Sauter GmbH

Instruction Manual Digital Coating Thickness Gauge

SAUTER TE

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PROFESSIONAL MEASURING

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Thank you for purchasing a digital coating thickness gauge from SAUTER. We hope you will be very satisfied with the high quality of this measuring device and its extensive functionality. For any questions, wishes and suggestions please do not hesitate to contact us.

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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 it to be used for many years, provided that all instructions in this manual are carefully followed.
Therefore please keep them always within reach!
Note: It is strongly recommended to adjust the new meter before first use, as described in chapter 6. This will result in a higher measurement accuracy from the beginning.

2. Functions

"This device complies with ISO 2178 and ISO 2361, as well as DIN, ASTM and BS standards. This means that it can be used both under laboratory conditions and under rough environmental conditions "in the field".
"The F probe is used to determine the thickness of non-magnetic layers, e.g. paint, plastic, enamelled porcelain, copper, zinc, aluminium, chrome, lacquer layers, 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 anodizations, lacquer layers, glazes, colours, enamel, plastic layers, powder coating 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/imperia
"Wide measuring range and high resolution
"The backlit display allows accurate reading
" Can be connected to a PC for data transfer 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 backlight		
Measuring range	0 to 1250 µm / 0 to 50 mil (standard)		
Resolution	0,1 µm (0 to 99,9 µm), 1 µm (over 100)		

Measurement uncertainty	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 accuracy	1 % of the measured value or min. 1,0 µm Applies within ± 50 µm around the *offset Accur* Point
PC connection	RS-232 interface
Power supply	4x1.5 AAA batteries (UM-4)
Ambient temperature	0°C to 50°C
Air humidity	≤ 80%
Dimensions	126 x 65 x 27mm
Weight	Ca 81g (without batteries)
Scope of delivery	- Carrying case - Operating instructions (in DE and GB) other languages via our homepage - 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 with TE 1250-0.1FN - 1 set of adjustment foils, available for each model - Zero plate (aluminium) for TE 1250-0.1N and TE 1250-0.1FN - Zero plate (iron) TE 1250-0.1F and for TE 1250-0.1FN - Optional accessories: Software and cable RS-232C: ATC-01, AFH 12 (RS 232 to USB converter)

<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 key
4- 4 Plus button
4- 5 Minus key
4- 6 On/off button (multifunctional)
4- 7 µm/ mil Changeover key (shortcut key)
4- 8 Battery compartment / rear cover
4- 9 Connector for RS-232C connection
4-10 S/C measuring mode button (single/continuous)

5. Measuring procedure

5.1 Connect F or N measuring probe - depending on the measured object

5.2 Switching on with the on/off button 4-6. '0' appears on the display 4-2.
The meter can recognize the probe itself by the symbol of the probe "Fe" (= F) for ferrous metals or "NFe" (= N) for non-ferrous metals shown on the display.

5.3 Placing the measuring probe 4-1 on the layer to be measured. The layer thickness can now be read on the display. The reading result can be corrected by pushing the plus key 4-4 or the minus key 4-5. For this purpose the probe should not be placed in close proximity to the layer to be measured or the zero plate.

5.4 To take the next measurement, simply add more
is raised by 1cm, the display shows "0" again and step 5.3 is repeated.

5.5 In case of possible inaccuracies in the measurement result, it is recommended to adjust the measuring instrument before the measurement as described in chapter 6.

5.6 The device can be switched off with the on/off button.
On the other hand, it switches itself off 50 seconds after the last keystroke.

5.7 The measuring unit can be displayed in µm or mil:
- By pressing the changeover key 4-7 **or**
- By pressing and holding down 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 the on/off button).

5.8 To switch to the measuring mode from "simple" to "continuous" or vice versa, either
- press the SC- button 4-10 **or**
- the on/off button 4-6 is pressed and held until SC appears on the display. Then the zero key 4-3 is pressed. The symbol **((-))** stands for the continuous measuring mode and 'S' for the simple measuring mode.
This process takes 9 seconds (from the time the on/off button is pressed).

6. Adjustment

6.1 Zero adjustment: The zero adjustment for "F" and "N" should be carried out separately.
The iron zero plate should be used when the display shows "F" and the aluminium zero plate when "N" appears in the display.
The measuring probe 4-1 is now carefully placed on the zero plate. The zero key 4-3 is pressed and "0" is shown in the display without lifting the probe.
Attention: The zero adjustment is useless if the measuring probe is not directly on the zero plate or another uncoated standard material.

6.2 A suitable adjustment foil must be selected according to the typical measuring range.

6.3 The selected adjustment foil is placed on the zero plate or the uncoated standard material.

6.4 Carefully press the measuring probe onto the spacer foil and lift it off again. The reading result appears on 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.

6.5 Step 6.4 is repeated until the desired measuring accuracy is achieved.

7. Battery replacement

7.1 When the battery symbol appears on the display, the batteries should be replaced.

7.2 The battery cover 4-8 is removed from the meter and the batteries are removed.

7.3 The batteries (4x1.5V AAA/UM-4) are inserted by observing the polarity when inserting them.

7.4 If the device is not used for a longer period of time, the batteries should be removed.

8. Adjusting foils

This instrument includes an adjustment foil set with different foils and measuring ranges, but always covers 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 grasped at the lower shaft segment and is only lightly pressed onto the test object.
The black, grooved shaft segment is mounted on a spring for movement. Through 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

10.1 The measuring instrument should always be adjusted on the base material used for the actual measurement, instead of on the supplied zero plate. This ensures that the measuring accuracy is more accurate from the outset.

10.2 The measuring probe may wear out. The service life of the measuring probe usually depends on the number of measurements and the roughness of the layer to be measured. Replacing such a probe should only be carried out by qualified personnel.

11. Restore factory settings

It is recommended that the factory settings be performed in the following cases:
- no more measurements can be made at all
- the measuring accuracy is impaired due to drastic changes in the environment in which the measuring instrument is used
- After replacing the measuring probe

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

<u>The procedure is described below:</u>
A distinction is made between the symbols "Fe" type and "NFe" type. If "Fe" appears on the display, the factory setting for "Fe" is made, if "NFe" appears, the factory setting for the "NFe" type is made.
- Press the on/off button 4-6 and do not release until "CAL" appears on the display. This takes about 5 seconds from the start of pressing the on/off button.
- If F:H (or NF:H) now appears on the display, the measuring probe is raised by more than 5 cm. Then the zero key is pressed and the instrument returns to the measuring mode. This restores the factory setting.

<u>Note:</u> This process should always be completed within the following 6 seconds. Otherwise, it will be automatically interrupted by the unit and the reset will be invalid.

12. Notes

With the **LN function it is** possible to change the linearization of the meter, which is given by the calibration (this is controlled by the on/off button and it takes about 11 seconds from the beginning of pressing this button).
However, it is expressly recommended not to make any changes to the **LN value**, as this change will lead to deviating measurement results.
Any change in the LN value can significantly affect the measuring 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).

The LN value must be corrected in this way:

Pressing the on/off button: It takes about 11 seconds from the start of pressing this button.
Its value can be changed by pressing the Plus or Minus key after 'LN' appears in the display and releasing the On/Off key. The value is stored and then the zero key is pressed.
A. The reading result in the lower area is corrected by pressing the Plus or Minus key.

E.g. 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 procedure of A. and B. is repeated until the reading result is satisfactory in its accuracy for each distance foil.

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