



**BANBROS ENGINEERING PVT. LTD.**

The Precision Measurement People

# AUTOMATIC MOTORIZED MICRO VICKERS HARDNESS TESTER



- *VALUE*
- *VERSATILITY*
- *PERFORMANCE*



## **BMVH-1XY**

**DESCRIPTION:-**

BMVH-1XY Automatic Micro Vickers Hardness Tester is integrated with several new technologies such as optical imaging, mechanical displacement, electronic control, digital imaging, image analysis, computer processing and so on. It controls the Micro Vickers hardness tester and automatic test table by the computer, and displays the indentation image on the computer screen. By means of automatic reading and manual reading, it accurately measures the HV hardness, hardening depth, film thickness, distance between two points of metals and some non-metallic materials and various films. It also can shoot metal surface morphology and taking fixed rate printing etc. This system breaks through the traditional test method, realize the hardness test of fully automatic, high precision, high repeatability, and it is the important equipment for materials analysis.

**FEATURES:-**

1. **Semi-Automation:** Manual do focus work, focusing done then click of a button, system starts automatic test and measurement process in indentation, measuring, and hardness curve plotting.
2. **Motorized XY Sample Stage:** System provides motorized XY sample stage, with XY stage table dimensions 110mmX110mm, travel lengths 50mmX50mm, and position precision 2  $\mu$ m as standard. Can be controlled by joystick and by software. Table dimensions and travellengths can be customized.
3. **Test Pattern and Path Setup:** Sets up test paths with various patterns such as line, line set, arc, gear top parallel, gear center, and matrices etc.
4. **Automatic Sample Boundary Scan:** Automatically scans along the sample boundary to obtain the sample overview image which is necessary in many test cases to set up test load paths.
5. **Hardness curve, Statistics, Auto-alarm:** Automatically detects and plots multiple hardness curves and calculates the hardness case depths. Automatically updates the statistics such as average, min and max, standard deviation, Cp, and Cpk; Automatically marks data that are out of specification limits; May load the depth template file for convenience.
6. **Conversion, compensation, and validation:** Converts HV to other hardness scales, simultaneously; Validates the test results with sample dimensions; Compensates the test results with respect to sample cylindrical/spherical diameters.
7. **Data archiving:** Measurement data and images can be saved in one file for later processing.
8. **Test report:** Automatically generates WORD, EXCEL or PDF report with customizable template; May enter user additional information in report.
9. **Data output by network:** Sends data to TCP/IP server in network to enterprise database.
10. **Knoop Scale, Fracture Toughness:** Can be configured for Knoop Scale measurement; Also for Fracture Toughness measurement by indentation.
11. **Other functionalities:** Image/Video capture/save; Geometric measurements; Document entries, etc.
12. **Stable Structure design:** Adopted one time casting aluminium machine body and car painting technology, structure more stable and appearance more decent.

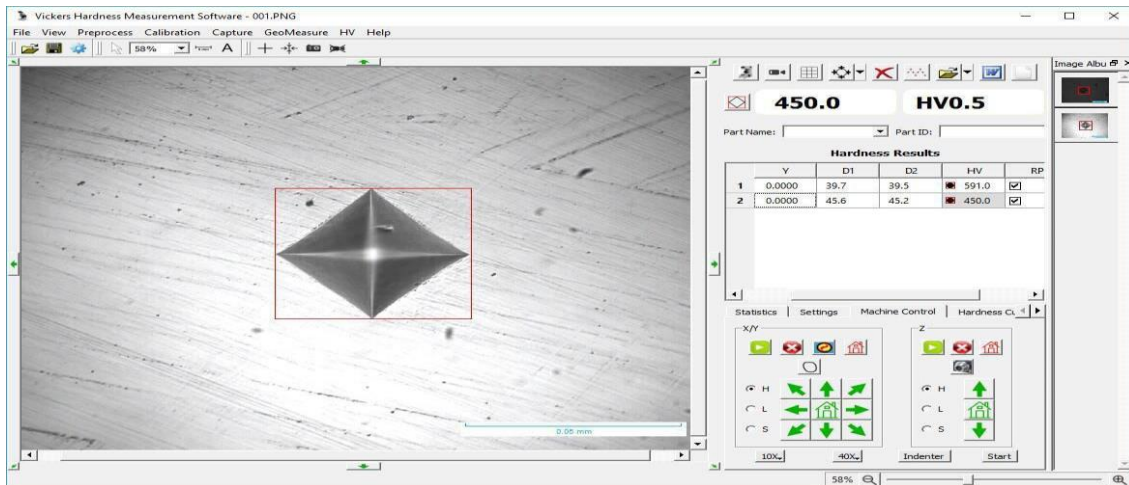


13. **Multi-functions:** Support automatic measuring with computer and software, also support manual test by machine independently. Double optical path design. Both eyepiece and CCD camera path can work at same time. No need switch optical path.

