# SANKO Coating Thickness Meter
# SWT－7200 II
# 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 (Japanese) is to be final authority.

SANKO ELECTRONIC LABORATORY CO., LTD.

Tokyo・ Osaka・ Nagoya・ Fukuoka・ Kawasaki

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# Attention for safety (to use in correct ways)

To prevent you and your properties from damaging please take some time to read thoroughly this "Attention for Safety" and correct uses keep these instructions attentive to read when necessary.

## Warning

Keep off water ● Do not dump nor wet the gauge unit in water, otherwise it may cause damages.
Please contact our distributor or sales office should submerged water into the unit.

Prohibition ● Keep metals or foreign substances from the unit, otherwise it may cause damages.
Please contact our distributor or sales office should put any materials or foreign substances in the unit.

Prohibition ● Do not insert a screwdriver into the connector, otherwise that it may cause damages.

Prohibition ● Do not throw, smash, drop the unit, otherwise it may cause damages.

Dismantling prohibited ● Never dismantle or modify the gauge unit by yourself, otherwise it may cause errors or damages.

Prohibition ● Do not use AC adaptors other than an exclusive adaptor for this unit, (SWT-8100Ⅱ only)
otherwise it may cause damages, electric shocks, fires.

Prohibition ● Please use the exclusive adaptor with a designated Voltage only, otherwise it may cause
damages, electric shocks, fires.

Prohibition ● Keep the terminals of the adaptor free from metal pieces or dust, otherwise it may cause short circuit,
electric shocks, fires.

Prohibition ● Do not handle the AC adaptor with wet hands, otherwise it may cause electric shocks.

Prohibition ● Do not damage, brake, modify, forcefully bend or twist the cord of the AC adaptor. Or, do not load it
with heavy staff or pinch it forcefully, otherwise it may cause breaking wires, short circuit, fires.

# Attention For Safety(to use safely and correctly)

## Warning

Must ● Never fail to remove batteries from the unit when not in use for a long time.
Leakages occurred from deterioration of batteries may cause erroneous reactions or damages.

Must ● Be sure to read this book on the item of「How to fit batteries」to replace batteries.

Must ● Store batteries in a place where children and pets are incapable of handling them.
Please call a doctor like in a case that a battery is swallowed.

Must ● Do not put batteries into fire or water. Store them in a cool, dry and dark place avoiding flames, high temperature and moisture.

Must ● Do not get batteries shocked and dismantled, and soldered for processing

Must ● Do not short or recharge batteries and handle with metallic tools like pliers.

Must ● Replace with new(unused) batteries according to the procedure of this Operating Instructions.

Must ● Be sure of paying attention on battery polarity marks,（＋、－） to place the batteries.

Must ● In case a battery has leakage please clean up the place with clothes to replace batteries.
And do not touch the leaked liquid and wash skins or clothes in case they are contaminated.

Must ● Comply to regulations and laws in your neighbors when disposing of them.

Must ● Insert a plug of the AC adaptor to the full end, otherwise it may cause electric shocks and fires with burns. And do not use faulty or loose receptacles.

Must ● Switch to OFF and unplug the AC adaptor from the receptacle to avoid electric shocks and damages when inspecting or cleaning the gauge.

# Attention For Safety(to use safely and correctly)

## Attention

Prohibition ● Do not use Benzene or Thinner for cleaning and spray pesticides on the meter, otherwise it may cause cracks or malfunctions.

Prohibition ● Do not store the meter in places getting high in temperatures such as in a car in strong sunlight or near heaters, otherwise it will be hazardous to the meter and may cause malfunctions.

Prohibition ● Do not step, trample down nor put anything on the meter.

Prohibition ● Keep the meter away off rubber-made articles or vinyl articles. A lengthy contact between meter and them may cause stickiness and it may be difficult to get rid of them.

# Notes:

- Please read this manual thoroughly for correct operations before getting started.
- This meter is a precision gauge.　Please handle with care.
- Do not tug, bend, fold or curl up forcefully the cables of probes.
- Do not knock or scratch objects with the tip of a probe.
- Keep the tip of a probe clean.　A slight amount of dust may cause errors in measurements.
- Clean the meter and store it in free from dust and moisture after operation.
- To keep precision with a gauge please contact our distributor or our sales office once a year for inspection
- Keep the meter away off electric noises, shocks or magnetic fields when in a use.

# Get started

## ◆ Contents in a package

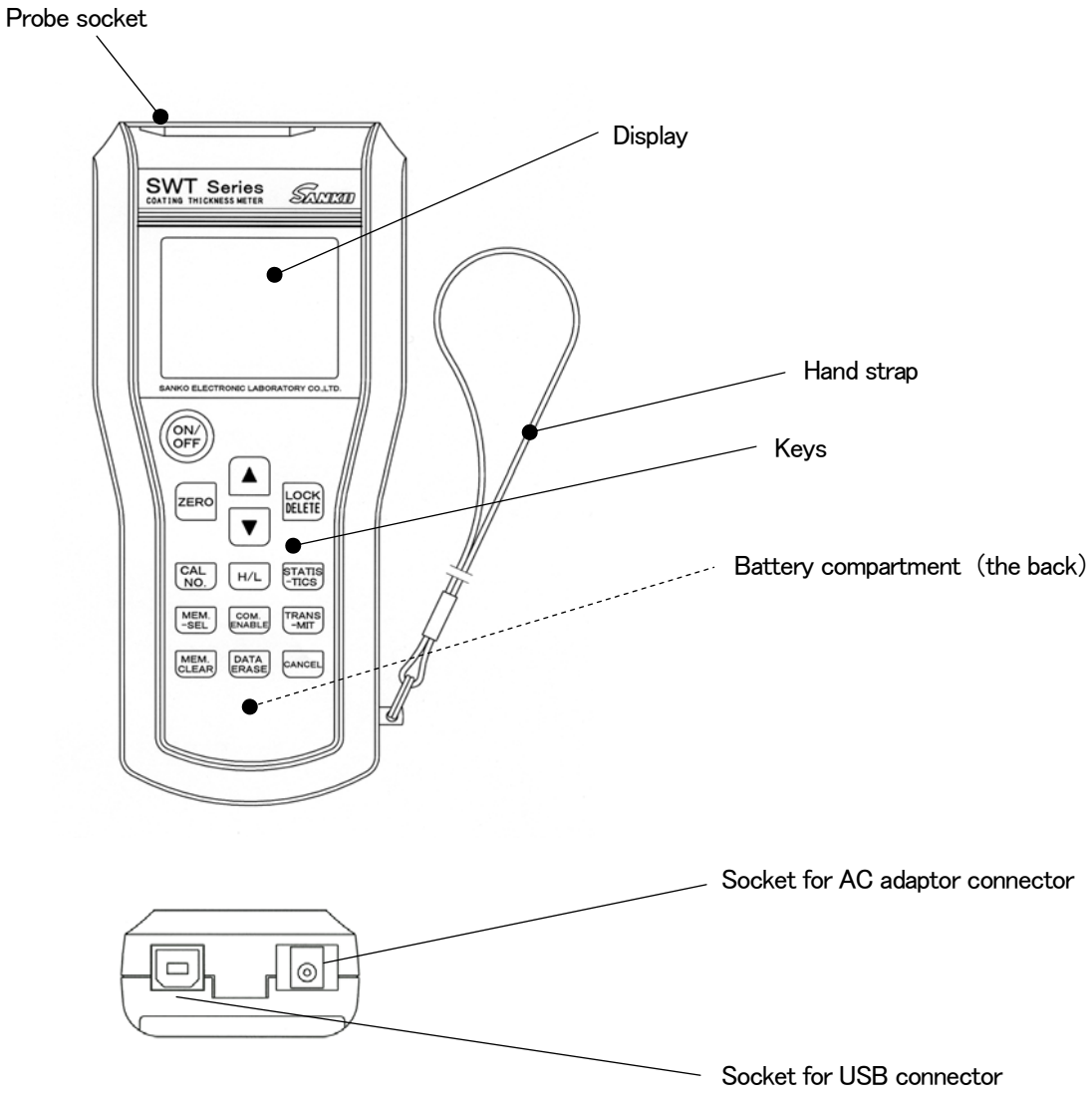
Check the package if there are the following items inside it.

- Main unit
  SWT－7200Ⅱ
- Dry batteries R6P/AA（2 pieces）
- Carrying case
- Instruction manual（this manual）
- Warranty／User resistor sheet （Available only in Japan）
- AC adaptor
- USB cable（2. 0m）
- USB driver（CD）

### ● In case of an optional probe

- Probe
  For ferrous(Fe), or non-ferrous(NFe)
- Zero boards for testing（for Fe:ferrous substrates／for NFe:non-ferrous substrates）
- Thickness standards(films :2 sheets、bake:1 sheet)

## ◆ Names of part




● Probe socket

Connect an optional-exclusive SWT probe to the probe socket.

（1） To measure a film thickness of coated, plated, lining layer on substrates made of ferrous material please use a probe of (Fe) series for the connection.

（2） To measure a film thickness of coated, plated, lining layer on substrates made of non-ferrous materials such as Aluminum, Copper, etc. please use a probe of (NFe) series for the connection

● Display

It indicates measurement results, operation guides, or malfunction status.

● Keys

（1） Power On/Off key

It switches On or Off.

（2）「ZERO」key、「▲」key、「▼」key

They are adjusting keys to be pre-used before measuring to obtain correct results.

（3）「LOCK/DELETE」key

LOCK: Protects against inadvertent key-operation.

DELETE: Deletes incorrect or unnecessary measuring results for adjustment

(works only when「ZERO」、「CAILIBRATION」 is processed.)

（4）「Cal No. 」key

A key to select calibration in a high function al operation.

（5）「H／L」 key

A key to set Upper/lower limits of measuring values in a high functonal operation.

（6）「STATIS-TICS」 key

A key to process data with statistics stored in memory in a high functional operation.

（7）「MeM-SEL」 key

A key to select memory to use in a high functional operation.

（8）「COM. ENABLE」 key

A key to select for data-tranfer in a high functional operation

（9）「TRANS-MIT」 key

A key to execute data-transfer in a high functional opearion.

（10）「MEM. CLEAR」 key

A key to delete data stored in memory in a high functional opearion.

（11）「DATA ERASE」 key

A key to erase a piece of data on the reading display in a high functional operation.

（12）「CANCEL」 key

A key to stop measuring operation and ajustment under being process in a high functional operation.

- Battery compartment

  It contains 2 pieces of dry battery (R06, AA).

- Hand strap

  Hang the meter through a strap over your wrist never to drop it.

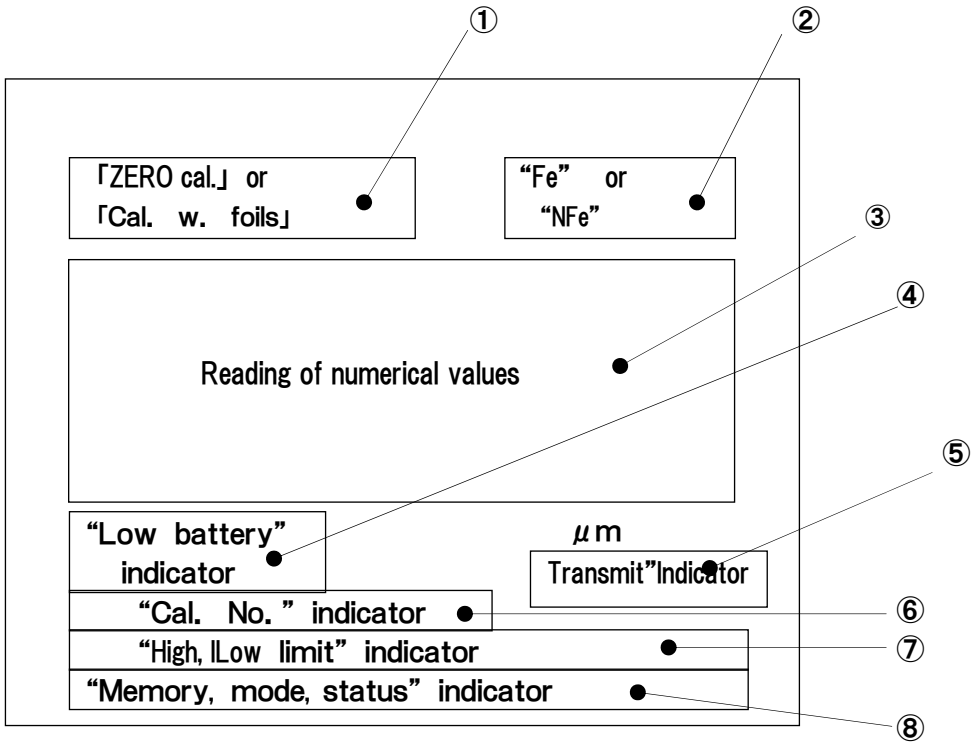
- Socket for AC adaptor

  This is a socket connected to the exclusive AC adaptor (accessory).

- Socket for USB cable

  It is a socket connected to a USB cable (accessory)

## ● Items indicated on LCD




① 「Zeroing」, 「Calibration」, 「Special Adjustment」 are indicated on the screen while they are being processed. Otherwise reading is not indicated.

② “Fe” is indicated on the screen while a SWT probe of “Fe” group is comnnected.
“NFe” is indiacted on the screen while a SWT probe of “NFe” group is connected.

③ Measuring data is indicated on the reading whenever a probe is pressed on the object.

④ BAT is indicated by 2 steps when the dry cells are runnin short of power.

⑤ USB mark is indicated when data transfer function is activated with PC

⑥ Calibration No. storing a pair of 「Zeroingand 「Cal. w. foil」 is indicated

Cal. No. @ No calibration is inputted in case of 〔blank〕 on th spot of @ mark
Calibration is inputted in case of 〔■〕 on the spot of @ mark
Calibraton in special adjustment is inputted in case of 〔▼〕 on the spot of @ mark

⑦ High or Low limit thickness value is indicated when they are set. When measuring values deviate from the both range of the high and low limits, the reading blinks.

⑧ The number of a storing place blinks when selecting the memory number to store measuring data and the storing place number Is indicated when measuring while storing data into mmory.

## ◆ How to fit batteries

① Open the battery lid on the back of the unit.
Press down and slide the lid in direction of arrow to open.

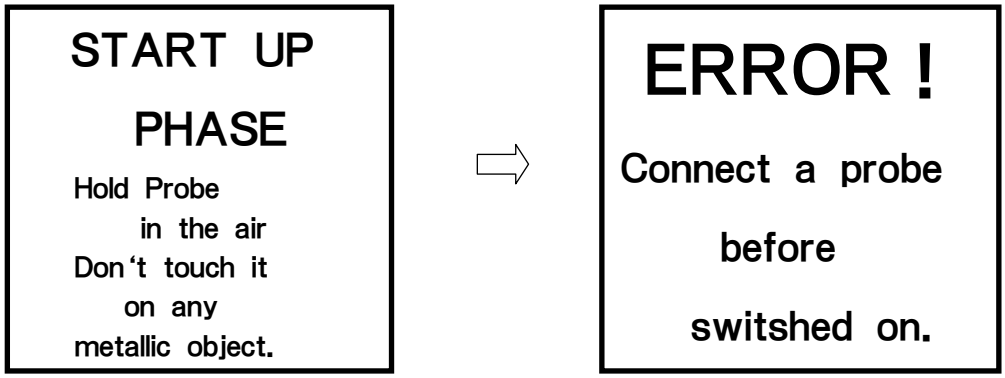
② Insert batteries.
Ensure correct battery polarity ⊕、 ⊖ for placement.

③ Close the lid.

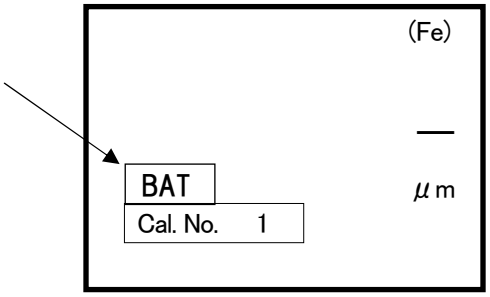
⚠ Caution

- Use designated and new (unused) batteries or ones supplied in this package.
- An incorrect use of batteries may cause leakages, bursts. Do not intermingle new ones with old ones.
- Take out batteries to store when not in use for a long absence, and that may avoid Leakages.
- Keep batteries off children and pets.
- Comply to the laws and rules in your Local Authorities when disposing of batteries.

When placing batteries in the unit, the messages and warning below on the screen may be indicated.
And these are not breakdowns, wait until the reading disappears with a beeping sound.




Batteries have run out when the display on the unit indicates the mark listed below.
Replace with new batteries.



## ◆ How to connect or disconnect a probe

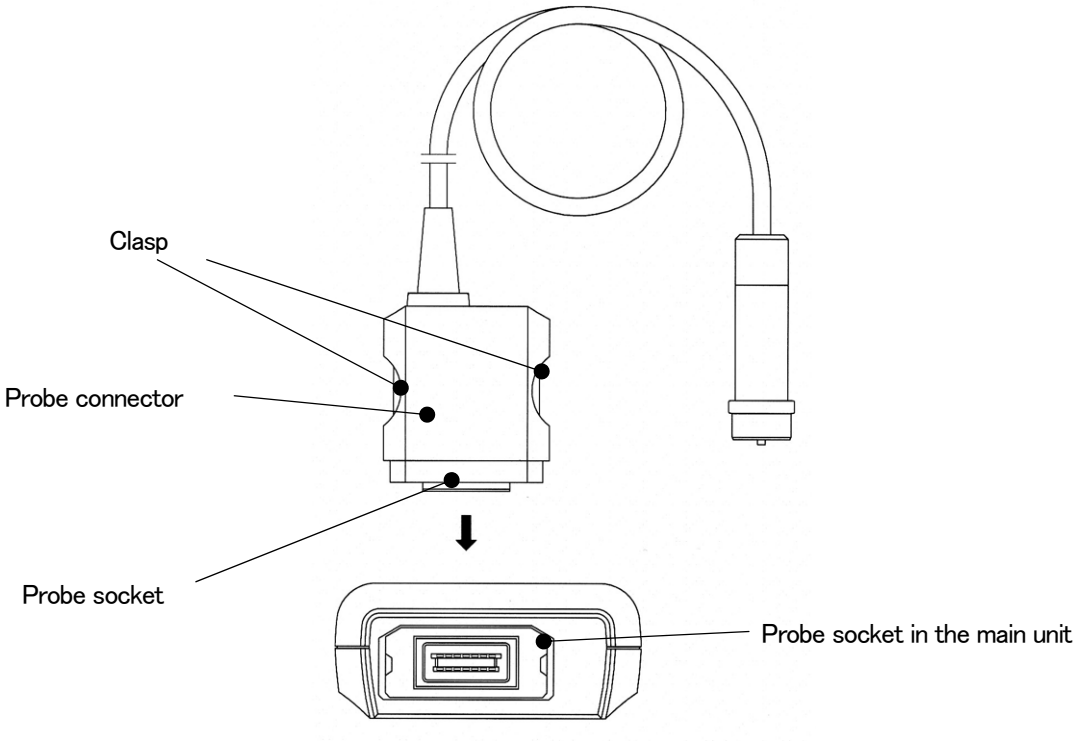
◎ Connect an optional, exclusive SWT probe to the main unit

Select one of the probes suited for your application.

Insert a probe connector into the probe socket of the main unit.

Make sure of aligning the keyway leading to a smooth joint without doing by force.

Insert and push it untill it is locked.




◎ Remove the exclusive probe from the unit.

Pull off the probe carefully by bending inward clasp springs at the both ends of the probe connector to release the clasps.

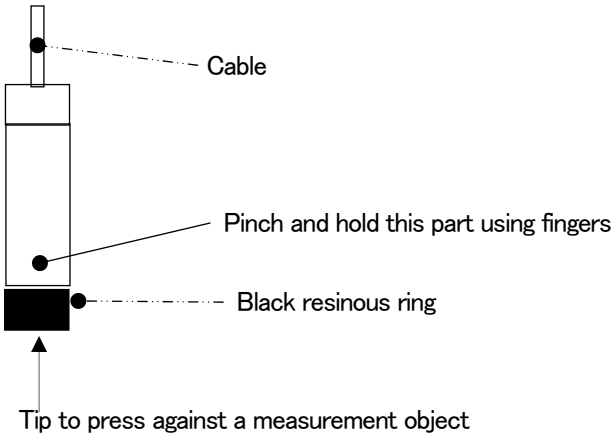
Do not pull off by force or it may cause damages.

⚠ Caution

Make sure that Power switches to off when connecting or disconnecting the exclusive SWT probes.

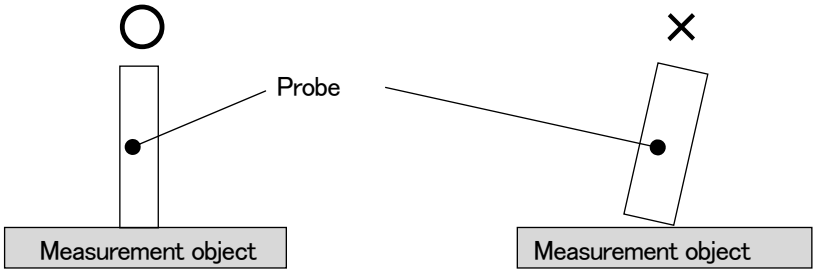
Or else, it may cause damages to connect or disconnect while Power is on.

## ◆ How to hold probes

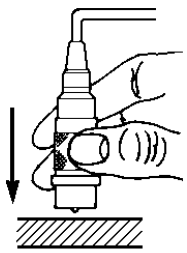



## ◆ How to press a probe to an object

- Keep the probe 5 cm or over away off metallic objects when not in use of measuring.
- Press the tip of the probe perpendicularly against a measurement object.
  Tilting may cause large errors.




※ Press the probe quickly and smoothly to objects.
A slow-acting press may cause large errors.



Quickly and calmly press perpendiculary against the object by grabing the probe as illustrated.
It beeps and the screen shows the measuring result.
When it does not beep, lift it 5～7 cm above the object and try again to take measurements.
＊use the Key-LOCK mode in taking measurements to prevent from inadvertent operations.

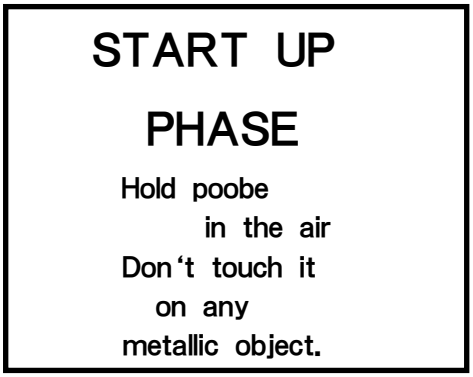
**Caution**

- ◆ Do not smash or hit the probe against objects, or it may cause damages to probes and to objects
- ◆ Do not scrape, scrub objects with the probe except in a special measurement.
  Or it may break the tip of the probe and cause damages to the tip and surface of objects

# How to operate

## （1） How to switch Power source

Press [ON／OFF] key.

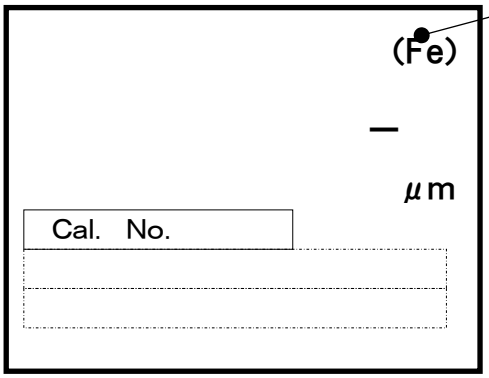



This message lasts for about 5 seconds.

**Caution**

Hold the probe in air without operation when the reading is on display. Or it may indicate 「ERROR」 and automatically switch off Power.

The buzzer emits a beeping sound.




「Fe」shows that a SWT exclusive probe in Fe series is connected
「NFe」shows that a SWT exclusive probe in NFe series is connected

The display shows that it becomes possible to take measuring and adjusting procedures of this unit.

**Caution**

Never remove probe from a unit when Power is ON. Or the electric shocks may damage the probe and the u

Note: 「Cal. No: __ 」
↑
A number「1」is indicated at the first opening of the unit, and from then on the last set entry is indicated everytime it is operated.

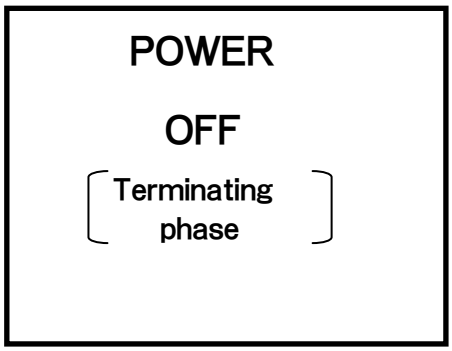
And, when「High limit value」、「Low limit value」is set, or when memory is used, the setting values and Nos. are indicated on each column (chained lined sections)

## (2) How to switch off

Press [ON／OFF] key.

The buzzer beeps, beeps. (twice)

⇩




The message lasts for about 5 seconds.

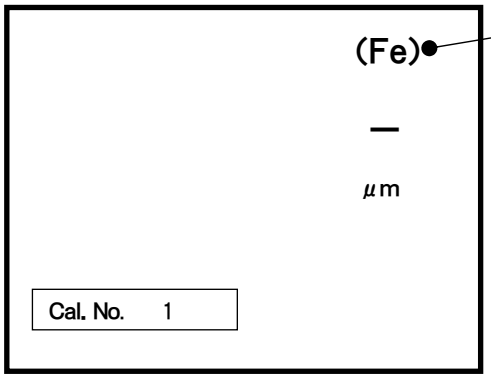
⇩

This unit switches off.

