

# Drive & Control profile

## Rexroth's Compact IndraDrive Mi Integrated Motor and Drive Helps KHS Develop Modular Packaging Machinery



With the IndraDrive Mi, drives can be added flexibly as needed, without requiring any changes to the control cabinet.

Packaging machinery OEMs are constantly seeking ways to improve their machines to meet the demands of rapid product changeover. Modular machine concepts provide all the prerequisites to meet these growing requirements, along with

an ideal formula for an economical solution. That's why KHS has used drive and control technology from Rexroth since the mid 1980s, and therefore has been recognized as one of the leaders in its industry. Innovative developments like dry area solutions in a modular

### Challenge

Help packaging machine builders add flexibility, reduce costs, save space, and improve motion control performance

### Solution

Rexroth IndraDrive Mi integrated motor and drive

### Benefits

- Servo motor and drive amplifier combined into one compact drive unit
- 50 percent smaller than traditional system using separate servo drive and motor
- Reduces control cabinet space requirement by up to 70 percent
- Reduces cabling needs by up to 85 percent
- Single cable provides both power supply and communication
- Add drives as needed without changing the control cabinet

format or high-performance labeling technology place KHS as an innovator in the market.

Today, KHS is setting a significant new milestone: using decentralized servo drive technology in its modular machine construction.

### **Modular Mechatronics— IndraDrive Mi**

KHS is one of the leading providers of filling and packaging technology in the beverage industry worldwide, with nearly 140 years of experience. Several years ago, KHS executed a comprehensive, modular machine program for the packaging industry. The program focuses on using combinable mechatronics modules to flexibly and economically meet its customers' growing needs for versatile packaging machinery.

The next step for KHS in this area is the use of decentralized servo drive technology. KHS relies on a development relationship with Rexroth, the drive and control company. KHS recently began using Rexroth's new compact drive concept: the IndraDrive Mi integrated motor and drive.



Revolution in packaging machinery automation: Rexroth IndraDrive Mi.

The IndraDrive Mi combines a traditional servo motor and drive amplifier into a compact but highly functional drive unit. With the IndraDrive Mi, Rexroth implemented a totally new design principle. The motor housing surface serves as a heat sink for the drive's control electronics, which are mounted flat on top of the motor without significantly changing the motor's shape. The unique design reduces the size volume by more than 50 percent compared to traditional servo drives consisting of a separate motor and converter. As a result, this drastically cuts down the

required space and power loss in the control cabinet.

In addition, the need for cable connections is significantly reduced. Only a single cable is needed for both power supply and communication via SERCOS interface. Up to 20 IndraDrive Mi units can be connected together without additional distribution boxes or modifications in the cabinet. More than one string of drives can be connected in series to a single supply unit. By connecting multiple IndraDrive Mi units in sequence, the number of required cable connections is further reduced. More importantly, drives can be added as needed, without requiring any changes to the control cabinet. As an example, the control cabinet volume can be reduced by up to 70 percent, while cabling needs can be reduced by up to 85 percent. Thus, this innovative solution provides significant potential for cost reduction to the machine builder.

The IndraDrive Mi offers high power density with full functionality. IndraDrive Mi units can be easily combined with



KHS Innopack Kisters SP shrink packer, equipped with the Rexroth IndraDrive Mi.



Only one cable is needed to supply power and communications to all drives.

other converters and inverters from the IndraDrive platform. As with all IndraDrives, these new servo drives are equipped with hundreds of advanced technical functions, including integrated Motion Logic according to IEC 61131-3. With this capability, totally new decentralized automation architectures become possible.

KHS is installing the new Rexroth integrated motor and drive concept in its Innopack Kisters SP machine, which is used to shrink wrap wine bottles. The Innopack Kisters SP series machines are packaging machines used in the manufacturing of foil multi-packs for sturdy products. The

series provides the complete power range from 35 to 150 cycles per minute in continuous operation. The machines handle 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 economical 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. Machine downtimes are reduced to a minimum because of the high degree of user-friendliness along with an error diagnostic system which is integrated into the HMI screens.

The advantage of using the IndraDrive Mi is that KHS can combine different machine modules with greater flexibility according to customer needs. For

example, with the addition of two extra machine modules, a shrink packer now becomes a tray shrink packer. Two more IndraDrive Mi drives are simply added to the existing seven—while in the control cabinet nothing changes.

“With the use of IndraDrive Mi, the system costs are significantly reduced, especially in the required installation effort for the control cabinet and wiring,” says Dirk Langanki, manager of electrical construction and development at the KHS Competence Center for Packaging Technology.

At KHS, the technology has proven itself through extensive testing. The company recently delivered its first machine equipped with IndraDrive Mi to an end-user in the beverage industry. More selected end-user machines are being built with Rexroth IndraDrive Mi technology. KHS plans to convert to the IndraDrive Mi for all machines in series, and thus become the first packaging machine builder in the market to implement the new technology across the board.

**Rexroth**  
Bosch Group