

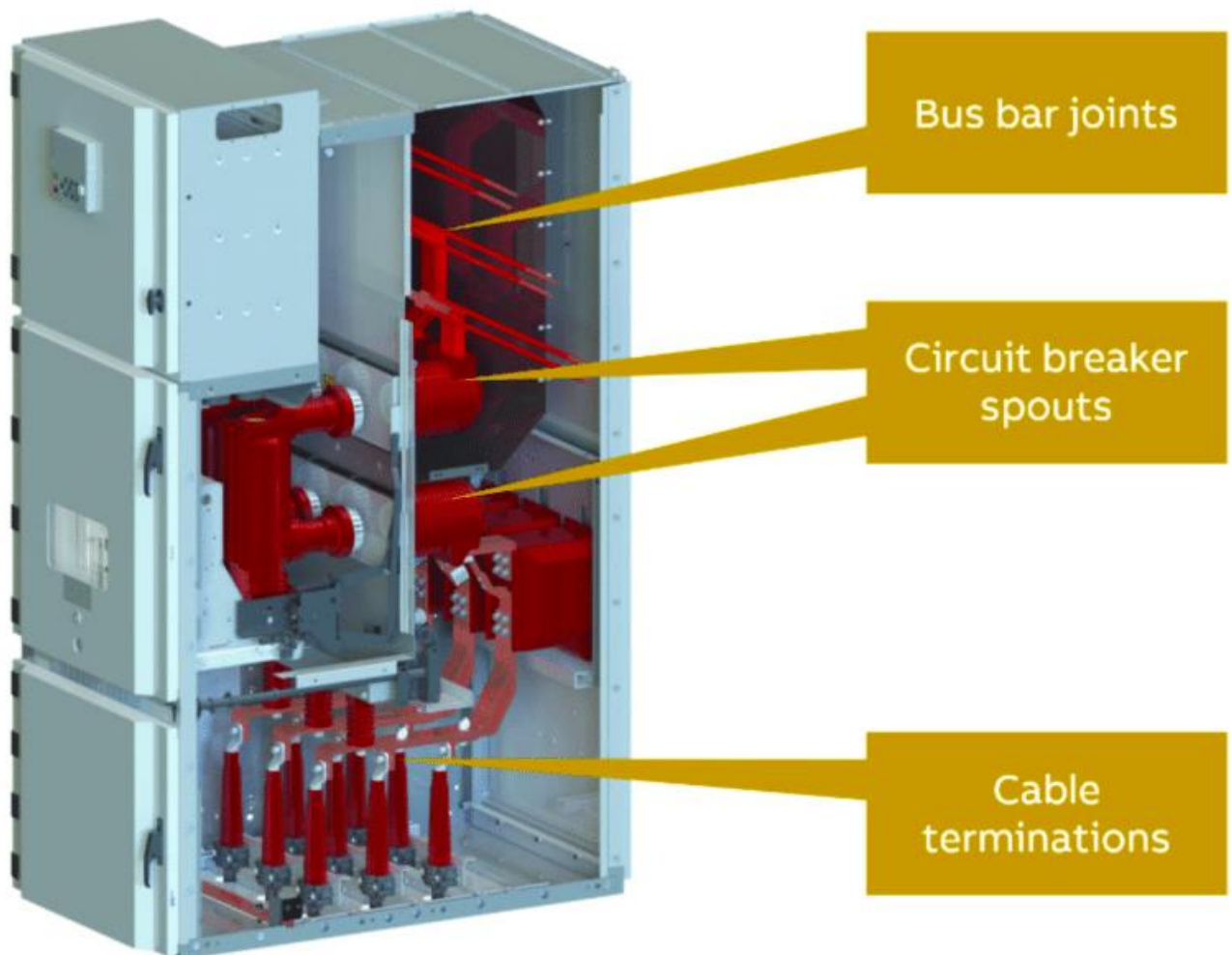
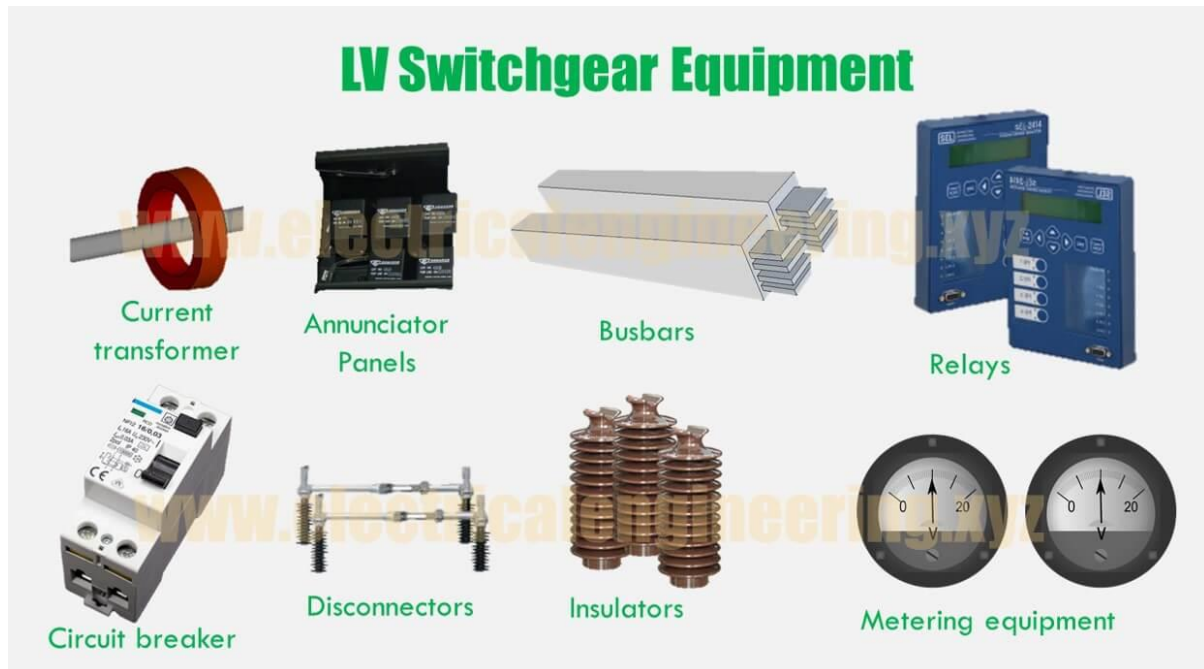