## 3) How to select「Calibration No: 」

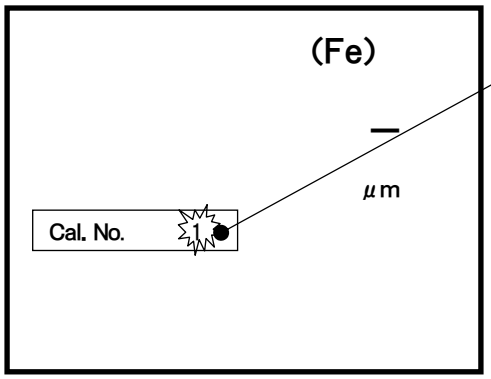
It is capable of getting started on measurements immediately after by switching Power to ON as described on page10,「it becomes possible to take measurements and adjusting」.
However, it may make errors depending on material formation and shapes to be measured. To minimize measurement errors and obtain as accurate results as possible please be sure of carrying out 2 points adjustments of「Zeroing」and「Calibration standard」before measuring process.
And this set of being adjusted is called "Calibration"
SWT－7200Ⅱ is capable of storing 10 pares of calibration data.

The storing place is indicated by a calibration No.




「NFe」is indicated when a SWT exclusive probe in NFe series is connected.

Press [CAL No.] key.
The buzzer emits a beeping sound.

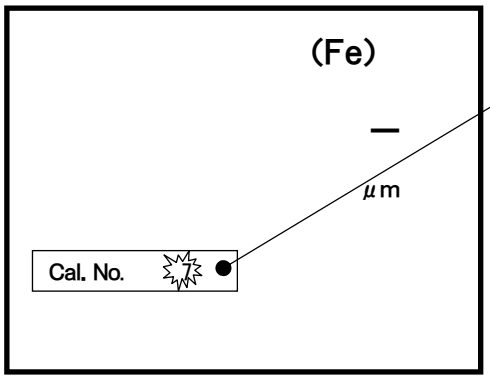



A number on the display flashes.

Press [▲] key or [▼] key to select your desired number.

**Caution**

The number flashes for about 10 seconds. Press [▲] or [▼] key during the period of 10 seconds flashing. Otherwise the buzzar beeps, beeps to return automatically to the beginning. Try again to reselect the number from the beginning. In case ■ or ▼ is indicated on the right side (＊ marked) of Cal.No, calibrated values are stored in the calibration.
When no more use for the value, process zeroing /calibration and delete the stored data that is replaced with new data.

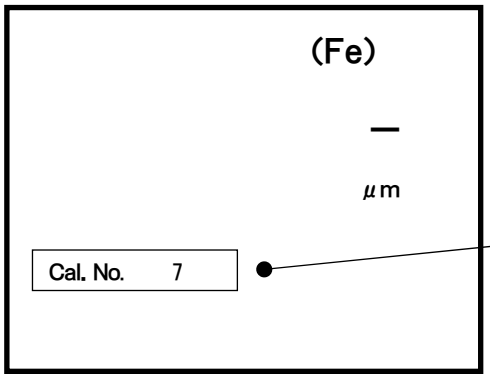



Your selected number flashes.

**Caution**

The number flashes for about20 seconds.
Press CAL No. key during the period of 20 Seconds, otherwise the buzzer beeps, beeps to return automatically to the beginning.
(in this case,「7」is canceled to return automatically to「1」). Try again to reselect from beginning.

Press CAL No. key.
The buzzer beeps.




The flashing stops
「Calibration No. 7」 is selected and fixed.

It is capable of getting started on measurements adjusting after selecting「Calibration No. 」and as the status turns "possible to take mesurements".
However, it may make errors depending on material formation and shapes to be measured. To minimize measurement errors and obtain as accurate results as possible please be sure of carrying out 2 kinds of adjustments of「Zeroing」and「Calibration standard」before measuring process.

## (3) Zeroing

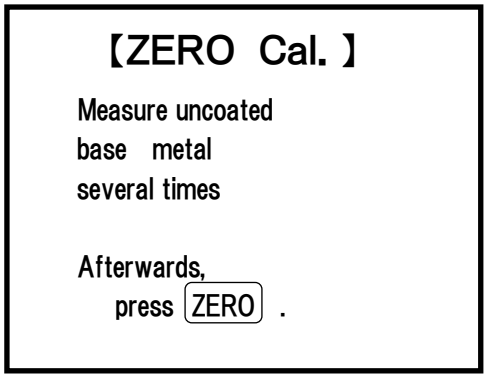
**It is capable of getting started on measurements immediately after the message of「START UP PHASE」 has disappeared as described on page 12.**
**However, it may make errors depending on material formation and shapes to be measured. To minimize measurement errors and obtain as accurate results as possible please be sure of carrying out 2 points of adjustments of 「Zeroing」 and 「Calibration standard」 before measuring process.**

※ Please prepare for a Substrate plate the identical material, quality and size to a measuring object.
(This substrate plate should be designated as a「Zero Plate」)

◆ Press [ZERO] key.

The buzzer emits a beep sound.

It stopes its LOCK function of [LOCK/DELETE] key and changes to one data "deletion".

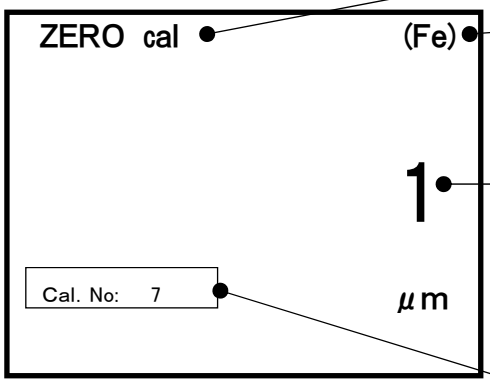



Press the probe on the above「Zero Plate」while the message is indicated on the screen. ( about 20 second)

⇩

The buzzer beeps.

⇩




Zeroing is in process.

The reading shows that the unit is set to measure on substrate material of Ferrous by connecting a probe of the「Fe」series.

Measured numerical value
When the measuring value results in largely off the "0", press [LOCK/DELETE] key to delete the latest data out of measured values.
It indicates "—"to delete all data.

「Cal. No._ 」for storing values of 「Zeroing」 and「Standard Calibration 」

Remove the probe from「Zero plate」

⇩

● Repeat a measuring process 2～10 times by pressing the probe to「Zero plate」. (A measurement value is displayed whenever a probe is pressed)

◆ When a measuring process reaches the 10th time, the buzzer beeps and zeroing automatically finishes without pressing [ZERO] key.

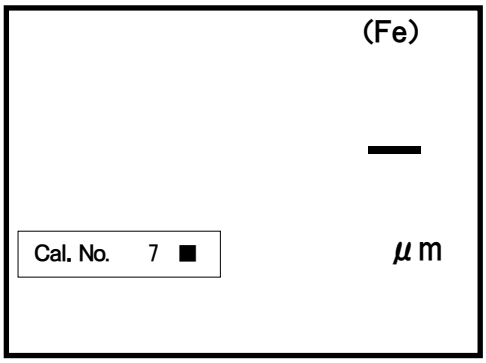
Press [ZERO] key in case of pressing less than 10 times.

⇩

The buzzer beeps.

It stopes its DELETION function of [LOCK/DELETE] key and returns to the "LOCK" function.

⇩




The reading shows that「Zeroing」has completed and it becomes possible to take measuring and adjusting operations of this unit.

⇩

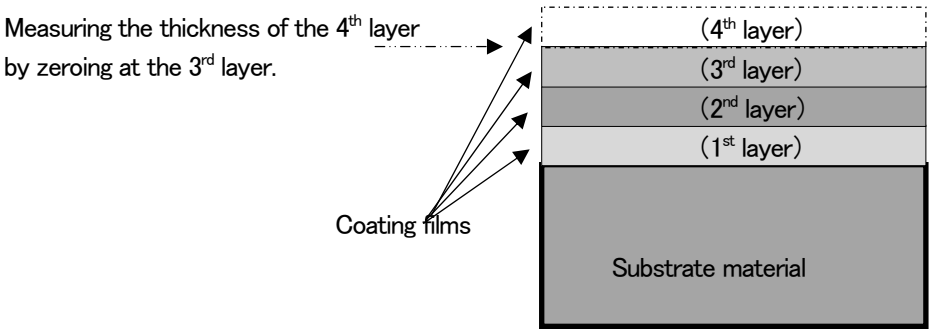
- It is correct that numerical values measured by pressing the probe to the「Zero Plate」indicates「O」or in the neighborhood of「O」.
  When the measured value results in largely off「O」μm, please try again zeroing from the beginning.

- [LLL] indicated on display during a time of zeroing means that the calibration point heavily deviates from the standard please make sure that the material is not in process of being built with others and repeat the zeroing in 2～4 times until a stable「O」is obtained.

⚠ Caution

The message of「ZERO cal.」described on the previous page is indicated on the screen for about 20 seconds. Without pressing the probe to the「Zero Plate」during the period of the reading on display, it automatically returns to the beginning. Try again zeroing procedures from the beginning if necessary.

## (4) Zeroing in special cases (Multi-layers)




In case of being painted as shown with multi-layers on the substrate there may be needs to measure thicknesses of each layer. For example, measuring only the thickness of the 4th layer please zero as an assumed ZERO at the surface of the 3rd layer stacked on the substrate.

### ◆ Releasing of special-case zeroing

When zeroing again on the substrate after having finished the above measurements and if the combined thickness of 3 coating layers from 1st to 3rd exceeds 50 μm, please zero the meter on the following procedures.
If the thickness of 3 combined layers is bellow 50 μm, take the same procedure as usual zeroing to release.

● Prepare the identical material quality, plate size to a measuring object.
(This is a designated as a Zero Plate)

Press [ZERO] key.
The buzzer emits a beeping sound.

It stopes the LOCK function of [LOCK/DELETE] key and changes to one data "DELETE" function.

⇩

**【ZERO Cal.】**

**Measure uncoated base metal several times.**

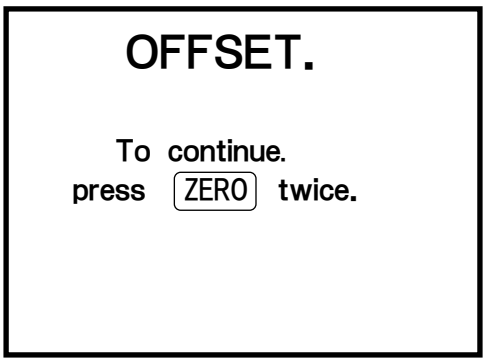
**Afterwards, press [ZERO].**

Press probe on the above「Zero Plate」 while the message is indicated on the screen. (for about 20 seconds)

⇩

The buzzer beeps, beeps, beeps.

⇩




Press ZERO key twice while this message is indicated on the screen (about 20 seconds).

**Caution**

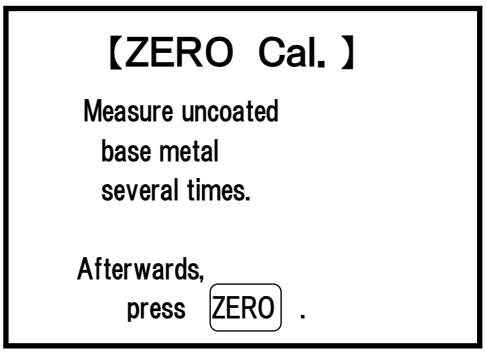
This message is indicated on display for about 20 seconds. If no ZERO key is pressed when the reading is on screen,「Zeroing」is automatically interrupted and returns to the beginning of the process Try again zeroing from the beginning if necessary.

Press ZERO key . —— ①
The buzzer beeps.

⇩

Press ZERO key. —— ②
The buzzer beeps.

⇩

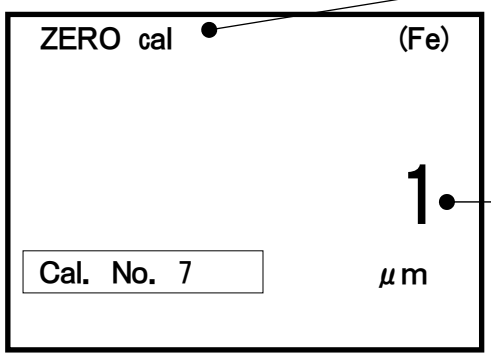



Press the probe to「Zero Plate」when on the reading for 20 seconds.

⇩

The buzzer beeps.

⇩




The reading shows that it is process of zeroing adjustments

Measured numerical value

Remove the probe from the「Zero Plate」

⇩

- Repeat a measuring process 2～10 times by pressing the probe to「Zero plate」.
  (A measurement value is displayed whenever a probe is pressed)
- ◆ When a measuring process reaches the 10th time, the buzzer beeps and zeroing automatically finishes without pressing ZERO key.

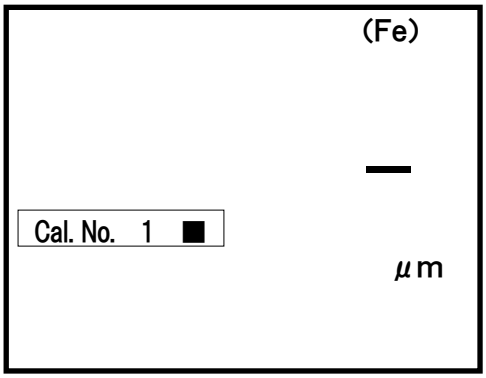
Press [ZERO] key in case of pressing the plate less than 10 times.

⇩

The buzzer beeps.

It stopes the LOCK function of [LOCK/DELETE] key and returns to the "LOCK" function.

⇩




「Zeroing」 has completed and it becomes possible to take measuring and adjusting operations of this unit.

- It is correct that numerical values measured by pressing the probe to the「Zero Plate」indicates「0」or in the neighborhood of「0」.
  When the measured value results in largely off「0」μm, please try again zeroing from the beginning.

- [LLL] indicated on display during a time of zeroing means that the calibration point heavily deviates from the standard please make sure that the material is not in process of being built with others and repeat the zeroing in 2～4 times until a stable「0」is obtained.

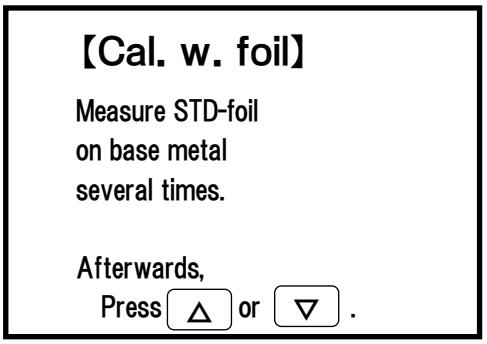
Note:
The latest measured value replaces the previous one and the new value of「Zeroing」is stored.

## 6) Calibration standard (CAL)

- Prepare 「Zero Plate」 used in 「Zeroing」.
- Prepare 「Thickness Standard」 which thicknesses is thicker or as thick as a measuring film.
- Place 「Thickness Standard」 on 「Zero Plate」.
- Press △ key or ▽ key.

The buzzer emits a beeping sound.

⇩



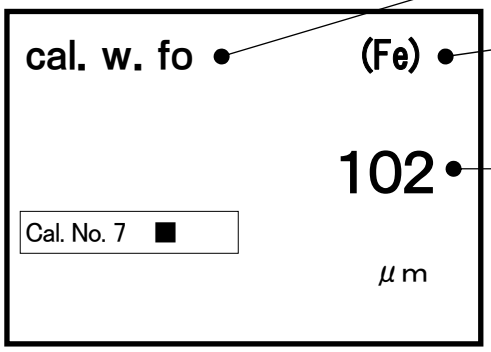

It stops the LOCK function of LOCK/DELETE key and changes to one data "deletion" function.

**Caution**

This message is indicated for approx. 20 sec. ithout new entry during this period by pressing △ or ▽ key, the unit automatically returnato the begging from where to start again for calibration.

The buzzer beeps whenever the probe is pressed.

⇩




The reading shows that it is in process of Calibration standard.

The reading shows that the unit is set to measure on the substrate material of Ferrous by connecting a probe of the 「Fe」series.

Measured numerical value

In case the measured value abnormally deviates from the thickness standard, a press of LOCK/DELETE key deletes the latest entry and shows "—" when all data were deleted.

● Repeat measuring operations 2～10 times by pressing probe to 「Thickness standard」 on the「Zero plate」.
(The measured value is indicated whenever the probe is pressed.)

Press △ or ▽ key after finsihing key operation.

⇩

◆ When the measuring process reaches the 10th time, the buzzer beeps to take the next page screen.

◆ When the measuring process reaches less than 10th time, being left doing nothing for 20 seconds, the buzzer beeps, beeps to move to the next page screen.

**Caution**

This message「Calibration Standard」 is indicated on the sacreen for approx. 20 sec.onds. If no press of probe is made during this period, the unit returns to status before pressing △ or ▽ key automatically
To calibrate again , try again from the beginning of the process of Calibration Standard

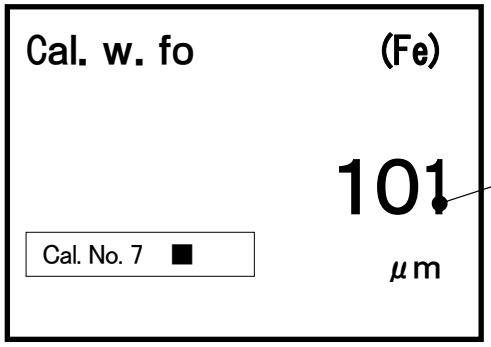
Equate a displayed value with Thic ness standard with △ or ▽ key while the message is on the reading (20 seconds)

〔Cal. w. Fo 〕

Use △ or ▽,
to set foil
thickness.

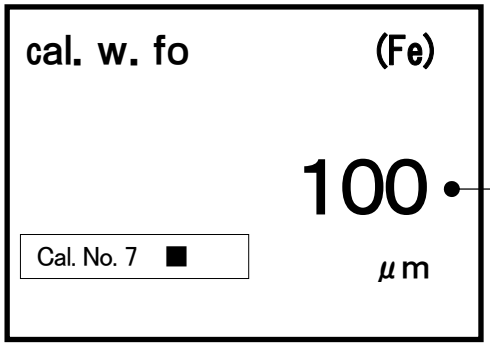
A press of △ or ▽ key makes the buzzer beep and afterward a press of probe indicates numerical values.

⇩




The last numerical v alue measured by probe

Press ▽ key to equate the number with Thickness Standard (in this case 100 μm)




A press of △ key increases a reading value.

A press of ▽ key decreases a reading value.

Equate this value with Thickness Standard

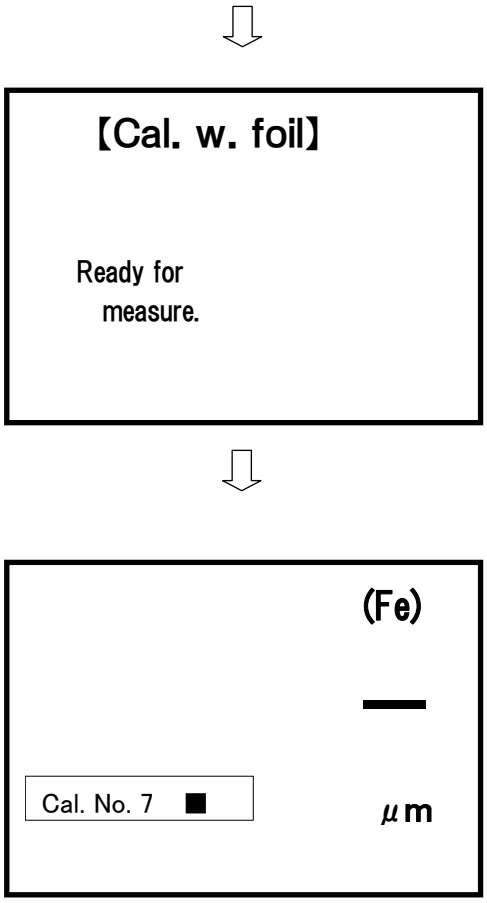
After matching with the thickness of the Thickness Standard,
choose one of the following Ⓐ or Ⓑ.

Ⓐ Waite for about 5 seconds.

Ⓑ Press probe to the measuring object.

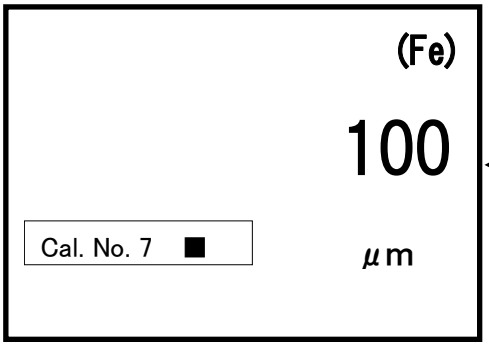
⇩

In case of Ⓐ:
The buzzer beeps, beeps.




This uni is now ready for taking mesurements and adjustments.

In case of Ⓑ:
Press the probe to the object for measurements.




Measuring mode

- It is correct that numerical values measured by pressing the probe to the「Thickness Standard」on the「Zero Plate」indicates in the neighborhood of「Thickness standard」.

- When the measured value results in largely off the thickness of「Thickness Standard」
  please try again calibration standard from the beginning.

Note:
The latest measured value replaces the previous one and the newly measured value with「Calibration standard」is stored.

## (7) 2-foil calibration when "Zeroing " is difficult to perform.

In case zeroing is difficult to perform such as measuring the thickness of the film on the rough surface of Blast-steel plates, a calibration method using 2 different thicknesses of standard plates pinching a thickness of the object is defined as 「JIS K5600」Standard. This calibration method complies to the regulations.

### ⚠ Caution

It is not possible to use both this calibration method and other calibration ones together, or mixing them together. Should were the methods taken, measuring results could be the wrong values.

- Prepare the same blast-steel-plate in material as the objective base or, a rough face on non-ferrous base like aluminum and 2 different thicknesses of Thickness standards.
  Please choose the suitable difference of thickness standards from the list below.

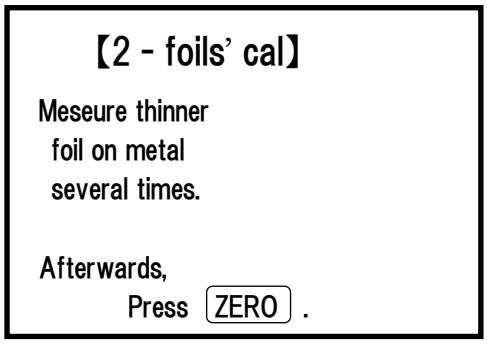
| Predicting film thickness | Difference of thickness standard |
|---|---|
| ～ 49. 9μm | 10μm or over |
| 50. 0 ～ 99. 9μm | 25μm or over |
| 100. 0 ～ 499. 9 μm | 50μm or over |
| 500 ～ 999 μm | 199μm or over |
| 1. 00 ～ 3. 00 mm | 0. 5mm or over |
| 3. 01mm ～ | 2. 0mm or over |

Press and hold the [ZERO] key for 5 seconds.

⇩

The buzzer beeps.

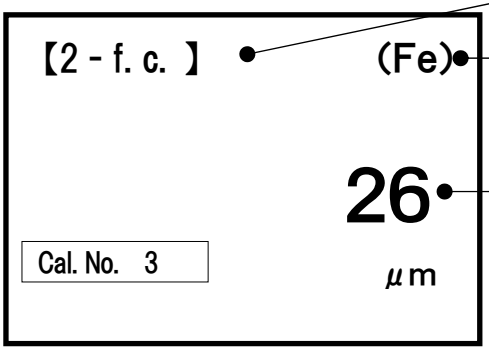
It stops the LOCK function of [LOCK/DELETE] key and changes to one data "DELETE" function.




Press and hold the probe on the thinner thickness standard chosen above, stacked on [ZERO plate] while this message being on display (approx. 20 seconds).

The buzzer beeps whenever pressing the probe.

⇩




It reads that 2-foil calibration is under process.

It reads that a probe of (Fe) series is connected to measure on a ferrous substrate.

Measured value
In case a measured value abnormally deviates, a press of [LOCK/DELETE] key deletes the latest entry and displays the second latest.
All deletion indicates " - " on the reading.

⇩

Press [ZERO] key afterwards.
The buzzer beeps, beeps.

＊Try measuring plural times in range of 2—10 times by pressiing the probe on a thinner「Thickness Standard」.
( a measuring result is indicated whenever the probe is pressed )
＊When repeating measurements 10 times, the buzzer beeps, beeps and changes automatically to the next adjusting process on the reading.

⇩

【2 - foils's cal】
Use [△] or [▽] ,
to set foil
thickness.

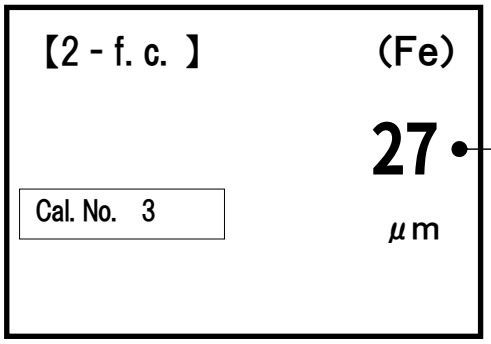
Afterwards,
presss [ZERO] .

**Caution**

This message is indicated for approx. 20 sec. Without new entry during this period by prfessing [△] or [▽] key, the unit automatically returnato the begging from where to start again for calibration.

