

# Low Voltage Electrical Installation

## MODULE 7

### Chapter 4: Electrical Protection System

by

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# Module Description

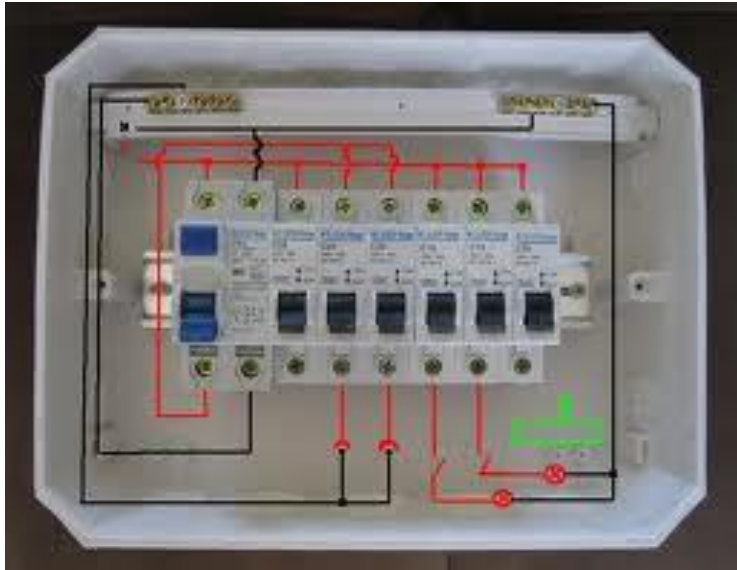
- **Expected Outcomes**

- Construct electrical wiring using suitable wiring tools and accessories.
- Apply ethical principles and commit to professional ethics.

# Distribution Board

- A distribution board (DB) is a component of an electricity supply system which divides an electrical power feed into subsidiary circuits, while providing a protective devices or circuit breaker for each circuit.

# Distribution Board



Single phase



Three phase

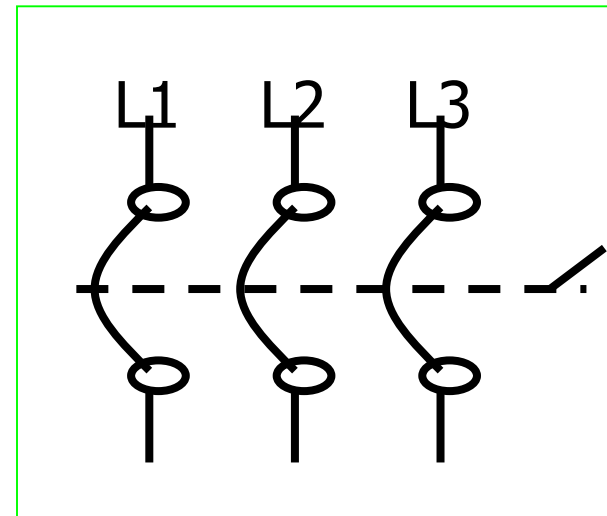
# Protection Devices In DB

- **Module Outline**
  - MCCB 40A/10kA 4 pole
  - ELCB/RCCB 40A/300mA 4 pole
  - Magnetic contactor
  - MCB 32A/4.5kA 3 pole
  - MCB 20A/4.5kA 1 pole
  - MCB 10A/4.5kA 1 pole
  - Earth Bar
  - Neutral Bar
  - Emergency stop push button

# 1. Mould Case Circuit Breaker (MCCB)

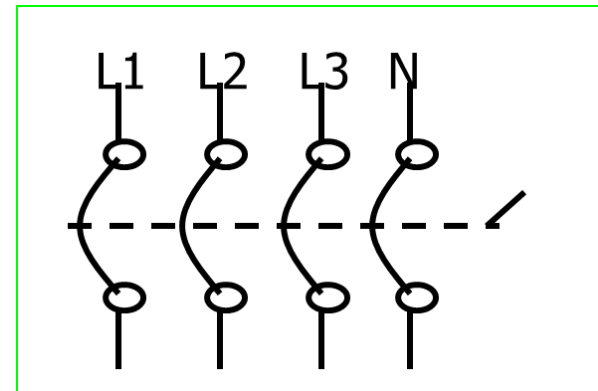
- MCCB 40A/10kA 3 pole
- To restrain the input current from exceeding the rated current through this MCCB.

