



Portable EMAT thickness gauge NKD- 019E *“UltraSonic”*





NKD - 019E «UltraSonic»

General information on NKD - 019E «UltraSonic»

A convenient, compact, sophisticated and innovative field instrument, the EMAT Wall Thickness gauge NKD - 019E «UltraSonic» can be used to easily yet precisely measure the thickness of components, pipes, vessels and other metal objects. The gauge enables measurements to be taken at a vast range of surface temperatures, going from -20 to +720 degrees Celsius. As a rule, a plastic coatings, paint or limescale on the surface do not affect the results of measurements. The unique properties of this gauge are caused by the clever use of the principle of electromagnetic-acoustic transduction (EMAT), allowing ultrasonic waves to be generated and received by metal objects without direct contact or the use of couplant.

In fact, the gap between the material being tested and the electromagnetic acoustic transducer in the gauge can be as high as 4mm!

Areas of application:

- Metalwork industry
- Petrochemical industry
- Aerospace industry
- Construction of transport and machinery
- Ship building and repair

And many more!



A - Scan

Gauge functions:

- Non-contact thickness measurement of aluminum, ferromagnetic and stainless steel products. Thickness can be taken without a couplant and even if the surface of the test object is rough, dirty or covered with scale
- Gauging corrosion, erosion, and wear and tear
- Characterisation of mechanical properties
- Detecting flaws of 2 mm and larger



Safety handle for measuring objects with a high surface temperature with UltraSonic

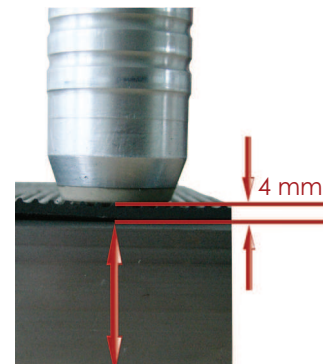


Ultrasonic Transducer

The NKD - 019E «UltraSonic» gauge is fitted with an extremely sophisticated and compact electromagnetic-acoustic transducer. This EMAT is a remarkably reliable device, very well protected against environmental influences.

NKD - 019E «UltraSonic»: The Key Advantages

- Intuitive, easy-to-use interface
- Able to measure objects with an extremely high surface temperature (up to 720 °C)
- Able to transmit and receive ultrasound waves without the use of a couplant and at a distance of up to 4mm
- Even units with insulation covers, corrosion or a rough surface can be tested non-destructively
- Precise to $\pm 0,05$ mm
- Wave speed automatically optimized to test object temperature
- Measurements can be recorded for future analysis



A precise measurement despite protective cover!



Telescopic extender

- Enables measurement at a distance
- Convenient telescopic design
- Extends up to 1600 mm
- Complete with case for ease of transportation



The product comprises of:

- 1 EMAT
- 1 set of removeable batteries (type AA, 8 pieces)
- 1 charging unit (for 4 batteries)
- 1 protective cover
- 1 case with aluminium handle for ease of transportation
- 1 user manual



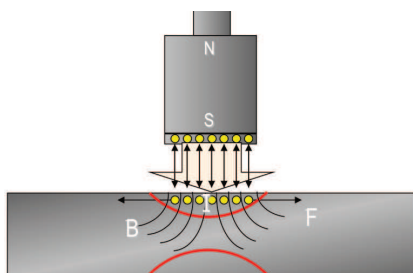
Accessories

- Power adapter
- Belt with additional power supply unit for working on site
- Telescopic extender
- PTFE film



How EMA technology works

Ultrasonics is the leading, most versatile method in non-destructive testing.



The principle of EMA transformation

Nordinkraft has had great success with non-contact testing using electromagnetic acoustic transformation to generate and receive ultrasonic signals. An EMAT transducer consists of a case with a socket, an induction coil, a protective cover, a magnetic flux concentrator and a permanent magnet. Alternate current feeds the induction coil, causing electromagnetic oscillations which, in turn, induce eddy currents on the surface of the test object. Eddy current interferes with the permanent magnetic

field, creating ultrasonic waves directly on the surface of the test object. These waves propagate in the test object, reflecting and deflecting from the walls back to the EMAT coil. Measuring the reception of these waves allows thickness to be gauged. The use of electromagnetism as a testing technique allows testing to be done without direct contact between the probe and test surface. As EMAT non-destructive testing does not even require the use of a couplant, this technique has extensive advantages over testing with classic thickness gauges.

Technical characteristics NKD - 019E «UltraSonic»

| | |
|-----------------------------------------------------------------|-------------------------------------------|
| Weight of the device (with batteries) | 1430 g |
| Weight of transducer | 178 g |
| Overall dimensions (LxWxH) | 274x168x36 mm |
| Power supply: | replaceable batteries (AA type, 8 pieces) |
| Operation time at a brightness of 50% | 12 hours |
| (using belt with additional external power supply unit) | 40 hours |
| Temperature range whilst in operation | - 10°C up to +50°C |
| Temperature range of the test object (<u>in basic design</u>) | - 20°C up to +720°C* |
| Measurement unit | millimeter |
| Measurement range | 1.5 – 100 mm |
| Resolution with a single measurement | 0.01 mm |
| resolution with a averaged readings | 0.001 mm |
| Distance from test object | up to 4 mm** |
| Transmission rate | 4 MHz |
| Type of ultrasonic wave | transversal |
| Gain | 80dB |
| Dead band at 4 MHz | max. 4 µs |
| Pulse Repetition Frequency (PRF) | at least 150 Hz |
| Hz ultrasonic speed | 1000-9999 m/sec |
| NVRAM | 1 MB |
| Sampling rate | 40MHz |
| 4.3"colour TFT screen with adjustable lighting | 480x272 |
| Pixel Languages | English, German, Russian |
| Precision | ± 0,05 mm |

* Depending on transducer and time measured

** Depending on the surface coating and probe specifications



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