



Non-contact capacitive displacement and position sensors

Due to the unique active tri-electrode guard-ring-capacitor principle capacitive displacement sensors are linear for all metals. The sensor acts as an electrode; the opposite electrode is the target.

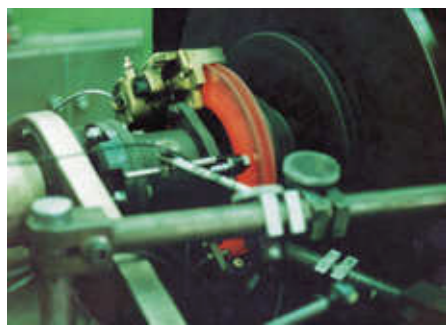
The measurement technique facilitates exclusively measurements against all conducting objects. Micro-Epsilon has extended the capacitive measurement principle with innovative functions which enable highly linear output characteristics, nanometer-precise resolution and very stable measurements to be obtained. The linear characteristic of the measurement signal is obtained for measurements with respect to target objects of electrically conducting materials without any additional electronic linearization.

The sensors, which measure without making contact, are conceived for industrial applications in production systems and in-process quality assurance, but are also used for test-rig applications.

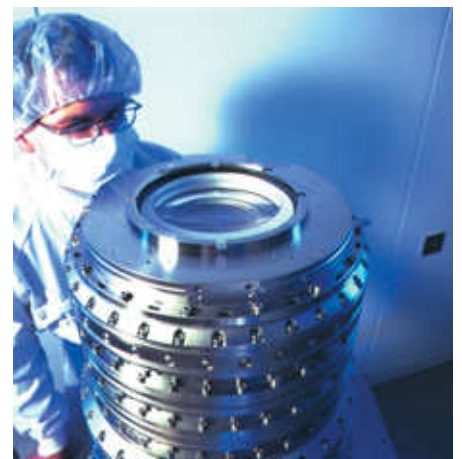
- Advantages**
- Superior precision and resolution
 - Excellent temperature stability
 - Outstanding long-term stability
 - Material-independent for metallic targets
 - For any conductive target



The world's smallest capacitive displacement measurement system: capaNCDT 6019 for OEM applications in machines and equipment.

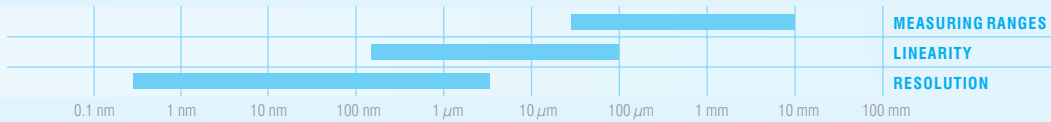


Even under extreme conditions on a test-rig, capacitive sensors supply the highest precision - here the wear on a brake disk is tested.



Non-contact capacitive displacement sensors measure with highest precision the alignment of the lens system used for wafer lithography.

**Performance
capaNCDT**



capaNCDT 600

Modular multi-channel system

Measuring ranges 0.05 - 10 mm

Linearity $\leq 0.2\%$

Resolution 0.004 μm

Measuring rate 6 kHz

capaNCDT 6100

Compact single-channel system

Measuring ranges 0.2 - 10 mm

Linearity $\leq 0.1\%$

Resolution 0.015 μm

Measuring rate 2 kHz

capaNCDT 6019

Miniature single-channel system

Measuring ranges 0.2 - 10 mm

Linearity $\leq 1\%$

Resolution 0.01 μm

Measuring rate 500 Hz



capaNCDT 6300/6310

Compact high resolution
single-channel system

Measuring ranges 0.05 - 10 mm

Linearity $\pm 0.2\%$

Resolution 0.001 μm

Measuring rate 8 kHz

capaNCDT 6350

Compact high speed
single-channel system

Measuring ranges 0.2 - 10 mm

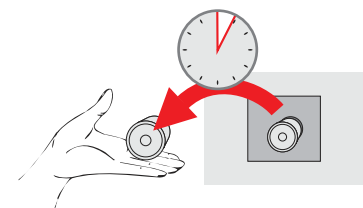
Linearity $\pm 0.3\%$

Resolution 0.005 μm

Measuring rate 50 kHz

Instant sensor swap without recalibration

The unique Micro-Epsilon capacitive technology allows changing any capaNCDT sensor in seconds! Replacing sensors with different measuring ranges and any capaNCDT controller without recalibration. A sensor swap with capaNCDT needs no more than 5 seconds, while other capacitive systems are not designed for replacing components without the need of individual calibration and linearization. The nominal range of each single probe can be extended by twofold and custom cable length are available as well.

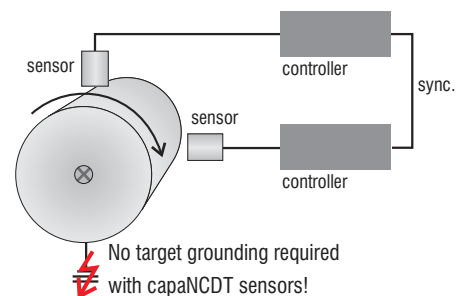


Instant sensor swap within 5 seconds!

