

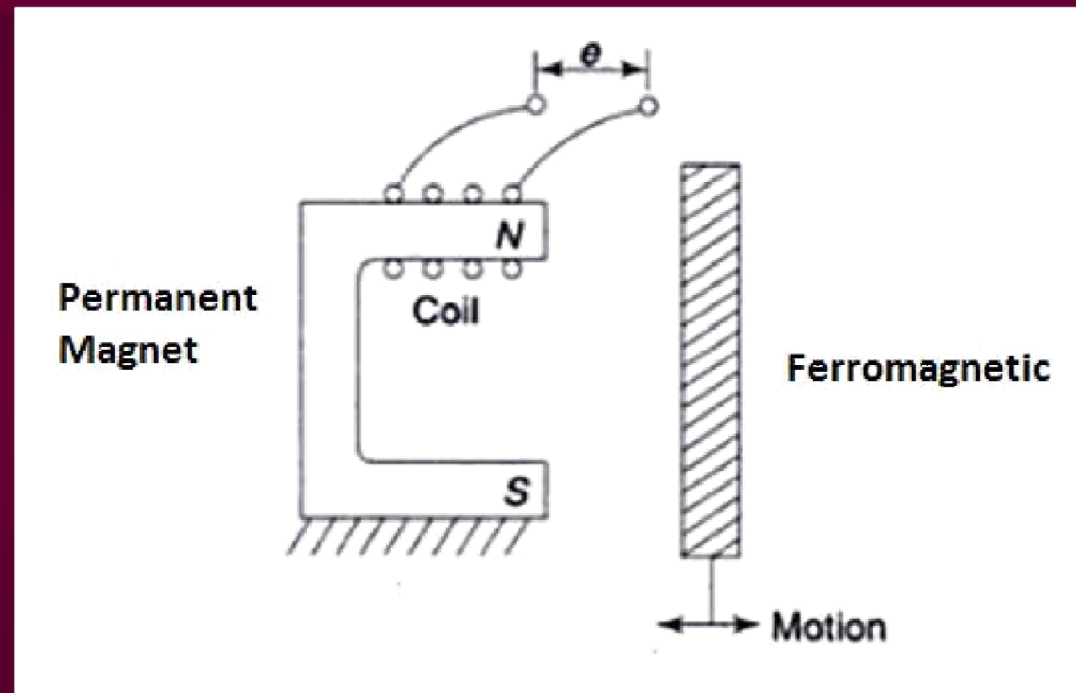
VARIABLE INDUCTANCE TRANSDUCER

These are based on a change in the magnetic characteristic of an electrical circuit in response to a measurand which may be displacement, velocity, acceleration, etc.

1. **Self-generating type:** Voltage is generated because of the relative motion between a conductor and a magnetic field.
 - Electromagnetic type
 - Electro-dynamic type
 - Eddy Current type
2. **Passive type:** Motion of an object results in the inductance of the coils of the transducer.
 - Variable reluctance
 - Mutual inductance
 - Differential transfer type