GANDHI SCHOOL OF
ENGINEERING, BHABANDHA, BERHAMPUR

**SUBJECT: SWITCH GEAR AND
PROTECTIVE DEVICES
SEMESTER: 6TH**

**SUBMITTED BY:-ER.GIRIDHAREE PRADHAN &ER.DEEPAK KUMAR
MAHARANA**

CHAPTER-1:INTRODUCTION TO SWITCHGEAR



CHAPTER-3: FUSES



Cartridge Fuse



Rewireable Fuse



Switch Fuse



Drop Out Fuse



MOV Fuse

DIFFERENT TYPES OF FUSES



Resettable POLYFUSE

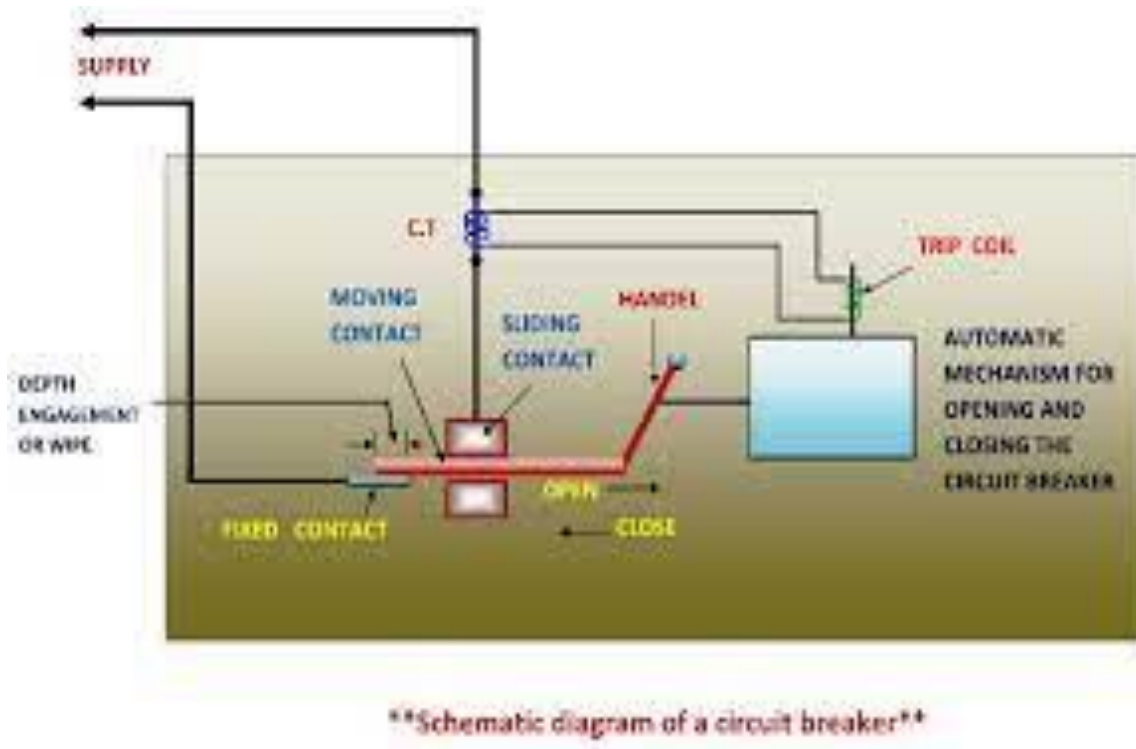


Automotive Fuse

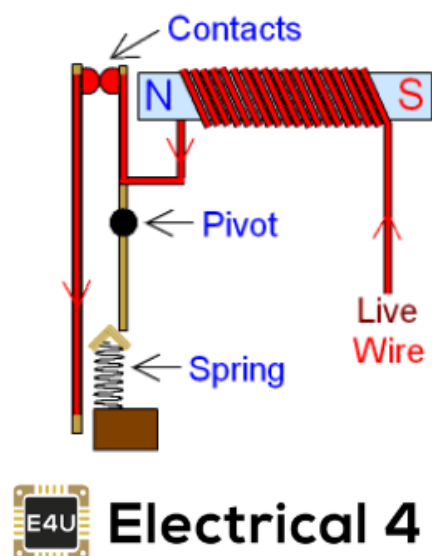
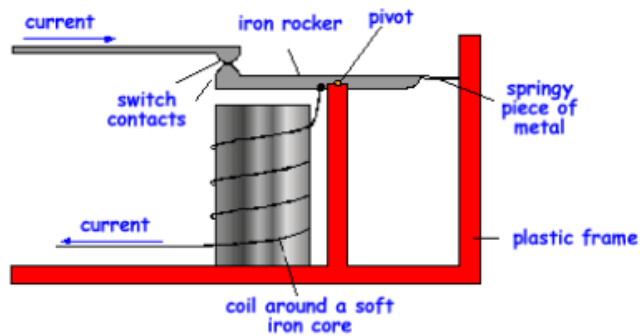


Expulsion Fuse

CHAPTER-4: CIRCUIT BREAKERS



What is a Circuit Breaker?



