

the diaphragm and its linkage into the cantilever spring to which is attached the pointer or pen arm to indicate or record the pressure. The pressure range can be changed by increasing or decreasing the gradient of the cantilever spring. This type of element is supplied for pressure ranges from 0–0.2 to 0–120 in. of water. To protect against overload pressures, the clearance between the diaphragm and its housing is small enough to prevent any excessive movement of the diaphragm.

Inverted-Bell-Type Pressure Element. Figure 2 shows a cross-sectional view of an inverted-bell-type pressure indicator. This unit is made up of two inverted bells, partly immersed in oil which acts as a liquid seal, supported at their upper ends on a balanced pivoted beam. The process pressure is introduced under the bell on the

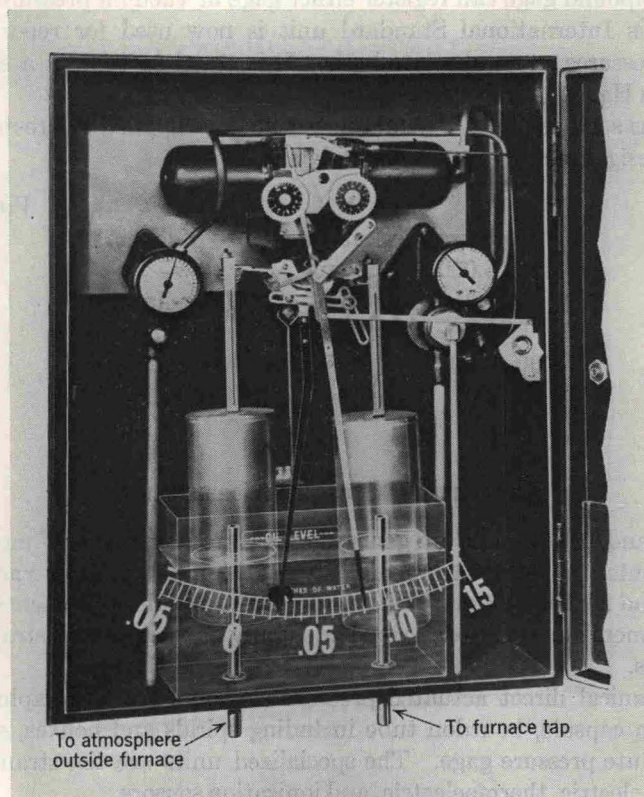


Fig. 2. Balanced-beam bell-type pressure gage.

right-hand side and atmospheric pressure is under the bell on the left-hand side. An increase in process pressure forces the right-hand bell to rise and, through a suitable linkage, connects to a pointer or pen arm to indicate or record the pressure. The two-bell arrangement permits lower pressure ranges and compensation for ambient pressure changes. The available ranges are from about 0–0.2 to 0–10 in. of water. A single-bell version can be supplied for ranges from about 0–0.6 to 0–10 in. of water. Both types of gage can be used on gage pressure, gage vacuum, or compound ranges. When subjected to overload pressures, these gages will lose their oil if a fast, large overload is applied, or if the overload is applied slowly, the bell will lift out of the oil seal and vent the process pressure.

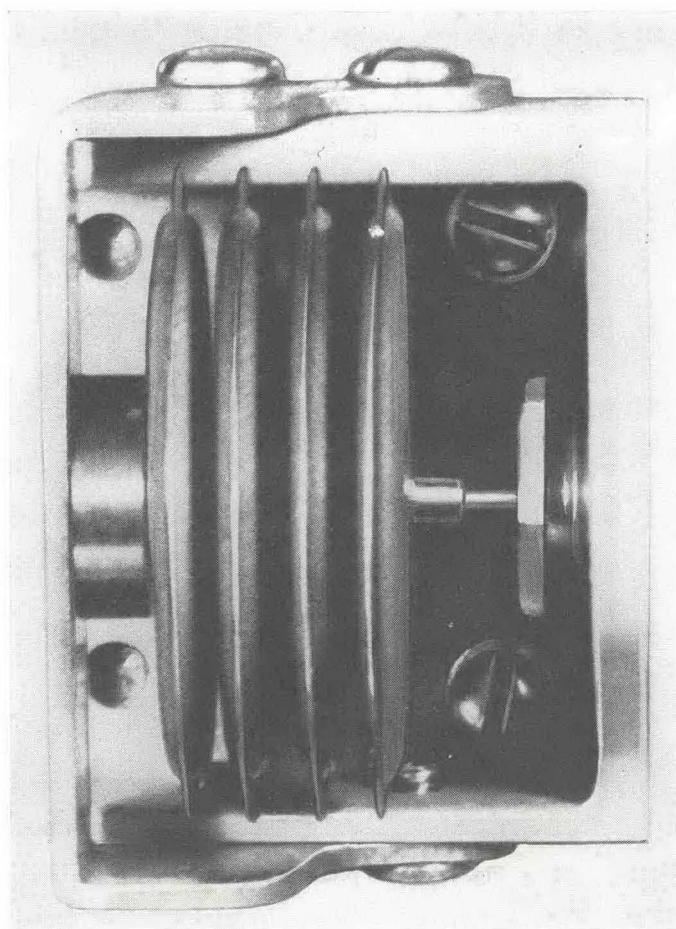


Fig. 3. Diaphragm capsule pressure element.

Diaphragm Capsule Pressure Element. This pressure element is made up of two or more circular formed metal diaphragms which are welded together at both their inner and outer edges around their complete periphery. Figure 3 shows a typical assembly. The fabricated unit becomes a flexible sac or container, sealed off at one end and open to a connecting tube at the other end for the process pressure connection. The diameter and number of diaphragms used to make up the complete unit depend on the material of the diaphragm and the pressure range desired. The process pressure is applied to the inside of the capsule through the connecting tube; it expands the capsule with a resulting movement at the closed end. The actuating linkage for the pointer or pen arm is attached to this closed end. Diaphragm capsules are used for pressure ranges from 0–10 in. of water to 0–100 psi. The materials may be phosphor bronze, stainless steel, or alloys of any type.

Bourdon Tube Pressure Elements. A bourdon tube is made from a flattened or elliptical tube, with one end sealed shut and the other end opened to the process pressure through a connecting tubing. The final shape of the tube along with the amount of flatness determines the trade name of the element and identifies the overall shape and form. There are spiral-, helix-, and "C"-type bourdon tubes.