



MANOMETERS

INTRODUCTION

A manometer gauge is an extremely basic but very effective device which is used to measure pressure. In the majority of cases this will relate to a gauge which consists of a U-shaped glass tube which is filled with mercury or some other liquid. Traditionally one end of the manometer tube is left open, susceptible to atmospheric pressure while a manometer hose is connected via a gas tight seal to an additional pressure source. While normally associated with gas pressures a manometer gauge can also be used to measure the pressure exerted by liquids.

As the manometer pressure gauge has no mechanical parts it requires minimal maintenance and is extremely accurate. It is a Device that is used to measure the pressure of the fluid but that of a liquid concerning the earth's atmospheric pressure. It comes in different forms. These are filled with mercury or any heavy liquid material but in some cases. They can be filled with a lighter liquid material.

FIDICON is a pioneer in the field of manufacturing Manometer in India since 2002 years of designing, manufacturing, installation and service of the same. Manometer manufactured by FIDICON are user friendly and easy to install. It comes in many ranges and can be tailor made as per the requirements of customers.

WORKING PRINCIPLE

The working principle of a manometer is that one end is connected to a seal-tight gas to measure the source of pressure. Whereas, its other end is left open to the atmospheric pressure of the earth.

The principle behind a manometer gas or liquid pressure gauge is extremely simple. Hydrostatic equilibrium shows that the pressure when a liquid is at rest is equal at any point. For example, if both ends of the U-tube are left open to the atmosphere then the pressure on each side will be equal. As a consequence, the level of the liquid on the left-hand side will be the same as the level of the liquid on the right-hand side – equilibrium. However, if one end of the U-tube is left open to the atmosphere and the other connected to an additional gas/liquid supply this will create different pressures.

If the pressure from the additional gas/liquid supply is greater than the atmospheric pressure this will exert a downward pressure on the measuring liquid. As a consequence, the liquid will be pushed down on one side with the greater pressure causing the liquid to rise on the side with the lesser pressure. The opposite would occur if the additional gas/liquid supply creates a lesser pressure than the atmospheric pressure. In this instance the liquid would fall on the side of the open section of the U-tube and rise on the side connected to the additional gas/liquid supply.



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Perhaps the easiest way to explain this is the movement of a playground see-saw. If both parties are the same weight and exerting no additional pressure on the see-saw it will balance perfectly. However, if the weight or the pressure exerted on one end of the see-saw is greater than the other, the heavier side will lower and the lighter side will rise.

For measuring the pressure, one tube of the inclined tube manometer forms into reservoir & The other tube of the manometer is inclined, as per its required angle. After giving the pressure On Its reservoir, which are filled with the suitable liquid, shows the changes, in the heights of The other tube or angle, of the Inclined Tube Manometer.

By Measuring the height of the liquid level in the liquid level in the two arms or limbs of the tube, the pressure difference between the two points in the system may be determined. The larger the differential pressure between the liquid level, the bigger the height difference between them.

TYPES OF MANOMETER

There are several types of Manometer which are listed below:

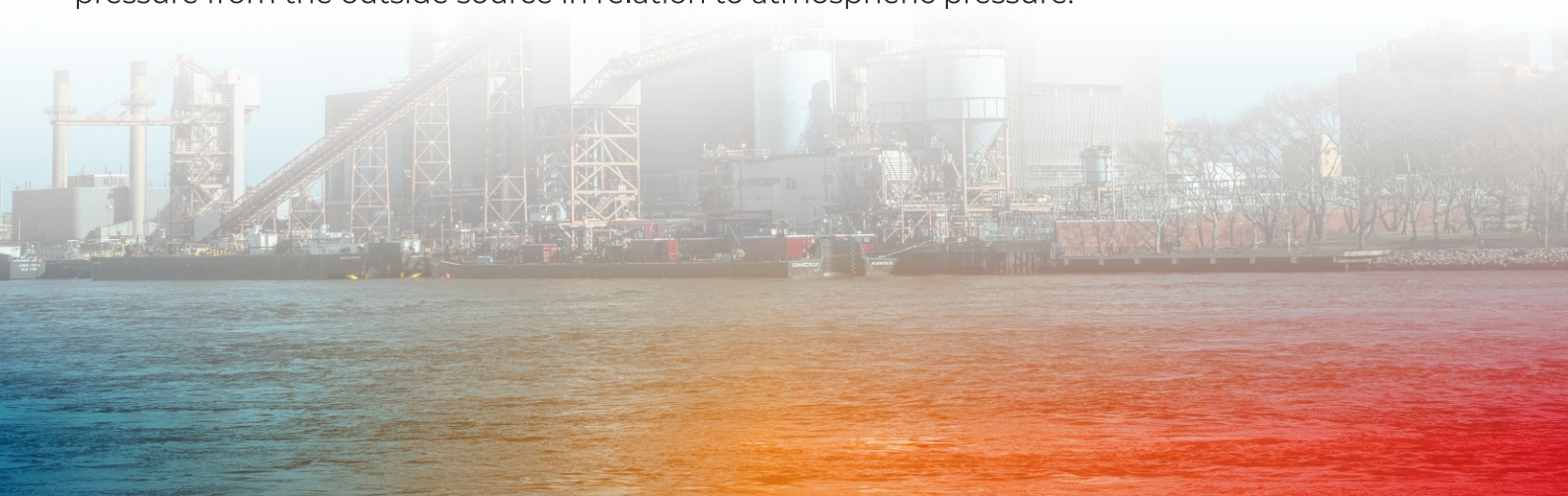
- **INCLINED TUBE MANOMETER** **MODEL NO : (FDI - ITL - 901)**
- **U-TUBE MANOMETER** **MODEL NO : (FDI - UTM - 902)**
- **SINGLE LIMB MANOMETER** **MODEL NO : (FDI - SLM - 903)**
- **MCLEOD GAUGE MANOMETER** **MODEL NO : (FDI - MG - 904)**
- **ABSOLUTE MANOMETER** **MODEL NO : (FDI - MG - 905)**

INCLINED TUBE MANOMETER

As the name suggests, an inclined manometer involves a gradual incline in the design. This allows for the measurement of minuscule pressure to extremely high levels of accuracy. It is used where the manometric properties of liquids are similar. Again, it is the simplicity, lack of maintenance and no moving parts make it extremely efficient and easy to use.

