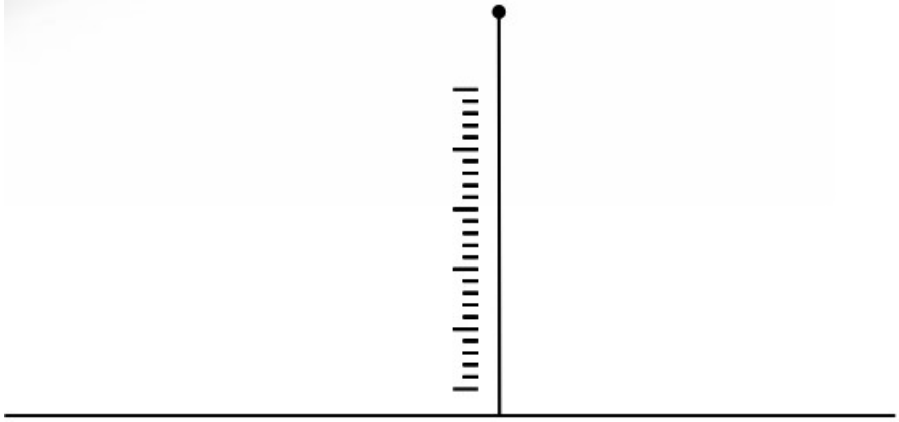
SAUTER TC 1250 Layer Measurement Device Instruction Manual

Instruction Manual Digital Coating Thickness Gauge
SAUTER TC
Version 2.0 04/2020 GB



PROFESSIONAL MEASURING
TC-BA-e-2020

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.

Contents

Introduction

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.

Functions

“This device complies with the ISO- Norm 2360 as well as the DIN-Norm, ASTM, and BS. This means that it can be used both under laboratory conditions and under rough environmental conditions “in the field”.
“The F” probe measures the thickness of non-magnetic layers, e.g. paint, plastic, enameled porcelain, copper, zinc, aluminum, chrome, lacquer layers, etc.
These layers should be on magnetic materials such as steel, iron, nickel, etc. This probe is often used to measure the thickness of galvanized layers, lacquer layers, enamelled porcelain layers, phosphorescent layers, copper plates, aluminum plates, alloys, paper, etc.
“The N- probe measures the thickness of non-magnetic 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.
“The FN measuring probe is a combination of both probes and is therefore defined for both areas of application
“Automatic recognition of the carrier material
“Manual or automatic switch-off to conserve battery power.
“Metric/ imperic conversion of the measured values of µm/mil
“Two measuring modes: – single and continuous (S= single/ C= continuous)
“Wide measuring range and high resolution
” Can be connected to a PC for data transfer via RS 232 interface Cable and software are available as optional accessories (ATC-01).

