

Engagement length control in high performance screwdrivers

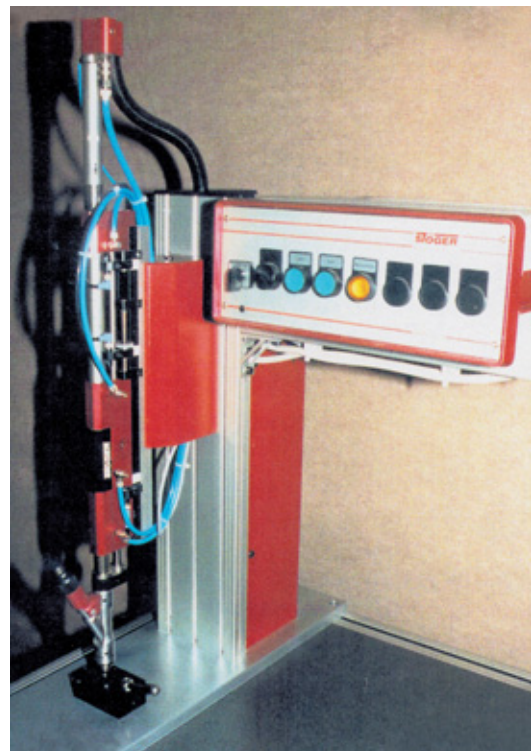
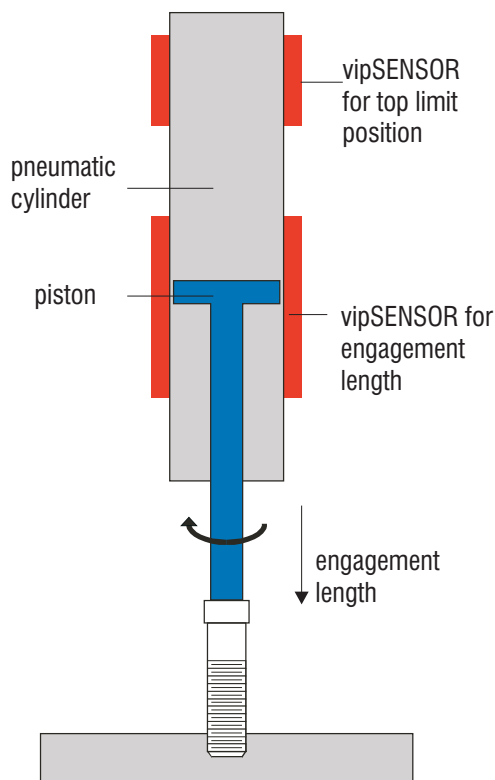
Industrial screwing in automated production systems is carried out by automatic screwdrivers. Apart from the torque, the engagement length is the most important criterion for the quality of the screwing operation. Generally, the engagement length, i.e. the screw-in depth, is determined with the aid of a mechanical end-stop or by using a limit switch. Consequently, once set, the engagement length cannot be changed during the production process.

The inductive potentiometric displacement sensors in the VIP Series provide decisive advantages in this application. The continuous measurement of the engagement length from 0 to 70 mm enables screwing operations with various depths to be carried out at the same station.

This means that it is now possible to realize different engagement lengths automatically at the station by appropriate program selection. The flexibility of the production line is therefore increased. In addition, the setting up times for adjusting the limit switches are no longer needed.

Measurement system requirements

- Measurement range: 0 to 70 mm (0 to 2.76 in)
- Repeatability: <0.05 % FSO (0.04 mm)
- Analog output: 0 - 10 V
- Supply: 24 VDC



Application

Measurement principle

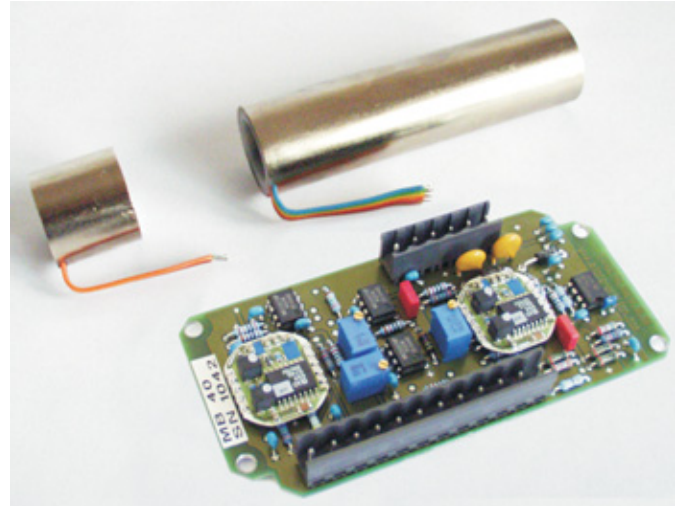
The acquisition of the engagement length occurs using a sensor which is mounted concentrically on the outside of the pneumatic piston. It measures the piston position without contacting it through the cylinder wall. Wear on the sensor is therefore eliminated. Furthermore, no access into the pneumatic cylinder is needed. Another sensor operating on the same measurement principle measures the top limit position of the piston. This is brought out separately to facilitate simple adaptation to cylinders with different strokes. Both sensors are controlled from a compact electronic evaluation unit which supplies an analog displacement signal or switching signal.

Reasons for selecting the system

- Continuous, wear-free measurement of the engagement length.
- No adjustment of limit switches or mechanical end-stops.
- Compact size
- Customer-specific OEM versions

Other application examples for OEM customers

- Dosage cylinder in glass
- Shock absorbers
- Synchronized cylinders
- Pneumatic pumps



Displacement sensors for engagement length and top limit position with electronic evaluation unit.