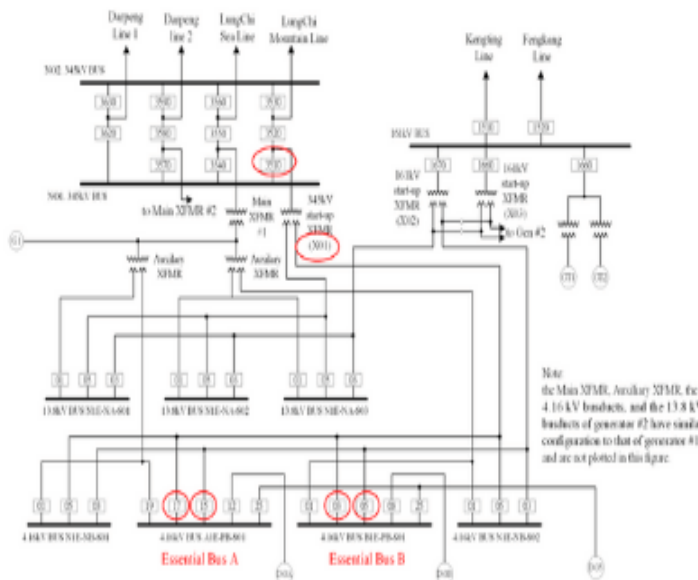
Electrical 4 U

The diagram illustrates a protection system for a busbar (Bus) and feeder. The main components and their connections are as follows:

- Busbar (Bus):** The top horizontal line representing the power source.
- Feeder:** The bottom horizontal line representing the load.
- Circuit Breaker (CB):** A rectangular box located between the Busbar and the Feeder.
- Current Transformer (CT):** A coil connected to the Feeder, used for current sensing.
- Potential Transformer (PT):** A coil connected to the Busbar and ground, used for voltage sensing.
- Relay:** A central component that receives input from the CT and the PT, and controls the Trip Contact.
- Trip Coil:** A coil connected to the Busbar and the CB, used for tripping the circuit breaker.
- Trip Contact:** A switch controlled by the Relay, connected to the Trip Coil and the CB.

The diagram shows the electrical connections between these components, including the CT, PT, Trip Coil, Trip Contact, and Relay, and how they are connected to the Busbar and Feeder.