Neutral link



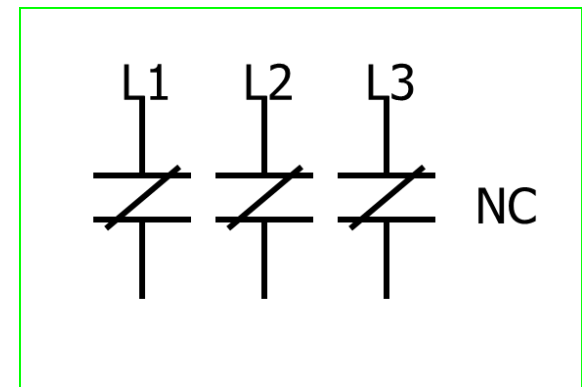
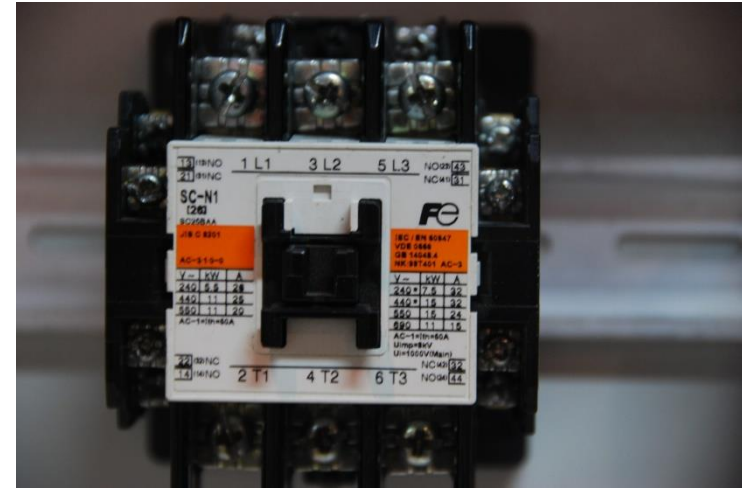
## 2. Earth Leakage Circuit Breaker (ELCB)

- ELCB 40A/300mA 4 pole
- To avoid electrical shock.
- Once a small stray voltage or leakage current on the metal enclosures of electrical appliances is detected, the ELCB will interrupt this active dangerous voltage by tripping the circuit.



