Power Factor.

Power Factor Definition : Power factor is the ratio between the KW and the KVA drawn by an electrical load where the KW is the actual load power and the KVA is the apparent load power. It is a measure of how effectively the current is being converted into useful work output and more particularly is a good indicator of the effect of the load current on the efficiency of the supply system.

All current will cause losses in the supply and distribution system. A load with a power factor of 1.0 results in the most efficient loading of the supply and a load with a PF of 0.5 will result in much higher losses in the supply system.

A poor power factor can be the result of either a significant phase difference between the voltage and current at the load terminals, or it can be due to a high harmonic content or distorted/discontinuous current waveform.

Poor load current phase angle is generally the result of an inductive load such as an induction motor, power transformer, lighting ballasts, welder or induction furnace.

A distorted current waveform can be the result of a rectifier, variable speed drive, switched mode power supply, discharge lighting or other electronic load.

A poor PF due to an inductive load can be improved by the addition of power factor correction, but, a poor power factor due to a distorted current waveform requires an change in equipment design or expensive harmonic filters to gain an appreciable improvement. Many inverters are quoted as having a PF of better than 0.95 when in reality, the true power factor is between 0.5 and 0.75. The figure of 0.95 is based on the Cosine of the angle between the voltage and current but does not take into account that the current waveform is discontinuous and therefore contributes to increased losses on the supply.

Reactive current flowing in the supply is referred to as reactive power and is usually expressed in VARs or KVARs. A VAR is the product of the reactive current and the applied voltage. A KVAR is equal tp 1000 VARs.