

# CPX9000 clean power drives in MCCs—the best solution for clean power



## Product description

Eaton's motor control centers (MCCs) provide a convenient method for grouping motor control, including the state-of-the-art CPX9000 clean power adjustable frequency drives and the associated distribution equipment.

Based on Eaton's high-tech and highly successful 9000 series of adjustable frequency drives, the CPX9000 drive—a market leader among clean power drives—uses advanced 18-pulse, clean power technology to significantly reduce line harmonics at the drive input terminals, resulting in one of the purest sinusoidal waveforms available. The CPX9000 drive also delivers "True Power Factor" so, in addition to reducing harmonic distortion, the CPX9000 prevents overheating of transformers and overloading of breakers and feeders.

Designed to exceed the IEEE® 519-1992 standard's requirements for harmonic distortion, the CPX9000 drives are the clear choice for application in the water, wastewater, HVAC, industrial and process industries where harmonics are a concern. The CPX9000 drives are now available integral to Eaton MCC assemblies, and in the smallest footprint available in the industry.

## Features and benefits

CPX9000 technology

- The integrated clean power technology includes an 18-pulse "differential delta" phase-shifting auto-transformer and an 18-pulse SCR bridge rectifier assembly to accomplish a near sine wave input current, and at a "true power factor"
- CPX9000 is selected most often because, unlike other available harmonic mitigation technologies (passive filters, active filters, additional inductive reactance, phase-shifted sources and 18-pulse rectifiers), the CPX9000 meets IEEE 519-1992 standard for harmonic distortion limits in every case at the drive input connection, even if power system conditions change. This means no retuning, no adjustments and no new system analysis
- The 18-pulse rectifier assembly is modular and compact, and uses diode packs to eliminate bulky external charging circuitry
- Highly stable bus voltage increases drive life (18 small inputs instead of six large inputs)
- Provides up to four times the harmonic reduction of 12-pulse technology
- CPX9000 phase-shifting transformer is significantly smaller than the isolation transformer used in 12-pulse technology
- Highly cost-effective solution at horsepower levels of 50 and higher



**EATON**

Powering Business Worldwide

## Standard features

- Smallest footprint in the industry
- SV Multi-Line™, easy-to-use operator control panel
- SV Drive™, Windows®-based programming software
- Selectable sensorless vector control
- Input fuses and MOV for input protection
- Options include auto-transfer bypass controllers, integration of operator interface station and PLC

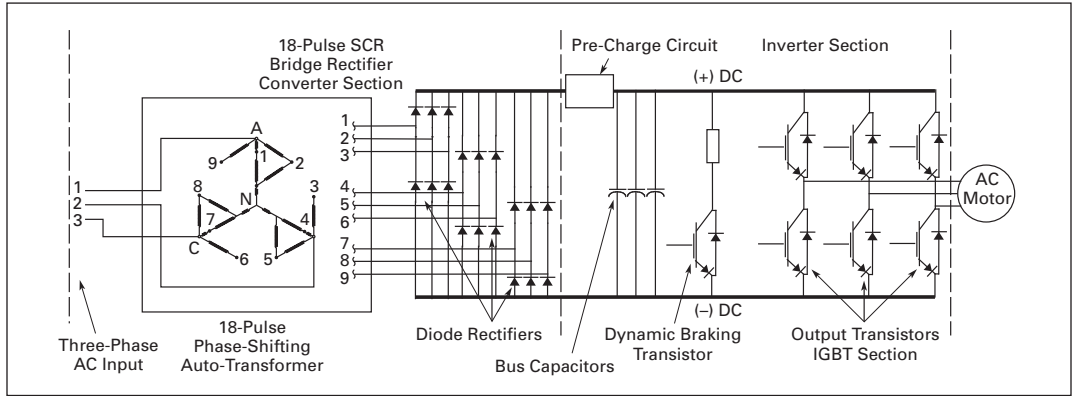
## Communication capabilities

- DeviceNet™
- PROFIBUS® DP
- Modbus®-RTU
- Modbus TCP
- EtherNet/IP
- LonWorks® and key HVAC protocols
- Up to five plug-and-play I/O cards, each with unique input and output configurations, can be installed

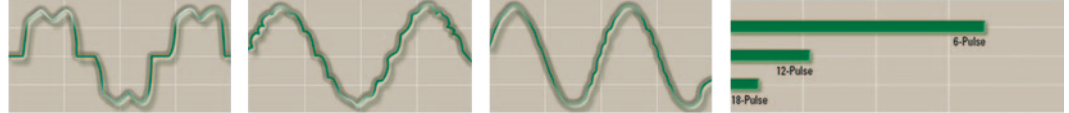
## Ratings and standards

- Designed to meet/exceed IEEE 519-1992 standard's requirements for harmonic distortion
- UL® 845 Listed for integration into MCC assemblies
- Designed for horizontal bus configurations up to 3200A and 100 kA short-circuit current rating
- 480 Vac, three-phase, three-wire or four-wire
- Available in NEMA® 1 gasketed MCC assemblies

## 18-pulse rectifier and "differential delta" phase-shifting auto-transformer assembly



## Comparison of 6-, 12- and 18-pulse drive technologies for reduction in harmonic distortion



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

12-pulse drives typically produce a rough sinusoidal waveform.

The CPX9000 Clean Power Solution 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.



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

## CPX9000 Drive Sizes Available in MCCs 1 2

I <sub>L</sub> -Low Overload Rated 3		I <sub>H</sub> -High Overload Rated 3		Dimensions W x D x H in Inches 4	Frame Size
hp	Amps	hp	Amps		
25	35	20	27	40.00 x 21.00 x 90.00	FR6
30	40	25	35	40.00 x 21.00 x 90.00	FR6
40	52	30	40	40.00 x 21.00 x 90.00	FR6
50	65	40	52	40.00 x 21.00 x 90.00	FR7
60	77	50	65	40.00 x 21.00 x 90.00	FR7
75	96	60	77	40.00 x 21.00 x 90.00	FR7
100	124	75	96	40.00 x 21.00 x 90.00	FR8
125	156	100	124	40.00 x 21.00 x 90.00	FR8
150	180	125	156	40.00 x 21.00 x 90.00	FR8
200	240	150	180	60.00 x 21.00 x 90.00	FR9
250	302	200	240	60.00 x 21.00 x 90.00	FR9
300	361	250	302	68.00 x 21.00 x 90.00	FR10
350	414	300	361	68.00 x 21.00 x 90.00	FR10
400	477	350	414	68.00 x 21.00 x 90.00	FR10
450	515	400	477	106.00 x 28.00 x 90.00	FR11
500	590	450	515	106.00 x 28.00 x 90.00	FR11

1 CPX9000 drives in MCCs are available in thermal-magnetic breaker, motor circuit protector and fused disconnect configurations.

2 A minimum clearance of 4.00 inches should be provided at the back of CPX9000 drive MCC section for ventilation.

3 The CPX9000 product uses the term Low Overload (I<sub>L</sub>) in place of the term "Variable Torque" and High Overload (I<sub>H</sub>) in place of the term "Constant Torque."

4 For dimensions in mm, multiply inches by 25.4.



## Eaton Corporation

Electrical Sector  
1111 Superior Ave.  
Cleveland, OH 44114  
United States  
877-ETN-CARE (877-386-2273)  
Eaton.com

© 2011 Eaton Corporation  
All Rights Reserved  
Printed in USA  
Publication No. PA04302003E / Z10766  
February 2011

**EATON**  
Powering Business Worldwide

  
PowerChain  
Management®

PowerChain Management is a registered trademark of Eaton Corporation.

All other trademarks are property of their respective owners.