

Silo load cell

Safety warnings



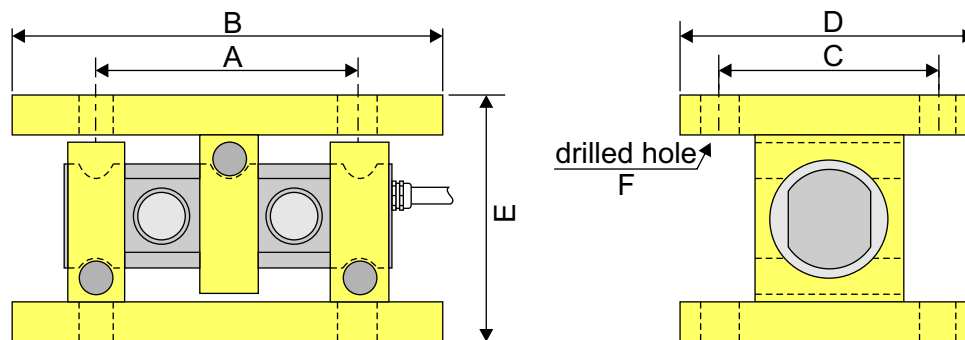
When mounting, initiating and operating this load cell the safety precautions and regulations have to be observed. Only staff with a corresponding qualification should work with the load cell. A non-observance of the safety regulations may cause serious injuries and/or damages. Check before initial operation the suitability of the load cell for this area of application. The technical data of this manual have to be followed.

Characteristics



Ranges: 1...75 t
 Output: 2 mV/V (+/- 0,25 %)
 Supply voltage: 10 V DC
 Accuracy: < 0,05 % of end scale value
 Degree of protection: IP 68
 Insensitive to off axis loads
 Standard length of connection cable: 4 m
 Option: completely made of stainless steel
 Sensor: double shearing load transducer

Dimensions



	Range	Dimensions (mm)					
		A	B	C	D	E	ØF
Size 1	1 - 5 t	105	150	94	124	88	13,5
Size 2	2 - 20 t	140	200	125	165	115	17,5
Size 3	20 - 75 t	175	280	175	230	160	22

Instructions for correct assembling of loadcells

General

- Keep the certificate (if existing) of the load cell in your file.
- Before mounting the load cell, make sure the load cell capacity corresponds with the requirements.
- Mark-up in your file the serial number of the load cell and their location in your installation.
- Never handle the load cell by lifting it at the cable.
- Do not over-bend the load cell cable.
- Avoid using welding units after fitting the load cells, because the current passing directly through the load cell or induction can seriously damage the loadcell. The risc can be limited by connecting a flexible copper earth lead (approx. 1 cm) between the upper construction and the lower support of the load cell.

It is always better to replace the load cell for a “Dummy” during welding operations close to the load cell.

Instructions for correct assembling of load cells (continued)

Instruction for laying cables

- The connection cables, whenever necessary, must be protected by conduit pipes.
- The load cell cables must be layed seperately and on a suitable distance from high-voltage and power cables.
- If the electronics are to be placed more than 20 meters from the loadcell, use an extension cable, double shielded, of 4 x 1 mm² by way of a watertight connection box.

Environment conditions

- Temperature: The load cell is normally calibrated for defined operating temperatures (operation and compensated temperature range). These values can be taken from technical data. On request the load cell can be calibrated for operating at different temperature ranges. When the load cell is used at temperatures below 0°C, avoid washing with steam or hot liquids because that will cause condensation inside the load cell.
- Water, damp etc.: The load cell is produced to a standard with a protection rating of at least IP 65 (other protection ratings can be delivered on request). Take care that the load cell is not be used at a location where a higher protection rating is needed. If the load cell is to be used in holes, use drainage pipes, bilge pumps or other protection devices. Take care the load cell cable will not be soaked by water.
- Aggressive chemical environments: Make sure there are no substances in the environment that could damage the load cell.

Mechanical installation

- Always handle with care, when you mount a load cell. Never use a hammer, the load cell is a precision measuring device.
- To ensure weighing accuracy, make sure the only force transmitted to the load cell is the weight. Other forces produced by the surrounding environment, such as vibration, shocks, wind force and temperature can give a false measurement or even damage the load cell.
- Take care, the load cell is loaded in only one direction, marked-up with an arrow (except for tension / compression cells) on the load cell.

Checking the load cell on location

- The measured values of a correctly working load cell and the colour wiring code can be taken from test certificate (if existing), and/or type plate, and/or data sheet and/or manual):
- Resistance measurement of the load cell bridge, disconnected from the amplifier. Between the supply wires the resistance (input resistance) has to be measured according load cells documentation. Between the output wires of the bridge the resistance (output resistance) has to be measured according documentation.
- Check the resistance between loadcell body and the supply and output wires. The resistance value measured with a multi-meter must be higher than 3000 Mohms.
- With the load cell connected to the amplifier, the mV output from the load cell, when the load cell is unloaded, must be approx. 0 mV. If this output is higher than 10% of the maximum output, the loadcell must be replaced. Check the output at several loading stages (example with connected bridge supply see page 3).

