Sub Module 2.8

Introduction to pressure measurement

Pressure measurement is important because of the following reasons:

- Pressure is an important quantity that describes a system.
- Pressure is invariably an important process parameter.
- Pressure difference is used many a time as a means of measuring the flow rate of a fluid.
- Pressure level spans some 18 orders of magnitude from the lowest to the highest pressures encountered in practice.

The pressure measuring devices and the corresponding ranges are shown in Table 13.

Table 13: Pressure gage types and ranges

No.	Type	Lower limit	Upper limit
1	Ionization gage	10^{-8}	10^{-3}
2	Pirani gage	10^{-4}	1
3	McLeod gage	10^{-6}	1
4	Manometers	10^{-1}	10^{4}
5	Piezoelectric transducers	10^{2}	10^{6}
6	Bellows type gage	10	10^{4}
7	Diaphragm gage	1	10^{6}
8	Bourdon gage	1	10^{7}
9	Resistance gage	10^{4}	10^{9}

Note: Entries in the Table are in mm of mercury (= Torr).

Useful units and conversion factors:

1. **1 Pascal or 1 Pa = 1 N/m^2,**
2. **1 atmosphere = 760 mm mercury column = 1.013×10^5 Pa**
3. **1 mm mercury column = 1 Torr**
4. **1 Torr = 1.316×10^{-3} atmosphere = 133.3 Pa**
5. **1 bar = 10^5 Pa**