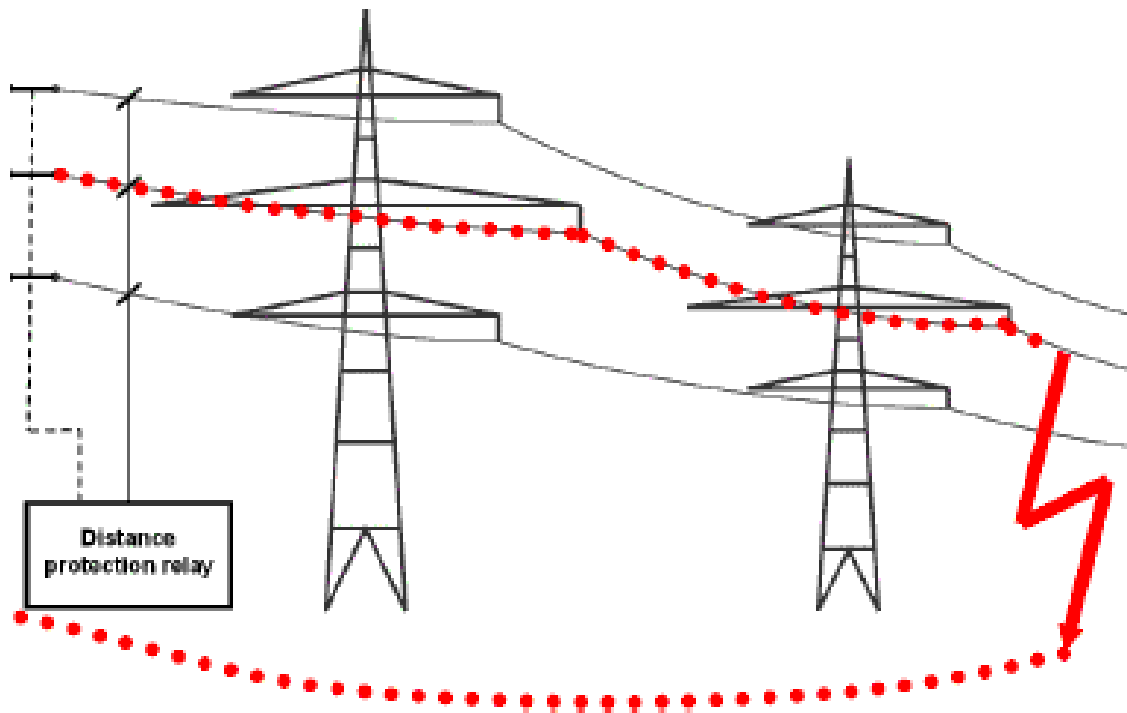
Power System Protection Systems



Basic connection diagram of protection relay



Electrical 4 U



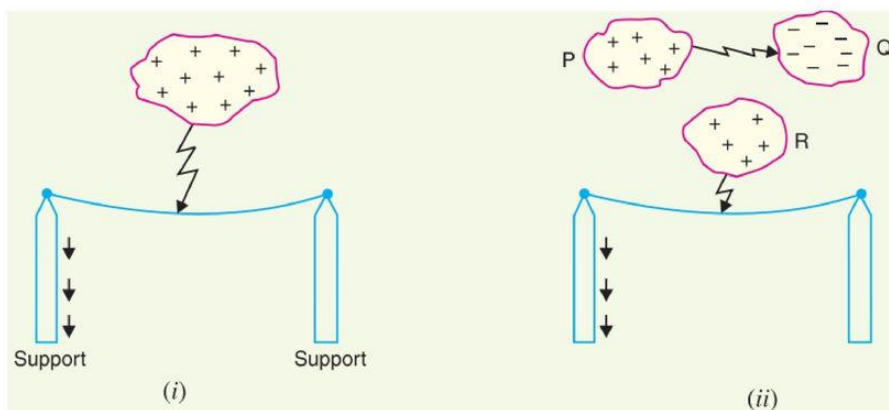
CHAPTER-5: PROTECTION AGAINST OVER VOLTAGE AND LIGHTNING

Types of Lightning Strokes

There are two main ways in which a lightning may strike the power system (*e.g.* overhead lines, towers, sub-stations etc.), namely;

- Direct stroke
- Indirect stroke

Direct stroke





Types of Lightning Arresters

Different types of lightning arrester



Horn Gap lightning
arreste



Rod Gap lightning
arrester



Multiple Gap lightning
arrester

