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› **VTSYIQI 98N Ultrasonic Hardness Durometer User Manual**

VTSYIQI VTSYIQI202409111440425863VTSYIQI

VTSYIQI 98N Ultrasonic Hardness Durometer User Manual

Model: VTSYIQI202409111440425863VTSYIQI

1. INTRODUCTION

The VTSYIQI 98N Ultrasonic Hardness Durometer is a precision instrument designed for measuring the hardness of various materials using the Ultrasonic Contact Impedance (UCI) method. This device offers high precision, fast measurement speed, and ease of operation, making it suitable for industrial applications involving ferrous metals, non-ferrous metals, and their alloys. It is particularly useful for testing hardness in areas such as flange edges, gear root grooves, stamping parts, thin plates, surface-hardened gear grooves, tapered parts, shafts, thin-walled pipes, and turbines.

This manual provides essential information for the safe and effective use of your VTSYIQI 98N Ultrasonic Hardness Durometer. Please read it thoroughly before operation and retain it for future reference.

2. SAFETY INFORMATION

To ensure safe operation and prevent damage to the instrument, please observe the following safety precautions:

- Always operate the device in accordance with the instructions provided in this manual.
- Do not expose the instrument to extreme temperatures, humidity, or corrosive environments.
- Avoid dropping or subjecting the device to strong impacts.
- Use only the specified power adapter and USB cable for charging and data transfer.
- Keep the probe tip clean and free from debris. Handle the probe with care to avoid damage.
- Do not attempt to disassemble or repair the instrument yourself. Refer all servicing to qualified personnel.
- Ensure the test surface is stable and properly prepared before taking measurements.

3. PACKAGE CONTENTS

Carefully unpack the box and verify that all items listed below are present and in good condition. If any items are missing or damaged, contact your supplier immediately.

- Main Host Unit (Ultrasonic Hardness Durometer)
- Ultrasonic Probe (10kgf)
- USB Communication Cable
- Power Adapter

- Operating Manual
- Carrying Case
- Calibration Block (optional, may vary by package)



Figure 3.1: Main unit, probe, and accessories neatly arranged in the protective carrying case.

4. PRODUCT OVERVIEW

4.1 Main Unit and Display

The main unit features a 3.5-inch IPS full digital LCD display with a wide viewing angle and adjustable backlight. The display resolution is 480x320 pixels, providing clear readability of measurement results and settings.



Figure 4.1: Front view of the durometer showing the display and control panel.

4.2 Control Buttons

The control panel includes function keys (F1, F2, F3), navigation arrows (Up, Down, Left, Right), DELETE, MENU, and Power ON/OFF buttons. These buttons allow for easy navigation through menus, selection of settings, and execution of measurements.

4.3 Ultrasonic Probe

The device utilizes a 10kgf ultrasonic probe for hardness measurements. The probe connects securely to the main unit. The system supports hot-swap and automatic/manual self-calibration of the probe.



Figure 4.2: The durometer with the ultrasonic probe connected.

5. SETUP

5.1 Initial Charging

Before first use, fully charge the device. Connect the USB communication cable to the main unit and the power adapter, then plug the adapter into a power outlet. The charging indicator on the display will show the charging status. A full charge typically takes several hours and provides approximately 10 hours of continuous working time.

5.2 Probe Connection

Carefully connect the ultrasonic probe to the designated port on the main unit. Ensure the connection is secure to prevent measurement inaccuracies. The device supports automatic recognition of the connected probe.

6. OPERATING INSTRUCTIONS

6.1 Powering On/Off

Press and hold the Power button to turn the device ON or OFF.

6.2 Navigation and Menu

Use the arrow buttons to navigate through menu options. Press the MENU button to access the main menu, where you can adjust settings such as material type, hardness scale, and data management options. The F1, F2, F3 buttons correspond to on-screen functions.

6.3 Calibration

The device features auto-calibration of the probe. For enhanced accuracy, especially with materials having different elastic moduli, a multi-point calibration function is available. Refer to the on-screen prompts and the detailed calibration section in the full manual for specific steps.



