

UNDERSTANDING DIMMER CAPACITY

Lighting designers and technicians must understand the science of electricity and how electrical theory affects lighting applications. One of the more important applications of this is determining the number of lighting instruments that can be safely connected to the lighting system.

A simple mathematical formula related to electrical capacity in a system is $W = (V)A$ or Watts = Voltage x Amperage. This is sometimes called the West Virginia rule for short because of the WVA abbreviation. When applied to a lighting system, this simple formula helps the technician understand how many lighting instruments can safely be plugged into one dimmer.

Many dimmers are rated at 20 amps. Standard electrical service in the US is 120 volts. Using the West Virginia rule, we see that each dimmer can safely control up to 2400 watts of power.

$W = (V)A$. 120 volt service at 20 amps = 2400 watts.

Understanding that each dimmer has a capacity of 2400 watts (2.4 KW) it is simply a matter of adding up the wattage of each lighting instrument to know how many can safely be plugged into one dimmer. If this number exceeds 2400w, then it is unsafe. If it is less than 2400w, then it is safe. If it equals the amount, it is technically possible but not recommended for use.

Below are a list of common instruments and their wattage. Using the information given, determine if the following scenarios are possible:

- Source 4 Ellipsoidal 575W
- Source 4 Par 575 W
- 6" Fresnel 500W
- PAR64 1000W (1 KW)
- Far Cyc 1000W (1 KW)

Will this number of instruments work, if plugged into 1 dimmer?

1. 2) Source 4's; 1) 6" Fresnel; 1) PAR64
2. 2) 6" Fresnels; 1) Source 4
3. 2) Far Cyc's; 1) Source 4 Par
4. 1) 6" Fresnel; 1) PAR 64
5. 2) Source 4's; 1) 6" Fresnel

How many dimmers would be required for this number of instruments?

6. 4) Source 4 Pars?
7. 6) Far cys; 10) Source 4 Pars; 2) PAR64; 3) 6" Fresnels
8. 2) PAR64; 2) Source 4's
9. 9) 6" Fresnels; 9) Source 4's
10. 5) PAR64