

Not all these benefits are possible for all lamp types and all control gear combinations. However, the availability and quality of electronic gear available for HID lamps is rapidly increasing.

5.1.2 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 5.10 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.

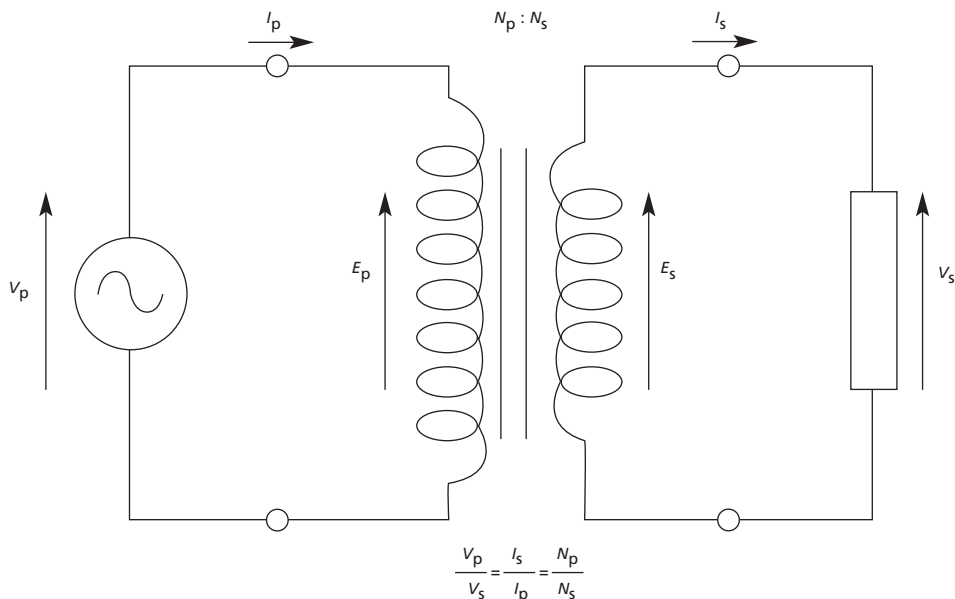


Figure 5.10 A circuit diagram for a transformer

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.

5.1.3 Drivers for LEDs

LEDs need to be run at a controlled current to ensure proper operation. To provide this drivers are used. Most drivers take mains power and provide a constant current output. However, it is possible to control some drivers so that output current is varied so that the LED may be dimmed. In more complex systems it is possible to dim three separate channels separately, so that when red, green and blue LEDs are used together it is possible to make colour changes.

Most LED drivers can maintain their constant current output over a range of voltages so it is often possible to connect a number of LEDs in series on one driver.