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)
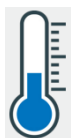
What can they detect?

- Presence

- Location or dimension
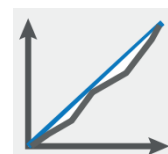
- Chemical composition

- Temperature

- Color

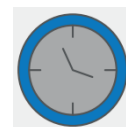## Characteristics of sensors

- **Measuring range**

- **Linearity**

- **Resolution**

- **Response time**

- **Sensivity**

- **Offset or Zero deviation**
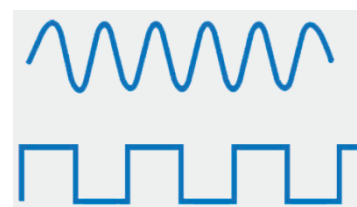
- **Repeatability**

- **Drift**

- **Precision and accuracy**

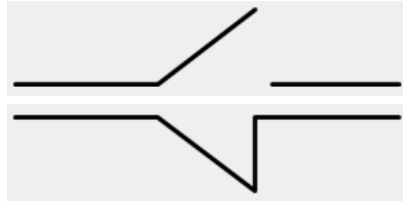- **Types of signal output: Analog or digital**
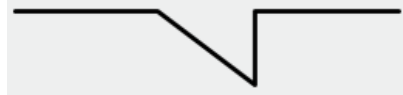
Types of sensors

Proximity sensors

Contact proximity sensors

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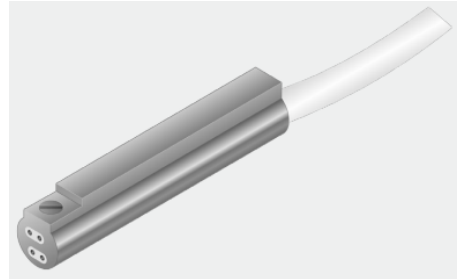
Normally open sensor	
Normally closed sensor	

Non-contact proximity sensors

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

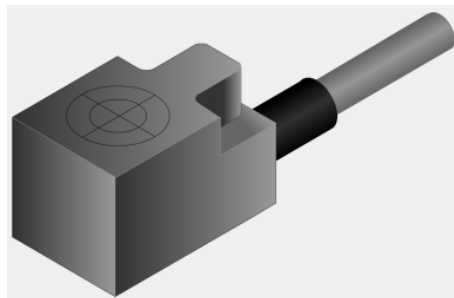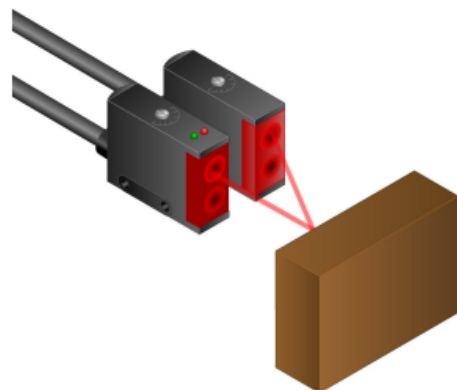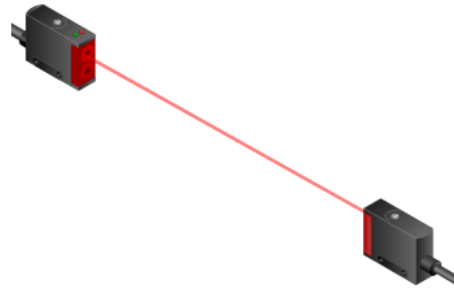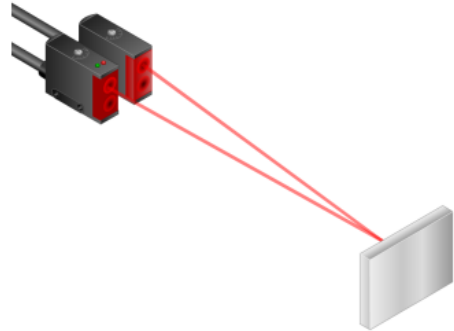|		
Magnetic sensors	Reed switch	
	Hall effect sensor	
Capacitive sensors		
Inductive sensors		
Photoelectric sensors	Diffuse sensor	

Through beam sensor

Retro-reflective sensor
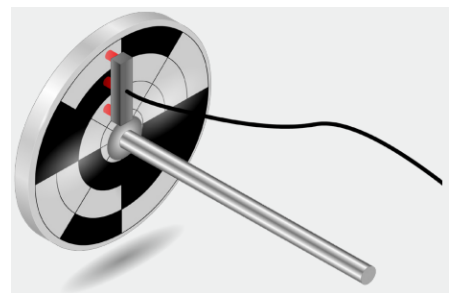
Position, speed and acceleration sensors

