

# ELEMENTS OF ELECTRICAL ENGINEERING

Course Code : UE25EE141A/B

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## RCCB, Types of Wires & Cables

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### ELCB

It detects the earth leakage current



### Types of ELCB

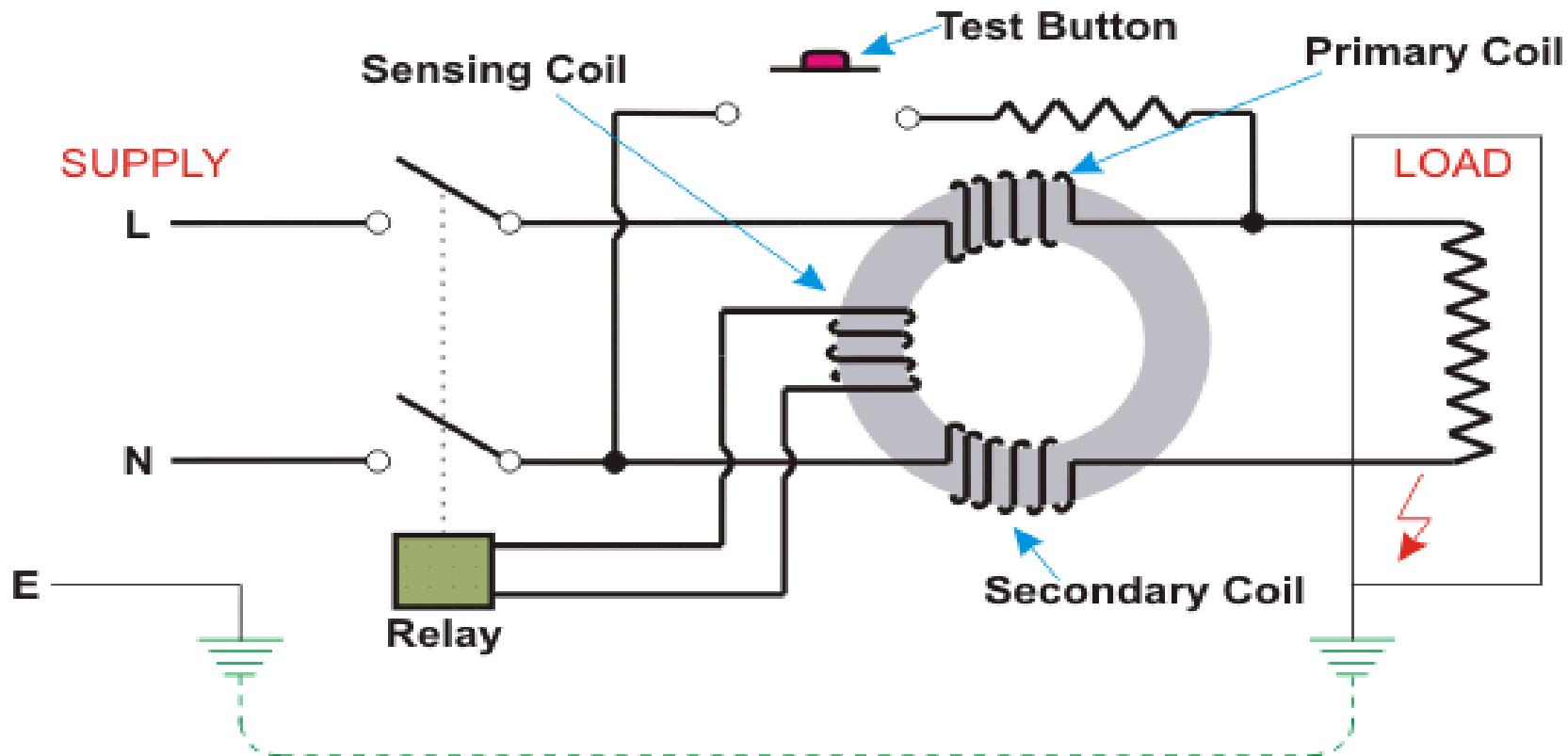
- **Voltage ELCB**

(detects a voltage to choose the Earth leakage)

- **Current ELCB (RCCB)**

(detects residual current to choose the Earth leakage)

### RCCB (Residual Current Circuit Breaker)



**Working Principle of Residual Current Circuit Breaker**

# ELEMENTS OF ELECTRICAL ENGINEERING

## RCCB, Wires & Cables

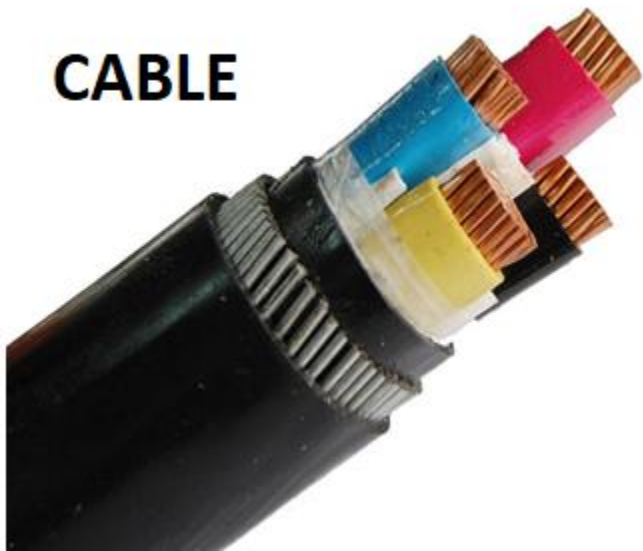


Wires/cables are conducting materials.



