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

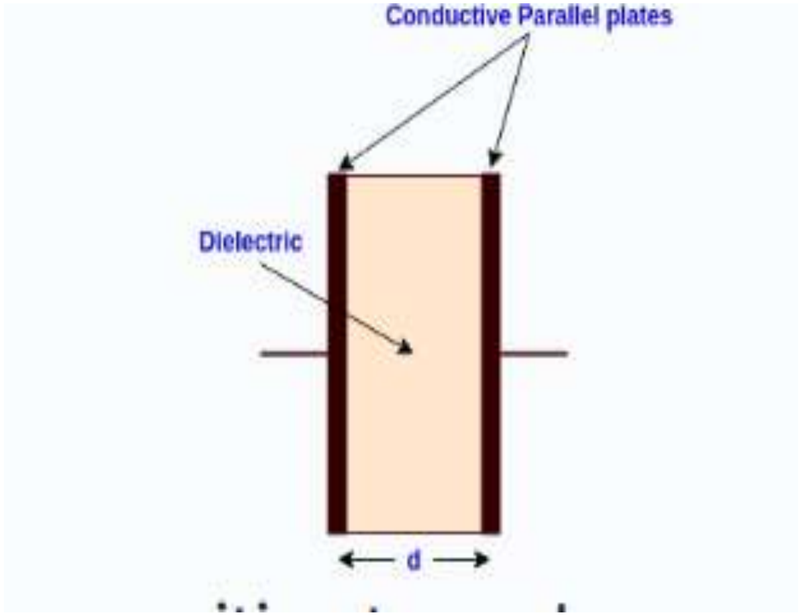
TOPIC -**VARIABLE CAPACITIVE TRANSDUCER**

VARIABLE CAPACITIVE TRANSDUCER

•Transducers based on the principle of changes in the capacitance are generally termed as capacitive transducers. These kinds of transducers are most common in linear displacement based applications.

• Other than displacement, many of the industrial variables such as pressure, level, moisture, etc. can be translated into an electrical signal by means of change in the capacitance. .

A capacitive transducer contains two conducting parallel metal plates separated by a dielectric medium.



Working Principle of capacitive transducer

C = $A\ d\ \varepsilon o \varepsilon r$ Where, A is the area of parallel plates D is the distance between the plates εo is the absolute permittivity of free space. εr is the relative permittivity of free space.
The capacitance between two plates can be varied by any of the following methods.
By changing the distance between two plates (**d**)
By changing the permittivity of the dielectric medium (**ϵ**)
By changing the area of overlapping of plates (**A**)
By changing the distance between two plates

•The capacitance can be varied by changing the distance between two plates. From the equation for C, we can observe that C and d are inversely proportional to each other. That is, the capacitance value will decrease with increasing distance and vice-versa.

•This principle can be used in a transducer by making the left plate fixed and the right plate movable by the displacement that is to be measured as shown in the figure.

The change in distance between two plates will vary the capacitance of the transducer. Change in capacitance can be calibrated in terms of the measurand. These types of transducers are used to measure extremely small displacements.