

Load Cells

Compression load cells
SIWAREX WL270 CP-S SA

Load cell

Overview



The can compression cell is particularly suitable for implementation in hopper scales, bin weighing equipment 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
Type of construction	Can compression 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 R-60	C3 ¹⁾
Max. scale interval n_{IC}	3 000
Min. scale interval V_{min}	$E_{max}/10\,000$
Minimum application range $R_{min(IC)}$	30%
Combined error F_{comb}	$\pm 0.02\% C_N$
Repeatability F_V	Not applicable
Creep error F_{Cr}	<ul style="list-style-type: none"> • 30 min $\pm 0.023\% C_N$
Temperature coefficient	<ul style="list-style-type: none"> • Zero signal T_{K0} • Characteristic value T_{KC}
Min. dead load E_{min}	0 kg
Max. working load L_u	$150\% E_{max}$
Breaking load L_d	$300\% E_{max}$
Safe side load L_{Iq}	$75\% E_{max}$
Deflection h_n at E_{max}	0.5 mm
Recommended supply voltage (range)	5 ... 12 V DC
Rated characteristic value C_N	2.0 ± 0.02 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 EN 1.4542
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
• Shield (not connected to the load cell body)	Transparent

¹⁾ SIWAREX WL270 CP-S SA 0.5 ... 5 t (0.49 ... 4.42 tn. l.) are not approved for legal-for-trade operation.

Selection and ordering data

Article No.

Load cell, type WL270 CP-S SA

Legal-for-trade according to OIML R-60 up to 3 000d,
15 m connecting cable (49.21 ft)

➤ 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⁾
- 1 t (0.98 tn. l.) ¹⁾
- 2 t (1.97 tn. l.) ¹⁾
- 5 t (4.92 tn. l.) ¹⁾
- 10 t (9.84 tn. l.)
- 20 t (19.68 tn. l.)
- 30 t (29.63 tn. l.)
- 50 t (49.21 tn. l.)

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D 0
3 P
4 A
4 G
4 P
5 A
5 G
5 K
5 P

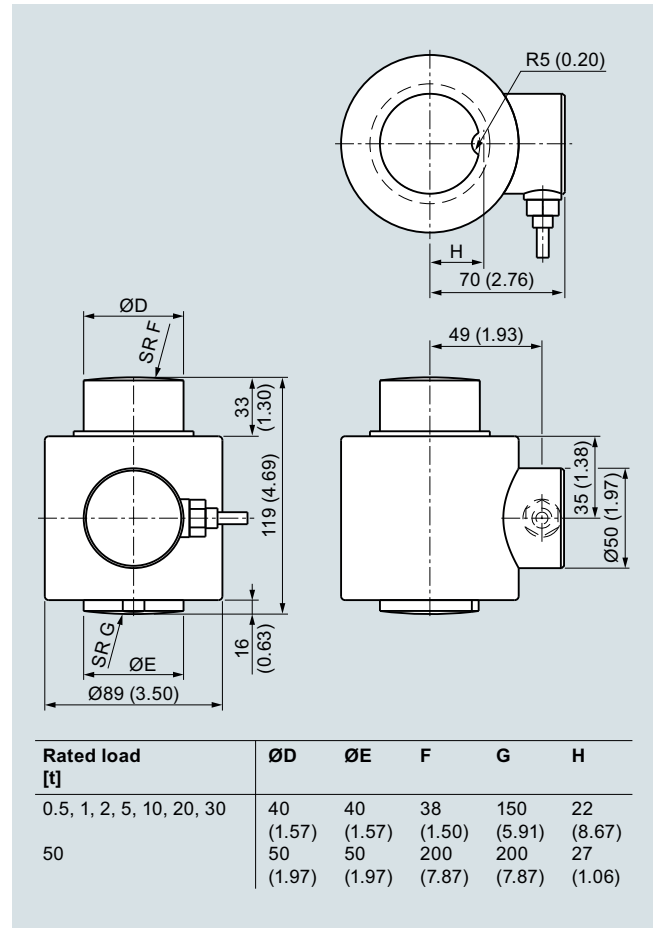
Explosion protection

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

0
1

¹⁾ SIWAREX WL270 CP-S SA 0.5 ... 5 t (0.49 ... 4.42 tn. l.) are not approved for legal-for-trade operation.

