



ELEMENTS OF ELECTRICAL ENGINEERING

Course Code : UE25EE141A/B

FACULTY CONTRIBUTED:

Department of EEE, RR Campus

Prof . Jyothi T N

Prof. Vadhira^J K P P

Prof. Kruthika N

Prof. Suma S

Prof. Pushpa K R

Prof. Sangeeta Modi

Department of ECE, EC Campus

Prof. Lokesh L

Prof. Dhanashree G Bhate

Dr. Renuka R Kajur

Prof. Rajesh Chandrashekhar

Prof. Sangam Kumar G H

RCCB, Types of Wires & Cables

Jyothi T N

Department of Electrical & Electronics Engineering

ELCB

It detects the earth leakage current



Types of ELCB

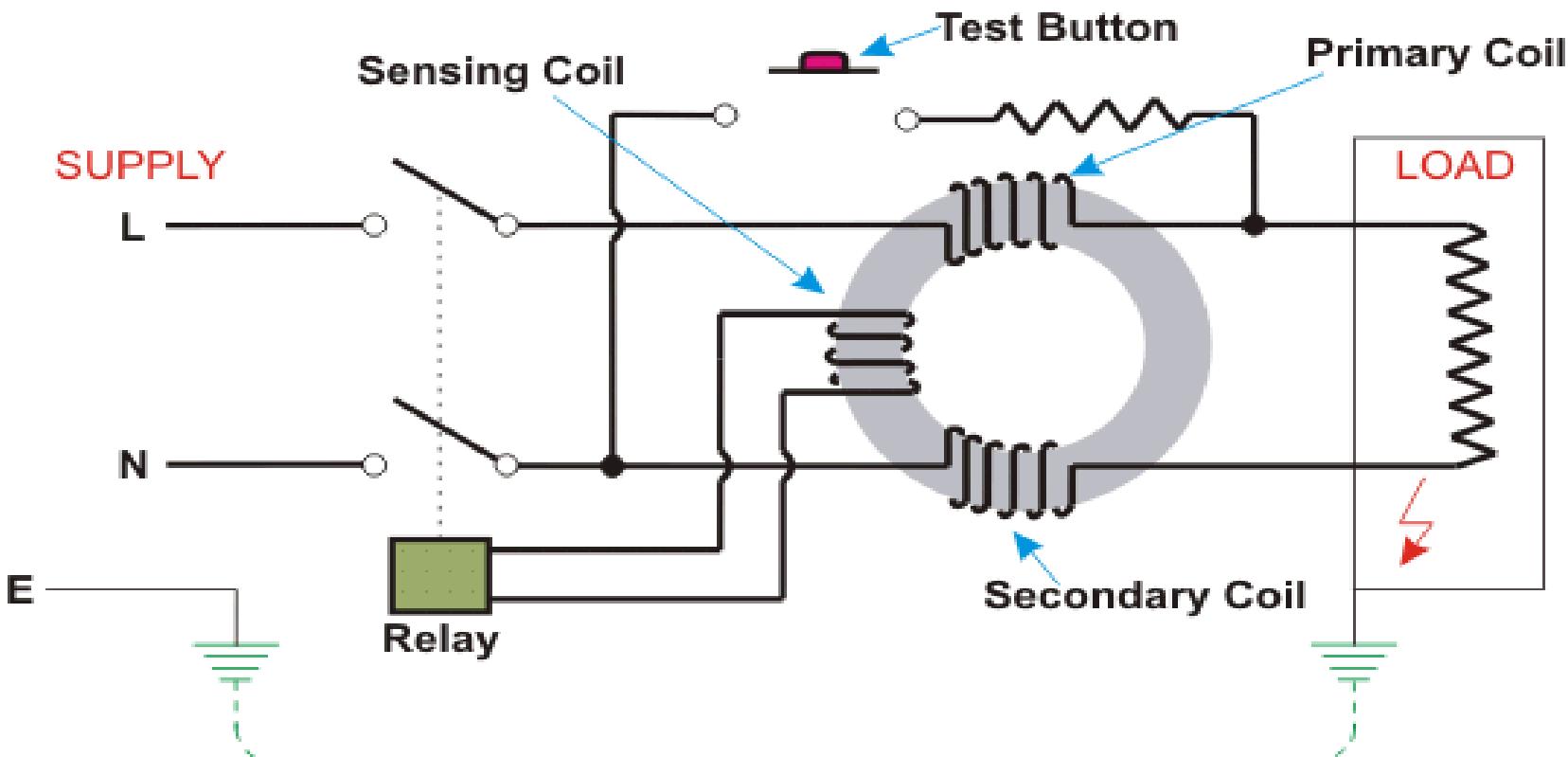
- **Voltage ELCB**

(detects a voltage to choose the Earth leakage)

- **Current ELCB (RCCB)**

(detects residual current to choose the Earth leakage)

RCCB (Residual Current Circuit Breaker)



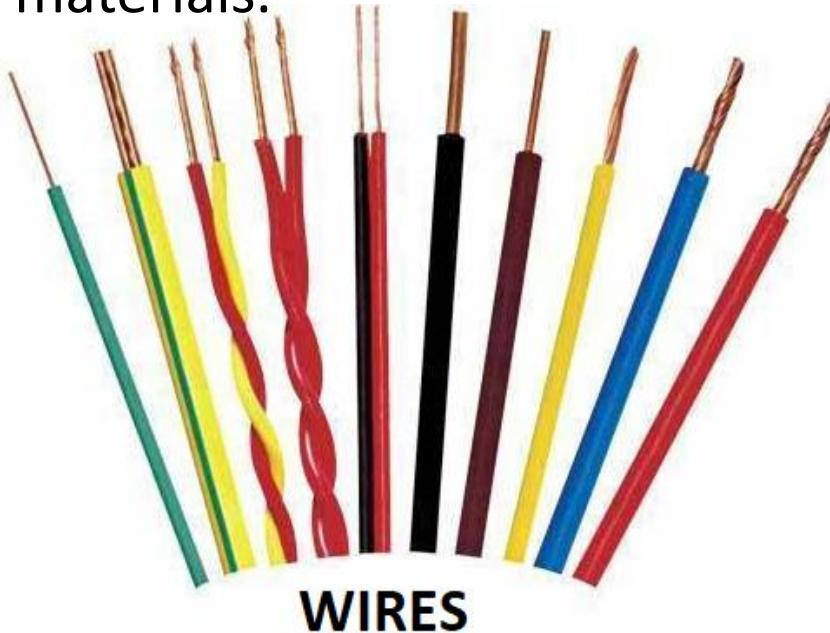
Working Principle of Residual Current Circuit Breaker

ELEMENTS OF ELECTRICAL ENGINEERING

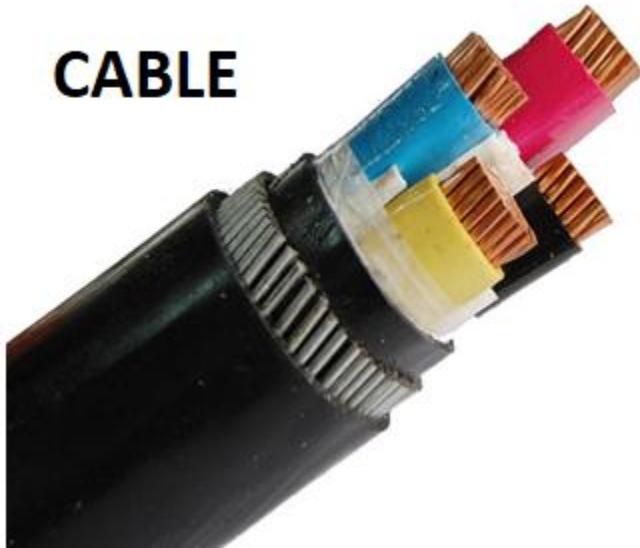
RCCB, Wires & Cables



Wires/cables are conducting materials.



CABLE



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.

