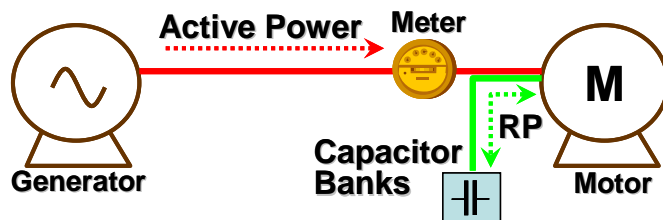
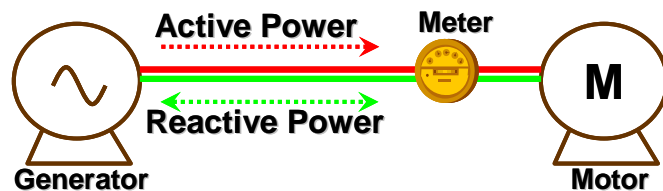


What is Power Factor?

All electrical equipment use electricity to convert into other forms of energy e.g. lamps produce heat and light, motors produce mechanical power, heaters produce heat. The electrical power drawn by some electrical equipment with magnetic or electrostatic properties, such as motors and fluorescent tubes, is comprised of two components; active power and reactive power. The active power is converted into useful work or other form of energy. However, the reactive component is only used to “energize” the magnetic or electrostatic properties of the equipment. In an AC supply system the reactive power is not actually consumed but rather oscillates between the generator and the equipment through electricity network and other infrastructure. The Power Factor is roughly a measure of what proportion of the total power (termed apparent power) supplied to an equipment is actually used by the equipment. Mathematically it is the ratio of active power to the apparent power for given equipment and can vary between just above 0 and 1. Resistive loads, such as resistance heaters, operate at unity power factor as they convert all electrical power supplied into heat. Please note that the Apparent Power is NOT an arithmetic sum of active and reactive powers.



Why need to Improve PF?

Although the reactive power is not actually “consumed” by the equipment, yet it must be generated by the generator and transmitted through electrical network to the equipment, resulting in need for unnecessarily bigger generators and network cables. There are other several technical and financial implications of poor power factor, including unnecessarily higher line losses.

Depending on mix of different types of equipment, your business may have a certain overall power factor. The electricity suppliers must recover the costs as a consequence of poor power factor from its customers. Such cost is recovered through different components in electricity bill; a specific penalty if power factor drops below a minimum value (generally 0.85) or maximum demand (apparent power measured in kVA) charges.

How to Improve PF?

In technical terms a poor power factor due to excessive electromagnetic equipment (motors, transformers, induction heating) is called Lagging PF, as compared to Leading PF caused by predominantly capacitive equipment (electrode tubes, electro-chemical plating). In majority cases the poor PF is the result of reactive power used by electromagnetic loads, also called inductive loads. The power factor of a facility can be improved by “trapping” the reactive power before it passes the meter. In case of inductive loads this is achieved by installing “banks” of capacitors near the inductive equipment or before the meter. The capacitors capture the reactive power of the inductive load when it is returning to the generator and supply it back when required by the equipment. All equipment that use motors, such as air conditioners, escalators, elevators, pumps, chillers, ventilation systems etc, contribute to lower power factor.

In order to achieve optimum technical and financial benefit it is important that the technical characteristics and design parameters of the PF correcting capacitors match with those of the induction equipment. This requires technical assessment and design and must be carried out by qualified professionals.

How PF Correction can help your business?

If your electricity bill contains a PF penalty or if are charged for peak load in kVA, power correction can help you reduce such surcharges. Often in many cases, the investment in PF correction equipment, including the fees of professional consultants, can be recovered between 2-5 years from the resulting savings in electricity bill.