.83)
60 (59.05)	20 (0.78)	52,7 (2.07)	90 (3.54)	20 (0.59)	50 (1.96)	63 (2.48)	90 (3.54)	100 (3.93)
130 (127.95)	26 (1.02)	77,5 (3.05)	121 (4.76)	20 (0.59)	64 (2.51)	78,5 (3.09)	116 (4.56)	125 (4.92)
280 (275.58)	45 (1.77)	114 (4.48)	165 (6.5)	20 (0.59)	90 (3.14)	100,5 (3.96)	170 (6.7)	183 (7.2)
350 (344.47)	40 (1.58)	132 (5.20)	192 (7.95)	50.5 (1.97)	139 (6.30)	124 (5.00)	240 (9.45)	325 (12.80)
500 (492.10)	47 (1.85)	155 (6.10)	236 (9.29)	99.5 (1.97)	164 (7.13)	146 (5.67)	275 (10.83)	450 (17.72)

SIWAREX WL270 K-S CA load cell, dimensions in mm (inch)

Load Cells

Compression load cells
SIWAREX WL270 K-S CA

Load cell



Rated load [t (tn.L.)]	a	Ød	ØD	F	H	k	L	R
13 (12.79)	12 (0.47)	24,5 (0.96)	55 (2.16)	20 (0.79)	44 (1.73)	45,5 (1.79)	68 (2.67)	66 (2.6)
28 (27.56)	14 (0.55)	36 (1.41)	64 (2.51)	20 (0.79)	46 (1.81)	50 (1.88)	74 (2.91)	72 (2.83)
60 (59.05)	20 (0.78)	52,7 (2.07)	90 (3.54)	20 (0.79)	50 (1.96)	63 (2.48)	90 (3.54)	100 (3.93)
130 (127.95)	26 (1.02)	77,5 (3.05)	121 (4.76)	20 (0.79)	64 (2.51)	78,5 (3.09)	116 (4.56)	125 (4.92)
280 (275.58)	45 (1.77)	114 (4.48)	165 (6.5)	20 (0.79)	90 (3.14)	100,5 (3.96)	170 (6.7)	183 (7.2)
350 (344.47)	40 (1.58)	132 (5.20)	192 (7.95)	50,5 (1.97)	139 (6.30)	124 (5.00)	240 (9.45)	325 (12.80)
500 (492.10)	47 (1.85)	155 (6.10)	236 (9.29)	99,5 (1.97)	164 (7.13)	146 (5.67)	275 (10.83)	450 (17.72)

SIWAREX WL270 K-S CA load cell, with double bridge, dimensions in mm (inch)

Overview



The self-centering self-aligning bearing for SIWAREX WL270 K-S CA load cells is particularly suitable for use in container and hopper scales.

Design

The self-aligning bearing comprises two pressure plates.

Together with the load cell, the pressure plates form a self-centering unit. This allows the top plate, and thus the load bearing implement, to accommodate horizontal displacements (e.g. due to temperature fluctuations). The design of the self-aligning bearing creates a restoring force which is dependent on the size of the displacement and the applied load.

If the load bearing implement is displaced by more than value s (see dimensional drawing table) in the horizontal direction, measures for restricting sideways play (e.g. stops) must be provided in the construction of the load bearing implement. Lifting of the load bearing implement must be prevented by suitable measures provided in the construction of the load bearing implement.

The load cell is not included in the scope of delivery of the self-aligning bearing.

Heavy load versions

Suitable mounting units are also available for heavy load cells with 350 and 500 t (344.47 and 492.10 tn. L.) rated loads. These are also designed as self-centering, self-aligning bearings.

Technical specifications

Pressure plate for load cell type SIWAREX WL270 K-S CA

Rated load t (tn. L.)	2.8 (2.76)	6 (5.91)	13 (12.80)	28 (27.56)	60 (59.10)	130 (127.95)	280 (275.88)
Permissible lateral deflection in mm (inch):	2 (0.08)	2 (0.08)	2.5 (0.10)	2.5 (0.10)	3 (0.12)	4 (0.16)	6 (0.24)
Rated measuring path h_n at E_{\max} mm (inch)	0.23 (0.009)	0.35 (0.014)	0.53 (0.021)	0.80 (0.032)	1.22 (0.048)	1.85 (0.073)	2.67 (0.11)

Selection and ordering data

Article No.

Pressure plate¹⁾²⁾

For SIWAREX WL270 K-S CA load cells
2 pressure plates are required to set up a self-aligning bearing, one each at the top and bottom respectively.

Material: Steel, painted

For load cells with a rated load of

- 2,8, 6 t (2.76, 5.91 tn. L.)
- 13 t (12.79 tn. L.)
- 28 t (27.56 tn. L.)
- 60 t (59.05 tn. L.)
- 130 t (127.95 tn. L.)
- 280 t (275.58 tn. L.)
- 350 t (344.47 tn. L.)
- 500 t (492.10 tn. L.)

7MH3115-3AA1
7MH3115-1BA1
7MH3115-2BA1
7MH3115-3BA1
7MH3115-1CA1
7MH3115-2CA1
7MH5714-6LD10
7MH5714-6PD10

¹⁾ The load cell is not included in the scope of delivery.

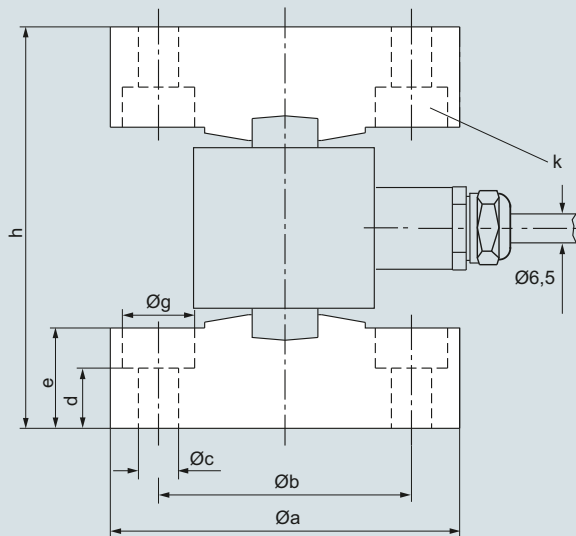
²⁾ Use of a grounding cable (7MH3701-1AA1) to protect the load cell is highly recommended.

Load Cells

Compression load cells
SIWAREX WL270 K-S CA

Self-aligning bearing

Dimensional drawings




Rated load [t]	Øa	Øb	Øc	d	e
2,8, 6	87 (3.43)	63 (2.48)	11 (0.43)	14 (0.55)	25 (0.98)
13	97 (3.82)	73 (2.87)	11 (0.43)	21 (0.83)	32 (1.26)
28	108 (4.25)	84 (3.31)	11 (0.43)	-	28 (1.10)
60	137 (5.39)	112 (4.41)	11 (0.43)	-	42 (1.65)
130	176 (6.93)	148 (5.83)	11 (0.43)	-	52 (2.05)
280	226 (8.90)	190 (7.48)	14 (0.55)	-	65 (2.56)
350	240 (9.45)	200 (7.87)	26 (1.02)	-	30 (1.18)
500	280 (11.02)	240 (9.45)	26 (1.02)	-	45 (1.77)

Rated load [t]	Øg	h	k	s (allowed sideways displacement)
2,8, 6	18 (0.71)	100 ± 0,5/-1	2 x 180°	2 (0.08)
13	18 (0.71)	120 ± 0,5/-1	2 x 180°	2.5 (0.98)
28	-	136 ± 0,5/-1	2 x 180°	2.5 (0.98)
60	-	174 ± 0,5/-1	4 x 90°	3 (0.12)
130	-	220 ± 0,5/-1	4 x 90°	4 (0.16)
280	-	300 ± 0,6/-1,2	2 x 180°	6 (0.24)
350	-	390 (15.35)	2 x 180°	6 (0.24)
500	-	490 (19.29)	2 x 180°	6 (0.24)

Self-aligning bearing for SIWAREX WL270 K-S CA load cells,
dimensions in mm (inch)

Overview

Type	Ring torsion		
Possible applications	Hopper and belt scales, platform weighing machines and roller table scales		
Example picture			
Series	WL280 RN-S SA		
Rated load E_{\max}	60 ... 280 kg (132.28 ... 617.29 lb)	0,5 ... 10 t (0.49 ... 9.84 tn. L.)	13 ... 60 t (12.79 ... 59.05 tn. L.)
Accuracy class	C3		
Max. load cell verification interval (n_{IC})	3 000		
Min. load cell verification interval (V_{\min})	$E_{\max}/16\ 000$	$E_{\max}/17\ 500$	$E_{\max}/17\ 500$
Supply voltage (U_{sr})	5 ... 30 V		
Rated characteristic value	1 mV/V	2 mV/V	2 mV/V
Degree of protection	IP66/IP68		
Material	Stainless steel		
Ex protection according 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 D Ex tc IIIC T63 °C Dc		

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"> • 60 kg (132.28 lb) • 130 kg (286.60 lb) • 280 kg (617.29 lb) 	<ul style="list-style-type: none"> • 0.5 t (0.49 tn. L.) • 1 t (0.98 tn. L.) • 2 t (1.97 tn. L.) • 3.5 t (3.45 tn. L.) • 5 t (4.92 tn. L.) • 10 t (9.84 tn. L.) 	<ul style="list-style-type: none"> • 13 t (12.80 tn. L.) • 28 t (27.56 tn. L.) • 60 t (59.05 tn. L.)
Accuracy class according to OIML R60	C3		
Max. load cell verification intervals n_{LC}	3 000		
Min. load cell verification intervals V_{min}	$E_{max}/16\ 000$		
Minimum application range $R_{min}(LC)$	19 %		
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}			
• 30 min	$\leq \pm 0.0245 \% C_n^{1)}$		
• 20 ... 30 min	$\leq \pm 0.0053 \% C_n^{1)}$		
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}	$\geq \pm 0 \% E_{max}$		
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		

SIWAREX WL280 RN-S SA load cells

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_{tn}	$-10 \dots +40 \text{ }^\circ\text{C}$ ($14 \dots 104 \text{ }^\circ\text{F}$)		
Operating temperature range B_{tu}	$-35 \dots +70 \text{ }^\circ\text{C}$ ($-31 \dots 158 \text{ }^\circ\text{F}$)		
Storage temperature range B_{ts}	$-50 \dots +90 \text{ }^\circ\text{C}$ ($-58 \dots 194 \text{ }^\circ\text{F}$)		
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 ²⁾	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.