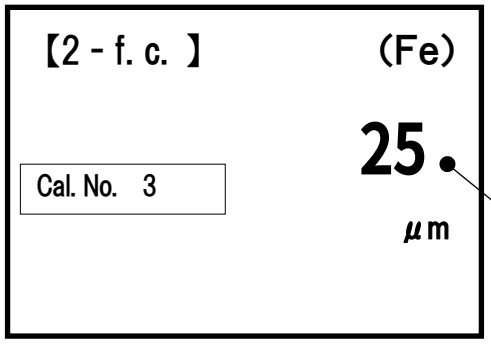
A press o f [△] or [▽] key makes the buzzer beep and mesuaring result appears on the reading.

⇩




Last measureing value

Equate this reading value with thickness Standard (in this example, 25 μm) by pressing [▽] key.




A press of [△] key increase a reading value.

A press of [▽] key decreases a reading value.

Equate this value with the Thickness Standard.

After equating the reading value with the thickness standard , take the following procedures from ① to ②.

① press [ZERO] key
② waite for 5 seconds.

⇩

The buzzer beeps.

⇩

【2 - foils' cal】
Measure thicker
foil on metal
several times.

Afterwards,
press [ZERO].

Press the probe on the thicker「Thickness Standard」stacked on the aforementioned「Zero plate」during this message being on the display (about 20 seconds).

The buzzer beeps whenever pressing the probe.

⇩

【2 - f. c. 】 (Fe)

198

μm

Measured value

In case the measured value abnormally deviates from the thickness standard, a press of [LOCK/DELETE] key deletes the latest entry and show s the second latest value on the reading.

＊ Try measuring plural times in a range of 2～10 times by pressing the probe on the thicker「Thickness Standard.
(a mesasured value is indicated whenever the probe is pressed)

Press [ZERO] key after completion of measuring processes.
The buzzer beeps, beeps.

⇩

【2 - foil's cal】
Use [△] or [▽] ,
to set foil
thickness.

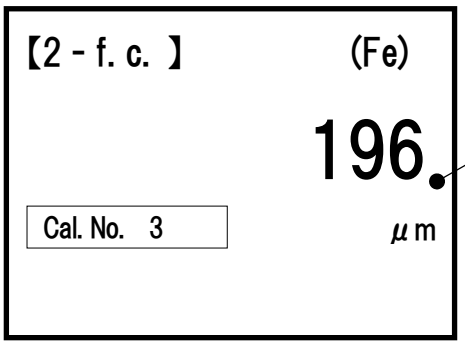
Then, ready for
measure.

＊ When repeating measurements 10 times, the buzzer beeps, beeps and change automatically to the next adjustment on the reading.

Press [△] or [▽] keys to match with Thickness Standard during this message being on display (about 20 seconds).

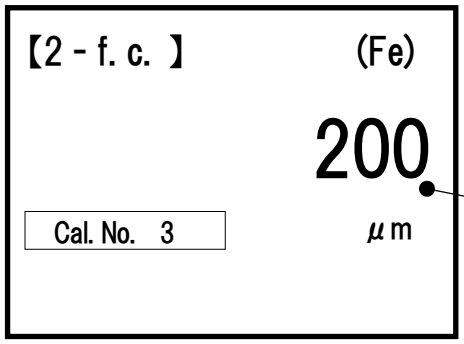
A press of [△] or [▽] key makes the buzzer beeps,
Indicating the last measured value on the reading.

⇩




Last measured v alue

Equate the displayed value with the thickness of Thickness Standard
(in this example 200 μm) by pressing [▲] key.



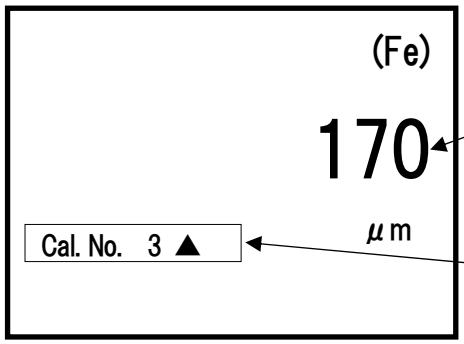

A press of [▲] key increases a reading value.

A press of [▼] key decrease a reading value.

Equate the value with the Thickness Standard.

After matching with the thickness of the Thickness Standard,
choose one of the following ① or ②.

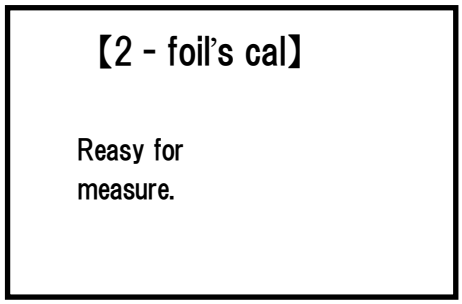
① Press probe to measuring object or Thickness Standard on substrate.
Adjustments be automatically processed and returns to Measuring mode.
The buzzer beeps and indicates a measuring value.




Measuring mode

This mark shows that 「Special adjustment」 data is stored in this number in Calibration.

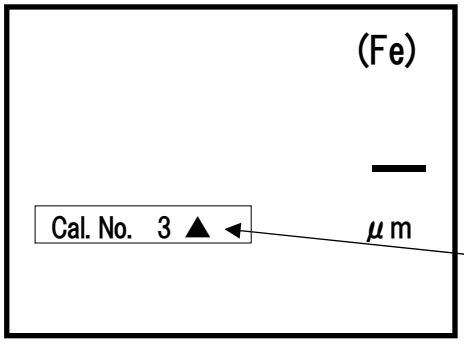
② Waite for about 5 seconds.
Then the buzzer beeps, beeps.



⇩

The buzzer beeps, beeps.

⇩




The unit is now ready to take mesurements and adjustments.

This mark shows that「Special Adjustment」data is stored in this number in Calibration.

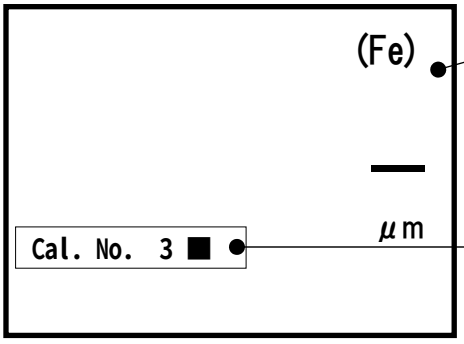
- It is correct that numerical values measured by pressing the probe to the「Thickness Standard」placed on the base like a blast steel plate ndicate「O」 or in the neighborhood of「O」.
- When the measured value results deviate largely from「Thickness Standard」, please try again performing calibration from the beginning.

Note:
The new entry replaces the previous one and the last data measured with「2-foils calibration」is stored.

## (8) How to delete calibration

Take the following procedures to delete calibration when the reading on the screen is locked or after batteries replaced or when it becomes impossible to process 「Zeroing」、「Calibration Standard」(CAL).

- Select 「Cal.No. 」(Calibration) stroring 「Zeroing value」 and 「Thickness Standard Value」 which you want to delete. See at page 14, How to select 「Cal. No. 」.

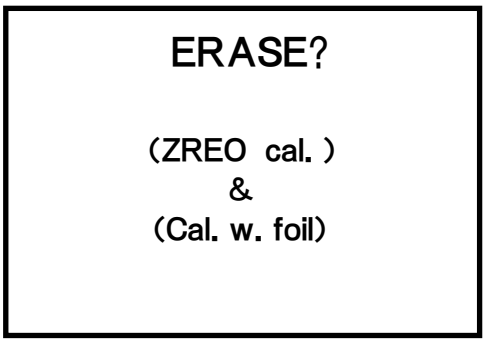



「NFe」I is indicated in case a SWT exclusive probe for 「NFe」 series is connected for use

「Cal. No. 」 storing 「Zeroing」 v alue and 「Thickness Standard」 Value that you want to delete.
「■」 mark means that those values are stored.

When holding [ZERO] key , press [▼] key.
The buzzer beeps, beeps.

⇩

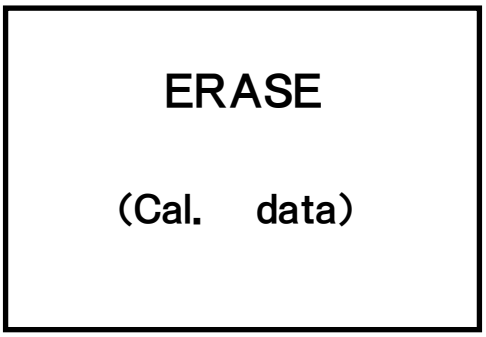



**Press [▼] key during this message on the reading (about 20 seconds)**

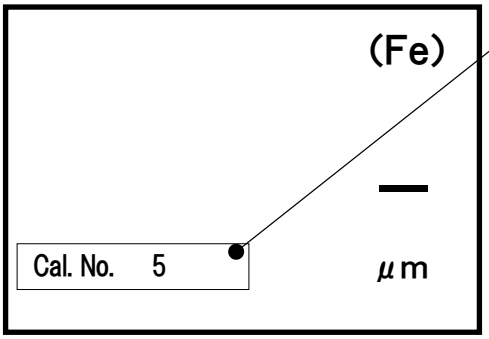
> ⚠ Caution
> This message is indicated for about 20 seconds.
> Unless [▼] key is pressed during 20 seconds the unit interrupts deleting and returns to the beginning . Try again from the beginning if deleting is necessary.

The buzzer beeps, beeps

⇩




⇩



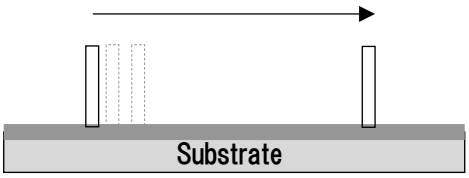

The disappearance of 「■」 mark shows that stored values are deleted and turn blank.
It becomes possible for this unit to take measurementsandadjustments procedures.

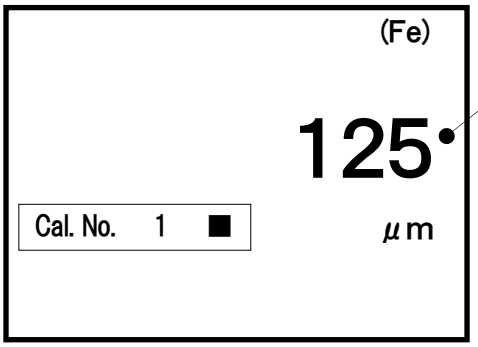
After deleting, take 「Zeroing」,「Calibration Sandard」 procedures proceeding to measuring.

# Function switching

## (1) Switching to Noninterrupt Measurement Mode

Switch to「non-interrupt measurement mode」when it is necessary to slide a probe along the measuring surface of a substrate as illustrated on the right figure for continuous measurements of films.



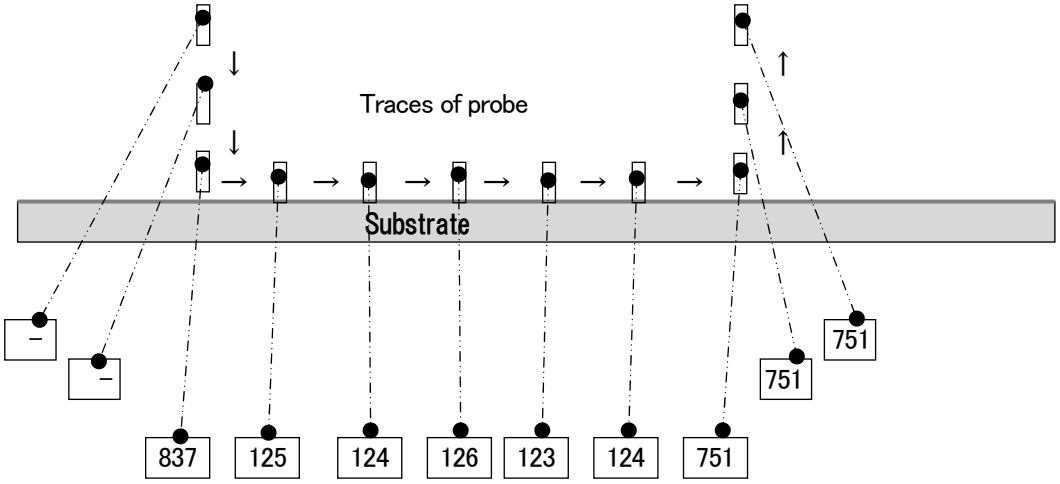

A measuring value is indicated and stored each time a probe is pressed in a normal state.

Hold [ZERO] key and press [▲] key.

The buzzer beeps, beeps.

⇩

This unit has turned into 「noninterrupt measurement mode」. Measurements can be made about in 0.5 seconds intervals and the data is indicated with a beeping sound.




Measuring values on display (indicated with blinking successively each 0.5 seconds interval)

※ The non-interrupt function is stored when switching Power to OFF, and can be maintained until re-activating to switch to ON.

Caution

Note that this measuring method may damage the measuring surface or the probe tip due to sliding frictions. Please try fewer to take this method to minimize the frictions.

## 《Returning to the beginning》

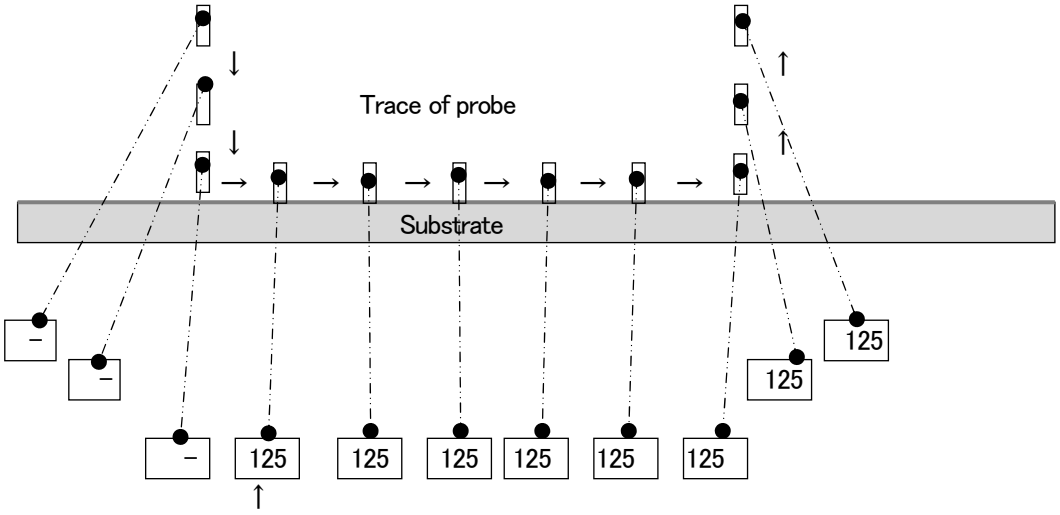
To return 「non-interrupt measurement mode」 to the beginning take the same procedures as at the initial setting.

Hold [ZERO] key and press [▲] key.

The buzzer beeps, beeps.

⇩

「non-interrupt measurement mode」 has been released and returned to the beginning.




Measured values are stored until a next measurement is taken.

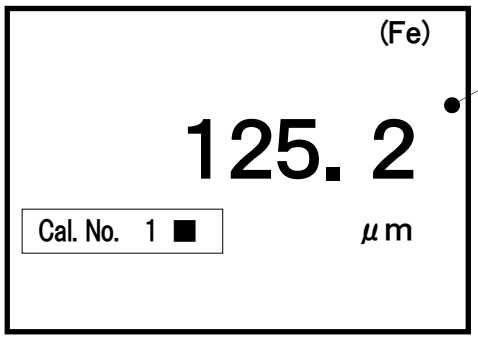
## (2) Switching to Resolution

To inspect precisely a thickness up to 500 μm it is possible to take solution measurements by switching to a 0.1 μm (0～400 μm) unit , to a 0.5 μm (400 ～ 500 μm) unit.
In this case it changes resolution units by taking the following procedures.

- Switch Power to Off.
- Hold [LOCK/DELETE] key and press [ON/OFF] key until the buzzer beeps in the following.

The buzzer beeps, beeps.

⇩




Indicated :
0～400 μm by the 0.1 μm unit,
400 μm～500 μm by the 0.5 μm unit.

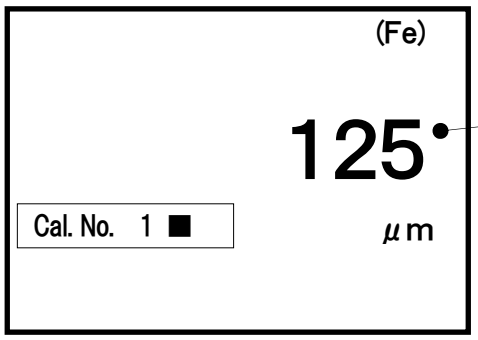
### 《Returning to the beginning》

To return「0.1 μm」display resolution to the beginning take the same procedures as the above.

- Switch power to OFF.
- Hold [LOCK/DELETE] key and press [ON/OFF] key until the buzzer beeps in the following.

The buzzer beeps, beeps.

⇩

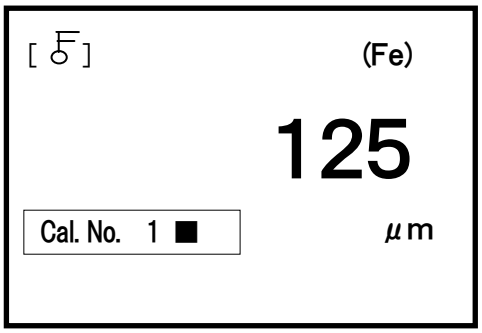



No indication under a decimal point

## (3) Switching to Key Lock Mode

This is to prevent this unit from making errors by inadvertently fingering a key in taking measures.

- Press [LOCK/DELETE] key when Power is On.
  The buzzer beeps.




Any prress of keys except [ON/OFF] key locks the operation to be non-operational to avoid errors.

### 《Releasing lock》

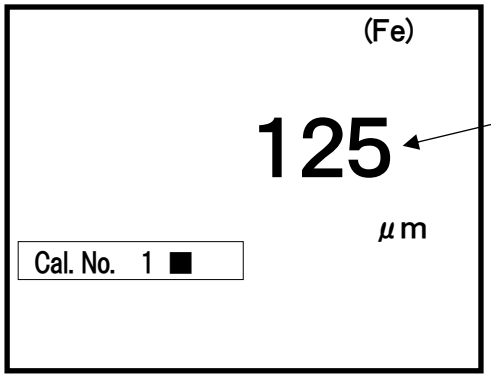
- Press [ON/OFF] key and switch Power off.
- Press [ON/OFF] key and switch Power on.
  The lock has been released and all keys can be activated.

# Measuring

Please use a hand strap to pass your wrist through to prevent a unit from dropping.

According to explanations on page 11 hold a probe and quickly press it to a measuring object.

The buzzer beeps.



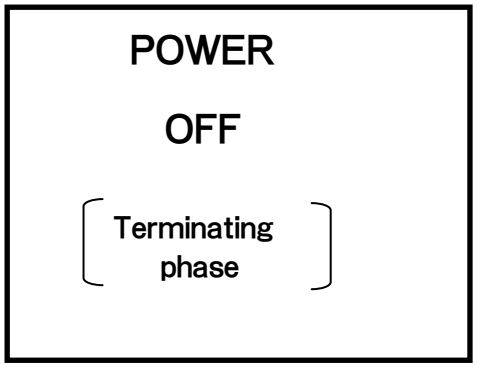

A measured result is indicated.

Each time a probe is pressed to an object the buzzer beeps and the measuring result is indicated.

## 《Auto-Power-OFF》

Power will automatically be switched off 3 minutes after the last entry to save batteries.

The buzzer beeps.




The message lasts for about 5 seconds.

The buzzer beeps.
This unit switches Power off.

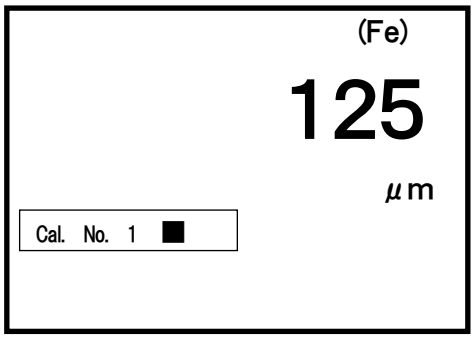
※ SWT－7200Ⅱ equip AC-adaptor as one of accessories. and Auto-Power-Off functions also works with AC-adaptor connected.

# Setting high/low limits value

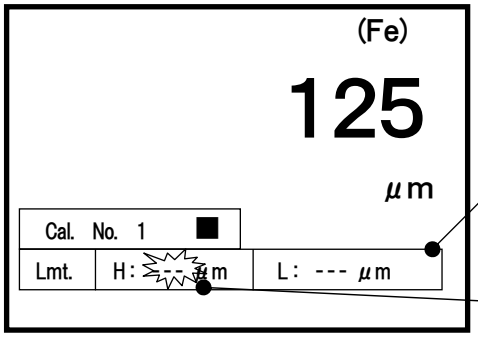
To judge quickly if the coated film thickness of a product stays within a range of thicknesses corresponding to management standards and controls, it is necessary to set high/low limits beforehand and if the numerical value on display exceeds the limits, the number flashes and emits a warning sound.

**Note: A 「CalibrationNo.　」 corresponds to a set of both limits values for settin**

## (1) Setting a High Limit value




Press [H/L] key.
The buzzer beeps.




A setting column for high/low limits is indicated

A high limit column flashes.

Press [▲] key to equate with a necessary value

If the number exceeds, press [▼] key to decrease numbers for equating.

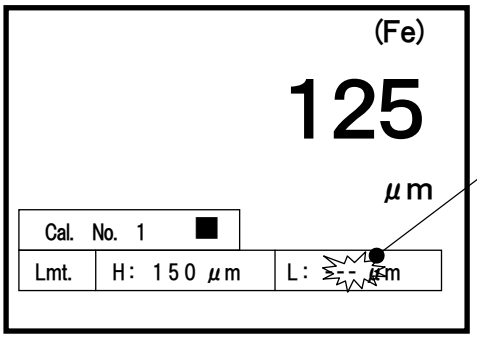
Press [H/L] key.
The buzzer beeps.

**Caution**

A high limit column flashes for about 20 seconds. Press [▲] key during this 20 seconds, or the setting column for high/low limits disappears and returns automatically to the beginning. In this case try again the limit setting from the beginning

Note: When no high limit is needed, press [H/L] key without pressing [▲] key.

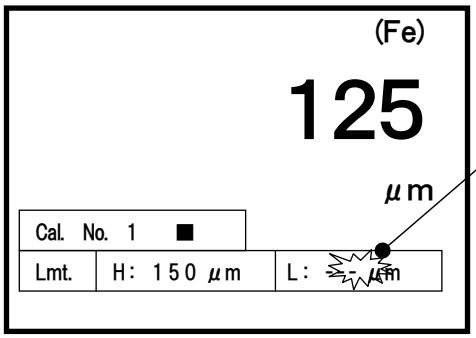
「H: ---　μm」 stops flashing




A low limit value setting column flashes.

When no low limit setting is necessary, press [H/L] key without pressing [▲] key.
And then the buzzer beeps and the unit returns to「measurement and adjustment of this unit」procedures.
When a low limit setting is necessary, take the following operation without pressing [H/L] key.

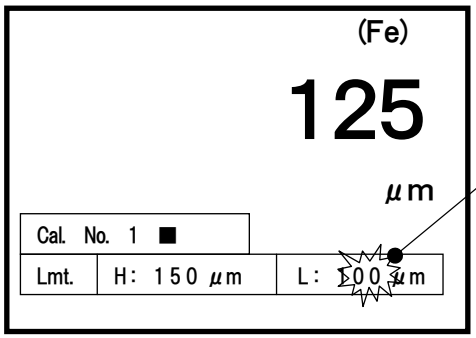
## (2) Setting a Low Limit value (following a high limit value)




A low limit value setting column flashes.

Press [▲] key to equate with necessary value.
If the value exceeds the limit, press [▼] key,
to decrease the value.

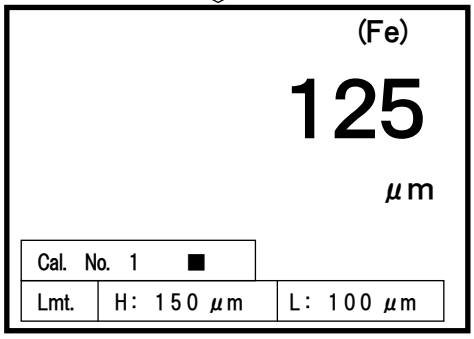
⇩




A low limit value setting column flashes.

Press [H/L] key.
The buzzer beeps.

⇩



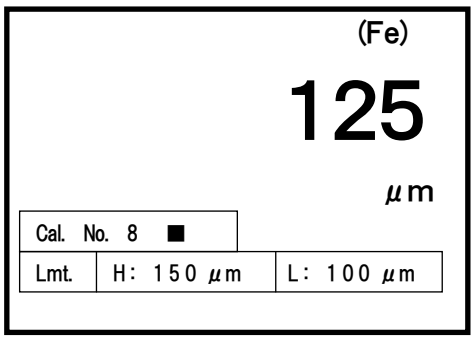

Limit values are set and it become possible to measure and adjust this unit.

**Caution**

A low limit value flashes for about 20 seconds.
Press [▲] key during this 20 seconds, or
a low limit setting interrupts and「L:--- μm」
stops flashing and automatically returns to the beginning. When a low limit setting is necessary,
press twice [H/L] key to turn the screen
into the above left figure.

## (3) Deleting a set limit value.

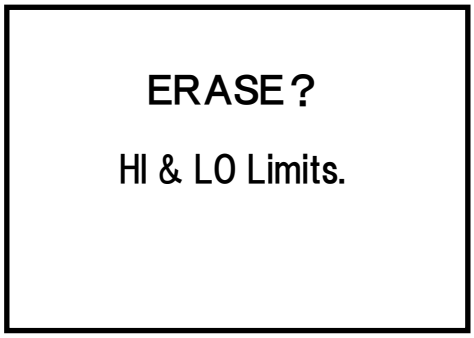
Select a「Calibration No: 」storing limit values to be deleted.
Refer to (How to select「calibration No: 」) on page 14.




