UNI-T

UT343A
Coating Thickness Gauge
User Manual

P/N:110401110306X

PREFACE

Thank you for purchasing the new UT343A coating thickness gauge. In order to use this product safely and correctly, please read this manual thoroughly, especially the Safety Instructions part.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

LIMITED WARRANTY AND LIABILITY

Uni-Trend guarantees that the product is free from any defect in material and workmanship within one year from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination and improper handling. The dealer shall not be entitled to give any other warranty on behalf of Uni-Trend. If you need warranty service within the warranty period, please contact your seller directly.

This warranty is the only compensation you can obtain. Uni-Trend will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by any reason or speculation.As some areas or countries do not allow limitations on implied warranties and incidental or subsequent damage, the above limitation of liability and stipulation may not apply to you.

Table of Contents

I. Overview ---------- 4
II. Accessories ---------- 5
III. Safety Instructions ---------- 5
IV. Function Description ---------- 6
V. Operating Instructions ---------- 9
VI. Performance Indexes ---------- 17

I. Overview

UT343A is a high-performance coating thickness gauge that can measure coating thickness on both ferrous and non-ferrous metals. This device has features of high precision, conductive coating measurement, stable and reliable performance and non-destructive measurement, etc. It is a necessary device for automobile manufacturing, sales, evaluation, metal processing, painting, inspection and other industries. It is widely used in manufacturing, metal processing, marine mechanics, bullet trains, quality supervision, and other fields.
The product is based on the principles of electromagnetic induction and eddy current measurement.
The principle of electromagnetic induction measurement is to measure the coating thickness according to the size of the magnetic flux flowing from the sensor through the non-ferrous magnetic coating into the ferromagnetic substrate. The symbol is Fe. It can measure non-conductive or conductive coatings on magnetically permeable metals such as iron and steel (for example: galvanized steel sheet).
The principle of eddy current measurement is to measure the coating thickness according to the difference in the eddy current formed by an AC magnetic field on a non-magnetic metal substrate (such as aluminum). The symbol is NFe. It can measure non-conductive coatings on non-magnetic metal materials such as aluminum and copper. The substrate must be metal, and the coating cannot conduct electricity.

Features:
1. The measurement method conforms to GB/T 4956 non-magnetic coatings on magnetic substrates-measurement of coating thickness -magnetic method.
2. The measurement method conforms to GB/T 4957 non-conductive coatings on non-magnetic basis metals-measurement of coating thickness-eddy current.
3. Two thickness measurement methods: magnetic and eddy current
4. Automatic identification of the ferrous or non-ferrous substrates.
5. With a high-precision, hard-wearing and stable sensor.

6. Single and multi-point calibration methods are adopted to correct the sensor systematic error and ensure the measurement accuracy.
7. 3-color warning light indicates the current value attribute (green: qualified; red: below the limit; yellow: above the limit).
8. Power on/off and measurement are accompanied by audio indication.
9. The content displayed on the screen can be rotated up and down, which is convenient for users to read the measured values from different angles.
10. The high-capacity memory chip can store 199 groups of data.

II. Accessories

Open the packing box and take out the gauge. Please double check whether the following items are missing or damaged.

1. Coating thickness gauge----------1 pcs
2. User manual----------1 pcs
3. Standard coating thickness sheets----------1 set (5 pcs)
4. Ferrous substrate ---------- 1 pcs
5. Non-ferrous substrate----------1 pcs
6. Sensor protective cover---------- 1 pcs
7. AAA alkaline batteries----------2 pcs

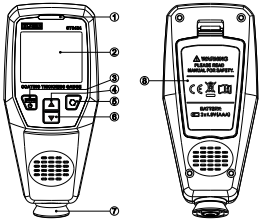
III. Safety Instructions

1. Initialization self-test is needed for the gauge when it is powered on. When turning on the gauge, please do not put the sensor close to any metal objects (at least 5 cm away from them) and stay away from strong electromagnetic fields, otherwise the meter will be unusable and need to be restarted under the above-mentioned environment.
2. Please keep the sensor clean and in good condition to avoid dust, oil and other factors affecting the measurement accuracy.
3. Do not use or store the gauge in high temperature, high humidity, flammable, explosive and strong magnetic field environments.

