**EXPERIMENT NO.1**

**Flow measurement with the help of rotameter.**

**Theory:**

**Definition of Rotameter:**

A rotameter is a device that measures the [volumetric flow rate](https://en.wikipedia.org/wiki/Volumetric_flow_rate) of fluid in a closed tube.

It belongs to a class of meters called [variable area meters](https://en.wikipedia.org/wiki/Variable_area_meter), which measure flow rate by allowing the cross-sectional area the fluid travels through to vary, causing a measurable effect.

**Advantage**:

* A rotameter requires no external power or fuel; it uses only the inherent properties of the fluid, along with gravity, to measure flow rate.
* A rotameter is also a relatively simple device that can be mass manufactured out of cheap materials, allowing for its widespread use.
* Since the area of the flow passage increases as the float moves up the tube, the scale is approximately linear.[[1]](https://en.wikipedia.org/wiki/Rotameter#cite_note-Brodkey03-1)
* Clear glass is used which is highly resistant to thermal shock and chemical action.

**Disadvantage**:

* Because operation of a rotameter depends on the force of gravity for operation, a rotameter must be oriented vertically. Significant error can result if the orientation deviates significantly from the vertical.
* Due to the direct flow indication the resolution is relatively poor compared to other measurement principles. Readout [uncertainty](https://en.wikipedia.org/wiki/Measurement_uncertainty) gets worse near the bottom of the scale.
* Since the float must be read through the flowing medium, some fluids may obscure the reading. A transducer may be required for electronically measuring the position of the float.
* Rotameters are not easily adapted for reading by machine; although magnetic floats that drive a follower outside the tube are available.

**Apparatus:**

Rotameter measurement tube

**Procedure:**

**Calculation table:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sr.no | H1(mm) | H2(mm) | Qact(lpm) | Qthr(lpm) | %Error |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |

**Conclusions:**