Dimensional drawings



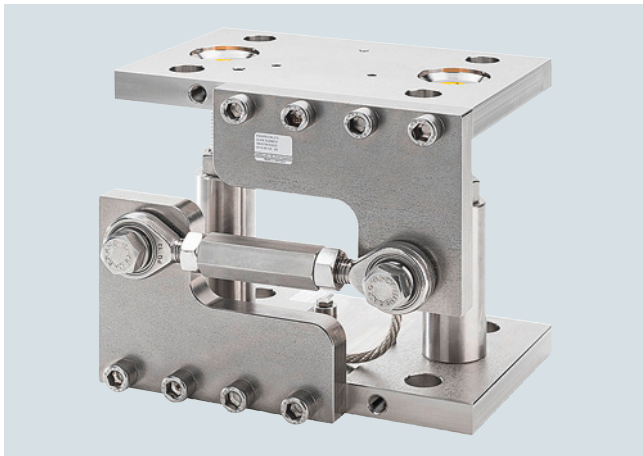
SIWAREX WL270 CP-S SA load cell, dimensions in mm (inch)

Load Cells

Compression load cells
SIWAREX WL270 CP-S SA

Mounting unit with guide element

Overview



The self-centering 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 compact 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 pressure pieces. Load cell and pressure piece are secured with clamping washers.

The load cell can be inserted in the scale before mounting the mounting unit. It is also possible to insert the load cell in the mounting unit after mounting.

After the mounting unit has been mounted in the scale, the load bearing implement is ideally aligned. The load cells are not yet loaded.

Finally, the load bearing implement is lowered by loosening the two hexagon 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 head screws prevent the load bearing implement from being lifted off or tipping.

Using the mounting unit as an installation aid results in optimum alignment of the load cells. This is essential to enable 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 tightening the hexagon nuts. After loosening the clamping washers, it can then easily be replaced.

Guide elements are used if the lateral movement of a load bearing implement 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 lug plates. 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, 4.92, 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
Permissible supporting load with fixed top plate	70 kN	70 kN
Permissible lifting force on the top plate	70 kN	70 kN
Permissible lateral force on the top plate with fixed top plate	30 kN	30 kN

Stainless steel guide element

Size	Values with rated load				
	0.5, 1 t (0.49, 0.98 tn. l.)	2, 5 t (1.97, 4.92 tn. l.)	10, 20 t (9.84, 19.68 tn. l.)	30 t (29.53 tn. l.)	50 t (49.21 tn. l.)
Permissible lateral force ¹⁾	2.5 kN	5 kN	10 kN	15 kN	25 kN

¹⁾ The values apply to one guide element.

Selection and ordering data

	Article No.
Mounting unit For load cells of the SIWAREX WL270 CP-S SA series Material: Stainless steel EN 1.4301 and EN 1.4112 Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7MH5708- 5 A 0 1
For load cells with a rated load of ¹⁾ <ul style="list-style-type: none"> 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.) 	K P
Guide elements (optional) For mounting units of the SIWAREX WL270 CP-S SA series Material: Stainless steel EN 1.4301 For load cells with a rated load of ¹⁾ <ul style="list-style-type: none"> 0.5 ... 1 t (0.49 ... 0.98 tn. l.); Permissible lateral force: 2.5 kN 2 ... 5 t (1.97 ... 5.92 tn. l.); Permissible lateral force: 5 kN 10 ... 13 t (9.84 ... 19.68 tn. l.); Permissible lateral force: 10 kN 30 t (29.53 tn. l.) Permissible lateral force: 15 kN 50 t (49.21 tn. l.) Permissible lateral force: 25 kN 	7MH5708- 4AE00 7MH5708- 4PE00 7MH5708- 5GE00 7MH5708- 5KE00 7MH5708- 5PE00
Shims (accessories) For mounting units of the SIWAREX WL270 CP-S SA series Material: Stainless steel EN 1.4301 For load cells with a rated load of ¹⁾ <ul style="list-style-type: none"> 0.5 ... 50 t (1.97 ... 29.53 tn. l.); Content: 4 units, each 0.5 mm; 20 units, each 1 mm 	7MH5708- 5PG00

