

New Controls Improve Reliability on a Stepper Motor Pusher System

Piramal Glass manufactures specialty containers in large glass production plants around the world. At their Park Hills, Missouri plant, they had an outdated stepper motor pusher system prone to breaking down. Maintenance managers complained about the system's unreliability and the difficulty of finding spare parts. In addition, it was hard to diagnose the cause of a problem when the system failed, and the system wasted energy and generated excess heat in current-limiting resistors.

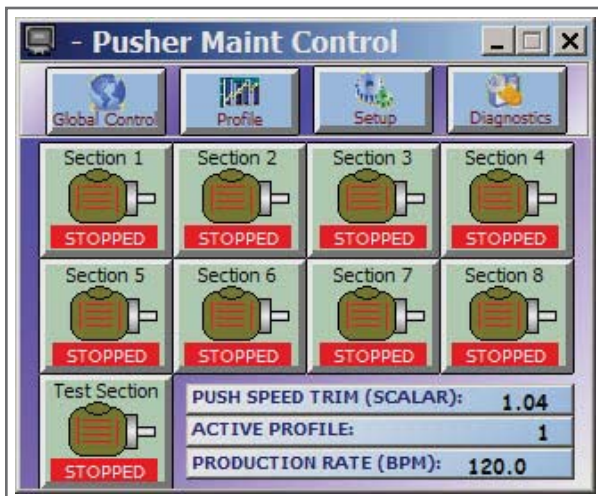


Upgrading Saves Equipment and Money

Piramal wanted to upgrade the system without having to scrap the existing—and working—stepper motors. In addition, they needed to minimize any downtime that a system upgrade might require.

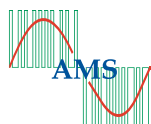
Ken Goheen and Bruno Zbinden, AMS systems engineers for the project, designed a drive and control system that replaced the old system with new, state-of-the-art features, while retaining the existing stepper motors. The new system featured:

- Kollmorgen stepper drives with modern PWM technology
- A Delta Tau motion controller capable of generating smoother motion profiles than the old controller
- An easy-to-use and graphically rich operator interface with simple job setup and diagnostic messaging features
- Readily available off-the-shelf spare parts
- A “hot” spare drive ready to run any section by moving just one cable



Production and Reliability Results

This cost-effective upgrade solution resulted in Piramal significantly improving the pusher system's reliability and performance without having to purchase a whole new system. Operators are thrilled with the new pusher system and enjoy its improved performance and reliability. Troubleshooting is easier now due to diagnostic messages displayed directly on the operator interface and alarm logs that users can view in a Web browser. A permissions-based security system prevents changes to operating parameters by non-authorized personnel.



Pusher System Upgrade

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System Features

Operator Interface

- User-friendly, intuitive operator interface with quick setup parameters and diagnostic messaging
- User-selectable profiles
- Sweep out speed trim (overall and individual sections)
- Variable sweep out position (selectable in degrees)
- Return speed trim
- Permissions-based access prevents unwanted changes to system parameters by non-authorized personnel
- Log of system alarms viewable in a Web browser
- Optional test section (additional push section immediately available as a hot spare to test a profile or spare motor)
- Status displayed for each section

Drive Control System

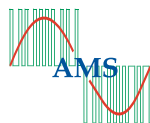
- Receives start of push signals from the IS machine timing system
- Ethernet-based communications between the operator interface, system controller, and a user's laptop
- Readily available off-the-shelf spare parts
- Hot-swappable drive system—replace a drive with a spare while the system is running
- All pusher controls located at the machine for ease of access
- Use existing motors or replace with new ones

Benefits

- Significant return on investment by extending machine life while improving production rates and reliability
- Minimizes downtime with a fast upgrade of the existing control system
- Off-the-shelf spare parts and system diagnostic features reduce maintenance costs and downtime
- Creates much less heat (no current-limiting resistors) and saves energy costs



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