

NORDIC TRANSDUCER

NCTE sensors feature the following unique advantages:

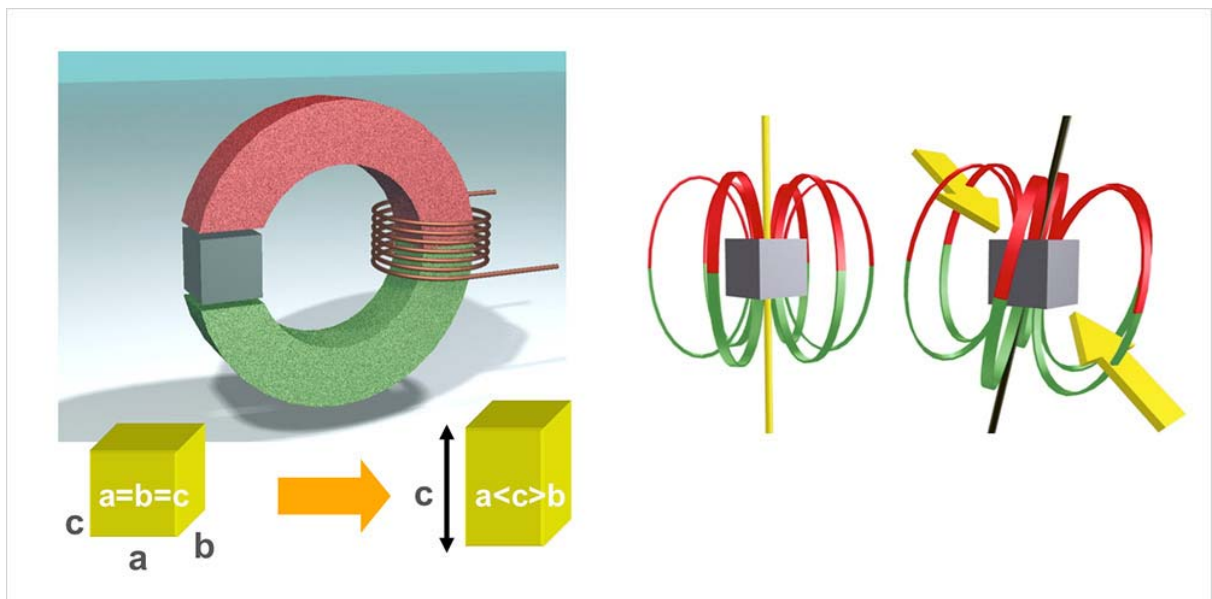
- Very simple construction
- Extremely low system complexity
- Extremely robust, long life, ultra high accuracy
- Easy integration into OEM products, and
- attractive cost structures enabling series and mass production

An existing component is turned into the primary sensor, without requiring extra materials, discrete additional components or strain gauges.

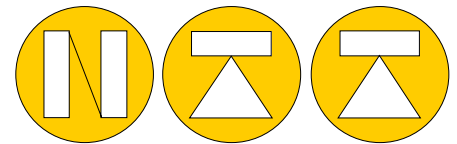
What is magnetostriction?

For measuring torque and other forces, NCTE uses the physical principle of magnetostriction (or the magneto-elastic principle): The dimensions of a body change in the presence of an external magnetic field. This effect is very stable, permanent, reproducible, and strictly linear, thus making it ideal for rugged, long-life sensor solutions and for series production.

Direct magnetostriction (left), inverse magnetostriction (right)