# 3. Magnetic Contactor (MC)

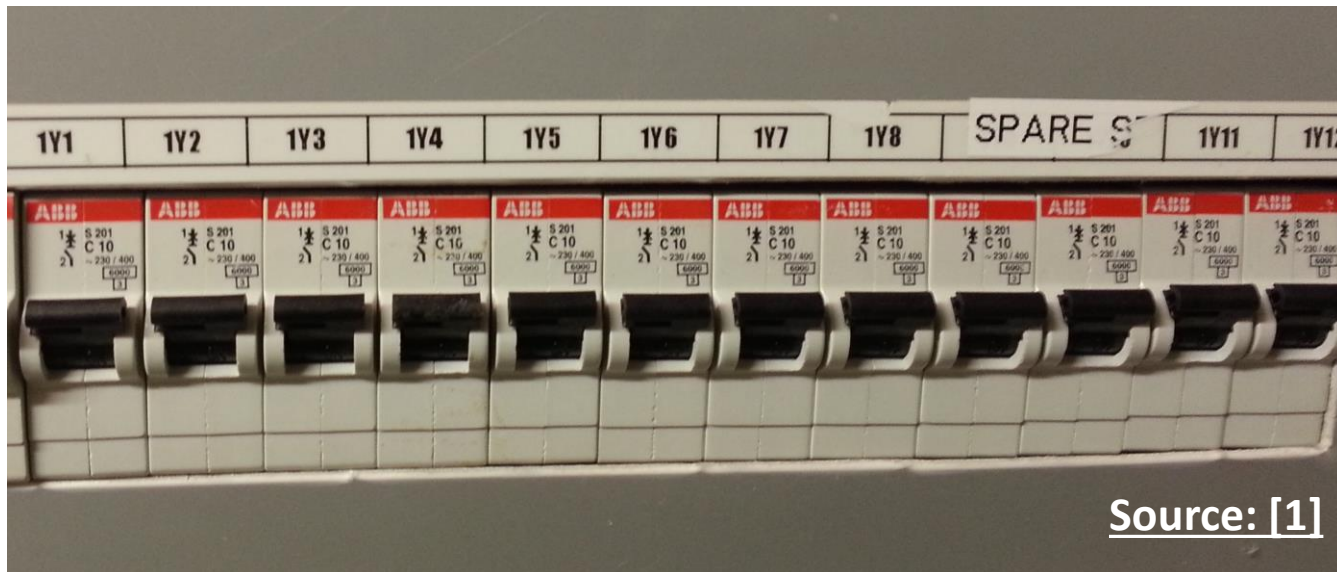
- **Magnetic contactor** is a switch that operates based on electromagnetism.
- It is quite safe to be used as a starter for a large load electric motor.





## 4. Miniature Circuit Breaker (MCB)

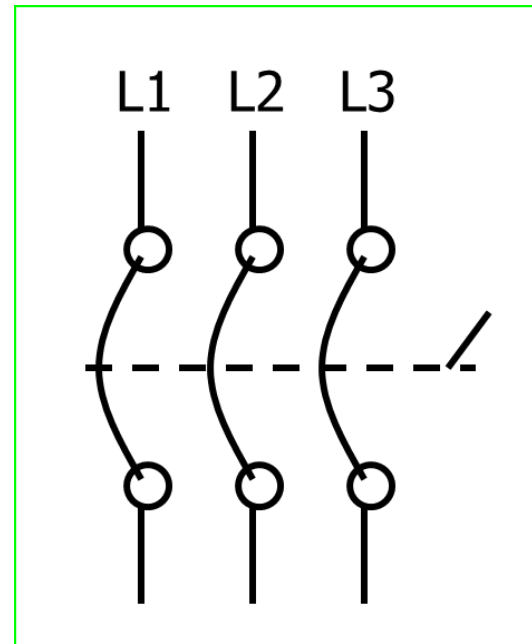
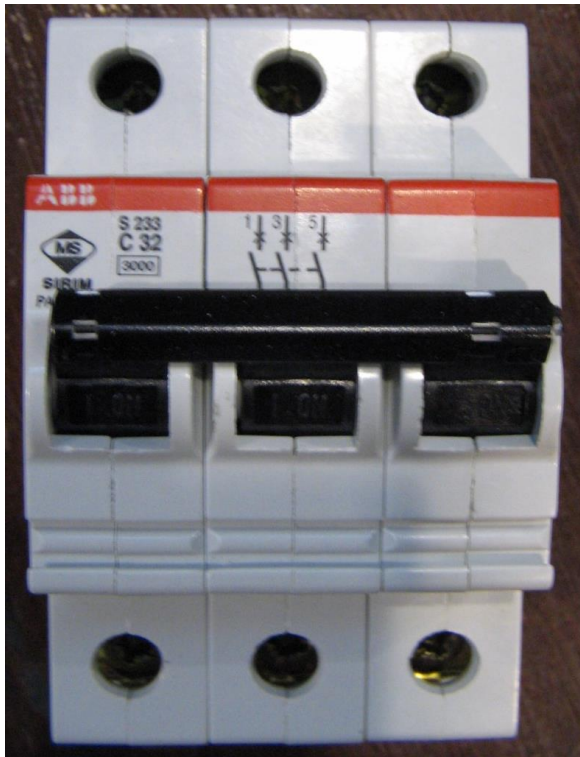
- **MCB** is a manually or automatically operated electrical switch. It protects an electrical circuit from damage caused by short circuit or overload.



