

UT341/UT342 Operating Manual



Coating Thickness Gauge

I. Introduction

Model UT341/342 are superminiature gauges, which can be quick and accurate to measure coating thickness on ferrous metal substrate (Magnetic) (UT341) or non-ferrous metal substrate (non-magnetic) (UT342) without causing any damage. They are widely used in manufacturing, metal processing, chemical industry, commercial inspection, etc.

II. Unpacking Inspection

- ★ The Gauge ----- 1pc;
- ★ Reference Film ----- 1pc;
- ★ 9V Battery ----- 1pc;
- ★ English Manual ----- 1pc;
- ★ Reference Substrate ----- 1pc; (UT342 one aluminum, one iron)

III. Product Features

- ★ LCD visual display for measuring values and status;
- ★ Capable of zero and two-point calibrations, and probe systematic error correction by using basic calibration methods;
- ★ Two measuring modes: continuous and single;
- ★ Low Battery Indication;
- ★ Auto Power Off;
- ★ LCD Backlight;
- ★ MAX/MIN Display
- ★ Data Hold
- ★ Data Save

IV. Description on Main Parts



Power On: Press and hold the trigger to power on

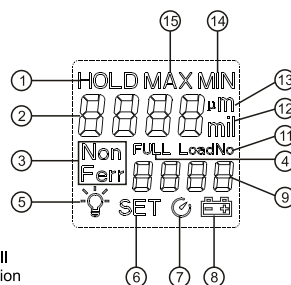
Unit selectable between μm and mil, and long press for around 2 seconds to turn on/off the backlight.

Maximum and minimum value switchover and calibration.

To read out data and function setting.

V. LCD Display

1. HOLD: data hold icon
2. Data display area
3. Non Ferr: non-ferrous metal icon
4. Ferr: ferrous metal icon
5. : backlight icon
6. SET: Setting icon
7. : Auto power off icon
8. : Low battery indication
9. Data recording number display zone
10. Full: to indicate memory is full
11. Loadno: data number indication
12. μm : unit icon
13. mil: unit icon
14. MIN: minimum reading
15. MAX: maximum reading

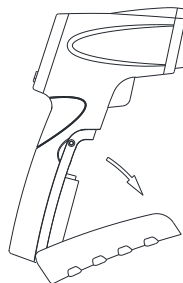


VI. Basic Operation

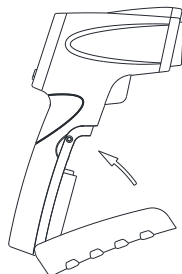
1. Prepared objects to be measured;
2. Press and hold trigger button to power on;
3. Touch the probe vertically toward measured surface, press the trigger one time and LCD display values just for this time;
4. If difference is found during operation, perform desired calibration for the gauge (refer to instrument calibrating instructions);
5. The gauge will automatically power off after about 60 seconds of inactivity.

VII. Battery Installation

Hold the gauge body with left hand, and press battery compartment door with right thumb to open in arrow direction shown on the right:



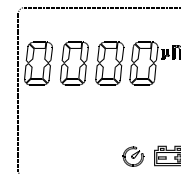
Properly install 9V battery into the compartment, ensure right battery polarity is selected and close the door, shown as below:



VIII. Power-on Check

Press the trigger to power on. Auto power off icon will constantly display on the LCD; without releasing the trigger, LCD will hold full display, and the gauge begin working after the trigger is released; the default status is normal measuring mode. Please change the battery if icon displays on the LCD.

Refer to the figure below:



IX. Operating Instructions

1. Measuring Modes (Single and Continuous)

- Single Measuring Mode—Touch the probe vertically against measured object, press the trigger one time and values have been taken.
- Continuous Measuring Mode—Touch the probe vertically against measured object, the gauge will continuously measure and update the display.

● Coating Thickness Measurement:

After power on, the default is measuring status with 0000 and μm unit shown on the LCD, then place the probe vertically against the measured object, next press down the trigger to begin , finally LCD displays readings and at the same time “HOLD” icon, “Ferr” or “Non-Ferr” icon (“Ferr ” for magnetic substrate, eg: iron; “Non-ferrous” for non-magnetic substrate, eg: aluminum), reading number on lower part if releasing the trigger button.

2. μm and mil Unit Switchover

Short press button to display mil on LCD, indicating the measurement is calculated in mil unit.

Repress press to display μm icon, indicating the measurement is calculated in μm unit.

3. Max/Min Measurement

Short press to access maximum measuring mode and display MAX icon on LCD, then maximum reading will show on data display area. Repress the button to access minimum measuring mode and display MIN on LCD, then minimum reading will display on data display area of LCD. Also short repress to enter into normal measuring mode.

4. Backlight Display



Long press button to access LCD backlit display mode, indicated by icon on LCD. LCD will be bright and then dark if long pressing the button to exit this function. Backlight will automatically turn off after 15seconds of idling.

5. Data Save


Data can be automatically saved every time if auto save function has been set in the menu. Then the function automatically stops when exceeding the maximum recording number-2000 times of the gauge.

6. Data View

Short press button to access recording data mode, “—” will display on data display area and “—” on data number zone if no data has been recorded, at the same time the gauge shows “Loadno” icon and then goes into measuring status after about 2 seconds; otherwise the last recorded reading and its number shows on the LCD, “Loadno” icon simultaneously indicates and flashes 3 seconds later; next press to reduce recorded data number and check its corresponding data; or long repress the button to automatically perform the previous operation; you can increase the recorded







number to check its corresponding data by using  button, which is also performed automatically by long pressing the button. If the maximum record of 2000 is achieved, the gauge will return to the first reading and its number, and exit this status with  pressed down.

