

echoLAB[®]

Hardness testers

echo^{LAB}

Hardness Testers

echoLAB Material Testing products are developed, produced, tested and guaranteed by the Italian manufacturer DEVCO srl, to assure quality, functionality, innovation and customization.

The echoLAB brand is a reliable and qualified partner in the **metallurgical and physical testing** laboratories field worldwide, offering expertise, know-how and best value for money

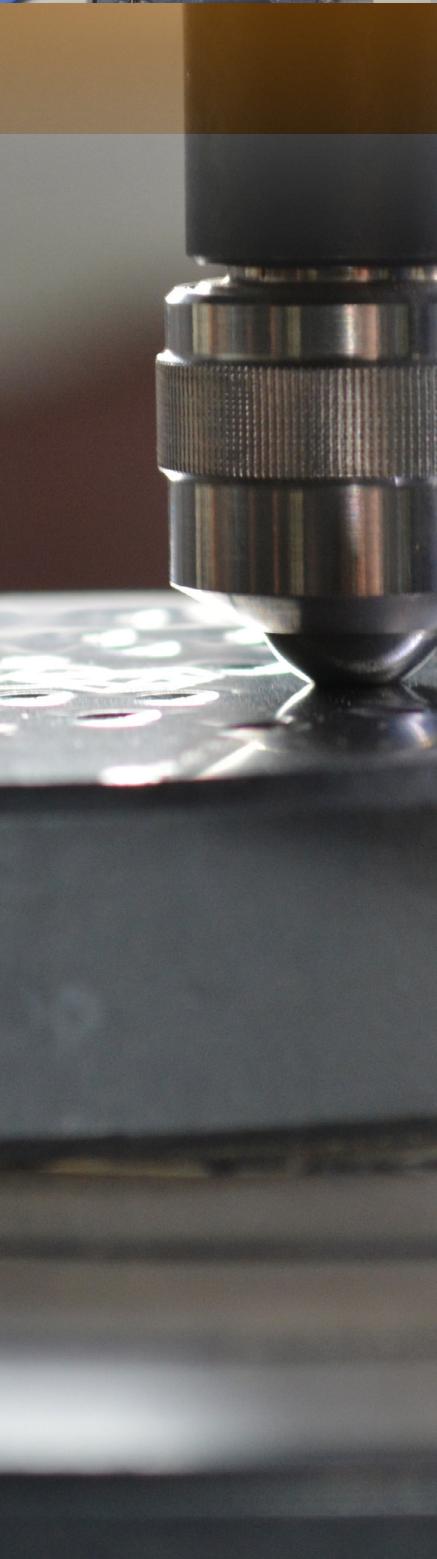
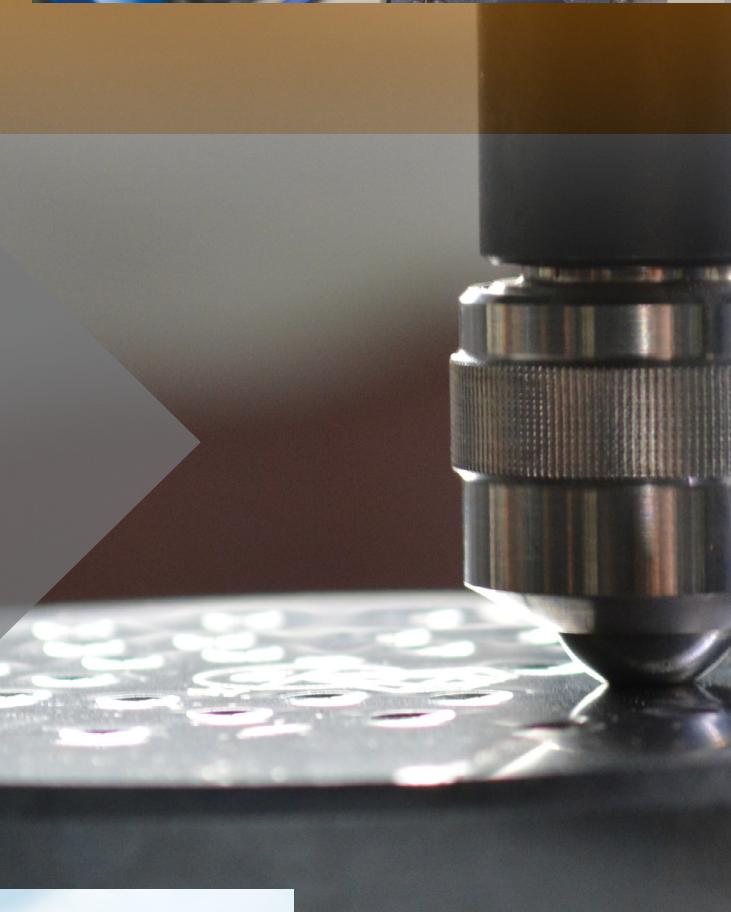


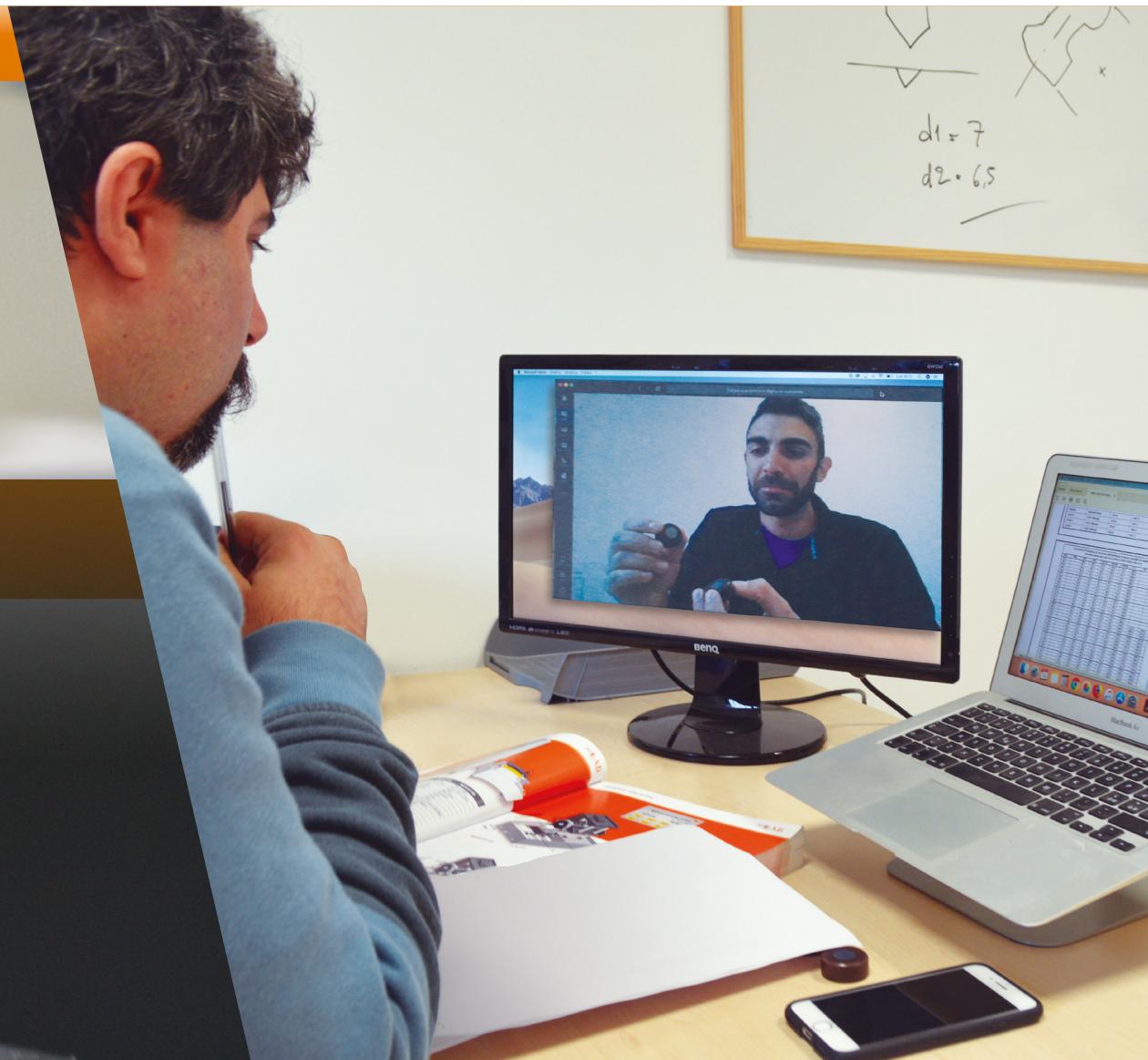
echoLAB EXPERIENCE





All echoLAB products are strictly controlled by our qualified engineers over the entire manufacturing process, in accordance with the EC quality standards. The echoLAB experience includes a **responsive customer service**, granting one-to-one relation with skilled personnel, as well as a global support by a network of qualified experts for **remote and on-site assistance**. Dedicated training and availability of spare parts and consumables contribute to ensure the long-term performance of the echoLAB equipment.





Our wide offer of Hardness testers, including Rockwell, Brinell, Vickers, Portable, Shore and Rockwell Hardness Testers, ranges from manual standard applications to fully automatic testing systems with related accessories and consumables. echoLAB hardness testing machines are designed to supply **advanced technology** with cost-efficient and **user-friendly solutions**.



Vickers

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MicroVickers

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Brinell

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Hardness Testers

VICKERS



Vickers Hardness

Developed in 1921 as an alternative to the Brinell Hardness test, Vickers Hardness test is a common method to measure the hardness of materials, specifically thin sections and small parts. The test is done by pressing a square-based pyramid diamond indenter on a well prepared sample surface under specific load. The resulting indentation is measured by scaled eyepiece or through a specific analyzing software and converted in the HV scale.

The Vickers method can be divided in two ranges that, while using the same indenter, vary depending on the applied load: Macro and Micro range.

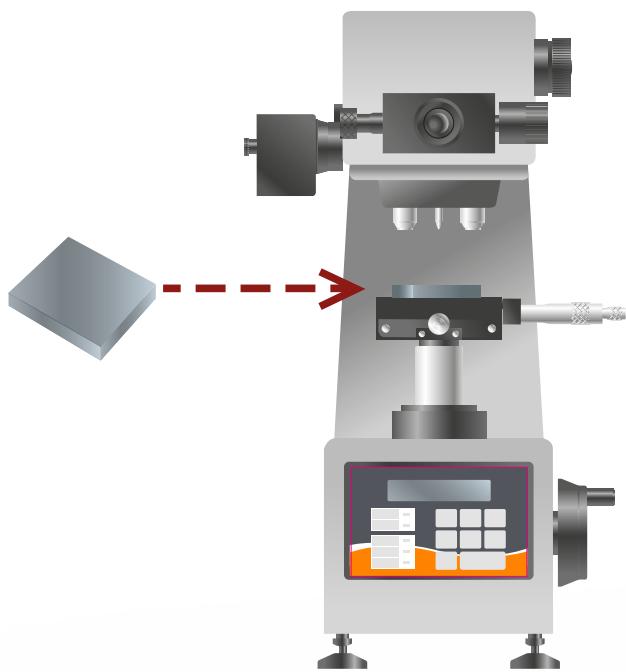
Vickers hardness numbers are always expressed as $xxHVyy$ where xx is the hardness number, HV is the hardness scale and yy the applied load.

Knoop Hardness

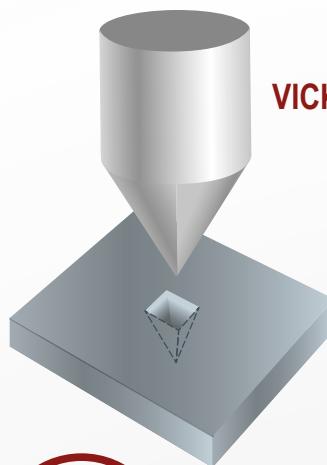
Developed in 1939, Knoop Hardness Test is used to measure the hardness of brittle materials or thin sheets. Knoop test can replace a Vickers test and use a pyramidal diamond indenter. It is expressed as HK .

LOADING

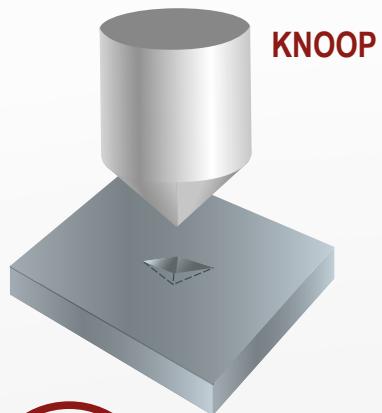
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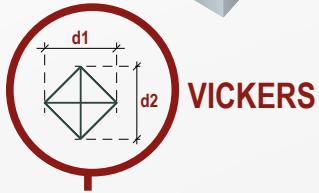
2 INDENTATION



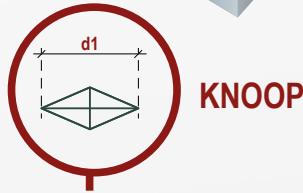
VICKERS



KNOOP

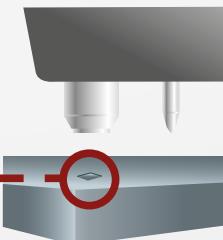


VICKERS



KNOOP

3 DIRECT READING



**Vickers**

Scale	Indenter	Indentation time	Sample preparation	Application
HV0.01	Pyramidal diamond	10 to 15 seconds	Polished	Small samples, thin layer, ceramics, CHD
HV0.02	Pyramidal diamond	10 to 15 seconds	Polished	Small samples, thin layer, ceramics, CHD
HV0.35	Pyramidal diamond	10 to 15 seconds	Polished	Small samples, thin layer, ceramics, CHD
HV0.5	Pyramidal diamond	10 to 15 seconds	Polished	Small samples, thin layer, ceramics, CHD
HV1	Pyramidal diamond	10 to 15 seconds	Polished	Hardness progressions, Surface hardness testing, CHD
HV2	Pyramidal diamond	10 to 15 seconds	Polished	Hardness progressions, Surface hardness testing, CHD
HV3	Pyramidal diamond	10 to 15 seconds	Polished	Hardness progressions, Surface hardness testing, CHD
HV5	Pyramidal diamond	10 to 15 seconds	Polished	Sintered materials, Welds
HV10	Pyramidal diamond	10 to 15 seconds	Ground	Sintered materials, Welds
HV20	Pyramidal diamond	10 to 15 seconds	Ground	Sintered materials, Welds
HV30	Pyramidal diamond	10 to 15 seconds	Ground	Jominy, surface hardness testing
HV50	Pyramidal diamond	10 to 15 seconds	Ground	Jominy, surface hardness testing
HV100	Pyramidal diamond	10 to 15 seconds	Ground	Jominy, surface hardness testing

Applicable standard ASTM E384 for Micro and Macro Ranges, ISO 6507 for Micro and Macro Ranges, JIS Z2244

Vickers and Knoop Standard

**Knoop**

Method	Indenter	Indentation time	Sample preparation	Application
HK 0.01	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers
HK 0.025	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers
HK 0.05	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers
HK 0.1	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers, embedded specimens
HK 0.2	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers, embedded specimens
HK 0.3	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers, embedded specimens
HK 0.5	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers
HK 1	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers
HK 2	172° x 130° Pyramidal diamond	10 to 15 seconds	High Polished	Very thin layers

Applicable standard ASTM E384, ISO 4545, JIS Z2251

HTV 10DT / HTV 50DT V3.0

Fully Automatic Vickers Hardness Tester

- > Automatic Vickers hardness tester adopts the integrated design of panel computer with Windows 7 operating system. CCD image acquisition system, show the indentation image directly on the touch screen and automatically detect the Vickers hardness value.
- > All testing parameters can be selected on the side panel computer. User friendly with touch screen.
- > CCD image acquisition system, shows the image clearly and detects the hardness value by touching the screen.
- > Separate screen for better view of results.
- > Automatic recognition and shifting between the objective and indenter.
- > Hardness scale conversion function.
- > With USB, VGA and LAN interfaces, the hardness measurement can be print out by USB interface printer.

- > Automatic data save, generate the hardness-depth curve and save as WORD or EXCEL document.
- > With motorized X-Y test table, automatic focusing and automatic measuring, it is the fully automation of Vickers hardness testing.

Application

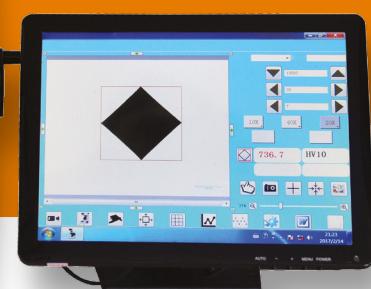
- > Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, alloy-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

- > ISO 6507, ASTM E92, JIS Z2244



FULLY AUTOMATIC



X-Y-Z MOTORIZED



Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2		4		6		8		9		10	11	11	12	12		
HV 0.3		4		5		6		7		8	9	10	10	11	11	
HV 0.5		3		5		5		6		6	7	7	8	8	9	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		4	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.

Model	HTV 10DT / HTV 50DT V3.0	Model	HTV 10DT / HTV 50DT V3.0
Test force control	Load cell closed loop - Load electronic controlled	Indenters	Diamond Vickers indenter
Load selection	Touch screen control panel	N. of indenters	1
Main loads	HTV 10DT V3.0: 0.2kgf, 0.3kgf, 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf HTV 50DT V3.0: 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf	Nose cone support diameter	6.35mm
dwell time	0~60s	Indent measure algorithms	Automatic
Loading time	0.2kgf~5kgf: 8s, 10kgf~50kgf: 10s	Auto reading time	0.3 sec/1 indent
Load applying speed (indenter descending speed)	0.04mm/s	Specimen detection	Yes
Test force tolerance	±1%	Movement program patterns	Zigzag, circle, arc, straight line, random, teaching etc.
Test cycle type	Fully-automatic type: focus, load, dwell, unload, show of the hardness value	Vertical test capacity	185mm
	HTV 10DT V3.0: HV0.2, HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10	Horizontal test capacity	130mm
Hardness scales	HTV 50DT V3.0: HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10, HV20, HV30, HV50	Anvils dimensions	Motorized cross test table, size: 110x110mm
Hardness test range	1HV~2967HV	Max. weight on anvil	50kg
Hardness resolution	0.1HV	X-Y travel	50x50mm
Repeatability hef/%	Table 1	X axis speed	High: 1mm/s, low: 0.25mm/s
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140	X axis resolution	0.002mm
Turret type	Automatic	Y axis speed	High: 1mm/s, low: 0.25mm/s
CCD camera pixel	1.30 Million	Y axis resolution	0.002mm
Microscope eyepiece	10x	Z axis movement	Motorized
Objectives	10x, 20x, 40x objectives	Z axis resolution	0.00125mm
Optical path	2 ways eyepiece	Z axis speed	High: 1mm/s, low: 0.0625mm/s
Optical function	Optical diaphragm / field aperture / color filter	Display type	Touch screen
Illumination	Halogen lamp	Display dimensions	External touch pad 15" Internal touch screen 8"
	0.1µm (10x objective)	Input mode	By tap touch
CCD min. measuring unit	0.05µm (20x objective)	Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, indentation, objective
	0.025µm (40x objective)	Statistics or functions	Max, min, average value, report, hardness curve
CCD max. measurement length	680µm (10x objective) 340µm (20x objective) 170µm (40x objective)	Data storage	SSD 64GB
Measurable. indent/indentation	10µm	Data output	Word, Excel format
Auto-focus time	3s	Energy saving mode	Yes
Total enlargment resolution	0.06µm, 0.03µm, 0.015µm	Interfaces	2x USB, 1x VGA, 1x LAN, 1x RS232 (15pin)
		Safety device	Emergency switch
		Operation temperature	23±5 °C
		Operation rel. humidity	≤65%
		Weight	52kg
		Dimensions	560x335x675mm
		Power supply	230 V
		Voltage variance	±10%
		Absorbed power	500W

Standard accessories

Model	Description	Q.ty
VT-10XOB	10x objective	1 pc
VT-20XOB	20x objective	1 pc
VT-40XOB	40x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-MCTT110	Motorized cross test table 110x110mm	1 pc
HB-400500HV5	Hardness block 400-500 HV5	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
VT-EXTCSC	External touch screen	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-TSRC	Touch screen remote control	1 pc
VT-TP	Touch pen	1 pc
VT-MSE	Mouse	1 pc
VT-SKUSB	USB storage key	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
VT-CTT100100	Cross test table 100x100mm
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø 76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-LTT108	Large plane test table ø 108mm
VT-VTT40	V-shaped test table ø 40mm
VT-WB	Work bench
VT-EXPR	External printer
Vickers hardness blocks	
Model	Range
HB-V0.2/200-750	200-750 HV0.2 (HTV 5DT V3.0, HTV 10DT V3.0)
HB-V0.3/200-750	200-750 HV0.3 (HTV 5DT V3.0, HTV 10DT V3.0, HTV 30DT V3.0)
HB-V0.5/200-750	200-750 HV0.5
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10 (HTV 10DT V3.0, HTV 30DT V3.0, HTV 50DT V3.0)
HB-V20/175-750	175-750 HV20 (HTV 30DT V3.0, HTV 50DT V3.0)
HB-V30/175-750	175-750 HV30 (HTV 30DT V3.0, HTV 50DT V3.0)
HB-V50/175-750	175-750 HV50 (HTV 50DT V3.0)

HTV 10D / HTV 50D V2.0



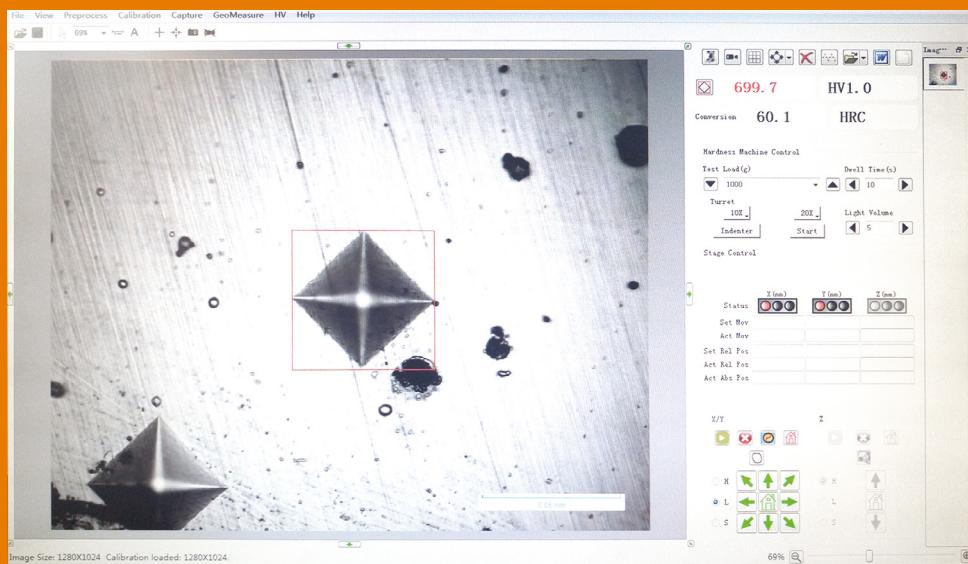
Automatic Vickers Hardness Tester

- Automatic Vickers Hardness Tester integrates mechanical displacement, electronic control, digital imaging, image analysis, computer processing. Automatic test table computer control, screen indentation display.
- Automatic reading and manual reading, accurately measures the HV hardness, hardening depth, film thickness of metals and some non-metallic materials and various films.
- Sample surface morphology detection and rate printing.



