



EDDY CURRENT TYPE
DIGITAL COATING THICKNESS METER

UNIBOY - E
INSTRUCTION MANUAL

CAUTIONS:

Before using the Meter, read this INSTRUCTION MANUAL thoroughly and use the Meter correctly.

Keep this INSTRUCTION MANUAL carefully and refer to this, when necessary.

In the event of any doubt arising, the original INSTRUCTION MANUAL in Japanese is to be final authority.

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1 . PRINCIPLE

The thickness of non-conductive films treated on non-magnetic metallic substrate can be measured nondestructively, simply, speedily, and accurately utilizing the electric correlation between the eddy current induced on metal surface by a high frequency electric field and the thickness of the surface film.

When a metal is moved toward or away from a coil which carries electric current supplied by a high frequency electric source, the current increases or decreases in accordance with a distance from the coil.

Utilizing this principle, the changes of this current is measured the distance(D) from the probe to the metal as the strength of the eddy current.

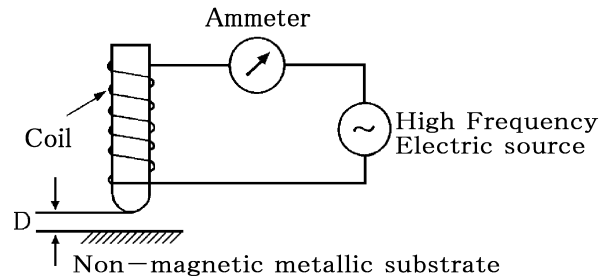


Fig.1

2 . APPLICATIONS

The Meter is used for non-destructive measurement of the thickness of a non-conductive film e.g. ALMITE, paintings, linings, etc. applied to non-magnetic metallic substrate e.g. aluminum, aluminum alloy, copper, etc. and austenitic stainless (non-magnetic stainless) steel substrate.

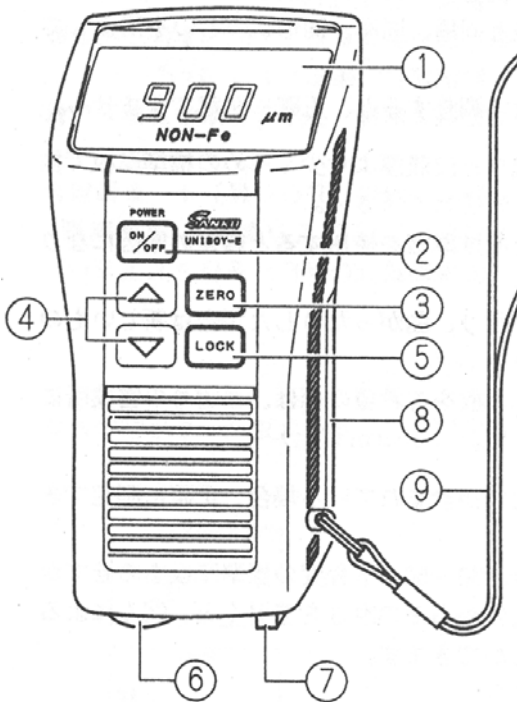
- Anodic oxide films -- Measurement of the thickness of ALMITE (anodic oxide films) applied to aluminum sashes, kitchen utenciles, electric appliances, etc.
- Paintings ----- Measurement of the thickness of coatings applied to building materials for inner and outer buildings, machines, tanks, etc. made of aluminum or stainless steel.
- Linings ----- Measurement of the thickness of linings applied to machines, parts, chemical plants, etc.

