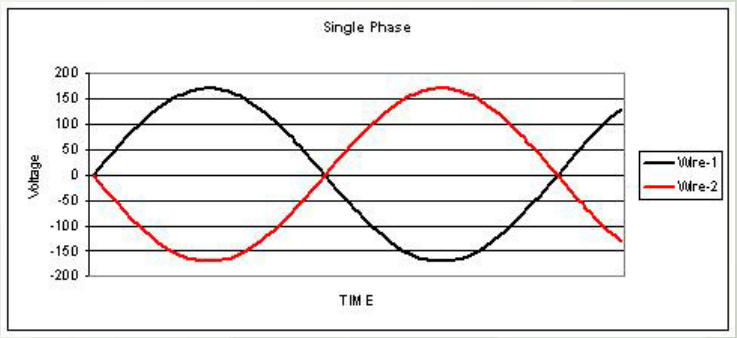
## Quick Electricity Primer

- Electricity is generated as either Alternating Current (AC) or Direct Current (DC)
- AC is delivered in a sine wave pattern with the resulting nominal voltage being lower than the peak voltage.
- Any material through which electricity flows is a conductor.
- Anything that consumes electricity is called a load.
- Volts are the push that moves electrical current through a conductor.
- Amperage or Amp is the rate or intensity of electric flow through a conductor.
- We buy electricity by consumption measured in kilowatts / hour.
- A kilowatt is 1000 watts.
- A single watt is equal to 1 volt-amp which is calculated by multiplying 1 volt x 1 amp.
- A load of 100 watts will use half the amps if the voltage is doubled. Or twice the amps if the voltage is halved.
- Electricity flows in a loop. We receive electricity via a wire and use the earth to complete the loop to the generating station. Inside the building the neutral wire is part of the return path.
- There are two kinds of commonly supplied electricity: single-phase and 3-phase. The difference between them is the number of degrees which separate the individual peaks and valleys in the sine waves of each of the voltages. For single phase it is 180° and for 3-phase it is 120°.

## The difference between single phase and 3 phase

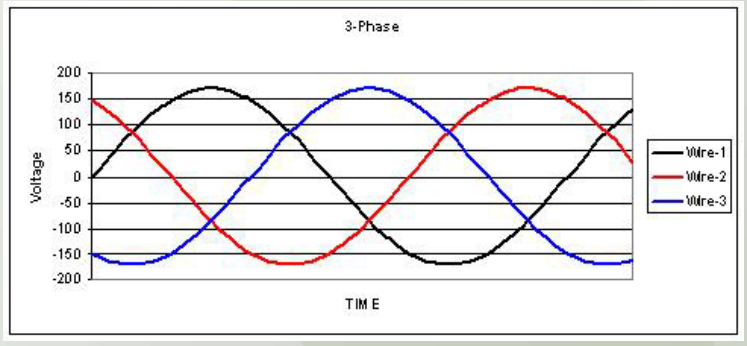
### Single Phase Voltages

Single phase voltage has two possible voltages: conductor to neutral, and conductor to conductor. This is household-type electricity, at 120/240V. This is a result of the 180 degree separation between the voltages. The 120 Volts or conductor to neutral voltage is used for small appliances and lighting. The 240 Volts or conductor to conductor is used for large appliance such as dryers, air conditioners, and ovens.

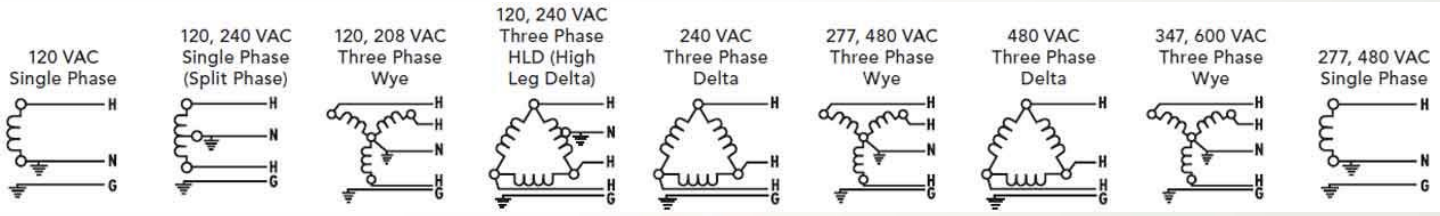



### 3-Phase Voltages

3-phase voltage works with the same combination of conductor to neutral and conductor to conductor voltages. But, in this case due to the 120 degree separation between waves the end result is 120/208V or 277/480. 3-Phase sources are found in commercial buildings.

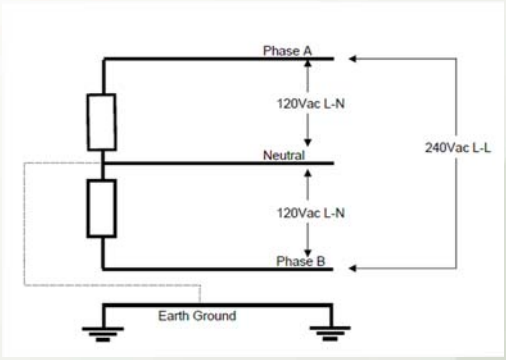


## Types of power supplies available in North America




Canada

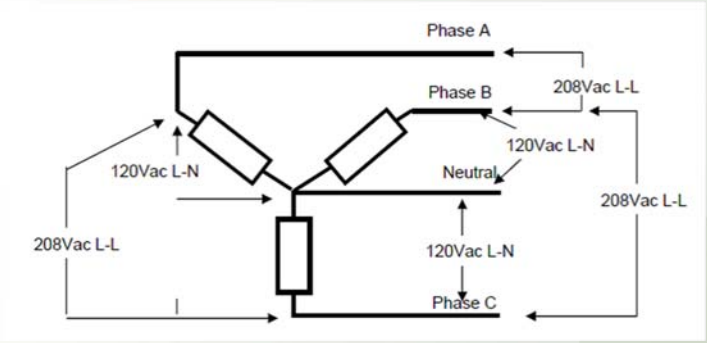
## USA Home Wiring



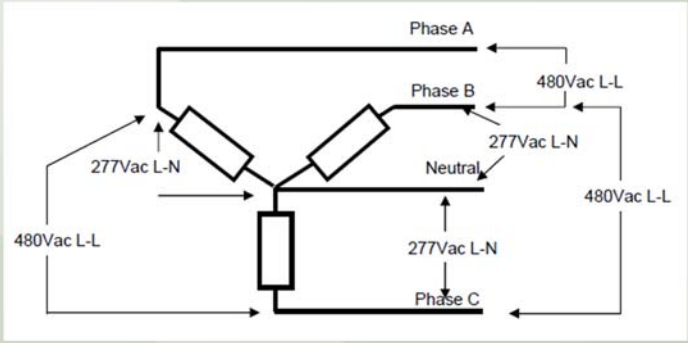

120/240V

## Common USA Industrial/Commercial Sources

### Most Common 3-Phase 4Wire WYE




120/208V




277/480V

### Less Common 3-Phase 3&4 Wire Delta