



Model: GM200A

Mini Coating Thickness Gauge Instruction Manual



Version:GM200A-EN-00

A、 Introduction

This product is a portable coating thickness gauge, which can quickly, nondestructively, and accurately measure non-metallic coating thickness (such as paint, film, etc.) of metal substrate. It is widely used in detection areas like manufacturing industry, Car washing industry, metal processing industry, chemical industry, and commodity inspection.

B、 Functions

1. Measure coating thickness of metal substrate surface
2. Two modes: Car/User
3. Three measurement ways: single measurement, continuous measurement, difference value measurement
4. Three calibration functions: zero calibration, two-point calibration, and basic calibration
5. Metric unit and imperial unit
6. Auto power off

C、 Technological Parameters

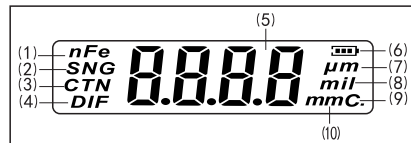
Measurement range	0~1.80mm/0~71.0mil
Car mode resolution	0.05mm/2mil
User mode resolution	0.01mm/1mil
Measurement error	±0.1mm
Minimum diameter of substrate	50mm
Minimum thickness of substrate	0.5mm
Temperature range	18~30°C
Work humidity range	10~80%RH
Power	2*1.5V AAA batteries

D、 LCD Display and Button Functions

1. LCD full-screen display (Figure 1)

- (1) **nFe** : Not in use
- (2) **SNG** : Single measurement
- (3) **CTN** : Continuous measurement
- (4) **DIF** : Difference value measurement
- (5) Display area of measured value
- (6) **▢** : Power indicator
- (7) **μm** : Not in use
- (8) **mil** : Imperial unit (1mil= 0.0254mm).

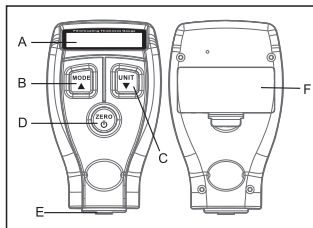
- (9). **C.** : Enter into calibration state
- (10). **mm** : Metric unit(1mm=39.4mil).



(Figure 1)

2. Part Names (Figure 2)

- A. LCD display
- B. : Switch button of measurement mode/increase button of calibration mode
- C. : Switch button of measurement unit/decrease button of calibration mode
- D. : Power button/zero calibration button
- E. Measuring probe
- F. Battery door



(Figure 2)

E、 Operation Instruction

1. Turn on: Short press power button to turn on the instrument. After LCD full-screen display, mode information will show on the screen (indicator Car appears under Car mode, no indicator appears under User mode), then follows measurement interface.

2. Select mode: Long press MODE button under measurement interface to switch Car/User mode

3. Car mode: Car mode can be used without calibration, which can measure coating thickness of three substrate materials-iron, aluminum and zinc, suitable for measuring the coating thickness of cars.

4. User mode: User mode requires calibration before use, which can measure coating thickness of substrate material for calibration.

5. Auto power off: The instrument will power off automatically in two mins of no measurement, or in five mins after measurement.

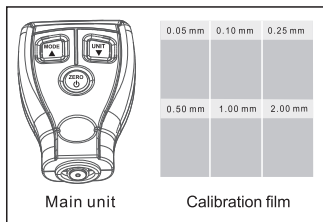
F、 Measurement of coating thickness

1. Press power button in the air to turn on the instrument, after LCD full-screen display follows a BI sound, which means that measurement state begins. Every time of power on is regarded as single measurement.
2. Press the probe lightly on the coated metal substrate, the instrument will let out two sounds of BI-BI, with LCD showing the measured value of coating thickness.
3. Press MODE button to select measurement way. There are three measurement ways to choose from: single measurement, continuous measurement, difference value measurement.
4. Single measurement means one data each time. Continuous measurement means as long as probe does not leave surface of substrate, the instrument will keep measuring. Difference value measurement means the difference value between this time and last time of measurement.
5. Press UNIT button to choose unit. There are metric unit (mm) and imperial unit (mil) to choose from.
6. If you turn on the instrument on metal substrate, ERR (error) will show after LCD full-screen display, then the instrument will power off because of wrong start-up way.

G、 Three calibration ways under User mode

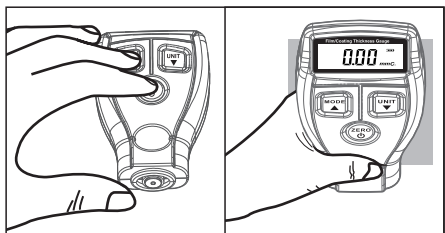
1. Basic calibration: if the instrument is in the first use or not in use for a long time, or substrate material to be measured is changed, substrate calibration should be taken. There are seven calibration points for basic calibration, the unit during calibration is mm.
 - a. Prepare 6 standard calibration films, the thickness of which is 0.04 ~ 0.06, 0.09 ~ 0.11, 0.22 ~ 0.28, 0.45 ~ 0.55, 0.90 ~ 1.05, 1.90 ~ 2.00, and the unit is mm. At the same time, prepare the corresponding metal substrate. If you need to measure the coating or film thickness on surface of zinc, use zinc block as substrate. The same to iron and aluminum.