SIWAREX WL280 RN-S SA load cell**7MH5113-**Stainless steel, low mounting height, IP66/68
accuracy class C3 according to OIML R60**D 0**
[Click on the Article No. for the online configuration in the PIA Life Cycle Portal.](#)
Rated load**Cable length**

• 60 kg (132.28 lb)	3 m (9.84 ft)	2 Q
• 130 kg (286.60 lb)	3 m (9.84 ft)	3 D
• 280 kg (617.29 lb)	3 m (9.84 ft)	3 J
• 500 kg (1 102.31 lb)	3 m (9.84 ft)	3 P
• 1 t (0.98 tn. L.)	3 m (9.84 ft)	4 A
• 2 t (1.97 tn. L.)	6 m (19.68 ft)	4 G
• 3,5 t (3.44 tn. L.)	6 m (19.68 ft)	4 L
• 5 t (4.92 tn. L.)	6 m (19.68 ft)	4 P
• 10 t (9.84 tn. L.)	15 m (49.21 ft)	5 A
• 13 t (12.79 tn. L.)	15 m (49.21 ft)	5 D
• 28 t (27.56 tn. L.)	15 m (49.21 ft)	5 J
• 60 t (59.05 tn. L.)	15 m (49.21 ft)	5 Q

Explosion protection

None	0
Explosion protection for zones 1, 2, 20, 21, 22	1

¹⁾ For rated temperature $-10 \dots +40 \text{ }^\circ\text{C}$ ($14 \dots 104 \text{ }^\circ\text{F}$)

²⁾ 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.

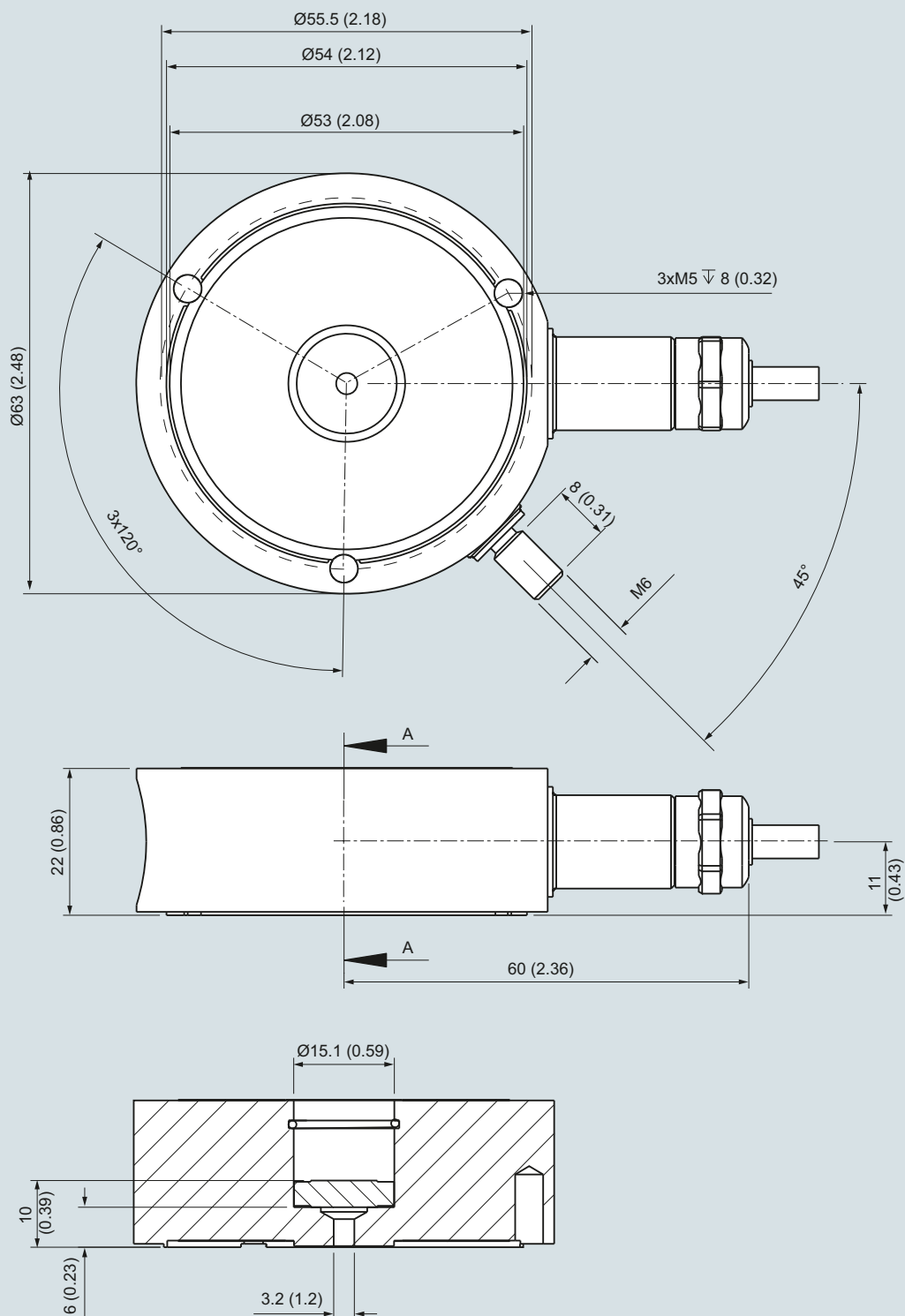
Load Cells

Ring torsion load cells

SIWAREX WL280 RN-S SA

Load cell

Dimensional drawings



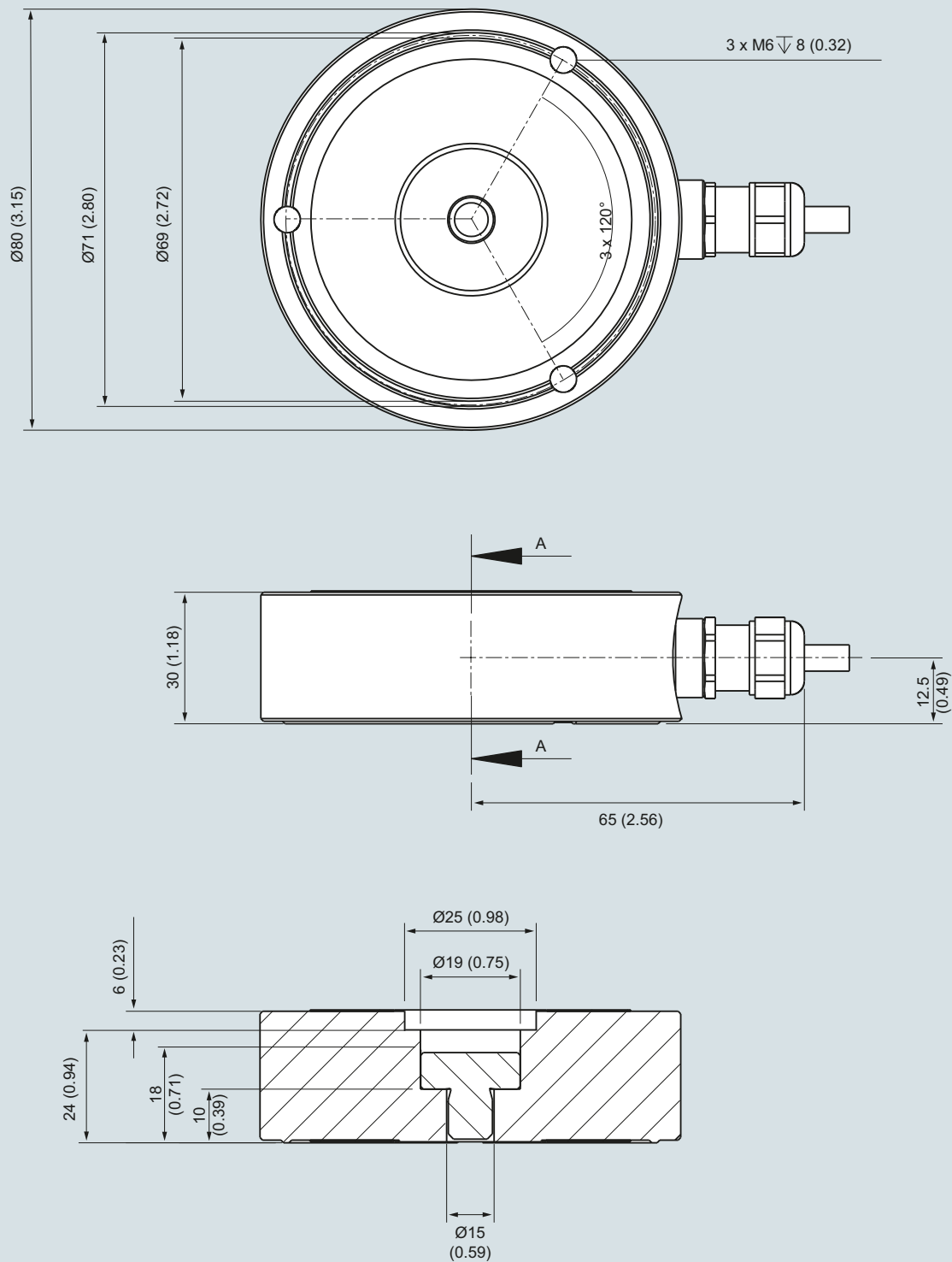
SIWAREX WL280 RN-S SA load cell (60 kg, 130 kg, 280 kg / 132.28, 286.60, 617.29 lb), dimensions in mm (inch)