3 . SPECIFICATIONS

Name	UNIBOY- E
Measuring method	Eddy current
Applications	Non-conductive films applied to non-magnetic metallic substrate
Measuring range	0 to 900 μ m
Resolution	1 μ m : 0 to 900 μ m
Accuracy	\pm 1 μ m on uniform surface or \pm 3% of reading
Calibration range	10 μ m to 900 μ m
Indication	Digital on Liquid Crystal Display(LCD) with display hold function
Probe	One point contact constant pressure type with V-groove, 17, Built-in electrode
Power source	Dry batteries R03 (1.5V) \times 2 pcs. With automatic power off function
Operating temperature	0 to 40 (except dew condensing condition)
Additional function	conversion of resolution 0.1 μ m : under 100 μ m (by conversion)
Dimensions	56 (W) \times 109 (H) \times 34 (D)mm, Tallboy type
Weight	140g (including batteries)
Accessaries	Standard thickness plate \times 2 pcs, Zero plate for testing

Specifications and appearance are subject to modify for improvement without prior notice.

4 . PARTS IDENTIFICATION AND FUNCTION



LCD display

Indicates film thickness in μm 's or mm's.

If the battery is consumed, LOBAT (Low battery) is displayed.

Power ON/OFF key

Switches power ON and OFF each press

Zero point set key

Standard calibration(CAL) keys

Press the [] key, and the number displayed will increase.

Press the [] key, and the number displayed will decrease.

When keep on the key pressing, the number will traverse quickly.

LOCK key

Locks all keys except the power ON/OFF key to prevent mis-operations. All keys are released by switching the power OFF.

Probe

Supporting leg

Battery compartment cover

Hand strap

Fig.2



Be sure to pass the hand strap around the wrist to prevent the Meter from dropping.

5 . PREPARATION

Preparation of the zero plate

Prepare the substrate which is the same kind, thickness and shape with an object to be measured.



The attached zero plate for testing, Aluminum 1050, is used for the operation check of the Meter.

Prepare the substrate of an actual object to be measured.

- Same kind ----- The same kind of material as the substrate of an object to be measured
- Same thickness ----- Nearly the same thickness as the substrate of an object to be measured
- Same shape ----- The same shape in pipe diameter, curvature, geometrical shape, etc. as the substrate of an object to be measured
- Size ----- Substrate with an area on which the probe and the supporting leg can be easily set and operated
- Surface condition ----- Untreated, unoxidized substrate having smooth surface
Remove rust, dirt or dust, if any.

6 . OPERATING INSTRUCTIONS

6-1 Power ON

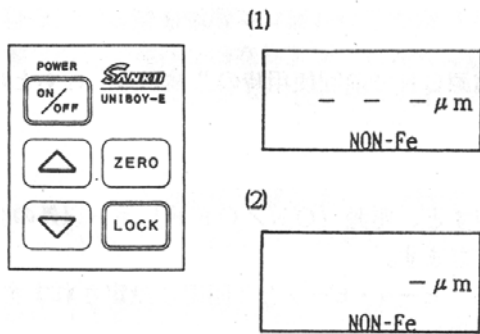


Fig.3

Press the Power ON/OFF key

When display (1) shifts to display (2) as shown in Fig.3, the buzzer emits a beeping sound.

Then the Meter is ready for measurement.

[LOBAT] is occasionally indicated for a moment, but this is not an abnormal condition.

When the power ON, keep the probe away 5cm or more from an object to be measured and a metal product until the Meter will be ready for measurement.

6-2 Handling the probe

Correct usage

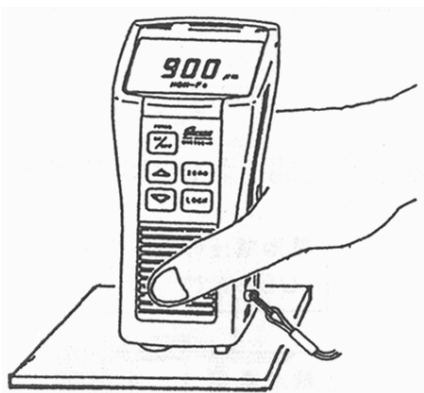


Fig.4

Hold the Meter as shown in Fig.4 and press it vertically, quickly and lightly against the surface of an object to be measured.

The buzzer emits a beeping sound and the thickness is indicated on the LCD.

If no sound is emitted, remove the Meter 4 to 5cm or more from the surface and measure again after waiting for a little while.

【NOTICES】

The attached zero plate for testing, Aluminum 1050, is used for the operation check of the Meter.

