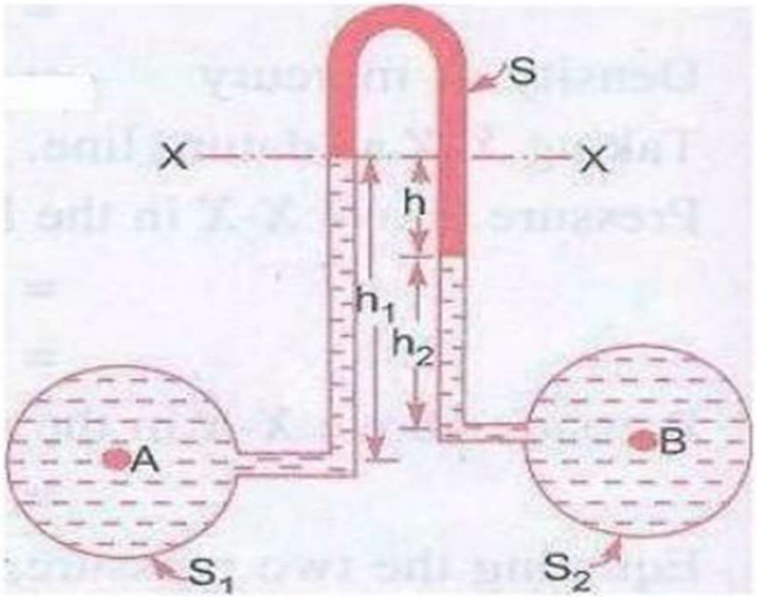
Inverted U – Tube differential manometer –

It consists of a inverted U – tube, containing a light liquid. The two ends of the tube are connected to the points whose difference of pressure is to be measured. It is used for measuring difference of low pressures.

Let an inverted U – tube differential manometer connected to the two points A and B. Let pressure at A is more than pressure at B.

h1 = Height of the liquid in the left limb below the datum line X-X h2 = Height of the liquid in the right limb.

- h = Difference of height of liquid
- $\rho 1$ = Density of liquid A
- $\rho 2$ = Density of liquid B
- ρs = Density of light liquid
- pA = Pressure at A
- pB= Pressure at B



Taking x – x as datum line

The pressure in the left limb below *x* – *x* = pA - ρ1 g h1

Pressure in the right limb below *x* –*x* = pB - ρ2 g h2 - ρ_s g h

Equating the above two pressures

$$pA - \rho 1\ g\ h1 = pB - \rho 2\ g\ h2 - \rho_s\ g\ h$$

$$pA - pB = \rho 1\ g\ h1 - \rho 2\ g\ h2 - \rho_s\ g\ h$$

Difference of pressure at A and B = ρ1 g h1 - ρ2 g h2 -ρ_s g h