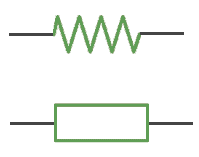
# Types of Resistors

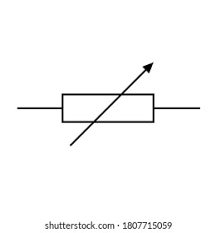
Resistors can be seen in almost all electronic circuits. There are many types of resistors and they can be divided into two groups namely fixed resistor and adjustable [resistor](https://www.codrey.com/resistor/resistor-basics/) (variable resistor). The main function of the [resistor](https://www.codrey.com/resistor/resistor-basics/) is to resist the flow of [electric current](https://www.codrey.com/dc-circuits/what-is-electric-current/) and regulate the flow of electrons. This is done by the material from which they are composed. They are mainly categorized on the basis of their applications, temperature coefficient, tolerance, size, power, reliability, voltage, etc.

**Fixed Resistors**:

Fixed resistors are the type of resistors which offers a fixed amount of [resistance](https://www.codrey.com/resistor/electrical-resistance/) in the circuit. A fixed resistor cannot be changed as it is set at a specific value.



**Variable Resistors:**



Variable resistors are the type of resistors in which the value of [resistance](https://www.codrey.com/resistor/electrical-resistance/) is not fixed. We can change the value of resistance in variable resistors.

## Construction

Fixed value resistors are the resistors which have fixed value and their value does not change on change of value or current. These fixed value resistors can further be divided according to their construction into carbon composition resistors, carbon film resistors, metal oxide film and wire-wound resistors.

#### Carbon composition Resistor

Carbon composition resistors were used for over 100 years but are rarely used today. They are large as compared to our general resistors. Carbon composition resistors are made by mixing carbon granules with the help of binder which is a binding agent and then converted into a small rod. The biggest advantage of these resistors is that they can withstand a high level of energy pulses. Although they have many disadvantages like big size, noise, high negative temperature coefficient, and instability.

#### Carbon film Resistor

Carbon film resistors have the carbon film on the ceramic former and they are covered with insulation coating material like epoxy (for protection). This type of resistor is not used today as superior resistor technologies are available in lower cost. Carbon film resistors are formed by cracking of hydrocarbons on a ceramic former which makes carbon film on it.

#### Metal oxide film Resistor

This type of [resistor](https://www.codrey.com/resistor/resistor-basics/) is widely used today. They are far better than the carbon film resistors. Here, metal oxides (metal film) like tin oxide are deposited on the ceramic carrier. Then [resistance](https://www.codrey.com/resistor/electrical-resistance/) is adjusted by using the trimming line. The resistance varies depending upon the thickness of deposition and after that by helix curve. After that outer covering is covered by an epoxy protection layer (insulation coating).

#### Wire Wound Resistor

Wire wound resistors are made by winding metalcore (wire) on a ceramic former. The ceramic former is used in costly wire wound resistor. This gives more resistance than general. After winding wire, they are covered with vitreous or silicon enamel. The whole material is tightened with electrode cap. This type of resistor is used for high power applications.

## Variable Resistors

Variable resistors are of many types. They are mainly categorized on the basis of how the [resistance](https://www.codrey.com/resistor/electrical-resistance/) value of adjusted. Here, resistance value depends on the operator or other natural sources. They are mainly classified as Potentiometer (abbreviated as **Pot**), Light dependent resistor, thermistors.

#### Potentiometer

Potentiometers are the type of **variable resistors**. In potentiometer, there are three terminals and a rotating shaft which when rotated changes the value of resistance.

#### Light Dependent Resistor (LDR)

Light Dependent Resistors are shortly known as **LDRs**. LDR is a type of variable resistor in which the value of resistance changes with the light intensity that falls on it. Light-dependent resistors have a photosensitive track made up of cadmium and silicon which is sensitive towards the light.

#### Thermistors

The thermistor is an electrical resistor whose resistance is greatly reduced by heating, used for measurement and control.  Also, there are two types of thermistors:

**NTC (**Negative Temperature Coefficient)**thermistor**: In NTC thermistor, resistance decreases with increase in temperature.  The symbol of the NTC thermistor has -t because it has a negative temperature coefficient.

### There are some important applications of resistors are as given below:

1. [Resistors](http://www.polytechnichub.com/resistor/) are used in high frequency instrument.
2. Resistor is used in power control circuit.
3. It is used in DC power supplies.
4. Resistors are used in filter circuit networks.
5. It is used in amplifiers, [oscillators](http://www.polytechnichub.com/what-is-an-oscillator/), telecommunication and digital multimeter.
6. It is used in wave generators.
7. Resistors are used in transmitters, modulators and demodulators.
8. It is used in medical instrument.
9. It is used in instrumentation applications.
10. Resistor is used in voltage regulators.
11. It is used in feedback amplifiers.