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Instruction Manual Digital Coating Thickness Gauge

SAUTER TE

Version 2.1
05/2023
GB

PROFESSIONAL MEASURING

TE-BA-e-2321

GB

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Instruction Manual Digital Coating Thickness Gauge

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1. Introduction

1.1 General description

This coating thickness gauge is small, light and handy. Although it has complex and advanced equipment, it is convenient and easy to use.
Its robustness allows many years of use, provided that all the instructions in this operating manual are carefully followed.
Therefore, please keep them within reach at all times!
Note: It is strongly recommended to adjust the new meter before using it for the first time, as described in chapter 6. This will give a higher measurement accuracy from the beginning.

2. Functions

- This device complies with ISO standard 2178 and ISO standard 2361, as well as DIN, ASTM and BS standards. It can therefore be used under laboratory conditions as well as under harsh environmental conditions "in the field".
- The F-measuring probe is used to determine the thickness of non-magnetic coatings, e.g. paint, plastic, enamelled porcelain, copper, zinc, aluminium, chrome, paint coatings, etc.
  These layers should be on magnetic metals such as steel, iron, nickel, etc. This test method is often used to measure the thickness of galvanised layers, lacquer layers, enamelled porcelain layers, phosphorescent layers, copper plates, aluminium plates, alloys, etc.
- The N-measuring probe is used to determine the thickness of non-magnetic and insulating layers on non-magnetic metals.
  It is used to measure anodising, lacquer coatings, glazes, paints, enamels, plastic coatings, powder coatings etc.. These should be on non-magnetic substrates such as aluminium, sheet metal, non-magnetic stainless steel and others.
- Manual or automatic switch-off to conserve battery power.
- Two measurement modes: -single and continuous
- Conversion of units metric/imperial
- Large measuring range and high resolution
- The backlit display enables precise reading
- Connectable to a PC for data transmission via RS 232 interface for statistical purposes. Cable and software are available as optional accessories (ATC-01).

3. Technical data

	TE 1250-0.1F	TE 1250-0.1FN	TE 1250-0.1N
Display	4 digits, 10mm LCD display with backlighting		
Measuring range	0 to 1250 µm / 0 to 50 mil (standard)		
Resolution	0.1 µm (0 to 99.9 µm), 1 µm (over 100)		
Uncertainty of measurement	3 % of the measured value or Min ± 2.5 µm. Applies within the tolerance band of ± 100 µm around the typical measuring range if a two-point calibration was also performed within this tolerance band		
Off-Set Accur	1 % of the measured value or min. 1.0 µm Applies within ± 50 µm around the *off-set Accur* point		
PC connection	RS-232 interface		
Power supply	4x1.5 AAA batteries (UM-4)		
Ambient temperature	0°C to 50°C		
Humidity	≤ 80%		
Dimension	126 x 65 x 27mm		
Weight	Approx 81g (without batteries)		
Scope of delivery	- Carry Case - Operating instructions (in DE and GB) other languages via our website - F- measuring probe (for TE 1250-0.1F and TE 1250-0.1FN) - N- measuring probe (for TE 1250-0.1N and TE 1250-0.1FN) - both measuring probes F and N at TE 1250-0.1FN - 1 set of adjustment foils, available with each model - Zero plate (aluminium) for TE 1250-0.1N and TE 1250-0.1FN - Zero plate (iron) TE 1250-0.1F and TE 1250-0.1FN - Optional accessories: Software and cable RS-232C: ATC-01		

<u>Attention:</u> All accuracy specifications apply after adjustment!

4. Description of the control panel

here: Model TE-1250-0.1FN

4-1 Measuring probe
4-2 Display
4-3 Zero button
4-4 Plus button
4-5 Minus button
4-6 On and off button (multifunctional)
4-7 µm/ mil changeover button (shortcut button)
4-8 Battery compartment/cover back
4-9 Connector for RS-232C connection
4-10 S/C measuring mode button (single/continuous)

5. Measuring process

1. Connect F or N measuring probe - depending on measuring object
2. Switch on by pressing the on/off button 4-6. `0` appears on the display 4-2.
   The meter can recognise the measuring probe itself by the symbol of the probe "Fe" (= F) for ferrous metals or "NFe" (= N) for non-ferrous metals shown in the display.
3. Place the measuring probe 4-1 on the layer to be measured. The thickness of the layer can now be read off in the display. The reading can be corrected by pressing the plus key 4-4 or the minus key 4-5. For this purpose, the measuring probe should not be in the immediate vicinity of the layer to be measured or the zero plate.
4. To take the next measurement, simply raise the measuring probe 4-1 by more than 1cm, "0" appears again in the display and step 3 is repeated.
5. In case of possible inaccuracies in the measurement result, it is recommended to adjust the meter before measuring, as described in chapter 6.

6. On the one hand, the unit can be switched off with the on/off button. On the other hand, it switches itself off 50 seconds after the last key operation.
7. The measuring unit can be displayed in µm or mil:
   - By pressing the changeover key 4-7 **or**
   - By pressing and holding the on/off button 4-6 until "UNIT" appears in the display and then pressing the zero button 4-3.
   This process takes a total of 7 seconds (from pressing down the on/off button).
8. To change to the measuring mode from "simple" to "continuous" or vice versa, either

- the SC button 4-10 is pressed **or**
- the on/off key 4-6 is pressed and held until SC appears in the display. Then the zero key 4-3 is pressed. The symbol **((-))** stands for continuous and `S` for simple measuring mode.
  This process takes 9 seconds (from pressing down the on/off button).

