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Chapter one introduction

一. Features of instrument:

VICTOR 852A coating thickness gauge is the fruit of high technology. It applies to the single chip microcomputer technology. It has high precision, digital display, stable indication and low power consumption. It can be easily operated and the keys should be pressed by touch. With a small volume and light weight, it provides sing probe full range measurement. It also has such functions as storing, reading, statistic, low-power indication, system/zero-scale/two-point calibration. Its properties have reached the international advanced levels of contemporary instruments of the same kind.

二. Application scope:

This instrument applies to the magnetic thickness gauging method. It can measure the thickness of non-magnetic coating on ferromagnetic materials conveniently and without any damage. For example, it can measure the thickness of the zinc, copper, chromium, paint, enamel, fiberglass, sprayed plastic, asphalt.etc. on the surface of steel. This instrument is widely applied in mechanical, car, shipbuilding, petroleum, chemical, electroplating, spray plastic, enamel, plastic etc. industries.

三. Working principles:


VICTOR 852A coating thickness gauge applies to electromagnetic induction method. The probe located on the surface of the instrument can produce a closed magnetic loop. With the change of the distance between the probe and the ferromagnetic material, the magnetic loop will change to different degrees and so the magnetoresistance and probe coil inductance change. With this

principle, it can accurately measure the distance between the probe and the ferromagnetic material, that is, the thickness of the coating.

四. Technical parameters:

- 1.measurement scope: 0~1200um
- 2.measurement error: $<3\% \pm 1\mu\text{m}$
- 3.minimum indication: 1um
- 4.display means: liquid crystal display with four digits
- 5.main functions:
 - (1)measurement: single- probe full-range measurement
 - (2)storage and deletion: it can store 254 measured data, delete some suspicious data and delete all the data that have been stored.
 - (3)reading: it can read the measured data that have been stored.
 - (4)statistic: there are three statistical values—the average value, the maximum value and the minimum value
 - (5)calibration: zero-scale calibration, two-point calibration and system calibration
 - (6)electric quantity: it has the function of displaying low power
 - (7)buzz indication: there is buzz indication in operation
 - (8)print: with a micro-printer it can print the measured data
 - (9)powering off: there are two means of powering off—automatic powering off and manual powering off
- 6.power supply: two 1.5v batteries
- 7.power consumption: the maximum power consumption is 100mw
- 8.external dimension: 50mm*124mm*24mm
- 9.weight: 150g(including batteries)
- 10.environment temperature when it is used: $0^{\circ}\text{C} \sim +40^{\circ}\text{C}$
relative humidity: less than 90%

- 11.the minimum thickness of the matrix: 0.2mm
- 12.the minimum plane of the matrix: 7mm
- 13.the minimum curvature radius: convex:1.5mm
concave:6mm

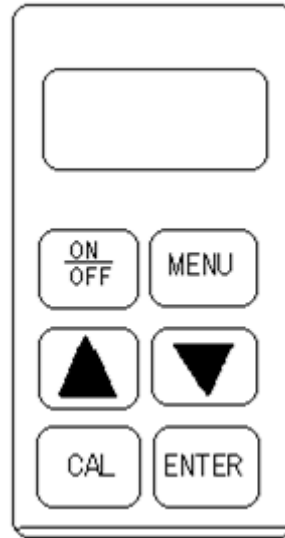
14.undervoltage indication: "  " is displayed in the top right corner

*the critical thickness: when the workpiece iron matrix thickness is over 1mm, the measurement of the coating thickness won't be influenced by the iron matrix thickness.

Chapter two application method

When reading this chapter, one should combine the instrument with the attached drawing and acquaint oneself with the external structure and various parts of the instrument.

- 一. Preparation before turning on the instrument: open the battery cover according to indication, put two 1.5v batteries according to positive and negative indication and then fix the battery cover.
- 二. Names of the keys and functions



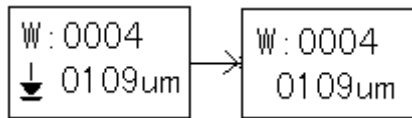
A. "ON/OFF": it is a multiple key. In powering off state, it is turning-on key; in turning on state, it is powering-off key. When the instrument is powered off automatically, one should press this key to turn on the instrument.

- B. "MENU": it is menu key.
- C. "▲"、"▼" : it is plus/minus multiple key.
- D. "CAL": it has the function of calibration/deletion.
- E. "ENTER": it is used to confirm one functional state.

三. Application method

1.turning on the instrument: insert the probe wire in the instrument, then press "ON/OFF" key (the distance between the probe and the iron matrix/magnetic field should be over 10cm). When buzzing sound is heard, the instrument goes into the state of measurement and it can measure directly. If the measured data have relatively large errors, one can operate the iron matrix calibration and then measure again.

When measuring, one should notice the measurement indication. As is shown in the right drawing, only when the arrow disappears can one measure again.