Prepare the substrate of an actual object to be measured.

Incorrect usage

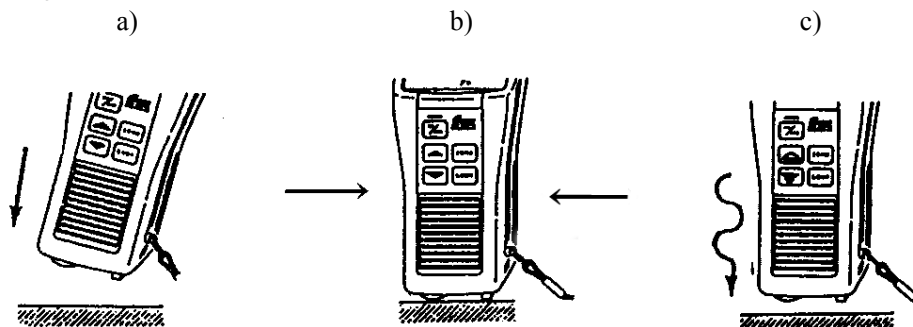


Fig.5

a) Tilting the Meter will result in an inaccurate measurement.
Hold it vertically to ensure an accurate reading.

b) Moving the Meter sideways will damage both the probe and an object to be measured.

Avoid any sideways movement of the Meter while pressing against an object.

c) Pressing the Meter too slowly will cause a very large measurement error.
Press the Meter lightly but quickly.

6-3 Zero adjustment

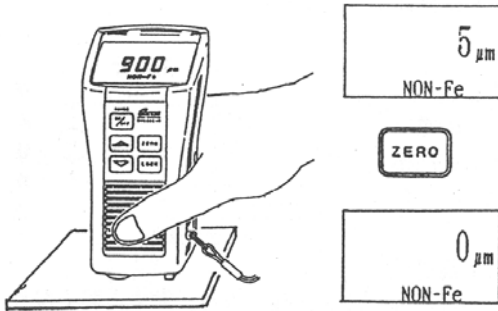


Fig.6

Press the probe against the zero plate and the buzzer emits a beeping sound and a certain figure is indicated on the LCD.

Remove the probe from the zero plate and press the [ZERO] key. Zero [0] which is indicated in the 2nd digit place moves to the 1st digit and the buzzer emits 3 beeping sounds.

Then the zero adjustment is completed.

Make sure of the zero adjustment by repeating the above mentioned steps. When [0 μ m] is indicated on the LCD, the adjustment is acceptable. When the indicated number is away from 0 μ m, repeat above zero adjustment 2 or 3 times.

6-4 Standard calibration(CAL)

Prepare a little thicker standard thickness plate than a film thickness to be measured.

Place the prepared standard thickness plate (ex. 52 μ m) on the zero plate.

Press the probe against the standard thickness plate, and the buzzer emits a beeping sound and the figure is indicated on the LCD.

Refer to Fig.7

Remove the probe from the standard thickness plate.

Be sure that the indicated figure matches with the same figure as thickness of the standard thickness plate by pressing the [] key or the [] key.

"CAL" is indicated while pressing the key.

The numbers traverse quickly keep on the key pressing.

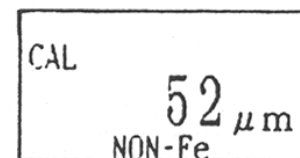
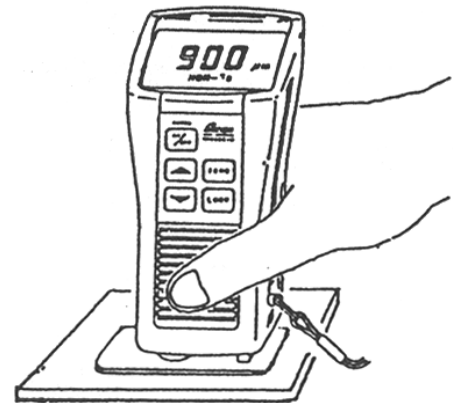


Fig.7

Release the [] key or the [] key and the buzzer emits a beeping sound. Then the standard calibration is completed.

