

Instruction Manual TE

DIGITAL COATING THICKNESS GAUGE (F&FN TYPE)



Model: TE 1250-0.1 FN

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Annotation: It is strongly recommended to calibrate the new instrument before the first use, as described in paragraph 5. By doing this, there will be achieved a much better measurement result right from the start.

1. Features

- »This instrument meets the standards of both ISO 2178, ISO 2360 as well as DIN, ASTM and BS. It is suitable for the laboratory and for use in "harsh field" conditions.
- »The F mode measures the thickness of nonmagnetic materials, e.g. paint, plastic, porcelain enamel, copper, zinc, aluminium, chrome, laquer layers etc. These layers are located on magnetic materials e.g. steel, iron, nickle etc. It is often used to measure the thickness of galvanizing layer, laquer layer, porcelain enamel layer, phosphide layer, copper tile, aluminium tile, some alloy tile, paper etc.
- »The N mode measures the thickness of nonmagnetic coatings on nonmagnetic materials. It is used on anodizing, varnish, paint, enamel, plastic coatings, powder etc. It can be applied on aluminium,

- brass, nonmagnetic stainless steel etc.
- »Automatically substrate recognition.
- »Manual or automatically auto power off to conserve batteries
- »Two measurement modes: - single and continuous
- »Data transfer to PC possible

2. Specifications

Display: 4 digits

Range: 0 to 1250 µm/ 0 to 50 mil

Resolution: 0.1µm (0 to 100 µm)
1 µm (over 100 µm)

Accuracy:

- Standard: 3% of the measured value or min. $\pm 2.5 \mu\text{m}$
Is valid within a tolerance range of $\pm 100 \mu\text{m}$ around the individually measured range, if a two-point calibration was performed within this tolerance range.

- Off-Set Accur Mode: 1% of the measured value
or min. $\pm 1.0 \mu\text{m}$
Is valid within $\pm 50 \mu\text{m}$ around the *Off-Set Accur* point.

PC- interface: with RS-232C interface

Power supply: 4x 1.5V AAA (UM-4) battery

Operating conditions: Temperature: 0 to 50°C
Humidity: <80%

Size: 126 x 65 x 27mm (5.0 x 2.6 x 1.1 inch)

Weight: about 120g (not including batteries)

Accessories: Carrying case
Operation manual
F-sensor
N-sensor
Calibration foils
Base plate (iron)
Base plate (aluminium)

Optional accessories: Cable & software for RS-232C

3. Front panel description

- 3- 1 Sensors (F and NF type)
- 3- 2 Display
- 3- 3 Zero- key
- 3- 4 Plus- key
- 3- 5 Minus- key
- 3- 6 Power key
- 3- 7 µm/ mil conversion key
- 3- 8 Battery compartment
- 3- 9 Jack for RS-232C interface
- 3-10 S/C key (single/ continuous measuring mode)

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4. Measuring procedure

- 4.1 Plug in the F- sensor or the NF- sensor according to the measured object.
- 4.2 Press the power key 3-6 to switch on the instrument. '0' appears on the display 3-2.
The instrument recognizes the sensor itself by the symbol 'Fe' (= F) or 'NFe' (= N) which is indicated on the display.
- 4.3 The sensor 3-1 is to be placed onto a coating layer to be measured. The reading on the display is the thickness of the coating layer. This can be corrected by pressing the Plus- key 3-4 or the Minus- key 3-5 (*Offset- Accur* function)
For doing this the sensor should be away from the measured object or the base plate.
- 4.4 For the next measurement just lift the sensor 3-1 for more than 1cm and step 4.3 is to be repeated.
- 4.5 In case of inaccuracies to the measurement result it is recommended to calibrate the instrument before measuring as described in part 5.
- 4.6 The instrument can be switched off by pressing the Power key 3-6. The power will switch itself off 50 seconds after the last operation.
- 4.7 The measurement unit can be indicated with 'µm' or 'mil': To convert:
 - A by pressing the conversion key 3-7 **or**
 - B by pressing the Power key and not releasing it til 'UNIT' appears on the display. Then the Zero key 3-3 is to be pressed. All in all this operation lasts about 7 seconds.
- 4.8 To change the measuring mode from 'single' to 'continuous' or vice versa,
 - A The SC- key 3-10 is to be pressed **or**
 - B The Power-key 3-6 is to be pressed and not released until 'SC' appears on the display. Then the Zero- key 3-3 is to be pressed. The symbol ((•)) indicates the continuous mode and 'S' indicates the single mode. This operation lasts 9 seconds (from starting pressing the Power- key 3-6).

5. Calibration

- 5.1 Zero adjustment:

Zero adjustment for 'F' and 'N' should be carried out separately. The iron base plate is to be used if 'F' is shown on the display. The base plate of aluminium is to be used if 'NF' is shown on the display. .
 The sensor 3-1 is to be placed carefully onto the base plate and the Zero- key is to be pressed without lifting the sensor. '0' appears on the display.

Attention: The calibration is invalid if the sensor is not directly placed on the base plate or another uncoated material.

- 5.2 An appropriate calibration foil is to be selected according to the measurement range.
- 5.3 The selected standard foil is to be placed onto the base plate or the uncoated material.
- 5.4 The sensor 3-1 is to be pressed carefully onto the calibration foil and then lifted.
The reading on the display is the value measured. This can be corrected by pressing the Plus- key 3-4 or the Minus- key 3-5 while the sensor is removed from the base plate or the measured object.
- 5.5 Repeat step 5.4 until the accuracy is achieved.

