



Circuit Breakers(MCB, ELCB), Electronic Fuses





MCB



Characteristics

- 1) Rates current, not more than 100 Amp.
- 2) Trip characteristics are normally not adjustable.
- 3) Thermal or thermal-magnetic operation.



MCB



- MCB stands for Miniature Circuit Breaker. It automatically switches OFF electrical circuit during any abnormal condition in the electrical network such as overload & short circuit conditions.
- However, fuse may sense these conditions but it has to be replaced though MCB can be reset.
- The MCB is an electromechanical device which guards the electric wires & electrical load from overcurrent so as to avoid any kind of fire or electrical hazards.



MCB



- Handling MCB is quite safer and it quickly restores the supply. When it comes to house applications, MCB is the most preferred choice for overload and short circuit protection.
- MCB can be reset very fast & don't have any maintenance cost.
- MCB works on bi-metal respective principle which provides protection against overload current & solenoid short circuit current.



ELCB



Characteristics



- Phase (line), Neutral and Earth wire connected through ELCB.
- ELCB is working based on Earth leakage current.
- **Operating Time of ELCB:**
 - The safest limit of Current which Human Body can withstand is 30ma sec.
 - Suppose Human Body Resistance is 500Ω and Voltage to ground is 230 Volt.
 - The Body current will be $500/230=460\text{mA}$.
 - Hence ELCB must be operated in $30\text{maSec}/460\text{mA} = 0.65\text{msec}$



ELCB



- ELCB stands for Earth Leakage Circuit Breaker. They have the same function as RCCB but are voltage sensor device. However, this is an old technology & is not in common use.
- RCCB stands for **Residual Current Circuit Breaker**. This residual current device is basically an electrical wiring device that disconnects the circuit whenever there is leakage of current flow through the Human body or the current is not balanced between the phase conductor.
- It is the safest device to detect and trip against electrical leakage currents, thus ensure protection against electric shock caused by direct contacts. RCCB is generally used in series with an MCB which protects them from over current and short circuit current.



Electronic fuses





Electronic fuses



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