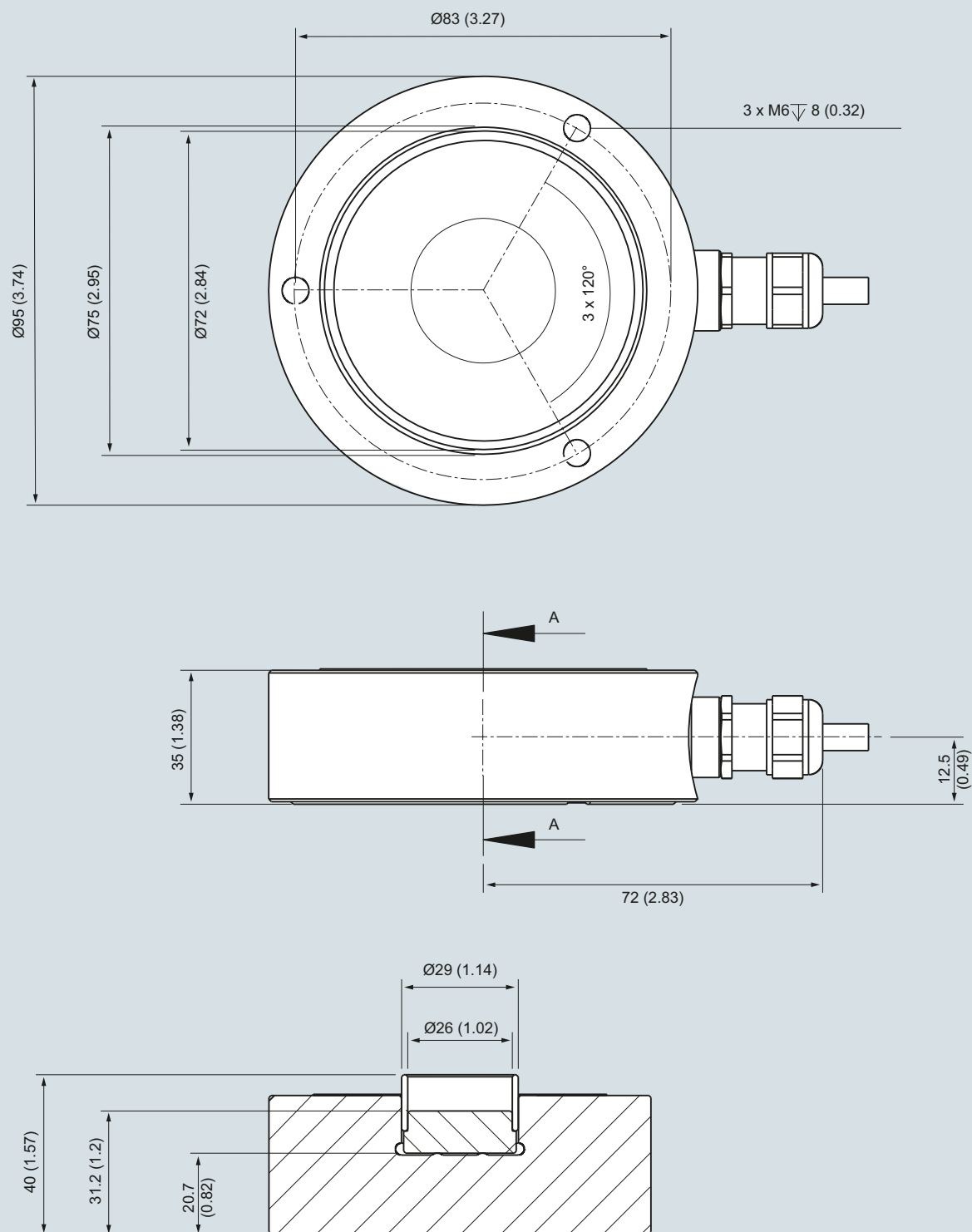
Load Cells

Ring torsion load cells

SIWAREX WL280 RN-S SA

Load cell

SIWAREX WL280 RN-S SA load cell (2 t, 3 t, 5 t / 1.97, 2.95, 4.92 tn. L.), dimensions in mm (inch)

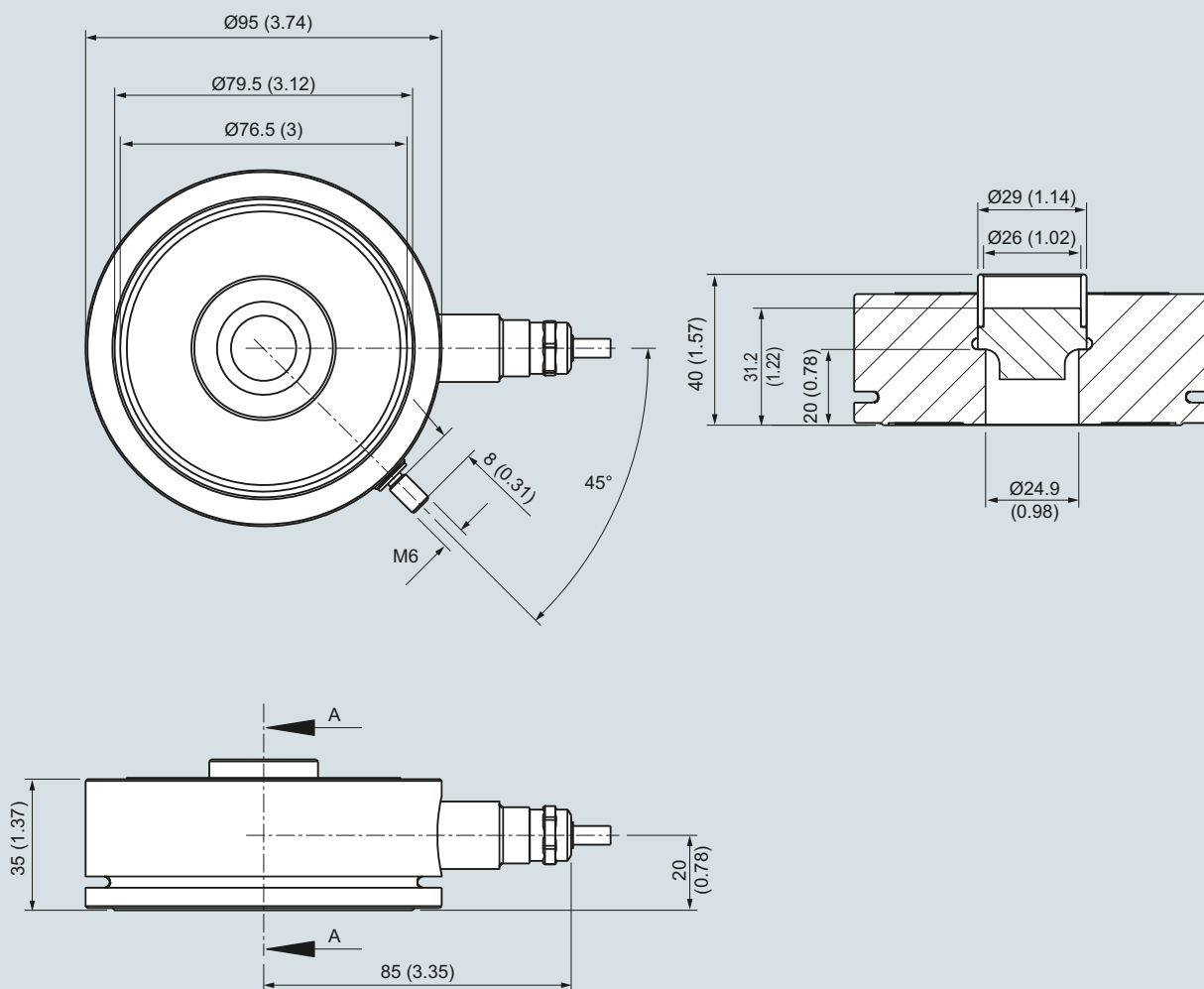


SIWAREX WL280 RN-S SA load cell (10 t / 9.84 tn. L.), dimensions in mm (inch)

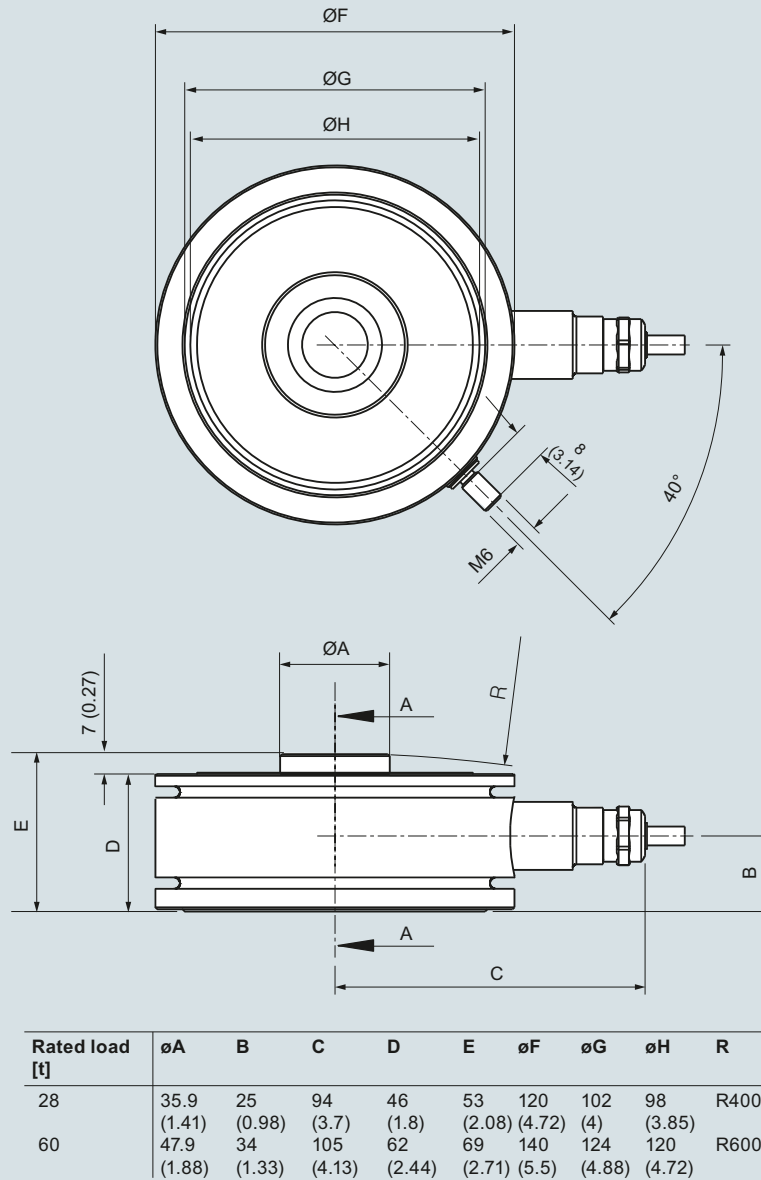
Load Cells

Ring torsion load cells

SIWAREX WL280 RN-S SA

Load cell

SIWAREX WL280 RN-S SA load cell (13 t / 12.79 tn. L.), dimensions in mm (inch)



SIWAREX WL280 RN-S SA load cell (28 t, 60 t / 27.56, 59.05 tn. L.), dimensions in mm (inch)

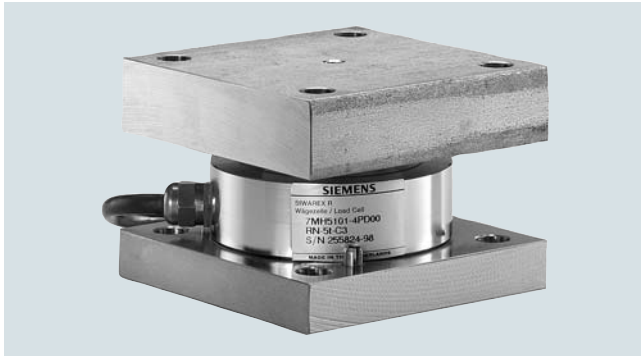
Load Cells

Ring torsion load cells

SIWAREX WL280 RN-S SA

Self-aligning bearing

Overview



The self-centering self-aligning bearing for SIWAREX WL280 RN-S SA load cells is particularly suitable for container and platform scales due to its low mounting height.