6. Adjustment

1. Zero adjustment: The zero adjustment for "F" and "N" should be carried out separately.
   Use the iron zero plate when the display reads "F" and the aluminium zero plate when the display reads "N".
   The measuring probe 4-1 is now carefully placed on the zero plate. The zero button 4-3 is pressed and the display shows "0" without lifting the measuring probe.
   Caution: The zero adjustment is unusable if the measuring probe is not directly on the zero plate or another uncoated standard material.
2. A suitable adjustment foil must be selected, according to the typical measuring range.
3. The selected alignment foil is placed on the zero plate or the uncoated standard material.
4. The measuring probe is carefully pressed onto the distance foil and lifted off again. The reading result appears in the display. This can be corrected by pressing the plus key 4-4 or the minus key 4-5. To do this, however, the measuring probe must be removed from the zero plate or the measuring body.
5. Step 4 is repeated until the desired measurement accuracy is achieved.

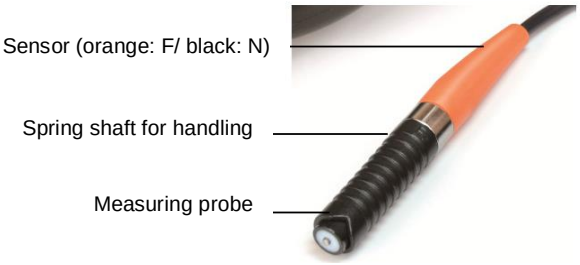
7. Battery change

1. When the battery sign appears on the display, the batteries should be changed.
2. The battery cover 4-8 is slipped off the meter and the batteries are removed.
3. The batteries (4x1.5V AAA/UM-4) are inserted by paying attention to the polarity when inserting them.
4. If the unit is not used for a longer period of time, the batteries should be removed.

8. Adjustment foils

This instrument comes with an adjustment foil set with different foils and measuring ranges, but always covering the measuring range from 20 to 2000µm. These are also available as optional accessories, article ATB-US07.

9. Correct handling of coating thickness measurement with external sensors



The sensor is to be touched at the lower shaft segment and is only lightly pressed onto the test object.
The black, ribbed shaft segment is movably mounted on a spring. Due to the spring, the sensor head presses with a defined force on the test object and thus avoids measuring errors.
Furthermore, measurement errors can be avoided if several measurements are taken for practice when using the device for the first time.

10. General notes

1. The meter should always be adjusted on the base material used for the actual measurement instead of on the zero plate supplied. This way, the measurement accuracy is more precise from the start.
2. The measuring probe will eventually wear out. The lifetime of the measuring probe usually depends on the number of measurements and the roughness of the layer to be measured. The replacement of such a probe should only be carried out by qualified personnel.

11. Restore factory settings

It is recommended to perform the factory settings in the following cases:
- Measurements can no longer be taken
- the measuring accuracy is impaired due to drastic changes in the environment in which the measuring device is used
- After replacing the measuring probe

The factory settings include both, the settings for "Fe" (F) and for "NFe" (N). One or both of these can be set separately.

The procedure is described below:
A distinction is made between the symbols "Fe" type and "NFe" type. If "Fe" appears on the display, the factory setting is made for "Fe", if "NFe" appears, the factory setting is made for the "NFe" type.

- The on/off button 4-6 is pressed and not released until "CAL" appears on the display. This takes about 5 seconds from the beginning of pressing the on/off button.
- If F:H (or NF:H) now appears in the display, the measuring probe is raised by more than 5 cm. Then press the zero key and the unit returns to the measuring mode. This restores the factory setting.

Note: This process should always be completed within the following 6 seconds. Otherwise it will be automatically interrupted by the unit and the resetting will be invalid.

12. Notes

The LN function can be used to change the linearisation of the meter given by the calibration (this is controlled by the on/off button and it takes about 11 seconds from the start of pressing this button down).
However, it is strongly recommended not to make any changes to the **LN value,** as these changes will lead to deviating measurement results.
Any change in the LN value can significantly affect the measurement accuracy. This value should only be set by qualified personnel.

In general, the larger the LN value, the smaller the reading result for the same layer thickness. A small change in the LN value causes a large change in the reading result in the upper measuring range (at 500µm/ 20mil).

This is how the LN value is to be corrected:

Pressing the on/off button: It takes approx.11 seconds from the beginning of pressing this button.
Its value can be changed by pressing the plus or minus key after 'LN' appears in the display and the on/off key is released. The value is stored and then the zero key is pressed.

A: The reading result in the lower range is corrected by pressing the plus or minus key.
B: The LN value is increased if the reading result is correct in the lower range (e.g. 51µm) but too large in the upper range (e.g. 432µm).
In contrast, the LN value is reduced if the reading result is correct in the lower range (e.g. 51µm) but too small in the upper range (e.g. 432µm).
C: This process of A. and B. is repeated until the reading result is satisfactory in its accuracy for each distance foil.

Remark:
To view the CE Declaration, please click on the following link:
https://www.kern-sohn.com/shop/de/DOWNLOADS/