

Electricity and Electrical Motors in the Shop

Basic Electrical Definitions:

Volts - the energy that causes current to flow

Amps - the amount of current flows

Watts - the energy produced by the electrical current

Power is measured in Watts

Current is measured in Amps

Pressure is measured in Volts

Resistance is measured in Ohms

Basic Electrical Calculations:

Power (watts) = current (amps) x voltage (volts)

Current (amps) = power (watts) / voltage (volts)

Voltage (volts) = power (watts) / current (amps)

Resistance (ohms) = voltage (volts) / current (amps)

Quick horsepower calculation:

For 120 volt motors, divide amps by 8

For 240 volt motors, divide amps by 4

Quick wire size vs. length chart (120 volt service):

Wire size	25 feet	50 feet	100 feet
16 gauge	10 amps	8 amps	5 amps
14 gauge	13 amps	10 amps	7 amps
12 gauge	18 amps	13 amps	10 amps

Built into the chart:

- 150% safety factor (amps 1.5)
- Double wire distance (to/from)
- 5% maximum voltage drop (6volts)