Checking the loadcell on location (continued)

Example: Sensitivity of load cell: 2 mV/V
 Bridge supply of load cell: 10 V
 Measured value bridge output without load (0%): 0 mV
 Measured value bridge output with nominal load (100%): 20 mV
 Measured value bridge output 0,5 nominal load (50%): 10 mV

For other loads the values are calculated correspondingly.

- Because of the robust and simple construction the load cell will not need any maintenance if mounted in the right way. Operation is guaranteed for years. However, because of the problems mentioned above a failure can appear.

The most frequent failure causes are:

- overload or other mechanical stress beyond load cell limits
- welding activities close to the load cell
- overheating
- humidity inside the load cell due to sudden temperature fluctuations (washing the load cell with jets of boiling water or steam)
- chemical attack
- damage of load cell cables

- To order a new load cell, always mention the type and serial number from the damaged load cell.

Technical data

Input

Ranges: 1 / 2 / 5 / 7,5 / 10 / 15 / 20 /
 30 / 50 / 75 t
 size 1: 1...5 t
 size 2: 2...20 t
 size 3: 20...75 t

Resistance:

 Input: 750 ohms \pm 20 ohms
 Insulation: >500 Mohms at 100 VDC

Safe overload: max.150% of nominal load

Output

Full load: 2,0 mV/V \pm 0,25 %
 No load: 0 mV $<\pm$ 2,0 %
 Resistance: 700 ohms \pm 2 ohms

Accuracy

Linearity < 0,05 % FS
 Repeatability < 0,01 % FS
 Temperature coefficient:
 span: < 0,005% FS / °C
 zero: < 0,005% FS / °C

Power Supply

Recommended excitation:10 VDC

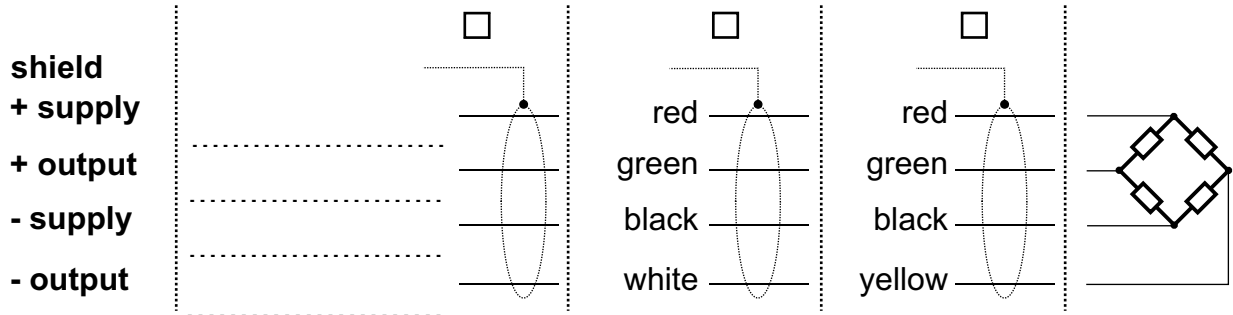
Ambient conditions

Temperature:
 Compensated: -10...+50 °C
 Operating: -20...+70 °C

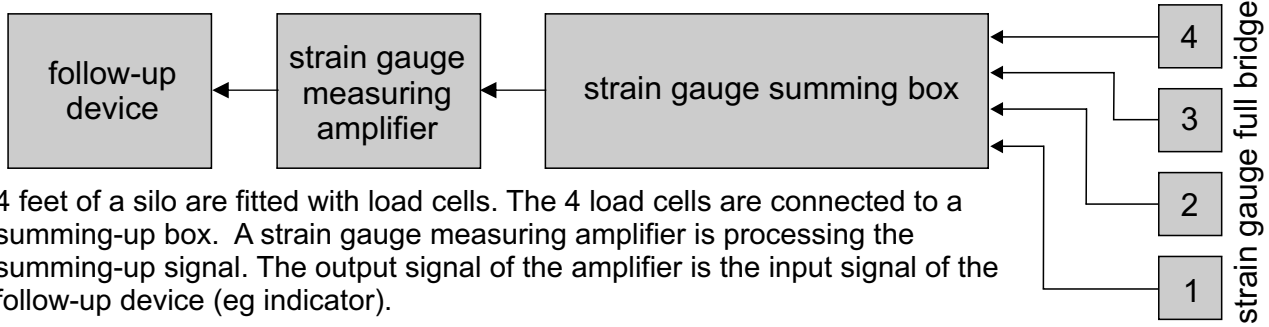
Mechanics

Case: see table page 1
 Material load cell: stainless steel
 Colour: signal yellow RAL 1003
 Degree of protection:IP 68
 Weight: size 1: approx. 5,2 kg
 size 2: approx. 13,6 kg
 size 3: approx. 37,0 kg
 Connection: 4 m cable, shielded,
 with polyurethane drain
 wire

