ELEMENTS OF ELECTRICAL ENGINEERING
Course Code : UE25EE141A/B

PES UNIVERSITY

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ELEMENTS OF ELECTRICAL ENGINEERING

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Fuse, MCB, MCCB

Jyothi T.N
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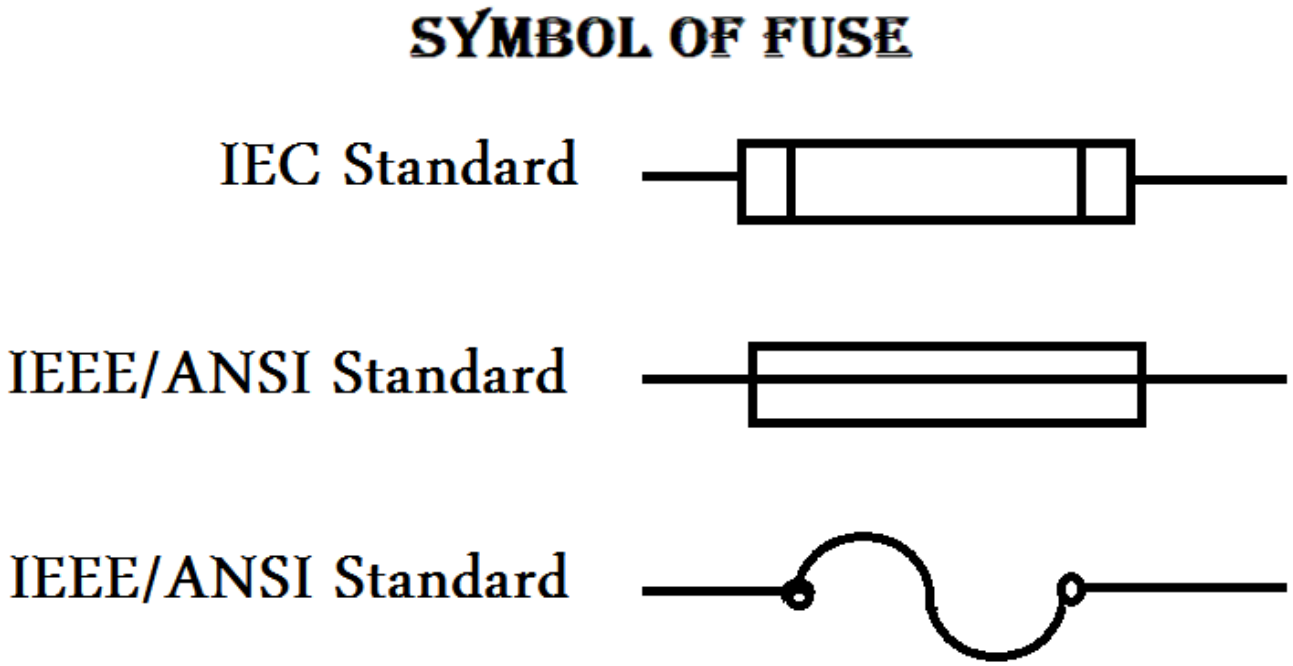
Fuse

- A fuse is an electric / electronic device, which is used to protect circuits from over current, overload and make sure the protection of the circuit.