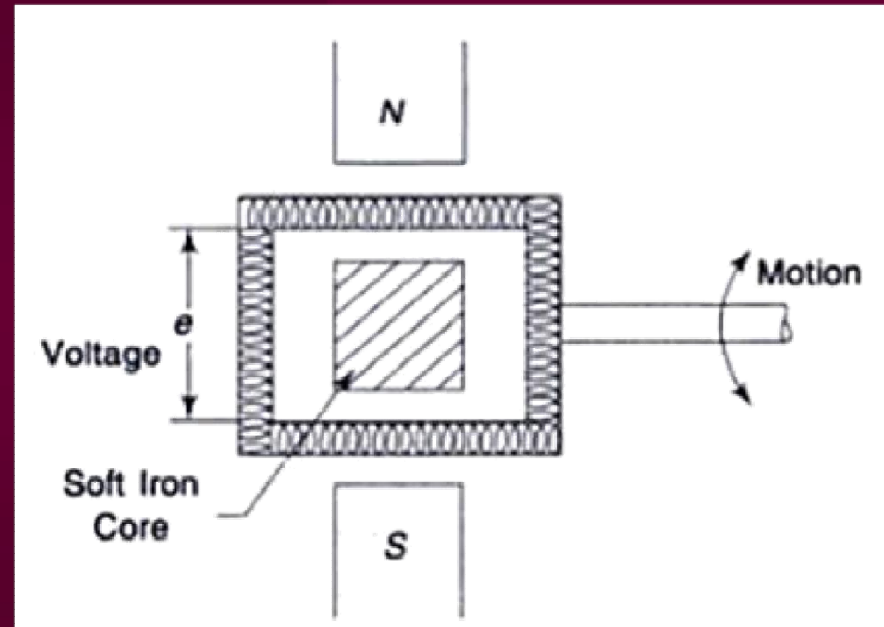
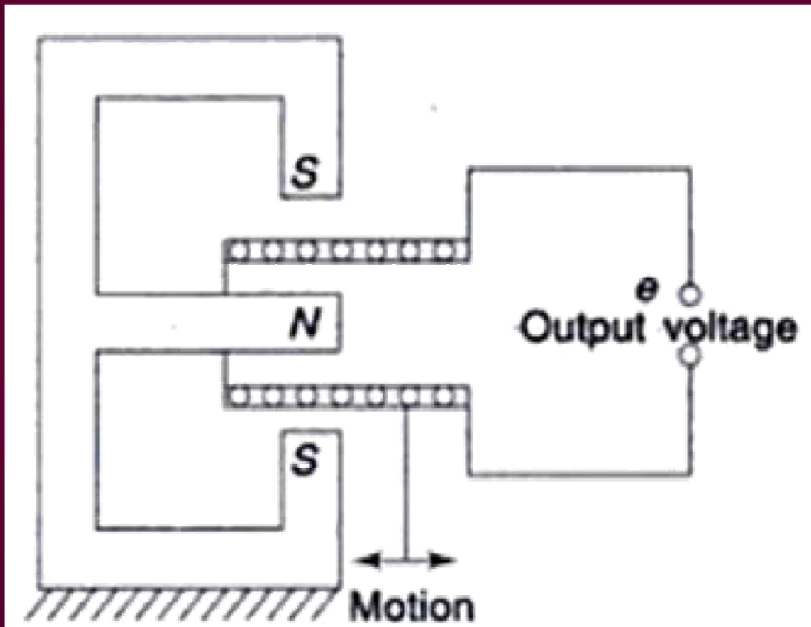
Electromagnetic Type Transducer

- When a plate of iron or other ferromagnetic material is moved w.r.t. the magnet, the flux field expands or collapses and a voltage is induced in the coil.
- Used for indication of angular speed.
- Speed can be measured when the pick-up is placed near the teeth of a rotating gear.