Hold [H/L] key and press [DATA ERASE] key.

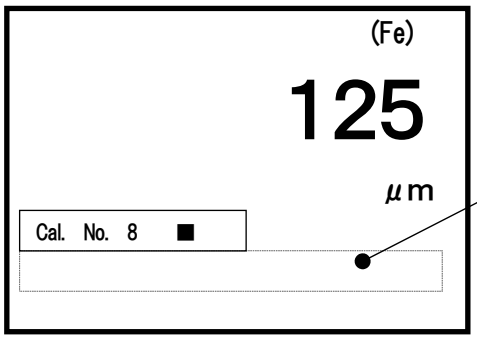
The buzzer beeps, beeps.

⇩




Press [DATA ERASE] key.
The buzzer beeps, beeps.

⇩



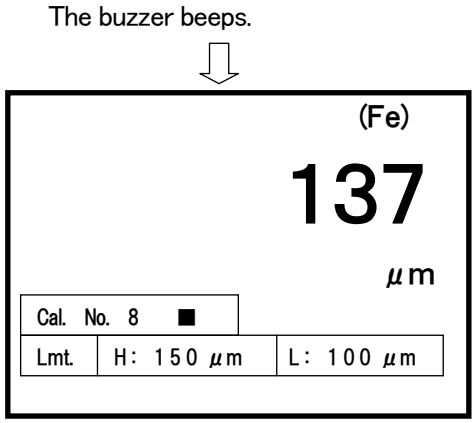

A set limited value is deleted and at the same time a displayed column of the limit value also disappears.

**Caution**

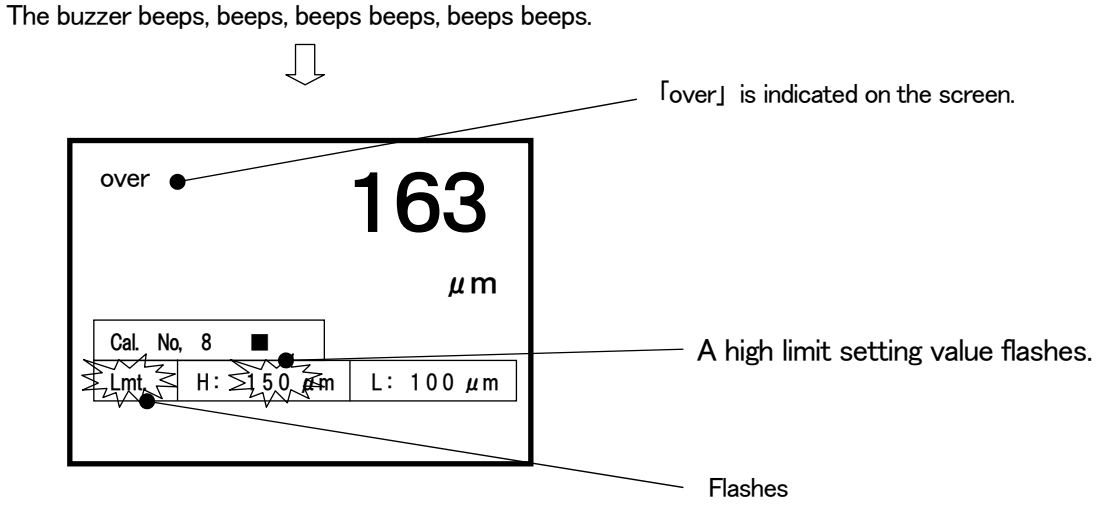
The message of deletion is indicated for 20 sec.
Press [DATA ERASE] during a time of 20 sec.
Or data is not erased and returns automatically to the beginning. Try again from the beginning to delete the limit value.

# Measurements with High・Low limit values

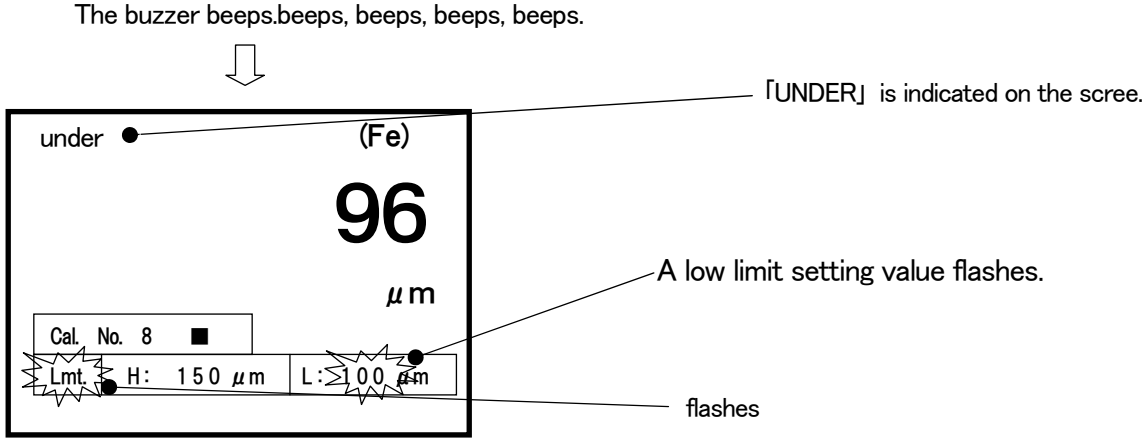
1） Within a range of limit values




（2） When a measured value goes over a high limit value




（3） When a measured value goes under a low limit value.



# Storing measured data

SWT－7200Ⅱ stores Max. 10, 000 data.
Places to store are listed as below.

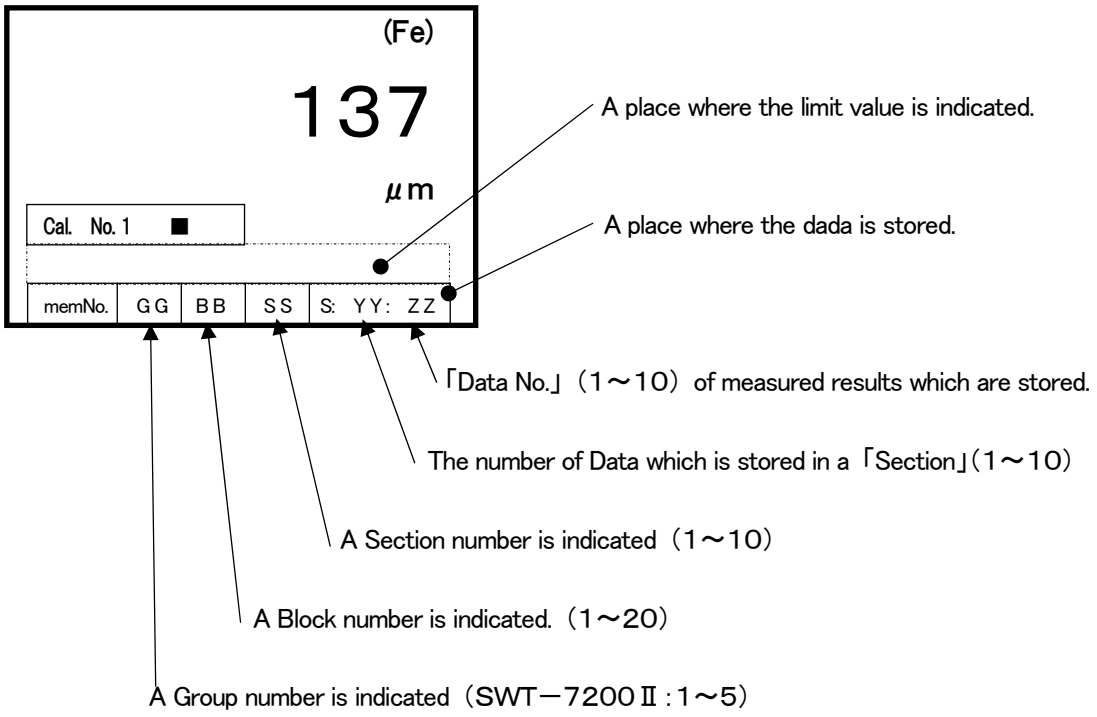
Sections: A section stores 10 data. There are numbers indicated in each「Places to store data」

Blocks: A block contains 10「Sections」. Each section has each independent number.

Groups : A group contains 20「Blocks」. Each block has each independent number.

SWT－7200Ⅱ has 5「Groups」.

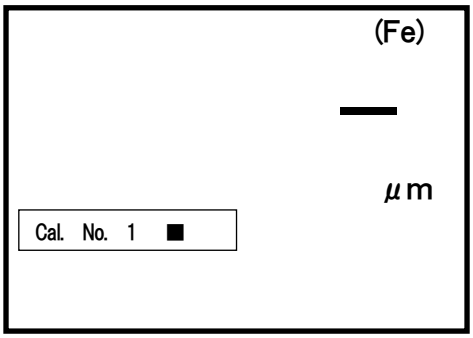
The relating indications are as follows.




Note: the above numbers are as follow when delivered to users.

| | | | | |
|---|---|---|---|---|
| mem No. | 1 | 1 | 1 | s: 10 : 1 |

## （1） How to select a data storing place



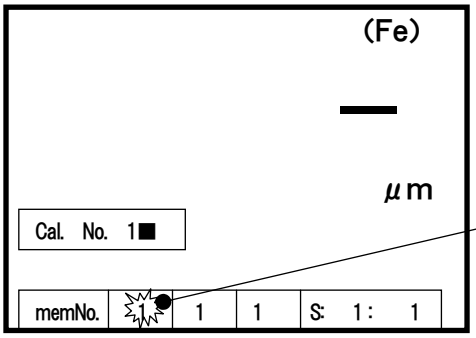

In this example:
A setting is made when storing data from the following
Group number:「3」
Block number:「12」
Section number:「1」

And a storing number per section is set at「8」.

Press [MEM.-SEL] key.

The buzzer beeps.

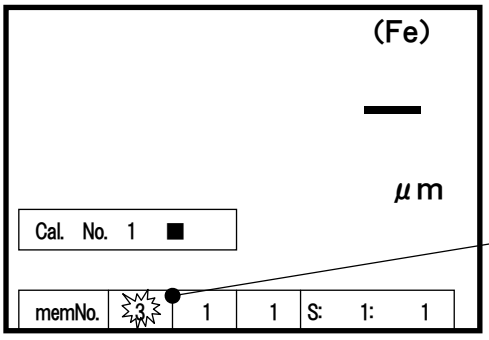
⇩




Note: The Figure on the left shows numbers when this unit is delivered.

Press [▲] key, or [▼] key.
Select a Group No.「3」.

⇩

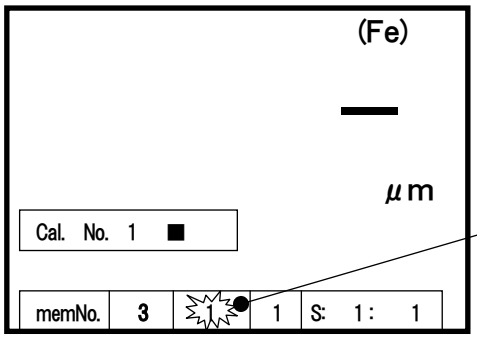



**Caution**

A memory number flashes for about 20 sec.
Press [MEM.-SEL] key otherwise the flashing interrupts and the previous indicated value remains set, returning to「Ready to measurements and adjustments」Try again from the beginning if necessary to change a group number.

Press [MEM.-SEL] key.
The buzzer beeps.

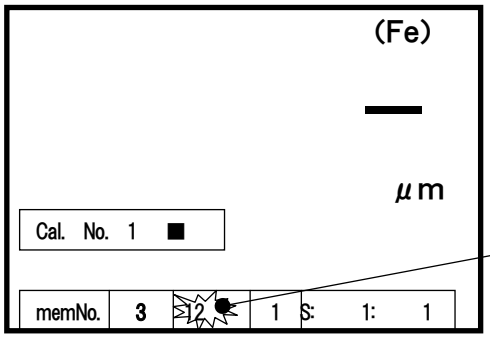
⇩




A group No.「3」 is set.
Then moving on to setting a Block No.

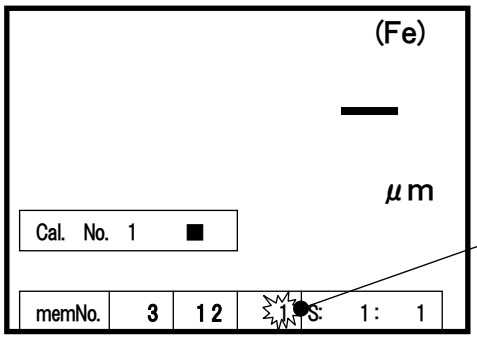
Flashes.

Press ▲ key or ▼ key to select a Block No.「12」.




Flashes.

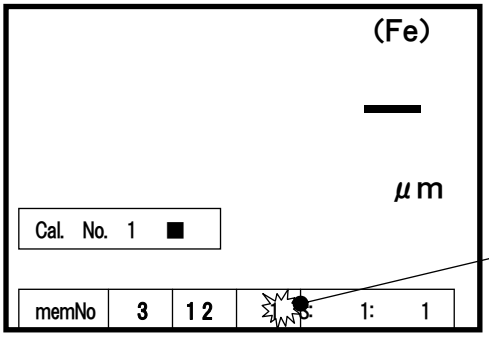
Press MEM.-SEL key.
The buzzer beeps.




A Block No.「12」 is set.
Then moving on to setting a Section No.

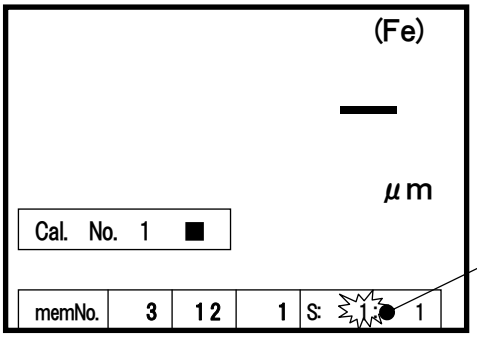
Flashes.

Press ▲ key or ▼ key to select a Section No.「1」.




Flashes

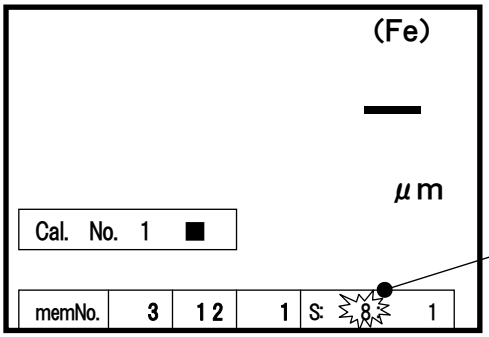
Press [MEM.-SEL] key.
The buzzer beeps.




A Section No.「1」 is set.
Then moving on to setting a storing number in one section.

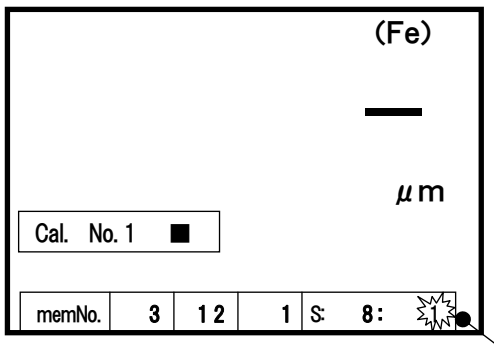
Flashes.

Press [▲] key or [▼] key to select a storing number「8」.




Flashes

Press [MEM.-SEL] key.
The buzzer beeps.

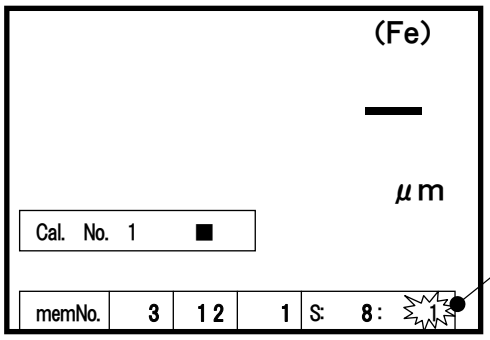



Designate the first storing place in a「First Section to store」 for data storing with a number.

In this example, designate to start storing from「the first (1) in Section」.

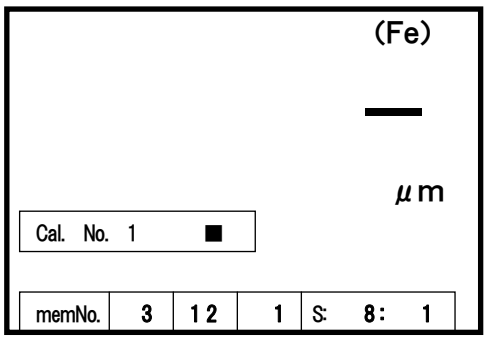
Press [▲] key or [▼] key to select the first storing place「1」.

Flashes




Flashes

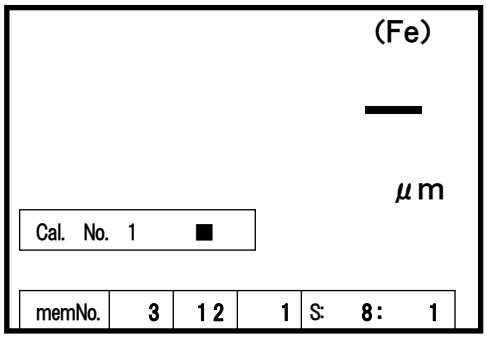
Press MEM.-SEL key.※
The buzzer beeps.




※ Note
Pressing twice MEM.-SEL key turns the screen to a stage of 「Data is not stored」 and then 「Data storing place」 disappears on the screen.
To store measured data press MEM.-SEL key 6 times successively and 「Data storing place」 as Fig. on the left is displayed. And make sure that any numbers on the screen do not flash.

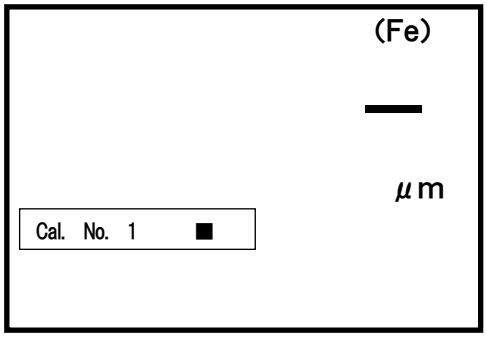
「Setting a data storing place」has completed and it becomes possible to take「Measurements and adjustments」procedures.

## (2) How to keep data from being stored




The screen is on the stage of 「Data is stored」.

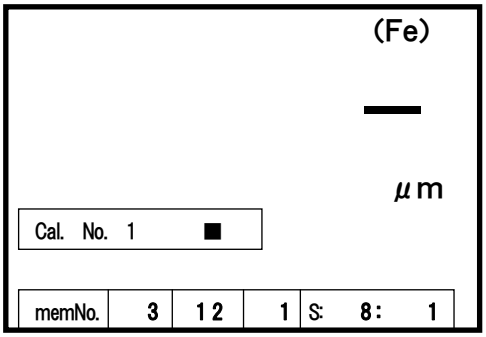
Press MEM.-SEL key.
The buzzer beeps.




The screen turns to a stage of 「Data is not stored」.

# Measurements in storing data

● Prepare this unit for measuring in storing data with 「Data is stored」 on the screen.

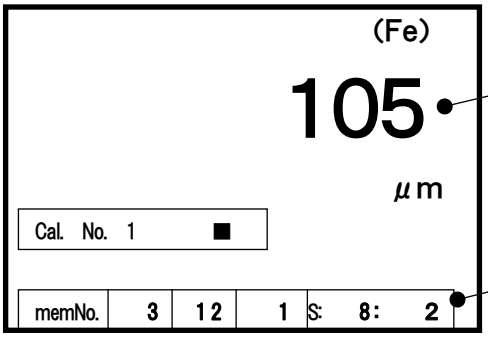



Measured data are stored in the following steps:
Data are stored in order into a 「Group No. : 3」,
a 「Block No.: 12 」, a 「Section No.: 1」 and
a 「Data No.: 1」

● According to explanations on page 11, press quickly and hold a probe to a measuring object

The buzzer beeps.

⇩



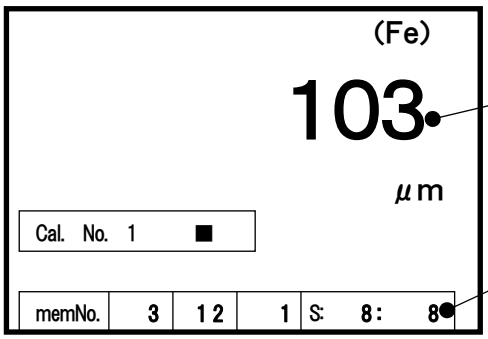

A measured result is indicated.

The number in a stored place advances to 2
A data measured now is stored in a 「1」.

A number advances by one each time a measurement is taken.
The number advances to 「7」 and the following 8th measuring is:

⇩

The buzzer beeps, beeps and data is stored in the last end of this section,
The beeping warns ttha a section number advnces by one with the following measurement.



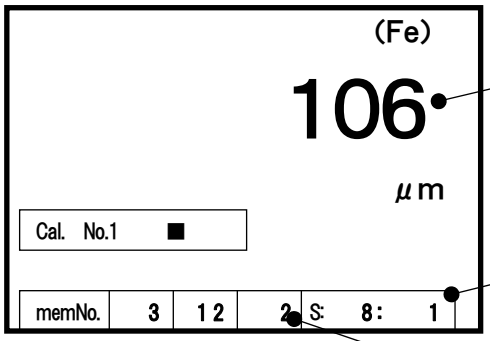

A measured result is indicated.

A number in a storing place advances to「8」.

8 pieces of Data measured are stored in places from
the numbers of 「1」 to 「8」.

⇩

The following measurement is taken.
The buzzer beeps.

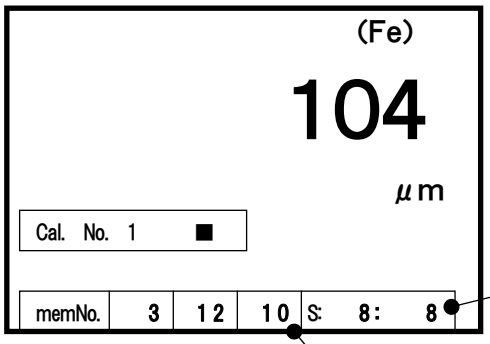



A measured result is indicated.

The number in a storing place returns to「1」.

When「Section No: 1」is filled, it moves in order on to 「Section No.: 2」and data is stored in the previous place each time a new measurement is taken.

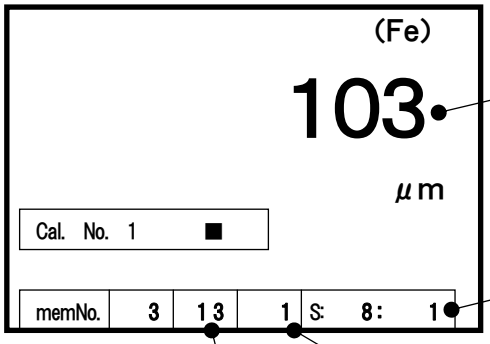
In a next case, As measurement data have been stored , they reached to a「Section No.: 10」、 a「Data No.: 8」:




A storing place turns「8」.

A section No. turns「10」.

A measurement is taken.
The buzzer beeps.




A measurement result is indicated.

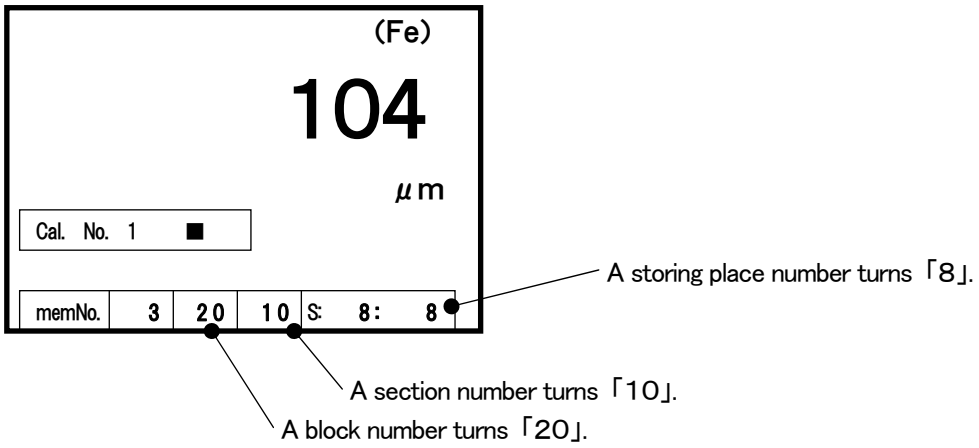
The number in a storing place returns to「1」.

A section number returns to「1」.

