

Instruction Manual

Coating thickness gauge

SaluTron® ComBi D3

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Instruction Manual

Coating Thickness gauge **SaluTron® ComBi D3**

Congratulations on the purchase of our coating thickness gauge **SaluTron® ComBi D3**!

The gauge belongs to a range of non-destructive coating thickness gauges. It is easy and handy to use and allows the user to make all the necessary adjustment with the aid of a menu – this allows for change to be implemented quickly and simply. The gauge can be used for a wide variety of applications and has to offer a large measuring range of 0 to 3.5 mm.

Modern electronics and the robust casing guarantee an extended lifetime for the high precision instruments.

Attention!

Automatic selection of the measurement method – magnetic or eddy current.

1. Place the device on Fe-ground material, left on top the display shows "Fe".
2. Place the device on NFe-ground material, left on top the display shows "NFe". To work with the device without automatic (switch over manual from Fe or NFe) press the MODE-Key 2 times. It shows "GAG" on the display.
3. Press "ENTER", it shows "AUT Auto".
4. Press "MODE" it shows "Fe Auto".
5. Once more press "ENTER", it shows "Fe" and a measuring value. The device is now in the normal manual measuring method.

To get into the manual measuring ("Fe or NFe") method proceed as follow:

1. Press the "MODE"-Key 2 times, the display shows "GAG".
2. Press "ENTER", it shows "AUT AUTO" on the display.
3. Press "MODE", it shows "Fe AUTO".
4. Press "MODE", it shows "nFE AUTO".

5. Press the "MODE"-key 2 times, it shows "AUT" and then "Fe".
6. Press "ENTER", it shows a measuring value. The device is in measuring mode and ready for measuring applications.

To go back again into the automatic measuring method ("Fe or nFE") proceed as follow:

1. Press "MODE"-key 2 times, it shows "GAG" on the display.
2. Press "ENTER", it shows "Fe" or "nFE".
3. Press "MODE"-key 2 times it shows "AUT".
4. Press "ENTER" once more, it shows "Fe AUTO" or "nFE AUTO". The device is now in the automatic application.

Switch the device on

Automatic display average value "Ave" and number of measurements "n".

1. Switch the device on, the display shows "Cd3" or the last measuring value.
2. Press "ON/OFF" shortly, the display shows "Ave" and measuring results (measurements before).
3. Press again "ON/OFF", it shows "n". "n" means the number of measurements.

If the store should become deleted proceed as follow:

Important! In the normal measuring application manual or automatic go on like follow:

1. Press "MODE", it shows „rS²“.
2. Press "ENTER", it shows "no".
3. Press "MODE" again, it shows "YES".
4. Press "ENTER", it shows the last measuring value in the normal measurement mode.
5. Now check if the store is empty.
6. Press "ON/OFF", it shows "Ave---".
7. Once more press "ON/OFF", it shows "n" "0".
8. The store is empty. Once more press "ON/OFF".
9. The store is empty and the device is in the normal measuring mode back again.

Automatic or manual: The store becomes deleted if the device is in the normal measuring mode. The device is easy to operate. Also the menu on the display makes all adjustments quick, easy and simple.

System overview SaluTron® ComBi D3

The coating thickness gauges D3 are simple, cost effective handheld devices (Type ComBi D3 plus: RS 232 interface and memory for data logging purposes).

The **SaluTron® ComBi D3** is built for two applications.

The gauge **SaluTron® ComBi D3** - measures all non-magnetic coatings such as synthetics, lacquers, enamels, copper, chromium, zinc, etc. on steel or iron.

Also the gauge **SaluTron® ComBi D3** measures all isolating coatings such as lacquers, synthetics, enamels, paper, glass, rubber, etc. on copper, aluminium or brass. This includes eloxal coatings on aluminium as well.

