
Sizing the Circuit Breakers

With the fixture's current draw information, the installer can calculate and select the right circuit breaker size (rating) to which they can connect a group of fixtures. The following provides several methods that can be used.

Using the Specification Sticker

CHAUVET® fixtures come with a specification sticker that indicates the current the fixture consumes in a circuit at the specified voltage. This sticker information simplifies calculating the total current drawn.

For example, the sticker on a fixture indicates **0.1 A @ 115 VAC, 60 Hz** and the installer is connecting **12** fixtures to the same **115 VAC** circuit.

You would determine the total current required by the fixtures using this simple calculation:

$$0.1 \text{ A} \times 12 = 1.2 \text{ A}$$

Using the Watts/Volts Method

Some installers may prefer to determine the current drawn by the fixture by dividing its power consumption, indicated in watts (W), by the voltage (V) on the circuit. As an example, assuming that a certain fixture consumes **240 W** and it is connected to a **120 VAC** circuit, the current drawn would be:

$$240 \text{ W} / 120 \text{ V} = 2 \text{ A}$$

Considering the Power Factor

The above method is accurate only with fixtures whose power factor (PF) is equal, or very close, to "1." Otherwise, the calculated current may be too low with respect to the actual current drawn by the fixture.

In fact, as the PF decreases, the difference between the current calculated using the watts/volts method and the actual current increases.

Therefore, for fixtures with a PF below "0.9," the installer must always consider the fixture's PF when using the watts figure to calculate the current it draws.

For the above example, if the published fixture's PF were "0.7", the resulting drawn current would be as follows:

$$2 \text{ A} / 0.7 = 2.8571 \text{ A}$$

This is approximately equal (\approx) to 2.86 A, 2.9 A, or even 3 A, depending on the installer's desire for accuracy. In other words, the actual current ended up being close to 50% higher than originally calculated.

Using the Volt Amps Method

If the fixture's specification sticker indicates the power consumption in "volt amps" (VA), the calculation of the drawn current is simply the result of dividing the amount in VA by the voltage on the circuit (V). For a fixture with a consumption of 360 VA, the calculation would be as follows:

$$360 \text{ VA} / 120 \text{ V} = 3 \text{ A}$$

Note that when the power consumption is in VA, the fixture's PF is never part of the current draw calculation.

Selecting the Circuit Breaker

The National Electric Code (NEC) determines that circuit breakers should handle 80% of their rated capacity for continuous loads (those being on for three or more hours) and 100% for intermittent loads. For safety reasons, CHAUVET® recommends assuming that all loads are continuous.

After calculating the total current the fixtures connected to a particular circuit will draw, the installer must consider the 80% rule indicated above. For a total current of 15 A, the calculation is as follows:

$$15 \text{ A} * 1.25 = 18.75 \text{ A}$$

The installer should use a 20 A CB because the immediately lower CB rating, 15 A, would not be enough for this load.