

# Drive & Control profile

## Rexroth GenNext™ Technology Adds Safe Motion,™ Lowers Costs on Aseptic Filling Machine



With IndraMotion for Packaging from Rexroth, the ABF 610 incorporates a compact design with an innovative machine drive concept and trendsetting safety technology.

Whether they are enjoying juice, non-carbonated or dairy beverages, consumers are now accustomed to drinking from aseptically filled high-quality plastic bottles.

SIG Asbofill of Neuss, Germany is an international manufacturer of linear aseptic filling machines for the juice, dairy and pharmaceutical industries. The company's ABF 610 aseptic filling machine is designed primarily for dairy and juice beverages in

plastic bottles (PET, HDPE) ranging from 100 to 750 ml in size. With IndraMotion for Packaging drive and control technology from Rexroth, the ABF 610 is able to incorporate a compact design along with an innovative machine drive concept using trendsetting safety technology.

### Machine Concept

The aseptic filler takes center stage in the packaging line, located between bottle production and end-of-line packaging. With an

### Challenge

Combine innovative machine drive concept with trendsetting safety technology for filling machine manufacturer

### Bosch Rexroth Solution

- IndraMotion for Packaging “Advanced” and IndraDrive digital drive system with Safety On Board and Safe Motion™ technology
- Reliable safety solution directly in the drive
- Designed in accordance with EN61508 and EN954-1 SIL3 standards

### Results

- Safety reaction times up to 400 times faster than traditional solutions that use contactors to produce a safe stop
- 60 percent cost savings
- Handles up to 40 axes per controller; capable of networking up to 32 controllers for precise synchronization of an entire line or process
- Meets international standards for safe stopping and safe motion

output of 25 cycles per minute, the ABF 610 operates in a linear and intermittent mode and consists of five functional units. Sterilization, capping stations, and the transport system for the bottle in- and out-feed are driven by a total of 13 controlled servo axes. Synchronized machine movement from the Rexroth servo system improves efficiency and replaces the time-consuming issue of mechanical changeovers.

In the aseptic zone, bottle sterilization occurs before the filling stage. Servo driven spray tubes spray peroxide inside the bottles and then dry them with hot air. After the bottles are filled, servo technology is used to close them with pre-sterilized screw caps.

The control technology of the modular ABF 610 gives it the flexibility to fill different bottle sizes without mechanical changeovers in the machine. The positioning profiles (cams) are automatically adjusted according to production speed and other process-relevant parameters.

#### **Automation with Rexroth IndraMotion for Packaging**

The Rexroth IndraMotion for Packaging automation system is an ideal control and drive solution for filling machines because it can complete all the relevant movement and positioning functions. IndraMotion for Packaging is available in three versions to handle different machine applications. The “basic” version is for drive-based applications; the “enhanced” is a compact, controller-based solution; and the “advanced” is the



Sterilization, capping, and the transport system for bottle in- and out-feed are driven by servo controlled axes.

controller- or PC-based solution. The ABF 610 uses the advanced version because of its high overall functionality and the need to operate up to 40 axes.

The core element of the system is the combination of motion control technology with standardized PLC to create an integrated solution. All IndraMotion for Packaging versions contain the Rexroth IndraLogic embedded core module of the PLC programming and runtime system.

A SERCOS interface with the drive is used for high-performance synchronization assignments. Design engineers also have the choice of complete, efficient logic functionality according to IEC 61131-3 and PLCopen standards, and specialized technology modules. The functional

groups are coordinated centrally by a PLC with the machine operating modes. The open architecture of the automation system supports all standard fieldbuses and is simple to integrate. Communication for the ABF 610 is via Profibus-DP. The SIG Asbofill PLC standards are met through the open architecture of the Rexroth automation solution.

#### **Drives with Safe Motion certified safety technology**

Some of the axes on the ABF 610 are equipped with Rexroth Safety on Board technology built in to the IndraDrive digital servo drives. The Safety on Board functionality ensures operator safety and efficient performance of the filler. A major benefit of this drive system is the Safe Motion capability that reduces downtime by safely reducing the machine’s line speed without

causing a full shutdown. With the drive-based safety system, the machine operator can set up the machine or clear jams inside even while the machine is operating.



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With Safety on Board, the drives on the SIG Asbofill machine offer many advantages compared to traditional safety components. Autonomous monitoring in the drive allows the machine to respond quickly when a fault occurs – up to 400 times faster than a controller-based solution. This helps protect the operator around highly dynamic servo axes. The quick acceleration and speed capabilities of the ABF 610 require the fastest response times for applied safety technology. External monitoring devices are inadequate because they have switch delays, which can increase the stopping distances and reduce operator protection.

All the important safety functions of the Rexroth IndraDrive are decentralized, without any additional hardware or alternative control routing. This not only shortens the machine reaction time, but also reduces the cost of

the control system. Compared to traditional safety concepts that use power contacts for motor cabling, the ABF 610 requires less wiring within the control cabinet, thus reducing costs. Thomas Niehr, head of design at SIG Asbofill said they saved 60 percent in costs by using Rexroth Safety on Board. “We achieved higher safety standards, lowered our installation efforts, reduced wear on components and have far greater flexibility for machine maintenance,” he said.

Drive-integrated Safe Motion technology is a key element of the Rexroth GenNext approach for food processing and packaging machinery. The technology in the ABF 610 filler ensures safe production processes with efficiency and speed, meeting the high output requirements of the dairy and beverage industries.

**Rexroth**  
Bosch Group