Displayed value repeatability %

Standard hardness range	HV5-HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5



Parameters:

- Operating system: WIN XP, WIN7
- Digital imaging system
- High resolution: 130 million pixel
- High speed acquisition: 1280x1024 resolution, 25 FPS
- High definition: Black and white images are clear and defined
- Target surface size: 1/2"

X-Y automatic test table

- Table size: 100x100x50 mm
- Maximum travel: 50x50 mm
- Minimum step: Less than 1µm
- Movement speed: Adjustable
- Control mode: Manual control, electric control, computer control

X-Y test table - computer control mode

- Location movement: Test table directly moves to the software input coordinates
- Point movement: Selecting a point on the sample, the table moves to place it below the indenter
- Directional movement: Click the eight directions to move the test table with setted up movements
- Arbitrary movement: Click any directions to move the test table with setted up movements for sample surface study
- Variable speed movement: Two speeds (fast and slow) test table moving, adjustable
- Other function: Original position arbitrary setting, automatic reset, mechanical limit, etc.

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2		4		6		8		9		10	11	11	12	12		
HV 0.3		4		5		6		7		8	9	10	10	11	11	
HV 0.5		3		5		5		6		6	7	7	8	8	9	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.

Measuring method

- > Automatic mode——Automatic test table moving (X and Y direction) + automatic
- > Manual mode 1——Automatic loading + manual eyepiece scribed line measurement
- > Manual mode 2——Manual test table moving + manual focus + Automatic / manual measurement

Automatic / manual reading

- > Automatic reading time: Single indentation reading time is about 300 ms
- > Automatic measurement precision: 0.1μm
- > Automatic measurement repeatability: ±0.8%
- > Manual reading: Manual pick, automatic search points, 4 points measurement, 2 diagonal measurement

Results save / output

- > Save/output: measurement data and parameters, including D1, D2, HV, X, Y, etc.
- > Save / output : effective hardening layer depth curve report, image.

Software function:

- > System linkage: System - hardness tester linkage through communication interface.
- > Pressure linkage: When converting test force, the system percepts the test force change and displays in real time.
- > Turret linkage: Software shifting controls between objective and indenter without manual control.
- > Loading linkage: Automatic loading control.
- > Measuring linkage: The software controls the turret, and after loading,directly reading the Vickers hardness value.
- > Light source linkage: Manual focus.
- > Image acquisition: Real time indentation display, saving and printing.
- > Automatic measurement: Automatically detect the four indentation vertices.
- > Automatic point search: The system automatically finds the best vertices, greatly reduce the human error.
- > Diagonal measurement: By just one mouse click on the top left and lower right corner of the indentation the hardness value will be displayed.
- > Four point measurement: Selecting the four indentation points the hardness value will be displayed.
- > Hardness conversion: According to international standard, automatically convert the hardness value between Brinell, Rockwell, Vickers and Knoop with real-time display.
- > Graphic report: Automatic record of measurement data, automatic generation of hardness-depth curves, saving or printing reports generated as Word documents.
- > Results statistics: Output the multiple measured indentation results in Excel format and automatically counts the measurement number, maximum value, minimum value, average value, variance, etc. of hardness.
- > Automatic displacement: Equipped with high precision X-Y automatic test table.
- > Automatic identification: Leading indentation automatic identification technology, read D1 / D2 and HV value in 0.3 seconds.
- > Stable performance: The indentation of non mirror polishing, uneven light, not in the center can be read automatically.
- > Powerful functions: Manual reading, automatic reading, hardness conversion, depth-hardness curve, indentation image, picture and text reports.
- > Automatic scanning: Automatically scan the sample edge and shape.

Model	HTV 10D / HTV 50D V2.0
Test force control	Load cell closed loop - Load electronic controlled
Load selection	PC and control panel keyboard (HV mode)
Main loads	HTV 10D V2.0: 0.3kgf, 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf HTV 50D V2.0: 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf
dwell time	0~60s
Loading time	0.3kgf~5kgf: 8s, 10kgf~50kgf: 10s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: Manual - focus Automatic - load, dwell, unload, show of the hardness value
Hardness scales	HTV 10D V2.0: HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10 HTV 50D V2.0: HV1, HV2, HV2.5, HV3, HV5, HV10, HV20, HV30, HV50
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Repeatability hcf/%	Table 1
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Turret type	Automatic
CCD camera pixel	1.30 Million
Eyepiece microscope	10x
Objectives	HTV 10D V2.0: 10x, 40x HTV 50D V2.0: 10x, 20x
Optical path	2 ways eyepiece
Optical function	Optical diaphragm / field aperture / color filter
Microscope min. measuring unit	HTV 10D V2.0: 0.25μm (10x objective), 0.0625μm (40x objective) HTV 50D V2.0: 0.25μm (10x objective), 0.125μm (20x objective)
Microscope max. measurement length	HTV 10D V2.0: 800μm (10x objective), 200μm (40x objective) HTV 50D V2.0: 800μm (10x objective), 400μm (20x objective)
CCD min. measuring unit	HTV 10D V2.0: 0.1μm (10x objective), 0.025μm (40x objective) HTV 50D V2.0: 0.1μm (10x objective), 0.05μm (20x objective)
CCD max. measurement length	HTV 10D V2.0: 680μm (10x objective), 170μm (40x objective) HTV 50D V2.0: 680μm (10x objective), 340μm (20x objective)
Measurable min. indent/indentation	10μm
Illumination	Halogen lamp
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose bore diameter	6.35mm
Indent measure algorithms	Automatic
Auto reading time	0.3 sec/1 indent
Specimen detection	Yes
Movement program patterns	Zigzag, circle, arc, straight line, random, teaching etc.
Vertical test capacity	170mm
Horizontal test capacity	130mm
Anvils dimensions	Motorized cross test table, size: 110x110mm
Max. weight on anvil	50kg

Model	HTV 10D / HTV 50D V2.0
X-Y travel	50x50mm
X axis speed	High: 1mm/s, low: 0.25mm/s
X axis resolution	0.002mm
Y axis speed	High: 1mm/s, low: 0.25mm/s
Y axis resolution	0.002mm
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	PC and Control panel keyboard (HV mode)
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, indentation, objective
Statistics or functions	Max, min, average value, report, hardness curve
Data storage	Temporary session memory: 96 tests (only tester) - PC storage (500GB)
Data output	Word, Excel format
Energy saving mode	Yes
Printer	Built-in printer External ink jet printer
Interfaces	Machine body 1x RS232 Control box: 1x USB, 1x XY interface, 1x RS232, 1x Z interface
Safety devices	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	530x280x630mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
VT-DE10x	10x digital measuring eyepiece	1 pc
VT-10XOB	10x objective (HTV 10D V2.0, HTV 50D V2.0)	1 pc
VT-20XOB	20x objective (HTV 50D V2.0)	1 pc
VT-40XOB	40x objective (HTV 10D V2.0)	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-MCTT110	Motorized cross test table 110x110mm	1 pc
HB-700800HV30	Hardness block 700-800 HV30 (HTV 50D V2.0)	1 pc
HB-700800HV10	Hardness block 700-800 HV10 (HTV 10D V2.0)	1 pc
HB-400500HV5	Hardness block 400-500 HV5 (HTV 50D V2.0)	1 pc
HB-700800HV1	Hardness block 700-800 HV1 (HTV 10D V2.0)	1 pc
VT-CCDC	CCD camera	1 set
VT-1.5XAD	1.5x adapter	1 pc
VT-JSKAX	Joystick	1 pcs
VT-MTTCB	Motorized test table control box	1 pc
VT-CNCBS	Control cables	1 pc
VT-SDUSB	USB softdog	1 pc
VT- MEASOFT	Measuring software	1 pc
VT-PCMP	Computer (Hard disk: 500Gb, memory: 2G, 19" LCD screen)	1 set
VT-PRNT	Ink jet printer	1 set
VT-RS232CBL	RS232 cable	1 pc
VT-HL1520	Halogen lamp 12V, 15-20w	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
VT-CTT100100	Cross test table 100x100mm
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTTT76	Thin specimen test table ø 76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-LTT108	Large plane test table ø 108mm
VT-VTT40	V-shaped test table ø 40mm
VT-WB	Work bench
VT-APP	Additional printer paper roll

Vickers hardness blocks

Model	Range
HB-V0.3/200-750	200-750 HV0.3 (HTV 5D V2.0, HTV 10D V2.0)
HB-V0.5/200-750	200-750 HV0.5 (HTV 5D V2.0, HTV 10D V2.0, HTV 30D V2.0)
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10 (HTV 10D V2.0, HTV 30D V2.0, HTV 50D V2.0)
HB-V20/175-750	175-750 HV20 (HTV 30D V2.0, HTV 50D V2.0)
HB-V30/175-750	175-750 HV30 (HTV 30D V2.0, HTV 50D V2.0)
HB-V50/175-750	175-750 HV50 (HTV 50D V2.0)

HTV 10DT /HTV 50DT

Semi-AutomaticDigital Vickers Hardness Tester

- > Automatic Vickers hardness tester adopts the integrated design of panel computer with Windows 7 operating system. CCD image acquisition system, show the indentation image directly on the touch screen and automatically detect the Vickers hardness value.
- > All testing parameters can be selected on the side panel computer. User friendly with touch screen.
- > CCD image acquisition system, shows the image clearly and detects the hardness value by touching the screen.
- > Automatic recognition and shifting between the objective and the indenter, automatically get the Vickers hardness value.
- > Hardness scale conversion function.
- > With USB, VGA and LAN interfaces, the hardness measurement can be print out by USB interface printer.

- > Automatic data save, generate the hardness-depth curve and save as WORD or EXCEL document.
- > With motorized X-Y test table, automatic focusing and automatic measuring, it is the fully automation of Vickers hardness testing.

Application

- > Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

- > ISO 6507, ASTM E92, JIS Z2244

Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV														
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000
HV 0.01															
HV 0.015	10														
HV 0.02	8														
HV 0.025	8	10													
HV 0.05	6	8	9	10											
HV 0.1	5	6	7	8	8	9	10	10	11						
HV 0.2		4		6		8		9		10	11	11	12	12	
HV 0.3		4		5		6		7		8	9	10	10	11	11
HV 0.5		3		5		5		6		6	7	7	8	8	9
HV 1		3		4		4		4		5	5	5	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5
HV 3		3		3		3		3		4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2
HV 100				3		2		2		2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.



Model	HTV 10DT / HTV 50DT	Model	HTV 10DT / HTV 50DT
Test force control	Load cell closed loop - Load electronic controlled	Indenters	Diamond Vickers indenter
Load selection	Touch screen control panel	N. of indenters	1
	HTV 10DT: 0.2kgf, 0.3kgf, 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf	Nose cone support diameter	6.35mm
Main loads	HTV 50DT: 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf	CCD camera Pixel	1.30 Million
dwell time	0~60s	Auto reading time	0.3 sec/1 indent
Loading time	0.2kgf~5kgf: 8s, 10kgf~50kgf: 10s	Indent measure algorithms	Automatic
Load applying speed (indenter descending speed)	0.04mm/s	Vertical test capacity	185mm
Test force tolerance	±1%	Horizontal test capacity	130mm
Test cycle type	Semi-automatic type: Manual - focus Automatic - load, dwell, unload, show of the hardness value	Test anvil dimensions	Digital cross test table size: 120x120mm
Hardness scales	HTV 10DT: HV0.2, HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10 HTV 50DT: HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10, HV20, HV30, HV50	Max. weight on anvil	50kg
Hardness test range	1HV~2967HV	X-Y travel	25x25mm
Hardness resolution	0.1HV	X axis speed	Manual
Repeatability hef/%	Table 1	X axis resolution	0.003mm
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140	Y axis speed	Manual
Turret type	Automatic	Y axis resolution	0.003mm
CCD camera pixel	1.30 Million	Z axis movement	Manual
Microscope Eyepiece	10X	Z axis resolution	Manual
Objectives	10x, 20x, 40x	Z axis speed	Manual
Optical path	2 ways eyepiece	Display type	Touch screen
Optical function	Optical diaphragm / field aperture / color filter	Display dimensions	8"
Illumination	Halogen lamp	Input mode	By tap touch
CCD min. measuring unit	0.25µm, 0.125µm, 0.0625µm	Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, indentation, objective
CCD max. measurement lenght	1.2mm, 600µm, 300µm	Statistics or functions	Max, min, average value, report, hardness curve
Measurable min. indent/indentation	0.01mm	Data storage	SSD 64GB
		Data output	Word, Excel format
		Energy saving mode	Yes
		Interfaces	3x USB, 1x VGA, 1x LAN
		Safety devices	Emergency switch
		Operation temperature	23±5 °C
		Operation rel. humidity	≤65%
		Weight	48 kg
		Dimensions	560x335x675mm
		Power supply	230V, 50Hz
		Voltage variance	±10%
		Absorbed power	500W

Standard accessories		Optional accessories	
Model	Description	Model	Description
VT-RM10X	10x reading microscope	VT-FLCTT7680	Flat clamping test table 76x80mm
VT-10XOB	10x objective	VT-TST776	Thin specimen test table ø 76mm
VT-20XOB	20x objective	VT-FICTT60	Filament clamping test table ø 60mm
VT-40XOB	40x objective	VT-LTT108	Large plane test table ø 108mm
VI-136	Diamond Vickers indenter	VT-VTT40	V-shaped test table ø 40mm
VT-DCTT120120	Digital cross test table 120x120mm	VT-WB	Work bench
HB-400500HV5	Hardness block 400-500 HV5	VT-EXPR	External printer
HB-700800HV1	Hardness block 700-800 HV1	Vickers hardness blocks	
VT-HL1520	Halogen lamp 12V, 15-20W	Model	Range
VT-4RS	Horizontal regulating screw	HB-V0.2/200-750	200-750 HV0.2 (HTV 10DT)
VT-LV	Spirit level	HB-V0.3/200-750	200-750 HV0.3 (HTV 10DT)
VT-TSRC	Touch screen remote control	HB-V0.5/200-750	200-750 HV0.5
VT-TP	Touch pen	HB-V1/200-750	200-750 HV1
VT-MSE	Mouse	HB-V2/175-750	175-750 HV2
VT-SKUSB	USB storage key	HB-V3/175-750	175-750 HV3
VT-PC	Power cable	HB-V5/175-750	175-750 HV5
VT-SK	Service keys	HB-V10/175-750	175-750 HV10 (HTV 10DT, HTV 50DT)
VT-ADC	Anti-dust cover	HB-V20/175-750	175-750 HV20 (HTV 50DT)
		HB-V30/175-750	175-750 HV30 (HTV 50DT)
		HB-V50/175-750	175-750 HV50 (HTV 50DT)

HTV 50D

Digital Vickers Hardness Tester

> Digital Vickers hardness tester adopts load cell control system, improves the accuracy of the test force and the repeatability of the indicating value. Equipped with color touch screen with adjustable backlight and energy-saving mode, for easier working operations. Directly shows the test force, indentation length, dwell time, test numbers, conversion scale, date and time. With digital measuring eyepiece after measuring the indentation length, the hardness value is automatically detected and shown on the screen. Test results can be saved or printed out by the built-in printer, with RS232 interface for computer connection. It can be equipped with LCD video measuring device and CCD image automatic measuring system.



Application

> Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

> ISO 6507, ASTM E92, JIS Z2244

Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2		4		6		8		9		10	11	11	12	12		
HV 0.3		4		5		6		7		8	9	10	10	11	11	
HV 0.5		3		5		5		6		6	7	7	8	8	9	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.



Model	HTV 50D	Model	HTV 50D
Test force control	Load cell closed loop - Load electronic controlled	Indenters	Diamond Vickers indenter
Load selection	Touch screen	N. of indenters	1
Main loads	1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf	Nose cone support diameter	6.35mm
dwell time	0~60s	Vertical test capacity	170mm
Loading time	0.3kgf~5kgf: 8s, 10kgf~50kgf: 10s	Horizontal test capacity	130mm
Load applying speed (indenter descending speed)	0.04mm/s	Anvils dimensions	Large plane test table, size: ø 108mm, V-shaped, size: ø 40mm
Test force tolerance	±1%	Max. weight on anvil	Large plane test table ø 108mm, V-shaped test table ø 40mm: 100kg
Test cycle type	Semi-automatic type: Manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)	Z axis movement	Manual
Hardness scales	HV1, HV2, HV2.5, HV3, HV5, HV10, HV20, HV30, HV50	Z axis speed	Manual
Hardness test range	1HV~2967HV	Display type	LCD touch screen
Hardness resolution	0.1HV	Digital dimensions	5.6"
Repeatability hcf/%	Table 1	Input mode	By tap touch
Scale conversion	HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HB - According to ASTM E140	Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, light, objective
Turret type	Automatic	Statistics or functions	Max, min, average value
Microscope eyepiece	10x	Data storage	Temporary session memory (192 tests)
Objectives	10x, 20x	Data output	Hyperterminal session format (.HT)
Microscope min. measuring unit	0.25µm (10x objective) - 0.125µm (20x objective)	Energy saving mode	Yes
Microscope max. measurement length	800µm (10x objective) - 400µm (20x objective)	Printer	Built-in printer
Measurable min. indent/indentation	10µm	Interfaces	1x RS232
Optical path	2 ways eyepiece	Safety devices	Emergency switch
Illumination	Halogen lamp	Operation temperature	23±5 °C
		Operation rel. humidity	≤65%
		Weight	35kg
		Dimensions	530x280x630mm
		Power supply	230V, 50Hz
		Voltage variance	±10%
		Absorbed power	500W

Standard accessories

Model	Description	Q.ty
VT-DE10x	10x digital measuring eyepiece	1 pc
VT-10XOB	10x objective	1 pc
VT-20XOB	20x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-LTT108	Large plane test table ø 108mm	1 pc
VT-VTT40	V-shaped test table ø 40mm	1 pc
HB-700800HV30	Hardness block 700-800 HV30	1 pc
HB-400500HV5	Hardness block 400-500 HV5	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 pc
VT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
VT-CTT100100	Cross test table 100x100mm
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø 76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-CCDMS	CCD measuring system
VT-LCDMD	LCD measuring device
VT-WB	Work bench
VT-APP	Additional printer paper roll

Vickers hardness blocks

Model	Range
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10
HB-V20/175-750	175-750 HV20
HB-V30/175-750	175-750 HV30
HB-V50/175-750	175-750 HV50

HTV 10D

Digital Vickers Hardness Tester

> Digital Vickers hardness tester adopts load cell control system, improves the accuracy of the test force and the repeatability of the indicating value. Equipped with color touch screen with adjustable backlight and energy-saving mode, for easier working operations. Directly shows the test force, indentation length, dwell time, test numbers, conversion scale, date and time. With digital measuring eyepiece after measuring the indentation length, the hardness value is automatically detected and shown on the screen. Test results can be saved or printed out by the built-in printer, with RS232 interface for computer connection. It can be equipped with LCD video measuring device and CCD image automatic measuring system.



Application

> Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

> ISO 6507, ASTM E92, JIS Z2244

Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2		4		6		8		9		10	11	11	12	12		
HV 0.3		4		5		6		7		8	9	10	10	11	11	
HV 0.5		3		5		5		6		6	7	7	8	8	9	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		2	2	2	2	2	2	2



Digital eyepiece interface



1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.

