MEASUREMENT OF PRESSURE

The pressure of a fluid is measured by the fallowing devices.

1. Manometers

2.Mechanical gauges.

1. Manometers: Manometers are defined as the devices used for measuring the pressure at a point in a fluid by balancing the column of fluid by the same or another column of fluid. They are classified as:

a) Simple Manometers

b) Differential Manometers.

Mechanical Gauges: are defined as the devices used for measuring the pressure by balancing the fluid column by the spring or dead weight. The commonly used Mechanical pressure gauges are:

a) Diaphragm pressure gauge

b) Bourdon tube pressure gauge

c) Dead – Weight pressure gauge

d) Bellows pressure gauge.

Simple Manometers:

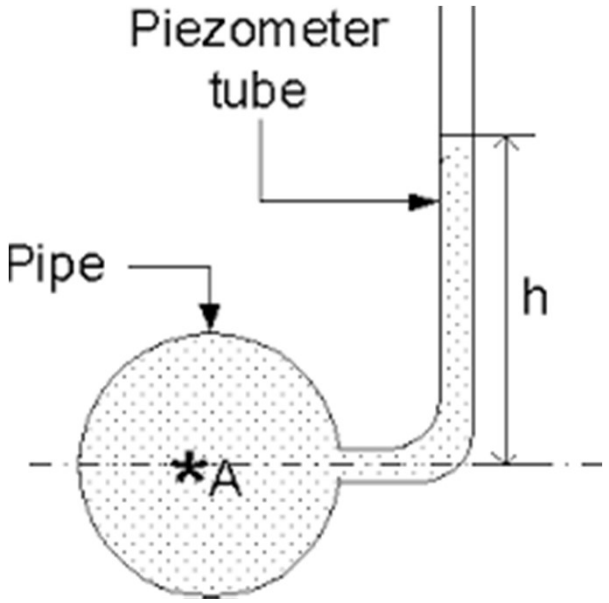
A simple manometer consists of a glass tube having one of its ends connected to a point where pressure is to be measured and the other end remains open to the atmosphere. The common types of simple manometers are:

1. Piezo meter.
2. U-tube manometer.
3. Single column manometer

Piezometer: It is a simplest form of manometer used for measuring gauge pressure. One end of this manometer is connected to the point where pressure is to be measured and other end is open to the atmosphere. The rise of liquid in the Piezometer gives pressure head at that point A.

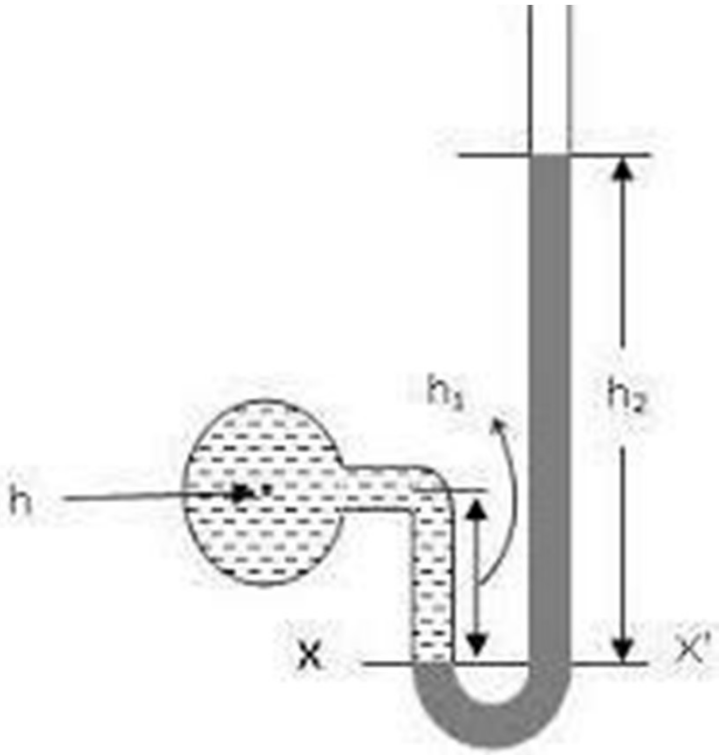
The height of liquid say water is 'h' in piezometer tube, then

Pressure at A = ρ g h



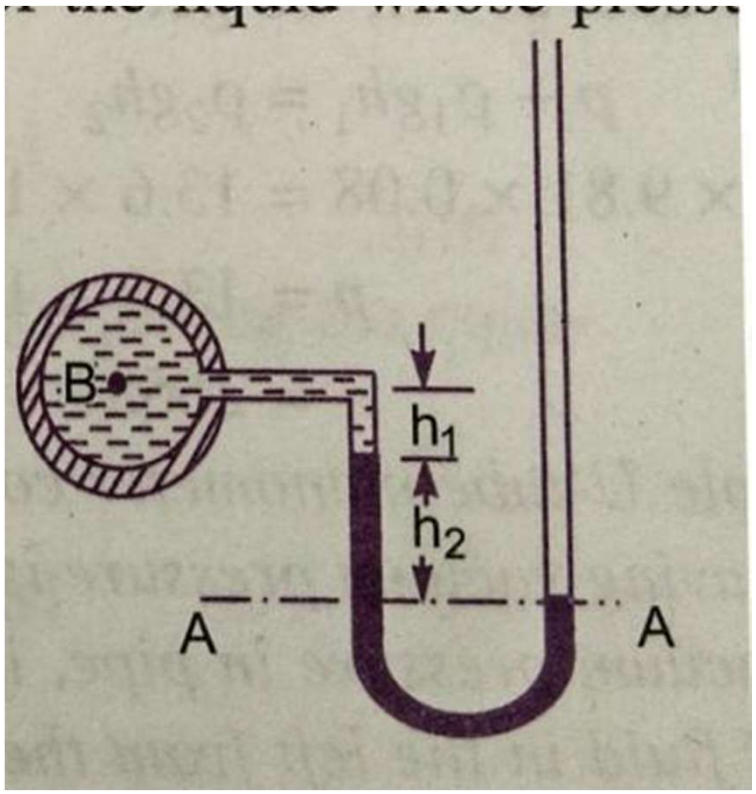
U- tube Manometer: It consists of a glass tube bent in u-shape, one end of which is connected to a point at which pressure is to be measured and other end remains open to the atmosphere. The tube generally contains mercury or any other liquid whose specific gravity is greater than the specific gravity of the liquid whose pressure is to be measured.

For Gauge Pressure



$p = \rho 2gh2 - \rho 1\ gh1$

For Vacuum Pressure:



$p = -(\rho 2g\ h2 + \rho 1g\ h1)$