Follow the above steps to , when the standard calibration(CAL) is needed again.

When the zero adjustment and standard calibration are completed, the Meter is ready for measurement.

【NOTICES】

- Applicable range of the standard calibration(CAL) is 10 μ m to 900 μ m.
- For the standard thickness plate to do the standard calibration(CAL), use a little thicker standard thickness plate than a film thickness of an object to be measured. Calibration with a quite different standard thickness plate from a film thickness to be measured causes an inaccurate measuring result.
- Some standard thickness plates other than the standard thickness plates attached to the Meter are available. When necessary, please contact us. (15 μ m or more in thickness)

7 . MEASUREMENT

Be sure to pass the hand strap around the wrist to prevent the Meter from dropping.
Press the [LOCK] key during the measurement to avoid mis-operations.

7-1 Measurement

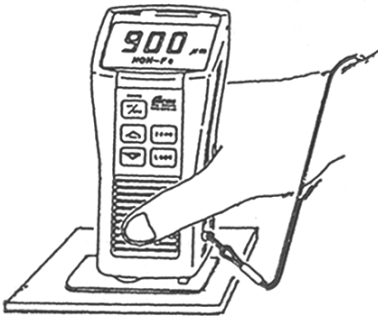


Fig.8

Press the probe against an object to be measured and the buzzer emits a beeping sound and the measured value is indicated on the LCD.
When no beeping sound is emitted, measure again after removing the Meter 4 to 5cm or more from the object and wait for a little while.

7-2 Indication of measured value

Indication in [μm]

Unit of the measured value is μm (1/1000mm).

ex. 0.2mm is 200 μm .

When a figure appears as 1 μm , fractions of .5 and over are counted as a unit and the rest are cut away.

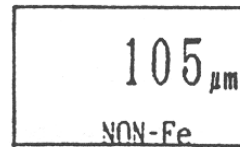
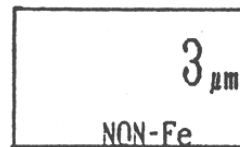


Fig.9

7-3 Measurement of round bars, curved surface, etc.

Film thickness on external surface of fine round bars, pipes, curved surface etc. can be measured by using the V-grooved parts of the both probe and supporting leg.

【NOTICES】

- Carry out the zero adjustment and standard calibration(CAL) again during measurement, if necessary.
- When the figure changed by touching the key accidentally, carry out the zero adjustment and standard calibration(CAL) again. Press the [LOCK] key during the measurement to avoid mis-operations.
- For use in the zero adjustment and standard calibration(CAL), prepare the zero plate which is the same kind, thickness and shape as the substrate of an object to be measured.
- The attached zero plate for testing, ALUMINUM 1050, is used for the operation check of the Meter. Prepare the substrate of an actual object to be measured.

8 . OTHER FUNCTIONS

8-1 Auto power OFF

Provided with Auto power OFF function(about 5 minutes later) so as to prevent consumption of the battery due to forget turning the power to off.

8-2 Memory / Resume

Working curve(characteristic of substrate) completed zero adjustment and standard calibration(CAL) is memorized even after turning the power to off.

The Meter is provided with the convenient resume function with which the measurement can be started immediately after succeeding power ON.

8-3 LOCK key function

When the LOCK key is pressed during measurement, the buzzer emits 3 beeping sounds and all the keys except the power ON/OFF key will be locked to prevent mis-operations.

Switch power OFF and the lock will be released.

8-4 Converting the resolution. (add. function)

Display of 0.1 μ m can be applicable for the measurement of the films less than 100 μ m thickness.

Insert a thin bar with a point into the small hole on the back face of the Meter and press the bottom, and the buzzer emits 2 beeping sounds. Then the resolution on the LCD is converted from 1 μ m to 0.1 μ m.

The resolution is converted alternately to 0.1 μ m and 1 μ m each press.

8-5 Resetting the working curve

When the batteries were replaced, indication was locked or measurement, zero adjustment, standard calibration(CAL)became impossible to operate, reset the Meter by following method.

