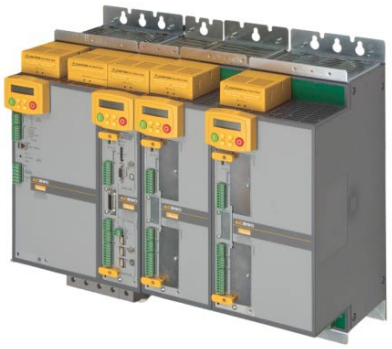
Application Profile



Drive solution from Parker Hannifin and Optima doubles productivity for laminating line

AC890 variable speed drives from Parker Hannifin, the global leader in motion and control technologies, are playing a crucial role in an innovative control system developed for a newly refurbished web laminating line operated by the API Group. The control system was designed and produced by Blackburn-based Optima Control Solutions, and in conjunction with the AC890 drives, has enabled availability of the laminating line to be significantly increased. In addition, the new system has improved production flexibility for API, while increasing line functionality and reducing overall energy consumption.

Optima Control Solutions is a Parker SSD System Integrator and specializes in variable speed drive, PLC and SCADA applications. The company's Managing Director, Michael Hill, explains that, "API is a leading manufacturer of high quality foil, holographic and laminate products for use throughout the packaging sector. The company had been operating the laminating line at its plant in Stockport for some time and as part of a planned refurbishment wanted to try and improve the performance of the web machine while also reducing its operating costs".

The original design of the laminator used a mechanical system with machine shafts or rollers being driven from PIV (positively infinitely variable) gearboxes, powered from DC motors by a complex arrangement of belts and pulleys. This configuration was unreliable, difficult to maintain and expensive to run due to the relatively high power consumption and ongoing maintenance costs. In addition, the existing drive system made product changeover a lengthy process that generated considerable scrap, as each PIV required manual adjustment. Furthermore, the system provided poor control of web tension, making it almost impossible to run the lighter and more specialized films and foils that are now commonly used by API; as a result, the machine was often idle for long periods. The solution developed by Optima replaced the common mechanical drive system with a series of individual drives, each controlling its own roller section with discrete control loops.

The drive system configuration included 13 closed-loop AC vector motors, each controlled by Parker AC890 variable speed drives, with a common DC bus, generated from a further AC890 Series active front end. This arrangement provides extremely efficient power management, with energy for the drives and motors being naturally balanced between units that are motoring and those that are regenerating when braking. The control capabilities of the AC890 drives also enabled Optima to specify a smaller PLC than would have otherwise been required, to manage the overall machine control.

Michael Hill points out, "We've worked closely with Parker to ensure that the new system is as energy efficient as possible and have managed to reduce the machine's power consumption by around 45%. Additionally, the AC890 drives have helped us make considerable improvements to machine functionality, to reduce setup times and make it easier to operate. For example, as standard the drives are supplied with powerful tension control

AC890 Modular Systems Drive

functional-ity, and the ability both to control line speed setpoints and set speed ratios between drives. They also have onboard I/O, which we used for speed setpoints or load cell signals".

The new system has made change-over between products quick and simple, by using recipes stored in a new touch screen HMI. Operators can now control individual web tensions each section of the mach-ine, with flexibility and accuracy. These enhancements enable API to run a far wider range of materials through the refurbished laminating line, now including holographic foils and unique biodegradable metalized films.

The complete system was installed and commissioned in just three weeks. To minimize production downtime, Optima carried out much of the mechanical and electrical work in advance, with the flexibility and ease of configuration of the AC890 drives enabling them to be pre-programmed and tested off-line. Michael Hill concludes, "Having worked in partnership with Parker for a number of years we knew that the outstanding web tension control capabilities that are standard with the AC890 would make these drives ideal for this project. As a result, we've been able to offer our customer real benefits in terms of machine performance and productivity, with the line now being in almost constant use, rather than standing idle for long periods".

AC890 bus bar connections

Common Bus AC890 System

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