**TECHNICAL SPECIFICATION:-**

Model		BMVH-1XY
Test Force	gf	10gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1000gf
	N	0.098N, 0.246N, 0.49N, 0.98N, 1.96N, 2.94N, 4.90N, 9.80N
Test Range		1HV-2967HV
Test Mode		HV/HK
Loading Method		Automatic (Loading/Dwell/Unloading)
Turret		Automatic Shifting
Conversion Scale		HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HB
Data Output		Built-in Printer; Computer screen (software window) WORD or EXCEL Report with Curve Chart
Hardness Reading		Indentation Displaying and Automatic Measuring on PC
Focus		By manual
Objective		10X (Observe), 40X (Measure)
Eyepiece		Digital 10X eyepiece with built-in encoder, auto calcu
Total Magnification		100X , 400X
Resolution		0.0625μm, measuring range 200μm
Dwell Time		5-99s, each step 1 second
Machine display		Touch screen
Light Source		LED cold light source (can be continuous use for 24 hours, no heat generate ensure stable working, servicing life can reach 100,000 hours)
Max. Height of Specimen		80mm
Throat		110mm
Power Supply		AC220V, 50Hz
Execute Standard		ISO 6507, ASTM E384, JIS Z2244, GB/ T 4340.2
Dimension		215×450×468mm, Packing Dimension: 560×390×810mm
Weight		Net Weight: 45kg, Gross Weight: 60kg

\* Banbros Reserves the rights of change in above specification due to constant improvement in design



**SOFTWARE SYSTEM:**

Camera	5 Million Pixel digital camera
X-Y Platform table	Auto move; 110X110mm
	Max. Move range: 25x25mm (X-Y axis direction)
	Precision: less than 2um (resolution 0.002mm)
	Move speed: 1-10mm/sec (adjustable)
	Displacement repeatability $\leq 2\mu\text{m}$
Move direction: Support 8 directions move	
<b>Software Main Functions</b>	

1. System linkage: Through the communication interface it realizes the linkage between the system and the hardness tester.
2. Pressure linkage: When converting test force, the system perceps the test force change and displays in real time.
3. Turret linkage: The software controls the shifting between the objective and the indenter without manual control.
4. Loading linkage: The software controls the loading without manual control.
5. Measuring linkage: The software controls the turret, loading and directly reading the Vickers hardness value.
6. Light source linkage: Automatic focus.
7. Image acquisition: Real time display of hardness image, store and print image.
8. Automatic measurement: Automatically find the four vertices of indentation with fast speed and accurate data, there are many professional algorithms to be suitable for different indentation. It continuously and immediately measures at specified coordinates once loading.



9. Automatic point search: The system automatically finds the best vertices near the four vertices of the indentation, greatly reduce the human error.
10. Diagonal measurement: Click the top left and lower right corner of the indentation, you can read the hardness value.
11. Four point measurement: Click the four point of the indentation and you can read the hardness value.
12. Hardness conversion: According to the national standard, automatically convert the hardness value between Brinell, Rockwell, Vickers, Knoop, real-time display.
13. Graphic report: Automatic record of measurement data, automatic generation of hardness-depth curves, saving or printing the hardness-depth curves and all indentation measurements. Save or print the indentation image and the current indentation hardness value. All the reports are saved in WORD file.
14. Results statistics: Output the multiple measured results of indentations by EXCEL and automatically count the measurement number, maximum value, minimum value, average value, variance, etc. of hardness.
15. Linkage control: Through the communication interface the system perceps the test force changes, controls the turret, loads and directly reads.
16. Automatic displacement: Equipped with high precision X-Y automatic test table.
17. Automatic identification: Leading indentation automatic identification technology, read D1 / D2 and HV value in 0.3 seconds.
18. Stable performance: The indentation of non mirror polishing, uneven light, not in the center can be read automatically.
19. Powerful functions: Such as manual reading, automatic reading, hardness conversion, depth-hardness curve, indentation image, picture and text report.
20. Easy to use: Through the hardness block calibration, in line with the users' habits. It can be normal used with half day training.
21. Automatic reading: Original algorithm of automatic reading to automatic read a variety of indentation with fast speed and high accuracy.
22. Good repeatability: It is automatic reading with high repeatability and can satisfy the requirement of professional users.
23. Automatic scanning: Can automatically scan the sample edge and shape.