1.1.7 Iron-Core Transformers for Low-Voltage Light Sources

Many tungsten halogen lamps are designed to run on low voltages the most common of which is 12 volts. Thus they need a device to reduce the supply voltage. The traditional way to do this was by using a transformer. Figure 124 shows the various currents and voltages in a transformer and gives the approximate relationship between the voltages, currents and the number of turns in the primary and secondary coils and all low-wattage lamp sizes are covered today and increasing into the larger wattages.

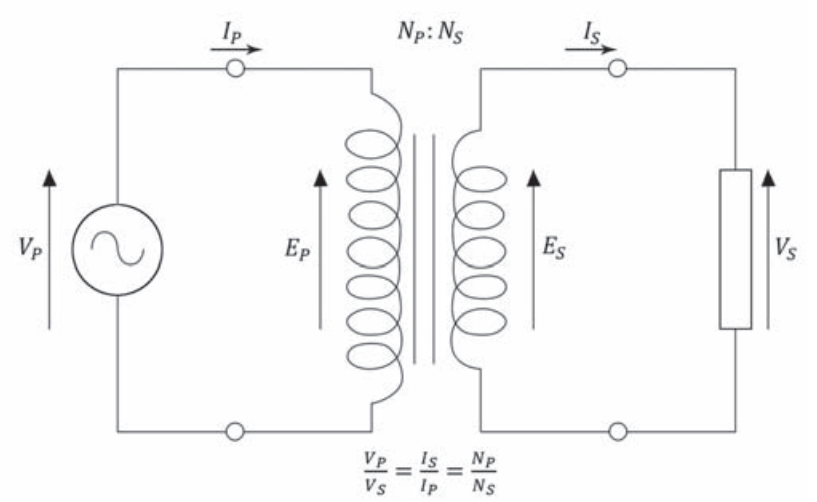

Figure 124
A circuit diagram for a transformer.

As well as reducing the voltage the transformer also isolates the lamp supply from the mains. This means that even under a fault condition the voltage in the secondary circuit will not rise significantly above the nominal output voltage and so it will always be safe to touch the conductors on the low voltage side.

Most modern transformers for halogen lamps involve electronics. They usually contain high frequency oscillators to permit the use of smaller transformers that have smaller power losses. With the introduction of electronics it is possible to introduce additional features such as constant voltage output and soft starting of the lamps.