Attention: the diameter of substrate should be longer than 50mm. iron substrate will be taken as an example to illustrate the basic calibration process in the following part (Figure 3)



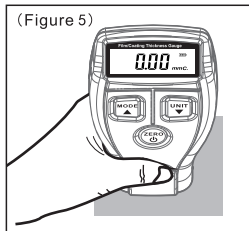
(Figure 3)

- b: Press MODE button to maintain, then press power button, after LCD full-screen display follows a BI sound. LCD screen shows 0.00, and the lower right part of LCD shows indicator C. which means entering into calibration interface.(Figure 4)



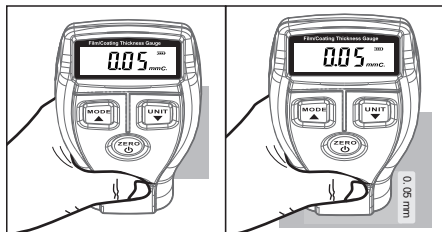
(Figure 4)

- c: The probe is lightly pressed on iron substrate without coating on the surface, then LCD shows 0.00, followed by two sounds of BI-BI, which is 0.00 calibration (Figure 5)



(Figure 5)

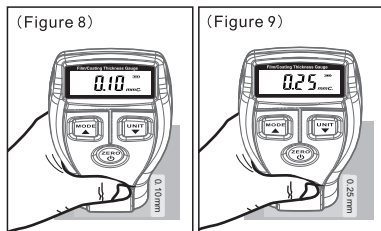
- d: Remove the probe, and LCD shows 0.05mm. Now start the second calibration by putting the 0.05mm calibration film on the iron substrate and pressing the probe lightly on the iron substrate. After two sounds of BI-BI, the second Calibration point is finished. (Figure 6, Figure 7)



(Figure 6)

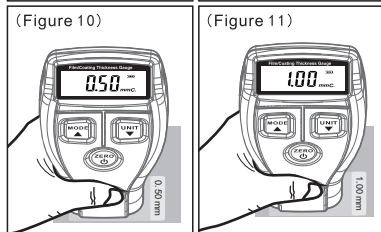
(Figure 7)

- e: Remove the probe, the LCD shows the third data, do calibration in turn according to the previous method. Until the last calibration film is calibrated, LCD displays OVER, the instrument turns off after two sounds of BI-BI, and the basic calibration is complete. (Figure 8, Figure 9, Figure 10, Figure 11, Figure 12)



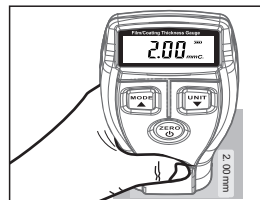
(Figure 8)

(Figure 9)



(Figure 10)

(Figure 11)



(Figure 12)

- f: After basic calibration is completed, the coating thickness of the same material as the calibrated substrate can be measured.
2. Zero calibration: after turning on the instrument in the air, choose User mode and then gently press the probe on the surface of substrate. Short press ZERO button, LCD displays 0.00, and zero calibration is completed.
 3. Two-point calibration
 - a. First carry out zero calibration
 - b. Take a calibration film (such as 1.00mm), measured value of which is 1.05mm. Do not remove the probe, pressing increase or decrease button of calibration data, until LCD displays 1.00mm. Remove the probe and two-point calibration is completed.

H. Other Items

Attention:

1. Factors influence accuracy of measurement and related instruction:
 - a. Metal thickness of substrate: Each instrument has a critical thickness for a substrate metal. If the thickness is greater than this value, the measurement will not be affected by thickness of substrate metal. Refer to requirements on product specifications for critical thickness of the instrument ($\geq 0.5\text{mm}$).
 - b. Edge effect: The instrument is sensitive to the steep change of the specimen's surface shape. So it is unreliable to make measurement near the edge or inner corner of the object under measurement.
 - c. Curvature: The curvature of object under measurement has influence on the measurement. This influence always increases significantly as the curvature radius decreases.
 - d. Surface roughness: Surface roughness of substrate metal and coating has influence on measurement.

As the degree of roughness increases, the influence increases. Rough surfaces can cause system errors and accidental errors. In each measurement, users should conduct more times of measurement at different places to overcome this kind of accidental error. If substrate metal is rough, users must take a few spots on uncoated substrate metal with similar surface roughness to calibrate zero point of the instrument; or dissolve and remove coating with a solvent that does not corrode substrate metal, then calibrate zero point.

- e. Surface cleanliness: Before measurement, any attached substances such as dust, grease and corrosive substances on the surface should be removed, but do not remove any coating material.
- f. The instrument cannot distinguish iron substrate from nonferrous substrate.
- g. The instrument can only measure non-metallic coating.

I. Notice for users

1. Since Car mode has built-in data, the user can no longer conduct calibration. Car mode can directly measure coating thickness of iron, aluminum, zinc substrate, suitable for measuring the coating thickness of cars.
2. Under User mode, after calibrating metal substrate, user can only measure coating thickness of this metal's surface, not other metals. For example, if you calibrate an iron substrate, you cannot measure coating thickness of aluminum substrate.
3. User mode calibration will not influence Car mode.
4. Car mode is default factory setting.
5. Default factory setting uses iron substrate to calibrate User model.
6. Calibrating under User model, diameter of substrate should be $\geq 50\text{mm}$, substrate thickness should be $\geq 0.5\text{mm}$.

Specific Declarations:

Our company shall hold no any responsibility resulting from our output from this product as an direct or indirect evidence. We reserves the right to modify product design and specification without notice.