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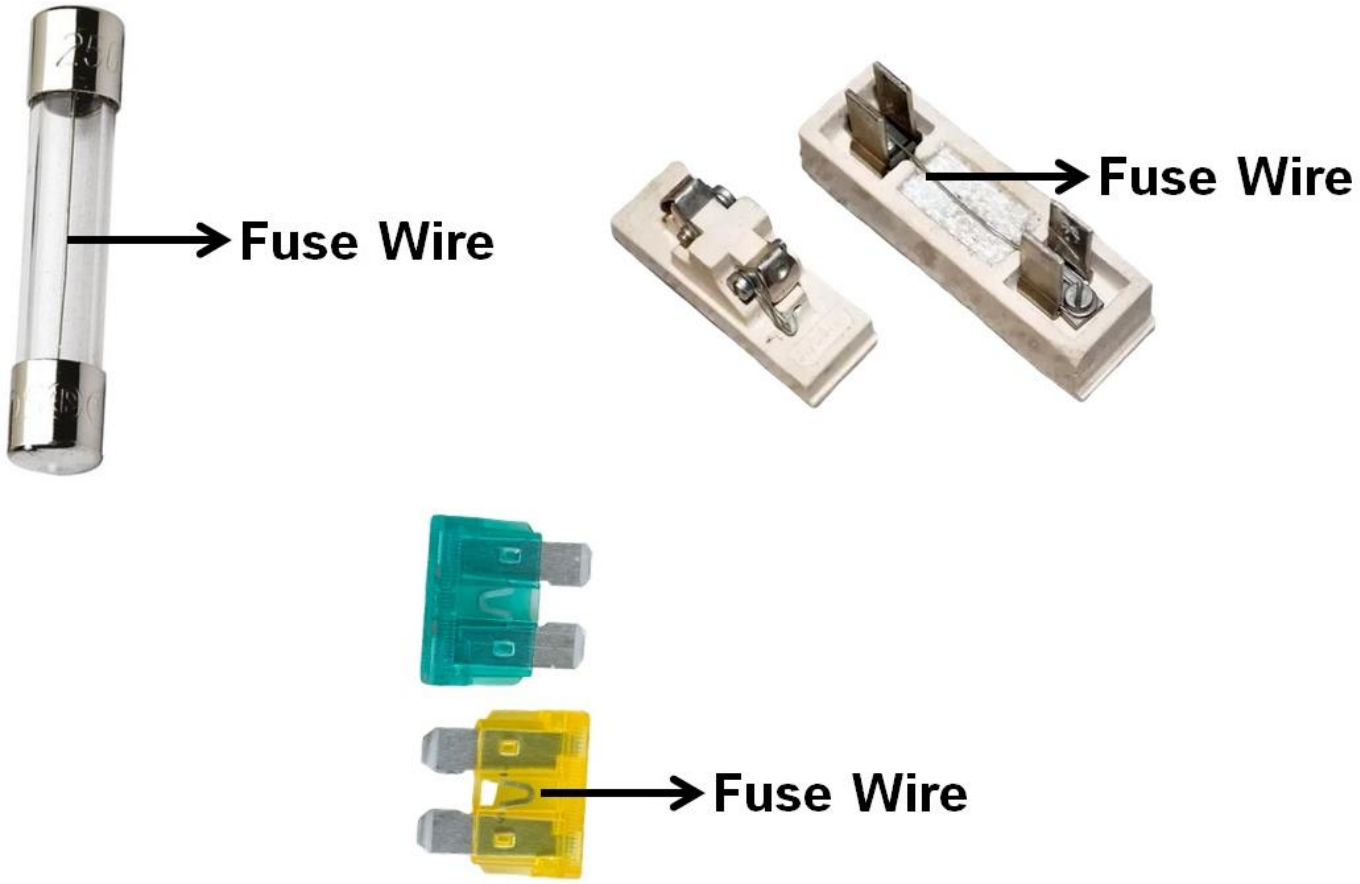
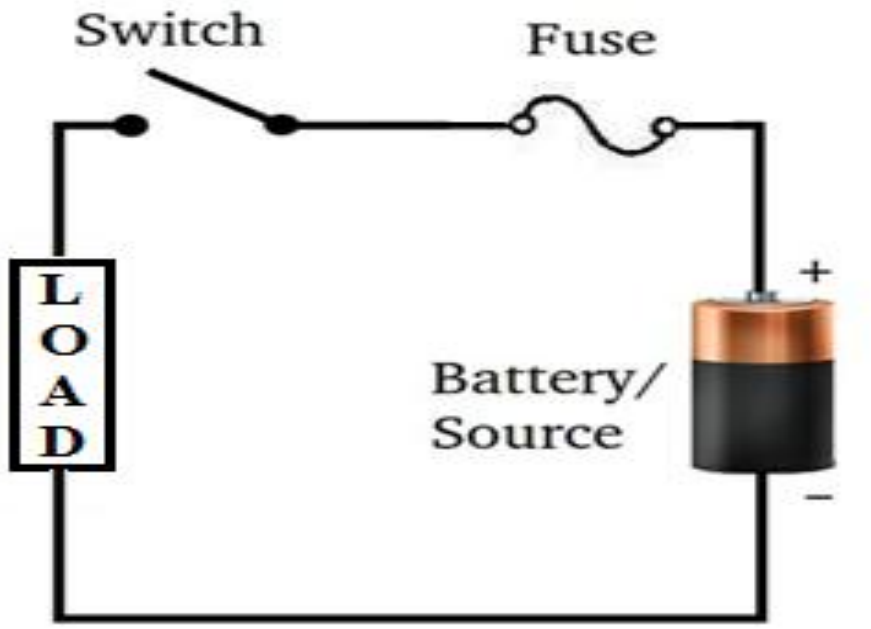
How does FUSE work ?

- The principle of a fuse is based on the heating effect of the electric current.



How does FUSE work ?

- It is always placed in series with the circuit.



