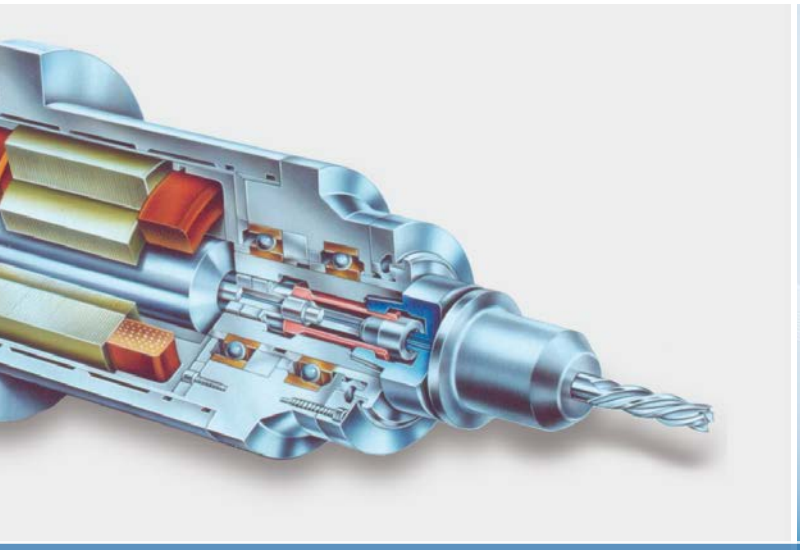
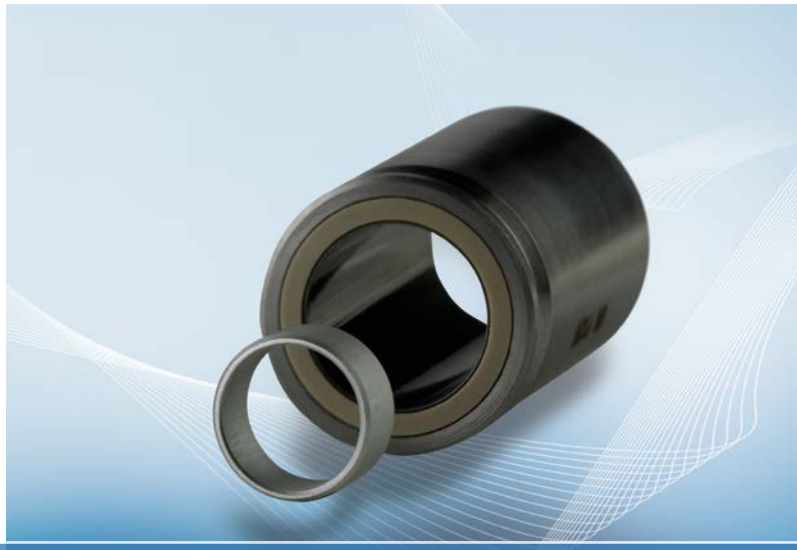
A115

Inductive sensors
vipSENSOR





Monitoring the clamping of tools

Modern, high performance machine tools are now achieving accuracies of just a few micrometers or even less. Such precision can only be achieved by optimum matching of all components, starting with the drive, then the release unit, the tool chuck through to the tool itself. Since most components are permanently installed on the machine, highest precision can be achieved with correct installation. The only problem is that the tool is changed with each new phase of the operation and can therefore cause critical deviations. So special attention has to be paid to correct clamping of the tool in the holder. In each case the correct seating of the tool or whether its position has changed must be detected. Swarf in the tool seating has fatal results: The fault caused by the slightly protruding tool would be immediately visible on the product and would lead to the scrapping of expensive work pieces.

Previously, proximity sensors and connector rings, which supply a switching signal, were used for monitoring the clamping position.

However, adjusting and setting these rings is complex. Analogue sensors from the VIP sensor series provide more ease of use. The sensor is integrated into the release unit and directly measures the clamping stroke of the drawbar. It can be universally used with the most varied types of tool due to its extremely compact design. The sensor supplies an analogue signal according to the stroke motion of the drawbar when clamping the tool. Consequently, continuous monitoring is possible without the switching point having to be laboriously set mechanically. The miniaturised sensor electronic unit is supplied with 24 VDC and can either be accommodated at the point of measurement or in the control cabinet.
Due to its high accuracy, the sensor provides a significant contribution in satisfying the continually increasing demands on the precision and availability of machine tools.

Requirements for the measuring system

- Measuring range: 25mm
- Linearity: typically ±0.5% FSO
- Resolution: 0.01mm
- Dynamic response: 150Hz (-3dB)
- Temperature range: -20...+120°C
- Temperature stability: < ±0.01% FSO / °C
- Medium: air, oil

Reasons for choosing the system

- Short sensor shape, but with a large measuring range
- Compact sensor for easy integration
- Non-contact measuring principle
- No adjustment of proximity sensors needed
- High resolution

Principle