Source: [1]

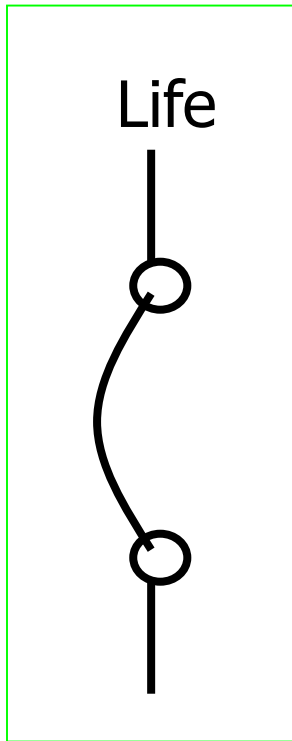
# 4. Miniature Circuit Breaker (MCB) (Cont.)

- MCB 32A/4.5kA 3 pole



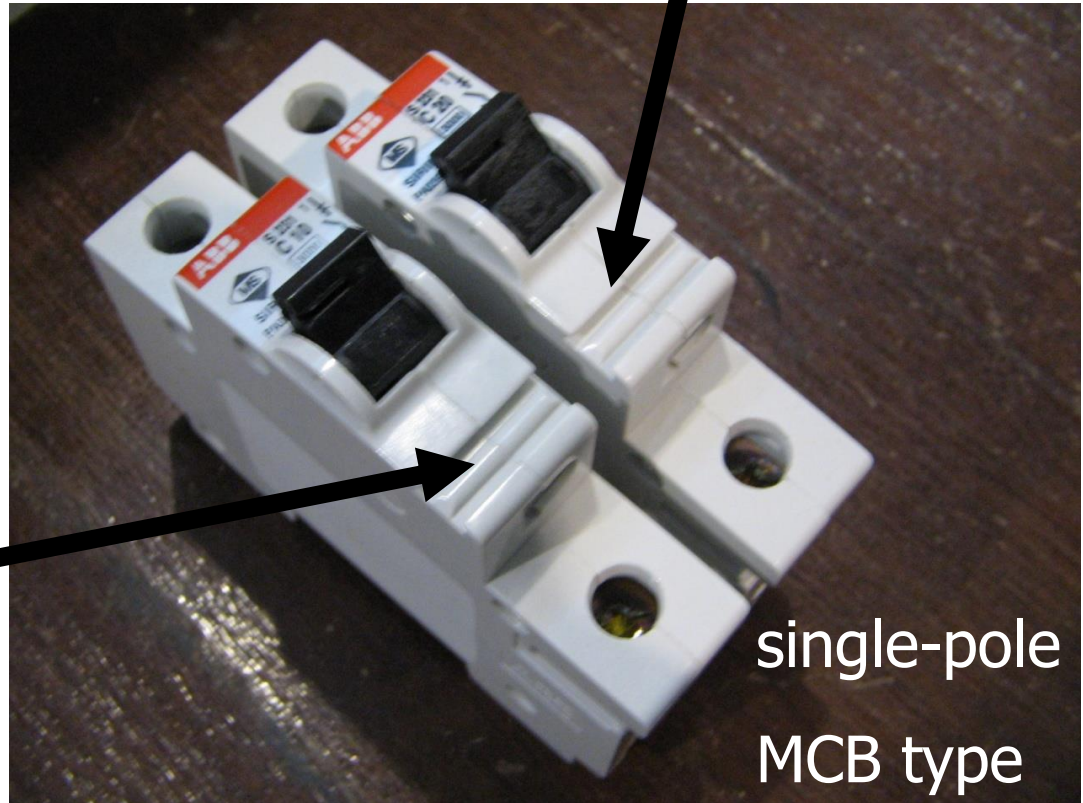
3-pole MCB type

# 4. Miniature Circuit Breaker (MCB) (Cont.)



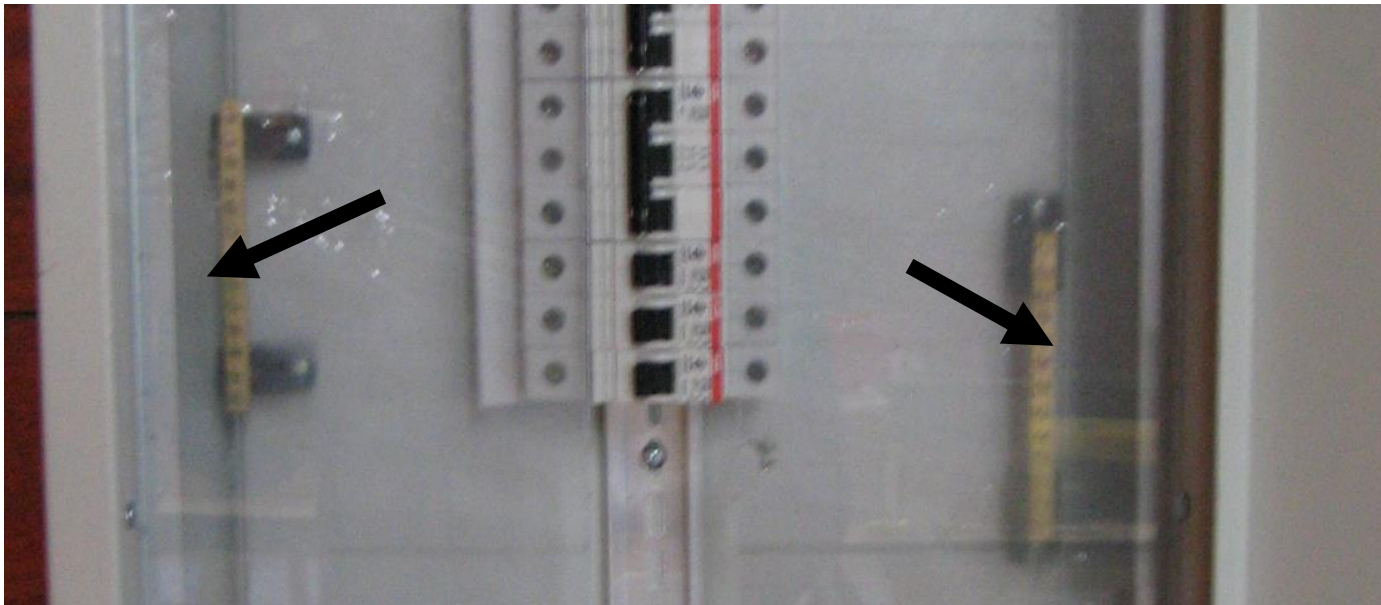
- **MCB 10A/4.5kA  
1 pole**

- **MCB 20A/4.5kA 1 pole**



## 5. Earth Bar and Neutral Bar

- Earth Bar – all appliances' earth cables are connected to the main grounding facility through this bar.
- Neutral Bar – link all appliances' neutral cables to the main source of neutral phase (TNB).





# References

- [1] Balurbala, *RCCB and Miniature Circuit Breaker*, [https://commons.wikimedia.org/wiki/File:RCCB\\_and\\_Miniature\\_Circuit\\_Breaker..jpg](https://commons.wikimedia.org/wiki/File:RCCB_and_Miniature_Circuit_Breaker..jpg), 2014.

# Thank you

