2.14 Types of Sensors

There are two types of sensors. They are

(i) Intrinsic Sensors or Active sensors

(ii) Extrinsic Sensors or Passive sensors

Displacement sensor

Definition

It is a sensor which is used to sense and measure the displacement of an object.

Construction

It consists of a bundle of transmitting fibers connected to a laser source and a bundle of receiving fibers connected to a detector. (figure)

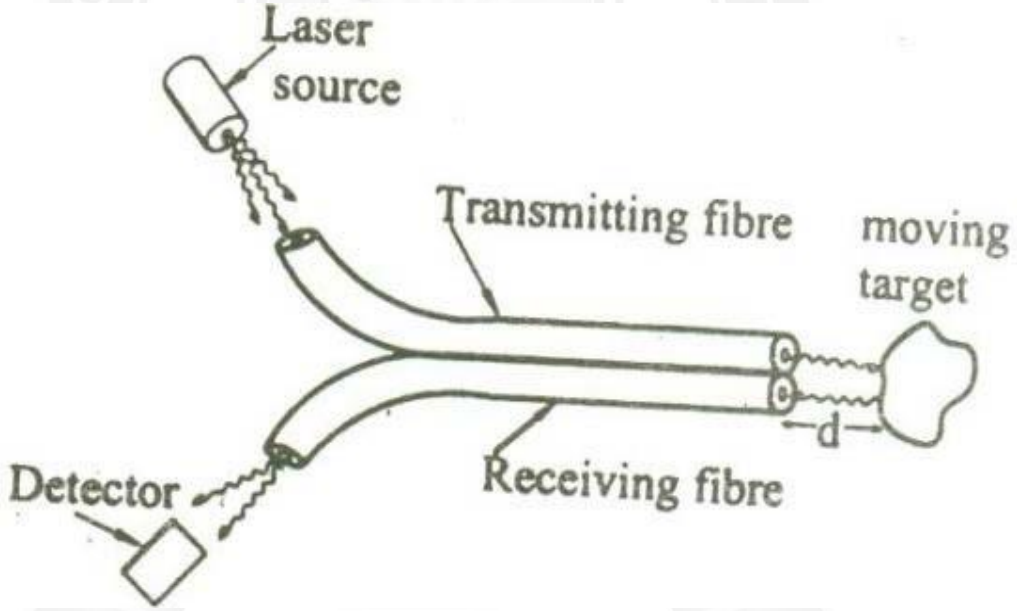

Fig 2.14.1 Displacement sensor

Working

First the light from the laser source is transmitted through transmitting fiber and it falls on the moving target.

The reflected beam from the target is made to passes through the receiving fiber and this light is detected by the detector. The intensity of the light received back depends on the displacement of the target.

If the received intensity increases, it denotes that the target is moving towards the sensor. If the intensity of light received decreases, it denotes that the target is moving away from the sensor.

Thus, the displacement of the target

Pressure Sensor

Principle :

It is based on the principle of interference between the beams emerging out from the reference fibre and the fibre kept in the measuring environment.

Description:

It consists of a Laser source to emit light.A beam splitter, made of glass plate is inclined to an angle of 45 degrees with respect to the direction of laser beam.There are two fiber namely

i)Reference fiber- which is isolated from the environment.

i) Test fiber – Seperate lens systems are provided to spit and to collect the beam.

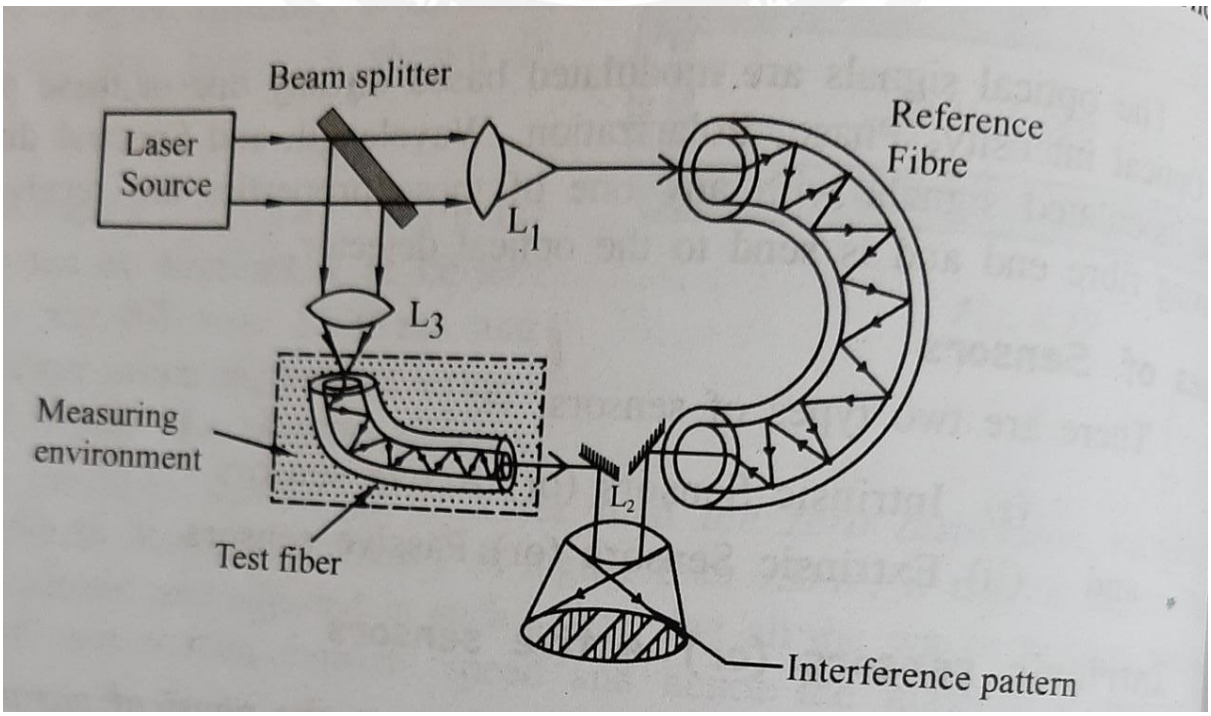

Fig 2.14.2 Pressure Sensor

Working:

1.Monochromatic source of light is emitted from the laser source.

2.The beam splitter kept at 45 degrees divides the beam emerging from the laser source into two beams

i)Main beam

ii)Splitted beam

3)The main beam passes through the lens L1 and is focussed onto the reference fibre.

4) The beam ,after passing through the reference fibre,falls on the lens L2.

5)The splitted beam passes through the lens L3 and is focussed onto the test fibre.

6) The splitted beam after passsing through the the test fibre is made to fall on the lens L2.

7) The two beams ,after passing through the fibre,produces a path difference,due to the change in pressure and temperature .

8)Therefore a path difference is produced between the two beams,causing the interference pattern.

9)Thus the change in pressure can be accurately measured with the help of the interference pattern obtained.