Sensors from SMC :)

What is a sensor?

A sensor is device that collect information about the world around it. Sensor operate on the principle of transduction: the conversion of energy from one form to another.

Classification of sensors

Level 1: Propioceptive / Exteroceptive

Level 2: Contact / Non-contact

Level 3: Active / Passive

Level 4: Type of detection (contact, sound, electromagnetic spectrum or chemical concantracion)

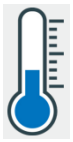
What can they detect?

- Presence

- Location or dimension

- Chemical composition

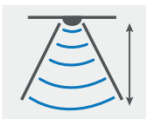
- Temperature



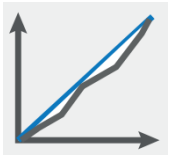
- Color

Characteristics of sensors

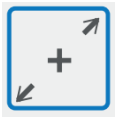
- Measuring range



- Linearity



- Resolution



- Response time

- Sensivity

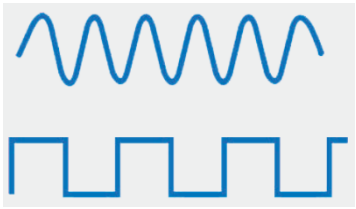
- Offset or Zero deviation

- Repeatability

- Drift

- Precision and accuracy

- Types of signal output: Analog or digital



Types of sensors

Proximity sensors

Contact proximity sensors

Contact proximity sensors must make physical contact with an object to determine if it is present or absent.

Normally open sensor

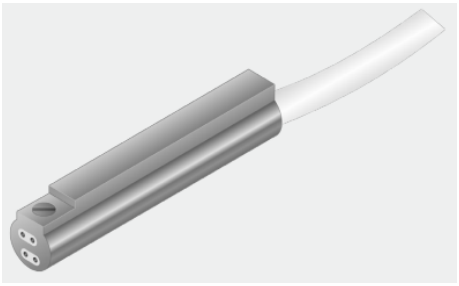
Normally closed sensor

Non-contact proximity sensors

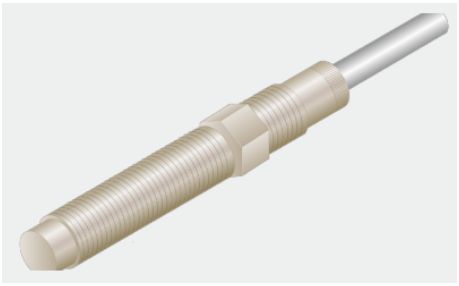
They are able to detect the presence of nearby object without any contact.