Model	HTV 10D
Test force control	Load cell closed loop - Load electronic controlled
Load selection	Touch screen
Main loads	0.3kgf, 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf
dwell time	0~60s
Loading time	0.3kgf~5kgf: 8s, 10kgf~50kgf: 10s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Accuracy: Repeatability hef/%	Table 1
Scale conversion	HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HB - According to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 40x
Microscope min. measuring unit	10x 0.25µm - 40x 0.0625µm
Microscope max. measurement length	10x 800µm - 40x 200µm
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Illumination	Halogen lamp
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose cone support diameter	6.35mm
Vertical test capacity	170mm
Horizontal test capacity	130mm
Anvils dimensions	Cross test table, size: 100x100mm
Max. weight on anvil	10kg
X-Y travel	25x25mm
X axis speed	Manual
X axis resolution	0.01mm
Y axis speed	Manual
Y axis resolution	0.01mm
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD touch screen
Display dimensions	5.6"
Input mode	By tap touch
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, light, objective
Statistics or functions	Max, min, average value
Data storage	Temporary session memory, 96 tests
Data output	Hyperterminal format session file (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1x RS232
Safety devices	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	530x280x630mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
VT-DE10x	10x digital measuring eyepiece	1 pc
VT-10XOB	10x objective	1 pc
VT-40XOB	40x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-CTT100100	Cross test table 100x100mm	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
HB-700800HV10	Hardness block 700-800 HV10	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-LTT108	Large test table ø 108mm
VT-VTT40	V-shaped test table ø 40mm
VT-CCDMS	CCD measuring system
VT-LCDMD	LCD measuring device
VT-WB	Work bench
VT-APP	Additional printer paper roll

Vickers hardness blocks

Model	Range
HB-V0.3/200-750	200-750 HV0.3
HB-V0.5/200-750	200-750 HV0.5
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10

HTV 50Z

Digital Vickers Hardness Tester

> Digital Vickers Hardness Tester adopts load cell control system, improves the accuracy of the test force and the repeatability of the indicating value. Directly shows the test force, indentation length, dwell time, test numbers, conversion scale, date and time. With digital measuring eyepiece after measuring the indentation length, the hardness value is automatically detected and shown on the screen. P Type: built-in printer, Z Type: automatic turret shifting and built-in printer. It can be equipped with LCD video measuring device and CCD image automatic measuring system.



Application

> Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

> ISO 6507, ASTM E92, JIS Z2244

Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2		4		6		8		9		10	11	11	12	12		
HV 0.3		4		5		6		7		8	9	10	10	11	11	
HV 0.5		3		5		5		6		6	7	7	8	8	9	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.



Model	HTV 50Z
Test force control	Load cell closed loop - Load electronic controlled
Load selection	Control panel keyboard
Main loads	1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf
dwell time	0~60s
Loading time	0.3kgf~5kgf: 8s, 10kgf~50kgf: 10s
Load applying speed	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV1, HV2, HV2.5, HV3, HV5, HV10, HV20, HV30, HV50
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Repeatability hcf/%	Table 1
Scale conversions	With table, according to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 20x
Microscope min. measuring unit	0.25µm (10x objective) - 0.125µm (20x objective)
Microscope max. measurement length	800µm (10x objective) - 400µm (20x objective)
Measurable min. indent/indentation	400µm (20x objective)
Optical path	2 ways eyepiece
Illumination	Halogen lamp
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose bore diameter	6.35mm
Vertical test capacity	170mm
Horizontal test capacity	130mm
Anvils dimensions	Large plane test table, size: ø 108mm, V-shaped, size: ø 40mm
Max. weight on anvil	100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, test force, dwell time, test number
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1xRS232
Safety devices	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	530x280x630mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
VT-DE10x	10x digital measuring eyepiece	1 pc
VT-10XOB	10x objective	1 pc
VT-20XOB	20x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-LTT108	Large plane test table ø 108mm	1 pc
VT-VTT40	V-shaped test table ø 40mm	1 pc
HB-700800HV30	Hardness block 700-800 HV30	1 pc
HB-400500HV5	Hardness block 400-500 HV5	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
VT-CTT100100	Cross test table 100x100mm
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-CCDMS	CCD measuring system
VT-LCDMD	LCD measuring device
VT-WB	Work bench
VT-APP	Additional printer paper roll

Vickers hardness blocks

Model	Range
HB-V0.5/200-750	200-750 HV0.5
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10
HB-V20/175-750	175-750 HV20
HB-V30/175-750	175-750 HV30
HB-V50/175-750	175-750 HV50

HTV 10Z

Digital Vickers Hardness tester

> Digital Vickers Hardness Tester adopts load cell control system, improves the accuracy of the test force and the repeatability of the indicating value. Directly shows the test force, indentation length, dwell time, test numbers, conversion scale, date and time. With digital measuring eyepiece after measuring the indentation length, the hardness value is automatically detected and shown on the screen. P Type: built-in printer, Z Type: automatic turret shifting and built-in printer. It can be equipped with LCD video measuring device and CCD image automatic measuring system.



Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2		4		6		8		9		10	11	11	12	12		
HV 0.3		4		5		6		7		8	9	10	10	11	11	
HV 0.5		3		5		5		6		6	7	7	8	8	9	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.

Model	HTV 10Z
Test force control	Load cell closed loop - Load electronic controlled
Load selection	Control panel keyboard
Main loads	0.3kgf, 0.5kgf, 1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf
dwell time	0~60s
Loading time	0.3kgf~5kgf: 8s 10kgf~50kgf: 10s
Load applying speed(indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV5, HV10
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Repeatability hef/%	Table 1
Scale conversion	With table, according to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 40x
Microscope min. measuring unit	0.25µm (10x objective) - 0.0625µm (40x objective)
Microscope max. measurement length	800µm (10x objective) - 200µm (40x objective)
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Illumination	Halogen lamp
Indenters	Diamond Vickers indenter
N. of indenters	1
Nose bore diameter	6.35mm
Vertical test capacity	170mm
Horizontal test capacity	130mm
Anvils dimensions	Cross test table, size: 100x100mm
Max. weight on anvil	10kg
X-Y travel	25x25mm
X axis speed	Manual
X axis resolution	0.01mm
Y axis speed	Manual
Y axis resolution	0.01mm
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, test force, dwell time, test number
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1xRS232
Safety devices	Emergency switch
Operation temperature	23±5 °C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	530x280x630mm
Power supply	230V, 50Hz
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
VT-DE10x	10x digital measuring eyepiece	1 pc
VT-10XOB	10x objective	1 pc
VT-40XOB	40x objective	1 pc
VI-136	Diamond Vickers indenter	1 pc
VT-CTT100100	Cross test table 100x100mm	1 pc
HB-700800HV10	Hardness block 700-800 HV10	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
VT-HL1520	Halogen lamp 12V, 15-20W	1 pc
VT-4RS	Horizontal regulating screw	4 pcs
VT-LV	Spirit level	1 pc
VT-PC	Power cable	1 pc
VT-SK	Service keys	1 set
VT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
VT-DCTT120120	Digital cross test table 120x120mm
VT-FLCTT7680	Flat clamping test table 76x80mm
VT-TSTT76	Thin specimen test table ø76mm
VT-FICTT60	Filament clamping test table ø 60mm
VT-LTT108	Large test table ø 108mm
VT-VTT40	V-shaped test table ø 40mm
VT-CCDMS	CCD measuring system
VT-LCDMD	LCD measuring device
VT-WB	Work bench
VT-APP	Additional printer paper roll

Vickers hardness blocks

Model	Range
HB-V0.3/200-750	200-750 HV0.3
HB-V0.5/200-750	200-750 HV0.5
HB-V1/200-750	200-750 HV1
HB-V2/175-750	175-750 HV2
HB-V3/175-750	175-750 HV3
HB-V5/175-750	175-750 HV5
HB-V10/175-750	175-750 HV10

CCD Image Automatic Measuring system



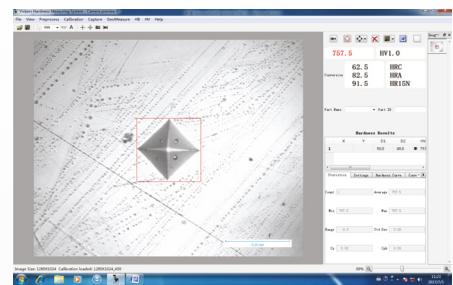
CCD Image Automatic Measuring system

Main Function:

CCD Image automatic measuring system for Vickers, Knoop and carburizing layer tests.

Equipped with CCD camera allow direct observation and measure of the indentation on the display. With its measuring software a single point measurement, random multipoint measurement, data statistical measurement, arbitrary two-point or multipoint measurement are possible and automatically display the depth, statistical calculations, conversions, display curves, data and images management, record and reports in Word or Excel documents.

Operating system: WIN7, WIN10



Standard Configuration:

1. Computer (Hard disk: 500G, memory: 2G, 19" LCD screen) 1 set
2. Ink jet printer 1 set
3. CCD camera + 1.5x adapter 1 set
4. Measuring software + USB softdog 1 pc

LCD Video Measuring device



LCD Video measuring device

Main Function:

LCD Video measuring device is composed by video measuring device, 8" color LCD monitor and connections components. With this device, the indentation can be directly showed on the monitor.

The measurement is more accurate. Avoids visual fatigue and human-made error, increasing working efficiency.

Standard Configuration:

1. 8" Color LCD monitor
2. Video measuring device
3. Video connection cable

Macro Vickers Accessories

Indenters

Code	Description	
VI-136	Diamond Vickers indenter	

Test tables

Code	Description	
VT-DCTT120120	Digital cross test table 120x120mm	
VT-CTT100100	Cross test table 100x100mm	
VT-FLCTT7680	Flat clamping test table 76x80mm	
VT-TSTT76	Thin specimen test table ø 76mm	
VT-FICTT60	Filament clamping test table ø 60mm	
VT-LTT108	Large test table ø 108mm	
VT-VTT40	V-shaped test table ø 40mm	

Additional options

Code	Description	
VT-WB	Work bench	
VT-APP	Additional printer paper roll	

Hardness blocks

Code	Scale	Range
HB-V0.2/200-750	HV0.2	200-750
HB-V0.3/200-750	HV0.3	200-750
HB-V0.5/200-750	HV0.5	200-750
HB-V1/200-750	HV1	200-750
HB-V2/175-750	HV2	175-750
HB-V3/175-750	HV3	175-750
HB-V5/175-750	HV5	175-750
HB-V10/175-750	HV10	175-750
HB-V20/175-750	HV20	175-750
HB-V30/175-750	HV30	175-750
HB-V50/175-750	HV50	175-750

Hardness Testers

MICRO VICKERS



HTMV 1000MDT V3.0

Fully Automatic Micro-Vickers Hardness Tester

- > Automatic Micro Vickers hardness tester adopts precision optics, high mechanical features and perfect indentation for high accuracy measurements. With digital measuring eyepiece directly shows the hardness value and show on the screen, moreover test mode, test force, indentation length, dwell time, test numbers and conversion scale can be displayed. Test results can be saved for checking or be printed out by printer.
- > All the testing parameters can be selected on the side touch screen panel computer
- > CCD image acquisition system
- > Separate screen for better view of results.



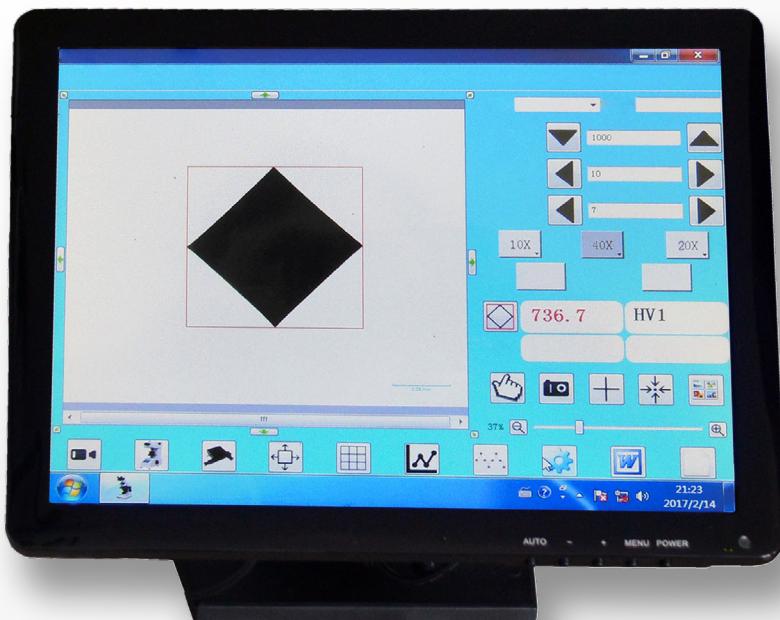
- > With two indenters and three objectives, automatic recognition and shifting between objective and indenter, automatically get the Vickers or Knoop hardness value
- > Hardness scale conversion
- > With USB, VGA and LAN interfaces, the hardness measurement can be printed out by USB interface
- > Automatically save the measuring data, generate the hardness-depth curve and save as WORD or EXCEL document
- > Motorized X-Y test table, automatic focusing and automatic measuring

Application

- > Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

- > ISO 6507, ASTM E384, JIS Z2244



Displayed value repeatability %			
Standard hardness range	HV5~HV100	HV0.2~ HV5	<HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Hardness	Hardness HV														
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000
HV 0.01															
HV 0.015	10														
HV 0.02	8														
HV 0.025	8	10													
HV 0.05	6	8	9	10											
HV 0.1	5	6	7	8	8	9	10	10	11						
HV 0.2		4		6		8		9		10	11	11	12	12	
HV 0.3		4		5		6		7		8	9	10	10	11	11
HV 0.5		3		5		5		6		6	7	7	8	8	9
HV 1		3		4		4		4		5	5	5	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	6
HV 3		3		3		3		3		3	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2
HV 100				3		2		2		2	2	2	2	2	2

1: When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2: For intermediate values, the maximum allowable error can be obtained by interpolation.

3: About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.

Model	HTMV 1000MDT V3.0	Model	HTMV 1000MDT V3.0
Test force control	Weights - Load electronic controlled	Specimen detection	Yes
Load selection	Right side handle	Movement program patterns	Zigzag, circle, arc, straight line, random, teaching etc.
Main-load	10gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1000gf	Vertical test capacity	185mm
Dwell time	0~60s	Horizontal test capacity	130mm
Loading Time	12s	Anvils dimensions	Motorized cross test table size: 110x110mm, flat clamping test table size: 76x80mm, thin specimen test table size: ø 76mm, Filament clamping test table size: ø 60mm
Load applying speed (indenter descending speed)	0.04mm/s	Max. weight on anvil	50kg
Test force tollerance	±1%	X-Y travel	50x50mm
Test cycle type	Fully-automatic type: Focus, load, dwell, unload, measurement of the indentation, show of the hardness value	X axis speed	high: 1mm/s, low: 0.25mm/s
Hardness scales	HV0.01, HV0.025, HV0.05, HV0.1, HV0.2, HV0.3, HV0.5, HV1 Optional: HK0.01, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1	X axis resolution	0.002mm
Hardness test range	1HV~2967HV	Y axis speed	high: 1mm/s, low: 0.25mm/s
Hardness resolution	0.1HV	Y axis resolution	0.002mm
Repeatability Hef/%	Vickers: Table 1 Knoop: Table 3	Z axis movement	Motorized
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140	Z axis resolution	0.00125mm
Turret type	Automatic	Z axis speed	high: 1mm/s, low: 0.0625mm/s
CCD camera pixel	1.3 Million	Display type	Touch screen
Microscope eyepiece	10x	Display dimensions	15" external touch pad 8" built in tester touch screen
Objective	10x, 40x	Input mode	By tap touch
CCD Min. measurement unit	0.025µm (40x objective) (10x objective is for observation purpose only)	Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, indentation, objective
CCD Max. measurement length	170µm (40x objective) (10x objective is for observation purpose only)	Statistics or functions	Max, min, average value, report, hardness curve
Measurable min. indent/indentation	10µm	Data memory	Internal SSD 64GB storage
Optical path	2 ways eyepiece	Data output	Word, Excel format
Optical function	Optical diaphram/field apperture / color filter	Energy saving mode	Yes
Illumination	Halogen lamp	Interfaces	2x USB, 1x VGA, 1x LAN, 1x RS232 (15pin)
Auto-focus time	3 s	Safety devices	Emergency stop button
Indenters	Diamond Micro-Vickers indenter	Operation temperature	23±5°C
N. of indenters	1	Operation rel. humidity	≤65%
Nose cone support diameter	3mm	Weight	52kg
Indent measure algorithms	Automatic	Dimensions	560x335x675mm
Auto reading time	0.3 sec/1 indent	Power supply	230V, 50Hz
		Voltage variance	±10%
		Absorbed Power	500W

Hardness Knopp - Displayed value repeatability %		
Standard hardness range	Displayed value repeatability %	
	HK0.01-HK0.5	HK0.5-HK2
100~250HK	9	8
>225~650HK	5	5
>650HK	4	4

Hardness Knopp - Displayed value tolerance %									
Hardness Scale	Max allowed tolerance of display value %								
	Hardness value (HK)								
	50	100	150	200	250	300	350	400	450
HK0.01	5	6	7	9	9	10	11	-	-
HK0.025	5	5	5	6	6	7	7	8	8
HK0.05	5	5	5	5	5	5	5	6	6
HK0.1	5	5	5	5	5	5	5	5	5
HK0.2	5	5	5	5	5	5	5	5	5
HK0.3	5	5	5	5	5	5	5	5	5
HK0.5	5	5	5	5	5	5	5	5	5
HK1	5	5	5	5	5	5	5	5	5

Note: table 3 and 4 valid only for optional Knoop hardness testing.

Standard accessories		
Model	Description	Q.ty
MVT-DE10X	10x digital measuring eyepiece	1 pc
MVT-10XOB	10x objective	1 pc
MVT-40XOB	40x objective	1 pc
MVI-136	Diamond Micro-Vickers indenter	1 pc
MVT-MCTT110	Motorized cross test table 110x110mm	1 pc
MVT-FLCTT7680	Flat clamping test table 76x80mm	1 pc
MVT-TSTT76	Thin specimen test table ø 76mm	1 pc
MVT-FICTT60	Filament clamping test table ø 60mm	1 pc
MVT-ETS15	External 15" touchscreen	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
HB-400500HV0.2	Hardness block 400-500 HV0.2	1 pc
HB-700800HK1	Hardness block 700-800 HK1	1 pc
MVT-HL1520	Halogen lamp 12V, 15-20W	1 pc
MVT-4RS	Horizontal regulating screw	4 pcs
MVT-LV	Level	1 pc
MVT-TSRC	Touch screen remote control	1 pc
MVT-TP	Touch pen	1 pc
MVT-MSE	Mouse	1 pc
MVT-SKUSB	USB storage key	1 pc
MVT-PC	Power cable	1 pc
MVT-6WS	Weights	6 pcs
MVT-WA	Weight axis	1 pc
MVT-SK	Service keys	1 set
MVT-ADC	Anti-dust cover	1 pc

Optional accessories	
Model	Description
MVT-KDI	Diamond Knoop indenter
MVT-DCTT120120	Digital cross test table 120x120mm
MVT-LTT108	Large plane test table ø 108mm
MVT-VTT40	V-shaped test table ø 40mm
MVT-LTT108	Large plane test table ø 108mm
MVT-WB	Work bench
MVT-EXPR	External printer

Vickers hardness blocks	
Model	Range
HB-V0.05/200-750	200-750 HV 0.05
HB-V0.1/200-750	200-750 HV 0.1
HB-V0.2/200-750	200-750 HV 0.2
HB-V0.3/200-750	200-750 HV 0.3
HB-V0.5/200-750	200-750 HV 0.5
HB-V1/200-750	200-750 HV 1

Knoop hardness blocks	
Model	Range
HB-K0.05/200-750	200-750 HK 0.05
HB-K0.1/200-750	200-750 HK 0.1
HB-K0.2/200-750	200-750 HK 0.2
HB-K0.3/200-750	200-750 HK 0.3
HB-K0.5/200-750	200-750 HK 0.5
HB-K1/200-750	200-750 HK 1

HTMV 1000MD V2.0**Automatic Micro-Vickers Hardness Tester**

› Automatic Micro-Vickers Hardness Tester integrated with state of art technologies, optics, mechanical features, electronic control, digital imaging, image analysis, computer processing. Automatic test table, automatic and manual reading, hardening depth, film thickness, distance between two points of metals and some non-metallic materials and various films. Sample surface morphology function.

Application

› Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

› ISO 6507, ASTM E384, JIS Z2244

**Displayed value repeatability %**

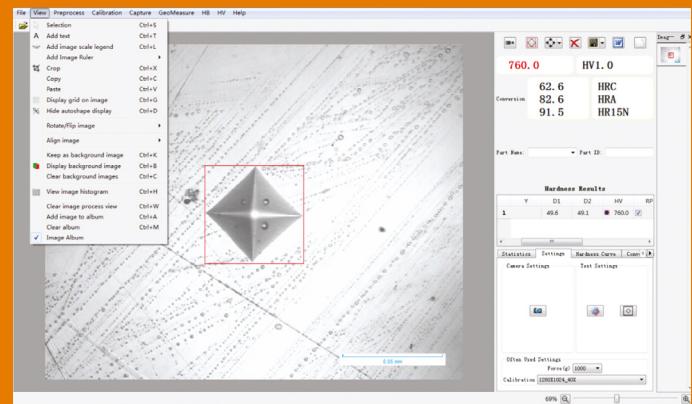
Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Parameters:

- > Operating system: WIN XP, WIN7
- > Digital imaging system
- > High resolution: 130 million pixel
- > High speed acquisition: 1280x1024 resolution, 25 FPS
- > High definition: Black and white images are clear and defined
- > Target surface size: 1/2"

X-Y automatic test table

- > Table size: 100x100x50 mm
- > Maximum travel: 50x50 mm
- > Minimum step: Less than 1µm
- > Movement speed: Adjustable
- > Control mode: Manual control, electric control, computer control



X-Y test table - computer control mode

- > Location movement: Test table directly moves to the software input coordinates
- > Point movement: Selecting a point on the sample, the table moves to place it below the indenter
- > Directional movement: Click the eight directions to move the test table with setted up movements
- > Arbitrary movement: Click any directions to move the test table with setted up movements for sample surface study
- > Variable speed movement: Two speeds (fast and slow) test table moving, adjustable
- > Other function: Original position arbitrary setting, automatic reset, mechanical limit, etc.