Design

The self-aligning bearing comprises a self-aligning bolt, a top plate (self-aligning bearing, top part) and a base plate (self-aligning bearing, base part).

The self-centering, self-aligning bolt allows the top plate, and thus the load support, to accommodate horizontal displacements (e.g. due to temperature fluctuations). The design of the self-aligning bolt creates a restoring force, which is dependent on the size of the displacement and the applied load.

The design of the load support must be such as to limit the lateral play (e.g. with limit stops), if the load support is displaced horizontally by the following values:

- > 4 mm (0.16") (up to 5 t (4.92 tn. l.) rated load)
- > 7 mm (0.28") (up to 13 t (12.80 tn. l.) rated load)
- > 10 mm (0.39") (up to 60 t (59.05 tn. l.) rated load)

Lifting of the load support must be prevented by suitable measures provided in the construction of the load bearing implement.

The load cell is not included in the scope of delivery of the self-aligning bearing.

Technical specifications

Self-aligning bearing for SIWAREX WL280 RN-S SA load cells

Rated load t (tn. L.)	0.06 ... 5 (0.06 ... 4.92)	10 ... 13 (9.84 ... 12.80)	28 ... 60 (27.56 ... 59.02)
Permissible lateral deflection in mm (inch)	± 4 (0.16)	± 7 (0.28)	± 10 (0.39)

Selection and ordering data

Article No.

Self-aligning bearing top part¹⁾²⁾

For SIWAREX WL280 RN-S SA load cells comprising: Top plate with seal holder and sealing ring, top plate pressure piece, self-aligning bolt, cell pressure piece (not for 28 t / 27.56 tn. l. and 60 t / 59.05 tn. l.)

Material: Stainless steel

For load cells with a rated load of

- 60, 130, 280 kg (132.28, 286.60, 617.29 lb)
- 0.5, 1 t (0.49, 0.98 tn. L.)
- 2, 3.5, 5 t (1.97, 3.45, 4.92 tn. L.)
- 10, 13 t (9.84, 12.80 tn. l.)
- 28 t (27.56 tn. l.)
- 60 t (59.05 tn. l.)

7MH4115-3DB11

7MH4132-4AK11

7MH4132-4KK11

7MH4115-5BB11

7MH4115-5DB11

7MH4115-5GB11

Self-aligning bearing base part¹⁾

For SIWAREX WL280 RN-S SA

load cells comprising:

Base plate, 3 tension pins

Material: Stainless steel

For load cells with a rated load of

- 60, 130, 280 kg (132.28, 286.60, 617.29 lb)
- 0.5, 1, 2, 3.5, 5 t (0.49, 0.98, 1.97, 3.45, 4.92 tn. L.)
- 10, 13 t (9.84, 12.80 tn. L.)
- 28 t (27.56 tn. L.)
- 60 t (59.05 tn. L.)

7MH4115-3DC11

7MH4132-4AG11

7MH4115-5BC11

7MH4115-5DC11

7MH4115-5GC11

Accessories

Pressure piece set

For SIWAREX WL280 RN-S SA load cells. Comprising pressure piece and pendulum support. The pressure piece set enables customer-specific installation requirements to be implemented. Material: Stainless steel

for load cells with rated load of:

- 60, 130, 280 kg (132.28, 286.60, 617.29 lb)
- 0.5, 1 t (0.49, 0.98 tn. L.)

7MH5713-3JD00

7MH5713-4AD00

Shims (accessories)

For self-aligning bearing base parts

Material: Stainless steel

For load cells with a rated load of¹⁾

- 10 t, 13 t (9.84, 12.80 tn. L.)
Contents: 16 units, each 0.5 mm thick
- 28 t, 60 t (27.56, 59.05 tn. L.)
Contents: 4 units each 0.5 mm thick, 20 units each 1 mm thick

7MH5713-3JG00

7MH5713-5DG00

¹⁾ The load cell is not included in the scope of delivery.

²⁾ The self-aligning bearing base part is not included in delivery.

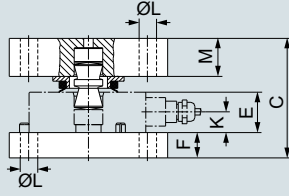
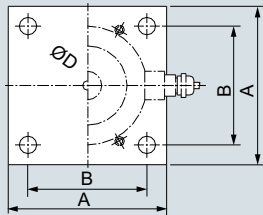
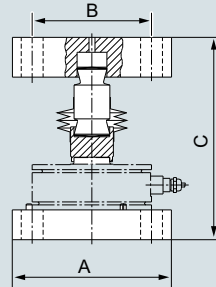
Load Cells

Ring torsion load cells

SIWAREX WL280 RN-S SA

Self-aligning bearing

Dimensional drawings

Front view
60 kg ... 13 tPlan view
60 kg ... 13 tFront view
28 t / 60 t

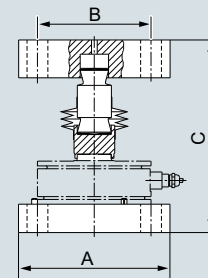
*s = permissible lateral
deflection

Rated load	A	B	C	ØD	E	s*
60 ... 280 kg	80 (3.15)	60 (2.36)	52 (2.05)	63 (2.48)	22 (0.87)	4 (0.16)
0.5 t, 1 t	100 (3.94)	75 (2.95)	79 (3.11)	80 (3.15)	25 (0.98)	4 (0.16)
2 t, 3.5 t, 5 t	100 (3.94)	75 (2.95)	79 (3.11)	80 (3.15)	30 (1.18)	4 (0.16)
10 t, 13 t	120 (4.72)	90 (3.54)	121.2 (4.77)	95 (3.74)	35 (1.37)	7 (0.28)
28 t	160 (6.30)	120 (4.72)	203 (7.99)	40 (1.57)	46 (1.81)	10 (0.39)
60 t	200 (7.87)	140 (5.51)	254 (10.00)	50 (1.97)	62 (2.44)	10 (0.39)

Rated load	F	K	ØL	M
60 ... 280 kg	8 (0.31)	11 (0.43)	9 (0.35)	12 (0.47)
0.5 t, 1 t	15 (0.59)	10 (0.39)	11 (0.43)	25 (0.98)
2 t, 3.5 t, 5 t	15 (0.59)	8.5 (0.33)	11 (0.43)	25 (0.98)
10 t, 13 t	20 (0.79)	20 (0.79)	14 (0.55)	40 (1.57)
28 t	30 (1.18)	25 (0.98)	22 (0.87)	40 (1.57)
60 t	36 (1.42)	34 (1.34)	28 (1.10)	50 (1.97)

Self-aligning bearing for SIWAREX WL280 RN-S SA load cells,
for 0.06 ... 13 t (0.07 ... 14.33 tn. L.), dimensions in mm (inch)

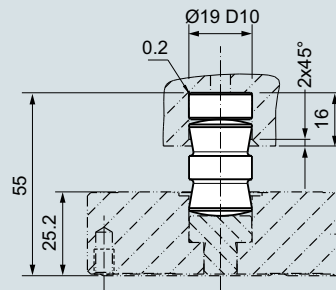
G_WT01_XX_10122



Rated load [t]	A	B	C	s
28	160 (6.30)	120 (4.72)	203 (7.99)	10 (0.39)
60	200 (7.87)	140 (5.51)	254 (10.00)	10 (0.39)

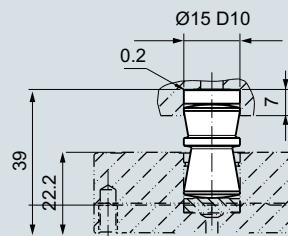
G_WT01_XX_10118

Self-aligning bearing for SIWAREX WL280 RN-S SA load cells,
for 28 ... 60 t (27.56 ... 59.05 tn. L.), dimensions in mm (inch)



G_WT01_XX_10138

Self-aligning bearing for SIWAREX WL280 RN-S SA load cells,
for 28 ... 60 t (27.56 ... 59.05 tn. L.), dimensions in mm (inch)



G_WT01_XX_10139

Pressure piece set WL280 RN-S SA for 60, 130, 280 kg
(132.28, 286.60, 617.29 lb)

Load Cells

Ring torsion load cells

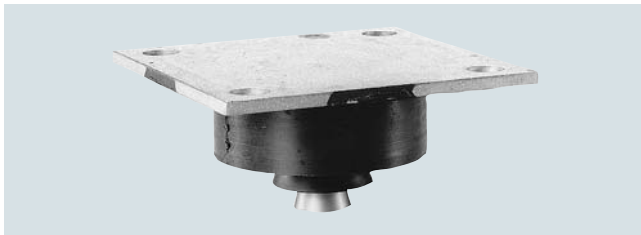
SIWAREX WL280 RN-S SA

Elastomer bearing

Overview



Elastomer bearing for SIWAREX WL280 RN-S SA load cells, 60 ... 280 kg (132.28 ... 617.29 lb)



Elastomer bearing for SIWAREX WL280 RN-S SA load cells, 0.5 ... 13 t (0.49 ... 12.80 lb)

Used in combination with the self-aligning bearing base part, the self-centering elastomer bearing for SIWAREX WL280 RN-S SA load cells is the ideal load introduction element for scales without guide elements. It is used in container, platform and roller table scales and dampens 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 horizontally displaced by more than 4 mm (0.16") or 6 mm (0.24") for a rated load of 10 t (9.84 tn. L.) and 13 t (12.80 tn. L.), the design of the load support must include measures to restrict lateral play (e.g. limit stops). Lifting of the load support must be prevented by suitable measures provided in the construction of the load bearing implement.

