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MAXIMUM HOLDING FORCE

Safety technology for safety doors increases machine availability

Machines from Eckel & Sohn are pioneers when it comes to sorting, supplying, screwing and assembling closures. To safeguard its plants, the company has come to rely on state-of-the-art bolt interlocks that fit to the safety doors to reliably monitor their positions.

Beverage companies were some of the first customers to partner with Eckel & Sohn, which was established back in 1956. They started with unscrewing machines that removed closures from empty containers, but the Gau-Odernheim company soon moved on to develop and produce machines dedicated to assembling closures. There are around 10,000 such machines in operation around the world for the variety of closure systems used on bottles, jars and cans. Eckel & Sohn has since produced assembly systems for every industry in which vessel and container closures are required, including the food industry.

Some of the company's machines have been running continuously for 35 years, impressive proof of the family company's focus on value and quality from day one. 'Machines have been produced exactly to the preferences and requirements of customers,' explains Thomas Prohaska of the electrical design department. 'As a customised machine builder, pretty much everything we make is a unique model.' The company's machines find their way around the world, from Canada to Chile, from Finland to Portugal, from Russia to New Zealand and everywhere in between. The continuous assembly lines for processing multi-part closures operate fully automatically and achieve an output of up 120,000 units per hour. Eckel & Sohn has also recently begun to make servo-controlled machines for multi-part closures, where the individual parts must be positioned correctly before processing begins. Optical checks of all individual components ensure optimal completion via the new assembly heads.

On the RAV 36S concentric assembly machine, which is typically installed downstream of an injection moulding machine, the lower part of the plastic closure is fixed in a mounting device while a rotating screw head presses down and screws the upper section of the closure in a continuous concentric movement. Each closure part is then checked with video or laser technology. The RAV 36S processes up to 72,000 closure per hour at 33.3 revolutions per minute.

The machine is safeguarded by seven safety doors made from a transparent material to ensure full visibility of the process. The position of these safety doors must be monitored, and safety switches with safety interlock are used to prevent the machining process from being interrupted if the operator attempts to open any of the doors. 'Since the end of 2017, we have been using the AZM 400 bolt interlock from Schmersal exclusively,' explains Prohaska. 'The solution is ideal thanks to the extremely high holding force.' The device achieves a holding force of 10,000 N, an exceptionally high figure for safety interlocks.

'Safety doors must always lock and unlock reliably.' This is because they protect against potentially hazardous run-on movements. At the same time, the safety technology must always contribute to a high machine availability level. 'The AZM 400 is the optimal

The electrically operated AZM400 safety interlock is easy to assemble.

Images:
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solution for precisely this reason,' explains Horst Rudolph, Sales Manager at Schmersal. The integrated electronic system in the devices combined with the sensor system offers numerous additional functions, such as early detection of error states, which helps to reduce the number of machine stops. Through integration of RFID technology, the bolt interlock also offers better protection against manipulation of the safety equipment and satisfies the stringent safety requirements in accordance with ISO 14119.

'We tested many devices and ultimately opted for the AZM 400 thanks to the many advantages offered by the interlock, including ease of assembly. In addition, it is robust, extremely compact and attractive in its appearance and design,' explains Thomas Prohaska.

The interlock is also used on the equipment upstream of the concentric assembly machine from Eckel & Sohn, which includes stocking, positioning and sorting, supply and test equipment. In the test plant, the tightness of the plastic closures is verified by means of a high voltage test at between 8,000 and 12,000 V. This plant is also safeguarded with safety doors, the position of which is monitored by the AZM 400.

'In our test plants, we help assure our customers that they can sell perfect, error-free goods,' emphasises Prohaska. Eckel & Sohn produces its machines to a high quality standard and this is matched by equally demanding safety technology.
Schmersal launched the AZM 400 safety interlock, which is driven by an electric motor, two years ago. It comprises the interlock unit with sensor system, a motor-driven locking bolt and an actuator. This contains an encoded RFID tag and a catch opening into which the locking bolt is inserted. As soon as the locking bolt has achieved a sufficient engaging depth into the opening of the actuator, the safety device is considered safely locked.

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Safety doors secured with bolt interlocks ensure flawless operation on machines made by Eckel & Sohn