The **SaluTron® ComBi D3** gauge poses a CE sign and conform to the following specifications:

- ◆ DIN 50981, 50984
- ◆ ISO 2178, 2360, 2808
- ◆ BS 5411 (3, 11) 3900 (c, 5)
- ◆ ASTM B499, D1400

Handling and storage

The **SaluTron® ComBi D3** gauge is a high-tech precision instruments with a wide scope of applications. It is therefore of great importance that the unit is handled with care to ensure an extended life and as a pre-requisite for precise and accurate measurement results. The following guidelines are to be followed to achieve the above:

- ◆ Protect the gauge against dirt and dust, and do not let the gauge drop!
- ◆ Protect the gauge from dirt, dust, humidity, chemicals and aggressive vapours.
- ◆ After use please store the gauge in the protective case.
- ◆ Avoid direct, strong sunlight and temperature-shocks as these can have a negative influence on the measurement result.
- ◆ The instrument housing is resistant to most chemical cleaners; use a soft, moist cloth for cleaning.
- ◆ Exact measurements can only be taken with a clean probe. The probe therefore has to be checked and cleaned regularly so that any paint residue and iron fragments can be removed from the probe and the ruby tip.
- ◆ If the gauge is not to be used for an extended period of time, the battery should be removed to avoid battery acid spoilage and the resultant destruction of the electronics. If the gauge has a fault condition, please return it to the agent who will assist you if possible or return the gauge to the factory for repair. No other repairs should be attempted under any circumstances.

Battery exchange

The **SaluTron® ComBi D3** gauge is powered by a 9 V alkaline battery. The battery compartment can be found in the top back portion of the instrument. If a "B" appears in the display, the battery has to be exchanged.

If a replacement battery is not available immediately, several measurements can still be taken until the gauge shuts down (the display shows "BAT") completely.

Zero calibration

The gauge has to be zeroed anew when

- ◆ different measurement jobs are called for,
- ◆ when the gauge is used for the first time,
- ◆ after a new battery has been inserted or periodically.

Place the gauge on the iron plate or the Al-plate in the instrument casa. You can also use a piece of uncoated Fe- or NFe-metal (substrate) as used in your process.

Take care to place the probe evenly onto the substrate. If the displayed value is out of the basic tolerance range, the instrument has to be zeroed. The following steps are to be taken to zero the gauge

1. Remove the gauge from the zero plate or the substrate.
2. Press the top left button "ZERO". The display shows "P-O.O."
3. Place the gauge onto the zero plate or the substrate again. The display shows "PinF" and automatic the last indication.
4. Place on zero plate again. The display shows "0". The unit is now ready for accurate measurements.

Note: If the measurement is repeated on the same spot on the zero plate, the gauge will not necessarily show 0.0 µm/mils as surface roughness and dirt, etc. can cause differences.

Operation

Switching the gauge ON:

There are two methods to switch the gauge on:

- ◆ The gauge can be switched on manually with the "ON/OFF" button. The display will show "Cd3".
- ◆ The gauge can also be placed on a test piece. It switches on automatically and display also Cd3. It switches automatically off after 40 sec. if no measurement is taken. The gauge is now ready for use.

Choose the function:

to measure on steel or iron or on non ferrum.

1. Press button "Mode". Stop with pressing when shown on the display "GAGU".
2. Press "Enter". The display shows "nFe" or "Fe".
3. If you like the function "Fe" press "Mode" button. The small "n" for "nFe" is off.
4. Press "Enter" button. The display shows ----- and the last result is shown on the display.
5. Press "Zero" button and start measuring.

Taking measurements

1. Place the gauge perpendicular onto the surface of the test piece.
2. Place the probe evenly and ensure that it does not sway.
3. To get the best results, place the thumb on the position indicated with the other fingers behind the gauge for balance.
4. A tone is emitted and the result of the measurement is indicated on the display.
5. If the gauge is removed from the test piece prematurely, or placed incorrectly, or the zero calibration is attempted on the incorrect substrate, then the display will show "ErrO" (error).
6. If the coating thickness exceeds the maximum range (3500 µm) or if the gauge is placed on the incorrect substrate (eg. wood, paper, cardboard, etc), then the display will show "InFi" (infinite).
7. For measurements on spinerical surfaces (eg. rods, pipes, corrugated surfaces, etc.) the V-groove will assist in the placement of the probe.

Do not take measurements on magnets or in magnetic fields!

Switching the gauge ON/OFF

- ◆ The gauge switches on automatically when being placed on the surface and turns off automatically after about 40 sec. when no other measurement is taken.
- ◆ To switch the gauge manual by hand, press the "ON/OFF"-key. It shows automatically the last measuring value. The device is ready for new measurement. To switch off the gauge press "ON/OFF"-key approximately 5 sec.

