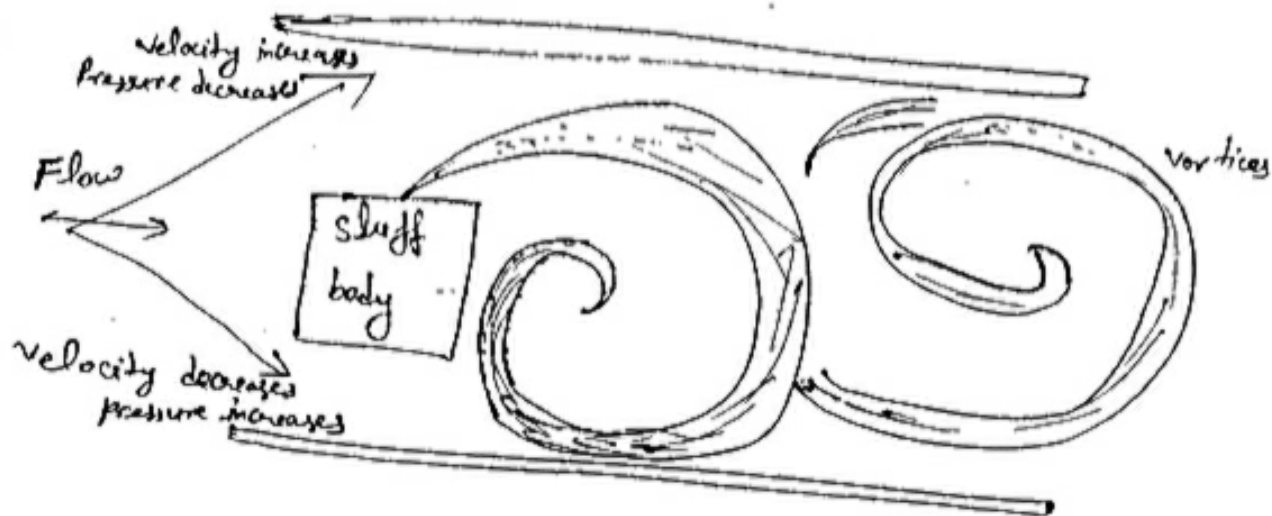


## Vortex flowmeters

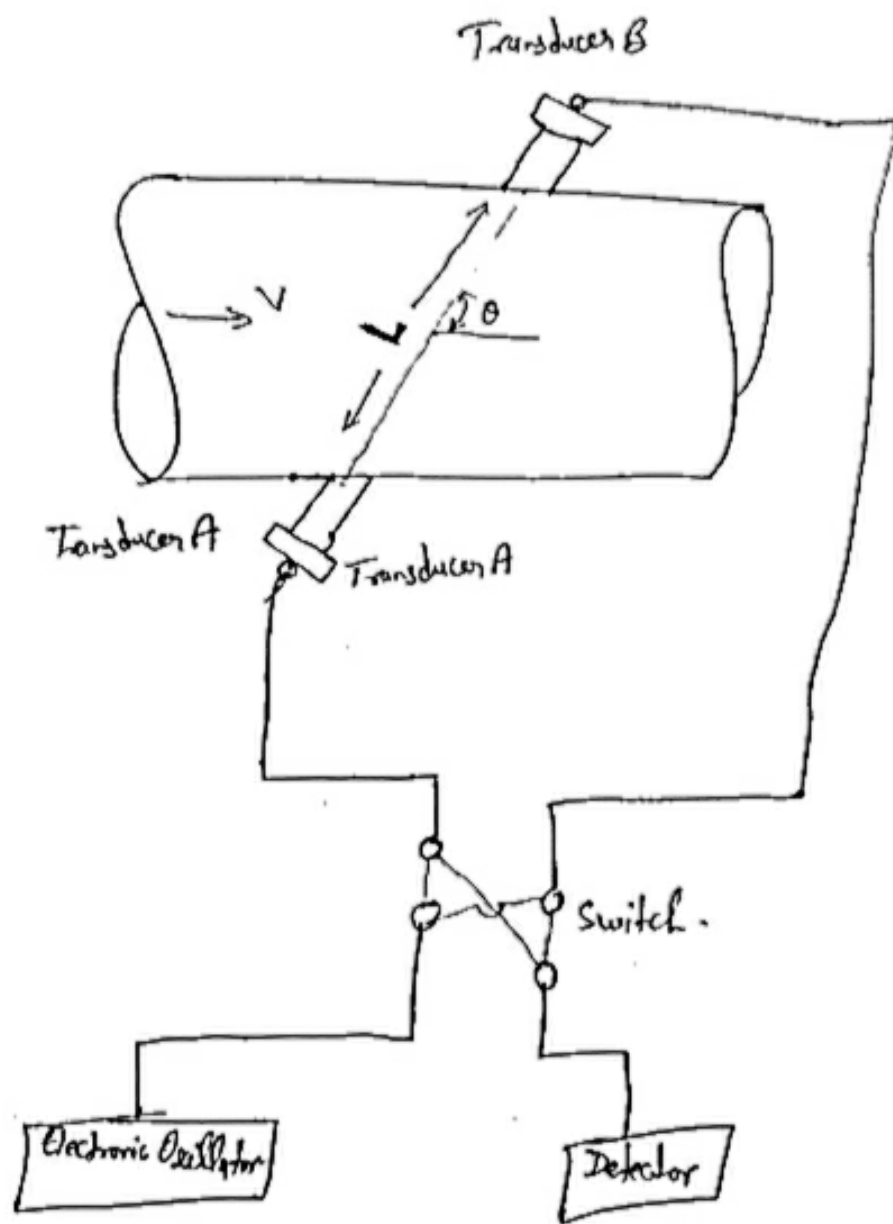


The velocity and pressure distribution in fluid around bluff body change at the same frequency as the vortex shedding frequency. The changes in pressure or velocity is sensed by a flow sensitive detector which can be either a heated thermistor element or a spherical magnetic shuttle. The vortex shedding flowmeters are available in sizes from 50.8 to 152.4 mm.

- Advantages →
- (i) It has excellent rangeability.
  - (ii) It has no moving parts.
  - (iii) It has very low pressure drop.
  - (iv) It has good response speed.

- Disadvantages →
- (i) Cost is high.
  - (ii) Upper temperature limit is  $204^{\circ}\text{C}$ .
  - (iii) Not available over 200 mm size.

## Ultrasonic flowmeters →



The ultrasonic waves are transmitted from transducer A to transducer B and vice-versa. An electronic oscillator is connected to supply ultrasonic waves alternately to A or B which is working as transmitter through a changeover switch when the detector is connected simultaneously to B or A which is working as receiver. The detector measures the transit time from upstream to downstream transducer and vice-versa.

$$T_{AB} = \frac{L}{C + V \cos \theta}$$

$$T_{BA} = \frac{L}{C - V \cos \theta}$$

$$\Delta T = T_{AB} - T_{BA} = \frac{2LV \cos \theta}{C}$$

$$V = \frac{\Delta T C}{2L \cos \theta}$$

Advantages → ① Its velocity / output relationship is linear.

② It has no moving parts.

③ Its repeatability is high.