

**CPX9000** Clean Power Adjustable Frequency Drives

# Clean Power Drive Solution to Harmonic Distortion



**EATON**

*Powering Business Worldwide*

# CPX9000

## The Proven Solution for Clean Power.

### **The most advanced clean power solution on the market—Eaton's CPX9000.**

Based on over 15 years of 18-pulse drive experience and the highly successful 9000X Series of adjustable frequency drives, the CPX9000 uses advanced clean power technology to significantly reduce line harmonics at the drive input terminals, resulting in one of the purest sinusoidal waveforms available.

The CPX9000 delivers true power factor, so in addition to reducing harmonic distortion, it prevents overheating of upstream transformers and the overloading of breakers and feeders. It allows adjustable frequency drives to be applied to generators and other high impedance power systems.

Designed to exceed the IEEE 519-1992 requirements for harmonic distortion, the CPX9000 is the clear choice for applications in the water/wastewater, HVAC, industrial and process industries where harmonics are a concern.

### **Facility analysis simulations and services.**

While utilities may deliver relatively clean power (pure sinusoidal waveforms), nonlinear loads such as computers, drives, and electronic ballasts can introduce undesirable harmonic currents into the power system.

Many facilities demand the IEEE 519-1992 standard for minimizing harmonic distortion be met to eliminate the potential for equipment failures that can lead to increased downtime and costs.

The first step in developing an appropriate clean power solution is a facility analysis. Eaton performs facility simulations for existing facilities and during the design and construction phase of new facilities. In addition to offering the CPX9000 solution, Eaton's Electrical Systems and Services organization is equipped to measure, analyze, and correct harmonic and other power quality issues.

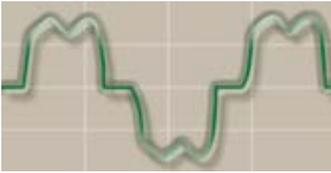
### **Ensuring IEEE Compliance.**

After the simulation is complete, a number of steps can be taken to ensure IEEE 519-1992 compliance. Major technologies include passive filters, active filters, additional inductive reactance, phase-shifted sources, 12-pulse rectifiers and the CPX9000 clean power drive. While all of technologies are viable, the CPX9000 is selected most often because unlike the other technologies, it meets IEEE 519-1992 at the drive input connection even if power system conditions change. This means no re-tuning, no adjustments and no new system analysis.

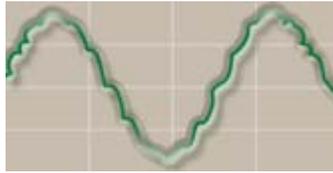
The 18-pulse rectifier assembly is modular, compact and uses diode packs to eliminate bulky external charging circuitry.



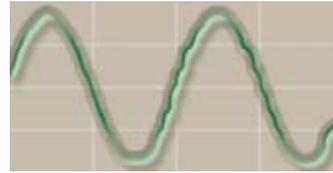
A full range of configuration options includes a variety of bypass contactors and cutting edge starters, such as Eaton's *IT* reduced voltage soft starters. All combinations are UL508C listed and approved.



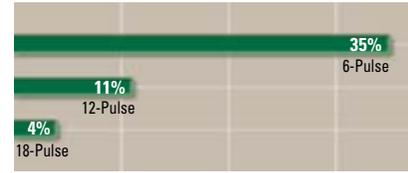
6-pulse drives typically have distortion with steep current rises.



12-pulse drives typically produce a rough sinusoidal waveform.



The CPX9000 clean power drive dramatically reduces harmonic distortion for a clean waveform.



18-pulse drives exceed the IEEE standard of 5% THD. The chart illustrates differences between 6-, 12- and 18-pulse solutions. For sensitive medical and electronic equipment, Eaton's CPX9000 is unsurpassed.



**CPX9000 standard features:**

- Multi-Line, easy-to-use operator control panel
- 9000X Drive, windows-based programming software
- Selectable sensorless vector
- Input fuses for protection
- Pre-engineered compact Type 1, 12 or 3R enclosures

**Communications Capabilities:**

- Devicenet
- Profibus DP
- Ethernet
- Modbus-RTU
- Lonworks & key HVAC protocols
- BACNET



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