4. Clean the gauge casing with a soft cloth and mild detergent. Do not use abrasives or solvents to avoid damage to the gauge.
5. Do not disassemble or modify the gauge.
6. When the LCD displays the low battery symbol " ", replace the battery in time. Remove the battery if the gauge is not used for a long time.
7. The batteries are normal "AAA" alkaline batteries that cannot be charged.
8. The standard coating thickness sheets are high-precision accessories that are related to the accuracy of the gauge and need to be preserved properly to prevent scratches, corrosion, bending and deformation of the surface.
9. The metal substrates also need to be preserved properly to prevent scratches, rust, oxidation and deformation of the surface.

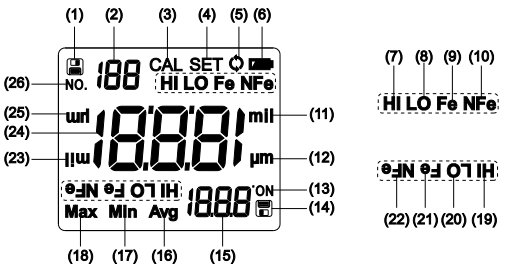
IV. Function Description

A. Product Structure



1	LED warning light	5	Rotate/cancel/delete
2	LCD screen	6	Down/value-
3	Power button	7	Sensor module
4	Up/value+	8	Battery door

B. Display Interface



1	View stored data	2	Stored data number
3	Calibration mode	4	Setting mode
5	Continuous measurement	6	Battery status
7	Higher limit	8	Lower limit
9	Ferrous substrate	10	Non-ferrous substrate
11	mil	12	µm
13	Stored data number symbol (rotated)	14	View stored data (rotated)
15	Stored data number (rotated) /MAX/MIN/AVG value	16	Average
17	Minimum	18	Maximum
19	Higher limit (rotated)	20	Lower limit (rotated)

21	Ferrous substrate (rotated)	22	Non-ferrous substrate (rotated)
23	mil (rotated)	24	Measured value
25	µm (rotated)	26	Stored data number symbol

C. Buttons

Interface	Normal measurement		Stat/set/view data/calibration	
Operation	Short press	Long press	Short press	Long press
MODE	Enter/exit stat modes (MAX/MIN /AVG)	Power on/off	Confirm and enter the next page	/
▲	View stored data	Enter setting interface	Adjust the value up/ view the last data	Constantly adjust the data number forward
▼	View stored data	Enter calibration mode	Adjust the value down /view the next data	Constantly adjust the data number backward
	Rotate screen	Clear all stored data	Cancel and return to the measurement interface	Clear this data

V. Operating Instructions

A. Power on/off

Power on: long press the button until the screen is on.
Power off: long press the button until the screen displays "OFF" and then release it.

B. Normal Measurement

1. Long press the button to turn on the gauge. The gauge displays the initialization process, and enters the normal measurement mode after the initialization is completed.
2. Estimate the coating thickness of the measured object, and select the corresponding or close standard coating thickness sheet to calibrate on the measurement substrate.
3. A substrate with thickness or material close to the measured object and without coating should be selected as the measurement substrate as far as possible.
4. Please refer to the calibration chapter for the calibration method.
5. When measuring, select 3 to 5 measuring points on the surface of the measured object evenly, measure 5 times for each point, and take the average value of the 5 times as the indicating value of the point.
6. After the indicating values of the 3 to 5 measuring points are measured, the average of the values should be taken as the reference value of the object coating thickness.

Note:

1. Hold the gauge perpendicular to the substrate to be measured, and lightly press the gauge sensor against the substrate for measurement. It is necessary to keep the sensor in close contact with the substrate surface and avoid the measurement error caused by excessive force.
2. When the measured indicating value is greater than 1750um and less than 2000um, the screen displays OL to indicate over range.
3. When the measured indicating value is greater than 2000um, the gauge will not respond.

C. Menu Settings

Long press the button in the normal measurement mode to enter the menu settings mode. "SET" will show on the LCD, as shown in the figure:

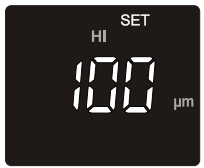
At this time, it is in the interface of setting the measurement unit. Short press the or button to adjust the unit (um or mil). Short press the button to confirm the setting and enter the next setting item. Short press the button to exit the setting interface and enter the normal measurement interface.