Using the menu

The menu can be used to configure / view the following features:

1. The measurement method – single point measurements or continuous measurements to find the coating thickness average.
2. The unit for the digital read-out – The result can be displayed in µm or in mils. (This is indicated by a line next to the respective unit).
3. The audible tone can be switched on/off.
4. The serial number of the particular gauge can be viewed.
5. The menu is accessed by pressing the mode button.
6. Consecutive pressing of the mode button will cause the program to cycle through all the available parameters as mentioned above.
7. If the parameter is to be changed, the "Enter" button is pressed.
8. Once the desired set-up has been found, the mode button is pressed once again to activate the desired mode.
9. For example, to change the measurement method, the mode button is pressed until the display shows "ConT".
10. The "Enter" button is then pressed to toggle the display between "OFF" and "ON" (OFF = single point measurement, ON = continuous measurement). Once the desired mode of operation has been chosen, the mode button is pressed again to activate the measuring-type.

Display messages

ErO	Incorrect usage
InF	Incorrect substrate, coating thickness out of range
B	Battery should be replaced soon
BAT	Battery needs to be replaced now

Cd3	Instrument identifié: SaluTron® ComBi D3
CnT	Continuously measuring- mode to be used when the average coating thickness is to be found by moving the gauge around on the substrate
OFF/ ON	By pressing the „ENTER“-key the user can toggle between the point measuring and the continuous measuring modes once the „MODE“-key has been pressed
UnT	By pressing the „ENTER“-key the user can toggle between µm and mils-mode once the "MODE"-key has been pressed
bEP	Switch the tone „ON/OFF“ for "ZERRO", "Mode", "ENTER", "ON/OFF"
Sn	Press „ENTER“-key. The serial-number is blinking.
GAG	Switch over from "Fe" or "NFe". Press "ENTER"-key. Select "Fe" or "NFe" with "MODE" and "ENTER"-key.
AUT	Automatic identification of the substrate (iron, steel or non ferrous material)
n	Number of measurement
Ave---	Store is empty
AUTO	The device switches always automatically to "Fe" or "NFe" depending of the ground material "Fe" or "NFe"
rS	Delete store
YES	Yes!
no	No!

Measuring: Press the „MODE“-key after every result configuration change with the „MODE" and „ENTER“-key to ensure that the gauge is in the standard measuring mode again.

Delivery

The electronic coating thickness gauge **SaluTron® ComBi D3** can be used immediately upon delivery. It is delivered with a carrying case, which includes an enclosed zero plates, a 9-volt battery (alkaline) and the instruction manual.

Option: Gauge D3 plus with USB connection, memory, transfer cable to a PC, statistics-function, Infrared-Mini-Thermo printer SP 100.

Technical Specifications

Fe	Substrate: Steel or Iron Coatings: All non-magnetic coatings as lacquer, plastics, chromium, copper, zinc, enamel, etc.
NFe	Substrate: Non-magnetic metals such as zinc, copper, brass, aluminium, stainless steel <i>and anodized aluminum</i> Coatings: insulating coatings such as lacquer, enamel, plastics, paper, glass, rubber, etc.
Continuous measuring range:	0 - 3500 µm or 0 - 140 mils
Display of measured values	0 - 999 in µm, 1.00 - 3.50 in mm or 0 - 140 in mils
Digital display resolution:	
0.1 µm	in the range of 0.0 - 99.9 µm
1 µm	in the range of 100 - 999 µm
0.01 mm	in the range of 1.00 - 3.50 mm or
0.01 mils	in the range of 0.00 - 9.99 mils
0.1 mils	in the range of 10.0 - 99.9 mils
1 mils	in the range of 100 - 140 mils
Repeatability:	± (1 µm + 2%) from 0 - 999 µm ± 3.5% from 1000 - 3500 µm
Tolerance:	+/- 1.0 µm or +/- 0.06 mils
Minimum object size:	10 x 10 mm or 0.4" x 0.4"
Minimum curvature:	
convex:	5 mm or 0.02"
concave:	30 mm or 1"
Minimum substrate thickness:	
Fe:	0.20 mm or 8 mils
NFe:	0.05 mm or 2 mils
Temperature range:	
Storing:	-10°C to 60°C or 14°F to 140°F
Operating	0°C to 60°C or 32°F to 140 °F
Display:	4-digit liquid crystal display (LCD)
Probes:	Single point
Power supply:	9V E Block Alkali
Dimension (L x W x H):	118 x 58 x 38 mm or 4.6" x 2.3" x 1.5"
Weight:	approx. 150 g or 5.3 oz incl. battery

Technical data subject to change without notification.