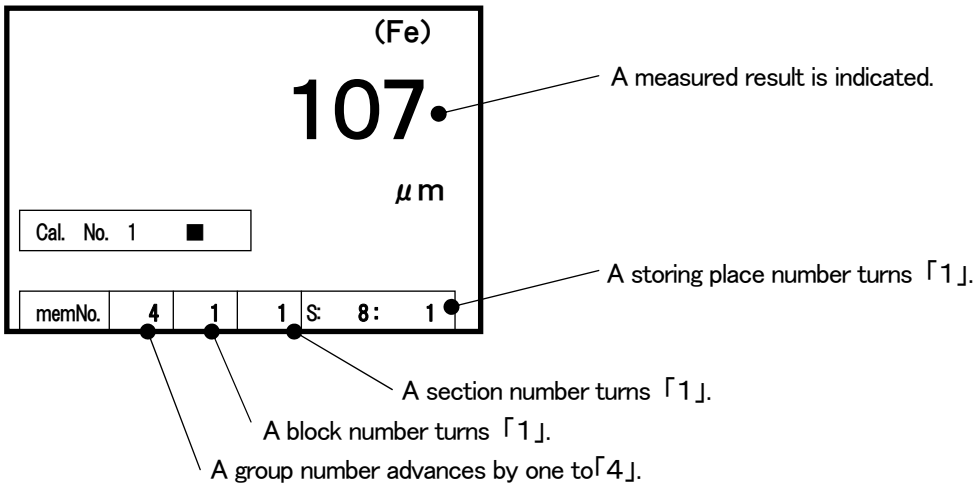
A block no. advances by one to「13」.

A storing place of「Block no.: 12」( = 8 data／section × 10 section = 80 ) becomes full of measured data , and then accordingly in order moves forward to a 「Block no. :13」each time measuring is taken.

When reaching to a「Block No.: 20」、a「Section No.: 10」、
A「Data No.: 8」:

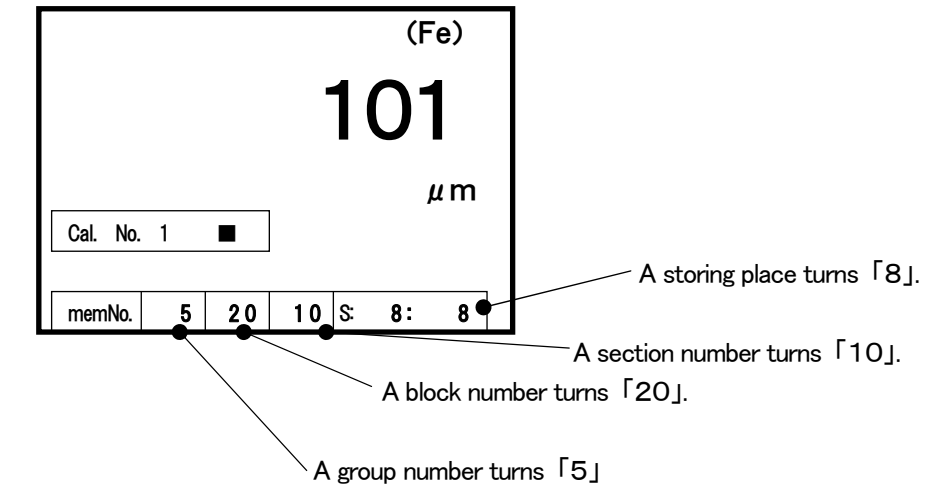



A measurement is taken.
The buzzer beeps.




A storing place of「Group No.: 3」( = 8 data／section × 10 section／block × 20 block = 1, 600 ) becomes full of measured data, and then accordingly in order moves forward「 Group No.: 4」each time a measurement is taken.

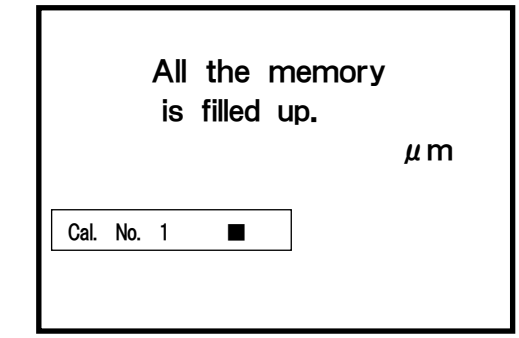
◆ When reaching to a「Group No. : 5 」(SWT－7200Ⅱ),
a「Block No.: 20」、a「Section Number: 10」、a「Data Number: 8」.




⇩

A measurement is taken.
The buzzer beeps.

⇩

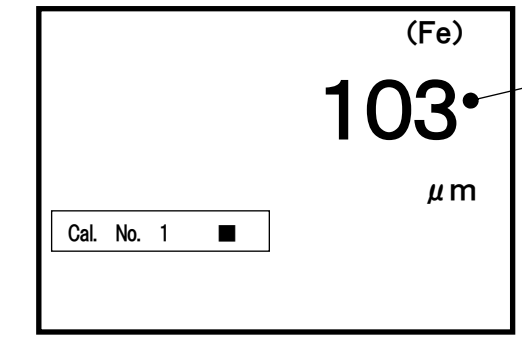



◆ There are 3 kinds of measurement methods when no memory place is empty.

（1） Continuing measurements

● Measuring
The buzzer beeps.

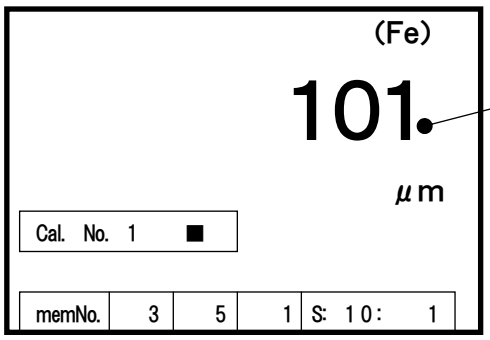
⇩



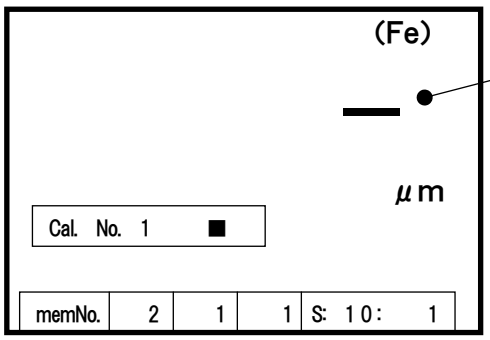

**Caution**
Measuring can be continued but data can not be stored.

## （2） Looking for an empty storing place

- Interrupt measuring.
- According to「How to select a data storing place」procedures on page 40 , select an unoccupied place.




If data is stored in a selected place, the value is indicated.

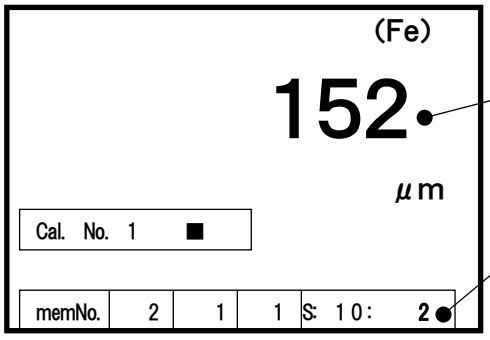



If a selected place is unoccupied,
「—」mark is indicated.

**Caution**

As depending on measurement quantities, 5～6 blocks (500～600 : storing quantity) recommended for selecting as empty places to store successively.

Measuring resumed.
The buzzer beeps.




A measured value is indicated.

A measured value is stored and advances the number of a storing place by one.

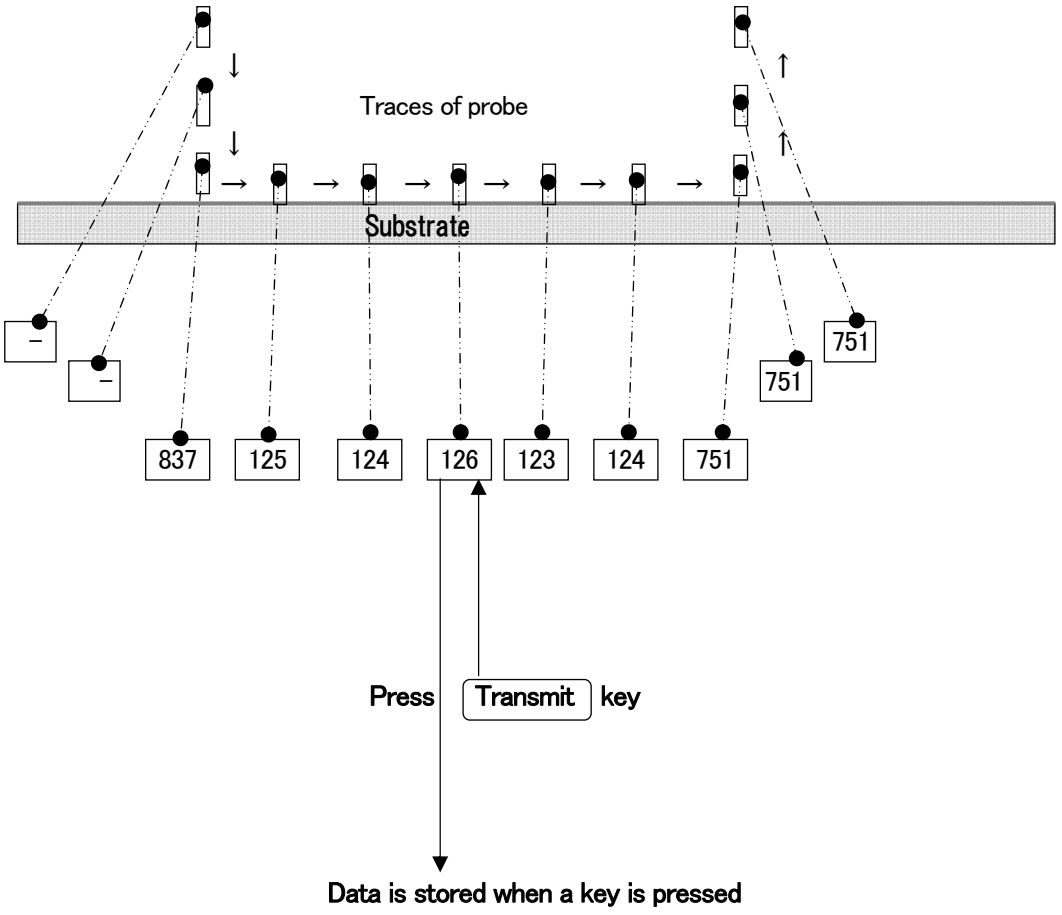
## （3） Deleting an unnecessary data

- Delete an unnecessary data in a storing place and store there new data which is to be taken.
- When all stored data is unnecessary, delete all of them.
  Refer to「Deletion of data」on page 51 to delete.
- Resume「Measurements in storing data」procedures afterward.

# Storing Measuring Data at Non-Interrupt Measurment Mode

**It is possible to store data in a prescribed storing place by sampling data in the following methods when this unit is set at Functions of「Storing Measuring Data and「Non-Intrrupt Measuring Mode」 described on page 30.**

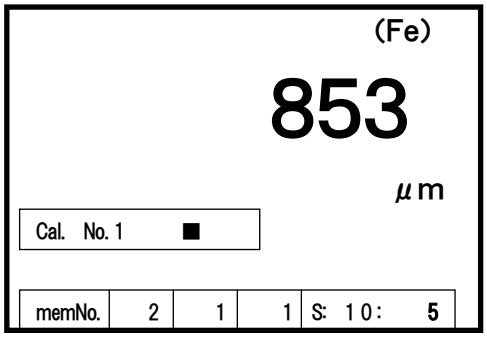
- Select a data storing place according to procedures「Select a data storing place」describe on page 40.
- Start Non-Interrupt Measurement.



# Deletion of a piece of data

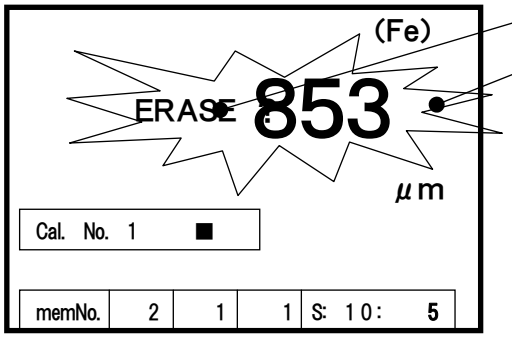
Inadvertently pressing a probe against objectives、poor and unstable press on objects make erroneous data which are stored can be deleted.

Erroneous value is indicated.




Press DATA ERASE key.

The buzzer beeps.




「ERASE？」 appears on the screen.

The measured value flashes.

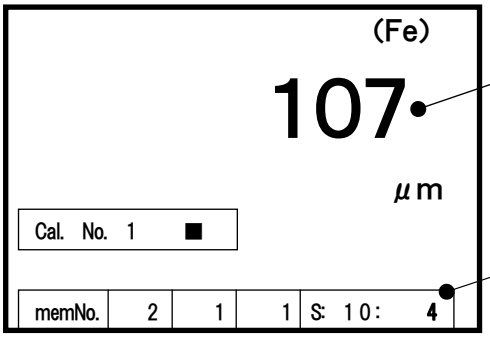
**Caution**

A measured value flashes for about 20 sec. Press DATA ERASE key during a time of 20 sec. otherwise the buzzer beeps, beeps to stop flashes and returns to a 「Measurements and adjustments」 operational stage.

If data deletion is necessary, try again pressing DATA ERASE key to start.

Press DATA ERASE key.

The buzzer beeps.



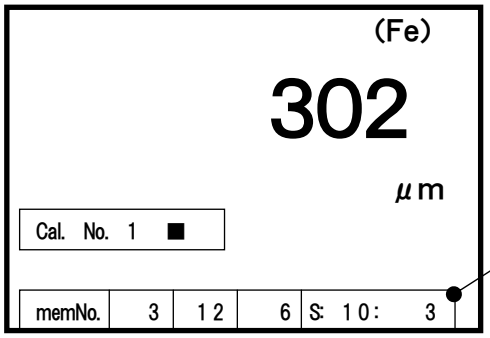

A last data (one step before) is indicated.

A storing place number returns to the last one.

# Deletion of all data

When data stored in a storing place are no more necessary, it is possible to delete it and store new data.
(deletion of data)

## (1) Deletion of 『all data』 stored



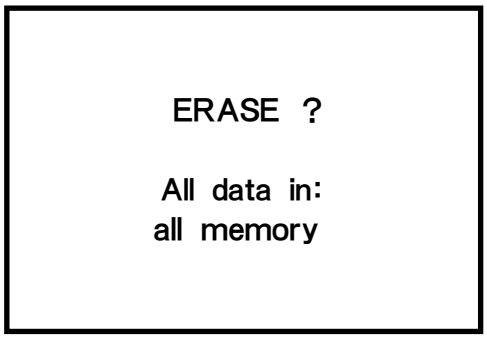

(Indication example)

**Caution**

Make sure that a data storing column is indicated. If it is not indicated, press MEM.-SEL key to activate the indication.

Press MEM.CLEAR key.
The buzzer beeps, beeps.

⇩

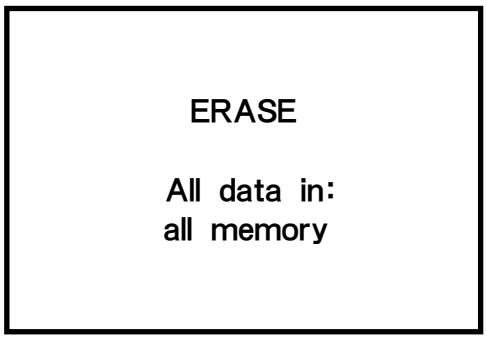



**Caution**

The message of deletion is indicated for about 10 sec. Press MEM.CLEAR key, otherwise the buzzer beeps, beeps, and the message disappears and this unit returns to 「Measurements and adjustments」operational stage.
If necessary to delete data, press MEM.CLEAR key to start up

Press MEM.CLEAR key.
The buzzer beeps, beeps.

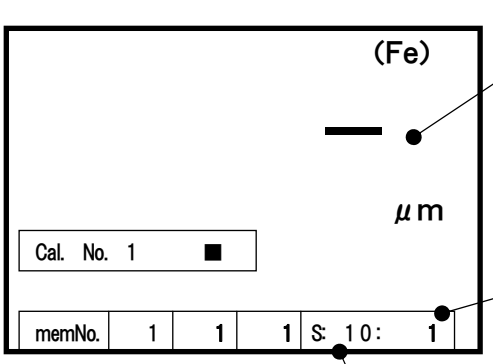
⇩




All stored data are deleted.

The buzzer beeps.

⇩




「 — 」mark is indicated.

In a data storing place, the following indications turn to (1).:

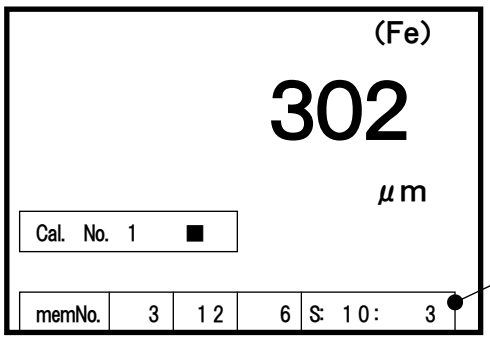
「Group No.」
「Block No.」
「Section No.」
「Data No.」

A data number per section turns to the initial stage「10 」.

# Deletion of data (group)

## (2)Deletion of data stored in a 『Group No.』

Group numbers: 1～5 (SWT－7200Ⅱ)

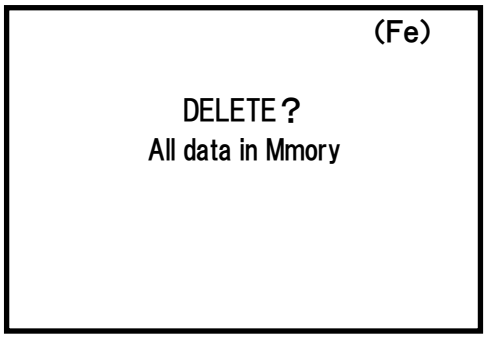



(Indication example)

**Caution**

Make sure that an indication colum is indicated. When the indication colums Is not indiated, pre MEM-SEL key to activater the indications.

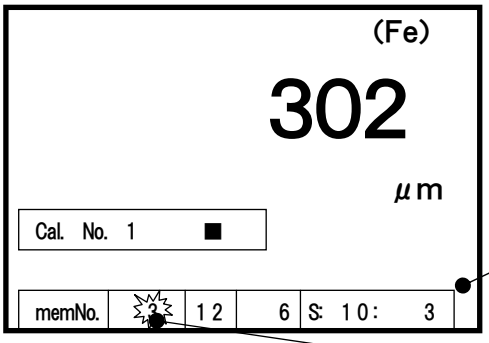
Press MEM.-SEL key.
The buzzer beeps.




**Caution**

The message of deletion is indicated for about 20 sec. Press MEM.-SEL key during this period, otherwise the buzzer beeps, beeps to delete the message and this unit returns to 「Measurements and adjustments」 operational stage.. If necessary to delete data, press MEM.-SEL key to start up

Press MEM.-SEL key.
The buzzer beeps.beeps.

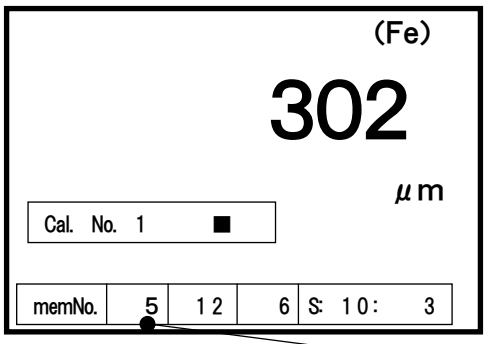



When deleting data stored in Group No.「5」.

A data indication column is displayed.

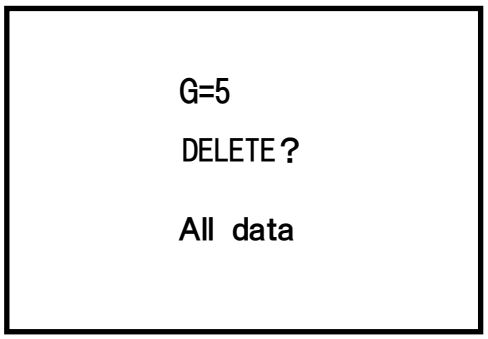
A「Group No.」flashes.

Select a group no. in which to delete data by pressing [▲] key or [▼] key

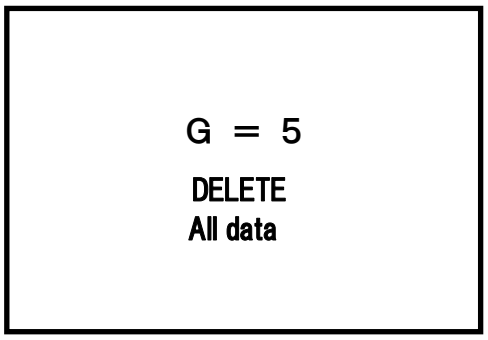



Press [MEM.CLEAR] key.
The buzzer beeps, beeps.

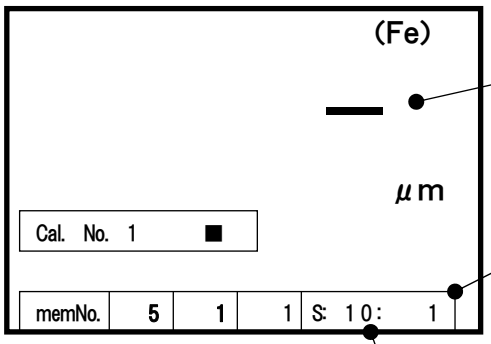
Select a group No.「5」




Press [MEM. CLEAR] key.
The buzzer beeps, beeps,



The buzzer beeps, beeps.




「－」 mark is indicated.

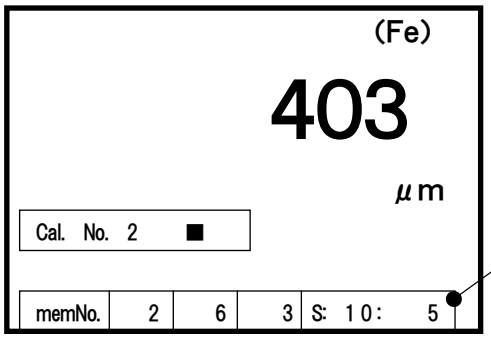
In an indication column of a data storing place,
the indications are as follows:
「Group No.」: 「5 」
「Block No.」: 「1 」
「Section No.」: 「1 」
「Data No.」: 「1」

A total data number per section is「10」.

# Deletion of data (block)

## (3) Deletion of data stored in a 『Block No.』 in a group.

Block numbers: 1～20 (SWT-7200Ⅱ)

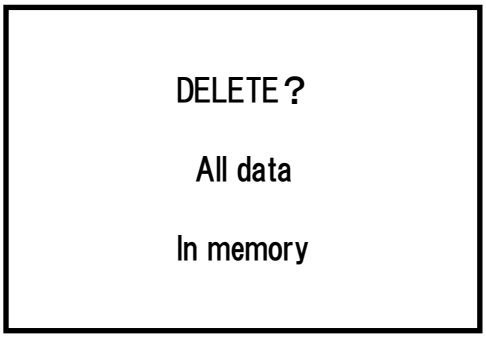



(Indication example)

An indication column of a data storing place is indicated.

Press [MEM. CLEAR] key.
The buzzer beeps,l beeps.

⇩

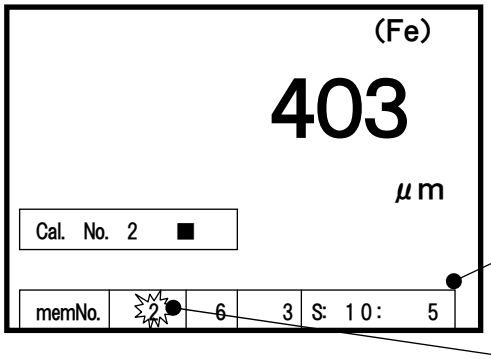



**Caution**

The message is indicated for about 20 sec.
Press a key during this period to move to a next stage, otherwise the buzzer beeps, beeps, to delete the message and returns the unit 「Measurement and adjustments」 operational stage.
If necessary to delete data stored in a block no. press again [MEM.-SEL] key to start.

Press [MEM.-SEL] key.
The buzzer beeps, beeps.

⇩

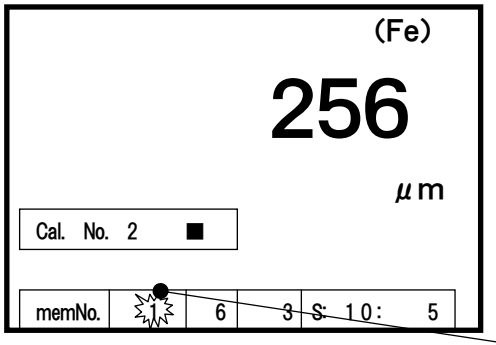



A data indication column is indicated.

「Group No.」 flashes.

Press [▲] key or [▼] key to select a group number where there is a block no. to be aimed at.

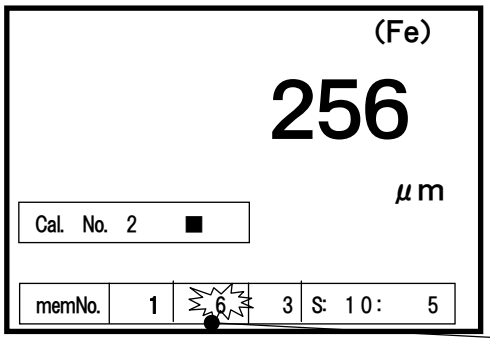
⇩




Select a「Group No 1.」

Press [MEM.-SEL] key.
The buzzer beeps.