Magnetic sensors

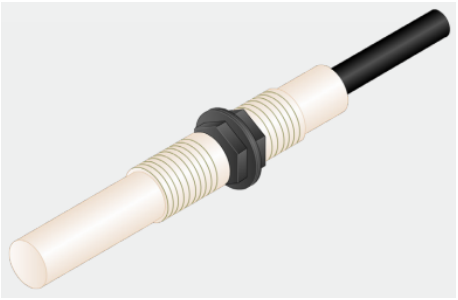
Reed switch



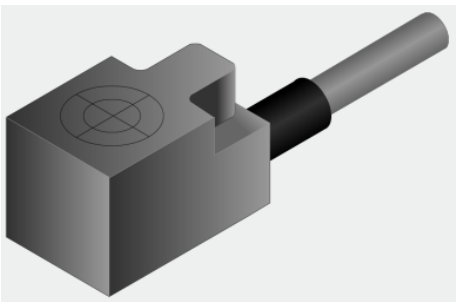
Hall effect sensor



Capacitive sensors

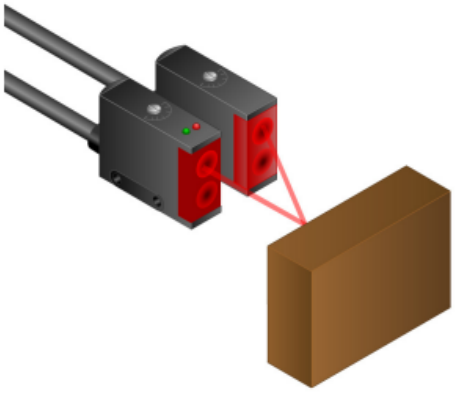


Inductive sensors

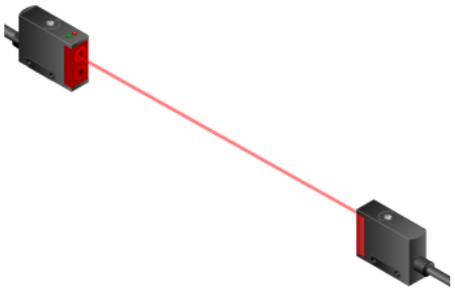


Photoelectric sensors

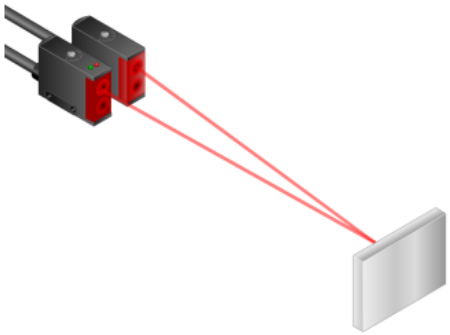
Diffuse sensor



Through beam sensor

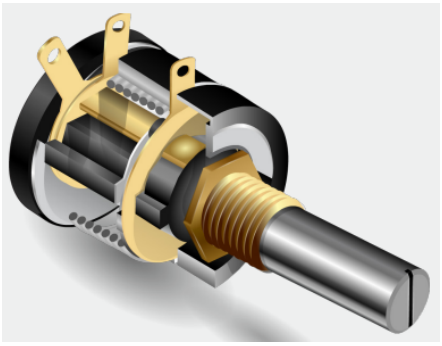


Retro-reflective sensor



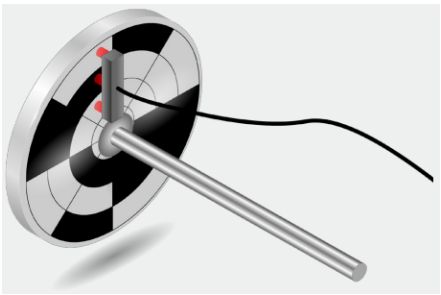
Position, speed and acceleration sensors

Position Potentiometer

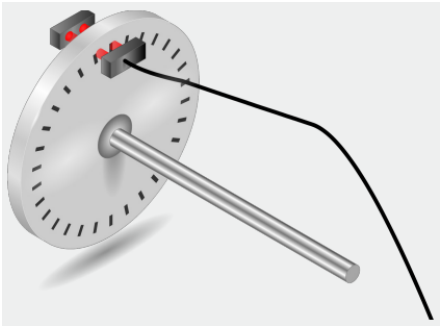


Linear encoder

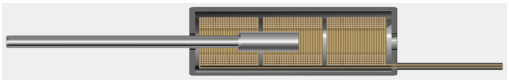
Rotary encoder Absolute



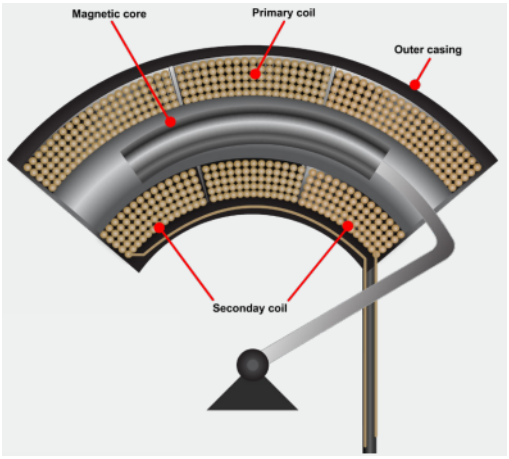
Incremental



Linear variable differential transformer (LVDT)



Rotary variable differential transformer (RVDT)



Speed

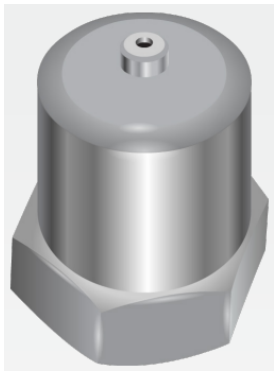
There are many sensors to measure the speed: Linear and rotary encoders, LVDT, RVDT, etc.

Acceleration

Acceleration sensors are used to measure forces on an object that are a result of:

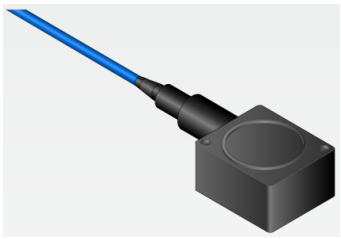
- Fall
- Tap
- Tilt
- Shock
- Vibration

Piezoelectric



Hall effect

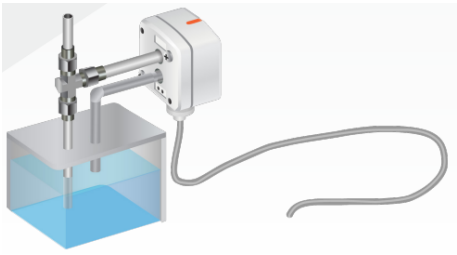
Capacitive



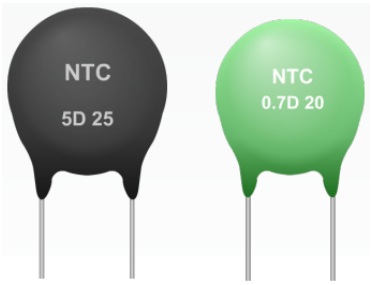
Process control sensors

Pressure sensor

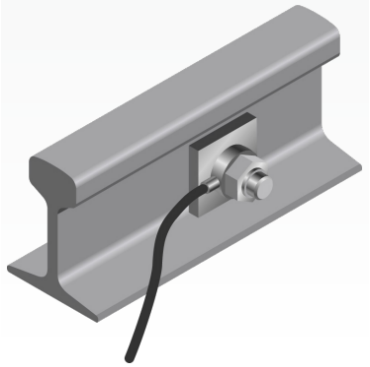
Flow sensor



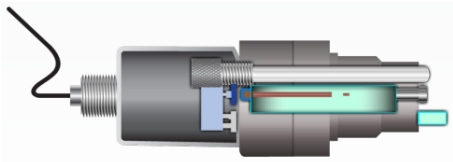
Level sensor



Temperature sensor



Load sensor



pH sensor