

# Technology Profile

## Variable-Frequency Drives

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PECO offers incentives for commercial, industrial and institutional customers who install energy-saving controls known as variable-frequency drives (VFDs). Power for electric motor-driven systems accounts for almost one-third of the electrical energy consumed in commercial buildings and much more in industrial facilities.

#### Take Control of Costs

Keep facility operations running smoothly by adding variable-frequency drives to heating, cooling and industrial processes. VFDs allow motor-driven devices such as fans, pumps and automation equipment to vary the rate of speed at which they operate to match system demands. Use what you need, when you need it, and reduce energy expenses by as much as 30%–40%.

#### Reap the Benefits of Quick Paybacks

Drives installed on motors not previously equipped with VFDs qualify for incentives from PECO, ranging from \$8.75 to \$250 per motor horsepower. VFDs provide superior returns relative to other investments.

Shaft speed reductions of 10% can reduce power consumption by 27%. A 20% shaft speed reduction can reduce power consumption by 49%.



## VFD Benefits

Saving energy is among the many reasons to install VFDs. Both easy to install and simple to maintain, VFDs offer superior control and provide a host of operational benefits:

- Extend motor life by reducing motor wear and tear
- Prevent voltage sag, the unexpected dimming of lights and shutdown of equipment
- Avoid damage to machinery by adjusting torque limits
- Adjust operating speeds for optimal efficiency
- Control acceleration and deceleration
- Integrate with programmable operating controls
- Minimize demand-based expenses
- Eliminate maintenance costs for mechanical drive components

## How VFDs Save Energy

Electric motors that drive equipment like pumps and fans normally operate at a constant speed. Fluctuations are usually adjusted by some form of mechanical throttling, such as valves or louvers, to control water or airflow speed and volume. A VFD handles fluctuations in demand without wasting energy by varying the current and motor speed.

VFDs optimize energy use when motors start up. VFDs can decrease motor current to about 1.5 to 2 times operating current. This “soft starting” feature dramatically reduces electrical system impact from each motor start.

## Typical Applications for VFDs

**HVAC Equipment:** Apply VFDs on pumps and fans to provide the precise airflow and pressure for maintaining desired heating or cooling levels. In a typical building, maximum HVAC capacity is required for only 10% of the week, and on average, buildings need only 40%–70% of maximum energy.

**Air Compressors:** Maintain exact and constant air system pressure levels by matching pressure to demand. At times of reduced demand, a VFD reacts to rising air pressure by reducing speed and output. Conversely, as system pressure falls, the VFD is prompted to increase output.

**Domestic Water Pumps:** Control pump speed while meeting building demands. VFDs can adjust pump speed and resulting pressure levels without the need to throttle valves. Optimizing motor power to meet water demand can save 30%–40% of motor energy.

**Other Applications:** Use VFDs in cooling tower fans, industrial and process equipment, exhaust fans, refrigeration and dust collection systems.

## Incentives for VFDs

PECO offers incentives for VFD installations that accompany the permanent removal or disabling of any throttling devices in equipment including:

- Air-handler and cooling tower fans
- Chilled water and heating hot water pumps
- Non-HVAC industrial process motors (less than 50 HP)
- Kitchen exhaust fan temperature sensors and/or optic sensors
- Refrigeration system compressors

### ► Contact us today!

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