

SUCCESS STORY

OPTIMIZING MOTOR SPEED IN A VACUUM PUMP APPLICATION

INFORMATION

Industry

Packaging

Application

Machine Pump

Product

Yaskawa GA500 Series VFD



THE VFD APPLICATION

Vacuum pumps use suction to remove air from an enclosed system and gradually decrease the air density to create a vacuum. These machines are used where enclosed areas need to be free of contaminants such as gases, refrigerants, air, and moisture. The packaging, food processing, dairy milking, and medical industries commonly use vacuum pumps.

It is important to understand the flow and pressure requirements of the application when selecting a pump. Two main types of vacuum pumps are rotary vane and piston. Rotary vane pumps are standard in single and multiple-stage versions suited for high volume (flow) at light to moderate pressure. Piston pumps are well suited for high vacuum pressure and moderate volume. Piston pumps are often used where a heavy amount of contamination may exist.

APPLICATION CHALLENGES

The customer's machine design required a solution that met the following criteria:

- Ability to regulate speed based on a 0-10 Vdc reference command to satisfy various operating conditions
- Ability to ride through short-duration momentary loss of input power
- Fast drive response to quickly regulate vacuum pressure without overloading the motor/drive
- Eliminate an increased pump-up time by removing the need for manual intervention in case of a drive fault

THE YASKAWA SOLUTION

A Yaskawa **GA500 Series Variable Frequency Drive (VFD)** was chosen to meet the needs of this application, as it provides these useful features:

- The capability to utilize analog inputs from a programmable logic controller (PLC) allows optimization of the motor speed based on the needs of the load and translates to significant energy savings.
- Kinetic Energy Backup (KEB) feature allows the drive to remain operational and in control during short-duration power outages



Yaskawa GA500 Series VFD
efficiently utilizing energy and
optimizing motor speed

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- Stall prevention and torque limit features allow rapid response to process changes while keeping both the drive and motor within their current ratings
- The Automatic Fault Restart feature automatically does self-diagnostics, resets drive faults, and restarts the motor

The **Yaskawa GA500 Series VFD**'s ability to maintain operation during process upsets and power disruptions had decreased unplanned downtime and increased the productivity of the machine. Programmatic speed control has made the process run more smoothly and require less energy translating to less equipment wear and a lower utility bill. The successful installation of the Yaskawa **GA500** is maximizing overall machine efficiency and equipment lifespan for this customer today.

KEY GA500 FEATURES

The **GA500 Series VFD** is specifically suited for industrial applications that require unparalleled performance and extensive utilization of drive I/O capability. This particular model is the preferred choice because of its ability to overcome kinetic flywheel energy without external braking circuitry. Some of the many features include:

- The Overvoltage Suppression feature eliminates typical VFD faults related to the excess energy of overhauling loads
- Normal Duty and Heavy Duty ratings for use in variable torque and constant torque applications
- Capable of controlling various motor types, including induction, permanent magnet (both SPM & IPM), and synchronous reluctance motors
- All major communication networks are supported via a variety of option boards (RS-485 Modbus RTU is built-in as standard)
- Free programming support tools are included, such as DriveWizard and DriveWizard Mobile, Programming Simulator, DriveWorksEZ, Energy Savings Predictor & Harmonic Estimator
- Yaskawa's award-winning 24-hour technical support department is free of charge.

Contact Yaskawa today to learn more about how you can use Yaskawa AC drives to perfect your packaging industry applications!