2.calibration: this instrument can operate system calibration, two-point calibration and iron matrix calibration. In general conditions, one can only operate the iron matrix calibration to assure accurate measurement. When the instrument iron matrix is greatly different from the measured workpiece iron matrix in magnetism and surface roughness, one can operate system calibration to assure the accuracy of the measurement.

(1) iron matrix calibration

the metal of the instrument standard matrix should be similar to the metal of the measured workpiece matrix in magnetism and surface roughness. In order to ensure the accuracy of measurement, iron

calibration can be operated before measuring the workpiece.

Calibration method: after the instrument is turned on, put the probe on the bare matrix of the measured workpiece to measure twice. When the second measurement is finished, don't move the probe. Press the key of "CAL". When two buzzing sound is heard the iron matrix calibration is finished. If no buzzing sound is heard, there is something wrong with the operation. Repeat the above-mentioned procedures until two buzzing sound is heard.

(2) Two-point calibration

In the process of measurement, if some measured data have relatively large errors, they can be adjusted through two-point calibration.

Calibration method: take a workpiece whose thickness has already been known as the standard workpiece and then measure it. If the indication is different from its true thickness, keys of "▲", "▼" should be pressed to plus 1 or minus 1. press "▲", "▼" keys without stop can continuously plus or minus until the indication is the same as its true thickness. When the calibration is finished, measurement can be operated normally.

Notice: the thickness of measured workpiece in two-point calibration shouldn't be close to the five sample values in system calibration, otherwise operation will be ineffective.

(3) system calibration

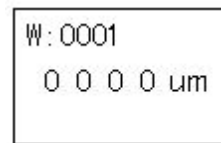
before instruments go to market, technicians have already operated system calibration on them. In order to ensure accuracy, the second system calibration can also be operated on working site.

The process of system calibration:

In the state of powering off, press the key of "ON/OFF" and

"MENU" key at the same time. Loosen the key of "ON/OFF" first and then the "MENU" key. Then instrument goes into the mode of system calibration.

Five sample workpieces need to be calibrated in system calibration. When instrument displays "iron matrix" screen, the probe should be put on the bare matrix of the measured workpiece to measure. If there is nothing wrong with operation, after the second measurement two buzzing sound will be heard and the instrument begins to measure the first sample workpiece. The screen displays the first sample workpiece value. If the indication is different from the true value, "▲▼"key should be pressed to plus 1 or minus 1. press"▲" or"▼" keys without stop can continuously plus or minus until the indication is the same as the true value. After the sample workpiece value is adjusted, the first sample workpiece can be measured. If there is nothing wrong with the two measurements, two buzzing sound can be heard and the next sample workpiece can be calibrated. If after two measurements there is still no buzzing sound, it indicates that there is something wrong with the operation. Then it should be measured once again. The adjustment method of the following four sample workpieces is similar. When the fifth sample workpiece is calibrated, the screen displays "0000" and instrument enters turning-on interface as is shown in drawing A. at this time, the instrument has finished system calibration. Then workpiece can be directly measured.



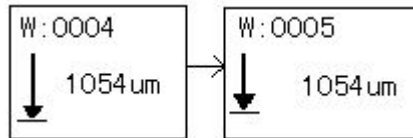
图A

Notice: the standard workpiece provided or sample workpieces whose thickness has already been known can serve as the five

sample workpieces. When sample workpiece is calibrated, it should be according to the small-to-big order. Certain value difference should exist between adjacent sample workpieces.

3.storage in the state of measurement

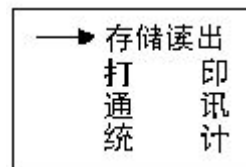
in the state of measurement, the screen displays the latest measured value. If it needs to be stored, press "ENTER" key and the storage address plus 1 automatically. For example, if the current address is 0004 and measured thickness is 1054um, the storage address will change to 0005 as is shown in the drawing.



The measured value displayed on screen can only be stored once. If it needs to be stored once again, it should be measured once again. If the data need to be stored from the initial address, press "ENTER" key under the storage and reading menu for a long time, then the storage address number will come back to the initial address 0001, that is to say, the data can be re-stored.

4.the use of menu:

no matter what state it is in, press "MENU" key and instrument displays four function menu: storage and reading----print----communication----statistic. Presskey can adjust the place of the arrow to choose different functions as is shown in the figure. For example, if storage and reading function needs to be set up, press "ENTER" key when the arrow points to “ storage and reading”. Then the instrument goes into the state of



storage and reading.

(1)、 storage and reading

this instrument can store 254 measured data continuously. Enter storage and reading menu, one can see the stored data. The content in different storage part can be displayed through "▲▼"key.

(2)、 print

first a printer should be prepared well. Connect the lines, place printing paper, and plug it into power supply. At this time, both the red and the green lights are on. If the green light is off, press the button "SEL" on the printer. If the green light is on, it indicates that the printer is ready to be used. Connect the printer with the three-needle plug. According to the red printing tube inserting needle, insert the plug into the "PCI" interface on the instrument. When the instrument is in the state of "print", press key "▲"and instrument begins to print. Press "▼"key for a long time, the printing can be stopped.