Measuring method

- > Automatic mode—Automatic test table moving (X and Y direction) + automatic

- > Manual mode 1—Automatic loading + manual eyepiece scribed line measurement
- > Manual mode 2—Manual test table moving + manual focus + Automatic / manual measurement

Automatic / manual reading

- > Automatic reading time: Single indentation reading time is about 300 milliseconds
- > Automatic measurement precision: 0.1µm
- > Automatic measurement repeatability: ±0.8%
- > Manual reading: Manual pick, automatic search points, 4 points measurement, 2 diagonal measurement

Results save / output

- > Save / output : measurement data and parameters, including D1, D2, HV, X, Y, etc.
- > Save / output : effective hardening layer depth curve report, image.

Displayed value tolerance %

Hardness	Hardness HV														
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000
HV 0.01															
HV 0.015	10														
HV 0.02	8														
HV 0.025	8	10													
HV 0.05	6	8	9	10											
HV 0.1	5	6	7	8	8	9	10	10	11						
HV 0.2		4		6		8		9		10	11	11	12	12	
HV 0.3		4		5		6		7		8	9	10	10	11	11
HV 0.5		3		5		5		6		6	7	7	8	8	9
HV 1		3		4		4		4		5	5	5	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	6
HV 3		3		3		3		3		3	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2
HV 100					3	2		2		2	2	2	2	2	2

1: When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2: For intermediate values, the maximum allowable error can be obtained by interpolation.

3: About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.

Software function:

- > **System linkage:** System - hardness tester linkage through communication interface.
- > **Pressure linkage:** When converting test force, the system percepts the test force change and displays in real time.
- > **Turret linkage:** Software shifting controls between objective and indenter without manual control.
- > **Loading linkage:** Automatic loading control.
- > **Measuring linkage:** The software controls the turret, and after loading,directly reading the Vickers hardness value.
- > **Light source linkage:** Manual focus.
- > **Image acquisition:** Real time indentation display, saving and printing.
- > **Automatic measurement:** Automatically detect the four indentation vertices.

- > **Automatic point search:** The system automatically finds the best vertices, greatly reduce the human error.
- > **Diagonal measurement:** By just one mouse click on the top left and lower right corner of the indentation the hardness value will be displayed.
- > **Four point measurement:** Selecting the four indentation points the hardness value will be displayed.
- > **Hardness conversion:** According to international standard, automatically convert the hardness value between Brinell, Rockwell, Vickers and Knoop with real-time display.
- > **Graphic report:** Automatic record of measurement data, automatic generation of hardness-depth curves, saving or printing reports generated as Word documents.
- > **Results statistics:** Output the multiple measured indentation results in Excel format and automatically counts the measurement number, maximum value, minimum value, average value, variance, etc. of hardness.
- > **Automatic displacement:** Equipped with high precision X-Y automatic test table.
- > **Automatic identification:** Leading indentation automatic identification technology, read D1 / D2 and HV value in 0.3 seconds.
- > **Stable performance:** The indentation of non mirror polishing, uneven light, not in the center can be read automatically.
- > **Powerful functions:** Manual reading, automatic reading, hardness conversion, depth-hardness curve, indentation image, picture and text reports.
- > **Automatic scanning:** Automatically scan the sample edge and shape.

Model	HTMV 1000MD V2.0
Test force control	Weights - Load electronic controlled
Load selection	Right side handle
Main loads	10gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1000gf
Dwell time	0~60s
Loading time	12s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: manual - focus Automatic - load, dwell, unload, measurement of the indentation, show of the hardness value
Hardness scales	HV0.01, HV0.025, HV0.05, HV0.1, HV0.2, HV0.3, HV0.5, HV1 Optional: HK0.01, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Repeatability hef/%	Table 1
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Turret type	Automatic
CCD camera pixel	1.3 Million
Microscope eyepiece	10x
Objectives	10x, 40x
Microscope min. measurement unit	0.0625μm (40x objective) (10x objective is for observation purpose only)
Microscope max. measurement length	200μm (40x objective) (10x objective is for observation purpose only)
CCD min. measurement unit	0.025μm (40x objective) (10x objective is for observation purpose only)
CCD max. measurement length	170μm (40x objective) (10x objective is for observation purpose only)
Measurable min. indent/indentation	10μm
Optical path	2 ways eyepiece
Optical function	optical diaphram / field aperture / color filter
Illumination	Halogen lamp
Indenters	Diamond Micro-Vickers indenter
N. of indenters	1
Nose cone support diameter	3mm
Measurable min. indent/indentation	0.01mm
Indent measure algorithms	Automatic
Auto reading time	0.3 sec/1 indent
Specimen detection	Yes

Model	HTMV 1000MD V2.0
Movement program patterns	Zigzag, circle, arc, straight line, random, teaching etc.
Vertical test capacity	100mm
Horizontal test capacity	98mm
Anvils dimensions	Motorized cross test table, size: 110x110mm, Flat clamping test table size: 76x80mm, thin specimen test table size: ø 76mm, Filament clamping test table size: ø 60mm
Max. weight on anvils	50kg
X-Y travel	50x50mm
X axis speed	High: 1mm/s, low: 0.25mm/s
X axis resolution	0.002mm
Y axis speed	High: 1mm/s, low: 0.25mm/s
Y axis resolution	0.002mm
Z axis movement	Manual
Z axis resolution	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	PC o control panel keyboard (HV mode)
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, indentation, objective
Statistics or functions	Max, min, average value, report, hardness curve
Data storage	500GB PC hard disk
Data output	Word, Excel format
Energy saving mode	Yes
Interfaces	Main body machine: 1x RS232, Control box: 1x USB, 1x XY interface, 1x RS232, (1x Z interface)
Printer	Built-in printer - External Ink-Jet printer
Safety devices	Emergency switch
Operation temperature	23±5° C
Operation rel. humidity	≤65%
Weight	31kg
Dimensions	480x325x545mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
MVT-DE10X	10x digital measuring eyepiece	1 pc
MVT-10XOB	10x objective	1 pc
MVT-40XOB	40x objective	1 pc
MVI-136	Diamond Micro-Vickers indenter	1 pc
MVT-MCTT110	Motorized cross test table 110x110mm	1 pc
MVT-FLCTT7680	Flat clamping test table 76x80mm	1 pc
MVT-TSTT76	Thin specimen test table ø 76mm	1 pc
MVT-FICTT60	Filament clamping test table ø 60mm	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
HB-400500HV0.2	Hardness block 400-500 HV0.2	1 pc
MVT-CCDC	CCD camera	1 set
MVT-1.5XAD	1.5x adapter	1 pc
MVT-JSKAX	Joystick	1 pc
MVT-MTTCB	Motorized test table control box	1 pc
MVT-CNCBS	Control cables	1 set
VT-SDUSB	USB softdog	1 pc
MVT-MEASOFT	Measuring software	1 pc
MVT-PCMP	Computer (Hard disk: 500Gb, memory: 2G, 19" LCD screen)	1 set
MVT-PRNT	Ink jet printer	1 pc
MVT-RS232CBL	RS232 cables	1 pc
MVT-HL1520	Halogen lamp 12V, 15-20W	1 pc
MVT-4RS	Horizontal regulating screw	4 pcs
MVT-LV	Spirit level	1 pc
MVT-PC	Power cable	1 pc
MVT-6WS	Weights	6 pcs
MVT-WA	Weight axis	1 pc
MVT-SK	Service keys	1 set
MVT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
MVT-KDI	Diamond Knoop indenter
MVT-DCTT120120	Digital cross test table 120x120mm
MVT-LTT108	Large plane test table ø 108mm
MVT-VTT40	V-shaped test table ø 40mm
MVT-WB	Work bench
MVT-APP	Additional printer paper roll

Vickers hardness blocks

Model	Range
HB-V0.05/200-750	200-750 HV 0.05
HB-V0.1/200-750	200-750 HV 0.1
HB-V0.2/200-750	200-750 HV 0.2
HB-V0.3/200-750	200-750 HV 0.3
HB-V0.5/200-750	200-750 HV 0.5
HB-V1/200-750	200-750 HV 1

Knoop hardness blocks

Model	Range
HB-K0.05/200-750	200-750 HK 0.05
HB-K0.1/200-750	200-750 HK 0.1
HB-K0.2/200-750	200-750 HK 0.2
HB-K0.3/200-750	200-750 HK 0.3
HB-K0.5/200-750	200-750 HK 0.5
HB-K1/200-750	200-750 HK 1

HTMV 1000MDT

Digital Micro-Vickers Hardness Tester

- > Micro Vickers hardness tester controlled by touch screen panel computer. With CCD image acquisition system, dynamic indentation image, image lock and hardness automatically displayed with high precision and stability.
- > Windows 7 operating system, can be connected to output devices such as external screen and printer;
- > Automatic recognition and shifting between objective and indenter;
- > Lifting screw worm and gear structure with smooth transmission;
- > Automatic test force loading, dwell and unloading;
- > CCD image acquisition system, clear images;
- > Hardness scale conversion;
- > Automatic data save, hardness-depth curve generation report in
- > Optional digital X-Y test table

Application

- > Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

- > ISO 6507, ASTM E384, JIS Z2244

Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2		4		6		8		9		10	11	11	12	12		
HV 0.3		4		5		6		7		8	9	10	10	11	11	
HV 0.5		3		5		5		6		6	7	7	8	8	9	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		4		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100			3	2	2	2		2	2	2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.



Model	HTV 1000MDT
Test force control	Weights - Load electronic controlled
Load selection	Right side handle
Main loads	10gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1000gf
Dwell time	0~60s
Loading time	12s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-Automatic type: manual - focus Automatic - load, dwell, unload, measurement of the indentation, show of the hardness value
Hardness scales	HV0.01, HV0.025, HV0.05, HV0.1, HV0.2, HV0.3, HV0.5, HV1 Optional: HK0.01, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Accuracy: Repeatability hef/%	Table 1
Scale conversions available(display)	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Turret type	Automatic
CCD camera pixel	1.3 Million
Microscope Eyepiece	10x
Objectives	10x, 40x
CCD min. measurement unit	0.025µm (40x objective) (10x objective is for observation purpose only)
CCD max. measurement length	170µm (40x objective) (10x objective is for observation purpose only)
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Optical function	Optical diaphragm / field aperture / color filter
Illumination	Halogen lamp
Indenters	Diamond Micro-Vickers indenter
N. of indenters	1
Nose cone support diameter	3mm
Indent measure algorithms	Automatic

Standard accessories

Model	Description	Q.ty
MVT-DE10X	10x digital measuring eyepiece	1 pc
MVT-10XOB	10x objective	1 pc
MVT-40XOB	40x objective	1 pc
MVI-136	Diamond Micro-Vickers indenter	1 pc
VT-DCTT120120	Digital cross test table 120x120mm	1 pc
MVT-FLCTT7680	Flat clamping test table 76x80mm	1 pc
MVT-TSTT76	Thin specimen test table ø 76mm	1 pc
MVT-FICTT60	Filament clamping test table ø 60mm	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
HB-400500HV0.2	Hardness block 400-500 HV0.2	1 pc
MVT-HL1520	Halogen lamp 12V, 15-20W	1 pc
MVT-4RS	Horizontal regulating screw	4 pcs
MVT-LV	Level	1 pc
MVT-TSRC	Touch screen remote control	1 pc
MVT-TP	Touch pen	1 pc
MVT-MSE	Mouse	1 pc
MVT-SKUSB	USB storage key	1 pc
MVT-PC	Power cable	1 pc
MVT-SK	Service keys	2 pc
MVT-6WS	Weights	6 pcs
MVT-WA	Weight axis	1 pc
MVT-ADC	Anti-dust cover	1 pc

Model	HTV 1000MDT
Auto reading time	0.3 sec/1 indent
Vertical test capacity	185mm
Horizontal test capacity	130mm
Anvils dimensions	Digital cross test table size: 120x120mm, clamping test table size: 76x80mm, thin specimen test table size: ø 76mm, Filament clamping test table size: ø 60mm
Max. weight on anvils	50kg
X-Y travel	25x25mm
X axis speed	Manual
X axis resolution	0.003mm
Y axis speed	Manual
Y axis resolution	0.003mm
Z axis movement	Manual
Z axis resolution	Manual
Z axis speed	Manual
Display type	Touch screen
Display dimensions	8"
Input mode	By tap touch
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, indentation, objective
Statistics or functions	Max, min, average value, report, hardness curve
Data storage	Internal SSD 64GB storage
Data output	Word, Excel format
Energy saving mode	Yes
Interfaces	3x USB, 1x VGA, 1x LAN
Safety devices	Emergency switch
Operation temperature	23±5° C
Operation rel. humidity	≤65%
Weight	48kg
Dimensions	560x335x675mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Optional accessories

Model	Description
MVT-KDI	Diamond Knoop indenter
MVT-LTT108	Large plane test table ø 108mm
MVT-VTT40	V-shaped test table ø 40mm
MVT-WB	Work bench
MVT-EXPR	External printer

Vickers hardness blocks

Model	Range
HB-V0.05/200-750	200-750 HV 0.05
HB-V0.1/200-750	200-750 HV 0.1
HB-V0.2/200-750	200-750 HV 0.2
HB-V0.3/200-750	200-750 HV 0.3
HB-V0.5/200-750	200-750 HV 0.5
HB-V1/200-750	200-750 HV 1

Knoop hardness blocks

Model	Range
HB-K0.05/200-750	200-750 HK 0.05
HB-K0.1/200-750	200-750 HK 0.1
HB-K0.2/200-750	200-750 HK 0.2
HB-K0.3/200-750	200-750 HK 0.3
HB-K0.5/200-750	200-750 HK 0.5
HB-K1/200-750	200-750 HK 1

HTMV 1000K

Digital Micro-Vickers & Knoop Hardness Tester

> Digital Micro-Vickers Hardness Tester adopts precision optics, high mechanical features and perfect indentation for high accuracy measurements. New type of automatic turret mechanism, equipped with Micro-Vickers and Knoop indenters with independent alignment device which ensures centered indentations. Test mode, test force, indentation length, dwell time, test numbers and conversion scale can be displayed. Test results can be saved for checking or be printed out by the built-in printer. Optional LCD video measuring device and CCD image automatic measuring system compatible.



Application

> Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

> ISO 6507, ASTM E384, JIS Z2244

Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2		4		6		8		9		10	11	11	12	12		
HV 0.3		4		5		6		7		8	9	10	10	11	11	
HV 0.5		3		5		5		6		6	7	7	8	8	9	11
HV 1		3		4		4		4		5	5	5	6	6	6	8
HV 2		3		3		3		4		4	4	4	4	5	5	6
HV 3		3		3		3		3		3	4	4	4	4	4	5
HV 5		3		3		3		3		3	3	3	3	3	4	4
HV 10		3		3		3		3		3	3	3	3	3	3	3
HV 20		3		3		3		3		3	3	3	3	3	3	3
HV 30		3		3		2		2		2	2	2	2	2	2	2
HV 50		3		3		2		2		2	2	2	2	2	2	2
HV 100				3		2		2		2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.



Model	HTMV 1000K
Test force control	Weights - Load electronic controlled
Load selection	Right side handle
Main loads	10gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1000gf
Dwell time	0~95s
Loading time	12s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: Manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV0.01, HV0.025, HV0.05, HV0.1, HV0.2, HV0.3, HV0.5, HV1 HK0.01, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1
Hardness test range	1HV~2967HV
Hardness resolution	0.1 HV 0.1 HK
Repeatability hcf/%	Vickers: Table 1 Knoop: Table 3"
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 20x, 40x (Micro-Vickers) 40x (Knoop)
Microscope min. measurement unit	0.03µm (20x objective), 0.015µm (40x objective) (10x objective is for observation purpose only)
Microscope max. measurement length	400µm (20x objective), 200µm (40x objective) (10x objective is for observation purpose only)
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Illumination	Halogen lamp
Indenters	Diamond Micro-Vickers indenter, Diamond Knoop indenter
N. of indenters	2

Model	HTMV 1000K
Nose cone support diameter	3mm
Vertical test capacity	90mm
Horizontal test capacity	120mm
Anvils dimensions	Cross test table, size: 100x100mm, clamping test table size: 76x80mm, thin specimen test table size: ø 76mm, Filament clamping test table size: ø 60mm
Max. weight on anvils	10kg
X-Y travel	25x25mm
Speed X, Y, Z axis	Manual
X axis resolution	0.01mm
Y axis resolution	0.01mm
Z axis movement	Manual
Z axis resolution	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time
Statistics or functions	Max, min, average value
Data storage	Temporary session memory, 96 tests
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1x RS232
Safety devices	Emergency switch
Operation temperature	23±5°C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	495x305x550mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Optional accessories

Model	Description
MVT-DCTT120120	Digital cross test table 120x120mm
MVT-LTT108	Large plane test table ø 108mm
MVT-VTT40	V-shaped test table ø 40mm
MVT-CCDMS	CCD measuring system
MVT-LCDMD	LCD measuring device
MVT-WB	Work bench
MVT-APP	Additional printer paper roll

Vickers hardness blocks

Model	Range
HB-V0.05/200-750	200-750 HV 0.05
HB-V0.1/200-750	200-750 HV 0.1
HB-V0.2/200-750	200-750 HV 0.2
HB-V0.3/200-750	200-750 HV 0.3
HB-V0.5/200-750	200-750 HV 0.5
HB-V1/200-750	200-750 HV 1

Knoop hardness blocks

Model	Range
HB-K0.05/200-750	200-750 HK 0.05
HB-K0.1/200-750	200-750 HK 0.1
HB-K0.2/200-750	200-750 HK 0.2
HB-K0.3/200-750	200-750 HK 0.3
HB-K0.5/200-750	200-750 HK 0.5
HB-K1/200-750	200-750 HK 1

Note: For Knoop hardness tables please refer to page 323

HTMV 2000M

Digital Micro-Vickers Hardness Tester

> Digital Micro-Vickers Hardness Tester adopts precision optics, high mechanical features and perfect indentation for high accuracy measurements. With digital measuring eyepiece directly shows the hardness value and show on the screen, moreover test mode, test force, indentation length, dwell time, test numbers and conversion scale can be displayed. Test results can be saved for checking or be printed out by the built-in printer. Optional Knoop indenter can be installed. Optional LCD video measuring device and CCD image automatic measuring system compatible.



Application

> Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

> ISO 6507, ASTM E384, JIS Z2244

Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2	4		6		8		9			10	11	11	12	12		
HV 0.3	4		5		6		7			8	9	10	10	11	11	
HV 0.5	3		5		5		6			6	7	7	8	8	9	11
HV 1	3		4		4		4			5	5	5	6	6	6	8
HV 2	3		3		3		4			4	4	4	4	5	5	6
HV 3	3		3		3		3			3	4	4	4	4	4	5
HV 5	3		3		3		3			3	3	3	3	3	4	4
HV 10	3		3		3		3			3	3	3	3	3	3	3
HV 20	3		3		3		3			3	3	3	3	3	3	3
HV 30	3		3		2		2			2	2	2	2	2	2	2
HV 50	3		3		2		2			2	2	2	2	2	2	2
HV 100			3		2		2			2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.



Digital eyepiece interface



Model	HTMV 2000M
Test force control	Weights - Load electronic controlled
Load selection	Right side handle
Main loads	10gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1000gf, 2000gf
Dwell time	0~60s
Loading time	12s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: Manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV0.01, HV0.025, HV0.05, HV0.1, HV0.2, HV0.3, HV0.5, HV1, HV2 Optional: HK0.01, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1, HK2
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Repeatability hef/%	Table 1
Scale conversion	HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HB - According to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 40x
Microscope min. measurement unit	0.0625µm (40x objective) (10x objective is for observation purpose only)
Microscope max. measurement length	200µm (40x objective) (10x objective is for observation purpose only)
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Illumination	Halogen lamp
Indenters	Diamond Micro-Vickers indenter
N. of indenters	1
Nose cone support diameter	3mm

Model	HTMV 2000M
Vertical test capacity	100mm
Horizontal test capacity	98mm
Anvils dimensions	Cross test table, size: 100x100mm, flat clamping test table size: 76x80mm, thin specimen test table size: ø 76mm, Filament clamping test table size: ø 60mm
Max. sample anvils	10kg
X-Y travel	25x25mm
X axis speed	Manual
X axis resolution	0.01mm
Y axis speed	Manual
Y axis resolution	0.01mm
Z axis movement	Manual
Z axis resolution	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, light
Statistics or functions	Max, min, average value
Data storage	Temporary session memory, 96 tests
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1x RS232
Safety devices	Emergency switch
Operation temperature	23±5° C
Operation rel. humidity	≤65%
Weight	32kg
Dimensions	480x325x545mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Optional accessories

Model	Description
MVT-KDI	Diamond Knoop indenter
MVT-DCTT120120	Digital cross test table 120x120mm
MVT-LTT108	Large plane test table ø 108mm
MVT-VTT40	V-shaped test table ø 40mm
MVT-CCDMS	CCD measuring system
MVT-LCDMD	LCD measuring device
MVT-WB	Work bench
MVT-APP	Additional printer paper roll

Vickers hardness blocks

Model	Range
HB-V0.05/200-750	200-750 HV 0.05
HB-V0.1/200-750	200-750 HV 0.1
HB-V0.2/200-750	200-750 HV 0.2
HB-V0.3/200-750	200-750 HV 0.3
HB-V0.5/200-750	200-750 HV 0.5
HB-V1/200-750	200-750 HV 1
HB-V2/175-750	175-750 HV 2

Knoop hardness blocks

Model	Range
HB-K0.05/200-750	200-750 HK 0.05
HB-K0.1/200-750	200-750 HK 0.1
HB-K0.2/200-750	200-750 HK 0.2
HB-K0.3/200-750	200-750 HK 0.3
HB-K0.5/200-750	200-750 HK 0.5
HB-K1/200-750	200-750 HK 1
HB-K2/200-750	200-750 HK 2

HTMV 1000MD

Digital Micro-Vickers Hardness Tester

> Digital Micro-Vickers Hardness Tester adopts precision optics, high mechanical features and perfect indentation for high accuracy measurements. With digital measuring eyepiece directly shows the hardness value and show on the screen, moreover test mode, test force, indentation length, dwell time, test numbers and conversion scale can be displayed. Test results can be saved for checking or be printed out by the built-in printer. Optional Knoop indenter can be installed. Optional LCD video measuring device and CCD image automatic measuring system compatible.



