

### 2.3 Protective device

Fuse.

Circuit Breaker.

Poly Switch.

RCCB.

Inrush Current Limiter.

Metal Oxide Varistor.

Gas Discharge Tube.

Lighting Arrester.



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#### Fuse

In electrical circuits, a fuse is an electrical device used to protect the circuit from overcurrent. It consists of a metal strip that liquefies when the flow of current through it is high. Fuses are essential electrical devices, and there are different types of fuses available in the market today based on specific voltage and current ratings, application, response time, and breaking capacity. The characteristics of fuses like time and current are selected to give sufficient protection without unnecessary disruption. Please refer to the link to know more about: [Different Types of Fuses and Its Applications](#)



Fuse

### Circuit Breaker

A circuit breaker is one kind of electrical switch used to guard an electrical circuit against short circuit otherwise an overload which will cause by excess current supply. The basic function of a circuit breaker is to stop the flow of current once a fault has occurred. Not like a fuse, a circuit breaker can be operated either automatically or manually to restart regular operation.

Circuit breakers are available in different sizes from small devices to large switch gears which are used to protect low current circuits as well as high voltage circuits. Please refer the link to know more about: Types of Circuit Breaker and Its Importance



**Circuit Breaker**

### Poly Switch or Resettable Fuse

A resettable fuse is a passive electronic component used for protecting electronic circuits from over-current mistakes. This device is also called as a poly switch or multi fuse or poly fuse. The working of these fuses is same as PTC thermistors in particular situations, however, work on mechanical transforms instead of charge-carrier-effects within semiconductors.

Resettable Fuses are used in several applications like power supplies in computers, nuclear or aerospace applications where substitution is not easy.



**Poly switch**

### RCCB or RCD

The RCD-residual current device (or) RCCB- residual current circuit breaker is a safety device which notices a problem in your home power supply then turns OFF in 10-15 milliseconds to stop electric shock. A residual current device does not give safety against short circuit or overload in the circuit, so we cannot change a fuse instead of RCD.

RCDs are frequently incorporated with some type of circuit breaker like an MCB (miniature circuit breaker) or a fuse, which guards against overload current in the circuit. The residual current device also cannot notice a human being due to by mistake touching both conductors at a time.

These devices are testable as well as resettable apparatus. A test button securely forms a tiny leakage condition; along with a reset button again connects the conductors after an error state has been cleared.



RCCB

### Inrush Current Limiter

This is one type of electrical a component used to stop inrush current for avoiding regular damage to apparatus and evade tripping circuit breakers and blowing fuses. The best examples of inrush current limiter device are Fixed resistors as well as NTC thermistors.

They present a high resistance firstly, which stops huge currents from flowing by turn-on. Because the flow of current will continue, NTC thermistors heat-up, permitting high flow of current throughout normal operation. These thermistors are generally much superior to measurement kind thermistors, which are intentionally planned for power applications.

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### Lightning Protection

The lightning protection includes MOV (metal oxide varistor) and gas discharge tube

### Metal Oxide Varistor

A varistor or VDR (voltage dependent resistor) is an electronic component and the resistance of this is changeable and depends on the applied voltage. The term varistor has been taken from the variable resistor. When the voltage of this component increases then the resistance decreases. In the same way, when an extreme voltage increases then the resistance will decrease significantly.

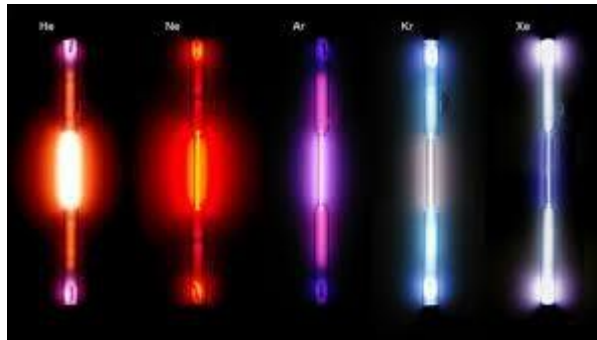
This performance creates them appropriate to guard electrical circuits throughout voltageflows. Origins of a flow can comprise electrostatic discharges as well as lightning strikes. The most frequent type of voltage-dependent resistor is the MOV (metal oxide varistor). Please refer the link to know more about varistor/voltage-dependent resistor circuit with working

### Gas Discharge Tube

A gas discharge tube or gas-filled tube is a collection of electrodes in a gas inside a temperature resistant envelope and insulating. These tubes use phenomena allied to electric discharge within gases, also work through ionizing the gas by an applied voltage enough to reason electrical conduction through the fundamental phenomena of the Townsend expulsion.

An expulsion lamp is an electrical device which uses a gas-filled tube such as metal halide lamps, fluorescent lamps, neon lights, and sodium-vapor lamps. Specific gas-filled tubes namely thyatron, ignitron, and krytron are employed as switching devices in various electrical devices.

The required voltage to begin and maintain discharge is reliant on the force, geometry of the tube, and composition of the fill gas. Even though the cover is normally glass, power tubes frequently employ ceramics, as well as military tubes frequently employ glass wrinkled metal.



Gas Discharge Tube