

Copeland variable frequency drives for commercial HVACR

Significant energy savings, precise temperature control and enhanced reliability for HVACR applications.

By **Joe Summers**, Product Marketing Manager, Variable Speed & Integrated Solutions Copeland





According to the Department of Energy (DOE), the commercial building sector accounts for 40 percent of the total energy consumption within the U.S. Among the greatest electricity consumers—and contributors to energy costs—are the motor loads from heating, ventilation, air conditioning and refrigeration (HVACR) equipment. For building operators seeking to reduce energy consumption and the associated costs on their existing systems, variable frequency drives (VFDs) deliver significant efficiency improvements and a quick return on investment (ROI).

To address the need for improved system efficiencies in food retail, commercial building and industrial applications, Copeland recently announced the introduction of its Copeland VFDs. As the culmination of several investments in power electronics capabilities and state-of-the-art production facilities, our new VFD products are designed to reduce both the costs and complexities of VFD implementation.

Adding a Copeland VFD allows operators to vary the speed of a fixed-speed HVACR motor—such as refrigeration compressors or evaporator/condenser fans in parallel rack and/or chiller applications—and quickly retrofit their facilities to achieve the following benefits:

- Improvements to system performance and reliability
- Reductions in energy consumption
- Fast ROI

Available VFD platforms

The Copeland VFDs are available in two product platforms: EVM and EVH.

The ***Copeland EVM VFD series*** is ideal for chillers, medical refrigeration, display cases, walk-ins, reach-ins and other applications where less control functionality is needed.

- Covers 1/2 to 30 HP range
- Available in single- and three-phase input options
- Equipped with onboard Bluetooth® capabilities for ease of use



The ***Copeland EVH VFD series*** is designed for large centralized racks including CO₂, advanced chillers and industrial refrigeration applications that require more demanding motor control functionality.

- Covers 1 to 250 HP
- Available in three-phase, including 575-volt options
- Delivers advanced motor control





These product lines offer a variety of connection options, including an onboard web server (available on EVM series only) and a multitude of available onboard communication options:

- Modbus RTU or TCP
- BACnet™ MS/TP or IP
- Ethernet IP/TCP
- Optional cards such as: CANopen, Dual Ethernet Port and Profibus

Energy savings and performance and reliability improvements

By adding Copeland VFDs to HVACR equipment, facility operators can implement a variable-capacity modulation strategy that reduces energy consumption while performing the same amount of work. Adding VFD to a fixed-speed fan or pump motor can result in a [30 to 50 percent](#) reduction in energy costs—allowing capacity to fluctuate from 10 to 100 percent. When added to a semi-hermetic compressor, a Copeland VFD provides a [15 to 30 percent](#) reduction in energy costs while enabling capacity modulation from 40 to 100 percent—without having to replace a compressor.

This efficiency from the VFD is a result of improved load matching, less on and off cycling, soft start-ups and faster temperature pull-downs. Thus, end users will experience the following system performance improvements:

- Precise temperature and humidity control
- Adaptable capacity for changing loads and weather conditions
- Controllable noise levels

In addition, Copeland VFDs enhance equipment reliability through proactive motor failure prevention, advanced diagnostics, decreased susceptibility to power issues, and by greatly reducing the number of start/stop events.

Maximum compatibility with Copeland compressors

The Copeland VFD platforms are designed with software that offers optimal performance when paired with Copeland compressors, including: scroll, semi-hermetic and screw compression technologies. In addition, our VFD software also provides the same optimization of control algorithms found in drives used for competitive compression technologies and general, multi-purpose motors, such as fans and pumps.

Fast retrofits, incentives and ROI

Because Copeland VFDs can be installed on existing fixed-speed HVACR motors, facility operators can retrofit their systems without having to swap out equipment, resulting in faster and more affordable retrofits. In addition, most U.S. states offer energy-efficiency incentives for operators who implement variable frequency drives, which can greatly reduce and/or offset upfront costs. When you factor in the ongoing energy savings produced by a VFD installation, the net results are an accelerated ROI and a lowering of long-term operational costs.

Designed for ease of use

The Copeland VFD series is designed to provide maximum ease of use for contractors and end users during installation, servicing and operation. An intuitive startup wizard, quick-start menus and simple

connections make set-up fast and uncomplicated, while offering seamless integration with Copeland's Lumity™ supervisory control platform, including the E3 and site supervisor controllers.

Each Copeland VFD model is designed to accommodate dozens of general motors and compressor SKUs, greatly simplifying the selection process. What's more, the online product information (OPI) tool can assist an OEM or contractor in determining which VFD is appropriate for their desired application. Simply locate the motor's nameplate and then begin selecting and sourcing the best-fit Copeland VFD model for your application. Product catalogs and manuals are also available on our [website](#).

Copeland's technical services team is fully trained and prepared to help you address your pre- and post-sale questions and/or concerns. To access online and self-paced learning, visit Education.Copeland.com/Learn and review the currently offered coursework. Be on the lookout for more variable speed solutions coming soon from Copeland. To learn more about our VFD product offering, please visit our website at Copeland.com/en-us/products/refrigeration/commercial-refrigeration/electronics/variable-frequency-drives.

Benefits at a glance:

Copeland variable frequency drives are designed to deliver the following performance and operational benefits:

- **Improved energy efficiency** via better load matching, less cycling on and off, soft start-ups and faster pull-downs
- **Increased precision and accuracy** of temperature and humidity control
- **Enhanced equipment reliability** via proactive motor failure prevention, improved diagnostics, reduced start/stops and power fluctuation management
- **Accelerated ROI** via energy and equipment savings
- **Faster and more affordable retrofits** without having to swap out compressors or other existing equipment
- **Adaptable** to multiple applications
- **Decreased, more controllable** noise levels
- **Affordable** via state incentives that can greatly reduce upfront costs

“ **When added to a semi-hermetic compressor, a Copeland VFD provides a 15 to 30 percent reduction in energy costs while enabling capacity modulation from 40 to 100 percent—without having to replace a compressor.** ”