Application

> Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

> ISO 6507, ASTM E384, JIS Z2244

Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2	4		6		8		9			10	11	11	12	12		
HV 0.3	4		5		6		7			8	9	10	10	11	11	
HV 0.5	3		5		5		6			6	7	7	8	8	9	11
HV 1	3		4		4		4			5	5	5	6	6	6	8
HV 2	3		3		3		4			4	4	4	4	5	5	6
HV 3	3		3		3		3			3	4	4	4	4	4	5
HV 5	3		3		3		3			3	3	3	3	3	4	4
HV 10	3		3		3		3			3	3	3	3	3	3	3
HV 20	3		3		3		3			3	3	3	3	3	3	3
HV 30	3		3		2		2			2	2	2	2	2	2	2
HV 50	3		3		2		2			2	2	2	2	2	2	2
HV 100			3		2		2			2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.



Digital eyepiece interface



Model	HTMV 1000MD
Test force control	Weights - Load electronic controlled
Load selection	Right side handle
Main loads	10gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1000gf
Dwell time	0~60s
Loading time	12s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-Automatic Type: Manual - focus, measure of Indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV0.01, HV0.025, HV0.05, HV0.1, HV0.2, HV0.3, HV0.5, HV1 Optional: HK0.01, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Repeatability hcf/%	Table 1
Scale conversion	HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HB - According to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 40x
Microscope min. measurement unit	0.0625µm (40x objective) (10x objective is for observation purpose only)
Microscope max. measurement length	200µm (40x objective) (10x objective is for observation purpose only)
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Illumination	Halogen lamp
Indenters	Diamond Micro-Vickers indenter
N. of indenters	1

Model	HTMV 1000MD
Nose cone support diameter	3mm
Vertical test capacity	100mm
Horizontal test capacity	98mm
Anvils dimensions	Cross test table, size: 100x100mm, flat clamping test table size: 76x80mm, thin specimen test table size: ø 76mm, Filament clamping test table size: ø 60mm
Max. weight on anvils	10kg
X-Y travel	25x25mm
X axis speed	Manual
X axis resolution	0.01mm
Y axis speed	Manual
Y axis resolution	0.01mm
Z axis movement	Manual
Z axis speed	Manual
type of display	LCD
Display dimensions	4.3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale, test force, date and time, light
Statistics or functions	Max, min, average value
Data storage	Temporary session memory, 96 tests
Data Output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1x RS232
Safety devices	Emergency switch
Operation temperature	23±5° C
Operation rel. humidity	≤65%
Weight	31kg
Dimensions	480x325x545mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Code	Standard Accessories	Qty
MVT-DE10X	10x digital measuring eyepiece	1 pc
MVT-10XOB	10x objective	1 pc
MVT-40XOB	40x objective	1 pc
MVI-136	Diamond Micro-Vickers indenter	1 pc
MVT-CTT100100	Cross test table 100x100mm	1 pc
MVT-FLCTT7680	Flat clamping test table 76x80mm	1 pc
MVT-TSTT76	Thin specimen test table ø 76mm	1 pc
MVT-FICTT60	Filament clamping test table ø 60mm	1 pc
HB-700800HV1	Hardness block 700-800 HV1	1 pc
HB-400500HV0.2	Hardness block 400-500 HV0.2	1 pc
MVT-HL1520	Halogen lamp 12V, 15-20W	1 pc
MVT-4RS	Horizontal regulating screw	4 pcs
MVT-LV	Spirit level	1 pc
MVT-PC	Power cable	1 pc
MVT-SK	Service keys	1 set
MVT-6WS	Weights	6 pcs
MVT-WA	Weight axis	1 pc
MVT-ADC	Anti-dust cover	1 pc

Optional accessories	
Model	Description
MVT-KDI	Diamond Knoop indenter
MVT-DCTT120120	Digital cross test table 120x120mm
MVT-LTT108	Large plane test table ø 108mm
MVT-VTT40	V-shaped test table ø 40mm
MVT-CCDMS	CCD measuring system
MVT-LCDMD	LCD measuring device
MVT-WB	Work bench
MVT-APP	Additional printer paper roll

Vickers hardness blocks	
Model	Range
HB-V0.05/200-750	200-750 HV 0.05
HB-V0.1/200-750	200-750 HV 0.1
HB-V0.2/200-750	200-750 HV 0.2
HB-V0.3/200-750	200-750 HV 0.3
HB-V0.5/200-750	200-750 HV 0.5
HB-V1/200-750	200-750 HV 1

Knoop hardness blocks	
Model	Range
HB-K0.05/200-750	200-750 HK 0.05
HB-K0.1/200-750	200-750 HK 0.1
HB-K0.2/200-750	200-750 HK 0.2
HB-K0.3/200-750	200-750 HK 0.3
HB-K0.5/200-750	200-750 HK 0.5
HB-K1/200-750	200-750 HK 1

HTMV I1000M

Digital Micro-Vickers Hardness Tester

> Digital Micro-Vickers Hardness Tester adopts precision optics, high mechanical features and perfect indentation for high accuracy measurements. With digital measuring eyepiece directly shows the hardness value and show on the screen, moreover test mode, test force, indentation length, dwell time, test numbers and conversion scale can be displayed. Optional Knoop indenter can be installed. Optional LCD video measuring device and CCD image automatic measuring system compatible.



Application

> Suitable for ferrous metal, non-ferrous metals, IC thin sections, coatings, ply-metals, glass, ceramics, agate, precious stones, thin plastic sections etc.

Reference standard

> ISO 6507, ASTM E384, JIS Z2244

Displayed value repeatability %

Standard hardness range	HV5~HV100	HV0.2~<HV5	>HV0.2
≤225HV	≤3	≤6	≤9
>225HV	≤2	≤4	≤5

Displayed value tolerance %

Hardness	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 0.01																
HV 0.015	10															
HV 0.02	8															
HV 0.025	8	10														
HV 0.05	6	8	9	10												
HV 0.1	5	6	7	8	8	9	10	10	11							
HV 0.2	4		6		8		9			10	11	11	12	12		
HV 0.3	4		5		6		7			8	9	10	10	11	11	
HV 0.5	3		5		5		6			6	7	7	8	8	9	11
HV 1	3		4		4		4			5	5	5	6	6	6	8
HV 2	3		3		3		4			4	4	4	4	5	5	6
HV 3	3		3		3		3			3	4	4	4	4	4	5
HV 5	3		3		3		3			3	3	3	3	3	4	4
HV 10	3		3		3		3			3	3	3	3	3	3	3
HV 20	3		3		3		3			3	3	3	3	3	3	3
HV 30	3		3		2		2			2	2	2	2	2	2	2
HV 50	3		3		2		2			2	2	2	2	2	2	2
HV 100			3		2		2			2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro Hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.



Model	HTMV I1000M
Test force control	Weights - Load electronic controlled
Load selection	Right side handle
Main loads	10gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1000gf
Dwell time	0~60s
Loading time	12s
Load applying speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1%
Test cycle type	Semi-automatic type: Manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HV0.01, HV0.025, HV0.05, HV0.1, HV0.2, HV0.3, HV0.5, HV1 Optional: HK0.01, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1
Hardness test range	1HV~2967HV
Hardness resolution	0.1HV
Repeatability hcf/%	Table 1
Scale conversion	HK, HRA, HRB, HRC, HRD, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HBW - According to ASTM E140
Turret type	Automatic
Microscope eyepiece	10x
Objectives	10x, 40x
Microscope min. measurement unit	0.0625µm (40x objective) (10x objective is for observation purpose only)
Microscope max. measurement length	200µm (40x objective) (10x objective is for observation purpose only)
Measurable min. indent/indentation	10µm
Optical path	2 ways eyepiece
Illumination	Halogen lamp
Indenters	Diamond Micro-Vickers indenter
N. of indenters	1
Nose cone support diameter	3mm
Measurable min. indent/indentation	0.01mm

Model	HTMV I1000M
Vertical test capacity	100mm
Horizontal test capacity	98mm
Anvils dimensions	Cross test table, size: 100x100mm, fork-shaped test table size: 76x80mm, Thin specimen test table size: ø 76mm, Fine wire test table size: ø 60mm
Max. weight on anvils	10kg
X-Y travel	25x25mm
X axis speed	Manual
X axis resolution	0.01mm
Y axis speed	Manual
Y axis resolution	0.01mm
Z axis movement	Manual
Z axis resolution	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, dwell time, test number, conversion scale
Data output	Hyperterminal format session file (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1x RS232
Safety devices	Emergency switch
Operation temperature	23±5°C
Operation rel. humidity	≤65%
Weight	31kg
Dimensions	480x325x545mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Optional accessories

Model	Description
MVT-KDI	Diamond Knoop indenter
MVT-DCTT120120	Digital cross test table 120x120mm
MVT-LTT108	Large plane test table ø 108mm
MVT-VTT40	V-shaped test table ø 40mm
MVT-CCDMS	CCD measuring system
MVT-LCDMD	LCD measuring device
MVT-WB	Work bench
MVT-APP	Additional printer paper roll

Vickers hardness blocks

Model	Range
HB-V0.05/200-750	200-750 HV 0.05
HB-V0.1/200-750	200-750 HV 0.1
HB-V0.2/200-750	200-750 HV 0.2
HB-V0.3/200-750	200-750 HV 0.3
HB-V0.5/200-750	200-750 HV 0.5
HB-V1/200-750	200-750 HV 1

Knoop hardness blocks

Model	Range
HB-K0.05/200-750	200-750 HK 0.05
HB-K0.1/200-750	200-750 HK 0.1
HB-K0.2/200-750	200-750 HK 0.2
HB-K0.3/200-750	200-750 HK 0.3
HB-K0.5/200-750	200-750 HK 0.5
HB-K1/200-750	200-750 HK 1

CCD Image Automatic Measuring system



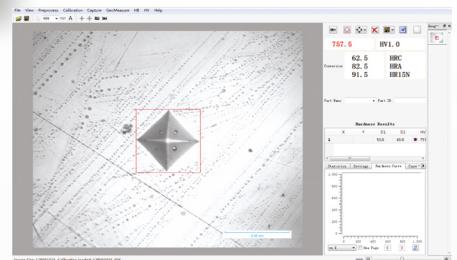
CCD Image Automatic Measuring system

Main Function:

CCD Image automatic measuring system for Micro Vickers, Knoop and carburizing layer tests.

Equipped with CCD camera allow direct observation and measure of the indentation on the display. With its measuring software a single point measurement, random multipoint measurement, data statistical measurement, arbitrary two-point or multipoint measurement are possible and automatically display the depth, statistical calculations, conversions, display curves, data and images management, record and reports in Word or Excel documents.

Operating system: WIN7, WIN10



Standard Configuration:

1. Computer (Hard disk: 500G, memory: 2G, 19" LCD screen) 1 set

2. Ink jet printer 1 set

3. 1.30 Million Pixel CCD camera + 1.5x adapter 1 set

4. Measuring software + USB softdog 1 pc

LCD Video Measuring device



LCD Video measuring device

Main Function:

LCD Video measuring device is composed by video measuring device, 8" color LCD monitor and connections components. With this device, the indentation can be directly showed on the monitor.

The measurement is more accurate. Avoids visual fatigue and human-made error, increasing working efficiency.

Standard Configuration:

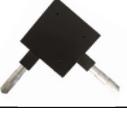
1. 8" Color LCD monitor
2. Video measuring device
3. Video connection cable

Micro Vickers Accessories

Indenters

Code	Description	
MVI-136	Diamond Vickers indenter	
MVT-KDI	Diamond Knoop indenter	

Test tables

Code	Description	
MVT-DCTT120120	Digital cross test table 120x120mm	
MVT-CTT100100	Cross test table 100x100mm	
MVT-FLCTT7680	Flat clamping test table 76x80mm	
MVT-TSTT76	Thin specimen test table ø 76mm	
MVT-FICTT60	Filament clamping test table ø 60mm	
MVT-LTT108	Large test table ø 108mm	
MVT-VTT40	V-shaped test table ø 40mm	

Additional options

Code	Description	
MVT-WB	Work bench	
MVT-APP	Additional printer paper roll	

Hardness blocks

Code	Scale	Range
HB-V0.05/200-750	HV 0.05	200-750
HB-V0.1/200-750	HV 0.1	200-750
HB-V0.2/200-750	HV 0.2	200-750
HB-V0.3/200-750	HV 0.3	200-750
HB-V0.5/200-750	HV 0.5	200-750
HB-V1/200-750	HV 1	200-750
HB-V2/175-750	HV2	175-750
HB-K0.05/200-750	HK 0.05	200-750
HB-K0.1/200-750	HK 0.1	200-750
HB-K0.2/200-750	HK 0.2	200-750
HB-K0.3/200-750	HK 0.3	200-750
HB-K0.5/200-750	HK 0.5	200-750
HB-K1/200-750	HK 1	200-750
HB-K2/200-750	HK 2	200-750

Hardness Testers

BRINELL



Brinell Hardness

The oldest hardness test in common use is frequently employed to measure the hardness of forgings and castings.

The test is performed by pressing a steel, or tungsten ball indenter on a well prepared sample surface under specific load. The resulting indentation is measured by scaled eyepiece or through a specific analyzing software and converted in the HB scale.

Typically, a 10, 5, 2.5 or 1mm diameter sphere indenter with kgf to 3000kgf load is used for the test, smaller spheres and low loads are used for softer materials tests.

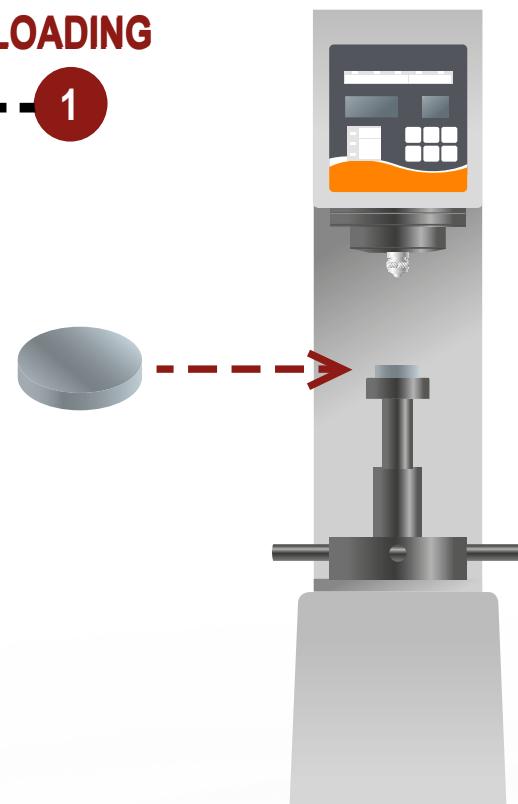
For harder materials the tungsten sphere is used.

The Brinell hardness is expressed as HB and must be followed by the test conditions.

These standards are two HBS when steel ball indenters are used, or HBW when tungsten indenter is used. These units are followed by XX/YYYY where XX is the ball diameter in mm and YYYY is the applied load in kgf.

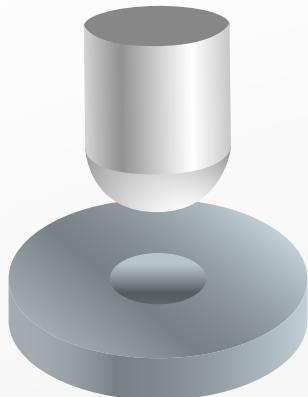
LOADING

1



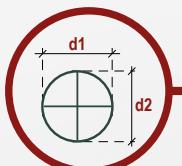
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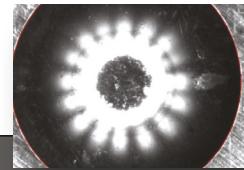
INDENTATION



3

MEASURING





Brinell

Method	Indenter	Indentation time	Sample preparation	Application
HBW 1/30	Tungsten carbide 1mm sphere	10 to 15 seconds	Ground, polished	Steel / Iron
HBW 2.5/187.5	Tungsten carbide 2.5mm sphere	10 to 15 seconds	Ground, polished	Steel / Iron
HBW 5/750	Tungsten carbide 5mm sphere	10 to 15 seconds	Ground, polished	Steel / Iron
HBW 10/3000	Tungsten carbide 10mm sphere	10 to 15 seconds	Ground, polished	Steel / Iron
HBW 1/10	Tungsten carbide 1mm sphere	10 to 15 seconds	Ground, polished	Light metals, copper, aluminium, copper alloys, aluminium alloys
HBW 2.5/62.5	Tungsten carbide 2.5mm sphere	10 to 15 seconds	Ground, polished	Light metals, copper, aluminium, copper alloys, aluminium alloys
HBW 5/250	Tungsten carbide 5mm sphere	10 to 15 seconds	Ground, polished	Light metals, copper, aluminium, copper alloys, aluminium alloys
HBW 10/1000	Tungsten carbide 10mm sphere	10 to 15 seconds	Ground, polished	Light metals, copper, aluminium, copper alloys, aluminium alloys
HBW 1/5	Tungsten carbide 1mm sphere	10 to 15 seconds	Ground, polished	Light metals, copper, aluminium, copper alloys or heat treated
HBW 2.5/31.25	Tungsten carbide 2.5mm sphere	10 to 15 seconds	Ground, polished	Light metals, copper, aluminium, copper alloys or heat treated
HBW 5/125	Tungsten carbide 5mm sphere	10 to 15 seconds	Ground, polished	Light metals, copper, aluminium, copper alloys or heat treated
HBW 10/500	Tungsten carbide 10mm sphere	10 to 15 seconds	Ground, polished	Light metals, copper, aluminium, copper alloys or heat treated
HBW 1/2.5	Tungsten carbide 1mm sphere	10 to 15 seconds	Ground, polished	Light metals
HBW 2.5/15.625	Tungsten carbide 2.5mm sphere	10 to 15 seconds	Ground, polished	Light metals
HBW 5/62.5	Tungsten carbide 5mm sphere	10 to 15 seconds	Ground, polished	Light metals
HBW 10/250	Tungsten carbide 10mm sphere	10 to 15 seconds	Ground, polished	Light metals
HBW 1/1	Tungsten carbide 1mm sphere	10 to 15 seconds	Ground, polished	Light metals, lead, tin
HBW 2.5/6.25	Tungsten carbide 2.5mm sphere	10 to 15 seconds	Ground, polished	Light metals, lead, tin
HBW 5/25	Tungsten carbide 5mm sphere	10 to 15 seconds	Ground, polished	Light metals, lead, tin
HBW 10/100	Tungsten carbide 10mm sphere	10 to 15 seconds	Ground, polished	Light metals, lead, tin

Applicable standard ASTM E10, ISO 6506, JIS Z2243

HTB 3000A

Fully Automatic Digital Brinell Hardness Tester

- > Fully automatic three indenters digital Brinell hardness tester adopts strong rigidity and precise structure design casting, load test force controlled by sensors, allowing accuracy and stability. Test process controlled by CPU, automatic switching between the objective and the indenter. Switching system adopts mechanical and electronic double control in order to obtain precision set. Built-in panel computer for easy parameters settings and results, reduces the measuring error. After scale choice, the instrument will automatically detect and select the indenter and objective, the test table rises automatically and, after loading the test force, back to the focusing position, a clear image of the indentation will be shown on the display and the system will automatically start the measuring.
- > 10 test force levels, 13 Brinell hardness test scales, suitable for different kinds of metals.

- > Three indenters and two objectives, no need to change the indenters when testing different samples; with rigorous optical structure and high magnification clear indentation observation;
- > Automatic indenter and objective selection according to the test scale;
- > Automatic lifting test table adopts precise structure with high stability;
- > Integrated design panel computer, Windows 7 operating system, touch screen, test force, dwell time, light source intensity adjustment, indentation length, hardness value, test range and test number etc.;
- > Hardness conversion scales;
- > Test result can be saved as WORD or EXCEL files, report and can be printed out;
- > CCD image measuring system;
- > With USB port, VGA interface and network interface for high connectivity;

Application

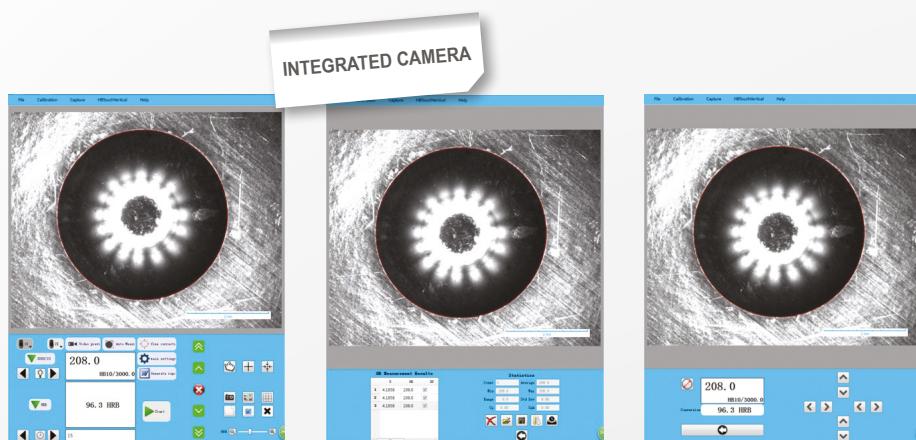
- > Suitable for cast iron, steel products, non-ferrous metals and alloys, etc. Also suitable for some non-metal materials such as rigid plastics and bakelite etc.

