Helpful Equations

Calculating Required Conductor Size:

$$\text{Conductor Size} = \frac{11.1 * \text{Amperage Capacity} * \text{Loop Distance}}{\text{Loop Voltage Drop}}$$

Calculating Allowable Voltage Drop:

$$\text{Allowable Voltage Drop} = \frac{11.1 * \text{Amperage Capacity} * \text{Loop Distance}}{\text{Conductor Size}}$$

Calculating Allowable Circuit Amperage Capacity:

$$\text{Allowable Amperage Capacity} = \frac{\text{Conductor Size} * \text{Loop Voltage Drop}}{11.1 * \text{Loop Distance}}$$

Calculating Allowable Loop Distance:

$$\text{Allowable Loop Distance} = \frac{\text{Conductor Size} * \text{Loop Voltage Drop}}{11.1 * \text{Amperage Capacity}}$$

Legend:

Conductor Size (mm) = Size of power cables being used (Refer to the cable sizing table below)

Voltage Drop (V) = Change in voltage from batteries to charger

Amperage Capacity (A) = The highest amount of amps that will be flowing through the power cables

Loop Distance (ft) = Distance of power cables from batteries to charger (power plant) and back to battery