The load cell and the self-aligning bearing bottom part are not included in the scope of delivery of the elastomer bearing.

Technical specifications

Elastomeric bearings for load cells of the SIWAREX WL280 RN-S SA series

Rated load t (tn. L.)	0.06 ... 5 (0.06 ... 4.92)	10 ... 13 (9.84 ... 12.80)
Permissible lateral deflection in mm (inch):	± 4 (0.16)	± 6 (0.24)

Selection and ordering data

Article No.

Elastomer bearings¹⁾

For SIWAREX WL280 RN-S SA load cells comprising: Elastomer package with fixing plate, force transfer, seal

Material: Stainless steel and neoprene

For load cells with a rated load of

- 60, 130, 280 kg (132.28, 286.60, 617.29 lb)
- 0.5, 1 t (0.49, 0.98 tn. L.)
- 2, 3.5, 5 t (1.97, 3.44, 4.92 tn. L.)
- 10, 13 t (9.84, 12.80 tn. L.)

7MH4130-3EE11

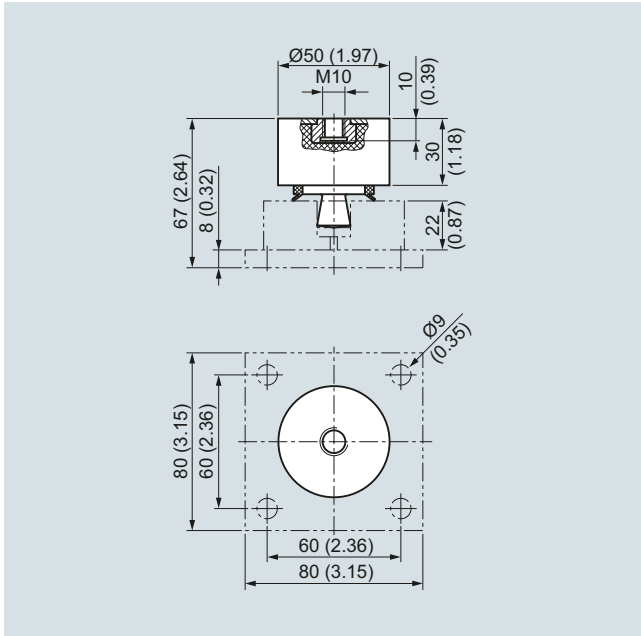
7MH4130-4AE11

7MH4130-4KE11

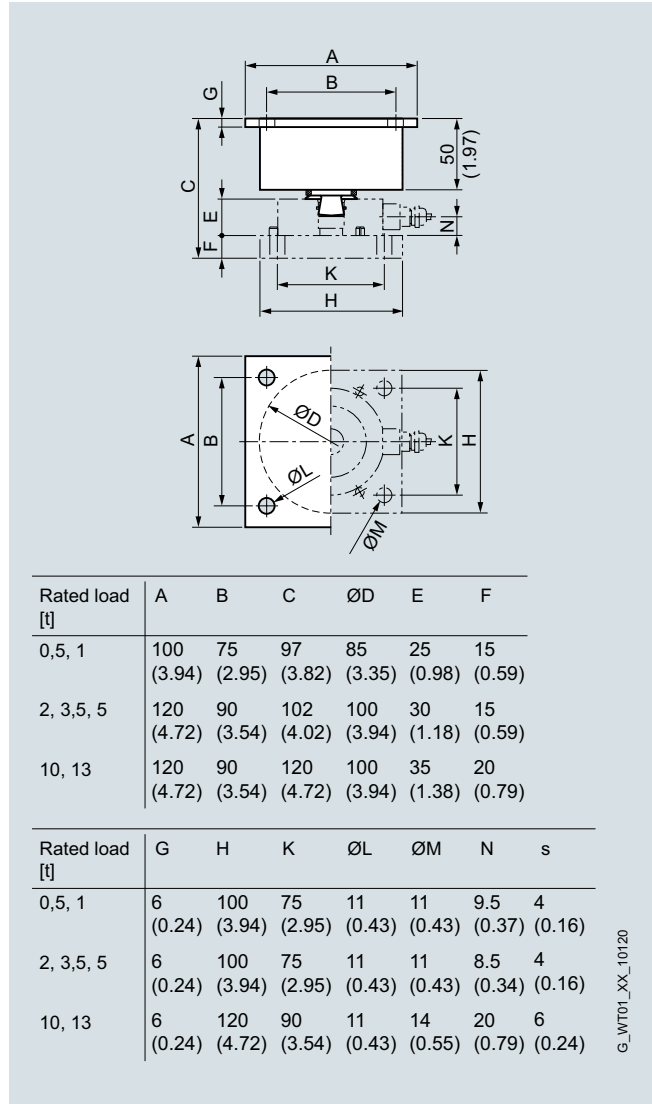
7MH4130-5CE11

¹⁾ The load cell and the self-aligning bearing bottom part are not included in the scope of delivery.

Dimensional drawings



Elastomer bearing for SIWAREX WL280 RN-S SA load cells, 60 ... 280 kg (132.28 ... 617.30 lb), dimensions in mm (inch)



Elastomer bearing for SIWAREX WL280 RN-S SA load cells, 0.5 ... 13 t (0.49 ... 12.80 tn. L.), dimensions in mm (inch)

Load Cells

Ring torsion load cells

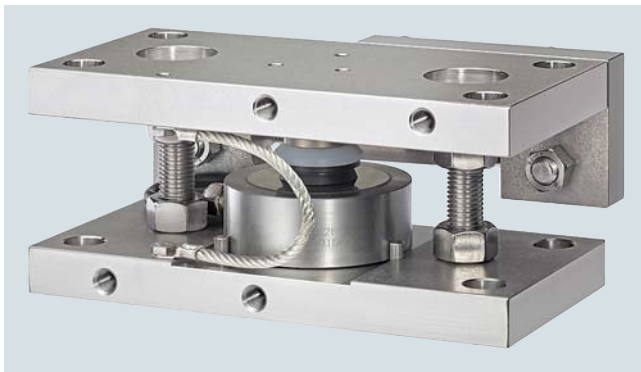
SIWAREX WL280 RN-S SA

Mounting unit and guide element

Overview



SIWAREX WL280 RN-S SA mounting unit and guide element, front



SIWAREX WL280 RN-S SA mounting unit and guide element, rear

The mounting unit, together with the load cells of the SIWAREX WL280 RN-S SA series, form a self-centering unit. The guide elements prevent a container, for example, from moving sideways due to an external lateral force. The guide elements can be mounted on one or both sides of the mounting unit.

Design

The mounting unit comprises a base plate and a top plate, a thrust pad with a flat gasket and a pendulum support. A very flexible grounding cable between the top and base plate conducts any fault currents past the load cell. The top plate is connected to the base plate by means of two countersunk head screws. On both sides of the base and top plate there are threaded holes for the later flange-fitting of guide elements.

The top plate is fixed above the base plate by means of two countersunk head screws. This results in a single unit that is easily handled. The top plate must be precisely aligned above the base plate. The height of the top plate is set so that it is 2 millimeters (for the 60 ... 280 kg version) or 3 millimeters (for the 0.5 ... 13 t versions) 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 lighter installation jobs.

The load cell, together with the pendulum support and the thrust pad, can be inserted into the mounting unit. Load cell and thrust pad are secured with clamping washers.

The load cell can be inserted in the scale before installing the mounting unit. In the same way, it is possible to insert the load cell after installation in the mounting unit.

The fixing holes of the mounting unit are 6 mm wider in diameter than the necessary fixing screws. This means that a greater tolerance error is permissible in the connection measurements. The mounting unit is clamped tightly using the washers supplied.

After the mounting units have been mounted in the scales, the load bearing element is ideally aligned. The load cells are not yet loaded. Finally, the load bearing implement is lowered by loosening the hexagonal bolts under the top plate. The weight now rests on the load cells.

In this state the load cell and the mounting unit together form a self-centering bearing unit. The mounting unit allows the top plate (and thus the load bearing implement) to be displaced up to two millimeters (for the 60 ... 280 kg version) or three millimeters (for the 0.5 ... 13 t versions) to the side in all directions. The countersunk head screws prevent the load bearing element from being lifted off or tipping up. The countersunk head screws secure the load bearing element against sharp lateral movement on the occurrence of sporadic transverse forces.

By using the mounting unit as an installation aid, the load cells are optimally aligned. This is absolutely essential for the best utilization of the load cells in terms of accuracy. In the event of maintenance or a fault, the load cell can be released again by undoing the hexagonal nuts. After loosening the clamping washers, the cell can then easily be replaced.

Guide elements are used if the lateral movement of a load bearing element is to be prevented. The lateral movements can be initiated by agitator start-up in a container, by braking or accelerating forces in a roller conveyor or through forces exerted by the wind on outdoor silos.

A guide element consists of two flanges and one clamping screw. The clamping screw is adjusted to the correct length. The guide element is attached to the operational mounting unit. A guide unit can be mounted on the front or rear of the mounting unit. If necessary, two guide elements can be used in parallel in order to double the transferrable lateral force.

In the case of scales with four load cells, only three mounting units may be equipped with guide units.

Shims are used to compensate for angular errors in the lugs. If more than three load cells are used, the shims are also used to adjust the height of the lugs.

Load Cells

Ring torsion load cells

SIWAREX WL280 RN-S SA

Mounting unit and guide element

Selection and ordering data

Article No.

Mounting units

For SIWAREX WL280 RN-S SA load cells

Material: Stainless steel

For load cells with a rated load of¹⁾

- 60 ... 280 kg (132.28 ... 617.29 lb)
- 0,5 ... 1 t (0.49 ... 0.98 tn. L.)
- 2 ... 5 t (1.97 ... 4.92 tn. L.)
- 10 ... 13 t (9.84 ... 12.80 tn. L.)