Reference standard

- > ISO 6506, ASTM E10-12, JIS Z2243



Standard block hardness range	Displayed value allowed tolerance %	Displayed value allowed repeatability %
≤125	±3	3
125<HBW ≤ 225	±2.5	2.5
>225	±2	2



Model	HTB 3000A
Technology	Load cell closed loop - Load electronic controlled
Load selection	Touch screen control panel
Main loads	62.5kgf, 100kgf, 125kgf, 187.5kgf, 250kgf, 500kgf, 750kgf, 1000kgf, 1500kgf, 3000kgf
Dwell time	0~95s
Loading time	62.5kg: 1.5s, 100kg: 2.5s, 125kg: 3.5s, 187.5kg: 4s, 250kg: 4.5s, 500kg: 7.5s, 750kg: 8s, 1000kg: 8.5s, 1500kg: 11s, 3000kg: 18s
Loading speed (indenter descending speed)	0.3mm/s
Test force tolerance	±1.0%
Test cycle type	Fully Automatic: minor load with automatic breaking system, load, dwell, unload, measure
Hardness scales	HBW10/3000, HBW10/1500, HBW10/1000, HBW10/500, HBW10/250, HBW10/125, HBW10/100, HBW5/750, HBW5/250, HBW5/125, HBW5/62.5, HBW2.5/187.5, HBW2.5/62.5
Hardness test range	3.18 ~ 653HBW
Hardness resolution	0.01HBW
Repeatability hef/%	≤125, ±3% 125 < HBW ≤ 225, ±2.5% > 225, ±2%
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS - According to ASTM E140
Turret type	Automatic
CCD camera pixel	3.0 million
Objectives	1x, 2x
Optical path	1
CCD min. measuring unit	3µm (1x objective) - 1.5µm (2x objective)
CCD max. measurement length	4.8mm (1x objective) - 2.4mm (2x objective)
Measurable min. indent/indentation	0.24mm
Illumination	LED light
Indenters	ø 2.5mm, ø 5mm, ø 10mm hard alloy steel ball indenter
N. of indenters	3
Nose cone support diameter	6.35mm
Indent measure algorithms	Automatic
Auto reading time	0.3 sec/1 indent
Specimen detection	Yes
Vertical test capacity	260mm
Horizontal test capacity	150mm
Anvils dimensions	Large plane test table ø 200mm Middle sized testing table ø 60mm V-Shaped test table ø 80mm
Max. weight on anvil	100kg
Z axis movement	Motorized
Z axis movement resolution	±10µm
Z axis speed	High: 1.78mm/s, Low: 0.2mm/s
Display type	Touch screen
Display dimensions	12"
Input mode	By tap touch
Displayed data	Hardness value, D1, D2, dwell time, test number, test force, date and time, light, conversion scale, hardness range, indenter, objective, indentation image
Statistics or functions	Max, min, average value
Data storage	Memory: 2G, SSD: 64G
Data output	Word, Excel format
Energy saving mode	Yes
Printer	External printer (optional)
Interfaces	3x USB, 1x VGA, 1x LAN
Safety device	Emergency switch
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	200kg
Dimensions	700x380x1000mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
BT-1XOB	1x objective	1 pcs
BT-2XOB	2x objective	1 pcs
BI-25	Hard alloy steel ø 2,5mm ball indenter	1 pcs
BI-5	Hard alloy steel ø 5mm ball indenter	1 pcs
BI-10	Hard alloy steel ø 10mm ball indenter	1 pcs
BT-LTT200	Large plane test table ø 200mm	1 pcs
BT-MTT60	Middle sized testing table ø 60mm	1 pcs
BT-VTT80	V-Shaped test table ø 80mm	1 pcs
HB-150250HBW103000	Hardness block 150~250 HBW 10/3000	1 pc
HB-150250HBW5750	Hardness block 150~250 HBW 5/750	1 pc
BT-PC	Power cable	1 pc
BT-SK	Service keys	1 set
BT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
BT-V10S	V1.0 System
BT-WB	Work bench
BT-EXPR	External printer
Brinell hardness blocks	
Model	Range
HB-BW10/3000	180-650 HBW 10/3000
HB-BW10/1500	180-650 HBW 10/1500
HB-BW10/1000	90-450 HBW 10/1000
HB-BW10/500	90-450 HBW 10/500
HB-BW5/750	180-650 HBW 5/750
HB-BW5/250	90-450 HBW 5/250
HB-BW2.5/187.5	180-650 HBW 2.5/187.5
HB-BW2.5/62.5	90-450 HBW 2.5/62.5

HTB 3000Z

Automatic Digital Brinell Hardness Tester

- > Automatic three indenters digital Brinell Hardness Tester adopts strong rigidity and precise structure design casting, load test force controlled by sensors, allowing accuracy and stability.
- > Test process controlled by CPU, automatic switching between objective and the indenter.
- > Switching system adopts mechanical and electronic double control 10 level of test force, 13 Brinell hardness test scales;
- > Three indenters and two objectives, no need to change the indenters when testing different samples; with rigorous optical structure and high magnification clear indentation observation;

- > Automatic indenter and objective selection; touch screen operating, test force, dwell time, light source intensity adjustment, indentation length, hardness value, test range and test number etc.;
- > Conversion scales of different kinds of hardness;
- > Built in printer and RS232 interface.
- > According to the requirements the tester can be equipped with CCD or Video measuring system.

Application

- > Suitable for cast iron, steel products, non-ferrous metals and soft alloys etc. Also suitable for some non-metal materials such as rigid plastics and bakelite etc.

Reference standard

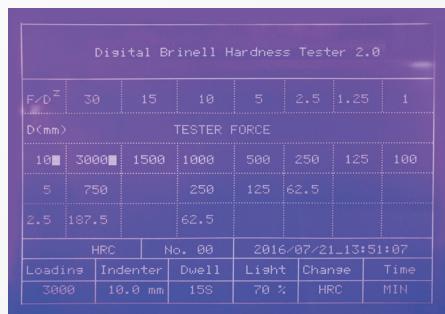
- > ISO 6506, ASTM E10-12, JIS Z2243



Table 1

Standard block hardness range	Displayed value allowed tolerance %	Displayed value allowed repeatability %
≤125	±3	3
125<HBW ≤ 225	±2.5	2.5
>225	±2	2

Digital eyepiece interface



Model	HTB 3000Z
Technology	Load cell closed loop - Load electronic controlled
Load selection	Control panel keyboard
Main loads	62.5kgf, 100kgf, 125kgf, 187.5kgf, 250kgf, 500kgf, 750kgf, 1000kgf, 1500kgf, 3000kgf
Dwell time	0~60s
Loading time	62.5kg: 1.5s, 100kg: 2.5s, 125kg: 3.5s, 187.5kg: 4s, 250kg: 4.5s, 500kg: 7.5s, 750kg: 8s, 1000kg: 8.5s, 1500kg: 11s, 3000kg: 18s
Loading speed	0.3mm/s
Test force tolerance	±1.0%
Test cycle type	Semi-automatic - manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HBW10/3000, HBW10/1500, HBW10/1000, HBW10/500, HBW10/250, HBW10/125, HBW10/100, HBW5/750, HBW5/250, HBW5/125, HBW5/62.5, HBW2.5/187.5, HBW2.5/62.5
Hardness test range	3.18 ~ 653HBW
Hardness resolution	0.01HBW
Repeatability hef/%	≤125, ±3% 125 < HBW ≤ 225, ±2.5% > 225, ±2%
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS - According to ASTM E140
Turret type	Automatic
Eyepiece microscope	20x
Objectives	1x, 2x
Optical path	1
Illumination	LED light
Microscope min. measuring unit	1.25μm (objective 1x) - 0.625μm (objective 2x)
Microscope max. measurement length	6mm (objective 1x) - 3mm (objective 2x)
Measurable min. indent/indentation	0.24mm
Indenters	ø 2.5mm, ø 5mm, ø 10mm hard alloy steel ball indenter
N. of indenters	3
Nose cone support diameter	6.35mm
Vertical test capacity	260mm
Horizontal test capacity	150mm
Anvils dimensions	Large plane test table ø 200mm Middle sized testing table ø 60mm V-Shaped test table ø 80mm
Max. weight on anvil	200kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, dwell time, test number, test force, date and time, light, conversion scale, hardness range
Statistics or functions	Max, min, average value
Data storage	Temporary session memory, 96 tests
Data output	Hyperterminal session format File (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1x RS232
Safety device	Emergency switch
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	150kg
Dimensions	535x260x890mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
BT- DE20X	20x digital measuring eyepiece	1 pc
BT-1XOB	1x objective	1 pcs
BT-2XOB	2x objective	1 pcs
BI-25	Hard alloy steel ø 2,5mm ball indenter	1 pcs
BI-5	Hard alloy steel ø 5mm ball indenter	1 pcs
BI-10	Hard alloy steel ø 10mm ball indenter	1 pcs
BT-LTT200	Large plane test table ø 200mm	1 pcs
BT-MTT60	Middle sized testing table ø 60mm	1 pcs
BT-VTT80	V-Shaped test table ø 80mm	1 pcs
HB-150250HBW103000	Hardness block 150~250 HBW 10/3000	1 pc
HB-150250HBW5750	Hardness block 150~250 HBW 5/750	1 pc
BT-PC	Power cable	1 pc
BT-SK	Service keys	1 set
BT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
BT-V10S	V1.0 System
BT-LCDMD	LCD measuring device
BT-CCDMS	CCD measuring system
BT-WB	Work bench
BT-APP	Additional printer paper roll

Brinell hardness blocks

Model	Range
HB-BW10/3000	180-650 HBW 10/3000
HB-BW10/1500	180-650 HBW 10/1500
HB-BW10/1000	90-450 HBW 10/1000
HB-BW10/500	90-450 HBW 10/500
HB-BW5/750	180-650 HBW 5/750
HB-BW5/250	90-450 HBW 5/250
HB-BW2.5/187.5	180-650 HBW 2.5/187.5
HB-BW2.5/62.5	90-450 HBW 2.5/62.5

HTB 3000D

Digital Brinell Hardness Tester

- > Digital Brinell Hardness Tester combines the high accuracy mechanical structure and load cell control system. Motorized test force application without weights with its 0.5% accuracy compression sensor, CPU control system automatically compensate the test force lost during the test.
- > The indentation can be directly measured through the digital measuring eyepiece, the control system show the test force, indentation length, dwell time, test number, date and time on the large screen.
- > Test results can be saved or printed out by the built-in printer.
- > According to the requirements the tester can be equipped with CCD or Video measuring system.



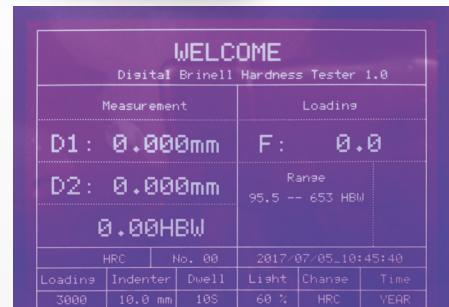
Application

- > Suitable for cast iron, steel products, non-ferrous metals and soft alloys etc. Also suitable for some non-metal materials such as rigid plastics and bakelite etc.

Reference standard

- > ISO 6506, ASTM E10-12, JIS Z2243

Standard block hardness range	Displayed value allowed tolerance %	Displayed value allowed repeatability %
≤125	±3	3
125<HBW ≤ 225	±2.5	2,5
>225	±2	2



Model	HTB 3000D
Technology	Load cell closed loop - Load electronic controlled
Load selection	Control panel keyboard
Main loads	62.5kgf, 100kgf, 125kgf, 187.5kgf, 250kgf, 500kgf, 750kgf, 1000kgf, 1500kgf, 3000kgf
Dwell time	0~60s
Loading time	62.5kg: 1.5s, 100kg: 2.5s, 125kg: 3.5s, 187.5kg: 4s, 250kg: 4.5s, 500kg: 7.5s, 750kg: 8s, 1000kg: 8.5s, 1500kg: 11s, 3000kg: 18s
Loading speed	Manual lifting of the test table (Z axis)
Test force tolerance	±1.0%
Test cycle type	Semi-automatic - manual - pre-load with sound alarm brake, measure of the indentation - Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HBW10/3000, HBW10/1500, HBW10/1000, HBW10/500, HBW10/250, HBW10/125, HBW10/100, HBW5/750, HBW5/250, HBW5/125, HBW5/62.5, HBW2.5/187.5, HBW2.5/62.5
Hardness test range	3.18 ~ 653HBW
Hardness resolution	0.01HBW
Repeatability hef/%	≤125, ±3% 125 < HBW ≤ 225, ±2.5% > 225, ±2%
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS - According to ASTM E140
Turret type	Manual shifting
Eyepiece microscope	20x
Objectives	1x
Optical Path	1
Illumination	LED light
Microscope min. measuring unit	1.25µm (1x objective)
Microscope max. measurement length	6mm (1x objective)
Measurable min. indent/indentation	0.24mm
Indenters	ø 2,5mm, ø 5mm, ø 10mm hard alloy steel ball indenter
N. of indenters	1
Nose cone support diameter	6.35mm
Vertical test capacity	225mm
Horizontal test capacity	135mm
Anvils dimensions	Large plane test table ø 200mm Middle sized testing table ø 60mm V-Shaped test table ø 80mm
Max. weight on anvil	200kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, dwell time, test number, test force, date and time, light, conversion scale, hardness range
Statistics or functions	Max, min, average value
Data storage	Temporary session memory - 96 tests
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1x RS232
Safety device	Emergency switch
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	130kg
Dimensions	545x235x790mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
BT- DE20X	20x digital measuring eyepiece	1 pc
BI-25	Hard alloy steel ø 2,5mm ball indenter	1 pcs
BI-5	Hard alloy steel ø 5mm ball indenter	1 pcs
BI-10	Hard alloy steel ø 10mm ball indenter	1 pcs
BT-LTT200	Large plane test table ø 200mm	1 pcs
BT-MTT60	Middle sized testing table ø 60mm	1 pcs
BT-VTT80	V-Shaped test table ø 80mm	1 pcs
HB-150250HBW103000	Hardness block 150~250 HBW 10/3000	1 pc
HB-150250HBW5750	Hardness block 150~250 HBW 5/750	1 pc
BT-PC	Power cable	1 pc
BT-SK	Service keys	1 set
BT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
BT-V10S	V1.0 System
BT-LCDMD	LCD measuring device
BT-CCDMS	CCD measuring system
BT-WB	Work bench
BT-APP	Additional printer paper roll

Brinell hardness blocks	
Model	Range
HB-BW10/3000	180-650 HBW 10/3000
HB-BW10/1500	180-650 HBW 10/1500
HB-BW10/1000	90-450 HBW 10/1000
HB-BW10/500	90-450 HBW 10/500
HB-BW5/750	180-650 HBW 5/750
HB-BW5/250	90-450 HBW 5/250
HB-BW2.5/187.5	180-650 HBW 2.5/187.5
HB-BW2.5/62.5	90-450 HBW 2.5/62.5

HTB 625Z**Low Load Digital Brinell Hardness Tester**

- > Low Load Digital Brinell Hardness Tester with direct-viewing display, stable performance and good reliability. 8 test force and 9 Brinell testing scales, 2 objectives 5x and 10x for measurement; automatic shifting between indenter and objectives; dwell time pre-set and light source intensity regulation; automatically display the testing indentation length, hardness value; test result can be printed out by the built-in printer; According to the requirements the tester can be equipped with CCD or Video measuring system.

Application

- > Suitable for cast iron, steel products, non-ferrous metals and soft alloys etc. Also suitable for some non-metal materials such as rigid plastics and bakelite etc.

Reference standard

- > ISO 6506, ASTM E10-12, JIS Z2243



Standard block hardness range	Displayed value allowed tolerance %	Displayed value allowed repeatability %
≤125	±3	3
125<HBW ≤ 225	±2.5	2,5
>225	±2	2



Model	HTB 625Z
Technology	Load cell closed loop - Load electronic controlled
Load selection	Control panel keyboard
Main loads	1kgf, 5kgf, 6.25kgf, 10kgf, 15.625kgf, 30kgf, 31.25kgf, 62.5kgf
Dwell time	0~60s
Loading time	8s
Loading speed (indenter descending speed)	0.04mm/s
Test force tolerance	±1.0%
Test cycle type	Semi-automatic type: Manual - focus, measure of indentation Automatic - load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HBW5/62.5, HBW2.5/62.5, HBW2.5/31.25, HBW2.5/15.625, HBW2.5/6.25, HBW1/30, HBW1/10, HBW1/5, HBW1/1
Hardness test range	3.18 ~ 653HBW
Hardness resolution	0.01HBW
Repeatability hef/%	≤125, ±3% 125 < HBW ≤ 225, ±2.5% > 225, ±2%
Scale conversion	With table, according to ASTM E140
Turret type	Automatic
Eyepiece microscope	10x
Objectives	5x, 10x
Optical path	2
Illumination	LED light
Microscope min. measuring unit	5x: 0.5µm - 10x: 0.25µm
Microscope max. measurement length	5x: 2.4mm - 10x: 1.2mm
Measurable min. indent/indentation	0.24mm
Indenters	ø 1mm, ø 2,5mm, ø 5mm hard alloy steel ball indenter
N. of indenters	1
Nose cone support diameter	6.35mm
Vertical test capacity	170mm
Horizontal test capacity	130mm
Anvils dimensions	Large plane test table ø 108mm V-Shaped test table ø 40mm
Max. weight on anvil	100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	3"
Input mode	Control panel keyboard
Displayed data	Hardness value, D1, D2, dwell time, test number, test force
Statistics or functions	Max, min, average value
Data storage	Temporary session memory, 96 tests
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1x RS232
Safety device	Emergency switch
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	35kg
Dimensions	530x200x630mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
BT-DE10X	10x digital measuring eyepiece	1 pc
BT-5XOB	5x objective	1 pcs
BT-10XOB	10x objective	1 pcs
BI-1	Hard alloy steel ø 1mm ball indenter	1 pc
BI-25	Hard alloy steel ø 2,5mm Ball Indenter	1 pc
BI-5	Hard alloy steel ø 5mm ball indenter	1 pc
BT-LTT108	Large plane test table ø 108mm	1 pc
BT-VTT40	V-Shaped test table ø 40mm	1 pc
HB-90120HBW2.562.5	Hardness block 90-120 HBW 2.5/62.5	1 pc
HB-180220HBW130	Hardness block 180-220 HBW 1/30	1 pc
BT-4RS	Horizontal regulating screw	4 pcs
BT-LV	Spirit level	1 pc
BT-PC	Power cable	1 pc
BT-SK	Service keys	1 set
BT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
BI-10	Hard alloy steel ø 10mm ball indenter
BT-V10S	V1.0 System
BT-LCDMD	LCD measuring device
BT-CCDMS	CCD Measuring system
BT-WB	Work bench
BT-APP	Additional printer paper roll

Brinell hardness blocks

Model	Range
HB-BW2.5/62.5	90-450 HBW 2.5/62.5
HB-BW1/30	150-250 HBW 1/30

Brinell Accessories

V 1.0 System

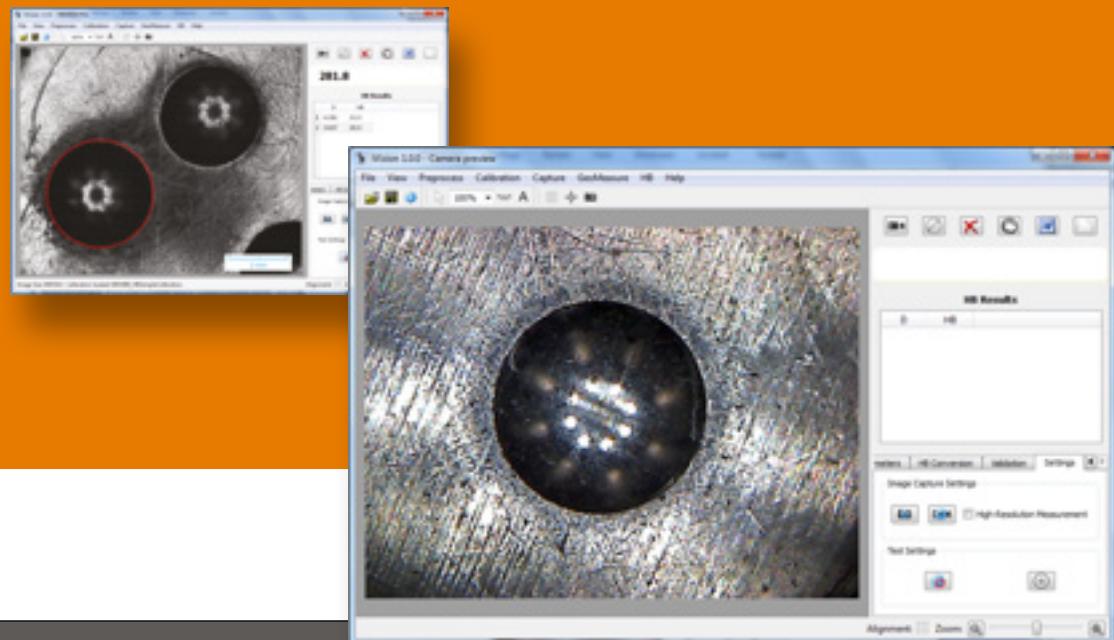


V 1.0 System

Main Function:

- 1. Basic function:** include all functions of image processing and measurement system, such as image capture, calibration, image processing, geometric measurement, annotation, photo album management and fixed times print etc;
- 2. Automatic measurement:** Automatically capture the indentation measure the diameter and calculate the corresponding value of Brinell hardness;
- 3. Manual measurement:** Manually measure the indentation, the system calculates the corresponding value of Brinell hardness;
- 4. Hardness conversion:** The system can convert the measured Brinell hardness value HB to other hardness value such as HV, HR etc;
- 5. Data statistics:** The system can automatically calculate the average value, variance and other statistical values the hardness;
- 6. Standard exceeding alarm:** Automatic mark the abnormal value, when the hardness exceeds the specified value, an alarm will appear;
- 7. Test report:** Automatically generate the report in Word or Excel format, report templates can be modified by the user.
- 8. Easy to use:** Click on the interface button or press the camera button to automatically complete all the work;
- 9. Strong noise resistance:** The advanced and reliable image recognition technology can handle the indentation recognition on the surface of complex samples, two automatic measurement modes to deal with difficult samples;
- 10. Automatic calibration:** System provided with calibration function. With a calibration grid, the system can automatically implement full calibration for calibration data.

