

Load Cells

Compression load cells
SIWAREX WL270 K-S CA

Load cell

Overview



This can compression cell is particularly suitable for use in hopper scales 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"> Hopper scales Bin weighing equipment
Type of construction	Can compression cell
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.)
Minimum initial loading E_{min}	0% E_{max}
Maximum working load L_u	120% E_{max}
Breaking load L_d	300% E_{max}
Safe side load L_{iq}	10% E_{max}

SIWAREX WL270 K-S CA	
Measurement characteristic values	
Deflection h_n at E_{max}	
• 2.8 t (2.76 tn. l.)	0.23 mm (0.009 inch)
• 6 t (5.91 tn. l.)	0.38 mm (0.015 inch)
• 13 t (12.79 tn. l.)	0.54 mm (0.02 inch)
• 28 t (27.56 tn. l.)	0.82 mm (0.03 inch)
• 60 t (59.05 tn. l.)	1.19 mm (0.05 inch)
• 130 t (127.95 tn. l.)	1.81 mm (0.07 inch)
• 280 t (275.58 tn. l.)	2.66 mm (0.10 inch)
• 350 t (344.47 tn. l.)	2.73 mm (0.11 inch)
• 500 t (492.10 tn. l.)	3.11 mm (0.12 inch)
Rated characteristic value C_n	1.5 mV/V
Tolerance D_o of zero signal	$\leq \pm 1.5\% C_n$
Tolerance D_c of characteristic value	$\pm 0.5\%$
Combined error F_{comb}	$\leq \pm 0.1\%$
Repeatability F_v	$\leq \pm 0.1\%$
Creep error F_{CR}	
30 min	$\leq \pm 0.06\%$
Temperature coefficient	
• Zero signal T_{K0}	$\leq \pm 0.25\% C_n/5 K$
• Characteristic value T_{Kc}	$\leq \pm 0.25\% C_n/5 K$

Technical specifications (continued)

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	Function	Color
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 (not connected to the load cell body)	Transparent
• 350, 500 t (344.47, 492.10 tn. l.)	703 $\Omega \pm 5 \Omega$	Rated temperature range B_{rn}	-10 ... +40 °C (14 ... 104 °F)
Insulation resistance R_{is}	$\geq 5\ 000\ M\Omega$	Operating temperature range B_{ru}	-20 ... +70 °C (-4 ... +158 °F)
		Storage temperature range B_{rs}	-30 ... +70 °C (-22 ... +158 °F)
		Degree of protection according to EN 60529; IEC 60529	IP66
		Accuracy class	0.1%

High temperature versions

Some technical data of the high temperature versions change according to the temperature range. For this reason, values are given for three different temperature ranges.

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			
• 2.8 ... 13; 130 ... 500 t (2.76 ... 12.79; 127.95 ... 492.10 tn. l.)	1.5 ± 0.02 mV/V	1.5 ± 0.1 mV/V	1.5 ± 0.1 mV/V
• 28 t (27.56 tn. l.)	1.9 ± 0.02 mV/V	1.9 ± 0.2 mV/V	1.9 ± 0.2 mV/V
• 60 t (59.05 tn. l.)	1.8 ± 0.02 mV/V	1.8 ± 0.2 mV/V	1.8 ± 0.2 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	$\leq \pm 0.3\%$	$\leq \pm 0.5\%$	$\leq \pm 5\%$
Creep 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}	$\geq 5\ 000\ M\Omega$		
Connection and environmental conditions			
Rated temperature range B_{rn}	-30 ... +180 °C (-22 ... +356 °F)		
Operating temperature range B_{ru}	-30 ... +250 °C (-22 ... +482 °F)		
Storage temperature range B_{rs}	-30 ... +250 °C (-22 ... +482 °F)		

