18ECO133T

Sensors and Transducers

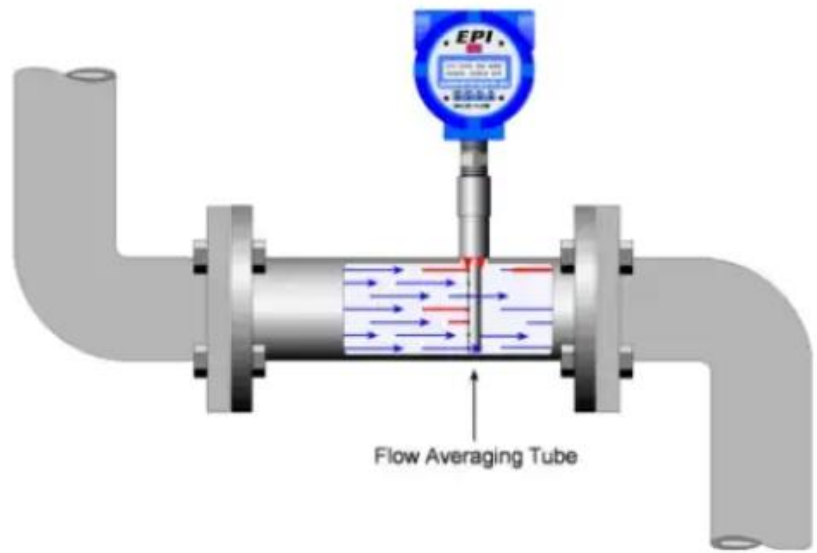
UNIT V

Unit V : Session 1 : SLO 2

Necessity Of Flow Measurement

- Flow Measurements are important in a number of applications such as
  - Drinking purpose
  - Agriculture purpose
  - Industrial purpose

Flow Meter



Necessity Of Flow Measurement

- Construction purpose etc
- To store the water for proper utilization
- To know volume of liquid and rate of flov
- Laboratory purpose

Flow of Water

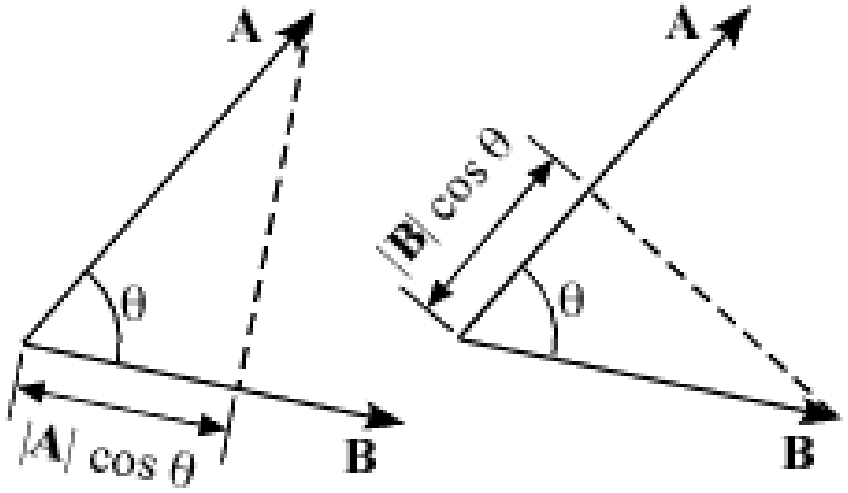
- Classification of flow meters based on

1. Weight / quantity (or) volume

2. Rate of flow

Mathematics of Flow Rate

- The Scalar Product of two vectors, namely velocity and area..



$$\mathbf{A} \cdot \mathbf{B} \equiv |\mathbf{A}||\mathbf{B}|\cos(\theta) = |\mathbf{A}|(|\mathbf{B}|\cos(\theta)) = |\mathbf{B}|(|\mathbf{A}|\cos(\theta))$$

Important characteristics of the dot product

- The first point to note about the definition is that the coordinate system does not enter the definition.
- The second point to note is that because $\cos\theta=\cos(-\theta)$, the order is not important, that is, the scalar product is commutative.

$$\vec{A}\cdot\vec{B} = \vec{B}\cdot\vec{A}$$

- The scalar product is also distributive.

$$\vec{A}\cdot(\vec{B}+\vec{C}) = \vec{A}\cdot\vec{B}+\vec{A}\cdot\vec{C}$$

- All these qualities help in development of a single instrument to measure the scalar product.