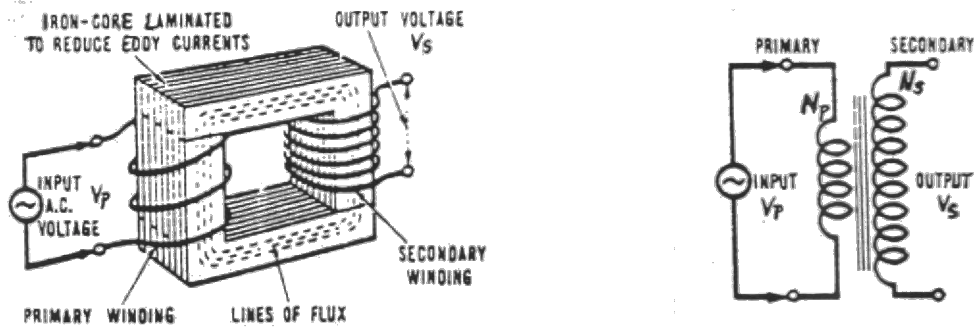


TURNS RATIO

A simple transformer consists of two coils, a primary and a secondary, wound on a high permeability, soft iron core. The changing current in the first coil creates a changing magnetic field that induces a voltage in the secondary coil.



The size of the secondary voltage compared to the voltage applied to the primary depends on turns ratio, or transformation ratio. That is, the number of turns of wire in the secondary winding compared to number of turns in the primary.

If losses are very small, the turns ratio may be expressed as:

$$\frac{V_{\text{Secondary}}}{V_{\text{Primary}}} = \frac{N_{\text{Secondary}}}{N_{\text{Primary}}} = T \text{ (transformation ratio)}$$

If the number of turns on the secondary is less than the number of turns on the primary, the output voltage will be less than the input voltage, and the transformer is called a step down transformer.

If the number of turns on the secondary is greater than the number of turns on the primary, the transformer is a step up type and the output voltage will be greater than the input voltage.

By convention, when writing the transformation ratio, the secondary voltage is put before the primary, therefore, a 4:1 transformer is a step up transformer, the secondary voltage being 4 times the primary voltage.