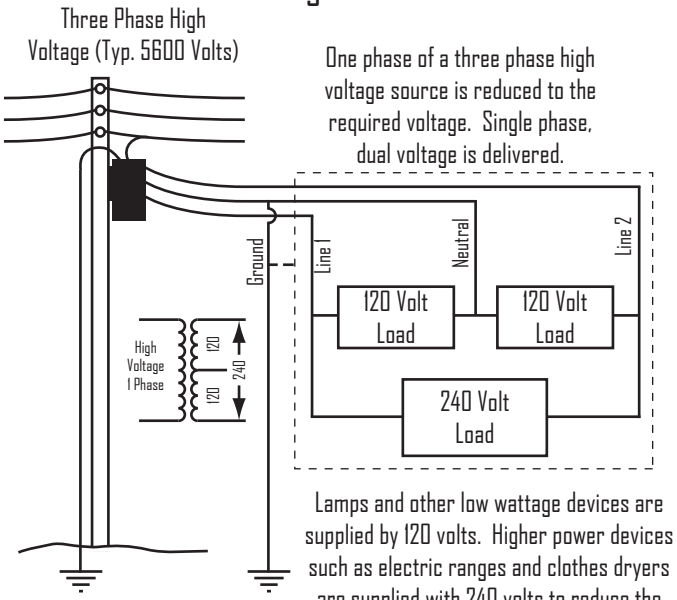
120/240 Volt Single Phase

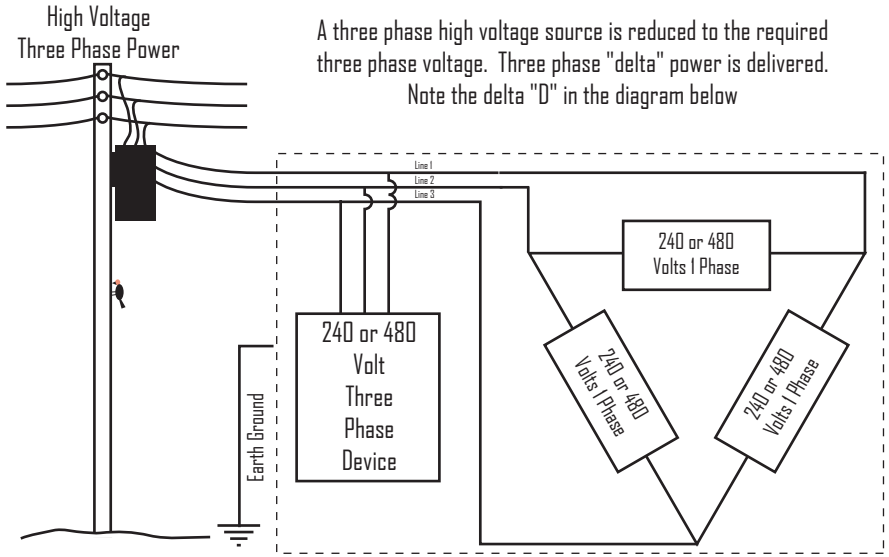


One phase of a three phase high voltage source is reduced to the required voltage. Single phase, dual voltage is delivered.

Lamps and other low wattage devices are supplied by 120 volts. Higher power devices such as electric ranges and clothes dryers are supplied with 240 volts to reduce the amperage required.

Used mostly for residential and other situations where power requirements are light to moderate.

240 or 480 Volt Three Phase



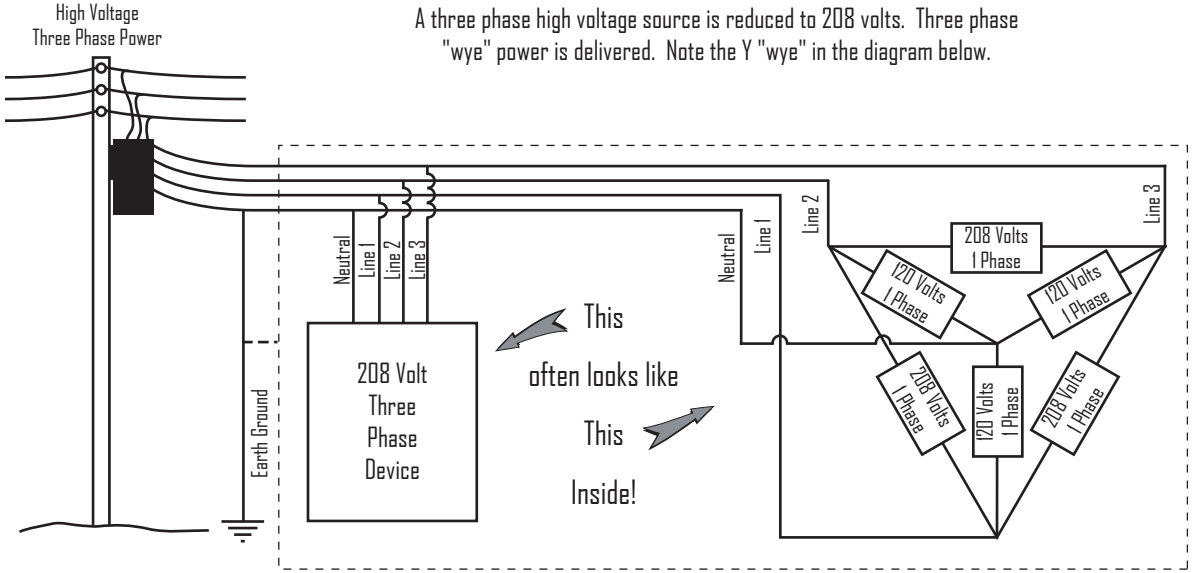
A three phase high voltage source is reduced to the required three phase voltage. Three phase "delta" power is delivered. Note the delta "D" in the diagram below

Note - The ground connection is not part of the circuit in the 240 or 480 volt three phase delta supply. It is used as a safety only and is connected directly to the earth ground.

This arrangement allows efficient delivery of large amounts of electrical power as required in heavy industrial applications. Many devices which consume large amounts of electrical energy including motors and heaters are specifically designed to use all three phases of the three phase supply to minimize the current requirement (and the size of the wires required). when a source of 120 or 240 volt single phase power is required, a transformer similar to that shown on the left is connected to a single phase of the 240 or 480 volt supply to reduce the voltage.

Used mostly for industrial and other situations where power requirements are very high.

208 Volt Three Phase



A three phase high voltage source is reduced to 208 volts. Three phase "wye" power is delivered. Note the Y "wye" in the diagram below.

Used mostly for multi-unit residential, retail stores, light industry and other situations where power requirements are moderate to heavy but the majority of the load is 120 volts.

This arrangement allows a large number of 120 volt devices to be powered from an efficient three phase source. As a compromise, it can also power some devices intended for use on a 120/240 single phase service such as ranges and clothes dryers although the actual delivered wattage of the unit will be reduced due to the lower voltage. Any unit designed for use on 120/240 volt service but that uses only the two 120 volt circuits and not the 240 volt source will operate normally and at full power from the 208 volt source. Most devices that operate from a "208 volt three phase" source are actually made up of several devices internally each of which operates from one of the three 120 volt sources available. For example, a machine may have a motor, a heater and a control circuit each of which operates from a 120 volt source. The entire machine, however, may be powered by a connection to a 208 volt three phase circuit.

Why 208 Volts?

Well, in order to produce a single phase which is at 120 volts, the three phase source must be 120 times the square root of 3 (1.732).

120 X 1.732 = 208 Voila!

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