



DEUTROMETER

Measurement of Magnetic Field Strength, UV and White Light

KARL DEUTSCH

DEUTROMETER

The practical gauge for UV, white light and field strength measurement



Supplied in a handy carrying case (example picture)

The DEUTROMETER makes it possible to measure field strengths and monitor limit values easily and conveniently. With a special probe, it is also possible to measure UV and white light.

The DEUTROMETER is available in three different expansion stages:

- **DEUTROMETER** (order no.: 3873.001)
Field Strength Meter
- **DEUTROMETER LIGHT** (order no.: 3873.002)
UV and White-Light Meter
- **DEUTROMETER UNIVERSAL** (order no.: 3873.003)
UV, White-Light and Field Strength Meter

Via an upgrade path, existing DEUTROMETER or DEUTROMETER LIGHT meters can be upgraded to the combination version DEUTROMETER UNIVERSAL. This can also be done on site at any time by entering a numerical code (from software version 2.01)

The field strength measurement

In magnetic particle crack detection, workpieces are magnetised by means of current or field flow. For a reliable indication of cracks, a minimum magnetising field strength needs to be achieved. After the test is completed, the workpiece is usually demagnetised.

The DEUTROMETER, thoroughly developed for practical use, helps to determine both measurands quickly and easily: In a separate measuring mode, both the magnetising field strength



The DEUTROMETER is also the right tool for checking the lighting conditions during PT testing

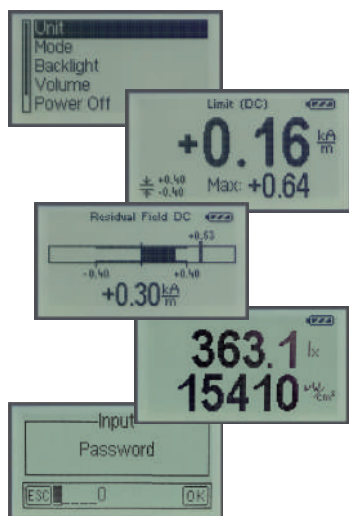
and the residual field strength can be measured directly one after the other. There is no need to switch manually between alternating and constant field mode, as the unit automatically detects whether a constant or an alternating field is present. This eliminates incorrect measurements caused by illegal device settings.

Two selectable display modes permit optimisation of the practical suitability: With the standard display, the current measured value is shown with large digits that are easy to read. The selected parameters, e.g. lower and upper limit value or the maximum value in relation to the measurement series, are displayed simultaneously in smaller digits. Alternatively, it is possible to switch to a bar graph, where the classification of the measured value is particularly easy due to the easy-to-read graphic display. The switchable optical and acoustic limit value alarm completes the practical features of the unit. The menu navigation is user-friendly and in comprehensible plain text. The illuminated display and the keypad lettering, which fluoresces under UV light, enable safe and easy operation of the device even in the darkened test booth.

The robust probes are optionally equipped either with a 0° or a 90° probe head for optimum adaptation to the test part geometry. For a narrow measurement geometry, a special probe is available with which transversely incident fields can also be measured.

The UV and white light measurement

For both magnetic particle crack detection and penetrant testing, the viewing conditions must be monitored to ensure that the test complies with standards. It is checked



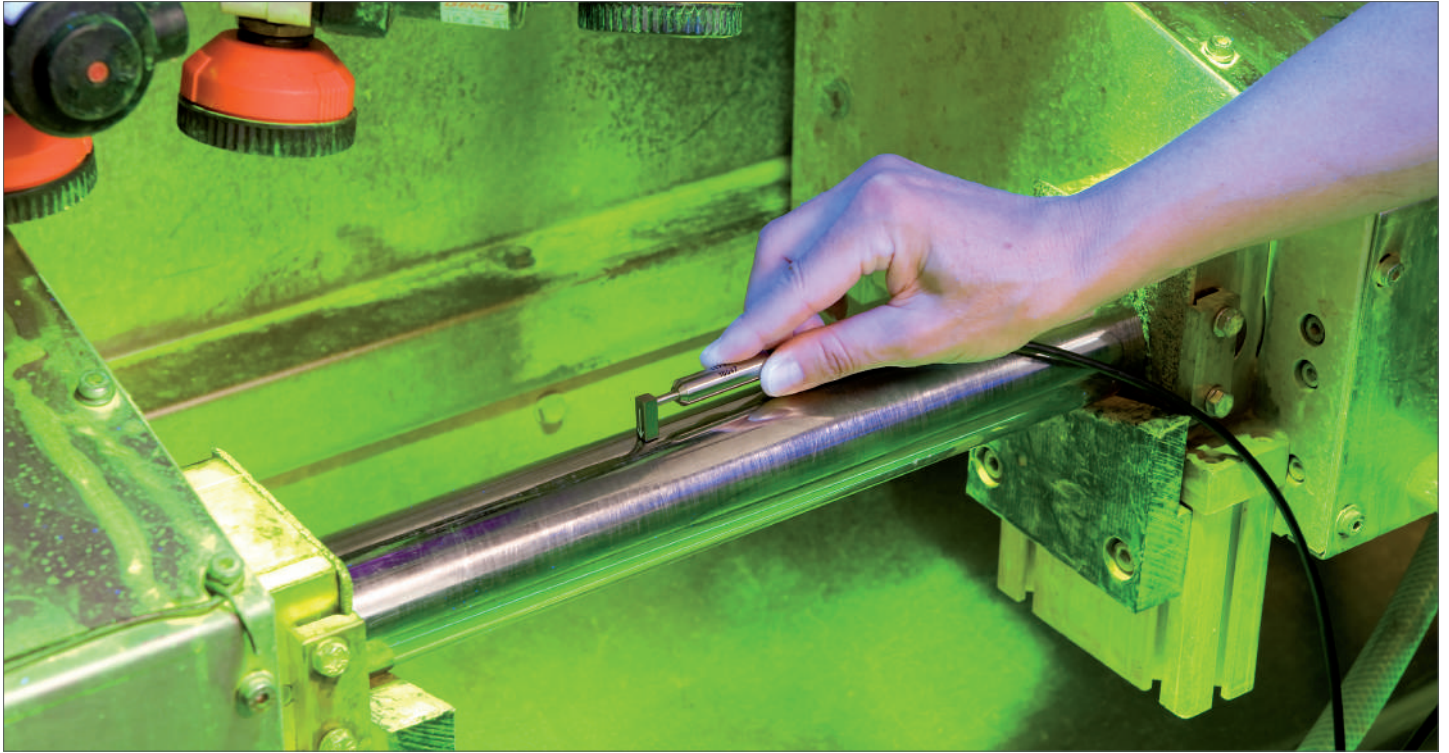
User-friendly menu navigation is in plain text. The display of measured values is easy to understand and clear.