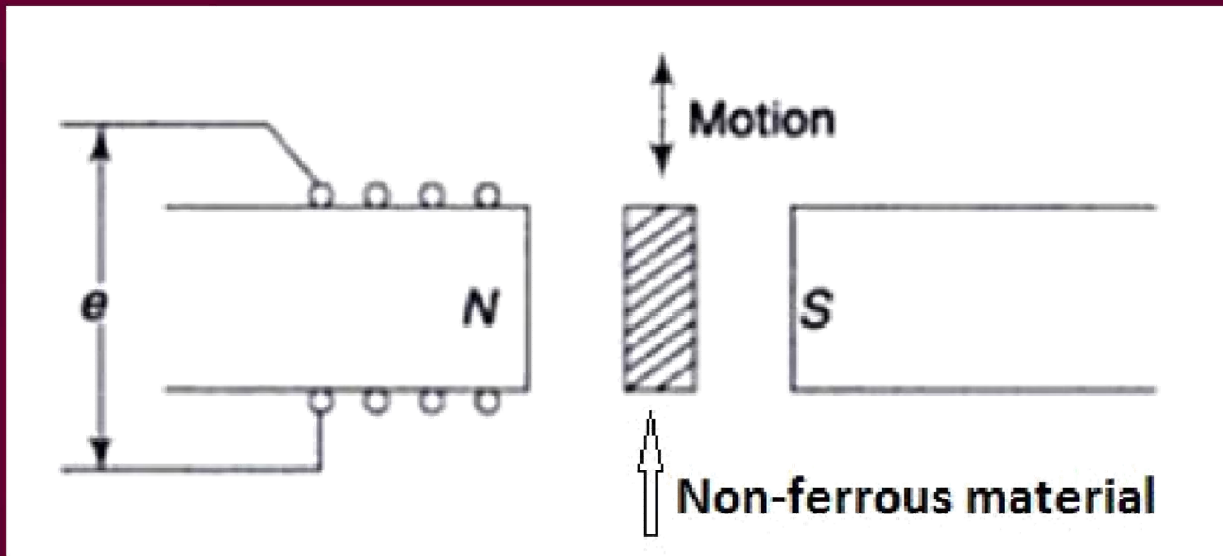
Electro-dynamic Type Transducer

- Coil moves within the field of magnet. The turns of the coil are perpendicular to the intersecting lines of force.
- When the coil moves it induces a voltage which at any moment is proportional to the velocity of the coil.
- Used in magnetic flow meters.



Eddy Current Type

- When a plate of nonferrous material is moved cutting magnetic flux lines, a voltage is induced in the coil.

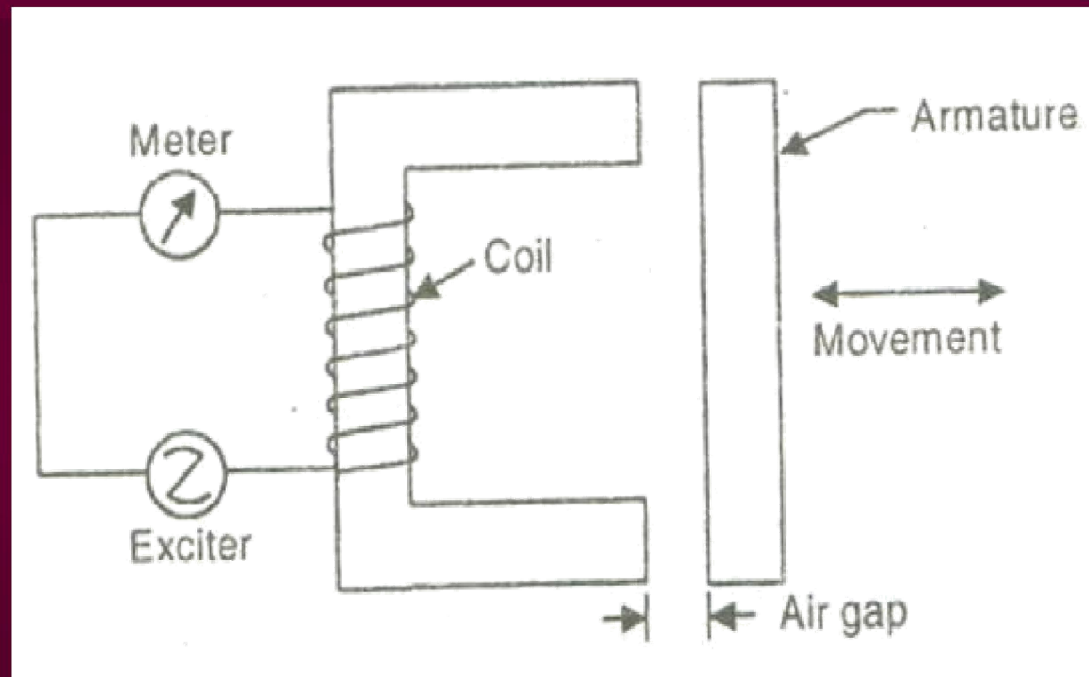


Variable Reluctance Transducer

- Magnetic circuit reactance may be changed by affecting a change
 1. In the air gap (reluctance type) or
 2. In the amplitude/type of core material (permeance type)

In variable reluctance type transducer, the change in inductance may be calibrated in terms of movement of armature.