Note: The arrangement order of the setting items is: unit, higher limit, lower limit, probe mode, measurement mode, sound, and factory reset.

Operation of other setting items:

1. Higher Limit

As shown in the figure below, when the LCD displays "SET" and "HI" symbols, it is in the higher limit setting state.



Short press the button to adjust the setting value upward, and short press the button to adjust the setting value downward. Short press the button to confirm and enter the next setting item. Short press the button to exit.

When the LCD displays "SET" and "LO" symbols, it is in the lower limit setting state. And its operation is the same as the higher limit setting.

Note: If an error occurs when setting the lower limit value (for example, the lower limit value is greater than the higher limit value), after short pressing the button, the LCD will display "Err" and return to the higher limit setting interface.

2. Probe Mode

As shown in the figure below, it is in the probe mode setting state.

Short press the or button to adjust the probe mode. Short press the button to confirm and enter the next setting item. Short press the button to exit.

The gauge has 3 probe modes:

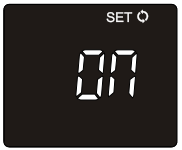
a. Auto mode (LCD displays “Aut”): In this mode, the type of substrate (ferromagnetic substrate or non-ferromagnetic substrate) of the measured object can be automatically identified. The probe will enter the corresponding operating mode according to the type of substrate. If the substrate of the measured object is a ferromagnetic material substrate, it will automatically enter the magnetic induction operating mode. If the substrate of the measured object is a non-ferromagnetic substrate, it will automatically enter the eddy current operating mode.

b. NFe mode (LCD displays “NFE”): The probe will enter the eddy current operating mode.

c. Fe mode (LCD displays “FE”): The probe will enter the magnetic induction operating mode.

3. Measurement Mode (Turn on/off Continuous Measurement)

As shown in the figure below, it is in the measurement mode setting state.



Short press the or button to turn on/off the continuous measurement mode. Short press the button to confirm and enter the next setting item. Short press the button to exit.

4. Sound

When the LCD displays "SET" and "SOU" symbols, it is in the sound setting state. Short press the or button to turn on/off the sound. Short press the button to confirm and enter the next setting item. Short press the button to exit.

5. Factory Reset

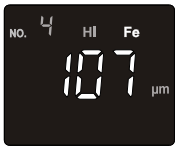
When the LCD displays "SET" and "rSt" symbols, it is in the factory reset setting state. Short press the ▲ or ▼ button to select perform factory reset or not. Short press the button to confirm and enter the next setting item. Short press the button to exit. After selecting "YES" and pressing the button, the gauge will restore the factory settings. After completion, the LCD will display "dON", and then automatically return to the normal measurement interface.

Note:

After restoring the factory settings, all setting items will be restored to the factory settings (including calibration data), and all the saved test data will be deleted.

D. View Saved Data

In the normal measurement mode, short press the ▲ or ▼ button to enter the mode of viewing test data, as shown below:



At this time, the LCD displays the last data of the last measurement: the number is 4, the test value is 107um, ferrous substrate, and the value exceeds the set higher limit. Short press the ▲ or ▼ button to switch the number of stored data. Long press the button to delete the current data. Short press the button to exit the viewing data mode and return to the normal measurement mode.

E. Calibration

In the normal measurement mode, long press the ▼ button to enter the calibration mode, as shown in the figure below:

At this time, the "CAL" symbol flashes. "LFt Up" means that the probe needs to be lifted (away from metal objects and strong electromagnetic fields), and press the button to perform probe compensation. After the compensation is completed, it enters the zero calibration point, and the LCD displays as follows:

The LCD displays 0.0um, and the calibration number "1" is displayed in the lower right corner. Press the gauge probe on the attached uncoated substrate to perform zero point calibration. The gauge will automatically identify whether it is a ferrous substrate or a non-ferrous substrate.

After completing the zero point calibration, it will automatically enter the calibration point 2 (ie the calibration point of 50.0um). Place the 50.0um coating thickness sheet flat on the substrate, press down the gauge probe and keep it stable to perform the calibration of this calibration point. After completion, it will automatically enter the calibration of the next calibration point. In addition to the zero point, the gauge can also perform calibrations of 50.0um, 100um, 500um, 1000um and 1500um. Short press the button to switch the calibration point.