Load Cells

Compression load cells SIWAREX WL270 K-S CA

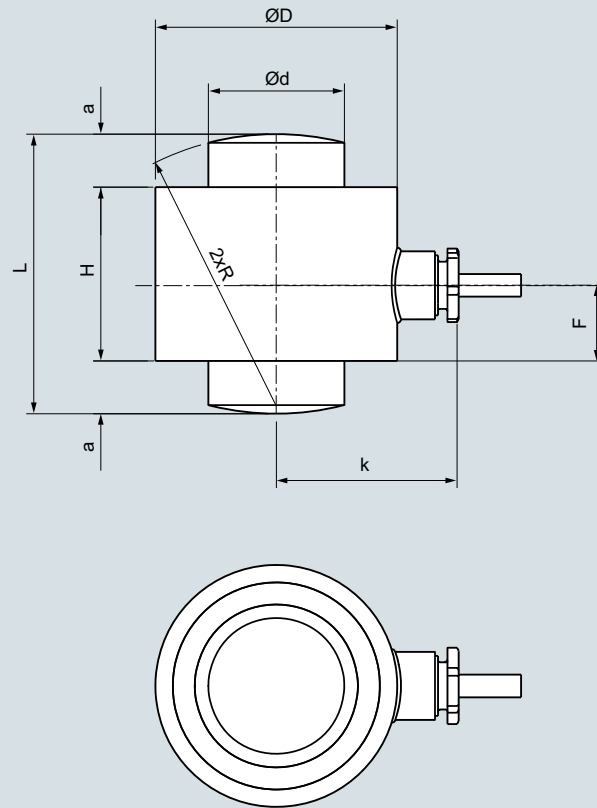
Load cell

Selection and ordering data		Article No.	
SIWAREX WL270 K-S CA load cell		7MH5114-	
Accuracy class 0.1%		■	■
Heat-resistant connecting cable ¹⁾		■	■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Rated load	Cable length		
• 2.8 t (2.76 tn. l.)	6 m (19.68 ft)	4 J	
• 6 t (5.91 tn. l.)	6 m (19.68 ft)	4 Q	
• 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	
• 130 t (127.95 tn. l.)	20 m (65.62 ft)	6 D	
• 280 t (275.58 tn. l.)	20 m (65.62 ft)	6 J	
• 350 t (244.47 tn. l.)	25 m (82.02 ft)	6 L	
• 500 t (492.10 tn. l.)	25 m (82.02 ft)	6 P	
Explosion protection			
• Without			0 0
• Explosion protection for zones 2, 22			0 1
<i>Options</i>			
Double bridge²⁾			6 0
Load cell, redundant design, without explosion protection			
High temperature²⁾			7 0
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⁾			8 0
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)

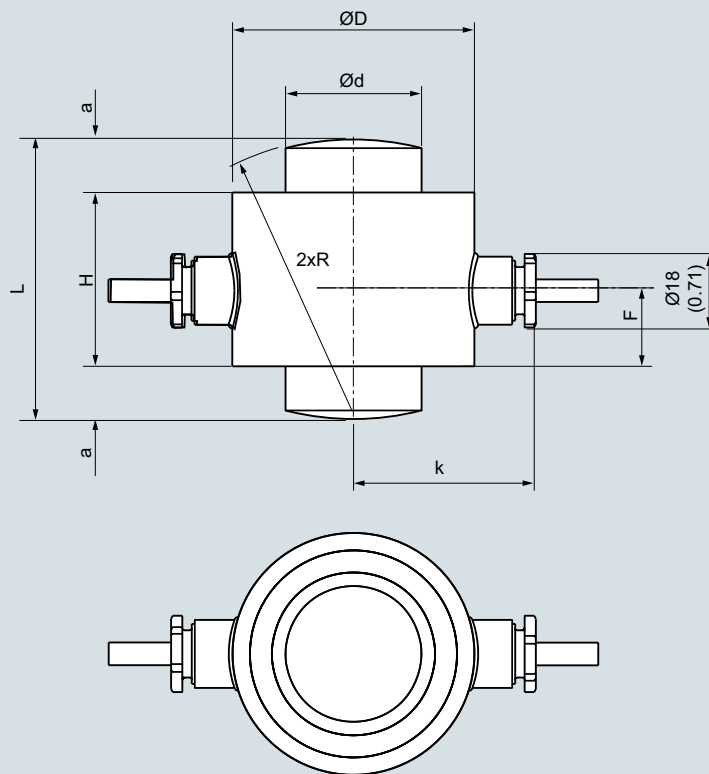
SIWAREX WL270 K-S CA load cell, dimensions in mm (inch)

Load Cells

Compression load cells
SIWAREX WL270 K-S CA

Load cell

Dimensional drawings (continued)



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)

Load Cells

Compression load cells SIWAREX WL270 K-S CA

Self-centering bearing unit

Selection and ordering data

Pressure plate¹⁾²⁾

For SIWAREX WL270 K-S CA load cells

For constructing a self-aligning bearing,
two pressure plates are required,
one at the top and one at the bottom

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.)

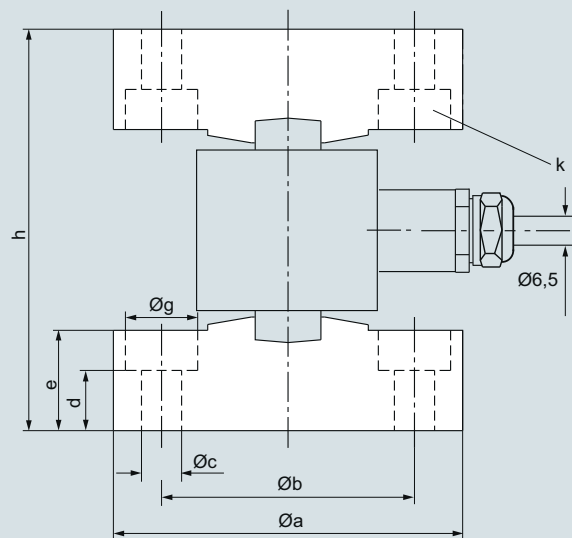
Article No.

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

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 (")