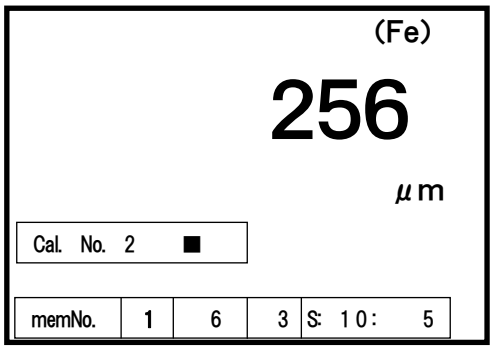
⇩




「Group No.」 is set at「1」, and
「Block No.」 flashes.

Press [▲] key or [▼] key to select a group no.
where there is a block no. to be aimed at.

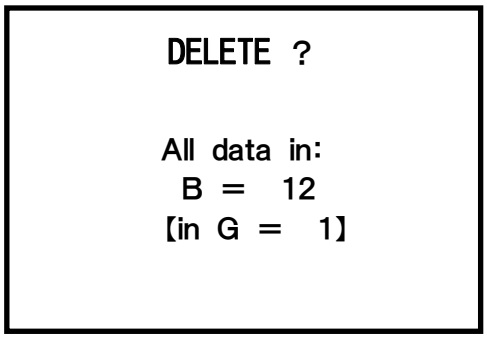
⇩




Select a group No.「12」.

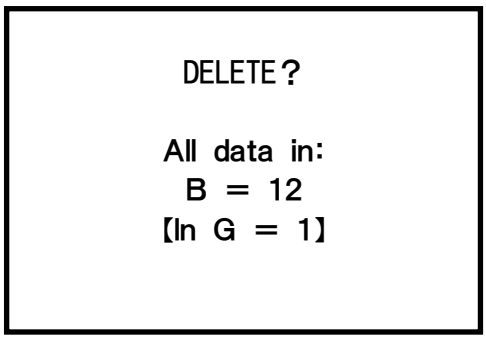
Press [MEM. CLEAR] key.
The buzzer beeps, beeps.

⇩



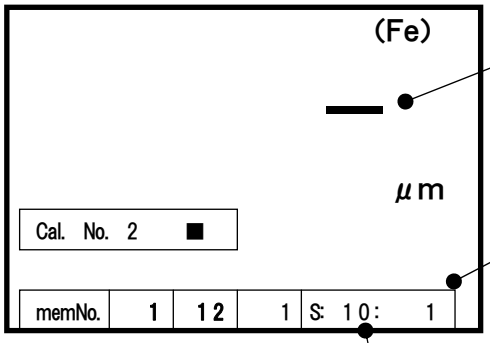

Press [MEM. CLEAR] key.

⇩




The buzzer beeps, beeps.

⇩




「－」 mark is indicated.

In an indication column of a data storing place, the indications are as follow.

「Group No.」: 「1 」

「Block No.」: 「12 」

「Section No.」: 「1 」

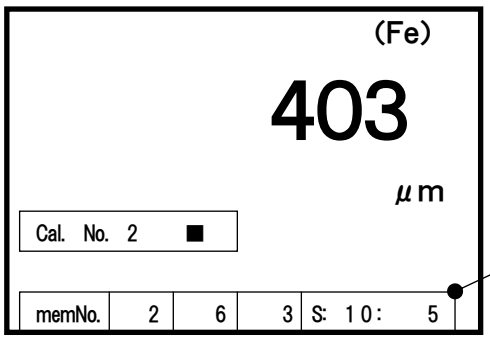
「Data No.」: 「1」

A total data number per section turns to 「10 」.

# Deletion of data (section)

## (4) Deletion of data stored in a 『Section No』 in a block in a group.

Section numbers: 1～10 (SWT-7200Ⅱ)




(Indication example)

An indication column in a data storing place is indicated.

Press [MEM.-SEL] key.
The buzzer beeps, beeps.

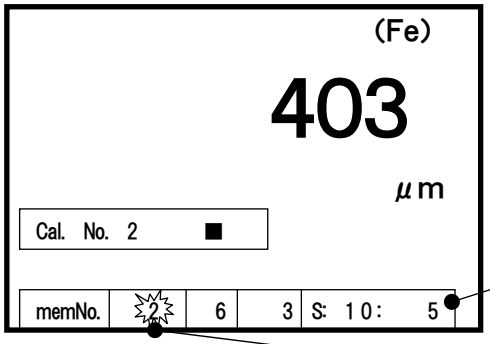
⇩


**CAUTION**

The message is indicated about 20 sec. Unless press [MEM.-SEL] key during this period, the buzzer beeps, beeps to delete the message and returns to 「Measuremnets and adjustments」operational stage.
If necessary to delete data stored in a section no., press again [MEM.=SEL] key to start.

Press [MEM.-SEL] key.
The buzzer beeps, beeps.

⇩



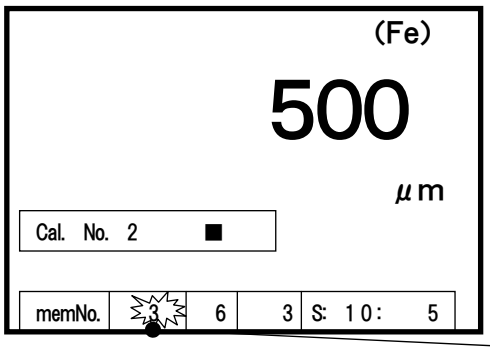

In case of deleting all data stored in a section No.「5」of block No.「7」of a group no.「3」

A data indication column is indicated.

「Group No.」flashes.

Press [▲] key or [▼] key to select a group number where there is a block No. to be aimed at.

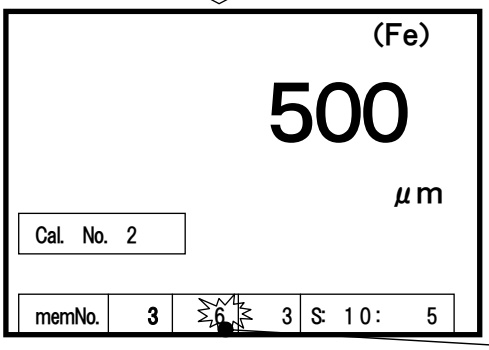
⇩




Note: When deleting data stored in a 「 section: 5 」 included in a block「7」 of a group No.「3」.

Select「Group No 3.」: flashes.

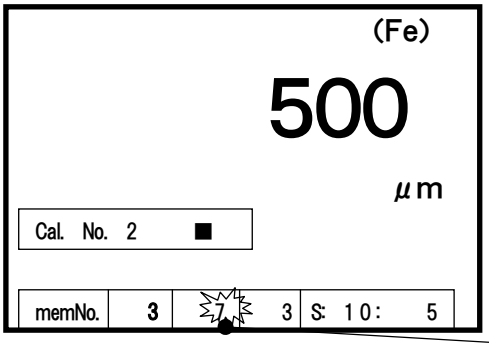
Press [MEM.-SEL] key.
The buzzer beeps.




Note: When deleting data stored in a 「Section: 5」 of a block No. (7).

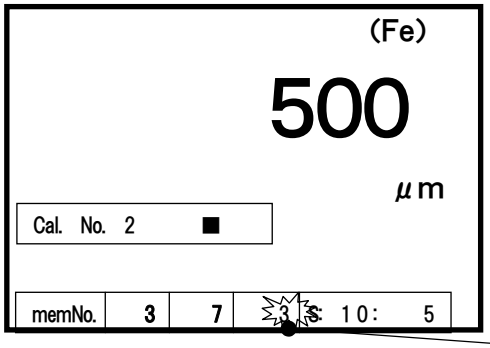
「Group No.」 is set at「3」 and 「Block No.」 flashes.

Press [▲] key or [▼] key to select a block number where there is a section to be aimed at.



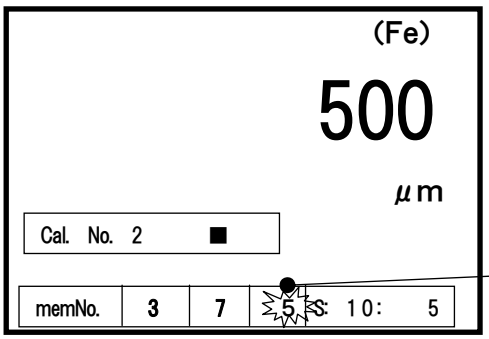

Select「Block No.」:「7」 flashes.

Press [MEM.-SEL] key.
The buzzer beeps.



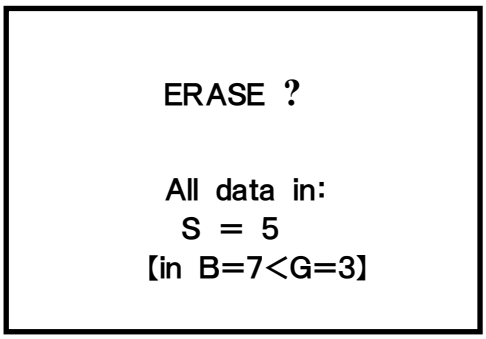

「Block No. 」 is set at「7」.
「Section No.」:「3」 flashes.

Press [MEM.-SEL] key.
The buzzer beeps.

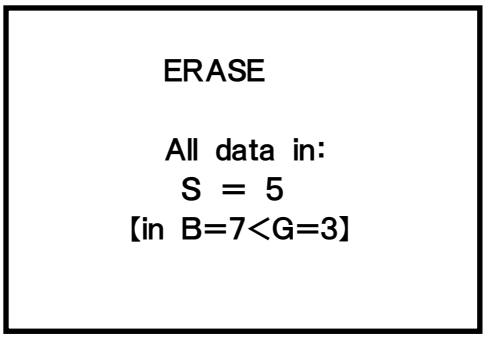



Select a section No.「5」

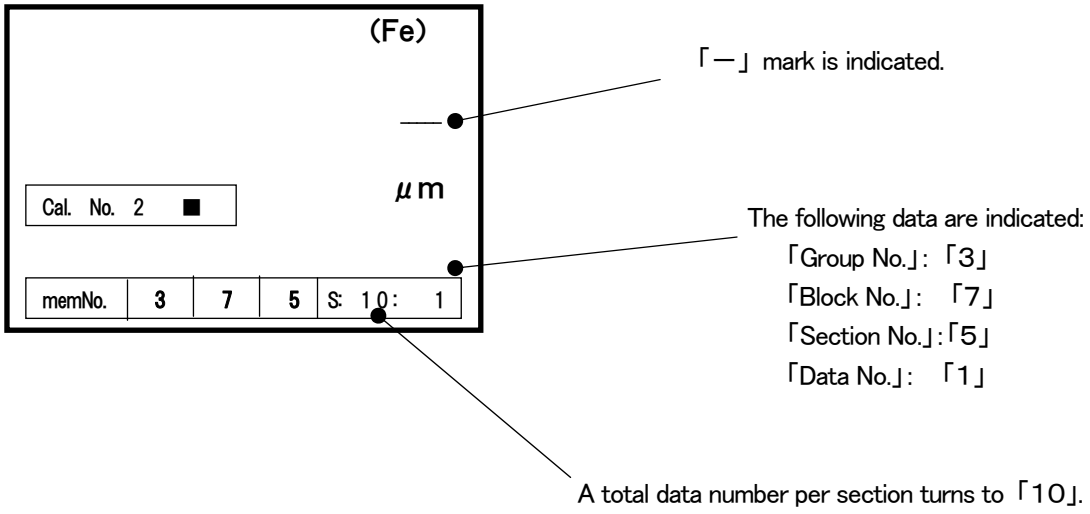
Press [MEM. CLEAR] key.
The buzzer beeps, beeps.




Press [MEM. CLEAR] key.

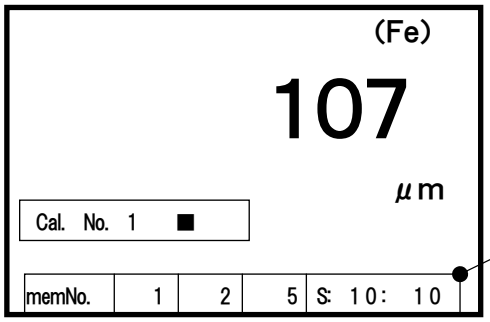


The buzzer beeps.



# Statistics

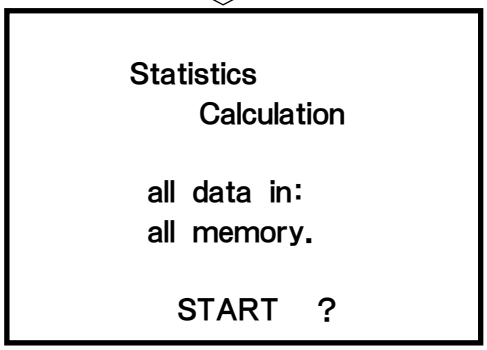
## （1） Statistics of 『all data』 stored （statistical calculation value of data is indicated）




Information in a storing place is indicated.

Press [STATIS-TICS] key.
The buzzer beeps, beeps.

⇩

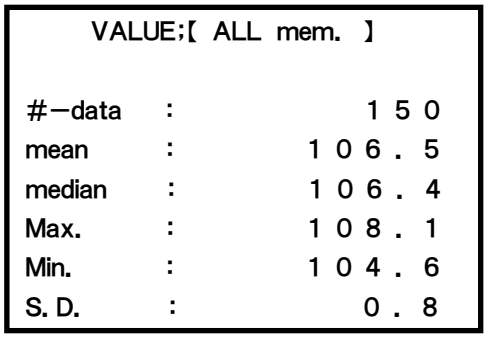



**Caution**

The message is indicated for bout 20 sec.
Press [STATIS-TICS] key ( the 2nd time),
otherwise the buzzer beeps, beeps, and this unit returns to 「Measurements and adjustments」 operational stage.
If necessary to take statistical calculations, try again pressing [STATIS-TICS] key to start up.

Press [STATIS-TICS] key.
The buzzer beeps, beeps, beeps （under process of calculations）.

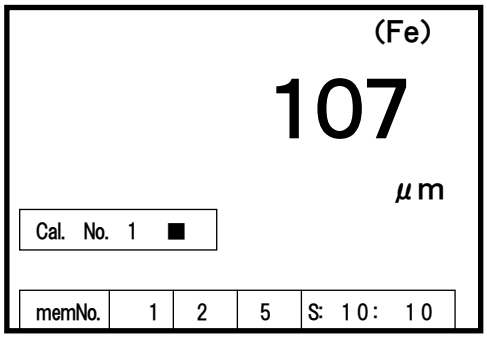
⇩




Press [STATIS-TICS] key.
The buzzer beeps.

Note: Keeping [STATIS-TICS] key from being pressed and left alone, this stage remains unchanged until 「Auto Power Off」 switches Power off.

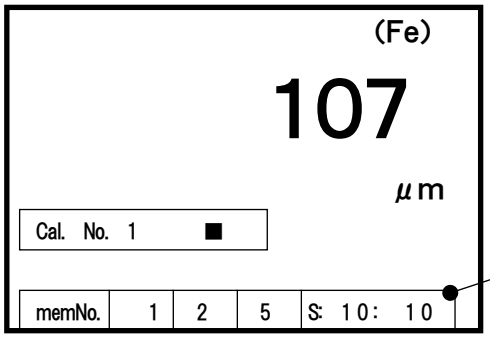
⇩




Returning to a stage before statistical calculations

## (2) Statistics of data stored in 『Group No.』.

Group numbers : 1～5 (SWT-7200Ⅱ)

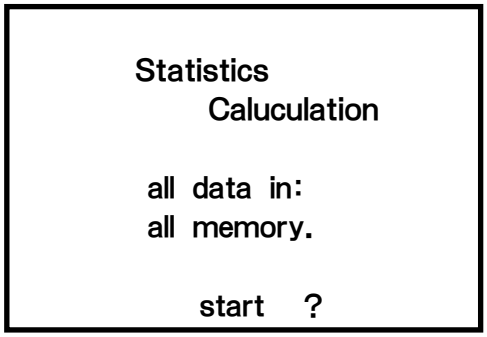



In case of statistical operations of data stored in a group number「3」.

Information in a storing place is indicated.

Press [STATIS-TICS] key.
The buzzer beeps, beeps.

⇩

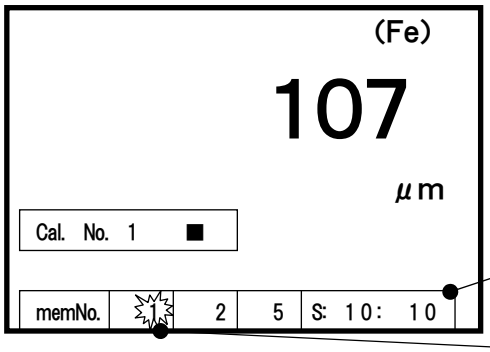



**Caution**

The message is indicated for about 20 sec.
Press key during this period, otherwise the buzzer beeps, beeps, and the unit returns to「Measurement and adjustments」operational stage.
If statistical calculation is necessary, try again pressing [STATIS-TICS] key to start up

Press [MEM.-SEL] key.
The buzzer beeps.

⇩

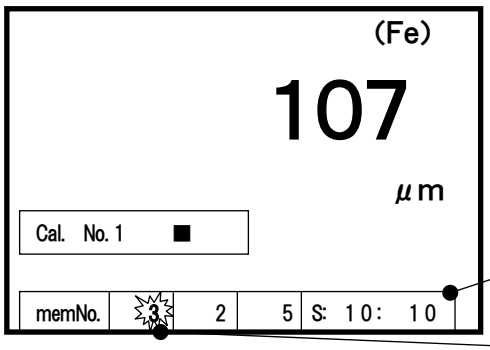



Information in a storing place is indicated.

A group No. flashes.

Press [▲] key or [▼] key to equate with a group number storing data of statistical calculations.

⇩



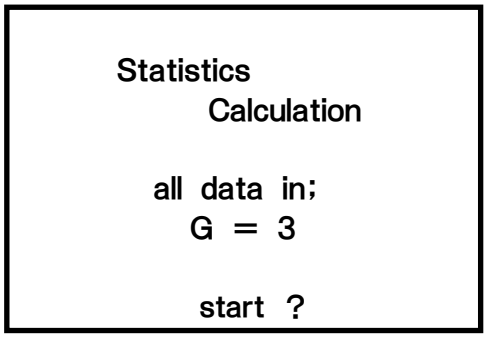

In case of statistical operations of data stored in a group number「3」

Information in a storing place is indicated.

Select a group No.「3」.

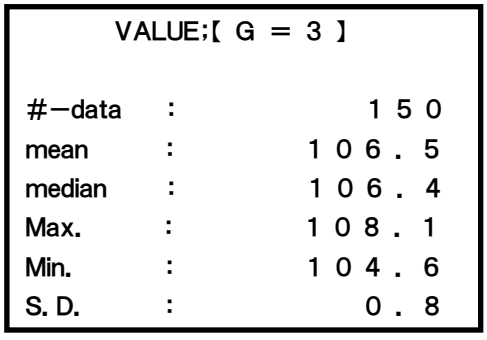
Press STATIS-TICS key.
The buzzer beeps, beeps.

⇩




Press STATIS-TICS key.
The buzzer beeps, beeps (under process of calculations)、beeps.

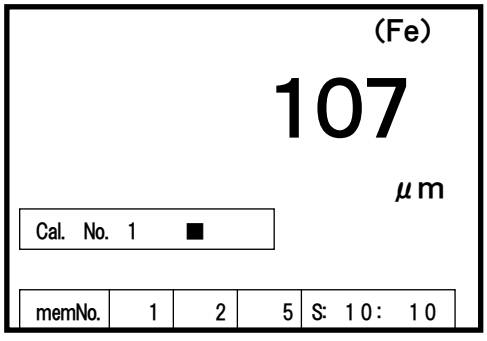
⇩




Note: Keeping STATIS-TICS key from being pressed and left alone, the stage remains unchanged until 「Auto Power Off」 switches Power off.

Press STATIS-TICS key.
The buzzer beeps.

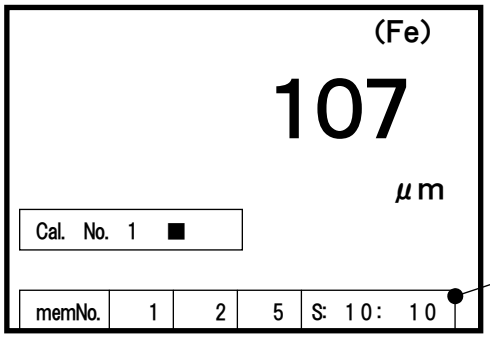
⇩




Returning to the stage before statistical calculations.

## (3) Statistics of data stored in a 『Block No.』 of a group

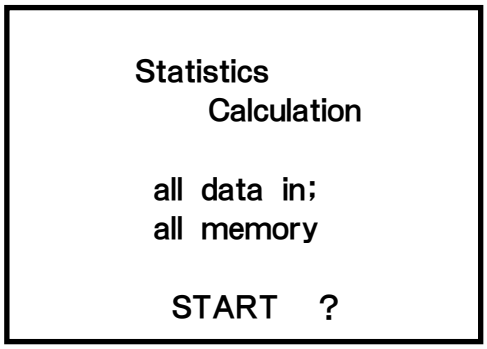
Block numbers : 1～20 (SWT-7200Ⅱ)




In case of statistical operations of data stored in a block no.「14」 of a group No.「1」.

Information in a storing place is indicated.

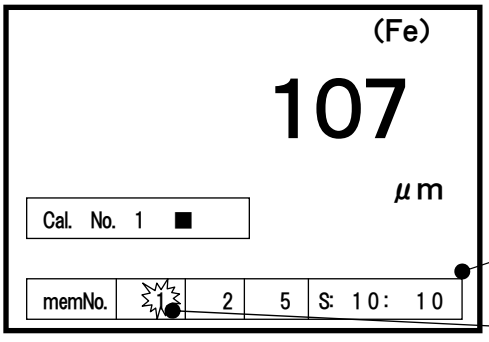
Press STATIS-TICS key.
The buzzer beeps, beeps.




**Caution**

The message is indicated for about 20 sec
Press a key during this period to move to a next otherwise the buzzer beeps, beeps to delete statitics message and this unit returns to 「Measurements and adjustments」 stage.
If statistical operation is necessary, press STATIS-TICS key again to start up.

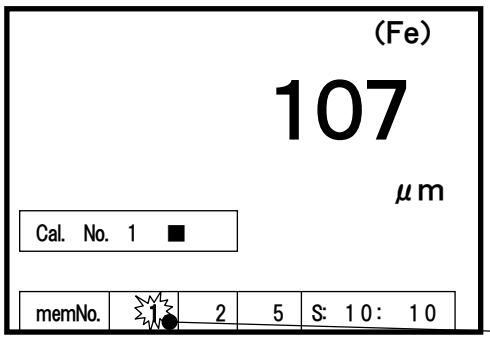
Press MEM.-SEL key.
The buzzer beeps.




Information in a storing place is indicated.

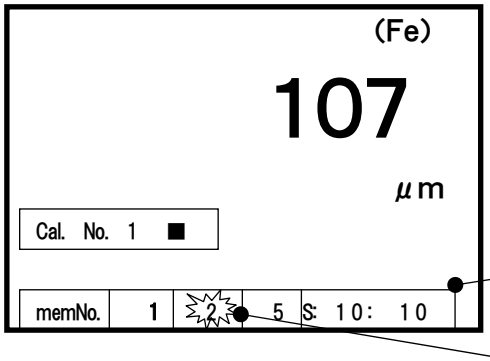
A group No. flashes.

Press ▲ key or ▼ key to equate with a group no. to calculate statistics.




Select a group No.「1」.

Press MEM.-SEL key.
The buzzer beeps.

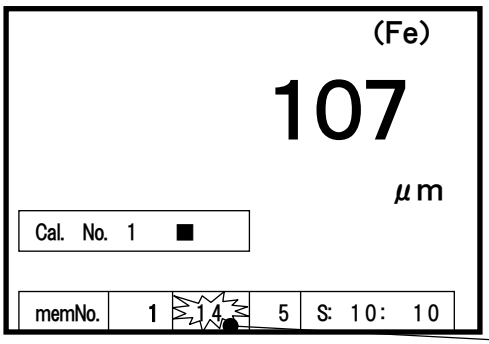



In case of statistical operations of data stored in a block No.「14」of a group No.「1」.

Information in a storing place is indicated.

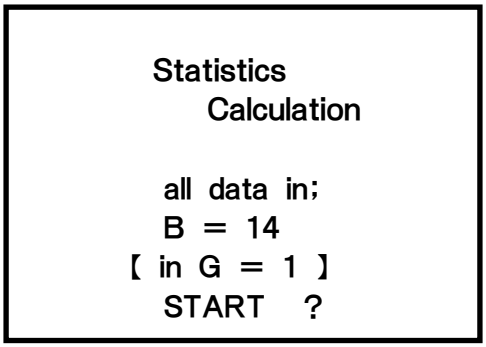
A group No.「1」is set and a block No. flashes.

Press ▲ key or ▼ key to equate with a block No. to calculate statistics.



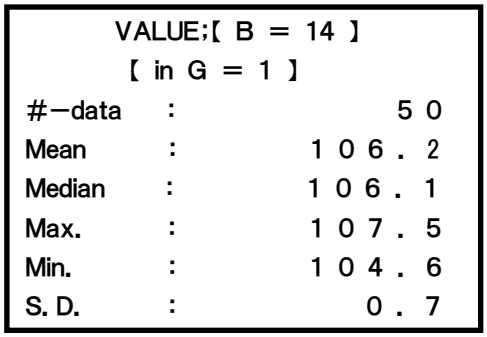

Select a block No.「14」.

Press STATIS-TICS key.
The buzzer beeps, beeps.



Press [STATIS-TICS] key.
The buzzer beeps, beeps (under process of calculations), beeps.

