Variable Area Flowmeters

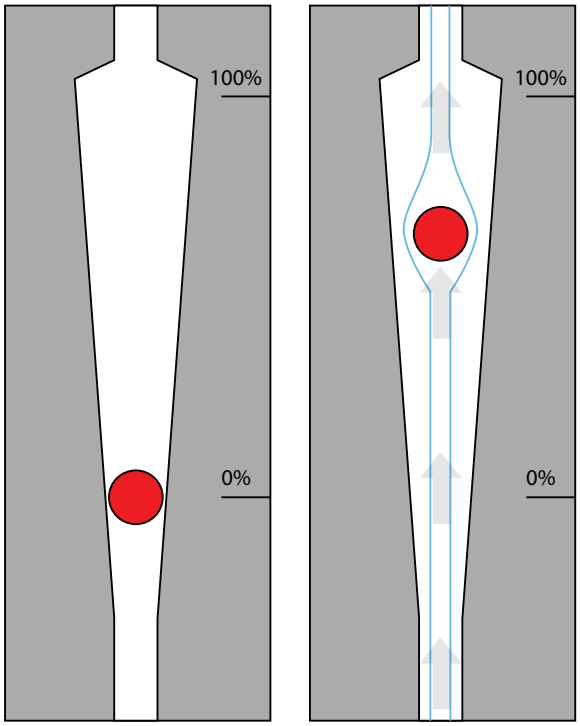
Visual Indication of Flow Through Variable Area Flowmeters / Rotameters

Method

Variable Area Flowmeters (sometimes called Rotameters) are fairly simple, precisely machined meters designed for visually displaying the rate of flow in small line sizes.

Usually constructed in a perspex block, the flow runs through a chamber at the center of the plastic block. The chamber is sloped so that it is significantly larger at the top than it is at the bottom.

A small ball (made of a variety of materials depending on the media used and range required) within the chamber is forced upwards against gravity against the flow. As the chamber gets larger, more and more flow can find its way around the restriction of the ball, meaning that it will settle at a specific point that is directly relative to flow.



NO FLOW

FLOW PUSHING BALL UPWARDS

Advantages

- Suitable for a range of liquids and gasses
- Low cost

Disadvantages

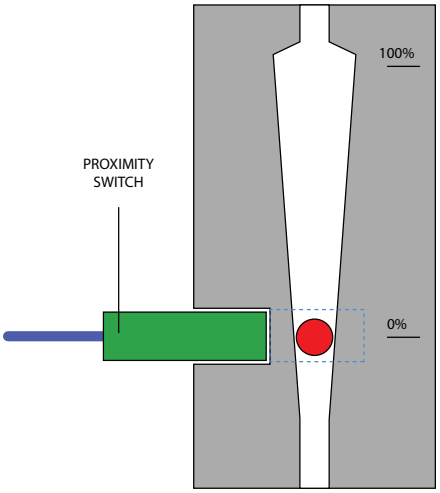
- Custom built for specific applications with a fixed range.
- In gas applications, pressure and temperature must be constant for the meter to be accurate
- Must be installed vertically

Considerations

If your flow conditions allow a metal ball, proximity switches can be installed to turn this indicator into a flow switch. Because the switches need to be drilled into place, the set points can not be changed in the future. It is best to use these for flow/no-flow indication.

Care must be taken when piping up to flow switches - while some have metal threads (such as the above unit), over-tightening the threads on a plastic block meter can cause the unit to break under the stress.

Yokgoawa and a few other companies produce variable area flowmeters that read on a traditional gauge rather than on a vertical column.



Detecting low or no flow using a proximity switch and metal ball in a variable area flowmeter