

CONTROL AT THE EDGE OF SPEED

HIGH-FREQUENCY PERMANENT MAGNET MOTOR CONTROL FOR EVAPORATION SYSTEMS

YASKAWA SUCCESS STORIES



Permanent magnet motor applications at high frequency push the limits of standard drive control. In this case, a custom PM motor driving a high-speed water atomization system required operation up to 300 Hz with tight control over current consumption. Yaskawa combined advanced control algorithms with hands-on application support to deliver a solution that improved performance and efficiency.

Product GA500 Series VFD

Industry Mining

Application Evaporation System

CHALLENGE

The application utilized a custom permanent magnet (PM) motor driving a high-speed water atomization basket, operating at output frequencies up to 300 Hz. However, the system experienced excessive current draw with a previously installed drive, particularly at higher speeds, making it difficult to meet the end user's performance expectations.

Additional challenges included:

- Maintaining consistent performance while keeping current draw within acceptable limits
- Long motor lead lengths ranging from 100 to 300 feet
- Operation in remote environments, sometimes powered by generators

SOLUTION

A Yaskawa GA500 Industrial Microdrive was applied to control the custom permanent magnet motor. The advanced parameters available through its built-in PM Open Loop control enabled a level of fine tuning not possible with the previous drive.

Through a combination of DriveWizard® software and direct application support, parameters were continuously refined to reduce current draw while maintaining consistent performance. Ethernet connectivity enabled remote access, allowing Yaskawa technical support to interface directly with the drive and provide real-time optimization and troubleshooting.

This approach delivered a standard solution capable of operating up to 300 Hz, precisely tuned to meet the application's performance requirements while keeping current draw within acceptable limits.

COMPANY HIGHLIGHTS

The end user specializes in engineered evaporation systems for mining and industrial applications. Their solutions efficiently remove large volumes of water by atomizing it into fine droplets, accelerating natural evaporation. This technology helps customers improve operational efficiency and meet environmental requirements in demanding environments.

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RESULTS

EFFICIENT

Lower
Current Draw

20–30% reduction in motor current compared to the previous drive solution.

STABLE

at High
Speeds

Improved control stability at high operating frequencies.

ROBUST

Power
Performance

Increased confidence in system performance under varying power conditions, including generator operation.

With large evaporation ponds requiring continuous operation, even modest reductions in current draw translate into significant energy savings. The result was a reliable, high-performance solution that met the end user's expectations and demonstrated the value of combining advanced drive technology with application engineering expertise.



GA500 KEY FEATURES

- Open loop zero speed and torque control of permanent magnet motors
- Normal Duty and Heavy Duty ratings for use in variable torque and constant torque applications
- Stall Prevention and Torque Limit features to manage motor current and machine stress to acceptable levels
- Capable of controlling various motor types, including induction, permanent magnet (both SPM & IPM), and synchronous reluctance
- Allows programming without connecting main power by use of the DriveWizard® Mobile application. Simply plug into one of your PC's USB ports or any USB on-the-go device and start programming
- All major communication networks are supported via a variety of option boards (RS-485 Modbus RTU is built-in as standard)
- Yaskawa's award-winning 24-hour technical support department is free

Looking to maximize profits at your mining-adjacent business? Contact Yaskawa today.

SCAN HERE



For more information on the
GA500 Series VFD visit:
www.yaskawa.com/ga500

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