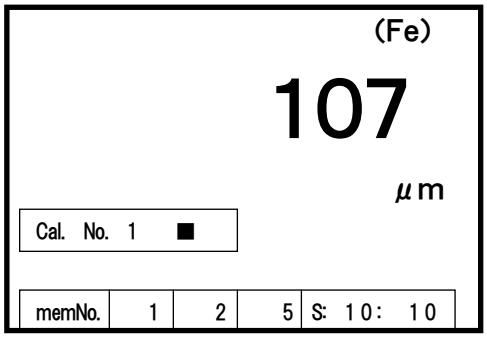
⇩




Note : Keeping [STATIS-TICS] key from being pressed and left alone, the stage unchanges remained until「Auto Power Off」 switches Power off.

Press [STATIS-TICS] key.
The buzzer beeps.

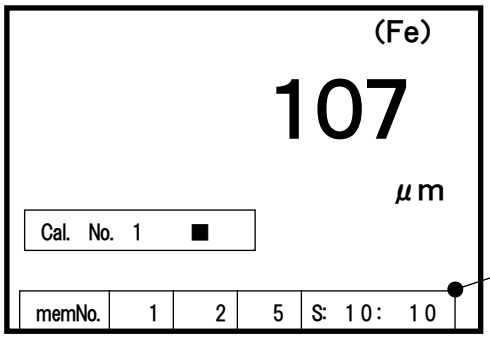
⇩




Returning to the stage before statistical calculations.

## (4) Statistics of data stored in a 『Section No.』 in a block of a group.

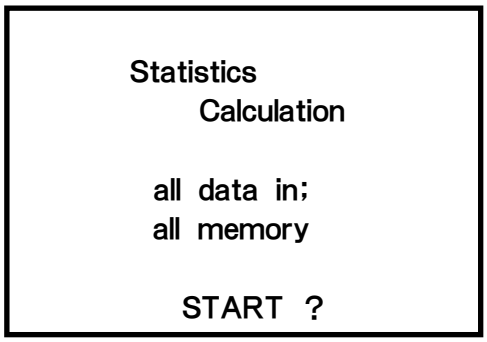
Section numbers: 1～10 (SWT-7200Ⅱ)




In case of data stored in a section no.「1」 in a block No.「2」 of a group No.「5」.

Information in a storing place is indicated.

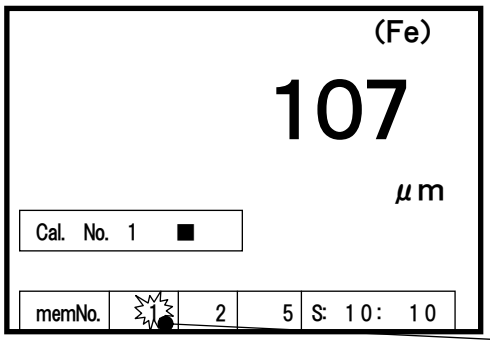
Press [STATIS-TICS] key.
The buzzer beeps, beeps.




**Caution**

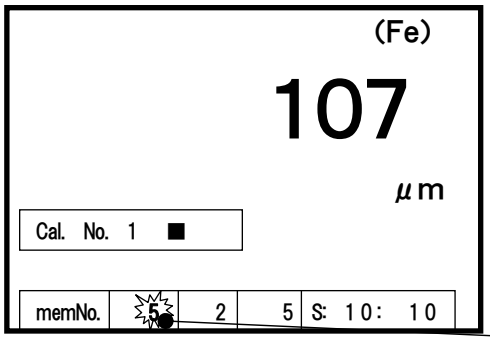
The message is indicated for about 20 sec.
Press [MEM.-SEL] key during this period, otherwise the buzzer beeps, beeps to delete statistic message and the unit returns to 「Measurements and djustments」stage.
If statistical calculations are necessary, press again [STATIS-TICS] key to start up.

Press [MEM.-SEL] key.
The buzzer beeps.



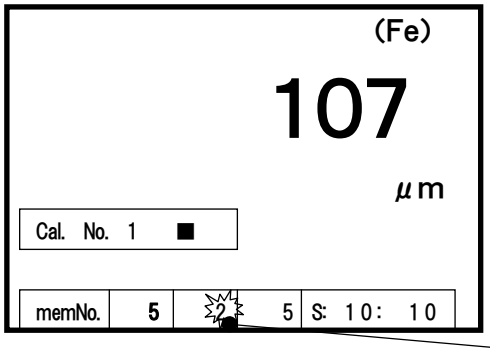

A group No. flashes.

Press [▲] key or [▼] key to equate with a group No. to calculate statistics.



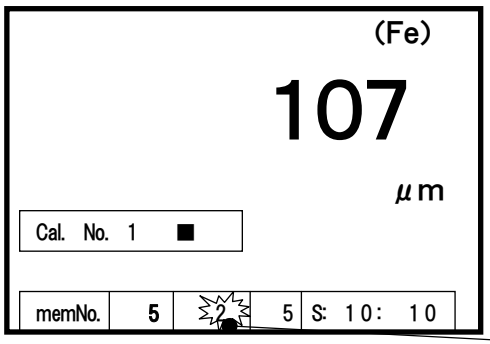

Select a group No.「5」.

Press MEM.-SEL key.
The buzzer beeps.



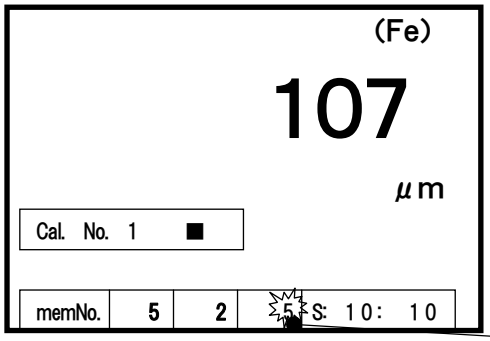

A group no.「5」 is set and a block No. flashes.

Press ▲ key or ▼ key to equate
with a block no. to calculate statistics.



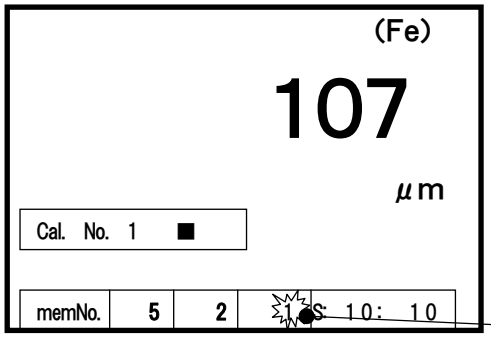

Select a block No.「2」.

Press MEM.-SEL key.
The buzzer beeps.



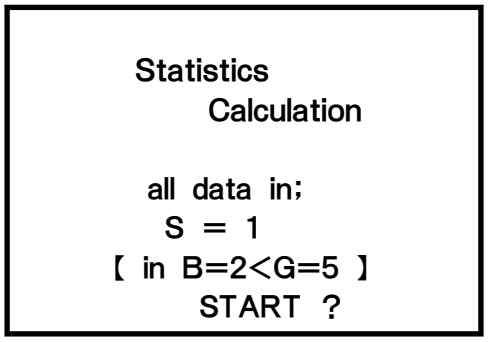

A block no.「2」 is set and
a section No. flashes.

Press [▲] key or [▼] key to equate with a section No. to calculate statistics.




Select a section No.「1」.
A section No. flashes.

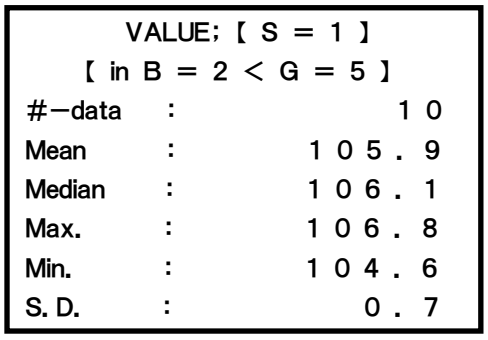
Press [STATIS-TICS] key.
The buzzer beeps, beeps.




**Caution**

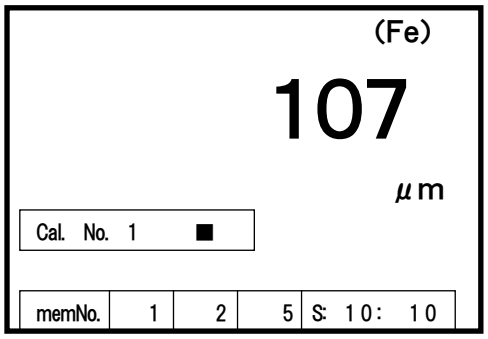
The message is indicated for about 20 sec.
Press [STATICS-TICS] key during this period, otherwise the buzzer beeps, beeps to delete statitic message and the unit returns to 「Measurements and adjustments」stage.
If statistical calculation are necessary, press again [STATIS-TICS] key to start up.

Press [STATIS-TICS] key.
The buzzer beeps, beeps (under process of calculations), beeps.




Note : Keeping [STATIS-TICS] key from being pressed and left alone, the stage unchanges remained until 「Auto Power Off」 switches Power off.

Press [STATIS-TICS] key.
The buzzer beeps.




Returning to the stage before statistical calculations.

# Transferring data—① (USB)

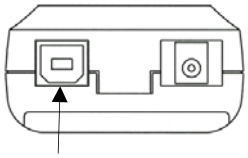
Transfer data to a PC (personal computer) by using a USB cable

Refer to separately attached information for arrangements to install a driver into a PC side.

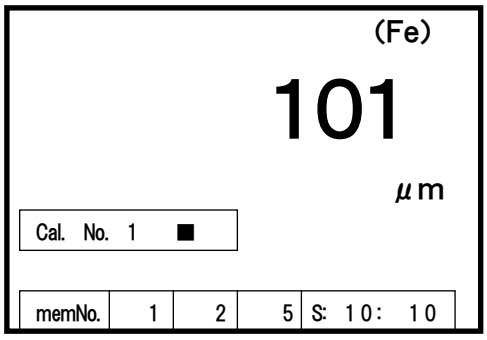
If this unit is set at 「Non-Interrupt Measurement Mode」, Data-transfer can not be used . Please make sure that the unit is set at ordinary measurement mode.

## (1) Outright transferring measured data (real time transfer)

- Prepare for a PC side.
- Connect a USB cable to a PC.

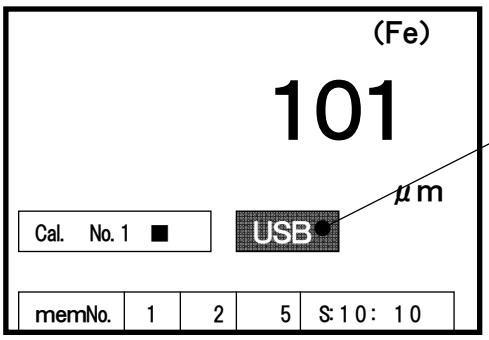


Connect USB connector cable and the other end to PC.

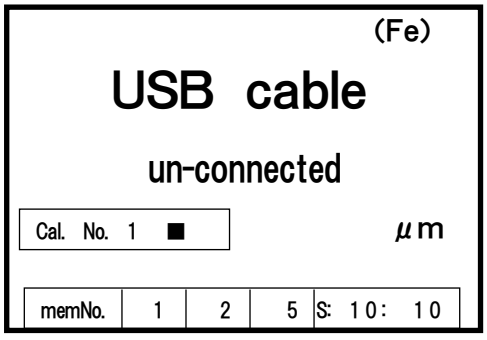



Press [COM.ENABLE] key.

The buzzer beeps.




A reversal display [USB] is indicated on screen.




Press [TRANS-MIT] key.

The buzzer beeps.

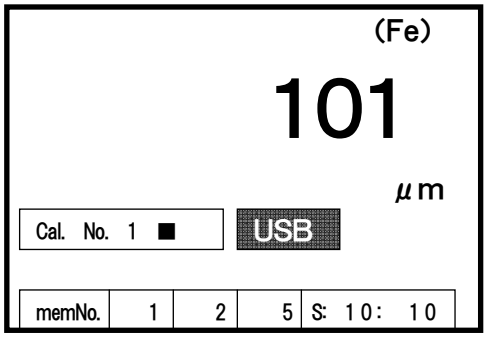
Data is sent out each time a measurement is taken.

**Caution**

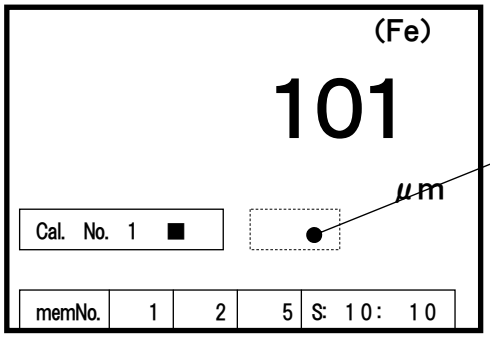
Pressing [COM.ENABLE] key without connecting a USB cable, a warning letter 「USB cable un-connected」 as above is indicated.

Press again [COM.ENABLE] key and connect the USB cable.

（2）Interrupt transferring data




Press COM.ENABLE key.
The buzzer beeps.



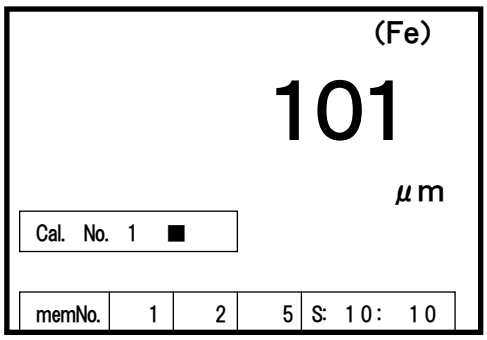

A reversal display USB disappear on screen.

Data stops being transferred.

# Transferring stored data—② （USB）

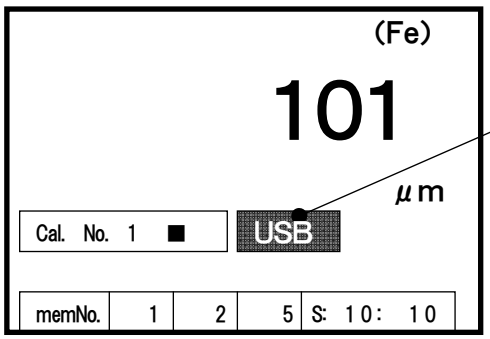
## （3） Transferring stored 『all data』.

- Prepare for a PC side
- Connect a USB cable to a PC.




Press [COM.ENABLE] key.
The buzzer beeps.

⇩

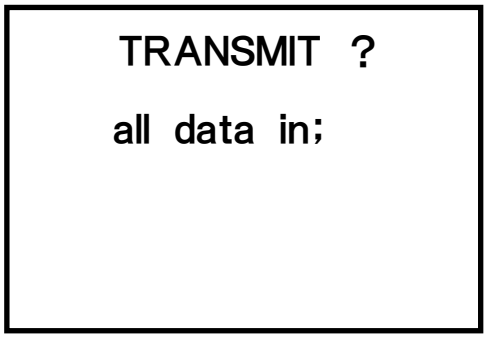



A reversal display [USB] is indicated on screen.

Note:
Pressing [COM.ENABLE] key without connecting a USB cable, a warning「USB cable un-connected」is indicated. Press again [COM.ENABLE] key and connect the USB cable.

Press [MEM.-SEL] key.
The buzzer beeps, beeps.

⇩




⇩

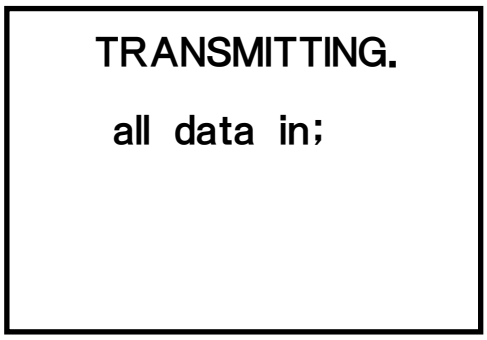
**Caution**

The message is indicated for about 20 sec.
Press a key during this period to move to a next stage, otherwise the buzzer beeps, beeps to delete statitics message and the unit returns to「Measurement and adjustment」state. If it is necessary to send out data, press [COM.ENABLE] key to display [USB] to start up.

Press [TRANS-MIT] key.

The buzzer beeps, beeps.

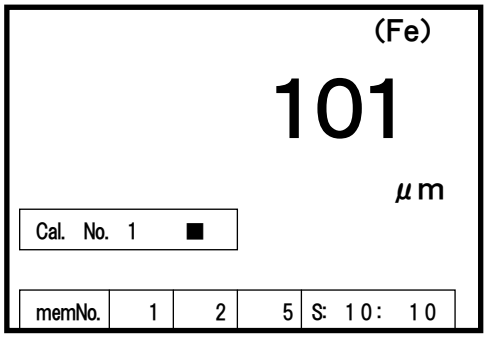
⇩




《 Transferring has completed 》

The buzzer beeps.

⇩

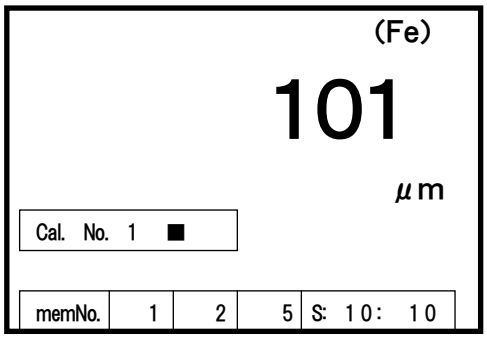



Returning to the beginning.

# Transferring stored data—③ (USB)

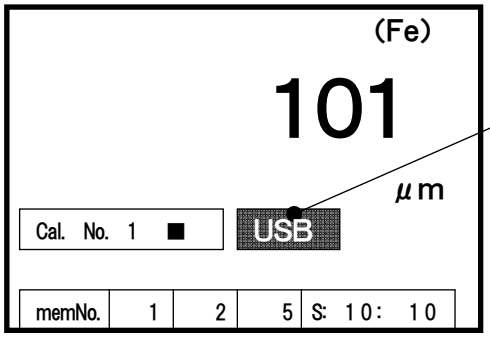
## (4) Transferring data stored in a 『Group No.』.

- Prepare for a PC side.
- Connect a USB cable to a PC.




Press [COM.ENABLE] key.
The buzzer beeps.

⇩

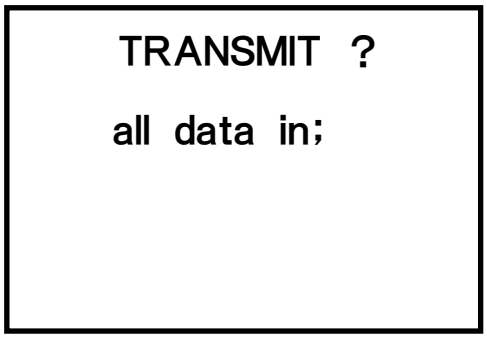



A reversal display [USB] is indicated on screen.

Note :
Pressing [COM.ENABLE] key without connecting a USB cable, a warning「USB cable un-connected」is indicated. Press again [COM.ENABLE] key and connect the USB cable.

Press [MEM.-SEL] key.
The buzzer beeps, beeps.

⇩

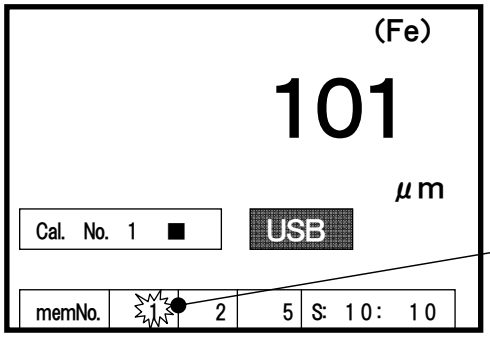



⇩

**Caution**

The message is indicated for about 20 sec.
Press a key during this period to move to a next stage, otherwise the buzzer beeps beeps to delete statistical message and this unit returns to 「Measurements and adjustments」 stage.
If it is necessary to send out data, press again [COM.ENABLE] key to display [USB] to start up

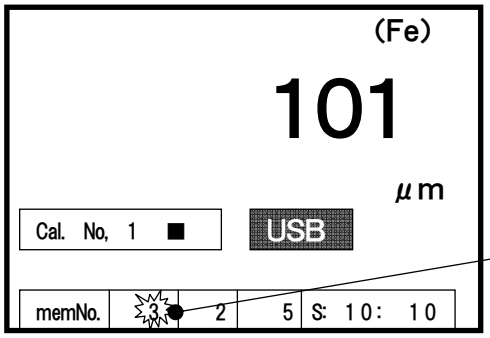
Press [MEM.-SEL] key.
The buzzer beeps.




In case of transferring data stored in a group no.「3」

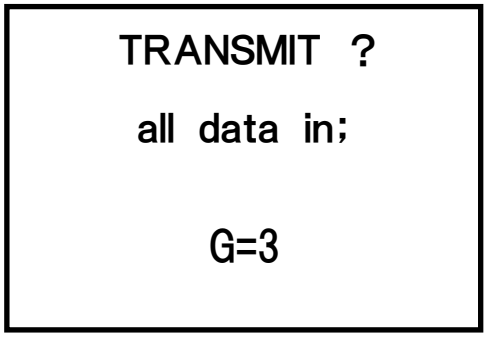
A group No. flashes.

Press [▲] key or [▼] key to equate with the group No.

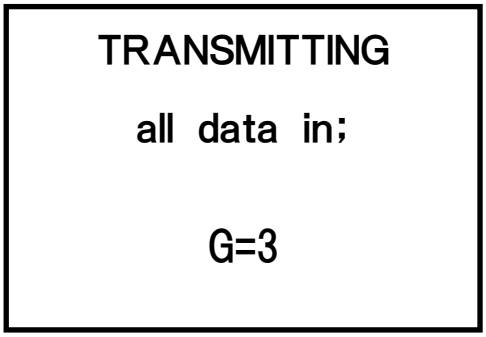



Select the group No.「3」.
Flashes.

Press [TRANS-MIT] key.
The buzzer beeps, beeps.




Press [TRANS-MIT] key.
The buzzer beeps, beeps.

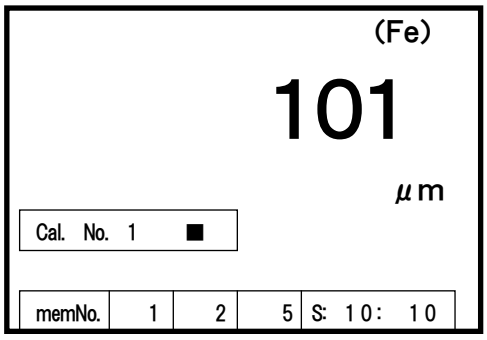



⇩

《Transferring has completed 》

The buzzer beeps.

⇩

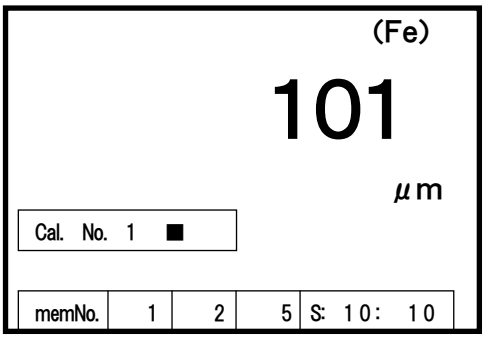



Returning to the beginning.

# Transferring stored data —④ (USB)

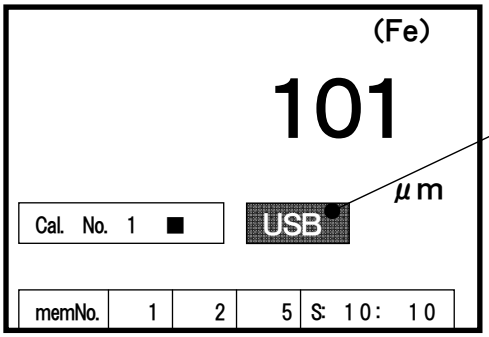
## (5) Transferring data stored in a 『Block No.』 of a group

- Prepare for a PC side.
- Connect a USB cable to a PC.




Press [COM.ENABLE] key.
The buzzer beeps.

⇩

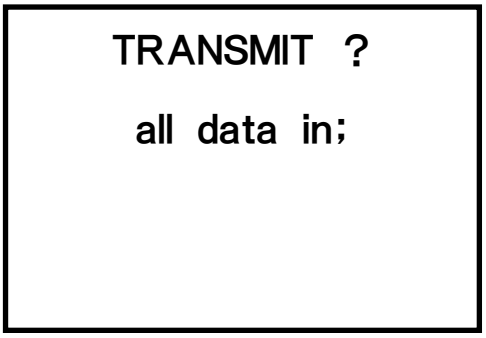



A reversal display [USB] is indicated on screen.

Note:
Pressing [COM.ENABLE] key without connecting a USB cable, a warning【USB cable un-connected 】is displayed. Press again [COM.ENABLE] key and connect the USB cable.

Press [MEM.-SEL] key.
The buzzer beeps, beeps.

⇩

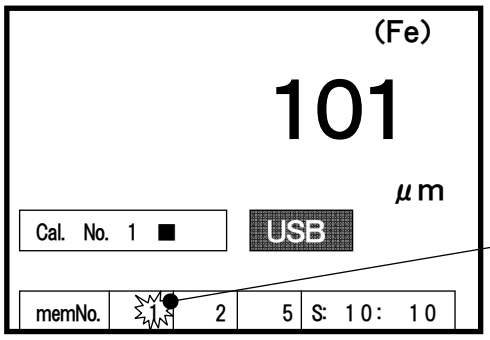



**Caution**

The message is displayed for about 20 sec.
Press key for next move during this period, otherwise the buzzer beeps, beeps to delete stastiscal message and this unit returns to 「Measurement and adjustments」stage
It is necessary to send out data, press again [COM.ENABLE] key to display [USB] to start up.

