# World novelty: Durable position measurement of hydraulic pistons

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PVDF sensors can measure piston positions durably and inexpensive. By several one behind the other arranged sensors piston positions can be seized quasi-similarly.

The patented procedure for the position control of pistons in hydraulic cylinders made a new generation possible of Low Cost sensors. So far position measurements for pistons in hydraulic cylinders are made by laterally attached ultrasonic sensors with ceramic(s) oscillators. In addition usually modified sensors become, how them admit from the material testing (NDT) are used. These sensors are usually manufactured as cylinders. These possess a planar coupling surface at the face. This front surface cannot rest upon however full-laminar the curved cylinder wall. The contact to the cylinder surface takes place only on a very narrow strip toward the cylinder expansion. The contact can be improved by a couple means somewhat. If these sensors are also pressed to large strength against the cylinder wall, inevitably the sensitive piezo-ceramic breaks. If the position measurement is implemented laterally at the cylinder, the position sensors stand more usually reject laterally outward. Well-known sensors are to be installed mechanically so far only by clips or welded on fastening spots. Further they are exposed to possible damages by their dimensions. The measurement of these sensors effected only point for point and is limited only to a position. The new patented sensor arrays made of PVDF foil rest upon against it flat the cylinder wall. The structure height amounts to less than 1 cm and by the housing and by the cable connection is essentially determined. These piezoelectric elements are attached laterally on the hydraulic cylinder. These elements are flexible and adapt to the curvature of the hydraulic cylinder. With several arrays from PVDF foil also longer distance can be seized. Available PVDF foils cover a temperature range of -40° C to +100° C, with sensors from copolymers are attainable a temperature range to 145° C. Thus the ultrasonic sensors developed in the new patented procedure can be used also for applications the higher application temperatures to require. New application type result for these sensors in the case of the monitoring of pipings of small dimensions. In the biotechnology and active substance production often residue control is in demand. With small flexible tubing sensors, which adapt to arbitrary pipe diameters, the monitoring of mini Plants is economically possible.

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Company
In January 2003 IBJ -Technology as partner of the industry for the interests of the process measuring technique one based.
Owner of the engineer's office for innovative measuring technique is
Mr. Dipl.-Ing. (TH), Dipl.-Ing.-Oek. Frank- Michael Jäger.
Our activity and thus our experiences in the process measuring technique for fastidious applications justify themselves on one over 15 years activity in the project management and development in research establishments of the chemistry, the natural gas industry and the mining industry.
The practical use of measurement principles and sensor technologies under most difficult operating conditions is supplemented by one over 12 years advisory activities to the employment and the use from process measuring technique to the benefit of the customers within all ranges of the economy.
As independent and reliable partners of the industry we offer comprehensive solutions in all questions of the process measuring technique.
Particularly with fastidious applications of the ultrasonic technology we can repair problems with new solutions.
Many innovative solutions for measuring tasks in the most different industries were protected in a multiplicity by patents and

utility models.

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