A Basic Circuit

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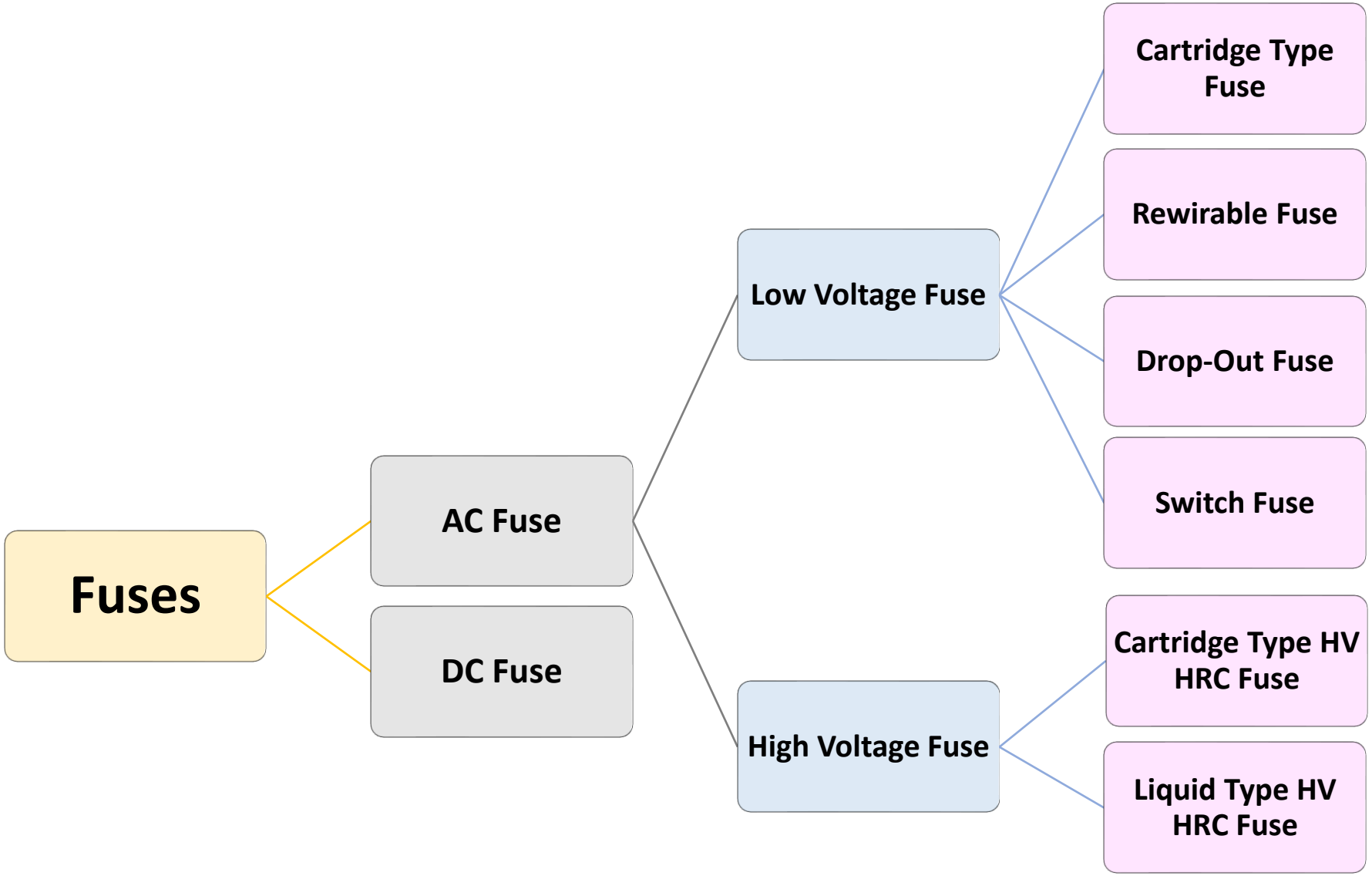
Types of Fuses