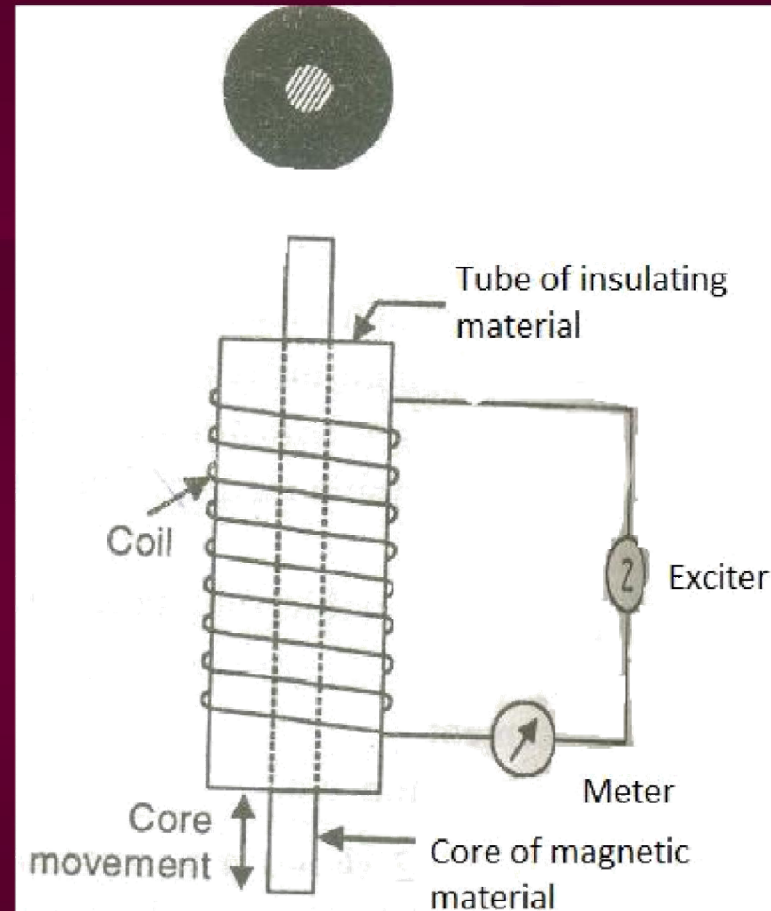
- Used for measurement of dynamic quantities such as pressure, force, displacement, acceleration, angular position, etc.



In Variable Permeance type Transducer the

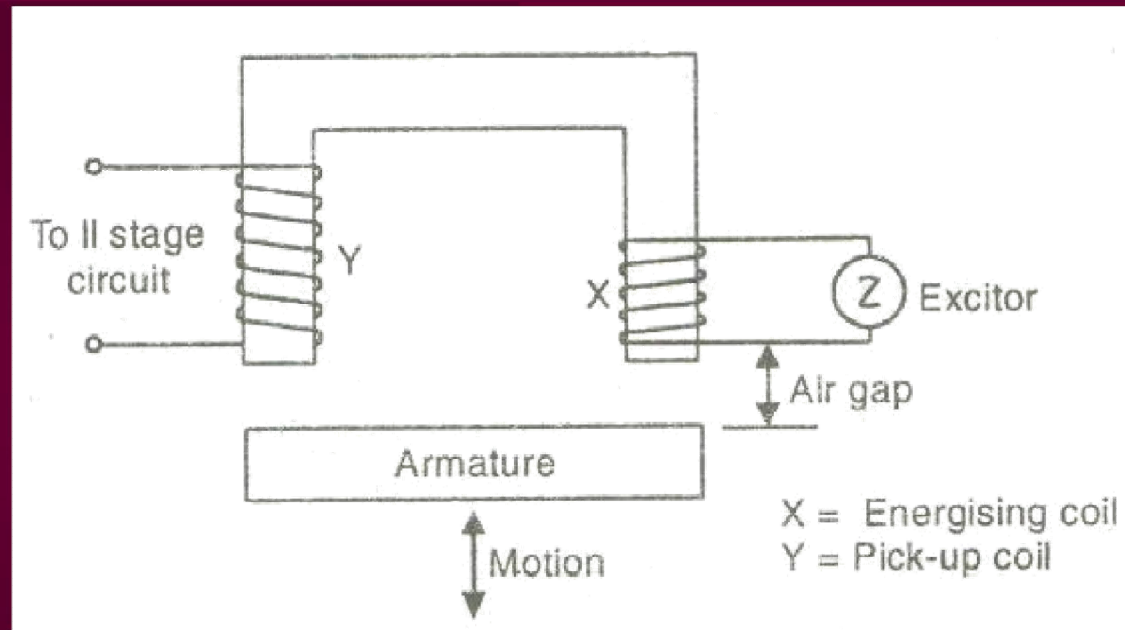
inductance of coil is changed by varying the core material.