Replace any capaNCDT controller and any capaNCDT sensor within seconds without recalibration!

Non-contact target grounding

Target grounding sometimes can be very difficult or even impossible. Unlike conventional systems due to the unique synchronization of two 6100 systems the target does not require any electrical grounding. The following principle shows two synchronized capaNCDT sensors measuring roller run out. The target does not require to be grounded because of the unique synchronized-non-contact-grounding technology. At the same time any interference caused by electrostatic charge of the target is eliminated.





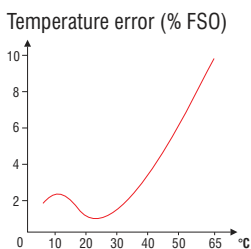
Eddy current principle: non-contact displacement and position sensors

Eddy current displacement sensors measure distances, displacements, or positions of any electrically-conductive target. The principle enables non-contact and wear free measurements. The measurement objects may have either ferromagnetic or non-ferromagnetic properties. Due to its immunity to oil, dirt, dust, moisture, interference fields, etc. the eddy current principle is ideally suitable for applications in harsh industrial environments. Micro-Epsilon's eddy current sensors are the only ones with active temperature compensation and field calibration capability.

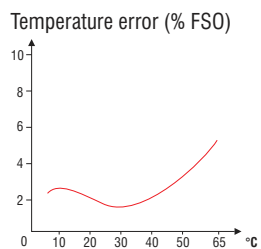
Advantages

- Non-contact and wear free
- Highest resolution and linearity
- Very stable measurements
- High measurement rates
- Excellent temperature range and temperature stability
- For industrial applications

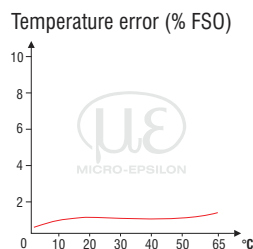
Temperature error by comparison



Common inductive sensor with ferrite core



Common eddy current sensor without temperature compensation



Best practice: eddyNCDT 3010 with temperature compensation



OEM integration in textile machines

Eddy current sensors measure the thickness variation of thread in textile machines.



Application in test rigs

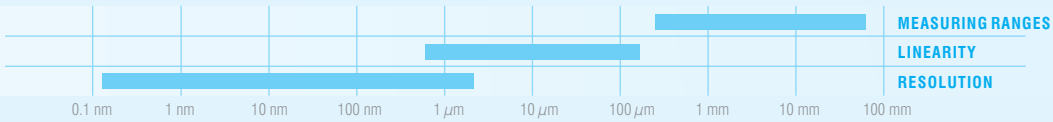
In the automotive industry these systems measure internal dimensional changes inside a running engine.



In-line quality control

Eddy current sensors measure the flatness in rolling mills.

**Performance
eddyNCDT**



eddyNCDT 3010

Low-Cost single channel system for industrial applications

Measuring ranges	0.5 - 15 mm
Linearity	≤0.25 %
Resolution	0.005 %
Measuring rate	25 kHz (-3dB)



eddyNCDT 3300

Intelligent eddy current system (single-channel) for very precise measurements

Measuring ranges	0.4 - 80 mm
Linearity	≤0.2 %
Resolution	0.005 %
Measuring rate	100 kHz (-3 dB)
Standard and miniature sensors available	



eddyNCDT 3700

Compact eddy current OEM system for differential measurements

Measuring ranges	0.5 - 6 mm
Linearity	≤5 %
Resolution	0.000018 %
Measuring rate	10 kHz (-3 dB)

Worldwide the largest selection of sensors

The technological leadership in eddy current sensors, which spans many years, is reflected in the sensor range - more than 400 sensors are available in different versions for the most varied applications.

Subminiature sensors for confined installation space

Apart from standard sensors in popular styles, miniature sensors can also be supplied which achieve high precision measurement results with the smallest possible dimensions. Pressure-resistant versions, screened housings, ceramic types and other special features characterize these sensors, which achieve highly accurate measurement results despite the small dimensions. The miniature sensors are employed in high pressure applications, e.g. in internal combustion engines. The subminiature sensors are matched to the controller of the eddyNCDT 3300 Series.

Suitable for extreme temperatures

The sensors can be used from -50°C to +235°C. The wide temperature range and the insensitivity to soiling or dust gives an enormous range of applications in industrial environments.

Whereas currently available eddy current sensors exhibit extreme drift with variations in the ambient temperature, an active temperature compensation with the eddyNCDT sensors ensures the highest signal stability. Consequently, measurements can be carried out over large temperature ranges with extreme signal stability.



Worlds leading technology

The family of EU05 and ES04 miniature eddy current displacement sensors is unbeatable in dimensions. The very fine integral coax cable can even pass through the eye of a needle. These sensors are ideally suited for measurements in combustion engines.