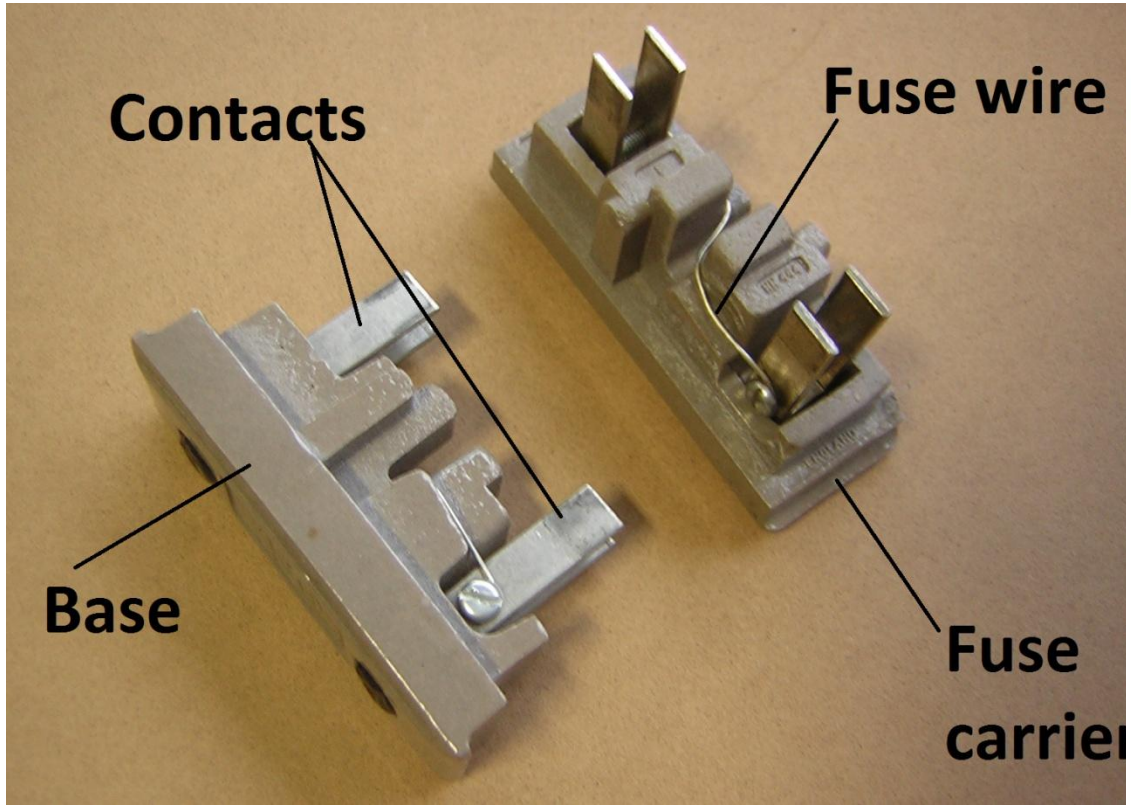


LOW VOLTAGE FUSE

CARTRIDGE FUSE

LOW VOLTAGE FUSE

REWIRABLE FUSE



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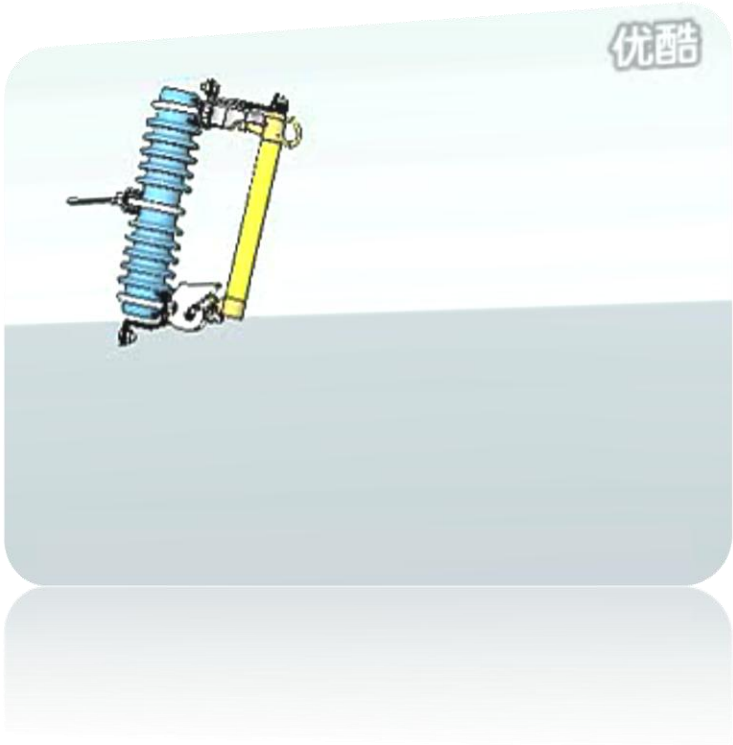
LOW VOLTAGE FUSE

