TECHNICAL ARTICLE

Common Misconceptions About Passive Harmonic Filters

Misconception #1:

Passive harmonic filters that are applied to VFD's increase the kVA loading on the power system since they draw reactive power continuously and make the displacement power factor worse.

Fact #1

A VFD, in addition to drawing real power (kW), will draw some lagging (inductive) reactive power (kVAr). A passive harmonic filter will draw primarily leading (capacitive) reactive power. The capacitive kVAr's of the passive filter will largely offset the inductive kVAr's of the VFD with the net result being that reactive power (kVAr) and apparent power (kVA) will be reduced. This means that the voltage will be more closely in phase with the current. The displacement power factor, which is the cosine of the difference in angle between the voltage and current, will therefore be increased (closer to 1.0).

Misconception #2:

Passive harmonic filters cause overvoltage faults on the VFD.

Fact #2

As long as the capacitor (KVAr) in the passive harmonic filter is kept relatively small (as is the case with the HPS design) the voltage will not vary by more than +/-5% from no load to full load. Overvoltage faults will not occur on the VFD under these circumstances. In some competitive passive harmonic filter designs the capacitor is larger which creates a risk that an overvoltage could occur at a light load condition

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