Stroke measurement in the hydraulic cylinder

The wire-actuated encoder SGH10 by Siko measures absolute, direct cylinder strokes in hydraulic cylinders. With this measurement system, cost-intensive drilling of the piston is no longer required.

The encoder provides a CANopen interface (Photo: Siko)

The SGH10 is a measuring system for direct stroke measurement in hydraulic cylinders. Siko from Germany has developed an integrated measurement solution based on customer feedback. The cylinder stroke is measured using wire-actuated sensor technology installed directly in the cylinder. The plug ensures the system fulfills protection class IP69K. The product comes with a CANopen interface and a measuring range from 0 mm to 1000 mm. Its operating voltage ranges from 9 V\text{DC} to 32 V\text{DC}.

Technologically speaking, the SGH10 cylinder stroke measuring system pursues an entirely different technological approach: other measuring systems are based on magneto-restrictive, inductive, or hall based technology. In contrast to these systems, a wire-actuated mechanism installed directly in the cylinder is used to measure the stroke. The wire is mounted in the piston head. If the cylinder is extended, the wire, which is wound up in a wire drum, is pulled out. The rotation of the wire drum that is thereby created is detected without contact by the sensor electronics and used to calculate the linear travel. This makes it possible to detect the position of the cylinder at all times.

The magnets that are used to detect the rotation are scanned by the electronics through the pressure-resistant base plate of the SGH10. The electronics are fully encapsulated on the unpressurized side of the system. This means the entire measuring system is built into the cylinder and is protected from external environmental conditions. In contrast to a measuring system mounted externally on a cylinder, the sensor system cannot be influenced or damaged by loose parts or by environmental influences.

Piston drilling unnecessary

Another aspect is the reduction of costs for integrating the system into the cylinder. This is because in previous measuring systems, the sensor rods had to be integrated into the piston over the entire measuring path; this often required long and highly precise bore holes in the piston. This is not only expensive, but also weakens the structure of the piston. In the SGH10 stroke measuring system, just one thread is needed in the piston to mount the cable. The measuring technology can even be used in telescopic cylinders. It provides design engineers with options when developing assistance systems and supplemental functions in mobile machines.