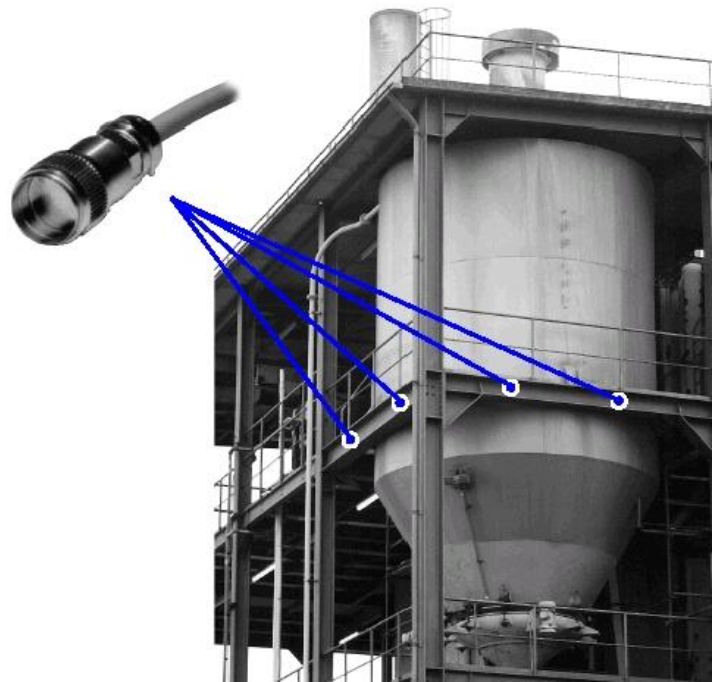


SENSiQ® Weigh Pin Structure WPS

- Compact sensor for measuring forces and masses
- Same sensor geometry for all load ranges
- Maintenance-free
- Hermetically sealed design, protection class IP68
- High corrosion protection through use of stainless steel
- Easy retrofit of existing silo structures
- No contact between sensor and material to be weighed
- ATEX categories
II 2G Ex ib IIC T6 Gb,
II 2D Ex tb IIIC T85 °C Db
II 3G Ex ec IIC T6 Gc
- IECEx



Application

The SENSiQ® Weigh Pin Structure (WPS) has been particularly designed for use as low-priced hopper level measuring system.

With very little effort it can be retrofitted into existing structures permitting gravimetric level measurement.

Other possible applications are, for instance, pre-assembled measuring supports or beams as well as threshold messages for cranes.

Construction

The WPS is made of stainless steel. The knurled pressing-in area on circumference transmits the deformations of the supporting structure to a web equipped with strain gauges.

Measuring body and cable outlet are connected by laser welding which produces a hermetical sealing effect.

Function

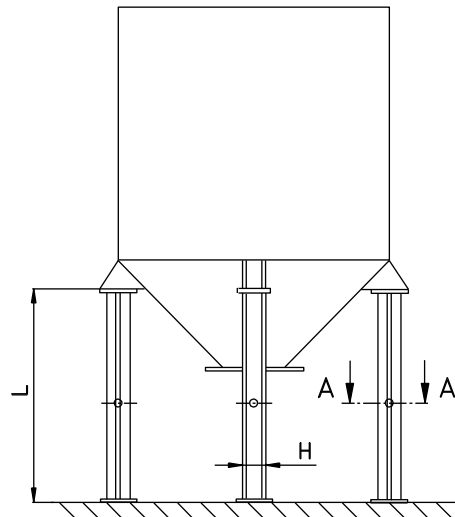
The WPS is pressed into the supporting structure of the construction to be weighed.

When the supporting structure is loaded, the resulting deformations generate a voltage change proportional to applied load.

The following types of WPS are available

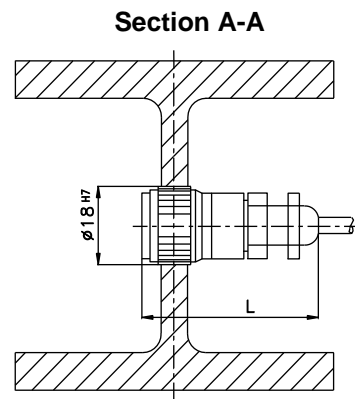
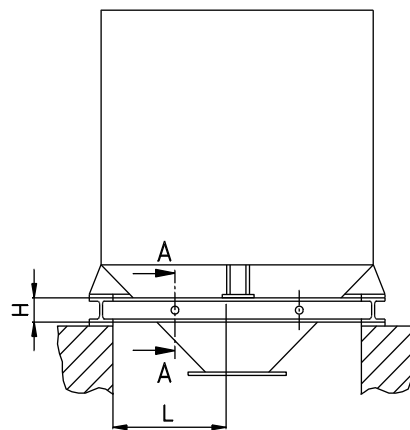
- **WPS:**
Standard WPS with complete strain gauge full bridge
- **WPS-OV:**
WPS with complete strain gauge full bridge and additional overvoltage protection, e.g. for use in railway tracks
- WPS and WPS-OV are also available as **ATEX and IECEx version**

Typical installation examples for WPS applications



Normal force measurement
Measuring eye mounted on vertical silo supports

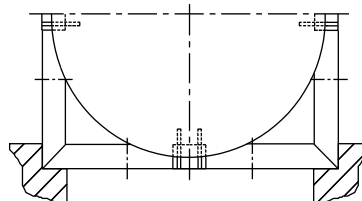
Installation requirement $L \geq 2.5 \times H$