Brinell Accessories



V 1.0 System

Standard Configuration:

1. Computer (Hard disk: 500G, Memory: 2G, 19" LCD screen) 1 set
2. Ink jet printer 1 set
3. Portable camera device 1 set
4. Measuring software 1 pc + USB softdog 1 pc

echoLAB

Brinell Hardness (HB) Test Results							
Submitter	Date Submitted	Part ID	Sample Description				
# of Samples							
Qual. UL	200	Qual. LL	120				
Machine ID							
Indenter Diam. (mm)	10	Press. Standard	G/T23.1-2002				
		Force (N)	9800.0				
Test Results							
#	D	HB	Converted	#	D	HB	Converted
1	10.000	200.0		1	10.000	200.0	
2	10.000	200.0		2	10.000	200.0	
3	10.000	200.0		3	10.000	200.0	
4	10.000	200.0		4	10.000	200.0	

Indentation Images

Statistics			
Maximum	206.0	Minimum	66.0
Average	125.0	Std. Dev.	20.37
Q9	1.28	CV%	0.18

Operator	Test Date	Auditor	Audit date
	2011.12.18		

We reserve the right to make changes without notice

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Brinell Accessories

CCD Image Automatic Measuring System



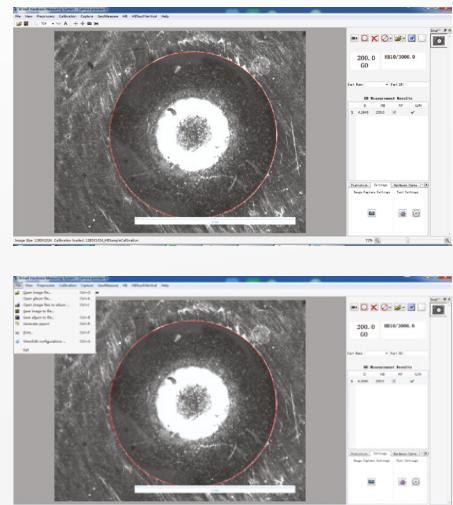
Brinell CCD Image Automatic measuring System

Introduction:

CCD Image automatic measuring system allow test performing through mouse click, and CCD camera for directly observe and measure the indentation on the display, test conditions setting, results clearly and conveniently managed and displayed. Automatic calculation of indentation depth, statistical calculations, conversions, curves, data managing and export as Word or Excel documents.

Main Functions:

- 1. Basic function:** include all functions of image processing and measurement system, such as image capture, calibration, image processing, geometric measurement, annotation, photo album management, etc;
- 2. Automatic measurement:** Automatically capture the indentation, measure the diameter and calculate the corresponding value of Brinell hardness;
- 3. Hardness conversion:** The system can convert the measured Brinell hardness value HB to other hardness scales such as HV, HR etc;
- 4. Data statistics:** Automatic calculation of average value, variance and other statistical values;
- 5. Standard exceeding alarm:** Automatic mark abnormal value, when the hardness exceeds the specified value, an alarm will appear;
- 6. Test report:** Automatically generate the report in Word or Excel format, the report templates can be modified by the user.
- 7. Easy to use:** Click on the interface button, press the camera button or press the run button to automatically complete all the steps;
- 8. Strong noise resistance:** The advanced and reliable image recognition technology can handle the indentation recognition on the surface of complex samples, two automatic measurement modes to deal with difficult samples;
- 9. Automatic calibration:** System provided with calibration function. With a calibration grid, the system can automatically implement full calibration for calibration data.



Standard Configuration:

1. Computer (Hard disk: 500G, Memory: 2G, 19" LCD screen) 1 set
2. Ink jet printer 1 set
3. CCD camera 1 set
4. Measuring software 1 pc + USB softdog 1 pc

Brinell Accessories

LCD Video measuring device



LCD Video measuring device

Main Function:

LCD Video measuring device is composed by video measuring device, 8" color LCD monitor and connections components. With this device, the indentation can be directly showed on the monitor.

The measurement is more accurate. Avoids visual fatigue and human-made error, increasing working efficiency.

Standard Configuration:

1. 8" Color LCD monitor
2. Video measuring device
3. Video connection cable

Brinell Accessories

Indenters

Code	Description	
BI-1	Hard alloy steel ø 1mm ball indenter	
BI-25	Hard alloy steel ø 2,5mm ball indenter	
BI-5	Hard alloy steel ø 5mm ball indenter	
BI-10	Hard alloy steel ø 10mm ball indenter	
BT-IB1	ø 1mm Hard alloy steel ball	
BT-IB2.5	ø 2.5mm hard alloy steel ball	
BT-IB5	ø 5mm hard alloy steel ball	
BT-IB10	ø 10mm hard alloy steel ball	



Test tables

Code	Description	
BT-LTT200	Large plane test table ø 200mm	
BT-LTT108	Large plane test table ø 108mm	
BT-MTT60	Middle sized testing table ø 60mm	
BT-VTT80	V-Shaped test table ø 80mm	
BT-VTT40	V-Shaped test table ø 40mm	



Additional options

Code	Description	
BT-APP	Additional printer paper roll	
BT-WB	Work bench	



Hardness blocks

Code	Scale	Range
HB-BW10/3000	HBW 10/3000	180-650
HB-BW10/1500	HBW 10/1500	180-650
HB-BW10/1000	HBW 10/1000	90-450
HB-BW10/500	HBW 10/500	90-450
HB-BW5/750	HBW 5/750	180-650
HB-BW5/250	HBW 5/250	90-450
HB-BW2.5/187.5	HBW 2.5/187.5	180-650
HB-BW2.5/62.5	HBW 2.5/62.5	90-450
HB-BW1/30	HBW 1/30	150-250

Hardness Testers

ROCKWELL



Rockwell Hardness

Rockwell hardness test, approved in 1919, is based on the measure of the net indentation depth increase when a load is applied.

The test is performed by pressing an indenter with a pre-load that causes an initial penetration, by setting the zero point on the tester and then by applying the full-load. Removing the full-load gives the result value that is referred to the indentation depth.

Different types of indenters are used: 120° diamond spherconical, 3.175mm and 1.588mm spheres.

This test is widely used due to its speed, resolution, reliability and small indentation area.

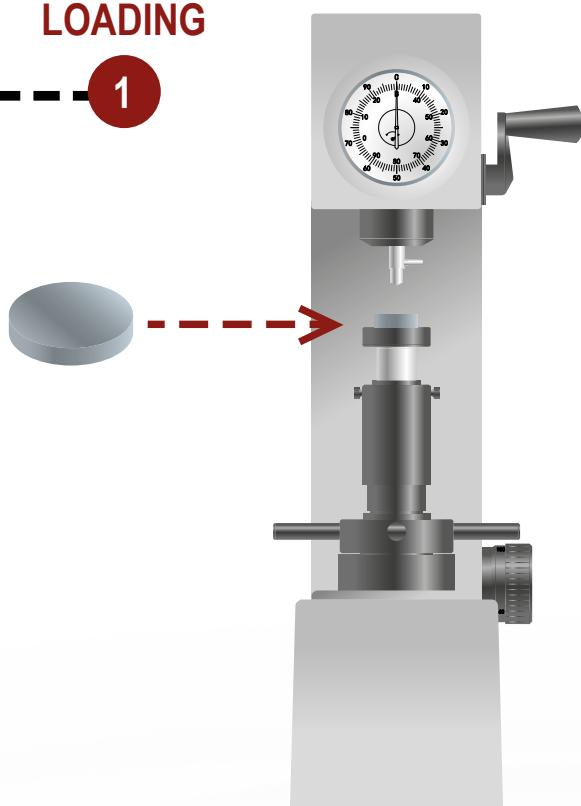
Superficial Rockwell tests uses low loads on thin samples and, depending on the indenter, can be performed from ceramic to metal sheets.

The hardness values are expressed with dimensionless numbers, the most commonly used scales are the C and B. There are several alternative scales A, B, C, D, E, F, G and others.

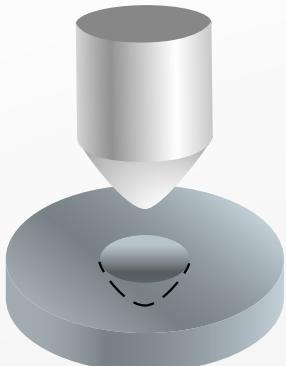
Superficial Rockwell scales are expressed as 15, 30 and 45 followed by N, T, W, X and Y depending on the used indenter.

LOADING

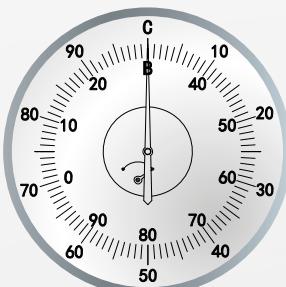
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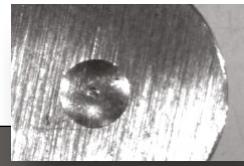


2 INDENTATION



3 DIRECT
READING



**Rockwell standard**

Scale	Indenter	Pre-load	Load	Indentation time	Sample preparation	Application
HRA	Spheroconical diamond	98.07 N (10 kgf)	588.4 N (60 kgf)	2 to 6 seconds	No surface preparation	Cemented carbides, thin steel, and shallow case hardened steel.
HRB	Ball, 1.588mm ($\frac{1}{16}$)	98.07 N (10 kgf)	980.7 N (100 kgf)	2 to 6 seconds	No surface preparation	Copper alloys, soft steels, aluminum alloys, malleable iron, etc.
HRC	Spheroconical diamond	98.07 N (10 kgf)	1471 N (150 kgf)	2 to 6 seconds	No surface preparation	Steel, hard cast irons, pearlitic malleable iron, titanium, deep case hardened steel, and other materials harder than 100 on the Rockwell B scale.
HRD	Spheroconical diamond	98.07 N (10 kgf)	980.7 N (100 kgf)	2 to 6 seconds	No surface preparation	Thin steel and medium case hardened steel, and pearlitic malleable iron.
HRE	Ball, 3.175mm ($\frac{1}{8}$)	98.07 N (10 kgf)	980.7 N (100 kgf)	2 to 6 seconds	No surface preparation	Cast iron, aluminum and magnesium alloys, and bearing metals.
HRF	Ball, 1.588mm ($\frac{1}{16}$)	98.07 N (10 kgf)	588.4 N (60 kgf)	2 to 6 seconds	No surface preparation	Annealed copper alloys, and thin soft sheet metals.
HRG	Ball, 1.588mm ($\frac{1}{16}$)	98.07 N (10 kgf)	1471 N (150 kgf)	2 to 6 seconds	No surface preparation	Malleable irons, copper-nickel-zinc and cupronickel alloys.
HRH	Ball, 3.175mm ($\frac{1}{8}$)	98.07 N (10 kgf)	588.4 N (60 kgf)	2 to 6 seconds	No surface preparation	Aluminum, zinc, and lead.
HRK	Ball, 3.175mm ($\frac{1}{8}$)	98.07 N (10 kgf)	1471 N (150 kgf)	2 to 6 seconds	No surface preparation	Bearing metals and other very soft or thin materials.
HRL	Ball, 6.350mm ($\frac{1}{4}$)	98.07 N (10 kgf)	588.4 N (60 kgf)	2 to 6 seconds	No surface preparation	Bearing metals and other very soft or thin materials.
HRM	Ball, 6.350mm ($\frac{1}{4}$)	98.07 N (10 kgf)	980.7 N (100 kgf)	2 to 6 seconds	No surface preparation	Bearing metals and other very soft or thin materials.
HRP	Ball, 6.350mm ($\frac{1}{4}$)	98.07 N (10 kgf)	1471 N (150 kgf)	2 to 6 seconds	No surface preparation	Bearing metals and other very soft or thin materials.
HRR	Ball, 12.70mm ($\frac{1}{2}$)	98.07 N (10 kgf)	588.4 N (60 kgf)	2 to 6 seconds	No surface preparation	Bearing metals and other very soft or thin materials.
HRS	Ball, 12.70mm ($\frac{1}{2}$)	98.07 N (10 kgf)	980.7 N (100 kgf)	2 to 6 seconds	No surface preparation	Bearing metals and other very soft or thin materials.
HRV	Ball, 12.70mm ($\frac{1}{2}$)	98.07 N (10 kgf)	1471 N (150 kgf)	2 to 6 seconds	No surface preparation	Bearing metals and other very soft or thin materials.

Applicable standard ASTM E18, ISO 6508, JIS Z2245

Superficial Rockwell

Scale	Indenter	Pre-load	Load	Indentation time	Sample preparation	Application
15N	Spheroconical diamond	29.42 N (3 kgf)	147.1 N (15 kgf)	2 to 6 seconds	No surface preparation	Similar to A, C and D scales, but for thinner gage material or case depth.
30N	Spheroconical diamond	29.42 N (3 kgf)	294.2 N (30 kgf)	2 to 6 seconds	No surface preparation	Similar to A, C and D scales, but for thinner gage material or case depth.
45N	Spheroconical diamond	29.42 N (3 kgf)	441.3 N (45 kgf)	2 to 6 seconds	No surface preparation	Similar to A, C and D scales, but for thinner gage material or case depth.
15T	Ball, 1.588mm ($\frac{1}{16}$)	29.42 N (3 kgf)	147.1 N (15 kgf)	2 to 6 seconds	No surface preparation	Similar to B, F and G scales, but for thinner gage material.
30T	Ball, 1.588mm ($\frac{1}{16}$)	29.42 N (3 kgf)	294.2 N (30 kgf)	2 to 6 seconds	No surface preparation	Similar to B, F and G scales, but for thinner gage material.
45T	Ball, 1.588mm ($\frac{1}{16}$)	29.42 N (3 kgf)	441.3 N (45 kgf)	2 to 6 seconds	No surface preparation	Similar to B, F and G scales, but for thinner gage material.
15W	Ball, 3.175mm ($\frac{1}{8}$)	29.42 N (3 kgf)	147.1 N (15 kgf)	2 to 6 seconds	No surface preparation	Very soft material.
30W	Ball, 3.175mm ($\frac{1}{8}$)	29.42 N (3 kgf)	294.2 N (30 kgf)	2 to 6 seconds	No surface preparation	Very soft material.
45W	Ball, 3.175mm ($\frac{1}{8}$)	29.42 N (3 kgf)	441.3 N (45 kgf)	2 to 6 seconds	No surface preparation	Very soft material.
15X	Ball, 6.350mm ($\frac{1}{4}$)	29.42 N (3 kgf)	147.1 N (15 kgf)	2 to 6 seconds	No surface preparation	Very soft material.
30X	Ball, 6.350mm ($\frac{1}{4}$)	29.42 N (3 kgf)	294.2 N (30 kgf)	2 to 6 seconds	No surface preparation	Very soft material.
45X	Ball, 6.350mm ($\frac{1}{4}$)	29.42 N (3 kgf)	441.3 N (45 kgf)	2 to 6 seconds	No surface preparation	Very soft material.
15Y	Ball, 12.70mm ($\frac{1}{2}$)	29.42 N (3 kgf)	147.1 N (15 kgf)	2 to 6 seconds	No surface preparation	Very soft material.
30Y	Ball, 12.70mm ($\frac{1}{2}$)	29.42 N (3 kgf)	294.2 N (30 kgf)	2 to 6 seconds	No surface preparation	Very soft material.
45Y	Ball, 12.70mm ($\frac{1}{2}$)	29.42 N (3 kgf)	441.3 N (45 kgf)	2 to 6 seconds	No surface preparation	Very soft material.

Applicable standard ASTM E18, ISO 6508, JIS Z2245

HTRS 150A V3.0

Fully Automatic Rockwell and Superficial Rockwell Hardness Tester

➤ Fully automatic Rockwell hardness tester with complete functions, easy operation, intuitive display and reliability. This instrument adopts the electronic test force load and unload instead of the weights. Fully automatic XYZ control allow the Jominy end-quench test. With external software various functions can be performed such as: statistical function, extreme value, average value, standard deviation, etc. and also can establish the corresponding statistics database. Statistics database allows input data from other devices which can be used together for statistical analysis. The test report can be customized according to the user's requirements including test parameters, test results and the curve chart. The hardness tester can be connected to a network for test results and reports share.

- 1. Support all the Rockwell and superficial Rockwell scales;
- 2. Support conversion scales of different kinds of hardness;
- 3. Arc correction function;
- 4. Touch screen display, lifting screw working state and the indenter dynamically displayed;
- 5. Computer controlled, XYZ full control;
- 6. One key touch for full working flow, from the rising of the specimen, loading dwell and unloading of the indenter, displaying of the hardness value, to the homing of the test table;
- With the X-Y motorized test table, the path setting continuous test can be performed;
- 7. Data storage function, automatic calculation of the maximum, minimum and average value, the test results can be easily managed, deleted, saved and printed out.

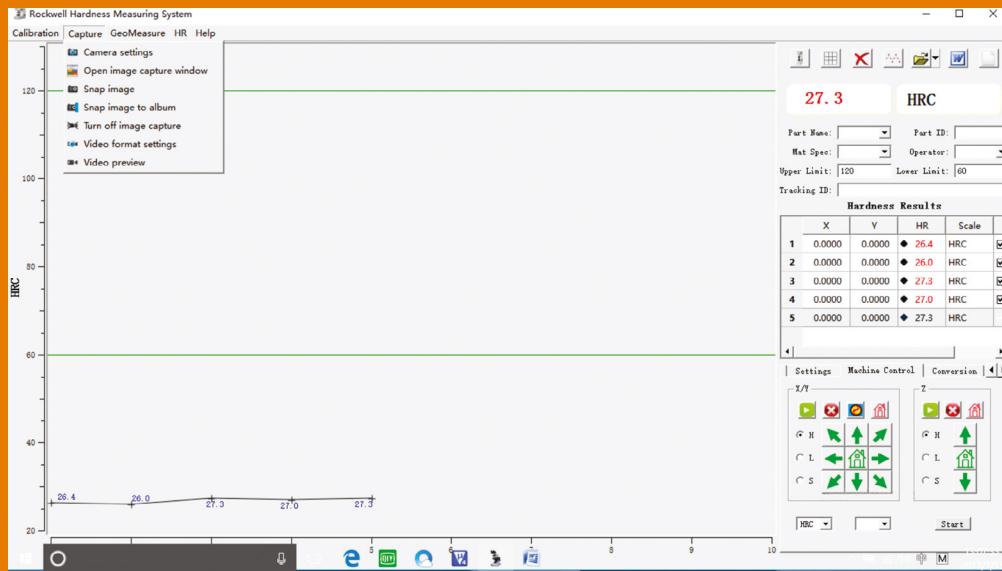
Application

➤ Quenched steel, tempered steel, annealed steel, cold and hard casting, malleable cast iron, hard alloy steel, aluminum alloy, copper, bearing steel, surface quenched steel, surface heat treating and chemical treating materials, sheet, zinc, chrome and tin layers.