7MH5713-3JA00**7MH5713-4AA00****7MH5713-4PA00****7MH5713-5DA00**

Guide elements (optional)

for mounting units of the SIWAREX WL280 RN-S SA series

Material: Stainless steel

For load cells with a rated load of

- 60 ... 280 kg (132.28 ... 617.29 lb); Permitted transverse force: 1,5 kN
- 0,5 ... 1 t (0.49 ... 0.98 tn. L.); Permitted transverse force: 2,5 kN
- 2 ... 5 t (1.97 ... 4.92 tn. L.); Permitted transverse force: 5 kN
- 10 ... 13 t (9.84 ... 12.80 tn. L.); Permitted transverse force: 10 kN

7MH5713-3JE00**7MH5713-4AE00****7MH5713-4PE00****7MH5713-5DE00**

Shims (accessories)

For mounting units of the SIWAREX WL280 RN-S SA series

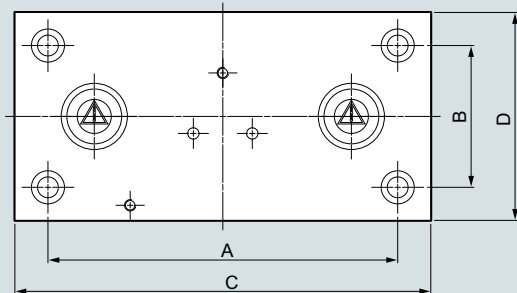
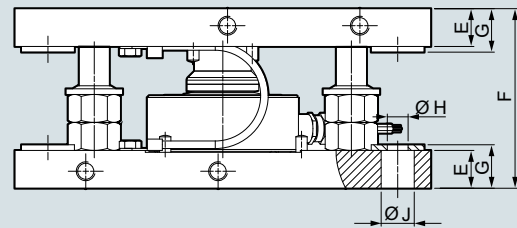
Material: Stainless steel

For load cells with a rated load of¹⁾

- 60 ... 280 kg (132.28 ... 617.29 lb); Contents: 16 units, each 0.5 mm thick
- 0.5 ... 1 t (0.49 ... 0.98 tn. L.); Contents: 24 units, each 0.5 mm thick
- 2 ... 5 t (1.97 ... 4.92 tn. L.); Contents: 4 units each 0.5 mm thick, 16 units each 1 mm thick
- 10 ... 13 t (9.84 ... 12.80 tn. L.); Contents: 4 units each 0.5 mm thick, 20 units each 1 mm thick

7MH5713-3JG00**7MH5713-4AG00****7MH5713-4PG00****7MH5713-5DG00**

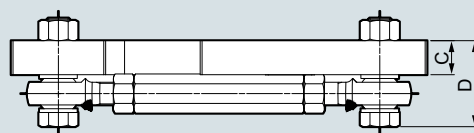
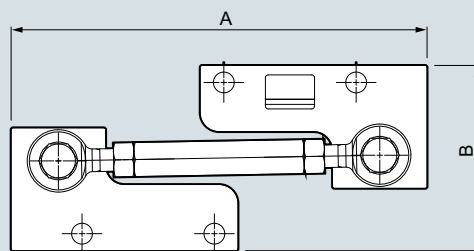
Dimensional drawings



	60 ... 280 kg	0,5 t / 1 t	2 t ... 5 t	10 t / 13 t
A	136	165	185	200
B	60	75	75	90
C	166	200	220	240
D	90	110	110	130
E	12	15	20	20
F	60	85	95	127.2
G	14.5	18	23	24
Ø H	9	11	11	13.5
Ø J	13.5	17.5	17.5	20

G_WT01_XX_10140

WL280 mounting unit



	60 ... 280 kg	0,5 t / 1 t	2 t ... 5 t	10 t / 13 t
A	166	200	220	240
B	60	85	95	127.2
C	10	12	18	18
D	~30.5	~35	~45.5	~54.4

G_WT01_XX_10141

WL280 guide element

¹⁾ The load cell and the compact mounting unit are not included in the scope of delivery.

Load Cells

Load cell accessories

Junction box SIWAREX JB

Overview



SIWAREX JB junction box, aluminum steel



SIWAREX JB junction box, stainless steel

The JB junction box in aluminum or in stainless steel is required for parallel connection of load cells. A maximum of 4 load cells can be connected to one junction box.

Only for junction boxes in aluminum:

If more than 4 load cells are to be connected, a second junction box must be connected in parallel via a cross connection. An expansion set is required for this purpose. The cross-connection can be used to connect up to three load cells in the first junction box. Up to four load cells can be connected in the second junction box.

Design

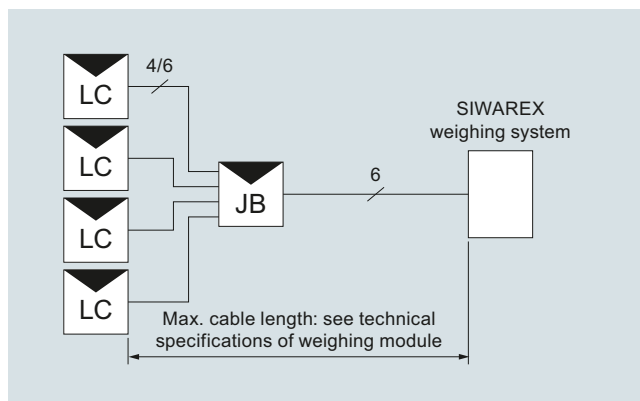
The junction box of die-cast aluminum consists of a lower section and cover. The enclosure is dust-protected and splashproof according to IP66 degree of protection. The cables are fed in through metric cable glands. In the enclosure, screw terminals are fixed onto a connection board.

Internal resistance, characteristic value and rated load of all parallel-switched load cells must be identical. The value of these variables is not limited by the junction box. Load cells can be connected in 4-wire or 6-wire systems.

For 6-wire systems, two jumpers must also be separated.

Connection examples

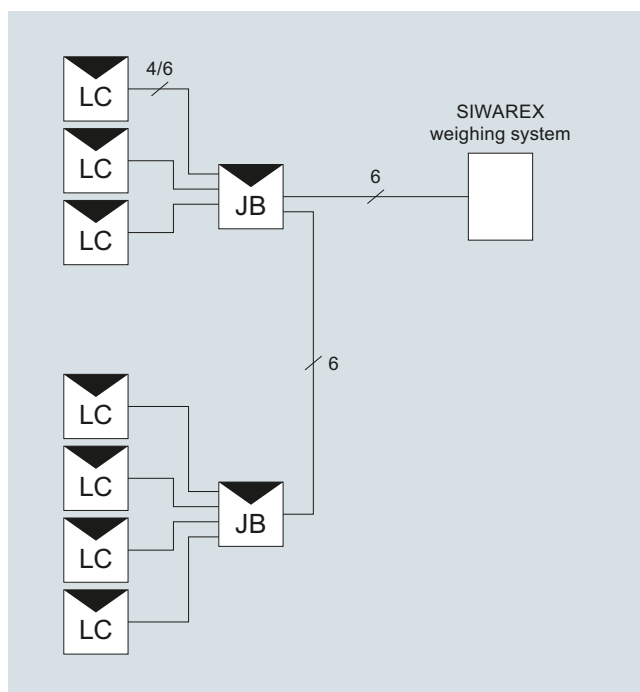
Four load cells



LC: Load cell

JB: Junction box in aluminum or stainless steel

Eight load cells



LC: Load cell

JB: Only for junction boxes in aluminum

Technical specifications

SIWAREX JB junction box, aluminum and stainless steel enclosure

Cable glands	
• Of load cells	4 x M16
• Of signal cable	1 x M20
Permissible ambient temperature	
• During operation	-50 ... +80 °C (-58 ... 176 °F)
• During operation for legal-for-trade medium accuracy weighing machine	-10 ... +40 °C (14 ... 104 °F)
• During transportation and storage	-50 ... +100 °C (-58 ... 212 °F)
Degree of protection	IP66 to EN 60529
Vibration resistance of terminals to DIN VDE 0611 11/77	10 Hz and 150 Hz, amplitude 0.35 mm

Selection and ordering data

Article No.

SIWAREX JB junction box, aluminum housing

For connecting up to 4 load cells in parallel, and for connecting several junction boxes

7MH5001-0AA20**SIWAREX JB junction box, stainless steel housing**

For connecting up to 4 load cells in parallel

7MH5001-0AA00**SIWAREX JB junction box, stainless steel housing (ATEX)**

For connecting up to 4 load cells in parallel

7MH4710-1EA01

(For zone allocation, see manual or type examination certificate)

Cable (optional)**Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY**

For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two JBs.

For permanent installation. Occasional bending is possible.

External diameter: approx. 10.8 mm (0.43 in)

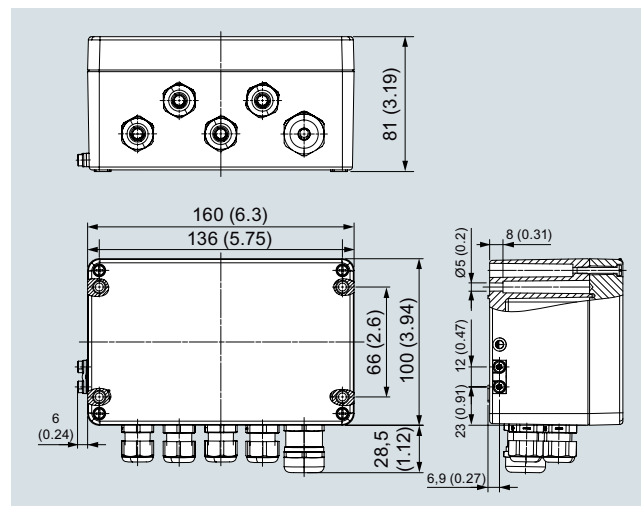
Permissible ambient temperature -40 ... +80 °C (-104 ... +176 °F).

Sold by the meter.