Colour wiring code

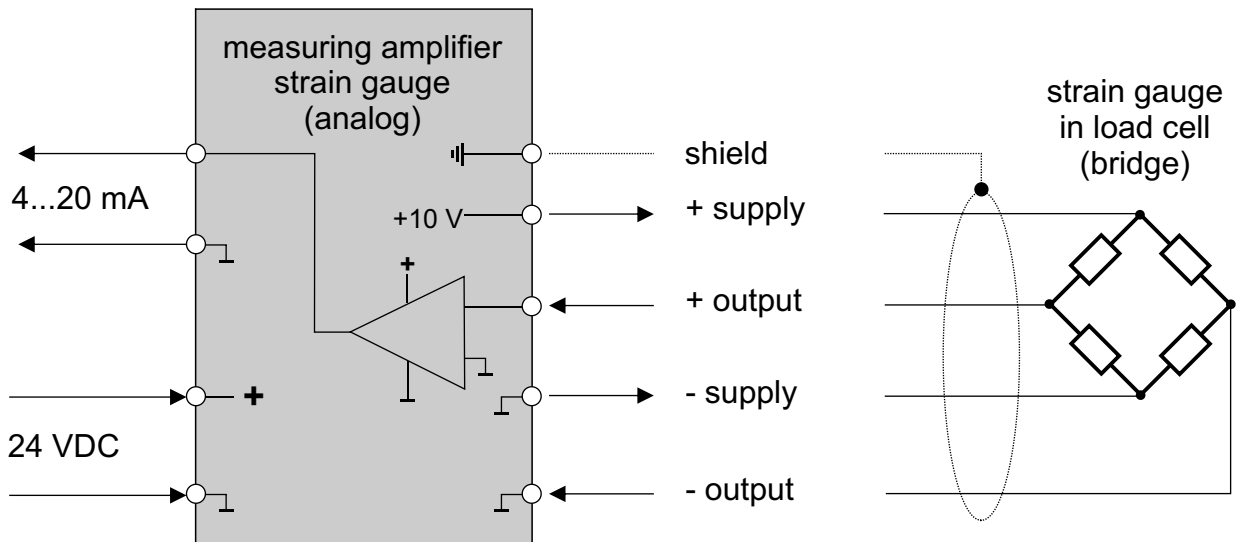


Example installation

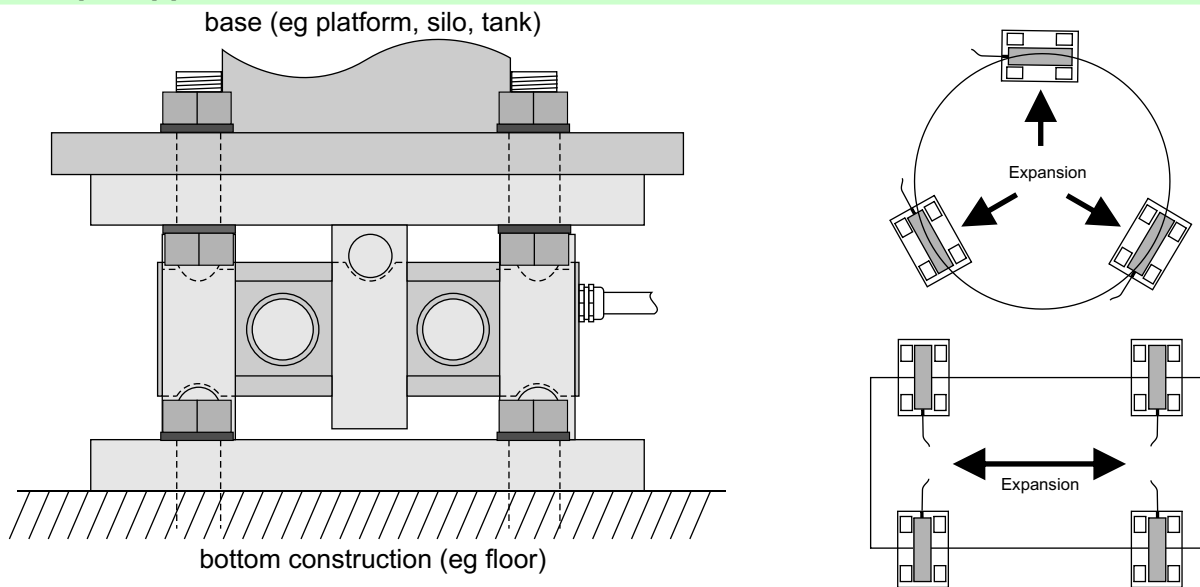


4 feet of a silo are fitted with load cells. The 4 load cells are connected to a summing-up box. A strain gauge measuring amplifier is processing the summing-up signal. The output signal of the amplifier is the input signal of the follow-up device (eg indicator).

Example connection



Example application



MANUAL

MANUAL

MANUAL