

# ED300 Coating Thickness Gauge



Dear customers,

Thank you for purchasing our products. Please read this instruction carefully before using the instrument. If you have any question, please contact our after-sales service department. We will provide necessary help and services.

We remind you that please pay attention to protect the probe of the instrument, the probe may be permanently damaged by any strong impact and contamination with Oxidation liquid.

## 1. OVERVIEWS

ED300 is a small and portable instrument with the characteristics of fast, convenient and nondestructive testing. It is suitable for measuring the thickness of insulating coating on various non-ferrous metal substrates. ED300 is the improved version of ED200. It has been reduced in size, light in weight, beautiful in appearance, improved in circuit board and probe, and improved in performance and service life.

ED300 is mainly used to measure the thickness of anodic oxide film and coating on the surface of aluminum profile, and also can be used to measure the surface coating of aluminum plastic composite plate for building, and to measure the thickness of anodic oxide film on the surface of various aluminum alloy parts as well as plastics and paper. The instrument can be used in the production site, sales site or construction site for rapid and non-destructive coating thickness inspection, can be used for production inspection, acceptance inspection, quality supervision and inspection. This instrument complies with ISO 2160 standard.

This instrument has the following important functions:

**Automatic Calibration.** Simply press the button to automatically calibrate the instrument, calibration data automatically stored, the next use can be directly measured.

**Data Statistics.** The measurement value can be automatically counted, and 5 statistical parameters can be output.

**The Beeping Prompt.** Beeping reports effective measurement, malfunction, or misoperation

**Power Control.** Battery under voltage prompt, stop 2 minutes and the battery voltage is too low will automatically shut down.

This instrument adopts eddy current principle to measure. When the probe is in contact with the sample, the high-frequency electromagnetic field generated by the probe will induce eddy current in the matrix metal. The additional electromagnetic field generated by the eddy current will change the probe parameters, and the change of the probe parameters depends on the distance between the probe and the substrate related to the coating thickness. The thickness of the coating can be obtained by measuring the change of the probe parameters and computer analysis.

The application of wear-resisting contact of super hard alloy material solves the problem that ruby contact is easy to be knocked off. The adoption of imported advanced probe wire solves the problem that the probe wire is broken due to the high frequency of instruments used in aluminum profile factory. The above two improvements greatly improved the service life of the probe and significantly reduced the repair rate of the instrument.

## 2. TECHNICAL PARAMETERS

Measuring Range: 0~50 $\mu$ m, 0~150 $\mu$ m

Accuracy:  $\pm 3\% \pm 0.5\mu$ m

Resolution: 0.1 $\mu$ m, 1 $\mu$ m

Operating Temperature: 0~40 $^{\circ}$ C

Power Supply: 9V battery

Power Consumption: 60mV

Dimension: 150mm $\times$ 80mm $\times$ 30mm

Weight: 280g

## 3. STANDARD PACKAGE

Gauge

Probe

Standard Substrate (6063 Aluminum Alloy) 1 pc

Calibration Foil 3 pcs

User's Manual

Certificate of Approval

Packing List

Carrying Case

## 4. BUTTON DESCRIPTION

**4.1** Power supply (ON/OFF)

**4.2** Statistics (RES) - statistics output key. The average value, maximum value, minimum value, standard deviation and measurement times of a group of measurement sequences can be output successively. After each measurement press the statistical key to make the display resolution high

to 0.1 $\mu$ m

**4.3** Delete (DEL) - delete key. You can delete the last measurement. Press twice to remove a calibration step.

**4.4** Calibration (ENTER/CAL) – calibration key. It is used to calibrate instruments.

**4.5** ▼- Down Button. It is used to lower the display value when calibration status. The buzzer can be withdrawn by cooperating with the switch button.

**4.6** ▲- Up button. It is used to raise the display value when calibration status. Cooperate with the switch button to activate the buzzer sounds.

## 5. OPERATION

Press “ON/OFF” button and wait until “0” is shown on display. It shows the thickness gauge works well and enter into measuring status, it needs to calibrate if the thickness gauge long time no used.

On “OFF” status, press the “ON/OFF” and “▲ ” button at the same time, activate the beeping function; press the “ON/OFF” and “▼” button at the same time, cancel the beeping function.

Operation procedures are as below:

### 5.1 Measurement

Hold the plastic part of the probe and place it vertically onto the clean and dry workpiece

surface. Hold it steadily and wait for the measurement to appear in LCD and a beep is heard (Do not exert too much force during measurement to avoid damaging the probe). Lift the probe for at least 10mm from the workpiece and maintain for at least two seconds onto the workpiece, can proceed next measurement. Repeat 5~10 times, can finish one set measurement.

## **5.2 Statistics**

Press the “STAT” button for 5 times, and the following data will show in turn:

MEAN --- average value

MAX --- maximum value

MIN --- minimum value

S --- Standard deviation

N --- Number of measurements

When measuring again, will start next set measurement. If press “▲”button for two times, no matter how many times you press the “STAT” button, the number of measurements will be continuously accumulated, and the data before you press the “STAT” button will be a continuous set of numbers.

## **5.3 Delete**

During measurement, if the probe placed unsteadily and lead to an obvious error value appears, it can be deleted by pressing “DEL” button.

#### **5.4 Turn off the power**

After the measurement, press “ON/OFF” button to turn off the power. The thickness gauge will turn off automatically if stop to use exceed to 2 minutes.

#### **5.5 Battery**

The thickness gauge has the function of battery under-voltage indication, “LOBAT” occurs when the battery is undercharged; at this point, the measurement should be completed within 10 minutes and the battery should be replaced. When the battery voltage is too low, the thickness gauge will automatically shut down.

