SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution

Coimbatore-35

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

IIYEAR/ III SEMESTER

19ECT201 Electrical Engineering and Instrumentation

TOPIC -**VARIABLE RESISTIVE TRANSDUCER**

VARIABLE RESISTIVE TRANSDUCER

•The resistive transducers or resistive sensors are also called as variable resistance transducers. The variable resistance transducers are one of the most commonly used types of transducers. They can be used for measuring various physical quantities, such as, temperature, pressure, displacement, force, vibrations etc.

•The output obtained from it is calibrated against the input quantity and it directly gives the value of the input.

•The variable resistance transducer elements work on the principle that the resistance of the conductor is directly proportional to the length of the conductor and inversely proportional to the area of the conductor.

Thus, if L is the length of the conductor (m) and A is its area (m^2) as shown in Fig.16.1, then its resistance R (ohms) is given by:

$R = \rho L/A$

Where ρ is called as resistivity of the material measured in ohm-m and it is constant for the given material.

VARIABLE RESISTIVE TRANSDUCER

The resistive transducers can be used either as primary transducers or secondary transducers. The methods based on measurement of the resistance change are most widely used in various industrial applications as,

i) Both a.c. and d.c. voltages and currents are suitable for the measurement of resistance change.

ii) The speed of response of the resistive transducers is high.

iii) They are available in various sizes with wide range of resistance value.

iv) High resolution in measurements can be achieved as large variety of electrical circuits are available.

The resistance change due to the change in the length of the conductor is used in translational or rotational potentiometers to measure linear or rotational displacement. The change in resistance of conductor or semiconductor due to the strain applied is the working principle of the strain gauge which is used to measure various physical quantities such as pressure, displacement and force. The change in resistivity of conductor due to the temperature variations causes change in resistance. This principle is used to measure temperature.