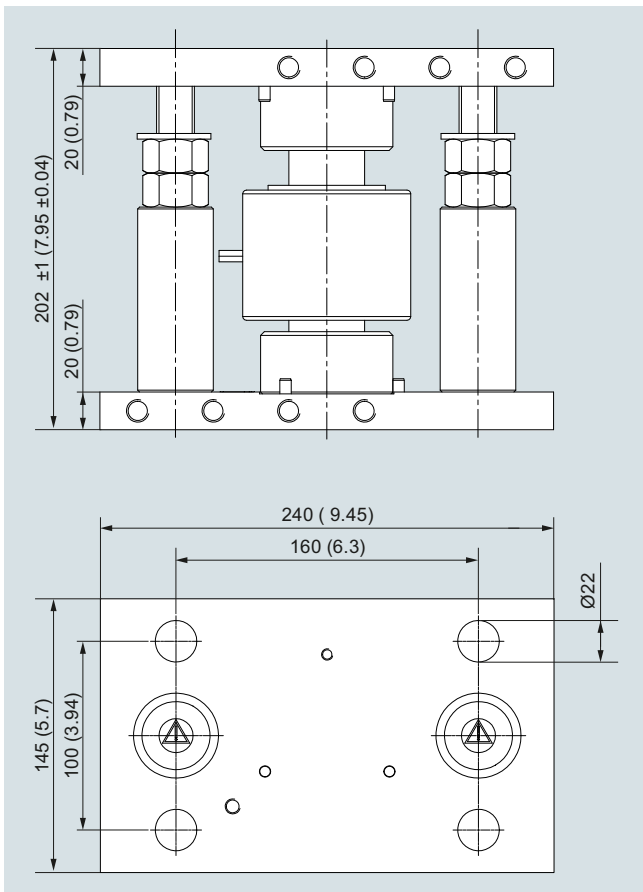
¹⁾ The load cell and guide elements are not included in the scope of delivery.

Load Cells

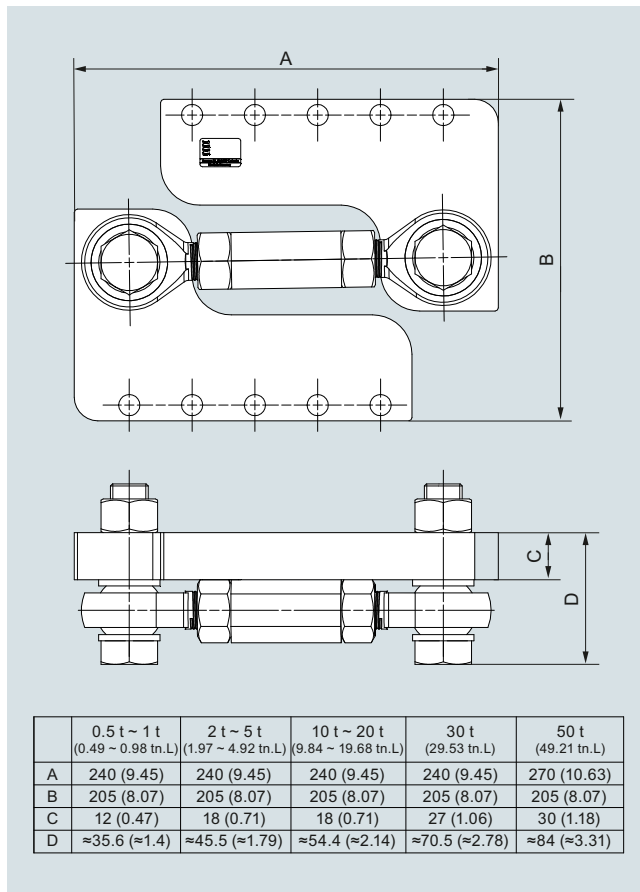
Compression load cells
SIWAREX WL270 CP-S SA

