



Schnaithmann Maschinenbau GmbH, Germany

# Dynamic transport

The new lift system by Schnaithmann Maschinenbau is based on a unique combination of a geared motor and a frequency inverter. The advantage: servo-electric properties are coupled with economical standard components.

Sinamics frequency inverters and Simogear geared motors shorten cycle times on Schnaithmann lift systems

**K**arl Schnaithmann, CEO of Schnaithmann Maschinenbau GmbH, knows: "When it comes to conveyor technology, cycle times are one of the top performance requirements." This is why the special-purpose machine manufacturer based in Germany, has developed a lift system for dual-track transfer systems that halves the cycle times of previous solutions.

### Two-stage geared motor for high energy efficiency

This is possible due to the special kinematics of the lift solution and the refinement of the applied drive technology. The two lifting units, which are offset by 180°, are positively driven in an elliptical face cam. This ensures that

bevel helical gear unit. "With an efficiency level of approximately 96%, it is more energy efficient than comparable worm gear motors," says Sieber. "The dynamic properties of geared motors also impressed us right from the start." The reason for this is that these types of drives display their full efficiency when deployed in conjunction with the distributed Sinamics G120D frequency inverter.

### Precise positioning

The geared motor with a three-phase asynchronous AC motor as the drive and an additional transmitter has already proven itself. The dynamics and the precision in positioning the two lifting units are achieved through the

positively driven operation mentioned earlier, there would be an additional axial offset of the y-axis for every axial offset of the x-axis. However, due to the precise signal processing in the frequency inverter, this does not negatively affect the overall drive, but rather only results in the servo-electric behaviors we need here."

### Frequency inverter with integrated safety

The communication with the machine control system – a fail-safe Simatic S7-317 F – takes place via Profinet. "We prefer to use this bus technology because it is a simple and efficient solution for systems integration," says Hentzner. The frequency inverter for the lift drive is also connected to the machine control system in this manner. "With this new development we have introduced two innovations," explains Sieber. "First, because it makes it possible to position the components without a servomotor, and second, because safety technology is integrated into the machine control system." The Sinamics G120D inverter is available with built-in fail-safe inputs and outputs. In addition, the existing safety functions have now also been supplemented with SDI (Safe Direction) and SSM (Safe Speed Monitor). Another advantage is the energy-recovery option: If the inverter is equipped with a Power Module, the energy can be fed back into the grid during lowering processes.

### Milestone in lifting technology

"This solution represents a milestone in lifting technology," says Sieber. "For us, this first use of a geared motor and a distributed frequency inverter in a dual-track transfer system is not only a pilot project but also an economical solution for a wide variety of positioning tasks in the material handling and logistics industries." ■



**"The use of a geared motor and a distributed frequency inverter is an economical solution for many tasks in the material handling industry."**

Volker Sieber (left) with Marc Hentzner, Schnaithmann Maschinenbau GmbH

only a minimum of space is required widthwise when the lift is at its highest point. "The dimensions of the lift system correspond to the width of the workpiece carriers, since they must be able to pass each other during the lifting process," explains Volker Sieber, head of construction and development at Schnaithmann. The lift system is driven by a centrally mounted rotary drive via two separate chain systems. The Simogear geared motor used for this purpose contains a two-stage

Sinamics frequency inverter. This inverter is available with a positioning function that receives the transmitter signals and processes them directly. "That makes this combination very easy to operate, also from the perspective of drive technologies," confirms Marc Hentzner, head of control technology at Schnaithmann. In practice, the lift system can be positioned with an accuracy of approximately 0.5 mm. According to Hentzner, "This accuracy is remarkable for the sole reason that due to the

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