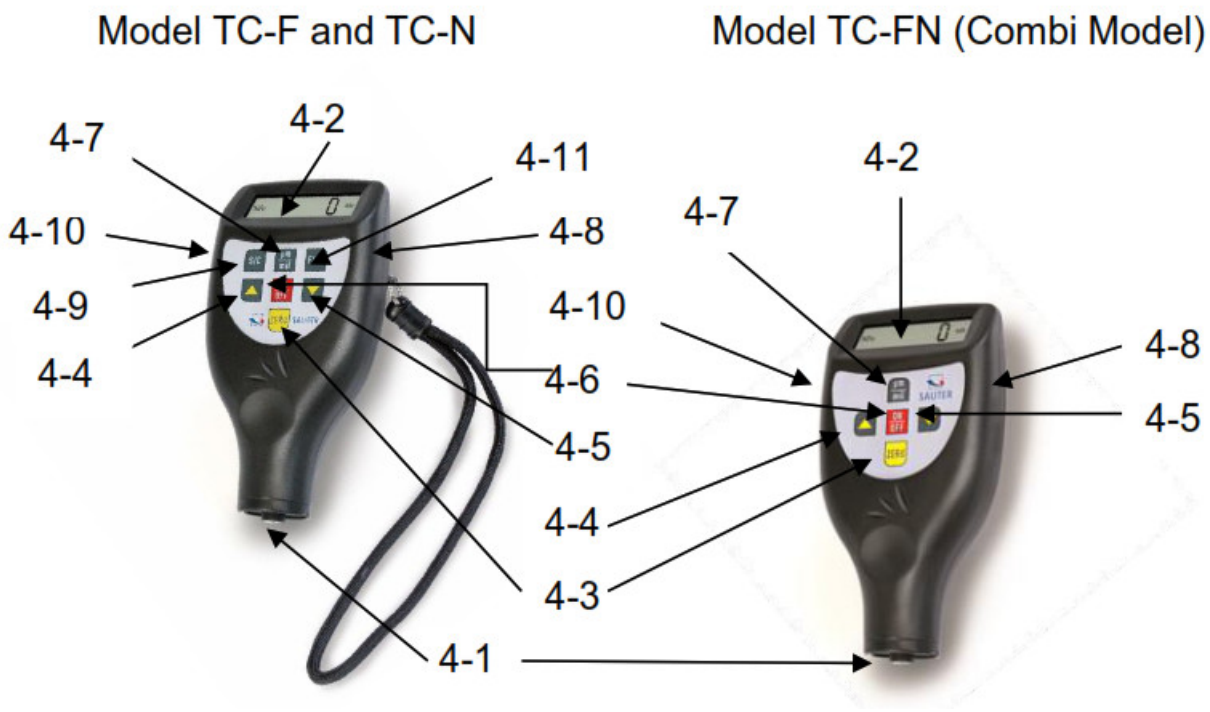
Technical data

	TC 1250-0.1F	TC 1250-0.1FN	TC 1250-0.1N
Display	4 digits, 10mm LCD display with backlight 0 to 1250 µm / 0 to 50 mil (standard)		
Measuring range			

Resolution	0,1 µm (0 to 99,9 µm), 1 µm (over 100)
Measurement uncertainty	3 % of the measured value or Min t 2,5 pm. Applies within the tolerance band of t 100 pm around the typical measuring range if a two-point calibration was also perform ed within this tolerance band
off-set accuracy	1 % of the measured value or min. 1,0 pm Applies within t 50 pm around the offset Accur Point
PC connection	RS-232 interface
Power supply	4×1.5 AAA batteries (UM-4)
Ambient temperature	0°C °C to 50°C
Air humidity	580%
Dimensions	126 x 65 x 27mm
Weight	Ca 81g (without batteries)
Scope of delivery	Carrying case, operating instructions Depending on the type:
	1.built-in measuring probe F: TC 1250-0.1 F, with F/N key 2.built-in measuring probe N: TC 1250-0.1 N, with F/N key 3.built-in measuring probe FN: TC 1250-0.1 FN, without F/N u.S/C key – Spacer foils, for each model – Zero plate (aluminium) for model N – Zero plate (iron) for model F – 2 zero plates (aluminium and iron) for model FN (combination unit) Optional accessories: Software and cable RS232C: ATC-01

Attention: All accuracy specifications apply after adjustment!

Description of the control panel



4-1 Measuring probe: F, N, or FN
4-2 Display
4-3 Zero key
4-4 Plus button
4-5 Minus key
4-6 On and Off button (multifunctional)
4-7 µm/ mil Changeover key (shortcut key)
4-8 Battery compartment/cover
4-9 S/C measuring mode button (single/continuous)
4-10 Connector for RS-232C connection
4-11 F/ NF- key

Measuring procedure

a) Switch on by pressing the on/off button 4-6. ‘0’ appears on the display 4-2. The TC 1250-0.1FN meter recognizes the setting of the last easurement itself by the symbol ‘Fe’ (= F) for ferrous metals or ‘NFe’ (= N) for non-ferrous metals shown on the display. It switches to the automatic measuring mode, which also correctly recognizes and assigns the zero plate or any other substrate itself.
b) Place 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 pressing the plus key 4-4 or the minus key 4-5. For this purpose, the measuring probe should not be in close proximity to the layer to be measured or the zero plate.
c) To take the next measurement, simply raise the measuring probe 4-1 by more than 1cm, the display will show “0” again and step b) will be repeated.
d) In case of possible inaccuracies in the measurement result, it is recommended to adjust the measuring instrument before measurement, as described in chapter 6.
e) On the one hand, the device can be switched off with the on/off button 4-6. Otherwise, it switches itself off 80 seconds after the last key is pressed.
f) The measuring unit can be displayed in µm or mil. The changeover is made as follows: – By pressing the changeover key 4-7 or – the on/off key 4-6 is pressed and held until ‘UNIT’ is shown on the display and then the zero key 4-3 is pressed. The measuring unit changes over to the other one when
the on/off key is released again. This process takes a total of 7 seconds (from pressing the zero or on/off button).
g) To change to the measuring mode from ‘simple’ to ‘continuous’ or vice versa, the zero or on/off key 4-6 must be pressed and held down until ‘SC’ appears in 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 pressing the on/off button).

