

Transformers

Primary and Secondary Windings

A transformer is a device that transfers electric energy from a primary winding to a secondary winding.

The primary converts the electric energy into magnetic energy. The secondary converts the magnetic energy back into electric energy.

The primary and secondary winding are said to be electrically isolated from each other but magnetically connected or coupled to one another.

Coefficient of Coupling

The portion of the flux that links one coil to the other coil is referred to as the coefficient of coupling. The coefficient of coupling can range from 0 to 1.

Changing Voltage Values

Whether a secondary is a step-up or step-down winding is determined by the primary-to-secondary turns ratio.

The turns ratio and the voltage ratio are equal.

Mathematically we can write

$$\frac{V_{pri}}{V_{sec}} = \frac{N_{pri}}{N_{sec}}$$

In this formula, N is the abbreviation for the number of turns. This formula can be rearranged to show that

$$\frac{N_{pri}}{V_{pri}} = \frac{N_{sec}}{V_{sec}}$$

It shows that the turns-per-volt ratio is the same for both the primary and the secondary.

Referring to Fig.A will help you understand why all windings have the same turns-per-volt ratio.

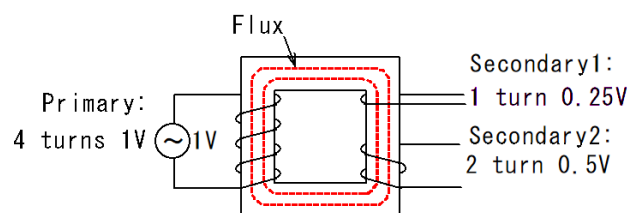


Fig.A