POWER FACTOR FOR LED LIGHTS EXPLAINED.

Why is it important to understand PF?

The Power factor of an LED light or driver indicates the ratio of **real power** used (which is the amount of Watts used by the light) to the **apparent power** drawn into the lamps circuit.

**Alternate definition:** PF provides a measure of how close your load is to a incandescent light bulb (which has a PF of 1). Historically, incandescent bulbs have had near-perfect power factor. All LEDs and drivers are measured against this base line.

A low power factor is also a sure sign of an inefficient product or light as it draws more current into the circuit than is utilised by the load.

When choosing a LED lights with higher power factors, it minimises the current capacity of components in your lighting circuit including dimmers and cables as the products are not drawing an excessive amount of current compared to what is required.

- The lower the current draws (higher power factor) of LED lamps, the more LED lamps that can be supplied by one circuit.
- A poor PF (power factor) means you are using more energy than you may realise on energy consumption.

**Example:**

<table>
<thead>
<tr>
<th>Wattage</th>
<th>Power Factor</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Watt LED bulb with a PF of 0.5</td>
<td>10W ÷ 0.5 = 20W consumption</td>
<td></td>
</tr>
<tr>
<td>10 Watt LED bulb with a PF of 0.8</td>
<td>10W ÷ 0.8 = 12.5W consumption</td>
<td></td>
</tr>
</tbody>
</table>

In addition to increased costs, what are some other problems that relate to a low PF?

- Power is recycled from the LED Bulb/ Fixture to the power source.
- Harmonics from the LED bulb/ fixture are degrading the line and affecting the performance of other equipment on the line
- The load is generating additional losses
- The load requires the power grid to provide more power than used by the lamp.

**Conclusion:** When choosing a LED light ensure that the PF is at least 0.7 or above. This is an EU and UL requirement. This is also extremely important when fitting an ALL-Dimmer™ to the circuit as it will increase or decrease the amount of LED lights that can be loaded onto the circuit.

**References:**

- [http://carbon8lighting.co.uk/power-factor-pf-explained/](http://carbon8lighting.co.uk/power-factor-pf-explained/)

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