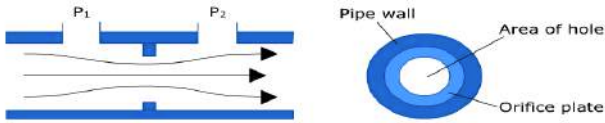
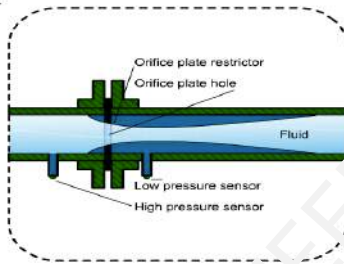


## Orifice Flow meter-working principal

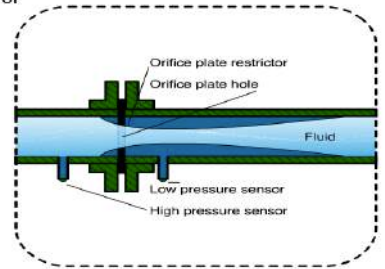


The orifice plate flowmeter consists of a plate with a hole bored into it to reduce the area through which the fluid can flow.

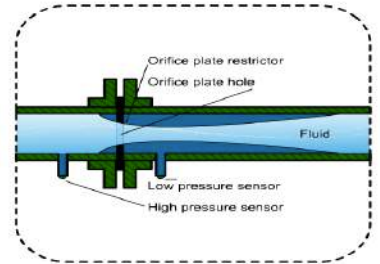
Therefore, the velocity of the fluid that leaves the orifice is faster than the velocity of the fluid that approaches it.



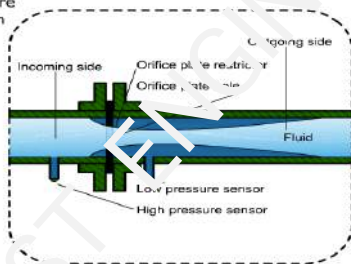
According to the laws of conservation of energy, the fluid mass entering the pipe must equal the mass leaving the pipe during the same period of time.



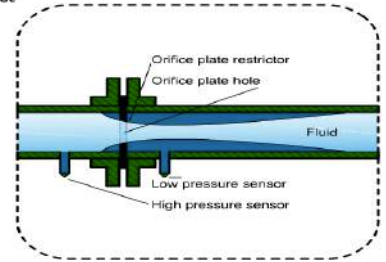
According to Bernoulli's principle, as the velocity of a fluid increases, the pressure it exerts on a surface it passes decreases.



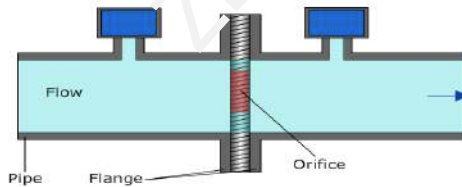
The result is that there is more pressure on the incoming side of the orifice than on the outgoing side.



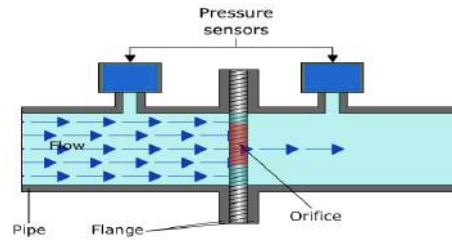
Since engineers can calculate the exact relationship between the differential pressure that forms across the plate and the velocity, the volumetric flow rate of the fluid can be measured.



As the fluid flow rate increases through the pipe, backpressure on the incoming side increases because the orifice plate is restricting flow.



The pressure exerted by the fluid on the outgoing side of the orifice also increases, but not by as much as on the incoming side.



That is why the differential pressure across the orifice increases, as measured by sensors on each side of the plate.

The Flow rate of a liquid through an orifice plate increases in proportion to

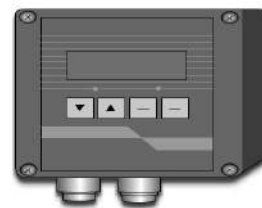
For example, if the flow rate doubles, the differential pressure is increased by 4. This relationship is shown mathematically by the following formula.

$$Q = K\sqrt{\Delta P}$$

Where,

- Q = Flow rate
- K = A constant value, which is determined by the orifice size and the type of liquid
- $\Delta$  = Change
- P = Differential pressure across the orifice plate

There is a device that compensates for the differential pressure increasing by a factor of 4 when the flow rate doubles.



This device is called a *square root extractor*. It produces an output, such as a standard 4-20mA signal, that doubles when the differential pressure doubles.