Non-contact sensors

Working in high pressures, extreme temperature, immersed in liquids or high shock and vibration, eddy current sensors remain reliable and stable in the most demanding conditions

In highly automated industrial production environments, non-contact displacement sensors featuring electromagnetic measuring technology are often used for quality- and production-control purposes. The requirements of these sensors are becoming more stringent. They need to operate with increasing functionality, in smaller packages, and offer smooth process integration.

In addition to tactile (gauging) sensors, non-contact metrology is now also used to measure displacement, deformation, stretching, distances, position, and other geometrical shapes and sizes. These sensors often measure faster, more accurately and reliably than tactile sensors. Measurement data is available in real time for automatic regulation and control in production. Metrology can also be used in the supervision and optimization of production processes, with the ultimate aim of improving product quality, reducing rejects to a minimum, and lowering total production costs.

The eddyNCDT 3001 sensor from Micro-Epsilon is a cost-effective eddy current sensor with housing that has, to date, only been used in inductive sensors and proximity sensors. This compact sensor comes with integrated electronics including temperature compensation, offering an excellent price/performance ratio, as well as easy operation. It also offers higher measurement accuracy and linearity, as well as a higher frequency response rate of 5kHz compared with other sensors in the same price range. Sensors are factory-calibrated for ferromagnetic and non-ferromagnetic metals in the measuring range of 4mm. Sensors are protected according to IP67. Easy to use and cost-effective, they are suitable for production in a range of OEM applications.

Micro-Epsilon's eddyNCDT 3001 offers an excellent price-performance ratio. Its highly compact design includes integrated electronics

With its DT3001 series, Micro-Epsilon can now cater for new applications, using technology based on the eddy current principle. Eddy current sensors from Micro-Epsilon can be used to measure displacement, distance, position, oscillations and vibrations. Non-contact eddy current sensors offer extremely precise measurement where submicron accuracy is required. Micro-Epsilon can customize sensors, according to requirements, in a number of ways: for example changes to the cable, sensor material and design, and to the controller, can all be made. These can be produced efficiently and cost-effectively. Sensors with integrated electronics in a miniature housing or special sensor designs are often requested by system integrators. Other examples of customizations include: modified offset and measuring range, different housing and mounting options, pressure-resistant sensors up to 2,000 bar, miniaturized sensors, various coil materials, housing and circuit boards, individual cable lengths, and specific target calibrations.

The eddyNCDT 3300 determines the exact position of piston, piston rings and pressure conditions

The exact position of the piston, the piston rings and the existing pressure conditions are essential information for manufacturers of combustion engines. Using simulation tools, this data is primarily used to make reliable predictions about wear, friction and oil consumption, for example. Failure analyses can also be produced. Micro-Epsilon's eddyNCDT eddy current sensor measures the so-called piston ring and piston secondary movements at high accuracies. Here, eddy current sensors are advantageous. They are resistant to high temperatures in combustion engines up to 180°C or even higher for short periods of time. Vibrations, pressure, oil, fuel and combustion gas or continuous mechanical movement do not influence the precision of measurement results. In this application, eddyNCDT sensors also fulfill the high performance requirements offering very fast measurement speeds with small measuring ranges (0-0.5mm) and high resolution (less than 1µm). The sensor is also suitable for installation in restricted spaces, where extreme temperatures and temperature fluctuations occur, and has no influence on the periphery.

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