

An ideal source is a theoretical model that provides a constant voltage or current, while a practical source is a real-world device that deviates from this ideal behavior due to internal resistance, leading to voltage or current variations under load.

Here's a more detailed breakdown:

Ideal Source:

- **Constant Voltage/Current:** An ideal voltage source maintains a constant voltage across its terminals regardless of the current drawn, and an ideal current source delivers a constant current regardless of the voltage across its terminals.
- **Zero Internal Resistance:** Ideal sources are assumed to have zero internal resistance.
- **Theoretical Model:** Ideal sources are not physically realizable but serve as a useful model for understanding circuit behavior.

Practical Source:

- **Non-Constant Voltage/Current:** Practical sources have internal resistance, causing their terminal voltage or current to vary with load conditions.
- **Non-Zero Internal Resistance:** All real-world sources possess some internal resistance.
- **Approximation of Ideal Behavior:** In many practical scenarios, the internal resistance of a source is small enough to be considered negligible, allowing the source to behave approximately like an ideal source.

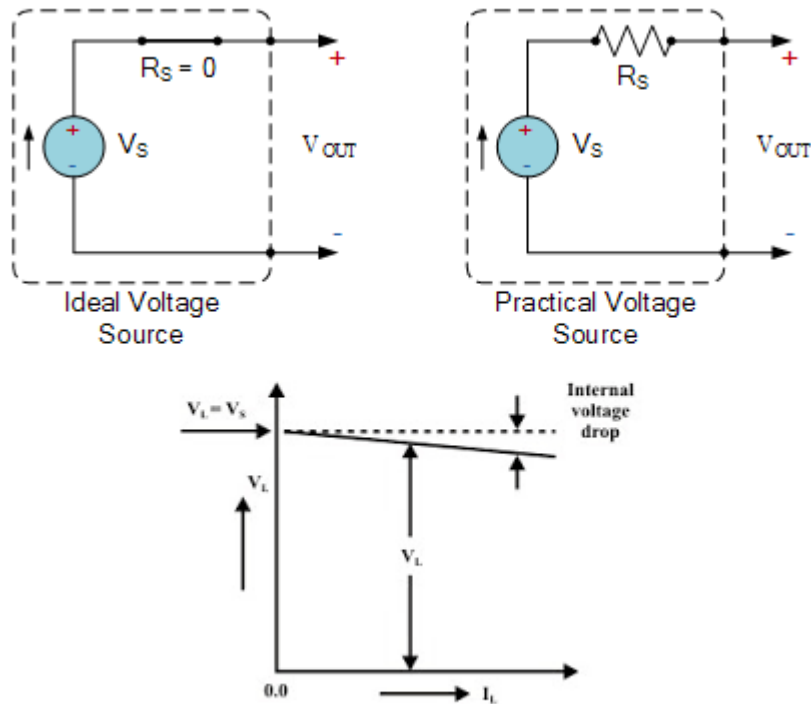


Fig. 3.16: V-I characteristics of practical voltage source

Example:

- **Ideal Voltage Source:**

A battery is sometimes modeled as an ideal voltage source, providing a constant voltage of, say, 9V regardless of the current drawn. However, in reality, the voltage drops when a large current is drawn due to the battery's internal resistance.

- **Practical Voltage Source:**

A real-world battery with internal resistance is a practical voltage source. The voltage drops as the load current increases because of the voltage drop across the internal resistance.

In essence, the ideal source is a theoretical concept, while the practical source is a real-world representation that deviates from the ideal behavior due to the presence of internal resistance.