### **6. CALIBRATION**

It is no need to calibrate the thickness gauge each time before using. But we suggest that you should make calibration when the alloy composition of substrate is changed, when the shape of the work piece is changed, or when the thickness gauge is used for a long time. After turning on for 1 minute, and then you can make calibration.

You should use the standard substrate without any coating and the calibrated plastic cover with accurate thickness value. The substrate and plastic cover should be clean carefully.

There are dual point calibration and single point calibration as follows:



## **6.1 Dual points calibration**

Please use standard substrate and selected three calibrated plastic covers to make calibration.

**6.1.1** Press “CALIBRATION” button to begin. The screen will show: ZERO, and “0.0”.

**6.1.2** Testing in standard substrate 5-10 times and then screen will show a value and show “MEAN”, which is the current, zero average value.

**6.1.3** Press “CALIBRATION” button, the thickness gauge will accept a new ZERO, and show “STDI”, show “0.0”.

**6.1.4** Put the thinnest plastic cover on the substrate, and testing within the circle 5-10 times, and the value is the average value.

**6.1.5** Please use “▲” or “▼” to adjust the value to the thickness value of this plastic cover.

**6.1.6** Press “CALIBRATION” button, after storing this calibrated value, it will show STD2, and show “0.0”.

**6.1.7** Repeat the operation steps of (6.1.4-6.1.6) to calibrate the other two plastic covers.

**6.1.8** After finishing the above steps, the thickness gauge retreat from the calibrated status and after showing “---”, it show “0” begin to working status.

## **6.2 Single Point Calibration**

Single point calibration means only use

standard substrate to make zero calibration.

**6.2.1** Press “CALIBRATION” button, the thickness gauge begin to calibrating status, and the screen will show “ZERO”, and show “0.0”.

6.2.2 Testing in standard substrate 5-10 times, and then screen will show a value and show “MEAN”, which is the current zero average value.

**6.2.3** Press “CALIBRATION” button twice constantly, the thickness gauge will store a new zero value, and retreat from calibration status, after showing “---”, it show “0”, and then begin to measuring status.

### **Notice:**

1. Turn on the thickness gauge to measurement; it is no need to calibrate the gauge for each measurement. When the erroneous measurement result appears, it can be used after calibrating the standard substrate. Dual point calibrate is necessary to make for a certain time.

2. The thickness of calibration plastic cover should exceed to the thickness range of work piece, and the calibration plastic cover should be choosing from low value to high value one step by one step.

3. In calibration mode, if an erroneous measurement result appears, it can be deleted by pressing the “DEL” button. Press once to delete the last result, press twice to delete all

measuring results in the current calibration sequence, and press the third time to quit calibration status and then back to original status.

4. In dual calibration mode, press “calibration” button for two times can quit the calibration status in advance and then to be on measuring status.

5. In order to increase the testing accuracy, under this circumstance as follows: you shall make calibration again using the substrate like the workpiece in its material and its shape.

(1). The surface of the workpiece is rough

(2). The radius of curvature of the workpiece  $< 20\text{mm}$

(3). Testing area of the workpiece  $< 200\text{mm}^2$

(4). The thickness of substrate  $< 0.5\text{mm}$

(5). The alloy composition of substrate is changed.

## 7. TROUBLE REMOVAL

### 7.1 Failures and solutions

Failures	Reasons	Solutions
No display or immediate shutdown	Power saving	Press ON/OFF button
	Empty battery	Change new battery
	No battery or incorrect battery installation	Reinstall the battery
	Broken battery connector	Contact manufacturer
No measurement from probe	Thickness over range	Check workpiece
	Instrument in free state	Press ▼ button
	Probe failure	Contact manufacturer
All characters displayed	Probe disconnection	Contact manufacturer
Obviously wrong measuring result	Change of the substrate materials	Calibrate instrument again on the new substrate material
	Curving surface or small measuring area	Calibrate on uncoated same workpiece
	Wrong calibration	Calibrate again
	Incorrect probe handling	Press DEL button
	Calibration data disorder	Reset
	Probe broken	Contact manufacturer
Display disappears after probe put down	Data disorder due to wrong operation	Reset
Unable to turn off	Circuit problem	Contact manufacturer

## 7.2 Error Information

Display information	Meaning	Solutions
E1	Input error of calibration data, unable to continue calibrating	Input data again, or repeat measurement sequence
E4	Over test range or probe broken	Check specimen or contact manufacturer
E5	Calibration data lost or probe broken	Reset or contact manufacturer

## 7.3 Reset Operation

Press DEL and CAL at the same time after instrument starts up, then the instrument will display “0”. Then press DEL and CAL again, after instrument displays “--”, it shows “0”. Then the reset operation finished. Reset operation can exclude the data disorder due to wrong calibration.

## 7.4 “Free State”

If there is strong current equipment such as rectifier, transformer, or electric welding machine etc near to the probe, the test result may be effected. If users have doubts about that, he can check according to the following methods”

Press ▼ button to make monitor shows “F”, then shows blank or numbers, now the instrument is in “Free state” to check magnetic field. Showing

blank means there is no strong magnetic field around, while showing numbers means there is strong magnetic field around. The closer the numbers is to 0, the stronger the magnetic field is. Press ▼ button again, and the instrument will be to measurement condition.

## **8. DAILY MAINTENANCE**

**8.1** After using instrument, users should put it in its carrying case to avoid shake or fouling.

**8.2** If instrument will not be used for long time, the battery should be taken out to avoid battery leakage and fouling instrument.

**8.3** The probe should be kept clean. The filth and dust on specimen should be cleaned well before test. When using in production line, the specimen should be wiped and dried before test. No electrolyte or water is allowed to flow into probe, and our company will not repair for free if probe rust or damage is caused by this reason.

**8.4** If there is any problem appears, please contact with us immediately, and we will solve for you in time.



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