DROP OUT FUSE



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LOW VOLTAGE FUSE

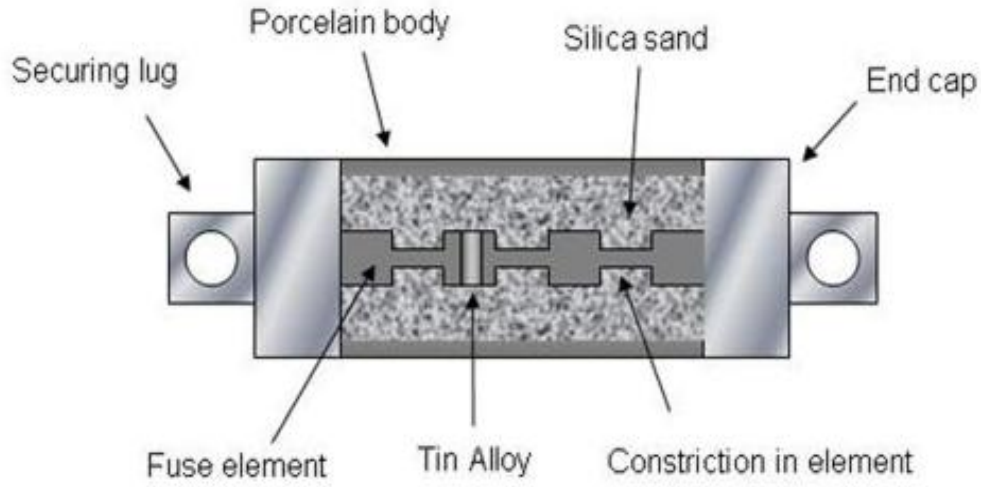
SWITCH FUSE

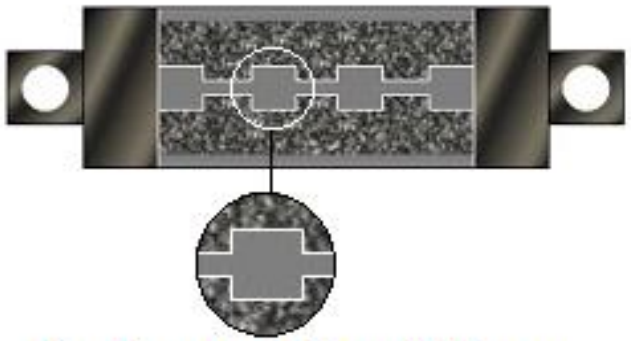
HIGH VOLTAGE FUSE

CARTRIDGE TYPE HV HRC(High Rupturing Capacity) FUSE

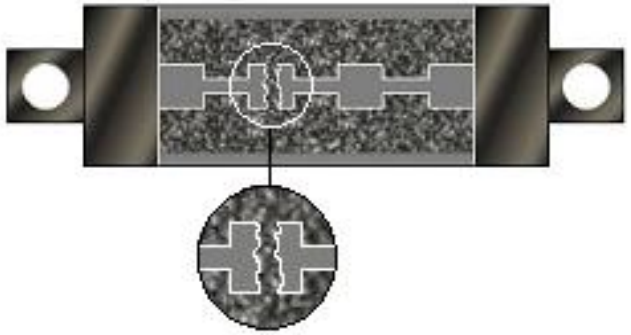
HIGH VOLTAGE FUSE

CARTRIDGE TYPE HV HRC(High Rupturing Capacity) FUSE





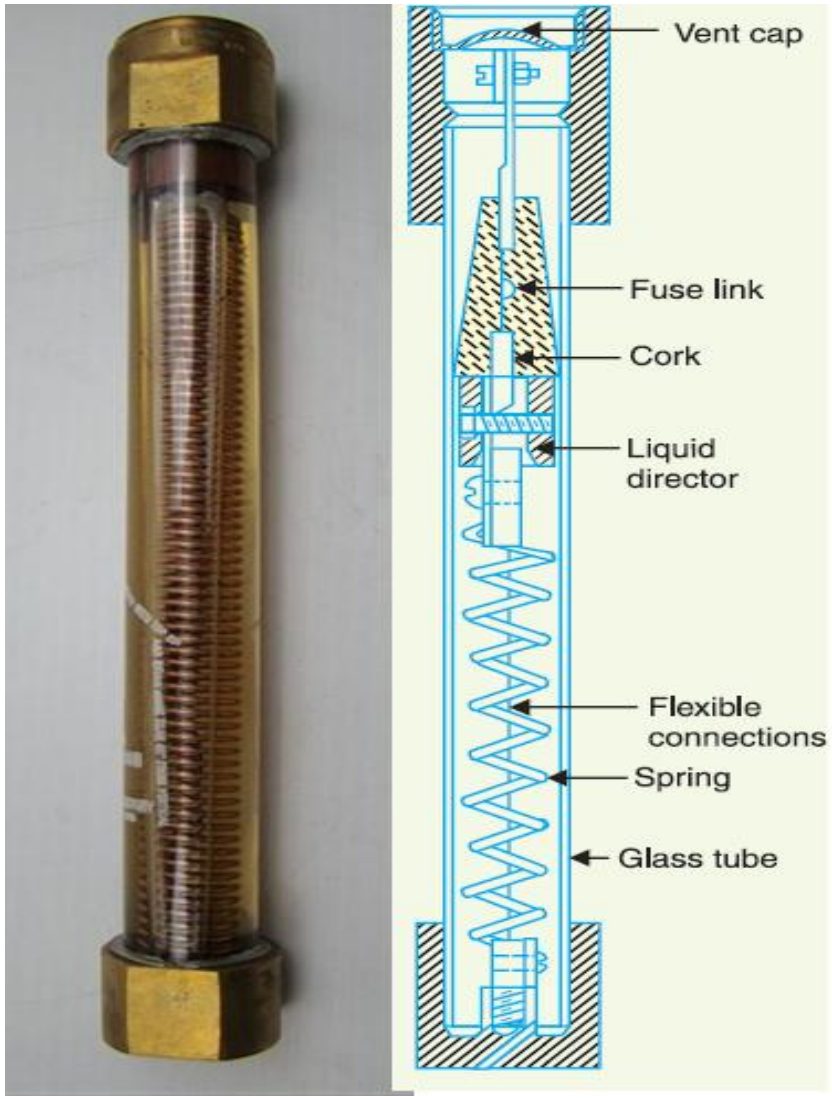
In Normal Conditions, Current Will flow through Fuse element to the circuit



In Short Circuit & Overload Conditions, The Fuse Element will Melt and open the Circuit

HIGH VOLTAGE FUSE

LIQUID TYPE HV HRC FUSE



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ADVANTAGES AND DISADVANTAGE OF FUSE

ADVANTAGES

- It is the cheapest form of protection available.
- It needs no maintenance.
- It interrupts enormous short circuit currents without noise, flame, gas or smoke.
- Its inverse time-current characteristics enables its use for overload protection.
- The minimum time of operation can be made much smaller than that with the circuit breakers.

DISADVANTAGES

- Considerable time is lost in rewiring or replacing a fuse after operation.