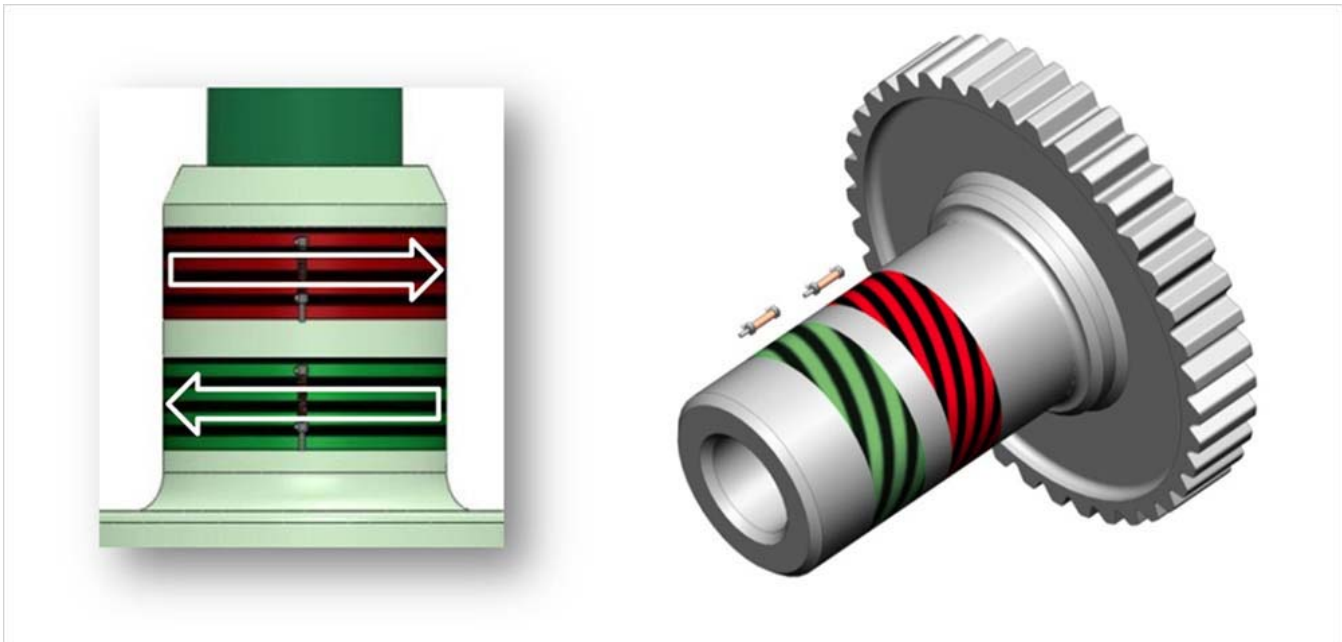


How do NCTE sensors work?



NORDIC TRANSDUCER

NCTE uses the so-called „inverse magnetostrictive effect“: When a force acts on a magnetically encoded component, the magnetic field surrounding it changes. These magnetic field changes are detected by sensors, enabling highly precise real-time determination of the acting forces.



Inverse magnetostriction:

low field strengths, the component does not turn into a magnet that attracts other matter.

Primary sensor

Non-contact, maintenance free

NCTE sensors are truly non-contact, no strain gauges/DMS – no maintenance.

The shaft itself becomes the primary sensor

In a proprietary, patent-protected process NCTE magnetically encodes steel components, e.g. drive shafts, to enable highly precise non-contact measurement of mechanical forces. The magnetic encoding is remanent. An additional, discrete primary sensor device is not required.

Ultra precise, ultra robust

To achieve highly precise measurements also in external magnetic fields, e.g. EMC disturbances, or mechanical challenges, e.g. bending or tumbling, at least two opposing magnet fields are generated.

Secondary sensor

Maintenance free, no re-calibration required

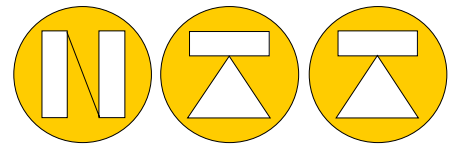
NCTE sensors are absolutely free of wear and require no maintenance or recalibration.

Highly precise, durable and stable

Next to the object to be measured, e.g. the shaft, NCTE arranges high resolution miniaturized magnet field sensors. These detect even the most minute magnet field changes – in a completely non-contact process, positioned some millimeters away from the primary sensor.

Works also submerged in water and oil

The technology also performs in water or oil, e.g. in vehicle gear boxes, with ultimate reliability and durability. The magnet field changes detected are strictly linear to the acting force, highly reproducible, and long-term stable.



NORDIC TRANSDUCER

Electronics

NCTE also supplies the electronics to translate the measured magnet field changes into visible, usable electric signals, adapting the interface to customer specifications. NCTE offers analog outputs (4 – 20 mA; 0 – 10 V), PWM, CAN-Bus, USB-interface and customized outputs.

Proof of long term stability

NCTE has established long term stability for the use of NCTE sensors in aviation applications. This proof of long term stability was performed with the support of aviation specialist Liebherr Aerospace:

»After over 2 million load changes, 68 temperature cycles, and 120 vibration hours the sensors still continue to deliver correct results. Even a static 8 week load applied did not lead to an offset or change of gradient of the sensor signal. No significant sensor inaccuracy or hysteresis could be observed (>1%).«

Ask us for the full report here in [German language](#). This extreme durability can typically not be achieved with strain gauges.