- When the coil on insulating tube is energized and the core enters the solenoid cell, the inductance of the coil increases in proportion to the amount of metal within the coil.
- Used for measurement of displacement, strain, force, etc.



Mutual Inductance Transducer

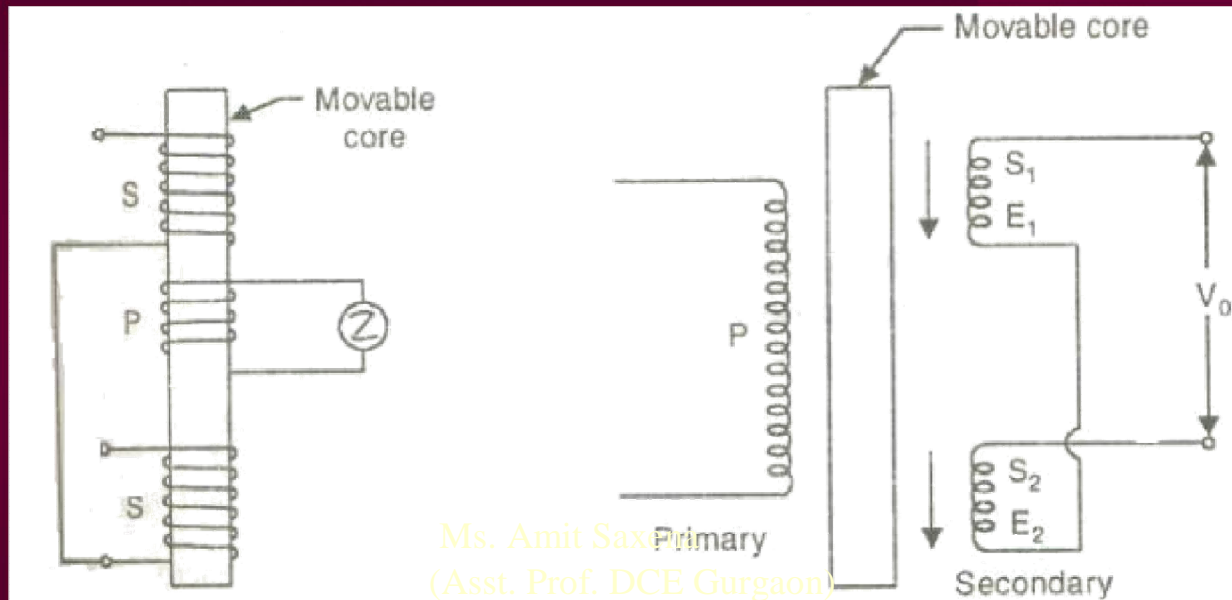
- A change in the position of armature by a mechanical input changes the air gap. This causes a change in output from coil Y, which may be used as measure of the displacement of mechanical input.



Linear Variable Differential Transformer (LVDT)

- Passive inductive transformer
- Used to measure force (or weight, pressure, acceleration etc which depend on force.

LVDT (Linear Motion Type)



Linear Variable Differential Transformer (LVDT)

LVDT (Rotary Motion Type)