Miniature Circuit Breaker

MCB

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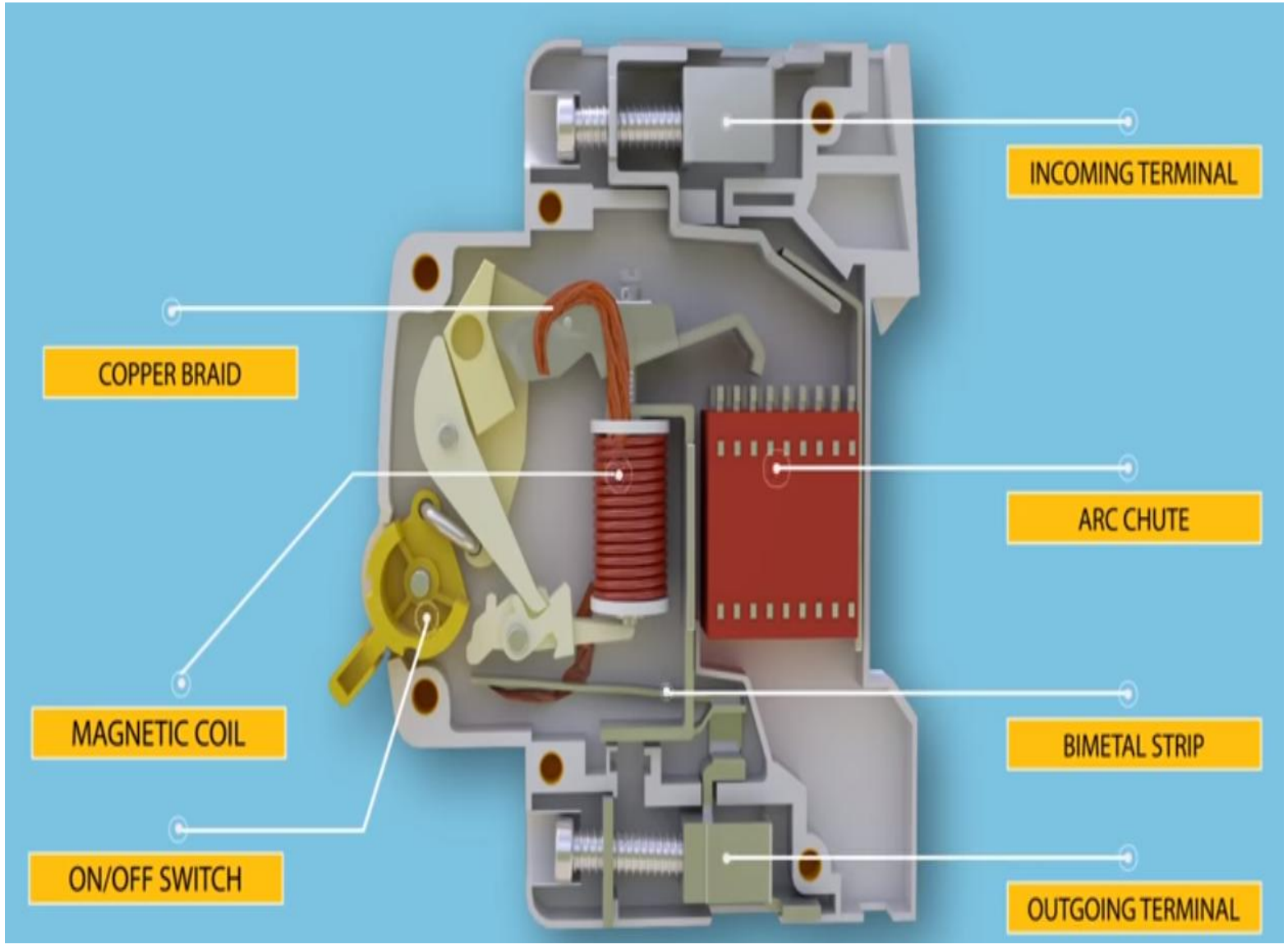
Parts of MCB



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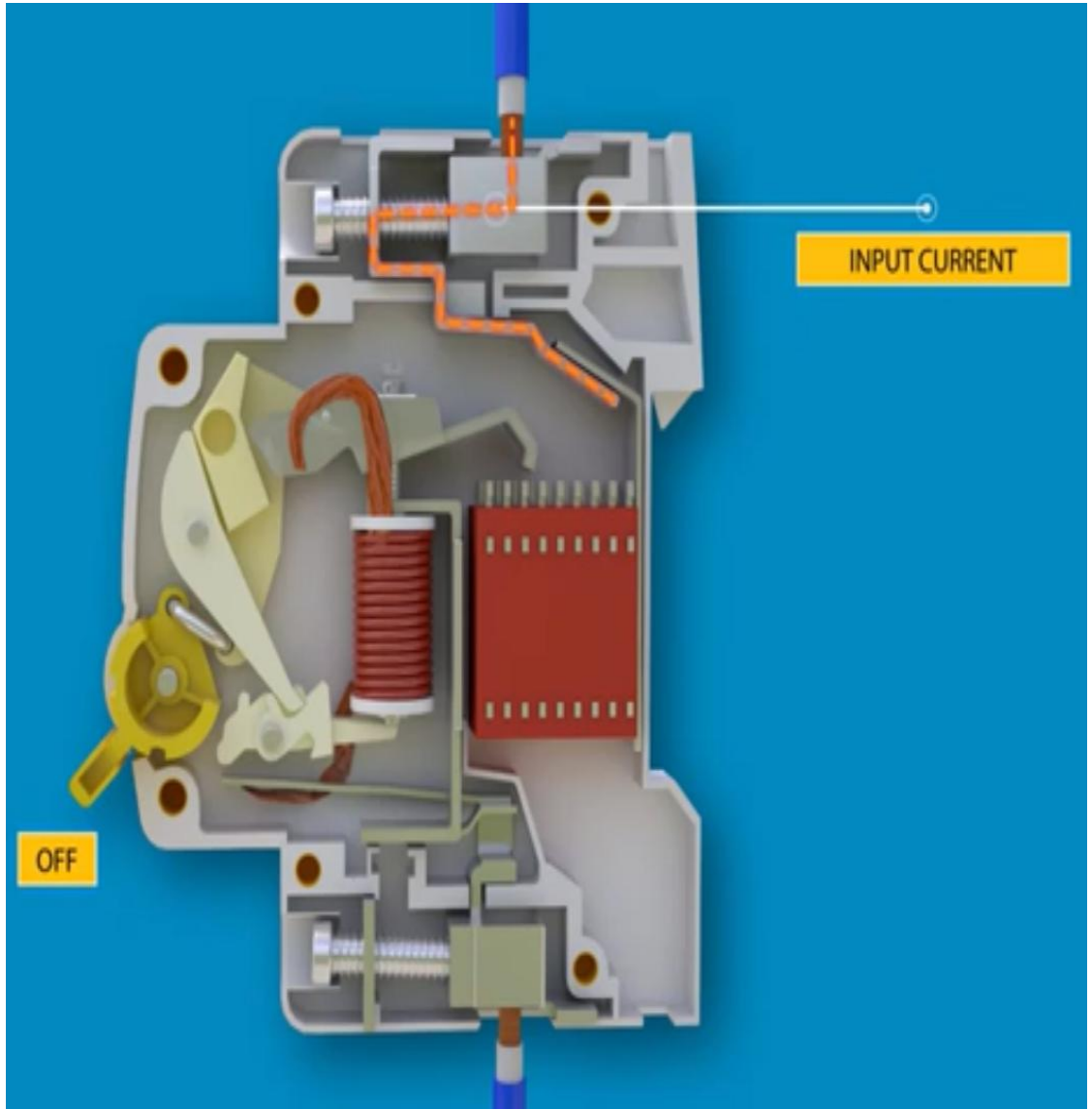
MCB Working