Figure 6.1: Multi-point calibration mode for improved accuracy across various materials.

6.4 Material Selection

The device includes pre-set material functions and allows for the addition of up to 3 new material settings to facilitate hardness testing of special materials. Select the appropriate material from the menu before taking measurements.

6.5 Performing a Measurement

1. Ensure the test surface is clean, smooth, and stable ($R_a < 15\mu m$).
2. Select the correct material and hardness scale.
3. Place the probe firmly and perpendicularly onto the test surface.
4. Initiate the measurement as per the on-screen instructions (e.g., press a function key).
5. The hardness value will be displayed on the screen, typically in Vickers (HV) along with the selected hardness scale.

6.6 Data Management

The device can store a maximum of 600 sets of measurement data. Each data set includes the measurement date, sensor

type, material, number of times, single measurement value, average value, maximum value, minimum value, and hardness scale.

Data can be exported via the USB 2.0 communication interface to a PC for further analysis. Software for data exchange and settings configuration on a PC is available.



Figure 6.2: Data export functionality to PC via USB.

6.7 Alarm Function

The upper and lower limits for hardness values can be pre-set. If a measurement falls outside this defined range, the device will issue an automatic alarm, which is useful for batch testing and quality control.

7. MAINTENANCE

Proper maintenance ensures the longevity and accuracy of your hardness durometer:

- **Cleaning:** Wipe the main unit and probe with a soft, dry cloth. Do not use abrasive cleaners or solvents.
- **Storage:** Store the instrument and its accessories in the provided carrying case in a dry, dust-free environment when not in use.
- **Battery Care:** To maintain battery health, avoid fully discharging the battery frequently. If storing for extended periods, charge the battery to approximately 50% and recharge every few months.
- **Probe Inspection:** Regularly inspect the probe tip for wear or damage. A damaged probe can lead to inaccurate readings.

8. TROUBLESHOOTING

This section addresses common issues you might encounter:

Problem	Possible Cause	Solution
Device does not power on	Low battery; Power button not pressed long enough	Charge the battery; Press and hold the Power button for 3-5 seconds
Inaccurate readings	Improper calibration; Damaged probe; Unsuitable test surface; Incorrect material selected	Perform calibration; Inspect/replace probe; Ensure surface is clean and smooth; Verify material settings
Probe not recognized	Loose connection; Damaged probe port	Ensure probe is securely connected; Contact support if issue persists
Data transfer failure	Loose USB connection; Driver issue; Software not installed	Check USB cable connection; Install necessary drivers/software on PC

9. SPECIFICATIONS

The following table outlines the technical specifications of the VTSYIQI 98N Ultrasonic Hardness Durometer:

Feature	Specification
Measurement Method	Ultrasonic Contact Impedance (UCI)
Hardness Scales	HV10-1900, HB76-618, HRB41-105, HRC20.3-68, HRA60.7-85.6
Test Error	HRC: ± 2 HRC; HB: $\pm 3\%$ HB; HV: $\pm 4\%$ HV
Display	3.5-inch IPS LCD, 480x320 resolution
Probe Type	10kgf (98N)
Applicable Materials	Steel and cast steel, cast aluminum alloy, pure copper, and other ferrous/non-ferrous metals
Data Storage	Up to 600 measurement data sets
Communication Interface	USB 2.0
Power Source	3.7V Lithium-ion battery pack
Continuous Working Time	Approximately 10 hours
Charging Power Supply	5V/1000mA
Product Dimensions	5.91 x 1.97 x 9.84 inches (15 x 5 x 25 cm)
Weight	8.82 Pounds (4 kg)
Standards Compliance	GB/T 34205-2017, DIN50159-1, ASTM-A1038

10. WARRANTY AND SUPPORT

VTSYIQI products are manufactured to high-quality standards. For information regarding warranty coverage, technical support, or service, please refer to the warranty card included with your product or contact your authorized VTSYIQI dealer or customer service directly. Please have your model number (VTSYIQI202409111440425863VTSYIQI) and purchase date available when seeking support.