Power Supply

Theatres require large amounts of power. As this service comes from the power company, there are three standard types of power configuration.

This power supply is what determines the amount of dimmers and their capacity which may be used in the theatre.

Each of these systems contains one or more "Hot Legs" - each hot leg carries a specified amount of Amps.

- 1 phase 2 system
- 1 phase 3 system
- 3 phase 4 system

- One phase Two contains one hot leg and one neutral.
  Example: 100 amps x 1 hot leg = 100 amps
- One phase Three contains two hot legs and one neutral.
  Example: 100 amps x 2 hot leg = 200 amps
- Three phase Four contains three hot legs and one neutral.
  Example: 100 amps x 3 hot leg = 300 amps
  Most typical type of power service in the theatre world.

How can you figure out how much power you have, and how many dimmers you can use? Multiply the Ampere amount (of the service, which varies by location) by the amount of Hot Legs in the system.

For example, if you have 100 amps	100A
in a **one phase three** system	* (2) hot legs
you have a total of	200A available

American Theatre Standards Dimmer Chart					
Dimmer:	1.2k	2.4k	3k	4k	6k
Amp usage	10	20	25	35	50
6-pack of dimmers (amps)	60	120	150	210	300

Note: Often small cases of dimmers are only available in packs of 6 because they are cheaper to manufacture in this way - so check with your supplier to see what the local options might include. For large installations, racks may be configured in more flexible ways.

How many dimmers can you use?

a) (6) 2.4K & (6) 1.2K dimmers = 180 amps in a total of 12 dimmers
b) (18) 1.2K dimmers = 180 amps in a total of 18 dimmers
c) (6) 3K dimmers = 150 amps in a total of 6 dimmers
d) (6) 3K dimmers & (5) 1.2k dimmers = 200 amps in a total of 11 dimmers
or (20) 1.2k dimmers = 200 amps in a total of 20 dimmers
but because it's unlikely you can find these configurations (since dimmers are typically in multiples of 6) this isn't a realistic option.

Right: ETC "Sensor" dimmer racks (a very popular choice) can hold up to 96 dimmers per rack.

Below: a CD-80 2.4k dimmer pack. Popular for touring - with (12) dimmers in a single module.

As a lighting designer, you are not affected by the type of service - what matters most is the size of the service.

If you need to order equipment, however, you need to tell the theatrical supply house what type of service it is so that the supplier can give you dimmers that match the theater's configurations. If they don't match, the power needs to go through a converter or the dimmers won't work properly.

This was just a quick introduction to the concept of power service. It's good to have a basic understanding of how this works; but you will likely not run into these types of decisions for at least a few years into your career.

Most likely you will begin working in spaces that already have dimmers installed.