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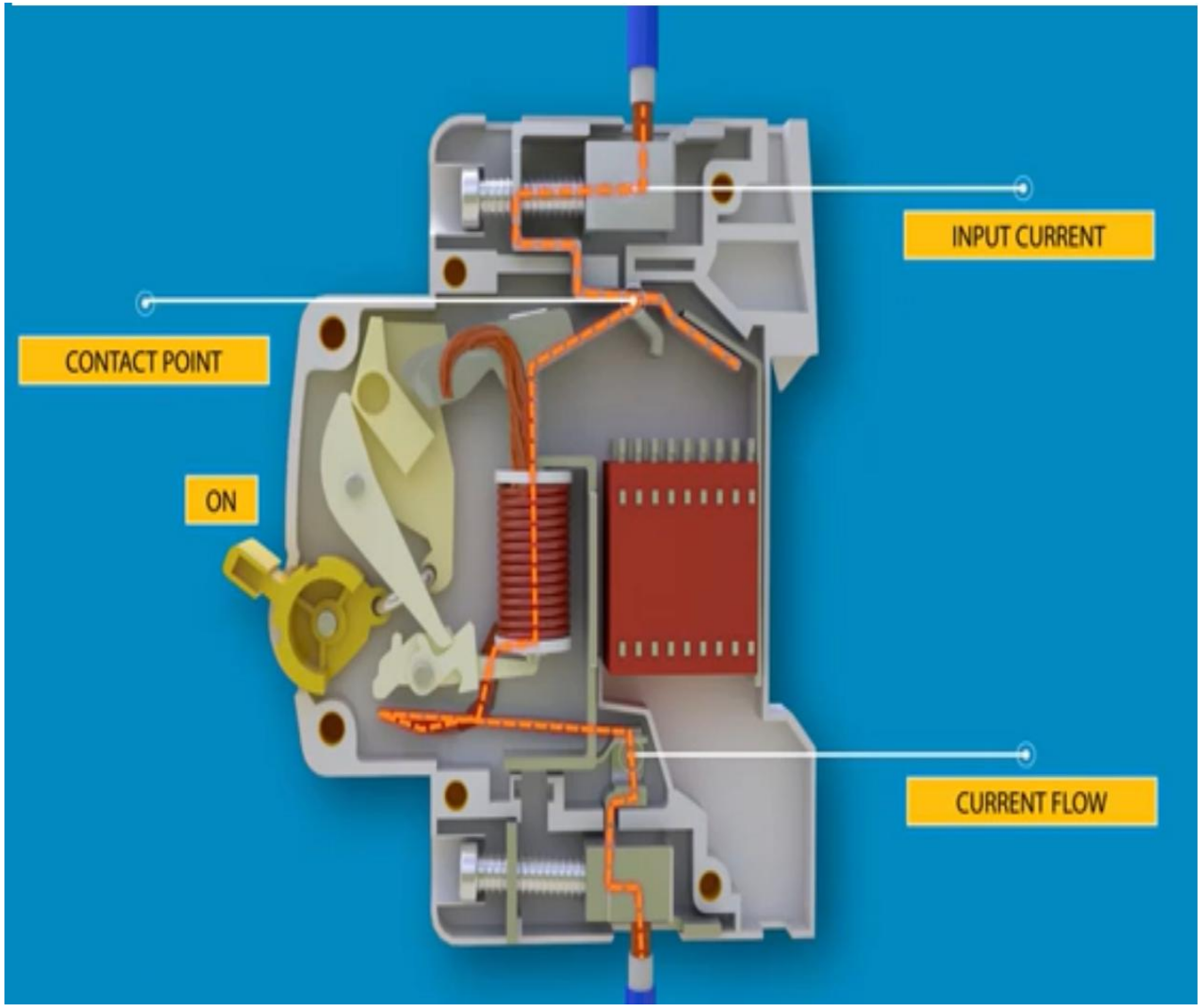
MCB Working



