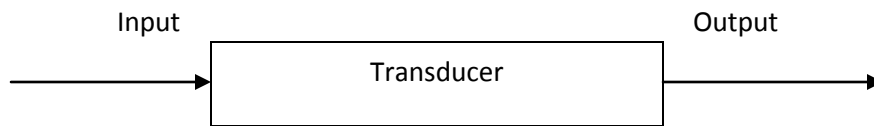


TRANSDUCERS

A transducer is a device where an input of some kind gives an output of some other kind. This is usually an electronic output.



Examples of Transducers:

- Light dependent resistors
- Thermistor
- The microphone

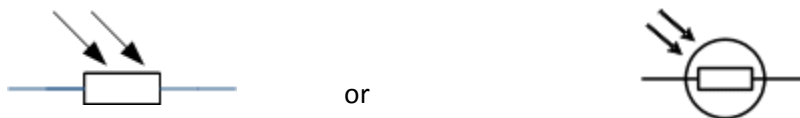
The examples above are referred to as input transducers since they are usually placed at the beginning of a circuit.

- Light emitting diode
- Buzzer

These last two are referred to as output transducers since they are usually placed at the end/output of a circuit.

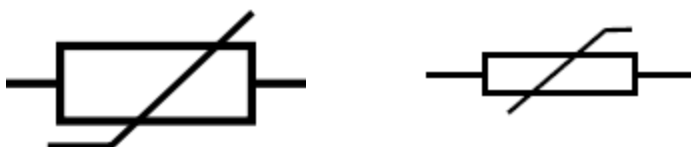
Light dependent Resistor

This is made of a semi conducting material and its resistance depends on the amount of light falling on it. In bright light, its resistance is in the order of kilo ohms or less. In darkness, it is to the order of Mega ohms.



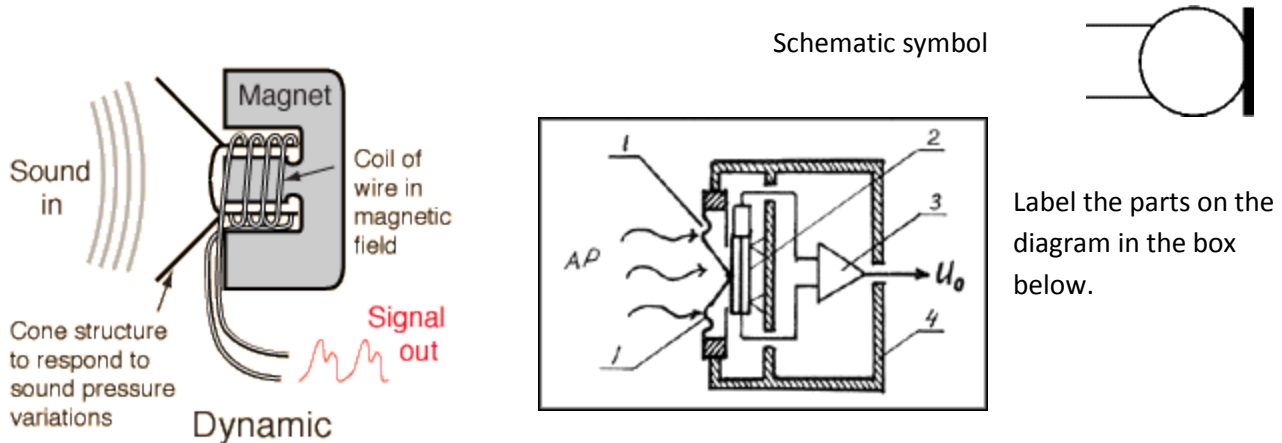
Thermistor

Like the LDR, the Thermistor is made from semi-conducting material, but its resistance depends on its temperature. There are two types of Thermistor. One whose resistance increases with increasing temperature and one whose resistance decreases with increasing temperature.



Microphone

The input to the microphone is sound energy while its output is electrical energy. Some microphones are of the moving coil type while some use the piezoelectric effect. The **piezoelectric effect** is the generation of an electric charge in certain nonconducting materials, such as quartz crystals and ceramics, when they are subjected to mechanical stress (such as pressure or vibration), or the generation of vibrations in such materials when they are subjected to an electric field. Piezoelectric materials exposed to a fairly constant electric field tend to vibrate at a precise frequency with very little variation.



Piezoelectric



Light Emitting Diode

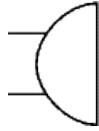
This is made of semi conducting material and emits light when a current is passed through it. They are low powered devices and come in many colors. Like a common diode, the LED (Light Emitting Diode) consists of a P-N contact. When a P-N junction is forward biased, current flows within it. This current flow will cause electrons and holes to move in a manner that an electron will move to fill a hole. When this happens, the electron will fall to a lower energy level and this will release an amount of energy in the form of photons. In a larger scale, those photons will produce light.

The LED should not be directly connected across the power source. Instead, a protective resistor reduces the current-flow in the circuit. This is because LEDs are very sensitive to over current. 10% current above the nominal will significantly decrease the lifetime of the device. Greater current will destroy the LED within seconds.



Buzzer

This is an electric oscillator circuit connected to a sounder (small speaker) which is wired and sealed in a small plastic case.



END OF TRANSDUCERS