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In today's energy climate more and more people have become motivated to accomplish what they can to become more energy efficient to conserve energy and money. Regrettably this same climate has encouraged some to take advantage of innocent consumers' desires to save energy and reduce operating expenses.

Vendors that advertise power factor improvement (kVAR correction) and transient voltage suppression to save energy are a good case in point of this bad trend. Recently we are seeing more and more of these businesses cropping up and we believe it is time to set the record straight.

First off, transient voltage surge suppression (TVSS) plays an important part in improving power quality to guard sensitive equipment inside a facility. However, TVSS does not save energy. TVSS's are barely active an infinitesimal portion of a second to defend against voltage surges which only last for less than a millisecond. To actually decrease energy use the TVSS would need to essentially cut power consumption for an extended amount of time which is not what they are designed to do. Again, TVSS is essential to protect susceptible electrical equipment but consumers should steer clear of vendors promising, or even guaranteeing, a reduction in energy consumption.

And what about salespeople who maintain that increasing power factor will save 15% or 20% or 30% of energy consumption and resultant costs? This is false but also a bit trickier.

For homes, power factor correction does zero to save energy because the average home already has an average power factor of approximately 0.97 which is nearly the perfect power factor of 1 or unity. Additionally, the unit (called a capacitor) is installed at the homes main circuit breaker. According to IEEE 5.5.3.3 capacitors must be located at or near the individual inductive motor loads to decrease power system losses by reducing heat and distribution losses known as I²R losses.

So what about commercial and industrial facilities looking to use power factor correction to shrink energy expenditures? It is completely appropriate for a business that is incurring penalties or a kVA billing structure from the utility company to improve the facility's overall power factor by installing a capacitor bank at the main electrical service entrance or individual capacitors at or near the particular motor loads. Doing so will do away with the power factor penalties and/or reduce the kVA demand charges on the electric bill which can save considerable money and provide a significant ROI on the investment.

But what about power factor correction reducing kWh consumption? IEEE also tells us that at most I²R losses only account for 2 to 5% of the total load in a facility. Simple arithmetic tells us that it would be in opposition to the laws of physics to obtain the 15% to 30% energy reduction claimed by some vendors. Consider it. Even if your facility had 5% distribution losses and you could correct 100% of the predicament via power factor correction at every load (which can't be done) you would still save no more than 5% at most. No where close to the claims of some capacitor reps and manufacturers.

All that said, power factor correction when done appropriately will eliminate utility penalties and kVA demand charges, improve facility power quality, increase electrical system capacity, and save a modicum of energy when applied at the proper motor loads in an industrial facility.

So make an investment in transient voltage surge suppression and power factor correction when appropriate and necessary. But caveat emptor!

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