Basic Difference Between Wires and Cables

Cables

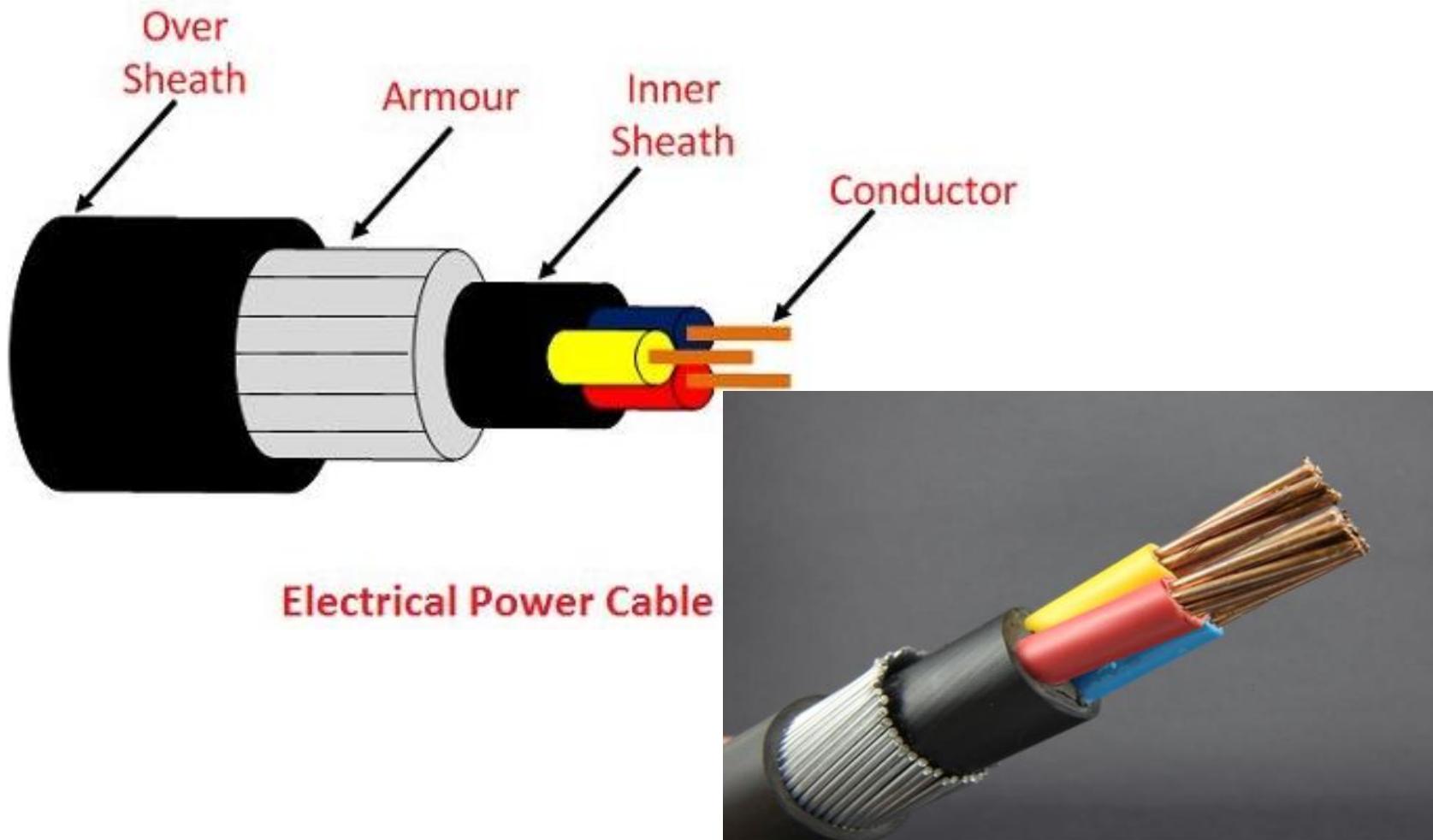
- Two or more conductors
- To allow power transmission, to carry electricity and telecommunications signals.
- Higher strength, heavy duty, and insulated.

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



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, 1st Edition Pearson India Education Services Pvt. Ltd., 2017
2. "Basic Electrical Engineering", D. C. Kulshreshtha, 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.



PES
UNIVERSITY

THANK YOU

Jyothi T N

Department of Electrical & Electronics Engineering

jyothitn@pes.edu