6. Battery replacement

- 6.1 If the battery symbol '+/-' appears on the display, the batteries should be replaced.
- 6.2 The battery cover 3-8 is to be removed and the batteries are to be taken off.
- 6.3 The batteries (4x1.5V AAA/UM-4) are to be installed correctly into the case.
- 6.4 If the instrument is not to be used for an extended period, batteries are to be extracted.

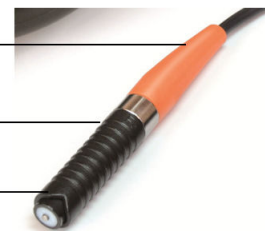
7. Correct handling of coating thickness measurement with external sensors

The sensor has to be touched at the lower pole segment and it has to be pressed slightly onto the test object. The black chequered pole segment is movably seated on a spring. By means of the spring, the sensor tip presses onto the test object with a defined force. This way, measurement errors can be avoided.

Sensor (orange: F / black: N)

Spring pole for handling

Sensor tip



It is recommendable to effect several test measurements before the first use of the instrument. This way, further measurement errors can be avoided.

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8. Trouble Shooting

- 8.1 The instrument should always be calibrated on the uncoated base material to be measured instead of the base plate included in the delivery. Then the accuracy is more precise.
- 8.2 Sensors will eventually wear off. Life of the sensor will depend on the number of measurements taken and how abrasive the coating is.

9. Restore factory settings

- 9.1 In the following cases it is recommended to restore factory settings:
- A. The instrument does not measure any more.
 - B. Measurement accuracy is degraded caused by the abraded sensor or affected by environmental conditions.
 - C. After the replacement of a new sensor.

9.2 How to restore?

'F' setting and 'N' setting are to be done. It can be done one or both of them. The procedure is as follows:

9.2.1 On the display the symbol 'F' or 'NF' appears.

If 'F' is shown on the display, you have to restore factory settings for 'F', as described below.

If 'NF' appears, you have to follow factory settings for 'NF'

9.2.2 The Power-on/ Power-off key 3-6 has to be pressed until 'CAL' appears on the display. This lasts about 5 seconds.

9.2.3 If now F:H or NF:H is shown on the display, the sensor has to be lifted for more than 5 cm. Then the Zero- key is to be pressed and the instrument returns into measurement mode .With this, factory setting is restored.

Comment: This procedure should always be done within 6 seconds. Otherwise it will be automatically cancelled and the restoration is invalid.

10. Notes

The linearization of the instrument, which is given by the calibration, can be changed with the **Ln- function**.

Any adjustment of the value of Ln will seriously affect the accuracy. This value should only be adjusted by professional persons.

Generally said:

The bigger the value of Ln, the smaller the reading on the display for the same (coating) thickness.

Only a small change on the value of Ln causes a big change in the reading of the upper measurement range (at 500µm/ 20 mil).

The value of Ln is to adjust as follows:

Pressing the Power on/ Power off key.

It lasts about 11seconds from starting depressing this key.

This value can be changed by pressing the Plus- /Minus- key after 'Ln' appears on the display and the Power- on / Power- off key is released. This value is stored and afterwards the Zero- key is to be pressed.

A. The reading at low end is to be adjusted by pressing the Plus-/ or the Minus- key.

B. The value of Ln is enlarged if reading at low end (e.g. 51µm) is o.k., but reading at high end (e.g.432µm) is too large. In contrast with this the value of Ln is to be decreased if the reading at low end (e.g. 51µm) is o.k. but at high end (e.g. 432µm) it is too small.

C. Procedures from A to B are to be repeated until the reading for every calibration foil is satisfactory in its accuracy.

11. Declaration of conformity



SAUTER GmbH
D-72458 Albstadt
E-Mail: info@sauter.eu

Tel: 0049-(0)7431- 938-666
Fax: 0049-(0)7431-938-292
Internet: www.sauter.eu

Konformitätserklärung

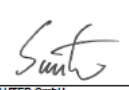
Declaration of conformity for apparatus with CE mark
Konformitätserklärung für Geräte mit CE-Zeichen
Déclaration de conformité pour appareils portant la marque CE
Declaración de conformidad para aparatos con marca CE
Dichiarazione di conformità per apparecchi contrassegnati con la marcatura CE

English	We hereby declare that the product to which this declaration refers conforms with the following standards.
Deutsch	Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt.
Français	Nous déclarons avec cette responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après.
Español	Manifiestamos en la presente que el producto al que se refiere esta declaración es: a de acuerdo con las normas siguientes
Italiano	Dichiariamo con ciò che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate.

Coating Thickness Gauge: SAUTER TE

Mark applied	EU Directives	Standards
CE	93/32/EEC EMC	EN 61325 : 1997+A1 : 1998+A2 : 2001 EN 55022 EN 61000-4-2 /-3

Date: 07.01.2009

Signature: 
SAUTER GmbH
Management

SAUTER GmbH, Schumannstrasse 33, D-72458 Albstadt, Tel: +49 (0) 7431 938 666, Fax: +49 (0) 7431 938 292