

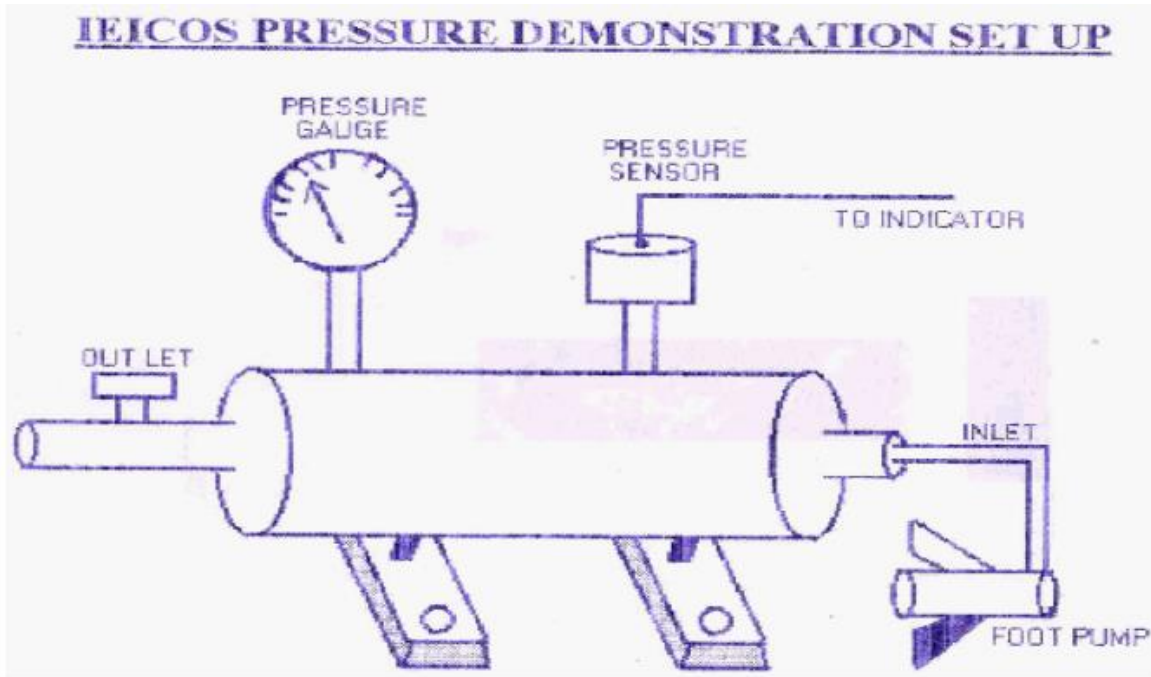
Experiment No 15

CALIBRATION OF PRESSURE GAUGE

Aim: To calibrate the given pressure transducer with dead weights.

Apparatus: Dead weights, pressure transducer and digital pressure indicator.

Experimental Setup:



Theory: Pressure is defined as force per unit area and is measured in Newton per square meter (Pascal) or in terms of an equivalent head of some standard liquid (mm of mercury or meter of water). A typical pressure gauge will measure the difference in pressure between two pressures. Thus, if a pressure gauge is connected to an air line the gauge itself stands in atmospheric pressure. The gauge reading will be the difference between the air pressure and the atmospheric pressure and is called gauge pressure. The absolute pressure (the actual pressure within the airline) is the sum of the gauge pressure and atmospheric pressure.

Pressure transducer is basically an electro mechanical device, especially manufactured and designed for wide range application in pressure measurement. The pressure transducer comprises of diaphragm and an inputs to facilitate pressure measurement. The strain gauges are bonded directly to the sensing member to provide excellent linearity, low Hysteresis and repeatability. Fluid medium whose parameter has to be measured is allowed to deflect the diaphragm (sensing member), which is a single block material and forms an integral part of the pressure transducer. It is made up non-magnetic stainless steel and thus has the advantage of avoids the yielding effects and leakage problems. The slight deflection of the diaphragms due to the pressure provided an electrical output.

$$\text{„E“ Error} = R_m - R_a$$

$$\% \text{ Error} = \frac{\text{Error}}{\text{Actual Reading}}$$

Model Graphs: X- axis vs. Y- axis

Actual Reading (Ra) vs. Measured Reading (Rm)

Actual Reading (Ra) vs. % Error