7. Data Delete



Method 1: Simultaneously press the trigger and  button before power on. With the gauge powered on, release the button, then the delete operation begins with CLR icon indicated on LCD and finishes after about 8 seconds. Note that do not move the probe close to the metal.

Method 2: It works through restoring factory setting. (Refer to the menu function for details)

8. Menu Setting

Long press  to access menu function setting, the default is for ASA1 which means auto save; this status can switch into ASAO using  button that indicates no save operation is allowed; repress to ASA1 again; then press  to enter into next option -- calibration mode, indicated by "CODE" (factory setting without user's operation), next press again  to access next option -- factory setting, indicated by DEF? icon (to restore factory settings). Finally use  to confirm ASA1 and delete all recorded data, power off the meter. You can switch from factory setting mode into measuring mode using .

9. Gauge Calibration

Zero Calibration: Under measuring mode, touch the probe to zero reference metal substrate, then long press  to automatically finish zero calibration. When LCD shows "0000", press down  to return to normal status.

Two Point Calibration: first perform zero calibration stated as above. When LCD displays "0000", place 1000µm reference film on zero reference metal substrate, locate the probe and then press the trigger. The gauge finishes its calibration if "Ferr" or "Non-Ferr" shows on LCD and returns to normal status.

Operation Considerations

The accuracy of the gauge can be determined by following items: substrate properties, substrate thickness, edge effect, curvature radius, surface roughness, exterior magnetic field, the attachment, probe pressure, probe location, sample deformation, ect.

1. Accuracy-Related Factors

1) Substrate Properties

Coating testing is affected by magnetic variation of the substrate (Low-carbon steel is considered with mild magnetic change in real practice). In order to avoid the influence of heat treatment and cold machining on the magnetic properties, it is necessary to choose substrate reference with same properties with substrate sample for the calibration. Uncoated substrate sample is also available for the calibration.

2) Substrate Thickness

There is always a critical thickness of substrate matched with every gauge. For thickness above the critical value, thickness factor is of no importance for measurement. The critical thickness for this gauge is 0.5mm.

3) Edge Effect

This kind of gauge is sensitive to surface deformation of substrate. So please do not move the probe close to edge or internal corner if you want to obtain reliable results.

4) Curvature Radius

The curvature radius of the sample affects readings of the measurement. The effect obviously increment with the curvature radius decreased gradually.

5) Surface Roughness

Measuring result is closely related to the degree of roughness of substrate and coating surfaces. The Higher the degree is, the more influence there will be. This factor will cause systematic and accidental errors to the measurement. Accidental errors can be prevented by increasing times of measurement on different locations. If the metal substrate is rough, you need to perform zero calibration on different locations of uncoated metal substrate sample with similar roughness, or perform the operation on the substrate after removing away its coating with corrosive-free solvent.

6) Magnetic Fields

Strong magnetic field produced by surrounding electrical equipment seriously interferes readings of measurement.

7) Attachments

The gauge reacts sensitively to attachments coming between the probe and the coating. The attachment should be cleaned away to ensure direct contact between the probe and object to be measured.

8) Probe Pressure

The pressure to place the probe against the measured object bears on results of the measurement. Therefore a spring is used for the probe to keep constant pressure that has been offered.

9) Probe Location

How to place the probe against the measured sample also affects the measurement. The probe is required to keep perpendicular to sample surface.

10) Sample Deformation

The probe may cause deformation to soft coating of the sample, which therefore may not produce reliable data if operation is done on these samples.

2. Working Practices

1) Substrate Material

Choose metal substrate references with similar magnetism and surface roughness to the metal substrate samples.

2) Substrate Thickness

Check if the thickness of metal substrate exceed critical value or not;

3) Curvature Radius

Do not measure on twisted surface of the sample.


4) Measuring Times

Given readings are not totally the same every time, it is necessary to perform several measurements on each area. Coating thickness distributes differently, thus also requiring the same operation in specified area. It is particularly true with surface roughness.

5) Surface Cleaning

Remove away any attachment on sample surface before measurement, for instance: dust, grease or corrosive. However do not damage the coating.

X. Maintenance

- Operating Environment : UT341/342 coating thickness gauge is precision instrument and should be prevented from any crash, heavy strike, moisture, strong electromagnetic field, grease or dust.
- Battery Replacement and Maintenance
 - users should change battery timely when  icon displays on LCD during the operation. Refer to "Battery Installation" section for instruction.
 - To avoid liquid leakage and damage to battery life, take out batteries when not used for a long time.

- Do not discharge the gauge or try to change internal parts.
- Housing Cleaning: do not use alcoholic or diluent to clean the housing because it may corrode LCD view window. Clean it with soft cloth damped with water.

XI. CE Certification

Standards Followed: EN61326-1: 2006

XII. Technical Specifications

Parameters	Specifications
Measuring Range	0 µm ~ 1000 µm (0 mils ~ 40 mils)
Resolution	1 µm
Accuracy	0 µm ~ 55 µm ± 3dgt 55 µm ~ 1000 µm ± (3%+1dgt)
LCD Display	3½ digits
Display Update Cycle	1 second
Power	9V Battery (NEDA1604 or 6F22 or 006P)
Power Off Current	≤ 1 µA
Operating Current	≤ 35mA
Backlight	Switch off after 15 seconds of idling
Auto Power Off	Auto off after 75 seconds of idling
Battery Life	20 hours (measuring ferrous substrate)
Operating Temperature Range	0°C ~ 50°C
Operating Humidity Range	20%RH ~ 80%RH
Storage Temperature Range	-20°C ~ 60°C
Operating Environment	No strong magnetic field
Low Battery Indication	Indicate when voltage ≤ 7.0V
Dimensions	170mm × 92mm × 40mm
Weight	144g
Altitude Height	< 2000 M

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The manual information is subject to changes without prior notice.

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