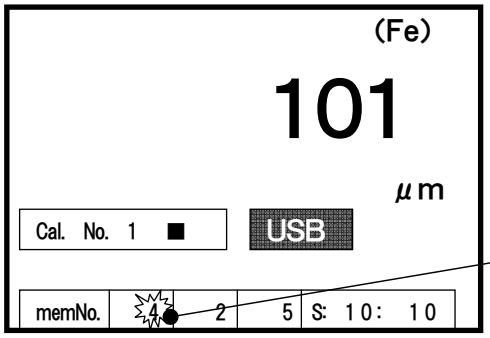
Press [MEM.-SEL] key.
The buzzer beeps.

⇩




The group No. flashes.

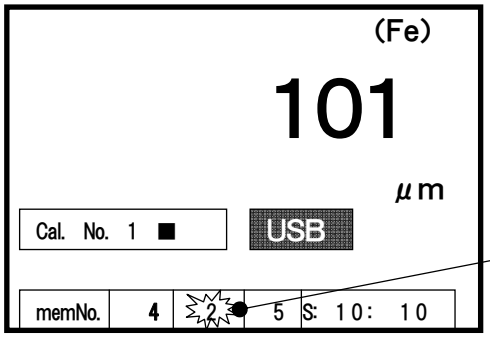
Press ▲ key or ▼ key to equate with the group No.




In case of transferring data stored in a block No.「7」 of a group No.「4」.

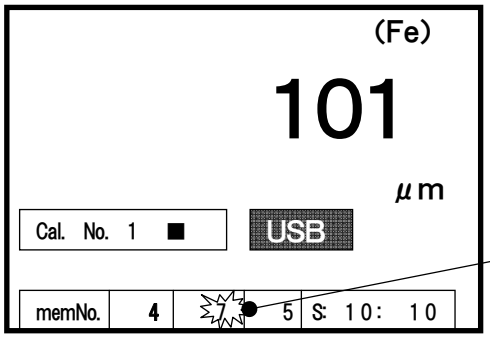
Equate with the group「4」. Flashes .

Press MEM.-SEL key.
The buzzer beeps.




A group no. is set at「4」. A block No. flashes.

Press ▲ key or ▼ key to equate with the block No.




Equate with the block No.「7」 Flashes.

Press [TRANS-MIT] key.

The buzzer beeps, beeps.

⇩

```
B=7
TRANSMIT ?
all data in;
【 in G = 4 】
```

Press [TRANS-MIT] key.

The buzzer does not beep.

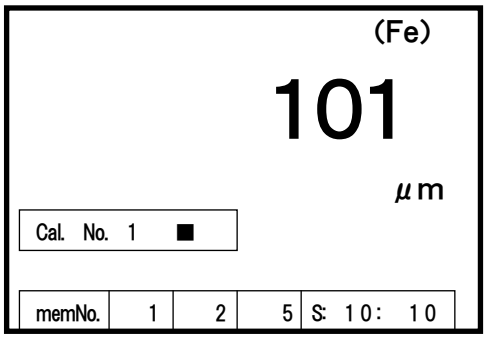
⇩

```
B=7
TRANSMITTING
all data in;
【 in G = 4 】
```

《 Transferring has completed 》

The buzzer beeps.

⇩

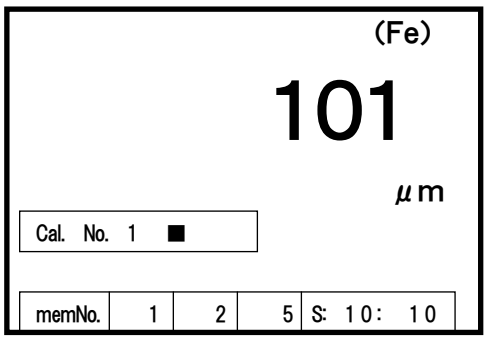



Returning to the beginning.

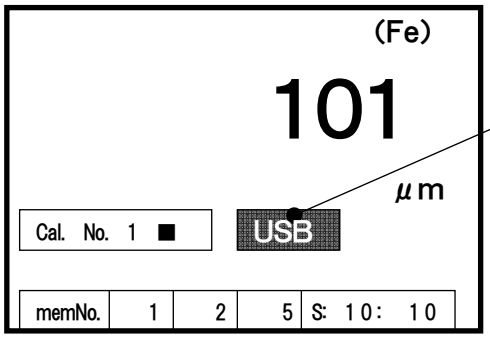
# Transferring stored data—⑤ USB

## (6) Transferring data stored in a 『Section No.』 in a block of a group.

- Prepare for a PC side.
- Connect a USB cable to a PC.



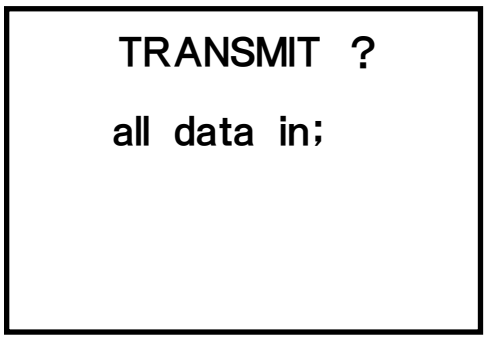

Press [COM.ENABLE] key.
The buzzer beeps.




A reversal display [USB] is indicated on screen

Note :
Pressing [COM.ENABLE] key without connecting a USB cable, a warning「USB cable un-connected」is displayed. Press again [COM.ENABLE] key and connect a USB cable.

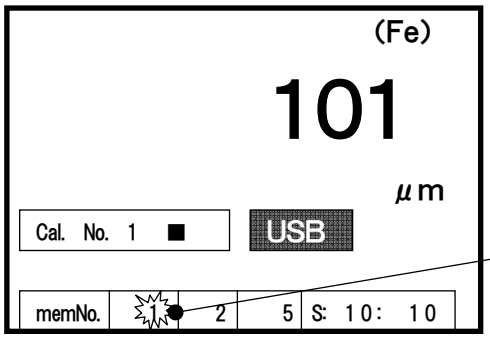
Press [MEM.-SEL] key.
The buzzer beeps, beeps.




**Caution**

The message is displayed for about 20 sec.
Press key for next move during this period, otherwise the buzzer beeps, beeps to delete *statiscal message and this unit* returns to「Measurements and adjustments」stage.
If it is necessary to send out data, press again [COM.ENABLE] key to display USB to start up.

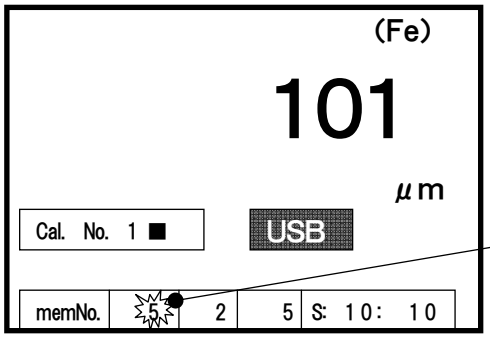
Press [MEM.-SEL] key.
The buzzer beeps.




In case of transferring data stored in a section「1」in a block no.「8」of a group no.「5」.

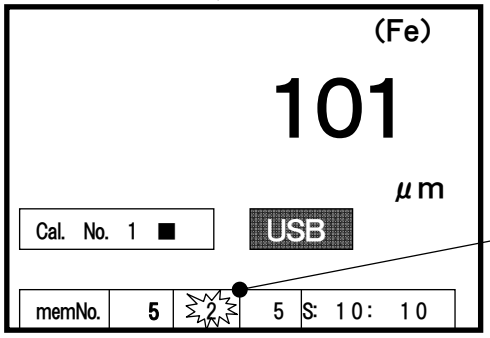
A group no. flashes.

Press ▲ key or ▼ key to equate with a group No.



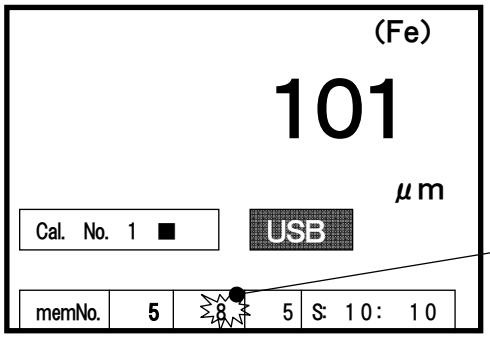

Equate with the group No.「5」.
Flashes.

Press MEM.-SEL key.
The buzzer beeps.



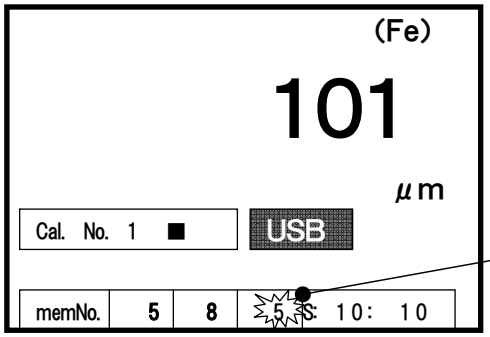

A group no. is set at「5」and a block No. flashes.

Press ▲ key or ▼ key to equate with a block No.



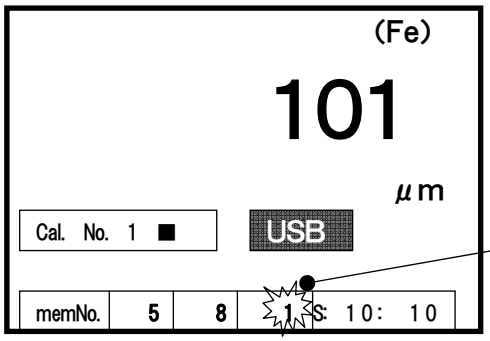

Equate with the block No.「8」
Flashes.

Press MEM.-SEL key.
The buzzer beeps.



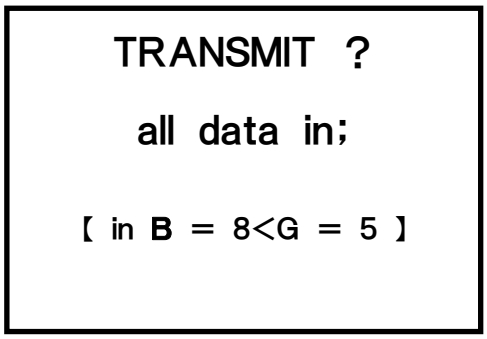

A block no. is set at 「8」.
A section No. flashes.

Press ▲ key or ▼ key to equate with a section No.

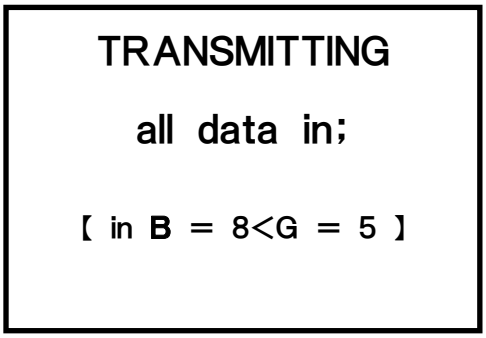



Equate with a section No.「1」
Flashes.

Press TRANS-MIT key.
The buzzer beeps, beeps.




Press TRANS-MIT key.
The buzzer does not beep.

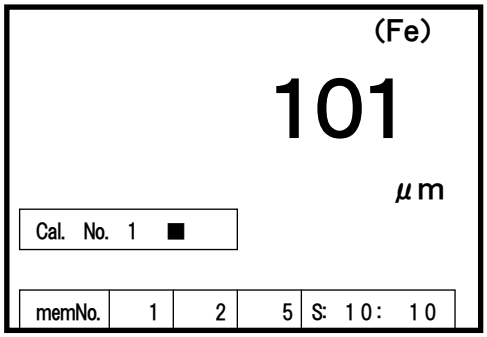


⇩

《 Transferring has completed 》

The buzzer beeps.

⇩




Returning to the beginning.

# Note to improve measuring accuracy

① Zero plate

Prepare the same material, thick and sized plate as the measuring object for zeroing and calibration standard (CAL). Different materials may not bring about correct measuring results.

＊ As accessories to probe, "zero plates for zeroing"「for electromagnetic: SUS-430」(ferrite stainless), 「for eddy current: AL1050 ( aluminum )」 for testing purpose only.
Select a substrate to meet actually measuring objects.

② Thickness standard (plates)

Take calibration standard measurements using a Thickness standard which is thicker or as thick as the measuring films.

＊ Use of a calibration standard with a deviant thickness may cause errors.
Replace worn-out or bent plates with new ones. In case non-accessorized plates are necessary (over 15 $\mu$ m), contact a local sales office.

③ Quality of films to be measured

Magnetic metal contained films can not correctly be measured. In case of measuring elastic films, place a standard plate of 30～50 $\mu$ m thick on the object and subtract the thickness from the measuring value to avoid errors to becaused by elastic dents.

④ Measurements of edges or angles

Magnetic fields in the neighborhood of the edges/the angles of a measuring object become uneven.
15～20 mm closer part to the center of the object shall generally be measured.
Pay attention to protruded part, curved part or unexpectedly deformed part.

⑤ Measurements of rough faces

Roughness of a substrate, a measuring face affects measuring results.
Take a mean value by measuring several places at a time.

⑥ Measurements of stretched part on faces

In some case stretched, rolled part occurred on a substrate, which may cause measuring errors.
Take a mean value by measuring several places at a time.

⑦ Temperature

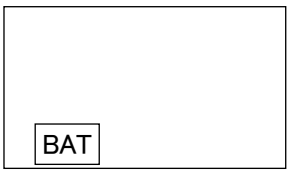
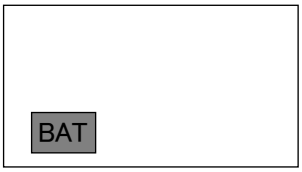
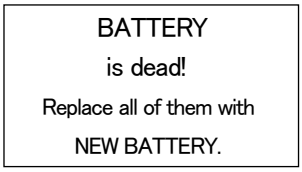
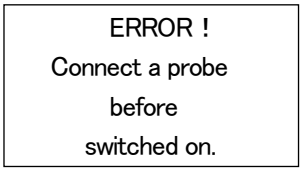
Operating temperature range is 0～40 ℃ Especially difference between a main unit and a probe causes measuring errors.

⑧ Residual magnetism, stray magnetic fields

Pay attention to transportation method of electromagnets, residual magnetism on substrates or arc welding, those of which emit strong magnetic fields to cause measuring errors.

# Trouble Shooting

Before contacting us please check with the following points.

| Symptoms | Points to check | Measures to be taken |
|---|---|---|
| No response upon press of ON/OFF key. | Are batteries worn out? | Replace them with new ones (2 ea.) |
| No response after replacing batteries and pressing a key | Something wrong inside a meter | Contact us for repair |
|  | Batteries is shorting. | They can be used for a while. Prepare for new batteries. |
|  | Batteries have worn out. | Replace them with new one |
|  《Power OFF》 | Out of batteries | Replace new batteries |
|  《Power OFF》 | Started pressing probe to object soon after switching on. | Hold probe in air, keeping it away off objects, metals during a time of the message on screen. . |
|  《Power OFF》 | Press ON/OFF key without connecting probe | Press ON/OFF key after being sure of connecting probe. |

| Symptoms | Points to check | Measures to be taken |
|---|---|---|
| Trouble !<br>Something wrong with probe. Replace with new one.<br>《Power OFF》 | Probe may be broken. | Contact our office for repair at your convienience. |
| Trouble !<br>Something wrong with probe or main unit. Needs to be repaired. | Eiither probe and unit may be faulty. | Contact our office for repair at your convienience. |
| No response against press of key | 「LOCK」 key is ON. | Switch Power to OFF and again switch to ON to turn off「LOCK」 key |
| No response even though 「LOCK」key released. | Something wrong with main unit. | Contact our office for inspection and repair |
| Measured data is not stored in memory. | No more space in memory | Make space by deleting unnecessary data |
| | Measuring mode is set at 「Non Interruption measurement」 mode | Press「TRANSMIT」 key.<br>When pressed data is stored. |
| Cable is not connected. | USB cable is not connected | Connect USB cable<br>Wireless transfer is not affected. |

| Symptoms | Points to check | Measures to be taken |
|---|---|---|
| USB cable transfer is not working. | ① Connections of USB cable<br>② PC is not ready to work with | ①Be sure of connecting USB cable<br>②(1)Correctly install Driver according ito instructions of attached CD<br>(2)Corectly set Vertial /Com Port |
| USB transfer is suddenly interrupted | ① Operation of PC<br>② Something wrong with main unit if nothing wrong with PC | ① Check PC side<br>② Contact our office for repair |
| Wireless transfer is not working | ① Distance between main unit and receiver (receiver: SWT-RU)<br>② Power Source of receiver<br>③ Output appliance<br>④ There arre nothing wrong with ①～③ | ① Check if main unit is placed within range of reachable distance<br>② Is power of receiver ON? If battery-operated, check if batteries are worn out or not.<br>③ Check if output appliance used with main unit like printer and/ or the connection cables<br>④ Contact our office for repair |

# Specifications

◆ Unit

| Items | Applications |
|---|---|
| Model names | Dual electromagnetic／eddy current（SWT－7200Ⅱ） |
| Display method | Graphic LCD（data ・ message） |
| Ranges | Depending on optional probes |
| Calibrations （CAL） | 2 points calibration type Zeroing : for substrate<br>Calibration standard : for substrate and standard thicknesses |
| Additional functions | ① Key Lock<br>② Auto Power Off（3 min.）<br>③ Switching modes（hold／non interrupt）<br>④ Switching display resolutions<br>⑤ USB connections<br>⑥ Possible setting number of calibration: Max. 10 points<br>⑦ Setting of High/Low limits, warning (setting at each calibration)<br>⑧ Measuring data memory: 10,000 data<br>⑨ Statistics process, indications<br>⑩ USB connection |
| Keys | ON/OFF 、 ZERO 、 ▲ 、 ▼ 、 LOCK/DELETE<br>CAL No.、 H/L 、STATISTIC 、 MEM.-SEL 、<br>COM.ENABLE 、TRANSMIT 、MEM.CLEAR 、<br>DATA ERASE 、CANCEL |
| Power | 3V DC （AA, R6P×2）、(exclusive AC adaptor ) |
| Operating Temperature | 0 ～ 40 ℃ （Non-condensing） |
| Accessories | Dry battery, Carrying case、<br>AC adaptor、USB cable、USB driver（CD） |
| Optional | For ferrous substrate probe(Fe)、 for nonferrous substrate probe（NFe） |
| Dimensions | 72(W) × 30(H) × 156(D)mm |
| weight | 210g |

Oct. 2009

◆ Probes （Optional）

| Models | Fe－2. 5/Fe-2. 5 L | NFe－2. 0 /NFe-2. 0 L | NFe－0. 6 |
|---|---|---|---|
| Methods | Magnetic inducing type | Eddy current type | |
| Ranges | 0～2. 50mm | 0～2. 00mm | 0～600μm |
| Display resolutions | 1μm:0～999μm<br>switching to<br>0. 1μm:0～400μm、<br>0. 5μm:400～500μm<br><br>0. 01mm:1. 00～2. 50mm | 1μm:0～999μm<br>switching to<br>0. 1μm:0～400μm、<br>0. 5μm:400～500μm<br><br>0. 01mm:1. 00～2. 00mm | 1μm:0～600μm<br><br>switching to<br>0. 1μm:0～400μm、<br>0. 5μm:400～500μm |
| Accuracies<br>（on flat face） | 0～100μm:±1μm<br>or ±2% the designated value<br>101μm～2. 50mm:±2% | 0～100μm:±1μm<br>or ±2% the designated value<br>101μm～2. 00mm:±2% | 0～100μm:±1μm<br>or ±2% the designated value<br>101μm～600μm:±2% |
| Probes | One point contact constant pressure type, V cut<br>φ13×48mm | One point contact constant pressure type, V cut<br>φ13×47mm | One point contact constant pressure type, V cut<br>φ11×48mm |
| | Option : V type probe adaptor<br>（3 kinds: forφ5 less、φ5～10、φ10～20） | | |
| Accessories | Standard thickness,<br>Zero plate fro testing（Fe） | Standard thickness, Zero plate for testing（NFe） | |
| Measuring objects | Coating,, lining,, thermal spray film, plating (except electrolyte nickel plating), etc. on magnetic metal substrates like ferrous, steel, etc. | Insulated films etc. on non-magnetic metal substrates like aluminum, copper, etc. | |
| | | For comparatively general measuring objects. | For high stability with bars, thin tubes, minute pieces etc. |

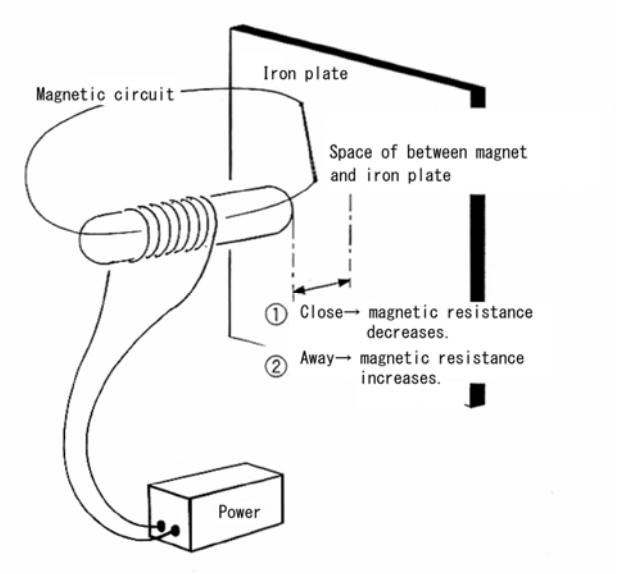
＊Probes except NFe-0.6 are heat-resistant ( about 200～250℃)

＊Please contact us for inquiries about other probes.

# Reference (Principle of measurements)

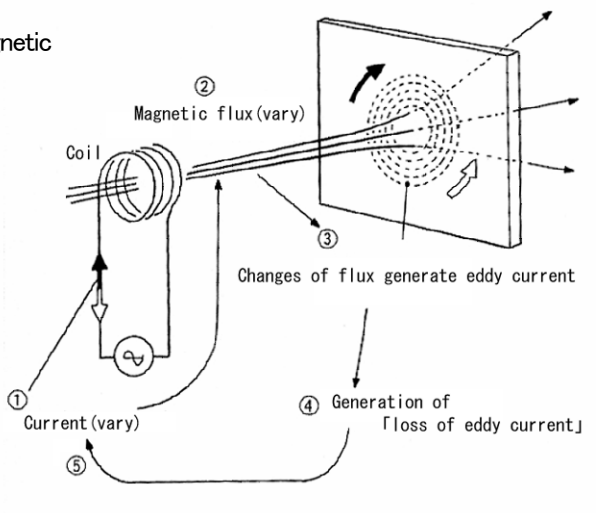
## ● Electro-Magnetic type

When metals approach to AC- magnetic fields emitted from probe, the metal and the magnet pull each other.
It makes the pulling force stronger as they come closer.
In other words, it makes the magnetic density higher as they come closer. On the contrary, it weakens the magnetic density as they move away from each other.
This symptom means that magnetism emitted from probe has Higher Transferability when they come closer, and lower Transferability when they move away from each other.
These levels of transferability of the magnetism co-relate with thicknesses of films coated on substrates.
By analyzing correlations of transferability/less transferability (Reluctance), and thicknesses of the films on the substrates, the correlated values can be converted to the thickness, actually by measuring the Reluctance to be processed.
Because it is difficult to observe and measure magnetic volumes, it is necessary that the Reluctance volumes be converted to electric volumes using coils and methods of the Principle of Electromagnetic Induction so that the measured values can be processed and converted to the thickness values.




## ● Eddy Current Type

The eddy current is induced on the surface of metals when metals approach to alternating current fields emitted from probe.
As the metal comes closer to the probe, the eddy current increases and the magnetic field density becomes high.
On the contrary, as the metal move away from the probe, the eddy current decreases and the magnetic density becomes low: Correlations of between density of magnetic field and film thicknesses on the substrate are analyzed beforehand.
It measure the thicknesses by converting to the thickness value from the magnetic density measured through the above correlations.
Because it is difficult to observe and measure the density of a magnetic field, it is necessary that a coil be put in magnetic fields and converted to electric volumes for measurements using the Principle of Electromagnetic Induction so that the measured value can be processed and converted to the thickness value. Generally in the eddy current type, it varies in measurement range on non-magnetic substrate by dividing substrates by a high-wave transferable like Alumi and Copper and non-transferable like irons to optimize the measurement methods.



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- ·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:**

**Sanko Electronic Laboratory Co., Ltd.**

Tokyo branch : Shibata Bldg., 2-6-4, Uchikanda, Chiyoda-ku, Tokyo 101-0047, Japan
Tel 81-3-3254-5031 Fax 81-3-3254-5038

Osaka branch : Konishi Bldg., 2-3, Sugawara-cho, Kita-ku, Osaka 530-0046, Japan
Tel 81-6-6362-7805 Fax 81-6-6365-7381

Nagoya branch : Meihoku Bldg., 3-11-27, Kinjo, Kita-ku, Nagoya 462-0847, Japan
Tel 81-52-915-2650 Fax 81-52-915-7238

Fukuoka branch : 11-11 Naraya-cho, Hakata-ku, Fukuoka 812-0023, Japan
Tel 81-92-282-6801 Fax 81-92-282-6803

Head office : 1677 Hisasue, Takatsu-ku, Kawasaki 213-0026, Japan
Tel 81-44-751-7121 Fax 81-44-755-3212