**WIRES**

**CABLE**



### Basic Difference Between Wires and Cables

#### Wires

- Single conductor
- to bear the mechanical loads, to carry electricity, to transmit telecommunication signals. Also used in heating jewelry, clothing, automotive or industrial manufactured parts like pins, needles, fish hooks , bulbs, etc.
- Solid wires offer low resistance, thus, perfect for use in higher frequencies.

#### Cables

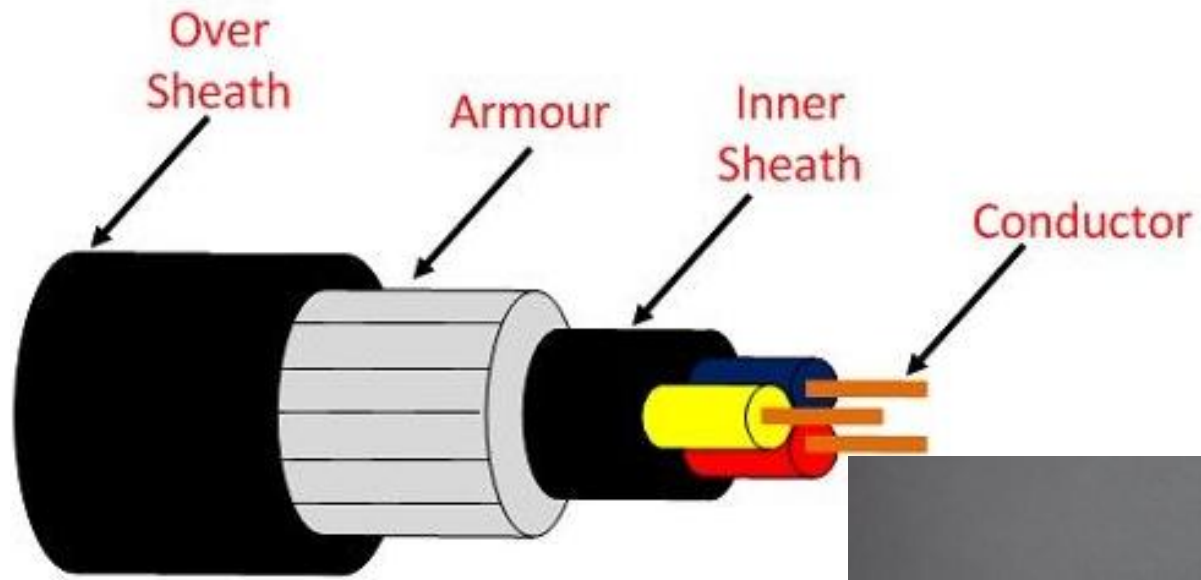
- Two or more conductors
- To allow power transmission, to carry electricity and telecommunications signals.
- Higher strength, heavy duty, and insulated.

### Cables

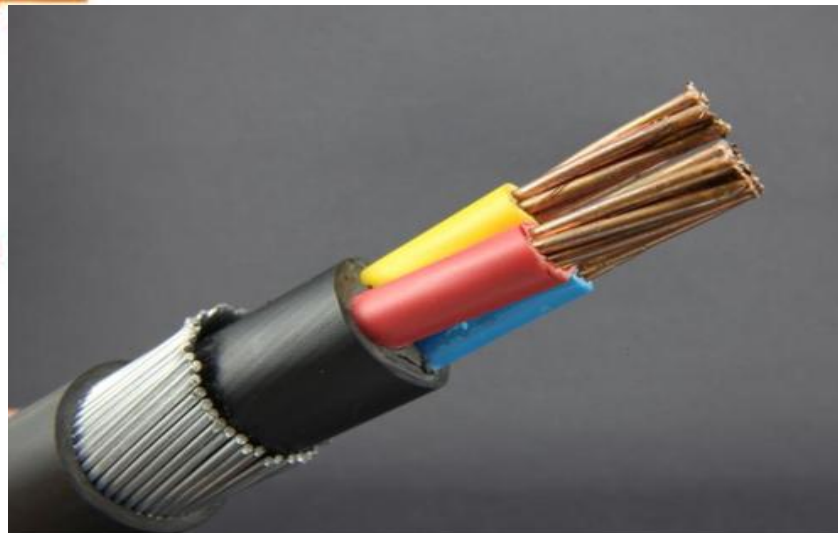
- It is an assembly of one or more individually insulated electrical conductors, usually held together with an overall sheath.
- They are used for transmission and distribution of electrical power.
- Installed as permanent wiring within buildings.
- Buried in the ground.
- Run overhead.



### Construction



Electrical Power Cable



### TYPES OF CABLES

#### Classification Based Upon Voltage Rating

- **Low tension cables**: These have a max voltage handling capacity of 1 kV
- **High tension cables**: These have a max voltage handling capacity of 11 kV.
- **Super tension cables**: These have a max voltage handling capacity of 33 kV.
- **Extra high tension cables**: These have a max voltage handling capacity of 66 kV.
- **Extra super voltage cables**: These are used for applications with voltage requirement above 132 kV.

### Text Book:

1. “Basic Electrical Engineering” S.K Bhattacharya, 1<sup>st</sup>Edition Pearson India Education Services Pvt. Ltd., 2017
2. “Basic Electrical Engineering”, D. C. Kulshreshta, 2<sup>nd</sup>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, 10<sup>th</sup> Edition McGraw Hill, 2023
2. “Electrical and Electronic Technology” E. Hughes (Revised by J. Hiley, K. Brown & I.M Smith), 12<sup>th</sup> Edition, Pearson Education, 2016.



**THANK YOU**

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