

slurries. They are frequently used in low flow services such as purges where the requirements are below the range of an orifice plate.

A rotameter consists of a plummet or float within a tapered vertical tube. The force of the flowing fluid causes the float to rise until the force is balanced by gravity. Rotameter calibration suffers if the variation in viscosity or density is greater than 15%.

Rotameters can be configured to either measure liquid or gas flow. Measuring the flow of liquids and gases is a critical need in many industrial plants. Important parameters to consider when specifying rotameters include liquid volumetric flow rate, gas volumetric flow rate, operating pressure, and fluid temperature.

- Liquid volumetric flow rate applies only to those rotameters that are liquid volumetric flow sensors or meters. It is expressed as the range of flow in volume/time.
- Gas volumetric flow rate applies only to those rotameters that are gas volumetric flow sensors or meters. It is the range of flow in volume/time.
- Operating pressure is the maximum head pressure of the process media the meter can withstand.
- The maximum temperature of the media that can be monitored is usually dependent on construction and liner materials. Pipe diameter is also important to consider, especially when specifying specific mounting options.

Mounting options for rotameters include insertion types, in-line flanged, in-line threaded, and in-line clamp.

- Insertion flow meters are inserted perpendicular to flow path. They usually require a threaded hole in the process pipe or other means of access.
- In-line flanged flow meters are inserted parallel to the flow path, usually inserted between two pieces of existing flanged process pipes.
- In-line threaded flow meters are inserted parallel to the flow path, and threaded into two existing process pipes.

Rotameters are often easy to install and offer a low cost solution to flow measurement.

A. Target Flowmeter

Target elements are impact devices that are coupled to restoring mechanisms such as springs or servomotors to maintain equilibrium.