e) On the one hand, the device can be switched off with the on/off button 4-6. Otherwise, it switches itself off 80 seconds after the last key is pressed.

f) The measuring unit can be displayed in µm or mil. The changeover is made as follows: – By pressing the changeover key 4-7 or – the on/off key 4-6 is pressed and held until 'UNIT' is shown on the display and then the zero key 4-3 is pressed. The measuring unit changes over to the other one when the on/off key is released again. This process takes a total of 7 seconds (from pressing the zero or on/off button).

g) To change to the measuring mode from 'simple' to 'continuous' or vice versa, the zero or on/off key 4-6 must be pressed and held down until 'SC' appears in 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 pressing the on/off button).
6. Zero adjustment
a) The zero adjustment for 'Fe' (=F) and 'NFe' (=N) should be done separately. The iron zero plate is taken when 'Fe' is read on the display, while the aluminium zero plate is taken when 'NFe' is read. The measuring probe 4-1 is now carefully placed on the zero plate. The zero/on/off key 4-6 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 carrier material. b) A suitable adjustment foil, which corresponds approximately to the measuring range, must be selected. (c) This standard alignment foil is positioned on the supplied zero plate or on the appropriate uncoated substrate for the forthcoming tests. d) Carefully press the measuring probe 4-1 in the middle of the standard foil and then lift it off again. The reading on the display corresponds to the measured value of the layer thickness. This reading can be corrected by pressing the plus key 4-4 or the minus key 4-5. This should be done if the probe is not in the nearer vicinity of the zero plate or the corresponding carrier material. e) The procedure described in d) should be repeated until the result is correct.

Zero adjustment

a) The zero adjustment for 'Fe' (=F) and 'NFe' (=N) should be done separately. The iron zero plate is taken when 'Fe' is read on the display, while the aluminium zero plate is taken when 'NFe' is read. The measuring probe 4-1 is now carefully placed on the zero plate. The zero/on/off key 4-6 is ressed 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 carrier material.**
b) A suitable adjustment foil, which corresponds approximately to the measuring range, must be selected.
(c) This standard alignment foil is positioned on the supplied zero plate or on the appropriate uncoated substrate for the forthcoming tests.
d) Carefully press the measuring probe 4-1 in the middle of the standard foil and then lift it off again. The reading on the display corresponds to the measured value of the layer thickness. This reading can be corrected by pressing the plus key 4-4 or the minus key 4-5. This should be done if the probe is not in the nearer vicinity of the zero plate or the corresponding carrier material.
e) The procedure described in d) should be repeated until the result is correct.

Battery replacement

a) When the battery symbol "+/-" appears on the display, the batteries should be replaced.
b) The battery cover 4-8 is removed from the meter and the batteries are removed. c) The batteries (4×1.5 V AAA/UM-4) are inserted by observing the polarity when inserting them. d) If the device is not used for a longer period of time, the batteries should be removed.

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

General notes

a) The measuring instrument should always be adjusted on the base material used for the actual measurement, if possible, instead of on the supplied zero plate F made of steel or N made of aluminium. This makes the measuring accuracy more accurate from the outset.
b) The measuring probe may wear out. The lifetime of it usually depends on the number of measurements and the roughness of the layer to be measured. The replacement of a measuring probe should only be carried out by qualified personnel can be carried out.

Restore factory settings

a) 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
b) Procedure:
The factory settings include both the settings for “Fe” (F) and for “NFe” (N). Please note which symbol is shown on the display. Only one setting at a time can be made, as follows:
• Press the on/off button 4-6 and do not release it until the display shows “CAL”. It takes about 5 seconds from the start of this button operation until CAL is displayed.
The measuring probe 4-1 is carefully pressed onto the corresponding carrier material.
Then the zero key is pressed, which is accompanied by a beep. When NF:H appears on the display, the measuring probe 4-1 is raised by more than 5 cm.
Then the zero button is pressed again and the meter returns to the measuring mode. The factory settings are now complete.
Note: 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.

Notes

With the LN function, the linearization of the measuring instrument specified by the calibration can be changed. However, it is strongly 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 of the Ln- value causes a large change in the reading result in the upper measuring range (at 500µm/ 20mil).
Thus the Ln value is to be corrected:
Pressing the on/off button: It takes about 11 seconds from the beginning of pressing the on/off 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.
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 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/**

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Documents / Resources

	SAUTER TC 1250 Layer Measurement Device [pdf] Instruction Manual TC 1250 Layer Measurement Device, TC 1250, Layer Measurement Device