Drive & Control profile

Rexroth helps Winpak vertical form-fill-and-seal machine do more (with less)

Rexroth servo, pneumatic and linear motion solution help the W-18 VFFS packaging machine reach even higher output—while saving energy, time and materials.

Winpak Lane (San Bernardino, CA www.winpak.com) has been producing its model W-18 four-axis vertical form-fill-and-seal (VFFS) pouch machine since 2002. The servo-driven unit has a solid reputation in the food and packaging industry for high throughput and reliable sealing across a wide range of food products from applesauce to yogurt.

Today, Winpak is creating a new W-18 series with simpler and more user-friendly operation, faster and more precise control, and reduced energy and material waste. To achieve these objectives, Winpak worked with drive and control company Bosch Rexroth (Hoffman Estates, IL www.boschrexroth-us.com) and local automation distributor Applied International Motion (AIM)—a Womack Company

Using a Rexroth drive and control system, Winpak made its W-18 machine faster and easier to use with more precision and reduced energy and material waste.

(La Verne and Benicia, CA www.aimotion.com) to specify and implement Rexroth electric drive and control, pneumatics, and linear motion components.

"We had already achieved greater efficiency by going to servos, so we wanted to take the next leap forward," said Mark Griffin, Director of Sales and Marketing for Winpak. "Rexroth's product capabilities promised maximum accuracy and efficiency at high-production speeds."

Challenge

Redesign VFFS machine for simplicity, more speed and precision, and reduced energy and material waste

Bosch Rexroth Solution

- IndraMotion MLC with built-in motion, logic, Flex Profile and automatic temperature control
- IndraDrive intelligent drives
- IndraDyn servo motors
- SERCOS communication
- IndraControl PC-based HMI
- ICS stainless steel cylinder
- HF03-LG pneumatic manifold with Profibus interface
- Belt-driven MKR linear module

Results

- Coordinated repeatable filling, high-speed registration
- Exceptional filling weight control
- Better sealing, reduced waste
- Product changeover in seconds
- 2X faster inkjetting
- Lower air consumption, more energy savings
- Quicker time to market
- Reduced splashing during fill operations

The W-18 is designed to form, fill, seal and date code up to 1,500 packages per minute with accurate and repeatable weight control. Rexroth servo drives and motors are used on the pump, pullwheel, rotor and seal bars, with a date coder as an optional fifth axis.

AIM recommended Rexroth's high-performance SERCOS-based IndraMotion MLC controller which has built-in motion, logic and Flex Profile capabilities. With Flex Profile for the seal axis, cycle times can be optimized for velocity, acceleration, position or time to avoid rebuilding cams each time a parameter changes. All four axes are synchronized to a common virtual axis—making coordinated and repeatable filling and high-speed registration possible. Precise timing on the pump and rotor system is expected to provide the W-18 with the best weight control of any machine in this class.

The IndraMotion MLC also features automatic temperature control with tuning and monitoring of 32 separate heat cartridges to help ensure a strong seal every time. The controller stops the machine if a seal bar is out of temperature range, thereby saving material and product waste due to incomplete sealing.

Product changeovers occur in a matter of seconds via the Rexroth IndraControl VEP model PC-based HMI running on a standard Windows platform. Recipes are saved in the controller so returning to baseline machine parameters requires only the touch of a button.

Each axis uses a Rexroth IndraDrive digital servo drive along with an IP67 washdown-rated synchronous IndraDyn servo motor. IndraDrive servo drives offer many advanced features, including distributed intelligence to close all the loops down in the drive. The motor on the rotor axis has an FDA-approved stainless steel coating to resist caustic cleaning chemicals.

Besides the servo system, the W-18 features a Rexroth belt-driven MKR linear module that allows two inkjet heads for the optional date coder to print date codes across 18-inch material widths at once, doubling the speed of the current one-inkjet model. The MKR linear module provides exceptional moment load capacity and smooth, low-friction travel at speeds up to five m/s.

Rexroth pneumatics also plays an important role. The pouch-cutting knife function uses Rexroth's ICS (ISO Clean Stainless) all-stainless steel cylinder, specifically designed to avoid bacteria build-up. The cylinder has Viton® seals to withstand the operating environment. In addition, Rexroth's modular HF03-LG pneumatic valve manifold with Profibus interface is used to open the pull wheels and relax the packaging material film web between each machine cycle. The HF03 provides high flow in a compact unit with low power consumption. The new machine saves up to 18 cubic feet of air per minute vs. previous mechanical and pneumatic control machines.

Griffin says working with AIM and Rexroth saved time in the re-design. "Our engineers are already familiar with their systems and program architecture, so that helps us get to market faster," he said.

For end-users, the new machine is designed to save significant time, energy, packaging material and more. Heat cartridge monitoring will all but eliminate bad seals and discarded packages. Rexroth's drive and control system will help reduce splashing during fill operations, thereby conserving material, and help lower energy consumption while using less compressed air. In all these ways, the newest W-18 will be doing more with less.

Rexroth
Bosch Group

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