Press the [] key continuously 5 times while keeping on the [ZERO] key pressing in power ON condition. [- E -] is indicated for 3 seconds with a longish beeping sound and reset is completed.

After resetting, carry out the zero adjustment and standard calibration again, if necessary.

9 . POWER OFF

Press the 「ON/OFF」 key .

The buzzer emits a beeping sound and [- μ m] is indicated.

After few seconds, the buzzer emits a beeping sound again and the indication is disappeared.

1 0 . REPLACING THE BATTERY

- When LOBAT(Low battery) is displayed on the lower left of the LCD as shown in Fig.10, replace the old batteries with fresh specified dry batteries R03 (1.5V) \times 2pcs (notice usable limits).

Be sure to switch the power OFF before replacing.

- Even if the old batteries are taken out of the Meter, "Calibration condition" is able to be kept without any change.

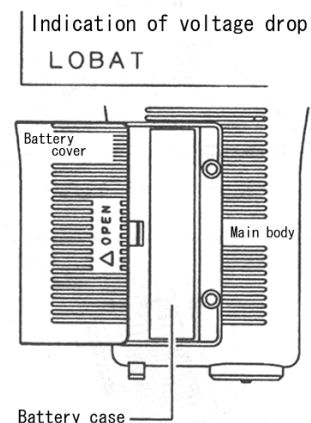


Fig.10

1 1 . MAINTENANCE AND INSPECTION

Use the Meter within the range of 0 to 40 .

Avoid to expose the Meter to dew condensation, wet with water, dust, intense heat, vibration, etc. in use.
Handle the probe cautiously not to damage on its tip.

Keep the Meter in a dust-free place where high temperature and high humidity can be avoided.

In case the Meter is left on not in use for 1 month or more, take the batteries out of the Meter.

To ensure an accurate measurement, regular inspection of the Meter at least once a year is recommended.

1 2 . CARES TO RAISE AN ACCURACY OF THE MEASUREMENT

Zero plate

For use in the zero adjustment and standard calibration(CAL), prepare the zero plate which is same kind, thickness and shape as the substrate of an object to be measured.

It will result in an inaccurate measurement to use the zero plate different specifications from an object to be measured.

Standard thickness plate

Carry out the standard calibration(CAL) with a little thicker standard thickness plate than a film thickness of an object to be measured.

It will cause an erroneous measurement to use a too thicker or thinner standard thickness plate than a film thickness of an object.

When the standard thickness plate has been damaged or bent, renew with a new plate.

In case the standard thickness plates other than the plates attached is necessary, please contact us.

(15 μ m or more in thickness)

Characters of a film

A film having a metallic substance can not be measured precisely.

With respect to an elastic film, place a standard thickness plate with 30 to 50 μ m on it and subtract the thickness of the standard thickness plate from the total thickness, then the measurement error due to film dent can be avoided.

Effect of edge and corner

The edges, corners and their surroundings of an object to be measured are the places where the condition of a magnetic flux is inequality.

Generally, measure inside taking 15 to 20mm or more away from the edges.

The same care is needed for a project, bend, sharp deformed portion and surroundings.

Effect of surface roughness

The surface roughness of a substrate or a film of an object to be measured affects measurement results.

Take several spots to measure and calculate the mean value.

Effect of rolling strain in steel plates

In some cases, rolling strain exists in a substrate and it causes an incorrect measurement depending on the spots to be measured.

Then take several spots to measure and calculate the mean value.

Show rooms:

You are welcomed to the show rooms located at the following places.

- Tokyo show room near the Otemachi station of the subway
- Osaka show room at Tenjinbashi-kitazume
- Nagoya show room near the Kurokawa station of the subway
- Fukuoka show room near the Gofukucho station of the subway

Products sold:

Sales of Coating thickness meter, Pinhole detector, Condensator, Viscosity cup, Moisture meter, Needle detector, Iron piece detector

Manufacturer:

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Tokyo 101-0047, Japan

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