

## Power Factor Correction vs. Power Factor Optimization

Power factor correction (PFC) equipment is usually installed near the main electrical service as it enters a building to reduce any power factor (PF) penalty charges that are sometimes imposed by the utility company tariffs. The electric supplier delivers “dirty power” (low PF) and basically forces you, the customer, to clean it up or pay a penalty charge. But like all capacitors, they **only** work from where they are installed back to the electricity supplier or the source. Capacitors installed here do **not** help the customer in removing  $I^2R$  losses ( $\text{Amps}^2 \times \text{Resistance} = \text{Power}$ ) nor the inefficiency and wastefulness of the motors inside the building. The National Electrical Code (NEC) requires all electrical components to be at least 125% oversized to prevent fires and injury; therefore, it is easy to conclude that all systems have significant losses. PFC equipment is considered a **20<sup>th</sup> Century technology**. They are mainly designed and installed to help the **electric company save money**.

The KVAR® Energy Controller (EC) pre-engineered and custom-built systems are installed on the demand side of electrical systems as close to the motor or inductive loads as possible, on a motor by motor basis. By installing these customized systems at this location, they greatly increase the power factor to unity, they fine tune the motors and most importantly, reduce the amperage and wattage to the meter (cash register) that **saves the customer money!**

Moreover, even if the PF coming into the building is over 90%, it does not relate to the individual motors because of the  $I^2R$  losses, the inefficiency of the motors, and the electromagnetic fields (EMF) that develops. The KVAR® EC systems store the reactive power to create the EMF around the inductive windings of a motor. As motors operate, reactive power is “pulled” and “pushed” to and from the KVAR® EC system by the motor at 60 cycles per second. The KVAR® EC system stores & releases to motors what they need to function more efficiently. The KVAR® EC systems remove the  $I^2R$  losses, increases the efficiency of the motors and removes the PF penalty charges, if these penalties are imposed. Proof of this is done with True RMS/PF meters and our patented optimizing equipment on “live” loads. This will show a reduction at the utility company’s meter (cash register), both in amperage and wattage. In addition, the motors will run cooler and last longer, positively affecting the bottom line dollar for the customer.

Most importantly, the motors will continue to receive the proper amperage and voltage that they were designed to perform work with, but the electric meter (cash register) will measure a drastically lower number, which converts to dollar savings to the customer. It is necessary that these precisely engineered capacitors are installed very close to the motors; usually on the load side of the contactor, the disconnect, or the MCC.

**This 21<sup>st</sup> Century technology** is called **Power Factor Optimization** and is only available through Kvar Energy Savings, Inc. with their patented methodology and apparatus. On live loads, it will only take a few minutes for a qualified and trained KVAR® professional to accurately determine, to an exact science, how much capacitance is required to optimize the inductive loads to unity. This creates an ideal balance in the system, resulting in a significant reduction in usage, which facilitates a maximum savings on electricity costs with a quick ROI. This information is then charted into our exclusive software for the 100+ pre-engineered systems to be customized for the client’s equipment.