(3)、 Communication

open communication software and "open serial port" on the software. The other settings are all default settings. When the instrument is in the state of communication, press "▲"key and instrument begins to communicate. Press "▼"key for a long time and communication can be stopped.

(4)、 statistic

in order to effectively analyze measured data, this instrument has the function of data statistic. In statistic menu, the maximum value, the minimum value and the average value of measured data can be displayed. In the state of measurement, the screen displays the newly measured data. The instrument stores measured data

automatically. The number that is displayed behind S on the top of the screen is the number of data that have entered statistic. In order to ensure the validity of statistical data, the average value will not be shown when measurements have been operated for fewer than eight times. When measurements have been operated for more than eight times, only the last eight data will enter statistic.

In the process of measurement, if some data have relatively large errors, one can remove probe and press "CAL" key in non-measurement state to delete to prevent the data enter statistical calculation. At this time, the screen displays "0000um", that means, the instrument can measure data again. If the instrument measures directly in the state of statistic, it can return to the state of measurement.

四. Notice:

(1) when the curvature radius of the measured curved surface or cylinder is relatively small, the instrument should be calibrated on uncoated workpiece to ensure accuracy of measurement.

(2) When it measures concave with a relatively small radius, the instrument should be calibrated again.

五. Some factors that may influence measurement

The magnetism of the matrix metal

Magnetic thickness measuring is influenced by the change in magnetism of the matrix metal (in practical application, the change of magnetism of low carbon steel can be regarded very light). In order to prevent the influence of heat treatment or cold working etc. the instrument should be calibrated on iron matrix that have the same properties as the coated metal.

The thickness of matrix metal

Every instrument has a critical thickness for the matrix metal. If the thickness of the measured workpiece is thicker than this critical thickness, the measurement will not be influenced by the thickness of matrix metal.

Edge effects

This instrument is sensitive to the change of the measured workpiece surface, so it is unreliable to measure on the edge of the workpiece or inner rounding places.

Curvature

The curvature of the workpiece can influence measurement. This influence becomes bigger as the curvature radius becomes smaller. So the workpiece shouldn't be measured on the curved surface whose curvature radius is bigger than permitted.

Surface roughness

The surface roughness of the matrix metal has influence on measurement. The bigger the roughness, the bigger the influence. Rough surface will cause system error and accidental error. In the process of measurement, increasing the times of measurement in different places can overcome this accidental error.

If the matrix metal is rough, some places in uncoated matrix metal workpiece with similar roughness should be selected to calibrate the zero point of the instrument. Or use non-corrosive liquid to get rid of the coating on the matrix metal and then calibrate the zero point of the instrument.

Magnetic field

The strong magnetic field produced by the various electrical equipment around can greatly interfere the work of magnetic thickness measuring.

Coating materials

This instrument is sensitive to the coating materials that prevent probe from closely contacting the surface. So coating materials should be removed to make sure that the probe can directly contact the coating surface.

The place of the probe

The place of the probe has influence on measurement. In the process of measurement, the probe should be vertical to the surface of the workpiece.

The deformation of the workpiece

The probe can cause soft coating workpiece to deform so the data gotten from these workpieces are unreliable.

Times of reading

In general conditions, the reading is different every time. So it should measure more than one time in every measured area. The partial difference of the coating thickness also requires that measurement should be carried out in designated area. When the surface is rough, more times are even needed.

Chapter three maintenance and overhaul

- 1.the instrument shouldn't be dampened or overheated. It also shouldn't contact corrosive gas or liquid.
- 2.don't swing or pluck the probe wire.
- 3.the instrument should be kept clean.
- 4.batteries should be brought out when the instrument is not used for a long time.
- 5.when the measurement is abnormal, one should do the following things:
 - A: check whether the voltage is normal and whether the positive and negative electrodes of the battery contact well.
 - B: whether the application method is proper.
 - C: if there is major failure, send the instrument to the factory or repair department to repair.
 - D: when it is used, first insert the probe and then turn on the instrument.

Accessory one packing list

- | | |
|--|---------|
| 一. Coating thickness gauge (VICTOR 852A) | one |
| 二. 1.5v battery (number 7) | two |
| 三. Probe | one |
| 四. Standard workpiece | one box |
| 五. Steel file | one |
| 六. Aluminum case | one |
| 七. Instruction manual. Certificate | one set |
- Selected fittings: micro-printer, data wire, operation software, anti-corrosive probe

letter to consumers

thank you for supporting my company! If you think we have problems in products, service or other work, or you have better advice, please write the following form carefully and give back to us so that we can improve our products and service in time. Your support will help us to improve the level and quality of our service!

name		telephone	
Company name		Company address	
fax		e-mail	
Product type		Purchase date	
Problems			
Advice on product			

Feedback address: SHENZHEN VICTOR HI-TECH CO. , LTD.

telephone: 0755-82426859 0755-82260245

fax: 0755-82268753 postcode: 518029