

## 2.6 ROTOR POSITION SENSOR

Rotor position information is important for the operation of SRM. Rotor angle information must be accurate for the high speed drives. Inaccurate position sensing results in decreased torque & efficiency. In high speed motors, error in  $1^\circ$  decreases the torque by 8%. Position sensing sensor is enough.

### Disadvantages of electro mechanical sensors are:

Unreliable due to dust, high temperature, humidity, vibration.

Cost increases with resolution.

Additional manufacturing expenses.

Extra electrical connections.

Need more space at the shaft.

To overcome the above problems, sensor less rotor position estimation methods are developed. Sensor less methods employ motor electrical parameters for position detection.

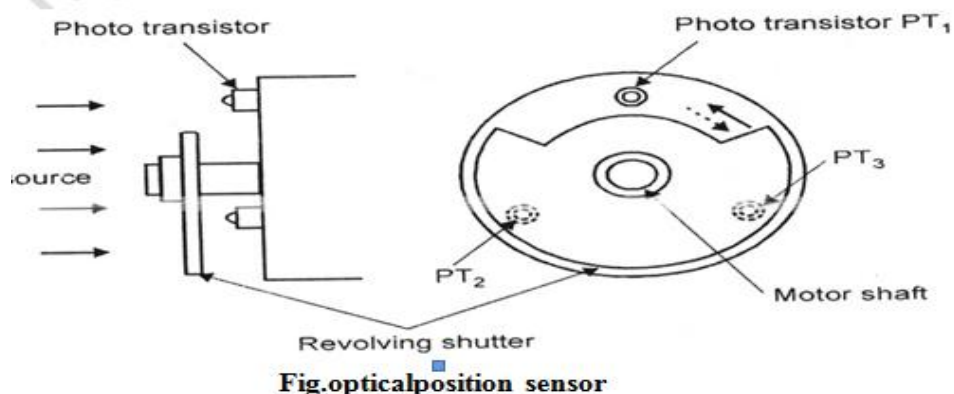


Fig. optical position sensor

## 1. HALL POSITION SENSOR:

- Based on Hall principle.
- On rotor shaft, 3 hall components, rotating plate with permanent magnet.
- Output of hall components indicates the rotor position.
  - ❖ Observer based sensing methods
  - ❖ Incremental inductance based sensing
  - ❖ Direct inductance based sensing
  - ❖ Intelligent control based sensing methods

Observer based sensing methods:

Use a state observer or a sliding mode observer

Depends on the inductances lobe for their convergence and functioning.

Computationally intensive and have the problem of convergence