

Load Cells

Load cell accessories

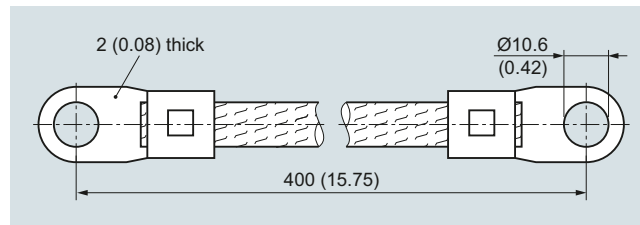
Cable

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 is an electrical shunt.

It protects the load cell from undesired voltages such as those that occur during welding or lightning strikes.

We recommend using one grounding cable per load cell.

The load cell and/or other mounting components 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 which are 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 see 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
Container empty weight:	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

More information

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 lugs (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

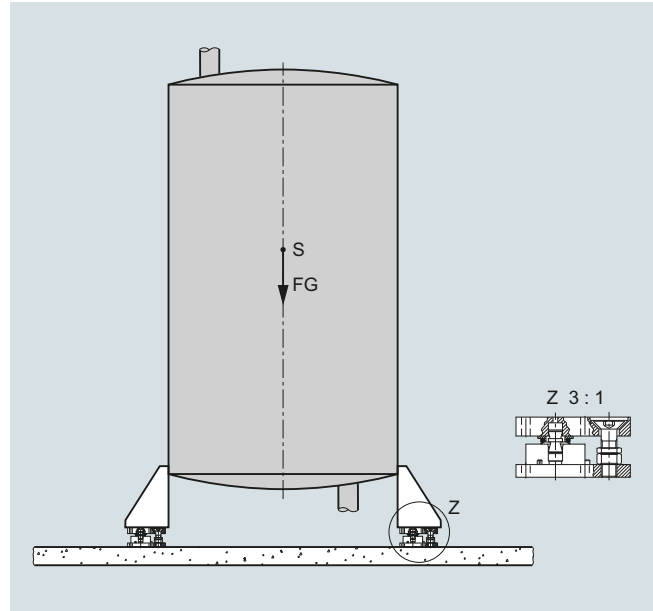
The three-point bearing of the container is statically determined and represents a stable state (see comment in the introduction).

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 example above, 4 SIWAREX WL280 RN-S SA load cells were used with a rated load of 1 t (0.98 tn. l.) since the construction height of the high-quality WL280 RN-S SA precision load cells is extremely low.

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.

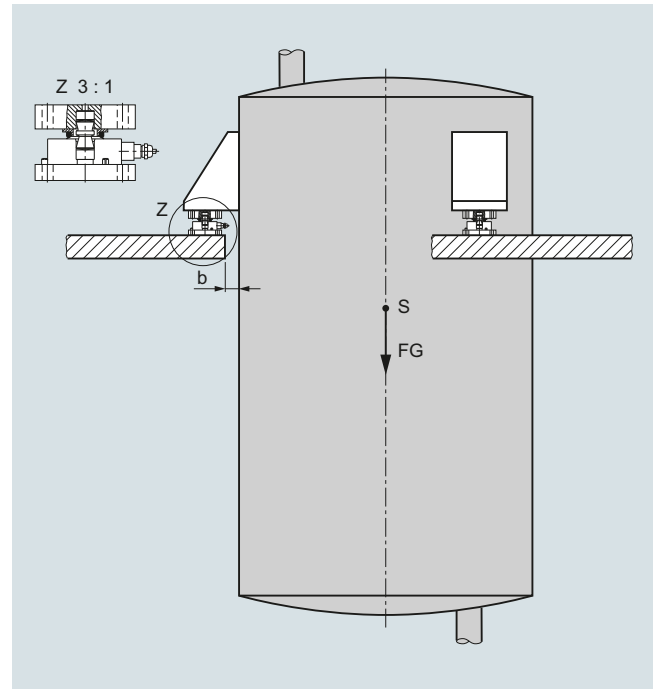
Self-centering self-aligning bearings are used as mounting components as the container is suspended and cannot lift up from the self-aligning bearing.

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 compact 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 top 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.

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Selection of load cells and mounting components

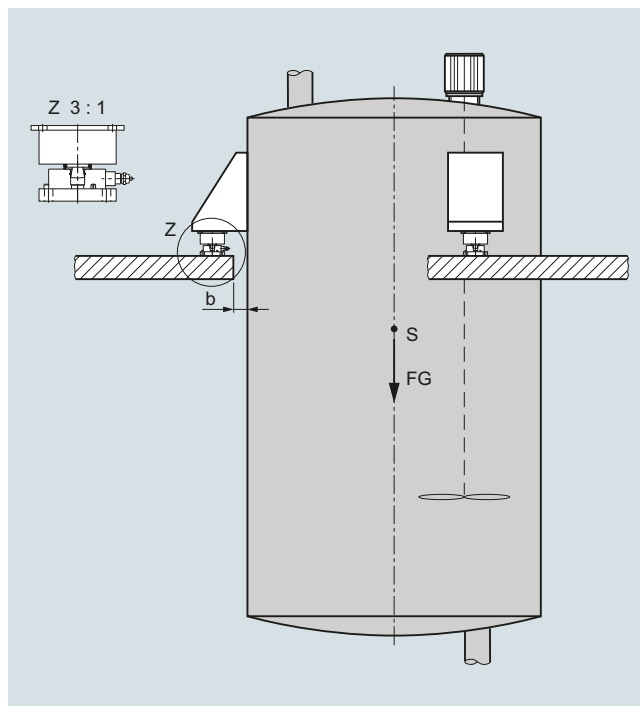
We recommend using 3 SIWAREX WL280 RN-S SA load cells with a rated load of 3.5 t (3.45 tn. l.) because the high-quality WL280 RN-S SA precision load cell has an extremely low constructional height (for determination of rated load, please refer to introduction).

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