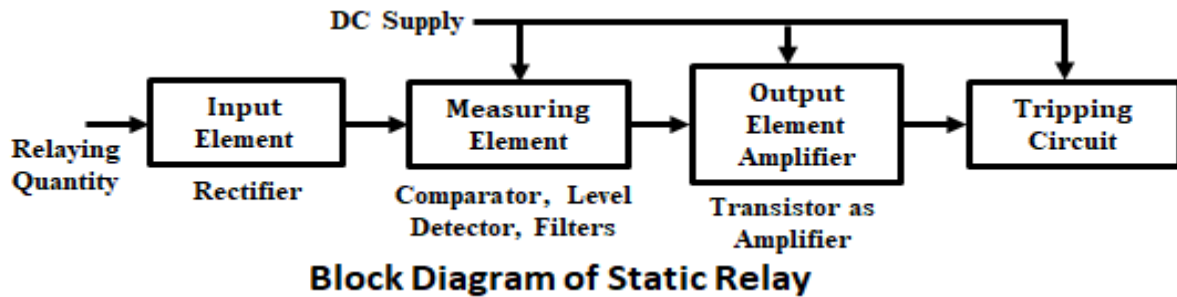


Oxide film lightning arrester

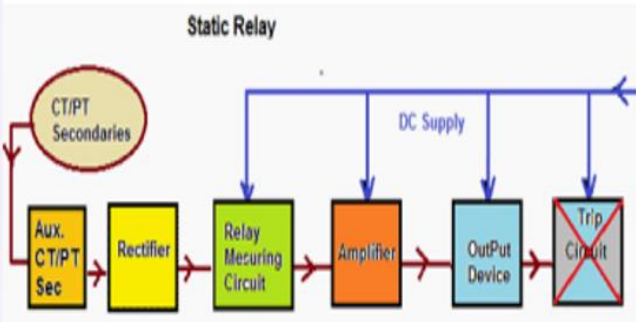



Thyrite lightning
arrester

CHAPTER-5: STATIC RELAY



EM Static Relay



The relay which does not contain any moving parts is known as the static relay. In such type of relays, the output is obtained by the static components like magnetic and electronic circuit etc. The relay which consists static and electromagnetic relay is also called static relay because the static units obtain the response and the electromagnetic relay is only used for switching operation.

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