

The rotation and swivel of the next generation

The progression of rotating and swiveling, and where the potential lies.

Be it high loads or short cycle times - rotary modules and swivel units are constantly under pressure to deliver even better performance when it comes to handling and assembly. In recent years, the competence leader for gripping systems and clamping technology, SCHUNK, has systematically expanded its modular program for rotary movements, developing particularly dynamic, intelligent and adaptable components.

"In the future, swivel units will become intelligent thanks to modern sensor technology." Prof. Dr.-Ing. Markus Glück, Managing Director Research & Development/CINO SCHUNK GmbH & Co. KG, Germany

Smart rotating for smart factories

For Prof. Dr.-Ing. Markus Glück, Managing Director Research & Development, CINO, at SCHUNK the potential for rotary motions is still far from being fully used: "We are currently experiencing a phase of rapid technological innovation. Highly automated, networked production systems are determining intelligent production processes and making their way into production facilities," states Glück. "The market is demanding swivel units that can be put into operation quickly and intuitively without the need for special technical know how. The swivel units of tomorrow will also have to adjust automatically to load situations and application scenarios." The SCHUNK ERP rotary module is a milestone in this regard – for the first time, it is possible to implement autonomous adjustment of the module using integrated intelligence.

Looking forward, the head of R&D expects that the sensitivity as well as power density and dynamics of swiveling and rotary modules will continue to increase. "In the future, a continuous system diagnosis will ensure the correct, optimal and resource-saving use of swivel units with maximum dynamics," assures Glück. "Commissioning engineers will be easily supported in the future by integrated sensor systems. What's more: when it comes to smart turning and swiveling, the entire rotary process will be monitored in the future, and the automated system control and peripheral units will be provided with corresponding process data in real time. "The aim is to provide continuous status information that can be accurately interpreted without detailed technical knowledge," emphasized Glück. These types of intelligent systems have resulted in longer machine runtimes and a reduction in unplanned, costly downtime and reinvestment. This can help eliminate or reduce the need to store replacement components, which from the user's point of view, ties up too much capital for too long of a time.

The intelligent auto-learn function of SCHUNK's ERP rotary module

This is exactly where the concept of the mechatronic SCHUNK ERP rotary module comes in: Intelligent auto-learn technology is a fully automatic means of ensuring that the movement profile is always adjusted to the respective part weight. For commissioning, the 24 V component is simply connected to

the control unit via digital I/O, the angle of rotation is defined via the end stops (90°/180°) and, if necessary, the end position is fine-tuned mechanically ($\pm 5^\circ$). Everything else is learned by the integrated auto-learn technology. Three to five rotary movements are enough to complete the programming. The movement profile is created as a ramp.

Depending on the angle of rotation and the weight of the swivel body, the direct drive rotary unit accelerates and brakes automatically. Impacts, oscillations, and uncontrolled movements at maximum speed are thus eliminated. This minimizes the noise level, wear and tear, and makes the use of hydraulic shock absorbers superfluous. At the same time, short reaction and travel times are possible. If the component weight changes during the process, the module automatically adjusts its movement profile, without requiring any operator intervention. The speed can be conveniently regulated directly via a rotary switch on the housing. As the control occurs via digital I/O, the SCHUNK ERP series is compatible with all controllers, and can easily be used to replace pneumatic modules. The 24 V rotary module is available in the first step in size 25 for moments of inertia of up to 0.1 kgm². The repeat accuracy is $\pm 0.01^\circ$.