When there is a deviation between the coating thickness sheet and the calibration point (for example, when the calibration point of 50.0um is to be calibrated, there is only a coating thickness sheet of 49.8um), the calibration point can be adjusted by short pressing the ▲ or ▼ button.

Note:

A. If only the zero point calibration is performed, after completing the zero point calibration, short press the button to exit.

B. After completing the calibration, please measure the standard coating thickness sheets according to the normal measurement mode. At this time, the indicating value of the gauge should be within the indicating error range of the nominal value of the standard coating thickness sheet. For example: the nominal value of the standard coating thickness sheet is 50.0um. After calibration, the indicating value of the gauge should be within the range of ± (1+3%H) um. If the indicating value of is out of tolerance, or the users think it is not satisfactory, please recalibrate.

C. There is no need to calibrate all calibration points except for the zero point. For example, if the thickness of the coating to be tested is

estimated to be in the range of 0.0um to 50.0um, only the calibration of 0.0um and 50.0um is required. After completing the calibration, short press the button to exit.

D. When the zero point calibration is completed and the gauge has identified the substrate, the substrate of the next calibration point will be fixed. For example, when the zero point calibration is completed, the gauge identifies ferrous substrate, and then the next calibration points (such as 50.0um, 100um, 500um, 1000um, and 1500um calibration points) will automatically exclude non-ferrous substrates and only identify ferrous substrates until the calibration is completed or exited.

E. If the calibration operation is incorrect and the calibration result is inaccurate, please restore the factory settings and recalibrate.

VI. Performance Indexes

A. Technical Indexes

Function	Range	Thickness	Resolution	Accuracy	Description
Ferrous and non-ferrous substrates measurement (FE and NFE)	0 1750μm	0 99.9μm	0.1μm	±(3%+ 1μm)	1. Each point needs to be measured 5 times, and the average value of 5 times is taken as the indication value of the point. 2. 1mil=25.4um.
		100 1750μm	1μm		
	0 68.9mil	0 4.99mil	0.01mil	±(3%+ 0.04mil)	
		5.0 68.9mil	0.1mil		
Probe measuring force	0.3 1.5 N				Probe measuring force range
Minimum convex radius of curvature	5mm				
Minimum concave radius of curvature	50mm				
Minimum measured area diameter	20mm				
Minimum substrate thickness	0.5mm				
Display	EBTN color screen				
Rotatable screen	√				Switch by pressing the button

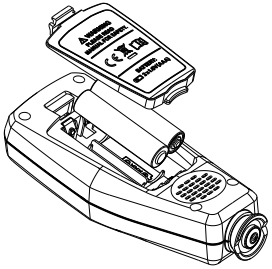
Unit conversion	μm/mil	Metric/imperial unit conversion
LED alarm	√	The LED lights up in the corresponding color when the value exceeds the set range for alarm.
Audio alarm	√	When measuring and alarming, there will be corresponding prompt sounds (the buzzer must be turned on).
Limit setting	√	Any limit value can be set between 0~1750um.
Measurement method	Single/continuous	
Statistical measurement	√	MAX/MIN/AVG
Probe mode	Optional	AUTO/FE/NFE
Data storage	199 groups	
Auto power off	5 minutes	
Low battery indication	Low battery indication at 2.3V±0.2V	Low battery symbol " ▭ "flashes.
Power	1.5V AAA*2=3V alkaline batteries	
Current consumption	Power off: ≤5μA Operate: ≤80mA	LED alarm+ audio alarm (measure current consumption based on 3.0V power supply)
Operating environment	0℃ 40℃≤80%RH	
Storage environment	- 20℃ 60℃ ≤75%RH	

B. General Specifications

1. Refresh rate: 0.5s
2. Sensor type: magnetic induction and eddy current composite sensor
3. Impact resistance: can withstand 1 meter drop
4. Power: 1.5V (AAA) alkaline batteries (2 pcs)
5. Product size: 117×53×37mm
6. Weight: about 111g (including batteries)

C. Battery Installation and Replacement

Please replace the battery as follows:



UNI-T®
UNI-TREND TECHNOLOGY（CHINA）CO., LTD.
No.6, Gong Ye Bei 1st Road,
Songshan Lake National High-Tech Industrial
Development Zone, Dongguan City,
Guangdong Province, China