

### 1.2.2 Resistive:

Resistive sensors are devices that change their resistance in response to changes in a physical quantity. They are commonly used to measure various parameters such as temperature, pressure, displacement, and humidity. Here's an overview:

#### How They Work

- **Principle:** The operation of resistive sensors is based on the principle that the resistance of a material changes with variations in physical quantities.
- **Measurement:** The change in resistance can be measured using a simple electrical circuit, often involving a voltage divider or Wheatstone bridge, to convert the resistance change into a voltage change that can be easily measured.

#### Types of Resistive Sensors

1. **Thermistors:** Used to measure temperature changes, these sensors have a resistance that varies significantly with temperature.
2. **Strain Gauges:** Measure force, pressure, or mechanical stress. The resistance of the strain gauge changes when it is deformed.
3. **Potentiometers:** Measure angular or linear displacement. The resistance changes as the wiper moves along the resistive element.
4. **Humidity Sensors:** Some humidity sensors use resistive materials that change resistance based on the moisture content in the air.

#### Applications

- **Environmental Monitoring:** Used in weather stations and HVAC systems to monitor temperature and humidity.
- **Automotive:** Used to measure various parameters like throttle position and air intake temperature.
- **Industrial:** Used in machinery to monitor stress and deformation.

#### Advantages

- **Simplicity:** Often simple in design and easy to interface with electronic circuits.
- **Cost-Effectiveness:** Generally inexpensive compared to other types of sensors.

#### Disadvantages

- **Sensitivity to Environmental Factors:** Can be affected by environmental conditions such as temperature and humidity.
- **Non-linear Response:** Some resistive sensors may have a non-linear response, requiring calibration or compensation in the measurement system.

Resistive sensors are versatile and widely used across various fields due to their simplicity and effectiveness in measuring different physical quantities.



Fig: Resistive Sensor

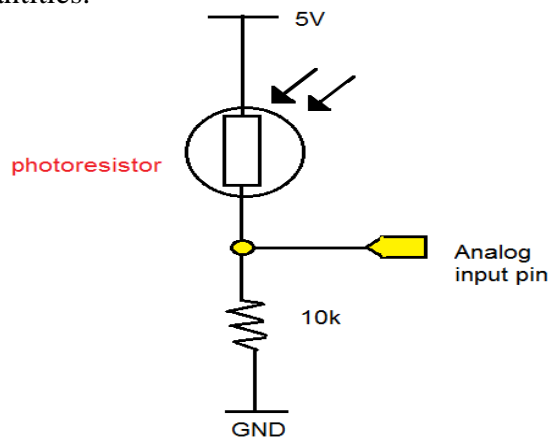


Fig: How Resistive Sensor Works

