Name: Nafinur Leo

Id: 20-42195-1

Section: H

**Power Factor Correction:**

Power factor is an expression of energy efficiency. It is usually expressed as a percentage and the lower the percentage, the less efficient power usage is. Power factor (PF) is the ratio of working power, measured in kilowatts (kW), to apparent power, measured in kilovolt amperes (kVA). Apparent power, also known as demand, is the measure of the amount of power used to run machinery and equipment during a certain period. It is found by multiplying (kVA = V x A). The result is expressed as kVA units. A high-power factor is an indicator that the electrical loads are utilizing power efficiently, while a low power factor indicates that the connected electrical loads are utilizing power inefficiently. The most commonly used types are constructed using a metallized polypropylene film while a few employs metallized polyester film or paper. Bi-metallized paper capacitors are commonly used in applications that demand robust power factor correction solutions. The special paper used for constructing these capacitors contains a thin layer of metal alloy. Sheets of paper are separated by a polypropylene film. These capacitors are constructed to withstand high temperatures and high harmonic content. Bi-metallized paper capacitors find many applications in power electronics. Metallized polyester film capacitors are compact, light and offer excellent capacitance stability. Although these capacitors are used primarily for DC applications, they are also suitable for AC line filtering and power factor correction. Power factor correction is the term given to a technology that has been used since the turn of the 20th century to restore the power factor to as close to unity as is economically viable. This is normally achieved by the addition of capacitors to the electrical network which compensate for the reactive power demand of the inductive load and thus reduce the burden on the supply. There should be no effect on the operation of the equipment. To reduce losses in the distribution system, and to reduce the electricity bill, power factor correction, usually in the form of capacitors, is added to neutralize as much of the magnetizing current as possible. Capacitors contained in most power factor correction equipment draw current that leads the voltage, thus producing a leading power factor. If capacitors are connected to a circuit that operates at a nominally lagging power factor, the extent that the circuit lags are reduced proportionately. Typically, the corrected power factor will be 0.92 to 0.95. Some power distributors offer incentives for operating with a power factor of better than 0.9, for example, and some penalize consumers with a poor power factor. There are many ways that this is metered but the net result is that in order to reduce wasted energy in the distribution system, the consumer is encouraged to apply power factor correction. Most Network Operating companies now penalize for power factors below 0.95 or 0.9.