U - TUBE MANOMETER

The traditional U-Tube device is the most common with one end of the partially liquid filled tube open to the atmosphere and the other connected to an outside source. By measuring the different heights of liquid on the left and the right-hand side of the U-tube it is possible to calculate the pressure from the outside source in relation to atmospheric pressure.



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SINGLE LIMB MANOMETER

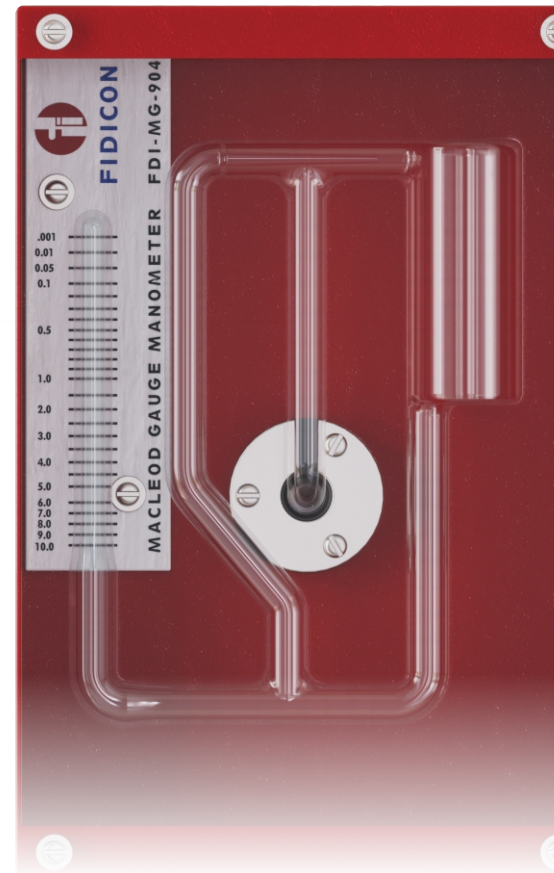
Direct reading from a single limb Manometers are used to monitor liquid levels as well as pressure, vacuum, and differential pressure flow. Its a Wall/Stand Mounted.

MCLEOD GAUGE MANOMETER

This manometer operate by taking in a sample volume of gas from a vacuum chamber, then compressing it by tilting and infilling with mercury. The McLeod gauge has the advantage that its calibration is nearly the same for all non-condensable gases. The device can be manually operated and the scale read visually, or the process can be automated in various ways. For example, a small electric motor can periodically rotate the assembly to collect a gas sample. If a fine platinum wire is in the capillary tube, its resistance indicates the height of the mercury column around it. It is similar to a mercury manometer. As it uses mercury as measuring fluid & height of the mercury column determines pressure difference.

ABSOLUTE MANOMETER

This manometer is used for leakage testing of sealed systems as they are not affected by the changes in air pressure and therefore ensures error free readings.



APPLICATION

- Used to measure the pressure of the fluids using mechanical properties of fluids
- Used to measure vacuum
- Used to measure Flow of Fluid
- Used to measure filter pressure-drop of the fluids
- Used for meter Calibration
- Used to measure leak testing
- Used to measure the liquid level present in a tank

ADVANTAGES

- It has good sensitivity
- Its construction is simple
- It comes at a low cost
- Its accuracy is good too
- It is suitable for application at low pressure
- It is simple in its operation
- It can be used for a variety of liquids.
- It does not require to be calibrated against any standard values

DISADVANTAGES

- It is large and bulky in size
- It cannot work without its leveling
- It does not have any fixed reference
- It has an error in the form of condensation
- It has no protection over range
- It has a very small operating range
- Its dynamic response is quite poor
- It has zero portability because of its fragility
- It can also have an error due to temperature change
- Its response is very slow and because of these fluctuating pressures cannot be measured in it

RECOMMENDED DISPOSAL

- Give it back to us & we will take care of recycling & possible disposal.
- User can dis-assemble the product in multiple stage
- The above may be handed over (state pollution board), authorized re-cycler item-wise.





ENQUIRY SPECIFICATIONS:

- [1] Service Media Details.
- [2] Size/Connection
- [3] System Operating and Design Pressure.
- [4] System Operating and Design Temperature.
- [5] Material Specifications (Body, Internal)

RECOMMENDED SPARES

- [1] Glass Tube
- [2] Mercury

OTHER RANGE OF PRODUCTS

- [1] Flame Arrester
- [2] Breather Valve
- [3] Level Indicators
- [4] Rotameters
- [5] Emergency Relief Valve
- [6] Gauge Hatch
- [7] Strainers
- [8] Pressure Reducing Valve
- [9] Safety Relief Valve
- [10] Flowmeters
- [11] Level Switches
- [12] Pressure Reducing Station
- [13] Level Gauge, etc.

Any Query?

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