Variant	L
WPS	46
WPS-OV	62
WPS-Ex	71

Lateral force measurement
Measuring eye mounted on horizontal silo supports

Installation requirement $L \geq 1.5 \times H$



Technical Data

		WPS		ATEX-Variant
		Normal force measurement	Lateral force measurement	
Required rated stress	σ, τ	$\sigma \geq 30 \text{ N/mm}^2$	$\tau \geq 15 \text{ N/mm}^2$	σ, τ , see left side
Sensitivity at required rated stress	C_n	$\geq 0,3 \text{ mV/V}$		
Input resistance	R_e	380 Ω		1060 Ω
Output resistance	R_a	350 Ω		1000 Ω
Ref. supply voltage	U_{sref}	10 V		
Max. supply voltage	U_{smax}	12 V		
Rated temperature range	B_{tn}	- 10 °C ... + 40 °C		
Service temperature range	B_{tu}	-30 °C ...+80 °C	-20 °C ...+60 °C	
Storage temperature range	B_{ts}	-40 °C ...+85 °C		
Zero signal temperature coefficient	TK_o	$< 1,5 \mu\text{V} / \text{V} / 10 \text{ K}$		
Material		Stainless steel		
Weight with cable		0,6 kg		
Protection class		IP68 (laser welded)		
Cable standard		PVC-cable $\varnothing 5,4 \times 15 \text{ m} / -30 \text{ °C} \dots +85 \text{ °C}$		
Cable Ex		TPE-cable $\varnothing 6,5 \times 15 \text{ m} / -40 \text{ °C} \dots +120 \text{ °C}$		
Connection assignment		black: input + 82; red:: output + 28; black-yellow: screen	blue: inlet - 81; white: outlet - 27;	

System and switching accuracies depend on several factors, e.g. hopper geometry, installation site and measuring task. Typically, system accuracies of $\pm 0.5 \%$ for lateral force measurement and $\pm 1.5 \%$ for normal force measurement can be obtained. The switching accuracies for preset fill levels (setpoints) are approx. $\pm 0.2 \%$ (each related to full scale).

These accuracies require highly qualified engineering and proper and workmanlike installation.

Projection notes

To determine whether an existing hopper can be retrofitted with Schenck Process WPS, calculate the rated stress as under:

- **Normal force measurement (required rated stress $\sigma \geq 30 \text{ N/mm}^2$)**

$$\text{Rated stress } \sigma \text{ in } [\text{N/mm}^2] = \frac{(\text{Mass of hopper contents in } [\text{kg}]) \times 10}{(\text{Number of supports}) \times (\text{supports cross-sectional area in } [\text{mm}^2])}$$

- **Lateral force measurement (required rated stress $\tau \geq 15 \text{ N/mm}^2$)**

$$\text{Rated stress } \tau \text{ in } [\text{N/mm}^2] = \frac{(\text{Mass of hopper contents in } [\text{kg}]) \times 10}{(\text{Number of cross members}) \times 2 \times (\text{cross member area in } [\text{mm}^2])}$$

Variants	Ordering No.
WPS WPS with strain gauge full bridge	D 705 336.01
WPS-Ex (intrinsically safe) II 2G Ex ib IIC T6 Gb WPS with strain gauge full bridge for use in ATEX/IECEX	D 724 987.02
WPS-Ex (not intrinsically safe) II 3G Ex ec IIC T6 Gc and II 2D Ex tb IIIC T85 °C Db WPS with strain gauge full bridge for use in ATEX/IECEX	D 724 987.03
WPS-OV WPS with strain gauge full bridge for use in railway tracks	D 705 336.08
WPS-OV-Ex (intrinsically safe) II 2G Ex ib IIC T6 Gb WPS with strain gauge full bridge for use in ATEX/IECEX and overvoltage protection	D 724 987.10
WPS-OV-Ex (not intrinsically safe) II 3G Ex ec IIC T6 Gc and II 2D Ex tb IIIC T85 °C Db WPS with strain gauge full bridge for use in ATEX/IECEX and overvoltage protection	D 724 987.11
WPS, 0,1 mm oversize Spare part for exchanged WPS	V030174.B01
WPS-OV for MULTIRAIL, 0,1 mm oversize Spare part for exchanged WPS-OV	V030174.B03
WPS-Ex, 0.1 mm oversize (intrinsically safe) II 2G Ex ib IIC T6 Gb Spare part for exchanged WPS-Ex	V030174.B04
WPS-Ex, 0.1 mm oversize (not intrinsically safe) II 3G Ex ec IIC T6 Gc and II 2D Ex tb IIIC T85 °C Db Spare part for exchanged WPS-Ex	V030174.B05
Mounting kit for pressing-in WPSs	D 705 046.01
Suitable for junction box , refer to data sheet BV-D2121	
Closing device to protect WPSs against mechanical damage (not for type WPS-OV)	D 705 968.01
Manual DK1 206 DE, German Manual DK1 206 GB, English Manual DK1 206 FR, French Manual DK1 206 RU, Russian	D 707 200.01 D 707 204.01 D 707 200.02

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