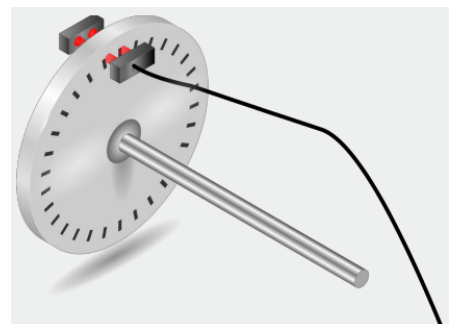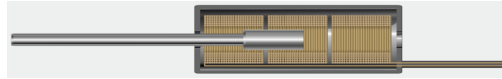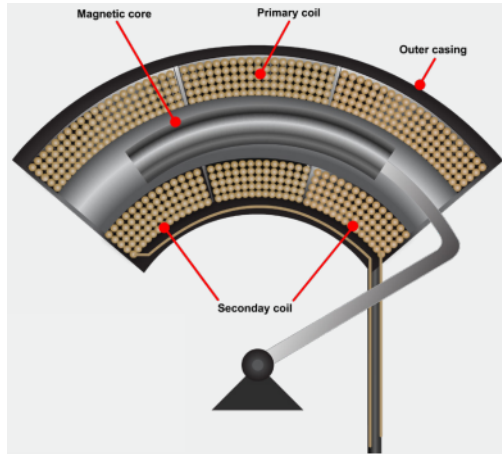| **Position**	Potentiometer	
	Linear encoder	
	Rotary encoder	Absolute
		Incremental
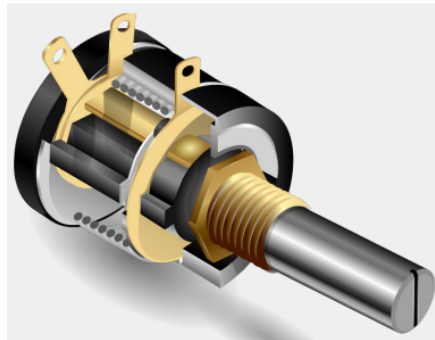
Linear variable
differential
transformer (LVDT)

Rotary variable
differential
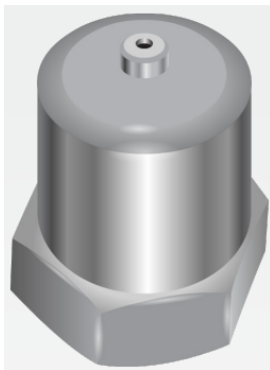transformer (RVDT)

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:
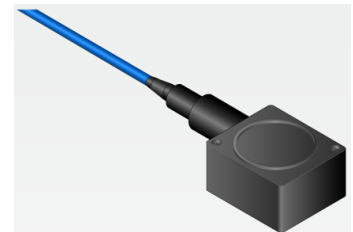
- Fall
- Tap
- Tilt
- Shock
- Vibration

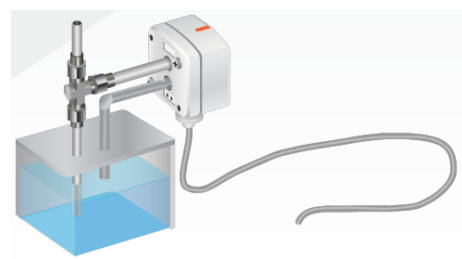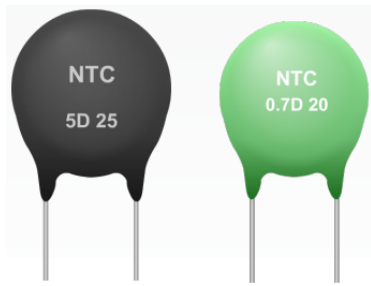| Piezoelectric	Hall effect	Capacitive

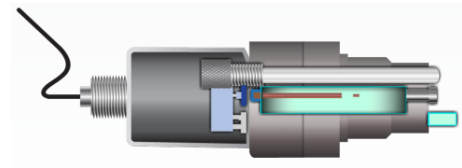**Process control sensors**

Pressure sensor	Flow sensor	Level sensor

Temperature sensor

Load sensor

pH sensor