To control the viewing conditions, the DEUTROMETER together with the DEUTROLIGHT probe simultaneously provide the measured values for the residual daylight and the UV intensity

DEUTROMETER

Developed with users for daily use



Application example: Tangential field measurement using the 90° probe with field flow

er the workplace is sufficiently darkened and the UV intensity is strong enough. According to the standard, existing white light portions of the UV source used must also be taken into account for measurement. According to EN ISO 3059, ≤ 20 lx for the white light portion and

≥ 10 W/m² for the UV intensity are specified for a fluorescent MT or PT examination. Here, assisted by the combined DEUTROLIGHT sensor for UV and white light measurement, the DEUTROMETER is also the right tool for the inspector. Under live conditions, the sensor is positioned at the observation location.

The DEUTROMETER then simultaneously indicates the intensity of the UV irradiation and the illuminance of the residual light.

The sensor is traceably calibrated to the PTB (a National Metrology Institute, Germany), can be recalibrated and is supplied with a factory calibration certificate. Excellent long-term stability is achieved by using selected materials.

Further benefits of the DEUTROMETER

- True-RMS measurement for direct and alternating fields (from software version 2.01)
- Peak measurement to check the crest factor (from software version 2.01)
- Battery-saving illumination
- Integrated flip stand
- Splash protection (IP54)



Probe for narrow geometries with transverse fields



UV and white light probe with translucent diffuser through which the light reaches the measuring unit in the probe

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Accessories for field strength measurement

Field-proven accessories are available for special conditions and on-site verification of the meter:

- The zero-field chamber largely shields external magnetic interference fields. If the probe is in the zero field chamber during zero calibration, the permanently present earth field is not measured.
- The reference magnet generates a static magnetic field of known magnitude, which is used to check the display accuracy of the field strength meter (field strength approx. 45 kA/m, the exact value is engraved).



Zero field chamber (left) with field-free inner space and reference magnet with defined field strength are accessories for field strength measurement and used for checking the gauge

Technical Data DEUTROMETER

Display	LCD, illuminated, 48 mm x 24 mm approx., graphics-capable with 128 px x 64 px, character height up to 12.5 mm
Measurand	Field measurement: magnetic field strength H or induction B (in air) in direct (DC) and alternating fields (AC) Light measurement: UV irradiance E _e , white light illuminance E _v
Uncertainty of measurement	Field measurement: ±0.01 kA/m ± 2 % (DC residual field mode), ±0.05 kA/m ± 4 % (modes: AC/DC standard, AC/DC limit, AC/DC peak, AC magnetisation), light measurement: ±5 % (white light illuminance), ±7 % (UV)
Measuring ranges	±80 kA/m or ±101 mT or ±1005 G, 0 up to 20000 lx (white light), 0 up to 20000 µW/cm ² or 200 W/m ² (UV)
Measuring principle	Field measurement: Hall sensor
Units of measurement	Field measurement: mT, A/cm, kA/m, Gauss, UV light: W/m ² or µW/cm ² , white light measurement: lx
Measurement methods (field)	DC = Measurement of a time-invariant DC field with indication of +/- for the direction of the magnetic field, AC = RMS value in an alternating field (True RMS)
Probe design	Field probes: 0° or 90° probe head, approx. 1 m connection cable, paraffin resistant, weight approx. 45 g Light probe: cylindrical, Ø 44 mm, 35 mm long, approx. 1 m connection cable, weight approx. 160 g
Spectral range of the UV+White Light Probe	White light: 380 nm – 780 nm UV: 315 nm – 400 nm (UVA)
Power supply	2 pieces of alkaline manganese batteries (operating time approx. 50 h) or 2 NiMH rechargeable batteries (operating time approx. 30 h when new), type AA/IEC R6 Externally via power supply unit or via USB cable from a PC
Battery check	4-stage battery level indicator, automatic battery end-of-life switch-off
Keyboard	4 Keys, lettering fluoresces under UV light
Dimensions, weight	133 mm x 80 mm x 32 mm approx., 150 g (with batteries, without protective rubber frame).
Applicable standards	Field measurement: EN ISO 17638, section 5.5.2, EN ISO 9934-3:2002, section 9.3 Light measurement: DIN EN ISO 3059:2012
Calibration cycle	Annual (recommended, follow applicable standards)

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