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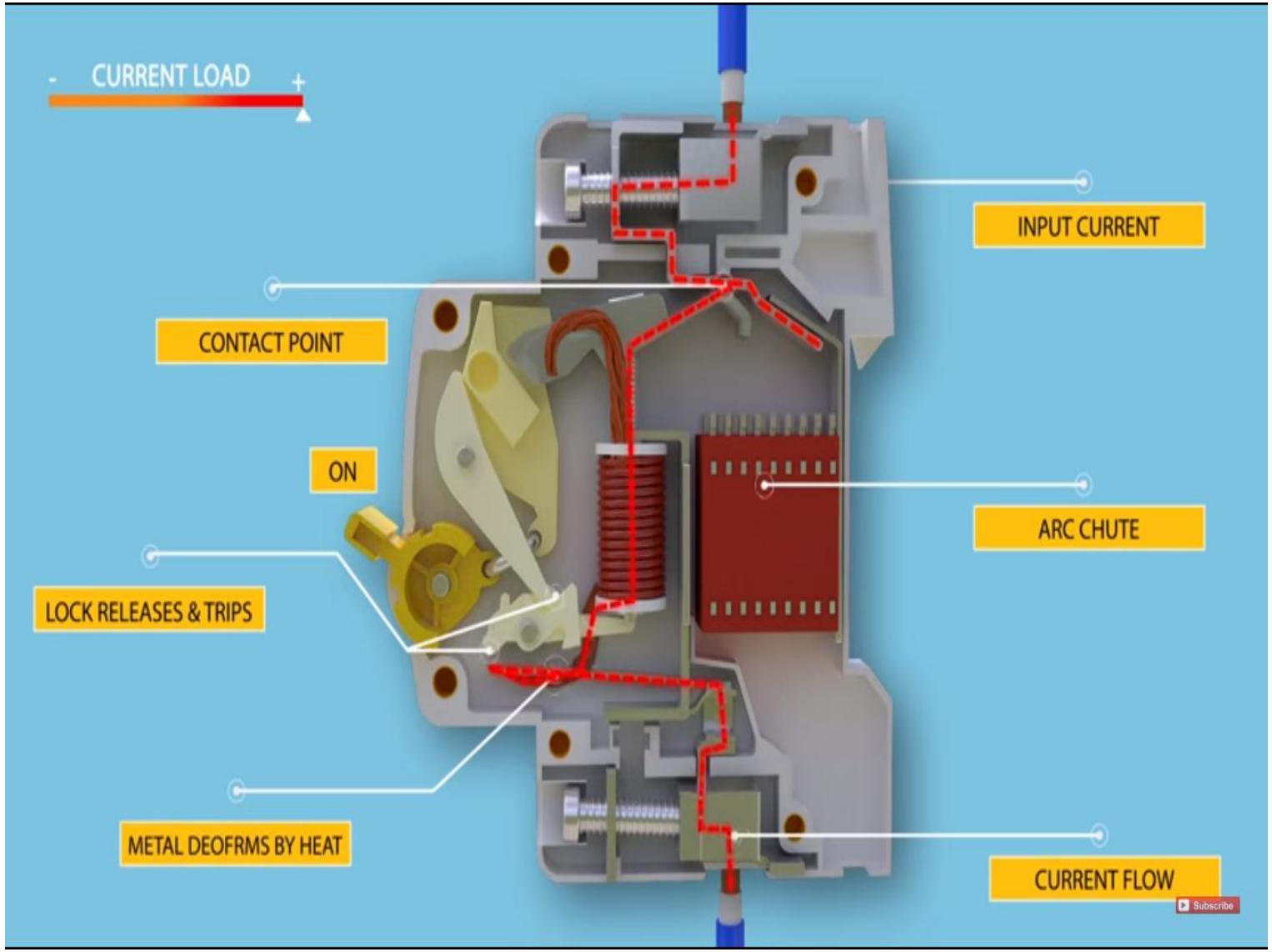

Molded Case Circuit Breaker

MCCB

Text Book & References

Text Book:

1. "Basic Electrical Engineering" S.K Bhattacharya, 1st Edition Pearson India Education Services Pvt. Ltd., 2017
2. "Basic Electrical Engineering", D. C. Kulshreshta, 2nd Edition, McGraw-Hill. 2019
3. "Special Electrical Machines" E G Janardanan, PHI Learning Pvt. Ltd., 2014

Reference Books:

1. "Engineering Circuit Analysis" William Hayt, Jack Kemmerly, Jamie Phillips and Steven Durbin, 10th Edition McGraw Hill, 2023

2. "Electrical and Electronic Technology" E. Hughes (Revised by J. Hiley, K. Brown & I.M Smith), 12th Edition, Pearson Education, 2016.

THANK YOU

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