Mounting unit with guide element

Dimensional drawings



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



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

	0.5 t ~ 1 t (0.49 ~ 0.98 tn.L)	2 t ~ 5 t (1.97 ~ 4.92 tn.L)	10 t ~ 20 t (9.84 ~ 19.68 tn.L)	30 t (29.53 tn.L)	50 t (49.21 tn.L)
A	240 (9.45)	240 (9.45)	240 (9.45)	240 (9.45)	270 (10.63)
B	205 (8.07)	205 (8.07)	205 (8.07)	205 (8.07)	205 (8.07)
C	12 (0.47)	18 (0.71)	18 (0.71)	27 (1.06)	30 (1.18)
D	≈35.6 (≈1.4)	≈45.5 (≈1.79)	≈54.4 (≈2.14)	≈70.5 (≈2.78)	≈84 (≈3.31)

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Load Cells

Compression load cells

SIWAREX WL270 CP-S SA

Pressure piece set with adapter plates

Overview



In combination with a pressure piece set and adapter plate, the SIWAREX WL270 CP-S SA load cell produces a self-aligning bearing. This unit is particularly suitable for installation in hopper scales, bin weighing equipment 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 complete the unit to form a self-aligning bearing. The adapter plates can be screwed directly to the load bearing implement using the existing holes.

The self-centering, self-aligning bearing thus formed allows the load bearing element 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 horizontal direction, measures for restricting sideways play (e.g. in the form of endstops or guide elements) must be provided in the construction of the load bearing implement. 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 delivery unit of the adapter plate 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 sets¹⁾

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

Material: Stainless steel EN 1.4112

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

For load cells with a rated load of²⁾³⁾

- 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

For adapting the SIWAREX WL270 CP-S SA

The package item consists of plate.

Material: Stainless steel EN 1.4301

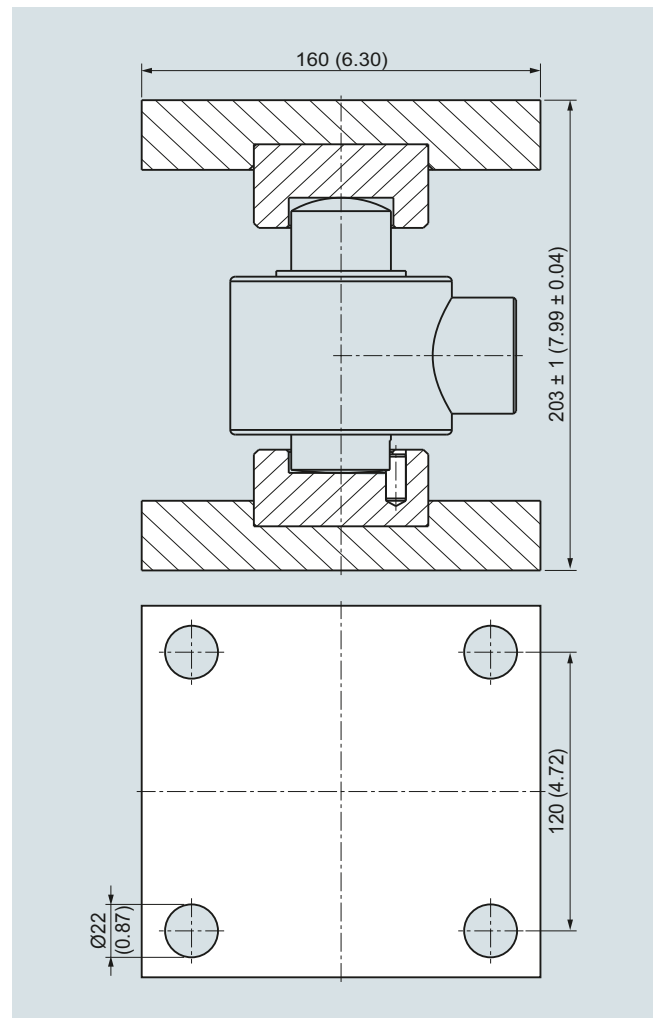
For load cells with a rated load of²⁾³⁾

- 0.5 ... 50 t (0.49 ... 49.21 tn. l.)

7MH5708-
5 D 0 0
K
P
7MH5708-
5 B 0 0
P

- 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.

Dimensional drawings



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