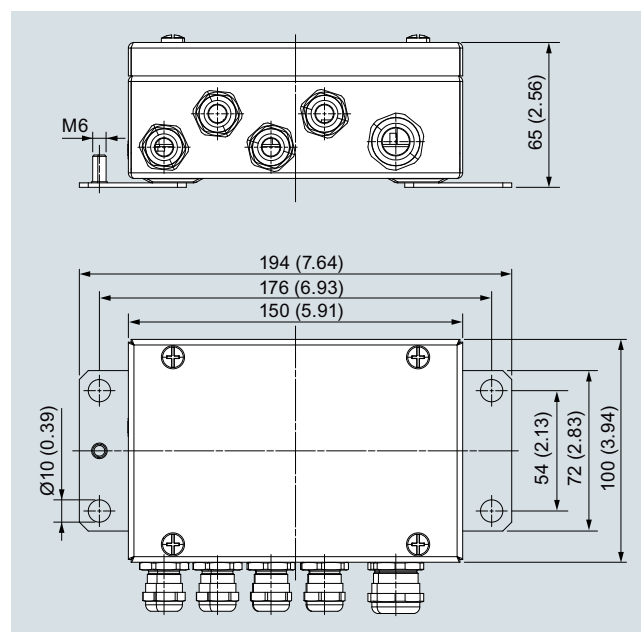
- Sheath color: orange
- For potentially explosive atmospheres. Sheath color: blue.

7MH4702-8AG**7MH4702-8AF**

Dimensional drawings



SIWAREX JB junction box in aluminum (7MH5001-0AA20), dimensions in mm (inches)



SIWAREX JB junction box in stainless steel (7MH5001-0AA00), dimensions in mm (inches)

Load Cells

Load cell accessories

Extension box SIWAREX EB

Overview



The EB extension box is used to lengthen load cell connection cables.

Load cells can be connected in 4-wire or 6-wire systems. The cable connection to the weighing module or to the JB junction box must always be implemented in 6-wire systems. The 7MH4 702-8AG or ...-8AF SIWAREX connecting cable is recommended for this purpose.

If load cell cables are extended to a JB junction box, the M16 x 1.5 cable glands on the box must be replaced. The following is required for each load cell:

- 1 EMC cable gland M20 x 1.5
- 1 extension M16 x 1.5 male thread to M20 x 1.5 female thread.

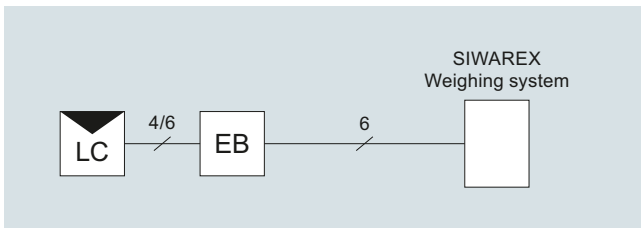
Design

The EB extension box has a housing made of die-cast aluminium. The housing is sealed against penetration of dust and splashed water in accordance with IP66. The cables enter the casing via metric EMC cable glands and are connected to spring-mounted terminals. The spring-mounted system results in vibration-resistant, maintenance-free connections.

When connecting load cells with a 4-wire system, two jumper elements are inserted for feedback of the sense signal.

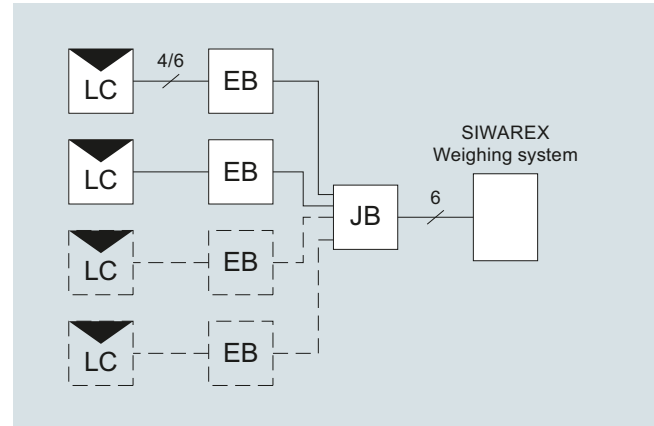
Connection examples

Connection of one load cell



LC: Load cell
EB: Extension box

Connection of several load cells



LC: Load cell
EB: Extension box
JB: Junction box

Technical specifications

Cable glands

- of load cell cable M16 x 1.5
- of signal cable M20 x 1.5

Permissible ambient temperature

- During operation -30 ... +85 °C (-22 ... 185 °F)
- During operation for legal-for-trade medium accuracy weighing machine -10 ... +40 °C (14 ... 104 °F)
- During transportation and storage -40 ... +90 °C (-40 ... 194 °F)

Degree of protection to EN 60529

IP66

Vibration resistance of terminals to DIN VDE 0611 11/77

12 Hz and 50 Hz, amplitude 1 mm

Insulation resistance of the terminals

$\geq 10^{12} \Omega$

Dimensions (H x W x D) in mm

80 x 75 x 57

Selection and ordering data

Article No.

Accessories

SIWAREX EB extension box, aluminum housing**7MH4710-2AA**

For extending load cell connection cables

Cable (optional)**Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY**

For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two JBs.

For permanent installation. Occasional bending is possible.

External diameter: approx. 10.8 mm (0.43 inch)

Permissible ambient temperature -40 ... +80 °C (-104 ... +176 °F).

Sold by the meter.

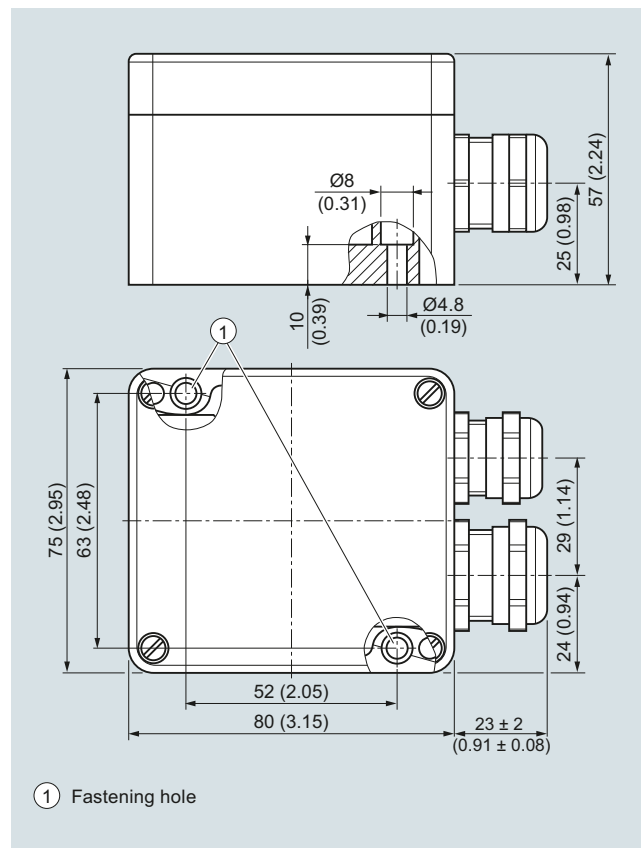
• Sheath color: orange

7MH4702-8AG

• For potentially explosive atmospheres. Sheath color: blue

7MH4702-8AF

Dimensional drawings



SIWAREX EB extension box (7MH4 710-2AA), dimensions in mm (inch)

Load Cells

Load cell accessories

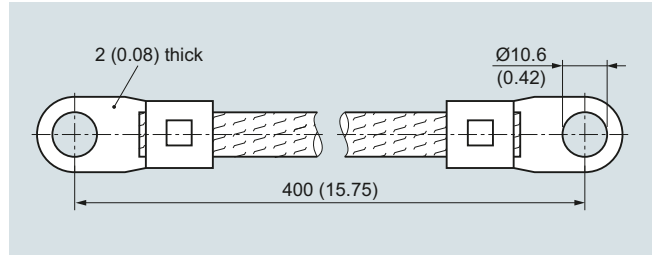
Cables

Overview



The ultra-flexible grounding cable is for discharging parasitic currents.

Dimensional drawings



Grounding cable, dimensions in mm (inch)

Design

The grounding cable is 400 mm long and corresponds to an electrical bypass.

It protects the load cell from undesirable voltages which can occur e.g. when welding or as a result of lightning.

We recommend using one grounding cable for each load cell.

The load cell and/or other mounting elements are not included in the scope of delivery of the grounding cable.

Selection and ordering data

Article No.

Grounding cable made of copper

for discharging parasitic currents

400 mm long

7MH3701-1AA1

Overview

Number of load cells

The three-point bearing is statically determined and offers a stable setup for any application.

If there are more than three bearing points, the load is likely to be unevenly positioned and, in extreme cases, that two diagonally positioned load cells would have to accommodate the entire load. Three-point bearing should therefore be used wherever possible.

To exclude the possibility of an uneven base, in the case of a bearing with more than three load cells, the prevailing weight distribution on the relevant load cells should be checked and a height adjustment performed if necessary. This can be achieved by using a suitable support to raise the load cells carrying less weight.

Force bypass

Force bypasses are produced if a partial load is transferred past the load cells into the base. There are various reasons for a force bypass (e.g. third-party supports, frictional forces, stresses, etc.).

Force bypasses must be avoided at all costs as they lead to measuring errors.

Rated load of load cells

The rated load is selected under maximum load, taking into account centers of gravity and load distribution on the individual load cells. The rated load is generally selected according to the most heavily loaded load cell. A check also needs to be performed to check if any dynamic forces are superimposed on the static load of the load cell. In this case, the rated load of the load cell must be calculated from the sum of the static load and the peak dynamic force.

Example (please also refer to configuration example 1)

Even load distribution without dynamic influences

Number of load cells	4
Empty weight of container	1.2 t (1.18 tn. L.)
Maximum capacity	1.8 t (1.77 tn. L.)
Total load	3 t (2.95 tn. L.)

The 4 load cells are each loaded with 0.75 t (0.74 tn. L.) in order to ensure even load distribution. During configuration and selection of load cells, approx. 20 % should be added to the calculated rated load for safety reasons. This produces a required load cell rated load of $0.75 \text{ t} \times 1.2 = 0.9 \text{ t}$ ($0.74 \text{ tn. L.} \times 1.2 = 0.89 \text{ tn. L.}$)

It therefore follows that it is necessary to select the next highest rated load level, with 1 t (0.98 tn. L.).

Load Cells

Configuration examples

Configuration example 1

Overview

Example 1: Container weighing

The total center of gravity **S** of the suspended container lies above the level of the load cells.

