



## Table of Contents



- [Different Types of Transmission Lines](#)
  - [1. Based on Voltage Levels](#)
  - [2. Based on Current Type](#)
  - [3. Based on Line Configuration](#)
  - [4. Based on Length of Line](#)

Transmission lines are used to carry electrical power from generating stations to substations and load centres. Classifications of transmission lines are used depending on **voltage level, current type, construction method, and line length**. This classification helps engineers choose the right system for safe, efficient, and economical power transfer.

## Different Types of Transmission Lines

### 1. Based on Voltage Levels

- **Ultra High Voltage (UHV): Above 765 kV**  
Used for very long-distance bulk power transfer. Common in countries with very large and interconnected power grids.
- **Extra High Voltage (EHV): 220 kV to 765 kV**  
Used for long-distance transmission of large amounts of power between major grid substations.
- **High Voltage (HV): 110 kV to 220 kV**  
Used for regional transmission and interconnection between large substations.
- **Medium Voltage (MV): 33 kV to 110 kV**  
Mainly used for sub-transmission and linking major substations to distribution substations.
- **Low Voltage (LV): Below 33 kV**  
Used for local distribution and supply to end users through distribution networks.

### 2. Based on Current Type

- **AC Transmission Lines (Alternating Current)**  
Most commonly used system for power transmission. Suitable for both short



and long distances.

Typical voltage levels include 66 kV, 132 kV, 220 kV, and higher.

- **DC Transmission Lines (Direct Current / HVDC)**

Used for very long distances and submarine or underground cables because losses are lower.

Common HVDC levels are 100 kV, 500 kV, 800 kV or more.

### 3. Based on Line Configuration

- **Overhead Transmission Lines**

Conductors are supported on towers or poles above the ground.

This is the most common and economical method, especially for high and extra high voltage lines.

- **Underground Transmission Lines**

Cables are laid below the ground.

Used in cities and congested areas where overhead lines are not practical or safe.

### 4. Based on Length of Line

- **Short Transmission Lines (Up to 80 km)**

Have small voltage drop and negligible capacitance effect.

Commonly used to connect nearby substations.

- **Medium Transmission Lines (80 km to 250 km)**

Show moderate voltage drop.

Capacitance and inductance effects become noticeable.

Used for regional power transfer.

- **Long Transmission Lines (Above 250 km)**

Have significant voltage drop and strong capacitance and inductance effects.

Often need reactive power compensation.

Used for long-distance bulk power transmission.