The Future is Modular
Decentralised Servo Drive for Packaging Machinery

The current demands on packaging machinery and its manufacturers are the result of increased product diversity, developments in packaging and changes in consumer demands. Today, the most significant factor for a packaging machine is its flexibility: only with the shortest conversion times for format changes can the manufacturer meet the demands of modern consumer products economically. For the packaging machine builder, modular machines meet these evolving requirements and provide a cost-effective solution.

KHS, one of the leading providers of filling and packaging technology in the beverage industry, has used Rexroth's servo and control technology since the mid-1980's, and is regarded as one of the most innovative companies in its industry responsible for developments such as high-performance labeling technology. By using modular machine constructions and servo drive technology to become further decentralised, KHS are setting a significant new standard.
Case Study

At the beginning of 2000, KHS introduced a comprehensive, modular machine program into the packaging industry, using combinable mechatronics modules. As a result it was able to meet its customers’ growing needs flexibly and economically (see picture 2).

The next step for KHS is the implementation of decentralized servo drive technology. For this, the company is counting on its well-established development relationship with Rexroth and the company’s new drive concept, IndraDrive Mi, which combines a traditional servo motor and drive amplifier into a compact but highly functional drive unit.

Efficiency all along the line

The IndraDrive Mi is made differently to other drive units. The motor housing surface serves as a heat sink for the drive’s control electronics, which are mounted flat on the motor, creating little change in its shape. The result of this is a total volume reduction of over fifty percent compared to traditional servo drives consisting of a separate motor and converter. This element cuts down the required space and power loss in the control cabinet significantly.

Furthermore, the need for cable connections is significantly reduced. Only a single cable is required for power supply and communication. By connecting multiple IndraDrive Mi units in series, the number of required cable connections is reduced even further. However, the most significant benefit is that additional drives can be added in the future, without requiring any changes to the control cabinet.

Thus, this innovative solution demonstrates considerable potential for cost saving and energy efficiency.

Even more modularity

IndraDrive Mi combines high power density with full functionality and is compatible with the Rexroth IndraDrive family. As with all IndraDrives, these servo drives are equipped with hundreds of advanced technical functions, including integrated Motion Logic (in accordance with IEC 61131-3). With this capability, totally new decentralized automation architectures become possible.
Using the new integrated motor/drive concept, KHS has built a machine for the Innopack Kisters SP series, which is used to shrink wrap wine bottles. Along with the Innopack Kisters SP shrink packers, the series provides the complete power range from 35 to 150 cycles per minute in continuous operation. The machines package cans, jars and bottles as well as pre-packaged products in the beer, soft-drink, hygiene, food and non-food industries.

Additionally, these machines allow the economic creation of multi-packs with clear, scatter-printed or pinpoint-printed foil. The packaging costs remain low because shrink foil is used as the only packaging material. The drive is controlled using Motion Logic by Rexroth for one to three-row processing, where the speed automatically adjusts to match the actual line capacity. Downtime is reduced because of the high degree of user-friendliness and the diagnostic system which is integrated into the HMI screens.

KHS is able to combine the machine modules (picture 2) with greater flexibility using IndraDrive Mi technology. For example, with the addition of two extra modules, a shrink packer becomes a tray shrink packer: simply, two additional IndraDrive Mi drives are added to the existing seven while in the control cabinet nothing changes. “With the use of IndraDrive Mi, the system costs are significantly reduced,” says Dirk Langanki, Manager of Electrical Construction and Development at the KHS Competence Centre for Packaging Technology. “This particularly affects the required installation effort for the control cabinet and wiring.”

**Successful Product Introduction**

From its introduction Indradrive Mi has proved to be a success and over 30 well-known machine builders are currently looking to use the new integrated motor/drive concept.

At KHS, the technology is proven and the company has delivered its first machines to the end users. KHS’ stated goal is that it would like to convert exclusively to the Indradrive Mi for every suitable application.
Case Study

Bosch Rexroth AG is one of the world’s leading specialists in the field of drive and control technologies. Under the brand name of Rexroth the company supplies more than 500,000 customers with tailored solutions for driving, controlling and moving. Bosch Rexroth is a partner for industrial applications and factory automation, mobile applications and using renewable energies. As The Drive & Control Company, Bosch Rexroth develops, produces and sells components and systems in more than 80 countries. In 2009 Bosch Rexroth part of the Bosch Group, achieved sales of around 4.1 billion Euro with 34,200 employees.
Case Study

Images:

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Modular machine program for KHS packaging technology

Bild_4_72.jpg:
First KHS Innopack Kisters SP shrink packer, equipped with the Rexroth IndraDrive Mi

Bild_5.jpg:
Dirk Langanki (left), Manager of Electrical Construction and Development at the KHS Competence Center for Packaging Technology, in a discussion with Steffen Winkler, Bosch Rexroth AG: “With IndraDrive Mi, we can reduce our wiring by up to 85%”

Compendium:

IndraDrive Mi Advantages
At a Glance:

- reduction in control cabinet volume by up to 70%
- reduction in cabling by up to 85%
- significant increase in flexibility and modularity of

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