



## A Comparison of BPU™ technology and Power Factor Correction Device

Occasionally we are asked to clarify the differences between our technology and various power factor correction devices on the market. Here are the major differences.

Comparison BPU™ with Power Factor Capacitor Bank	BPU™	PFD
Capacitor Type	Run	Start-up & Power Factor
Unit capacitance on electrical service	9 uF	Up to 5000 uF
Unit is compatible with Variable Speed Drives	YES	Sometimes
Unit contains microprocessor	NO	Sometimes
Unit Provides Voltage Optimization	YES	Minor Benefit
Unit Provides Lightning Suppression	YES	NO
Unit Provides Phase Balancing	YES	NO
Unit Provides Surge & Sag Suppression	YES	Minor Benefit
Unit Provides Harmonic Mitigation	YES	NO
Unit Provides Power Factor Correction	YES	YES
Unit can capture and recycle distorted electrical power	YES	NO
Unit reduces kW Demand Spikes	YES	Minor Benefit
Unit reduces kWh Consumption	YES between 11% & 20%+	YES between 1% and 2%

### BASIC POWER UNIT™

The **BPU™** combines multiple Power Quality features which include voltage optimization, phase balancing, harmonic mitigation, sag and swell mitigation, surge suppression, lightning suppression and power factor correction. The **BPU™s** primary application is kWh and kW demand reduction which is achieved through the operation of a patent pending electromagnetic reactor. The reactor senses and captures electricity distorted by the external electrical grid and the electricity distorted by the operation of electrical equipment within a building. This distorted electricity is recycled back into useable power that is then supplied to your equipment. The electromagnetic reactor is integrated with a series of filters and transient power storage in a small number of capacitors improving power quality in residential, commercial and industrial settings.

The **BPU™** improves power factor, as a secondary attribute, through the operation of the electromagnetic reactor and dedicated capacitors and reacts instantaneously to variations in the level of power factor required by the building. The **BPU™** places a maximum of 3 microfarads per leg on the electrical service and is safe to use with Variable Speed and Variable Frequency Drives that are often found in large HVAC systems. IF NO POWER FACTOR IMPROVEMENT IS REQUIRED (UNITY) THEN THE BPU™ SYSTEM THROTTLES BACK AND DOES NOT PUSH POWER FACTOR LEADING.

Customers have seen the **BPU™** deliver kWh savings in the range of 11% to 20% as is shown on a Class A utility grade power quality analyzer at time of installation (where actual kilowatt consumption is analyzed) and also demonstrated in the electric utility bill in the billing cycle following installation.

### POWER FACTOR CORRECTION CAPACITOR BANK

A **power factor correction device** (“PFCD”) contains numerous “start-up” and /or “power factor correction” capacitors, and occasionally microprocessor controls. A PFCD is simply a large array of capacitors that serves one purpose: to correct

# BASICPOWER™

power factor in industrial applications where power factor is low. A PFCD places large amounts of static capacitance on the electrical service (which measure in the thousands of microfarads) and, if not sized exactly correct, are detrimental to the operation of variable speed drives and variable frequency drives and can damage control systems for these drives. PFCD are sized to correct power factor issues when all equipment is running and can bring the power factor to plus .95. However, when some of the equipment is not running the PFCD can push the power factor into a current leading situation unless there are internal controls within the PFCD. If power factor is above unity, then KVAR acts as a load causing more current to be drawn from the mains leadings to overheating of equipment and other electrical issues.

Banks of capacitors cannot reduce kWh consumption and power factor correction is meaningless outside of industrial settings as is evidenced by multiple white papers from governmental and private testing labs and professionals. Disingenuous vendors selling PFCD as power savers like to demonstrate a reduction of amperes as evidence of electricity savings. However, a reduction in amperes does not equate to a reduction in kilowatts (in a PFCD) and kilowatts is what the utility company bills you for. Also, a PFCD does not protect against lightning or surges and other Power Quality metrics found in the electrical circuits within a building.