

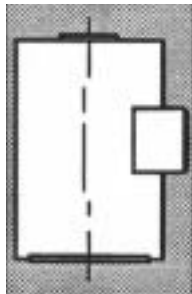
# Load Cell Types Used in Industrial Weighing Systems

## Compression Applications

**Canister** – Canister or column type load cells have a proven record of performing with a high degree of accuracy. However, canister load cells require significant attention to detail during installation and vessel fabrication. Canister load cells leave little margin for error.

The column design can produce significant errors when it is subjected to side loads in excess of 10% rated capacity, or angular loading produced by nonparallel surfaces and/or off-center loading.

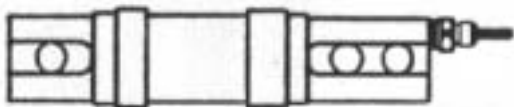
When used in compression, canister load cells will usually require some kind of check rod system to insure that the vessel will remain in its proper position. Check rod can be incorporated as part of the load cell assembly, or as individual



check rods attached to the vessel. Specifying minimum rod lengths will insure system accuracy. Check rods never increase system accuracy, they can only detract from it. It is important that check rods remain horizontal so as not to introduce inaccuracies.

Generally, canister load cells have been displaced by the newer designs that have been developed in recent years. Today, the major application for compression type canister load cells is in the replacement parts business, or the expansion of existing older systems.

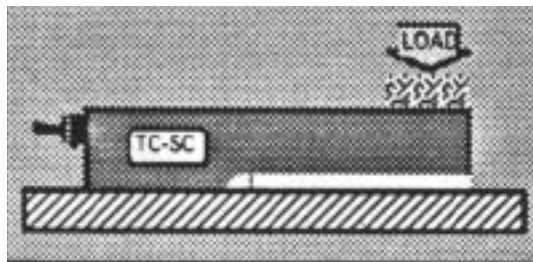
**Bending Beam** – Bending beam load cells were one of the earlier designs that started the trend away from the canister type load cells by taking advantage of the bending beam's ability to withstand high side loads and high axial loads. These features permitted the bending beam to be used as the measuring device while also performing the function of a check rod, thereby eliminating the



requirement for additional check rods in some applications.

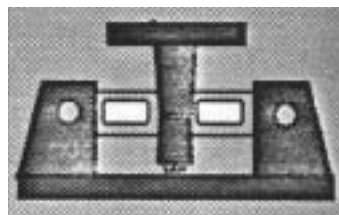
The major deficiency of the bending beam load cells is that they are actually cantilever beams, and as such, they are sensitive to changes in load position. Cantilever load beams are still used in the lower capacities of 250 lbs. and below.

**Single Ended Shear Beam** – Shear beam load cells retain the advantages of the bending beam load cells and at the same time, eliminates the sensitivity to changes in load position. For load



capacities between 300 lbs and 10,000 lbs., the single ended shear beams in the larger capacities lose some of the advantages because of the large turning moments associated with their moment arm. These turning moments require significant load cell mounting attachments, and in some cases present structural problems when placed at right angles to I-beam structural steel.

**Double Ended Shear Beams** – Double ended shear beams in capacities of 5,000 lbs. and larger are usually placed tangent to the vessel, and along



the web of the I-beam. This method will usually provide a better distribution of load to the structural members.

Because the load cell is supported at both ends, the load cell mounting hardware is not in tension, and not subjected to the large turning moments that effect the single-ended design.

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## Tension Applications

**“S” Beams** – “S” beam load cells are used primarily in OEM applications where cost is a major consideration. “S” beams provide little protection from torsional bending in any direction because they do not incorporate an upper and lower diaphragm similar to that used in the canister design.

**Canister** – Canister load cells are more suitable for tension applications and still present a good solution in applications where the proper length of tension flexure rods and swivel washers can be applied.

**Single Ended Shear Beams** – Single ended shear beams are used in tension applications by providing a clearance hole in the base plate, and a single tension flexure rod and a swivel washer.