It is supported on 4 brackets (container manufacturer specification), has an empty weight (dead load) of 1.2 t (1.18 tn. L.), and a maximum capacity of 1.8 t (1.77 tn. L.). The load is evenly distributed across all 4 load cells.

Note

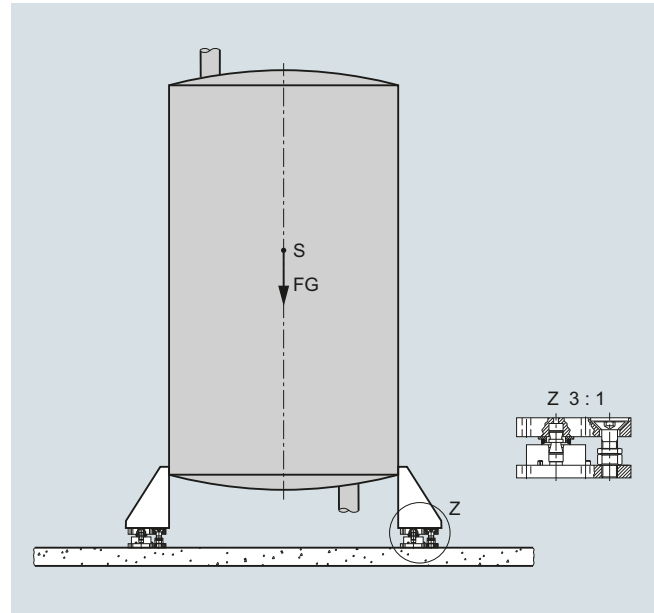
The three-point bearing of the container is statically determined and represents a stable state (see comment in the introduction).

Selection of load cells and mounting components

The determination of the rated load, as described in the introduction, results in a rated load of 1 t (0.98 tn. L.).

For the above example, 4 SIWAREX WL280 RN-S SA load cells were used with a rated load of 1 t (0.98 tn. L.) because the high-quality WL280 RN-S SA precision load cells have an extremely low constructional height.

Self-centering compact mounting units are used as mounting components because, in addition to their oscillation function and oscillation limitation, they are also fitted with anti-lift protection. The anti-lift protection can absorb a maximum vertical force of 4.2 kN. In the event of greater lifting forces (e.g. due to wind load), the container must be safeguarded with additional catastrophe protection.



Container on SIWAREX WL280 RN-S SA load cells and compact mounting units

Configurator for container weighing (basic configuration)

Item	Description	Article No.	Selection criterion	Number in example
1	SIWAREX WL280 RN-S SA, rated load 1 t (0.98 tn. L.), C3	7MH5113-4AD00	High-quality ring torsion load cells with low structure height, ideal for container weighing.	4
2	Compact mounting unit for SIWAREX WL280 RN-S SA load cell, rated load 0.5 / 1 t (0.49 / 0.98 tn. L.) Material: Stainless steel	7MH5713-4AA00	Ensures anti-lift functionality in addition to the oscillation function with oscillation limitation. Incl. grounding cable for dissipation of unwanted electrical current.	4

More information

Example 2: Container weighing

The combined center of gravity **S** of the suspended container lies below the level of the load cells.

It is mounted on three lugs, has an empty weight (total load) of 1.2 t and a maximum capacity of 1.8 t. The container has a diameter of 1 m (3.3 ft). Weighing of the individual components produces a chemical reaction that raises the temperature of the container with contents from approx. 18 °C to approx. 55 °C (131 °C).

Selection of load cells and mounting components

We recommend using 3 SIWAREX WL280 RN-S SA load cells with a rated load of 2 t (1.97 tn. L.) (for determination of the rated load: please refer to introduction). Due to its low constructional height, the WL280 RN load cell was selected.

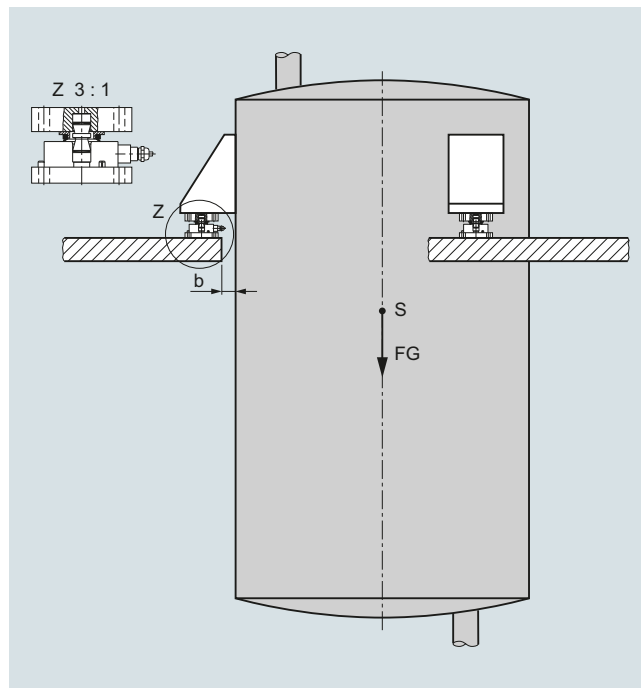
Self-centering self-aligning bearings are used as mounting components as the container is suspended and cannot lift up from the self-aligning bearing.

The 37 K temperature rise will cause the diameter of the container to increase by 0.4 mm (0.02 inch).

The self-aligning bearing permits a maximum oscillation path of ± 4 mm (0.16 inch) and is therefore able to accommodate the temperature expansion of the container.

An oscillation limitation is not necessary because there is a small gap of $b = 3$ mm (0.12 inch) between the container and the platform. In this case, the platform acts as an oscillation limitation.

For wider gaps in other applications, either mounting units have to be used (instead of the self-aligning bearings) or external pendulum limiters must be provided as an alternative.



Container weighing with SIWAREX WL280 RN-S SA load cells and self-aligning bearing

Configurator for container weighing (basic configuration)

Item	Description	Article No.	Selection criterion	Number in example
1	SIWAREX WL280 RN-S SA, rated load 2 t (1.97 tn. L.), C3	7MH5113-4GD00	High-quality ring torsion load cells with low structure height, ideal for container weighing.	3
2	Self-aligning bearing base part for SIWAREX WL280 RN-S SA load cell, rated load 2 t (1.97 tn. L.) Material: Stainless steel	7MH4132-4AG11	Allows the load cells to follow temperature expansions without conducting disruptive reaction forces into the load cells.	3
3	Self-aligning bearing base part for SIWAREX WL280 RN-S SA load cell, rated load 2 t (1.97 tn. L.) Material: Stainless steel	7MH4132-4KK11		3
4	Grounding cable	7MH3701-1AA1	For diverting unwanted currents.	3

Load Cells

Configuration examples

Configuration example 3

More information

Example 3: Mixer weighing

The combined center of gravity **S** of the suspended container lies below the level of the load cells.

It is supported on 3 brackets, has an empty weight (dead load) of 2.8 t (2.76 tn. L.) and a maximum capacity of 4.5 t (4.43 tn. L.). To improve mixing of the individual components, an agitator is mounted on the container, which also operates during the weighing process.

To improve mixing of the individual components, an agitator is mounted on the container which also operates during the weighing process.

Selection of load cells and mounting components

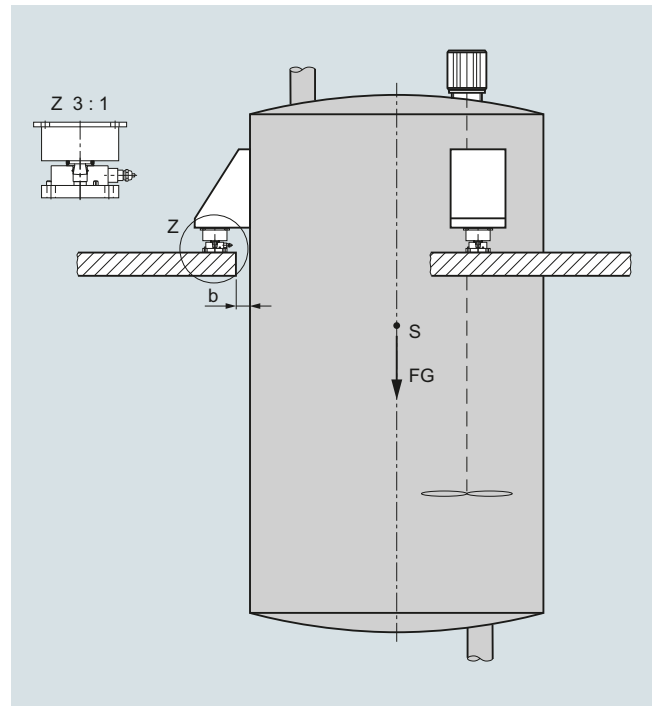
We recommend using 3 SIWAREX WL280 RN-S SA load cells with a rated load of 3.5 t (3.45 tn. L.) because the high-quality WL280 RN-S SA precision load cell has an extremely low constructional height (for determination of rated load, please refer to introduction).

Self-centering elastomer bearings are used as the mounting components to minimize the vibrations caused by the mixer.

The elastomer bearing permits a maximum oscillation path of ± 4 mm (0.16 inch).

An oscillation limitation is not necessary because there is a small gap of $b = 3$ mm (0.12 inch) between the container and the platform.

For wider gaps in other applications, endstops or external pendulum limiters must be provided.



Container with agitator on SIWAREX WL280 RN-S SA load cell and elastomer bearing

Mixed weighing processes configurator (basic configuration)

Item	Description	Article No.	Selection criterion	Number in example
1	SIWAREX WL280 RN-S SA, rated load 3.5 t, C3, without EEx	7MH5113-4LD00	High-quality ring torsion load cells with low structure height, ideal for container weighing.	3
2	Self-aligning bearing base part for SIWAREX WL280 RN-S SA load cell, rated load 2 t (1.97 tn. L.) Material: Stainless steel	7MH4132-4AG11		3
3	Elastomeric bearing for SIWAREX WL280 RN-S SA load cell, rated load 2 t (1.97 tn. L.) Material: neoprene and stainless steel	7MH4130-4KE11	Enables the damping of vibrations, thereby minimizing the influences on the load cells.	3
4	Grounding cable	7MH3701-1AA1	For diverting unwanted currents.	3