Reference standard

➤ ISO 2039-2, ISO 6508 - ASTM D785(A+B), ASTM E 18 - JIS Z2245



**Rockwell**

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRA	20~≤75 HRA	±2 HRA	≤0.02 (100-H) or 0.8 Rockwell unit*
	>75~≤88 HRA	±1.5 HRA	
HRB	20~≤45 HRB	±4 HRB	≤0.04 (130-H) or 1.2 Rockwell unit*
	>45~≤80 HRB	±3 HRB	
	>80~≤100 HRB	±2 HRB	
HRC	20~≤70 HRC	±1.5 HRC	≤0.02 (100-H) or 0.8 Rockwell unit*
HRD	40~≤70 HRD	±2 HRD	≤0.02 (100-H) or 0.8 Rockwell unit*
	>70~≤77 HRD	±1.5 HRD	
HRF	60~≤90 HRF	±3 HRF	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRF	±2 HRF	
HRG	30~≤50 HRG	±6 HRG	≤0.04 (130-H) or 1.2 Rockwell unit*
	>50~≤75 HRG	±4.5 HRG	
	>75~≤94 HRG	±3 HRG	

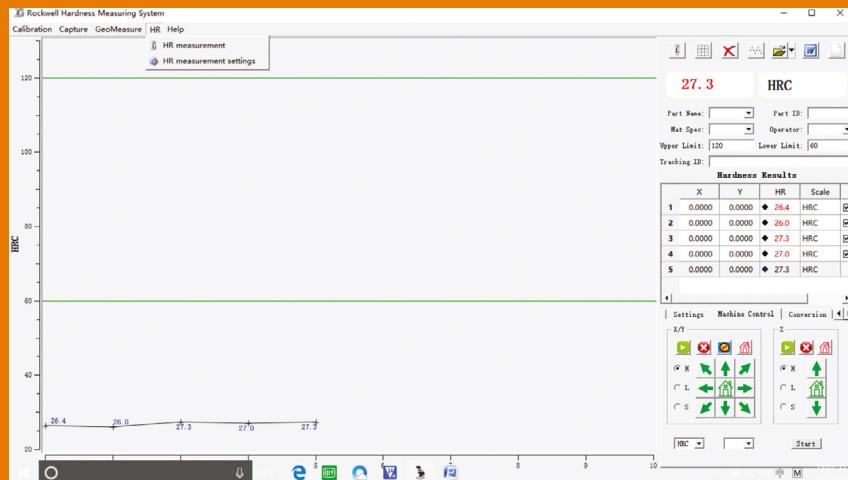
Plastic Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRH	80~≤100 HRH	±2 HRH	≤0.04 (130-H) or 1.2 Rockwell unit*
HRE	70~≤90 HRE	±2.5 HRE	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRE	±2 HRE	
HRK	40~60 HRK	±4 HRK	≤0.04 (130-H) or 1.2 Rockwell unit*
	>60~≤80 HRK	±3 HRK	
	>80~≤100 HRK	±2 HRK	
HRL	100~120 HRL	±1.2 HRL	1.5 HRL
HRM	85~110 HRM	±1.5 HRM	2 HRM
HRP	72~130 HRP	±1 HRP	2 HRP
HRR	114~125 HRR	±1.2 HRR	1.5 HRR
HRS	99~122 HRS	±1 HRS	2 HRS
HRV	78~115 HRV	±1 HRV	2 HRV

Superficial Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HR15N	70~77 HR15N	±2 HR15N	≤0.04 (100-H) or 1.2 Rockwell unit*
	78~88 HR15N		
	89~91 HR15N		
HR30N	42~54 HR30N	±2 HR30N	≤0.04 (100-H) or 1.2 Rockwell unit*
	55~73 HR30N		
	74~80 HR30N		
HR45N	20~31 HR45N	±2 HR45N	≤0.04 (100-H) or 1.2 Rockwell unit*
	32~61 HR45N		
	63~70 HR45N		
HR15T	73~80 HR15T	±3 HR15T	≤0.06 (100-H) or 2.4 Rockwell unit*
	81~87 HR15T		
	88~93 HR15T		
HR30T	43~56 HR30T	±3 HR30T	≤0.06 (100-H) or 2.4 Rockwell unit*
	57~69 HR30T		
	70~82 HR30T		
HR45T	12~33 HR45T	±3 HR45T	≤0.06 (100-H) or 2.4 Rockwell unit*
	34~54 HR45T		
	55~72 HR45T		
HR15W	83~100 HR15W	±1 HR15W	2 HR15W
HR30W	60~99 HR30W	±1 HR30W	2 HR30W
HR45W	38~99 HR45W	±1 HR45W	2 HR45W
HR15X	89~100 HR15X	±1 HR15X	2 HR15X
HR30X	75~100 HR30X	±1 HR30X	2 HR30X
HR45X	63~99 HR45X	±1 HR45X	2 HR45X
HR15Y	80~100 HR15Y	±1 HR15Y	2 HR15Y
HR30Y	77~100 HR30Y	±1 HR30Y	2 HR30Y
HR45Y	64~100 HR45Y	±1 HR45Y	2 HR45Y

(H: average hardness value, *: select a larger value)

HTRS 150A V3.0**Standard accessories**

Model	Description	Q.ty
RI-120	Diamond Rockwell indenter	1 pc
BI-15	ø 1.588mm ball indenter	1 pc
RT-XYTTM	XY motorized test table	1 pc
HB-RC2030	Hardness block 20~30 HRC	1 pc
HB-RC6070	Hardness block 60~70 HRC	1 pc
HB-RB80100	Hardness block 80~100 HRB	1 pc
HB-R30N6580	Hardness block 65~80 HR30N	1 pc
HB-R30T7085	Hardness block 70~85 HR30T	1 pc
RT-CMP	Computer	1 pc
RT-MS	Measuring software	1 pc
RT-CC	Control cables	1 set
RT-PC	Power cable	1 pc
RT-SK	Service keys	1 set
RT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
RT-BI3.1	ø 3.175mm ball indenter
RT-BI6.3	ø 6.35mm ball indenter
RT-BI12.7	ø 12.7mm ball indenter
RT-WB	Work bench
RT-EXPR	External printer
RT-APP	Additional printer paper roll

Rockwell hardness blocks

Model	Range
HB-RA45-75	45-75 HRA
HB-RA80-84	80-84 HRA
HB-RB60-70	60-70 HRB
HB-RB88-100	88-100 HRB
HB-RC20-30	20-30 HRC
HB-RC35-55	35-55 HRC
HB-RC60-70	60-70 HRC
HB-RD40-47	40-47 HRD
HB-RD55-63	55-63 HRD
HB-RD70-75	70-75 HRD
HB-RF105-114	105-114 HRF
HB-RG80-94	80-94 HRG

Superficial Rockwell hardness blocks

Model	Range
HB-R15N70-77	70-77 HR15N
HB-R15N78-88	78-88 HR15N
HB-R15N89-91	89-91 HR15N
HB-R30N42-54	42-54 HR30N
HB-R30N55-73	55-73 HR30N
HB-R30N74-80	74-80 HR30N
HB-R45N20-31	20-31 HR45N
HB-R45N32-61	32-61 HR45N
HB-R45N63-70	63-70 HR45N
HB-R15T77-80	77-80 HR15T
HB-R15T80-83	80-83 HR15T
HB-R15T88-93	88-93 HR15T
HB-R30T49-56	49-56 HR30T
HB-R30T57-63	57-63 HR30T
HB-R30T73-82	73-82 HR30T
HB-R45T34-43	34-43 HR45T
HB-R45T58-72	58-72 HR45T

Optional accessories**Plastic Rockwell hardness blocks**

Model	Range
HB-RE95-100	95-100 HRE
HB-RE107-114	107-114 HRE
HB-RK91-100	91-100 HRK
HB-RH96-100	96-100 HRH
HB-RL110-115	110-115 HRL
HB-RM110-115	110-115 HRM
HB-RR110-115	110-115 HRR

Model	HTRS 150A V3.0
Technology	Loadcell closed loop - Load electronic controlled
Load selection	Touch screen control panel or pc selection
Pre-load	Superficial Rockwell: 3kg Rockwell: 10kg
Main loads	15kg, 30kg, 45kg, 60kg, 100kg, 150kg
Dwell time	0~99s
Loading time	15kg = 2s, 30kg=4s, 45kg=5s, 60kg=5, 8, 100kg=7s, 150kg=10s
Test force tolerance	±1.0%
Test cycle type	Fully Automatic: Pre-Load with automatic braking system, load, dwell, unload, show of the hardness value.
Hardness scales	HRA, HRD, HRC, HRF, HRB, HRG, HRH, HRE, HK, HRL, HRM, HRP, HRR, HRS, HRV, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15Y, HR30Y, HR45Y
Hardness test ranges	Rockwell: HRA 20 - 88, HRB 20 - 100, HRC 20 - 70, HRD 40 - 77, HRF 60 - 100, HRG 30 - 94 Plastic Rockwell: HRE 70 - 100, HRH 80 - 100, HRK 40 - 100, HRL 100 - 120, HRM 85 - 100, HRP 72-130, HRR 114 - 125, HRS 99-122, HRV 78-115 Superficial Rockwell: HR15N 70 - 91, HR30N 42 - 80, HR45N 20 - 70, HR15T 73 - 93, HR30T 43 - 82, HR45T 12 - 72, HR15W 83 - 100, HR30W 60 - 99, HR45W 38 - 99, HR15X 89 - 100, HR30X 75 - 100, HR45X 63 - 99, HR15Y 80 - 100, HR30Y 77 - 100, HR45Y 64 - 100
Hardness resolution	0,1HR
Scale conversion	Automatic conversion: HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Indenters	Diamond Rockwell indenter, ø 1.588mm ball indenter
Nose bore diameter	6.35mm
Vertical test capacity	180mm
Horizontal test capacity	145mm
XY motorized test table	Size: 250x160mm, travel: 100x100mm, dimension: 365x300x140mm
Max. sample weight	100kg
X Y Axis movement	Motorized
X Y Axis speed	High: 4mm/s, Low: 1mm/s
Z axis movement	Motorized
Z axis speed	High: 1.7mm/s, Low: 0.18mm/s
Z Axis resolution	10µm
Computer	CPU: I3, memory: 2G, HD: 500G, 19" LCD screen
Display type	Touch screen and PC display
Display dimensions	Tester: 8"
Input mode	By tap touch or software
Displayed data	Scale, test force, dwell time, Indenter, conversion scale, test number, date and time
Statistics or functions	Max, min, average value
Data storage	Internal storage, machine: 160 tests, PC: 500G
Data output	Word, Excel format
Energy saving mode	Yes
Printer	Built-in printer or external printer (optional)
Interfaces	1x RS232, 1x USB
Safety devices	Emergency switch
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	85kg
Dimensions	535x410x890mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

HTRS 150A**Automatic Rockwell and Superficial Rockwell Hardness Tester**

- > Automatic Rockwell and Superficial Rockwell Hardness Tester, with its complete test automation through full motorization and touch screen control, grants high accuracy test results.
- > Support all the Rockwell and superficial Rockwell scales.
- > Support conversion scales of different kinds of hardness.
- > Touch screen control panel realtime displays lifting screw and indenter working state.
- > Automatic specimen lift, loading, dwell and unloading, hardness value displaying, test table homing.
- > Storage, statistics, data output.

**Application**

> Quenched steel, tempered steel, annealed steel, cold and hard casting, malleable cast iron, hard alloy steel, aluminum alloy, copper alloy, bearing steel, surface quenched steel, surface heat treating and chemical treating materials, sheet, zinc, chrome and tin layers.

Reference standard

- > ISO 2039-2, ISO 6508 - ASTM E 18, ASTM D785(A+B) - JIS Z2245

Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRA	20~≤75 HRA	±2 HRA	≤0.02 (100-H) or 0.8 Rockwell unit*
	>75~≤88 HRA	±1.5 HRA	
HRB	20~≤45 HRB	±4 HRB	≤0.04 (130-H) or 1.2 Rockwell unit*
	>45~≤80 HRB	±3 HRB	
	>80~≤100 HRB	±2 HRB	
HRC	20~≤70 HRC	±1.5 HRC	≤0.02 (100-H) or 0.8 Rockwell unit*
HRD	40~≤70 HRD	±2 HRD	≤0.02 (100-H) or 0.8 Rockwell unit*
	>70~≤77 HRD	±1.5 HRD	
HRF	60~≤90 HRF	±3 HRF	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRF	±2 HRF	
HRG	30~≤50 HRG	±6 HRG	≤0.04 (130-H) or 1.2 Rockwell unit*
	>50~≤75 HRG	±4.5 HRG	
	>75~≤94 HRG	±3 HRG	

Plastic Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRH	80~≤100 HRH	±2 HRH	≤0.04 (130-H) or 1.2 Rockwell unit*
HRE	70~≤90 HRE	±2.5 HRE	≤0.04 (130-H) or 1.2 Rockwell unit*
HRK	>90~≤100 HRE	±2 HRE	
	40~60 HRK	±4 HRK	≤0.04 (130-H) or 1.2 Rockwell unit*
	>60~≤80 HRK	±3 HRK	
HRL	>80~≤100 HRK	±2 HRK	
	100~120 HRL	±1.2 HRL	1.5 HRL
HRM	85~110 HRM	±1.5 HRM	2 HRM
HRP	72~130 HRP	±1 HRP	2 HRP
HRR	114~125 HRR	±1.2 HRR	1.5 HRR
HRS	99~122 HRS	±1 HRS	2 HRS
HRV	78~115 HRV	±1 HRV	2 HRV

Superficial Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HR15N	70~77 HR15N	±2 HR15N	≤0.04 (100-H) or 1.2 Rockwell unit*
	78~88 HR15N		
	89~91 HR15N		
HR30N	42~54 HR30N	±2 HR30N	≤0.04 (100-H) or 1.2 Rockwell unit*
	55~73 HR30N		
	74~80 HR30N		
HR45N	20~31 HR45N	±2 HR45N	≤0.04 (100-H) or 1.2 Rockwell unit*
	32~61 HR45N		
	63~70 HR45N		
HR15T	73~80 HR15T	±3 HR15T	≤0.06 (100-H) or 2.4 Rockwell unit*
	81~87 HR15T		
	88~93 HR15T		
HR30T	43~56 HR30T	±3 HR30T	≤0.06 (100-H) or 2.4 Rockwell unit*
	57~69 HR30T		
	70~82 HR30T		
HR45T	12~33 HR45T	±3 HR45T	≤0.06 (100-H) or 2.4 Rockwell unit*
	34~54 HR45T		
	55~72 HR45T		
HR15W	83~100 HR15W	±1 HR15W	2 HR15W
HR30W	60~99 HR30W	±1 HR30W	2 HR30W
HR45W	38~99 HR45W	±1 HR45W	2 HR45W
HR15X	89~100 HR15X	±1 HR15X	2 HR15X
HR30X	75~100 HR30X	±1 HR30X	2 HR30X
HR45X	63~99 HR45X	±1 HR45X	2 HR45X
HR15Y	80~100 HR15Y	±1 HR15Y	2 HR15Y
HR30Y	77~100 HR30Y	±1 HR30Y	2 HR30Y
HR45Y	64~100 HR45Y	±1 HR45Y	2 HR45Y

(H: average hardness value, *: select a larger value)

Model	HTRS 150A
Technology	Loadcell closed loop - Load electronic controlled
Load selection	Touch screen control panel
Pre-load	Superficial Rockwell: 3kg Rockwell: 10kg
Main loads	15kg, 30kg, 45kg, 60kg, 100kg, 150kg
Dwell time	0-99s
Loading time	15kg = 2s, 30kg=4s, 45kg=5s, 60kg=5.8, 100kg=7s, 150kg=10s
Test force tolerance	±1.0%
Test cycle type	Fully Automatic: Pre-Load with automatic braking system, load, dwell, unload, show of the hardness value.
Hardness scales	HRA, HRD, HRC, HRF, HRB, HRG, HRH, HRE, HK, HRL, HRM, HRP, HRR, HRS, HRV, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15Y, HR30Y, HR45Y
Hardness test ranges	Rockwell: HRA 20 - 88, HRB 20 - 100, HRC 20 - 70, HRD 40 - 77, HRF 60 - 100, HRG 30 - 94 Plastic Rockwell: HRE 70 - 100, HRH 80 - 100, HK 40 - 100, HRL 100 - 120, HRM 85 - 100, HRP 72-130, HRR 114 - 125, HRS 99-122, HRV 78-115 Superficial Rockwell: HR15N 70 - 91, HR30N 42 - 80, HR45N 20 - 70, HR15T 73 - 93, HR30T 43 - 82, HR45T 12 - 72, HR15W 83 - 100, HR30W 60 - 99, HR45W 38 - 99, HR15X 89 - 100, HR30X 75 - 100, HR45X 63 - 99, HR15Y 80 - 100, HR30Y 77 - 100, HR45Y 64 - 100
Hardness resolution	0,1HR
Scale conversion	Automatic conversion: HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Indenters	Diamond Rockwell indenter, ø 1.588mm ball indenter
Nose bore diameter	6.35mm
Vertical test capacity	320mm
Horizontal test capacity	150mm
Anvils dimensions	Large plane test table ø 150mm Middle plane test table ø 60mm V-shaped test table ø 40mm
Max. sample weight	100kg
Z axis movement	Motorized
Z axis speed	High: 1.7mm/s, Low: 0.18mm/s
Z Axis resolution	10µm
Display type	Touch screen
Display dimensions	8"
Input mode	By tap touch
Displayed data	Scale, test force, dwell time, Indenter, conversion scale, test number, date and time
Statistics or functions	Max, min, average value
Data storage	Internal storage, 160 tests
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	External printer (optional)
Interfaces	1x RS232
Safety devices	Emergency switch
Operation temperature	10-30°C
Operation rel. humidity	≤65%
Weight	80kg
Dimensions	535x330x890mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories		
Model	Description	Q.ty
RI-120	Diamond Rockwell indenter	1 pc
BI-15	ø 1.588mm ball indenter	1 pc
RTLTT150	Large plane test table ø 150mm	1 pc
RTMTT60	Middle plane test table ø 60mm	1 pc
RTVTT40	V-shaped test table ø 40mm	1 pc
HB-RC2030	Hardness block 20-30 HRC	1 pc
HB-RC6070	Hardness block 60-70 HRC	1 pc
HB-RB80100	Hardness block 80-100 HRB	1 pc
HB-R30N6580	Hardness block 65-80 HR30N	1 pc
HB-R30T7085	Hardness block 70-85 HR30T	1 pc
RT-PC	Power cable	1 pc
RT-SK	Service keys	1 set
RT-ADC	Anti-dust cover	1 pc

Optional accessories	
Model	Description
RT-BI3.1	ø 3.175mm ball indenter
RT-BI6.3	ø 6.35mm ball indenter
RT-BI12.7	ø 12.7mm ball indenter
RT-WB	Work bench
RT-EXPR	External printer
RT-APP	Additional printer paper roll

Rockwell hardness blocks	
Model	Range
HB-RA45-75	45-75 HRA
HB-RA80-84	80-84 HRA
HB-RB60-70	60-70 HRB
HB-RB88-100	88-100 HRB
HB-RC20-30	20-30 HRC
HB-RC35-55	35-55 HRC
HB-RC60-70	60-70 HRC
HB-RD40-47	40-47 HRD
HB-RD55-63	55-63 HRD
HB-RD70-75	70-75 HRD
HB-RF105-114	105-114 HRF
HB-RG80-94	80-94 HRG

Superficial Rockwell hardness blocks	
Model	Range
HB-R15N70-77	70-77 HR15N
HB-R15N78-88	78-88 HR15N
HB-R15N89-91	89-91 HR15N
HB-R30N42-54	42-54 HR30N
HB-R30N55-73	55-73 HR30N
HB-R30N74-80	74-80 HR30N
HB-R45N20-31	20-31 HR45N
HB-R45N32-61	32-61 HR45N
HB-R45N63-70	63-70 HR45N
HB-R15T77-80	77-80 HR15T
HB-R15T80-83	80-83 HR15T
HB-R15T88-93	88-93 HR15T
HB-R30T49-56	49-56 HR30T
HB-R30T57-63	57-63 HR30T
HB-R30T73-82	73-82 HR30T
HB-R45T34-43	34-43 HR45T
HB-R45T58-72	58-72 HR45T



Optional accessories	
Plastic Rockwell hardness blocks	
Model	Range
HB-RE95-100	95-100 HRE
HB-RE107-114	107-114 HRE
HB-RK91-100	91-100 HRK
HB-RH96-100	96-100 HRH
HB-RL110-115	110-115 HRL
HB-RM110-115	110-115 HRM
HB-RR110-115	110-115 HRR

HTRS 150**Digital Rockwell and Superficial Rockwell Hardness Tester**

- > Digital Rockwell and Superficial Rockwell Hardness Tester equipped with large displaying screen allowing excellent operation and easy watching. Display and set the scale, test force, test indenter, dwell time and hardness conversion;
- > Main functions: Rockwell and superficial Rockwell scales selection, conversion scales, test results, data save function, printing, automatic calculation of maximum, minimum and average value.

**Application**

- > Quenched steel, tempered steel, annealed steel, cold and hard casting, malleable cast iron, hard alloy steel, aluminum alloy, copper alloy, bearing steel, surface quenched steel, surface heat treating and chemical treating materials, sheet, zinc, chrome and tin layers, etc.

Reference standard

- > ISO 6508, ASTM E 18, JIS Z2245

Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRA	20~≤75 HRA	±2 HRA	≤0.02 (100-H) or 0.8 Rockwell unit*
	>75~≤88 HRA	±1.5 HRA	
HRB	20~≤45 HRB	±4 HRB	≤0.04 (130-H) or 1.2 Rockwell unit*
	>45~≤80 HRB	±3 HRB	
	>80~≤100 HRB	±2 HRB	
HRC	20~≤70 HRC	±1.5 HRC	≤0.02 (100-H) or 0.8 Rockwell unit*
HRD	40~≤70 HRD	±2 HRD	≤0.02 (100-H) or 0.8 Rockwell unit*
	>70~≤77 HRD	±1.5 HRD	
HRF	60~≤90 HRF	±3 HRF	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRF	±2 HRF	
HRG	30~≤50 HRG	±6 HRG	≤0.04 (130-H) or 1.2 Rockwell unit*
	>50~≤75 HRG	±4.5 HRG	
	>75~≤94 HRG	±3 HRG	

Plastic Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRH	80~≤100 HRH	±2 HRH	≤0.04 (130-H) or 1.2 Rockwell unit*
HRE	70~≤90 HRE	±2.5 HRE	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRE	±2 HRE	
HRK	40~60 HRK	±4 HRK	≤0.04 (130-H) or 1.2 Rockwell unit*
	>60~≤80 HRK	±3 HRK	
	>80~≤100 HRK	±2 HRK	
HRL	100~120 HRL	±1.2 HRL	1.5 HRL
HRM	85~110 HRM	±1.5 HRM	2 HRM
HRP	72~130 HRP	±1 HRP	2 HRP
HRR	114~125 HRR	±1.2 HRR	1.5 HRR
HRS	99~122 HRS	±1 HRS	2 HRS
HRV	78~115 HRV	±1 HRV	2 HRV

Superficial Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HR15N	70~77 HR15N		
	78~88 HR15N	±2 HR15N	
	89~91 HR15N		
HR30N	42~54 HR30N		
	55~73 HR30N	±2 HR30N	≤0.04 (100-H) or 1.2 Rockwell unit*
	74~80 HR30N		
HR45N	20~31 HR45N		
	32~61 HR45N	±2 HR45N	
	63~70 HR45N		
HR15T	73~80 HR15T		
	81~87 HR15T	±3 HR15T	
	88~93 HR15T		
HR30T	43~56 HR30T		
	57~69 HR30T	±3 HR30T	≤0.06 (100-H) or 2.4 Rockwell unit*
	70~82 HR30T		
HR45T	12~33 HR45T		
	34~54 HR45T	±3 HR45T	
	55~72 HR45T		
HR15W	83~100 HR15W	±1 HR15W	2 HR15W
HR30W	60~99 HR30W	±1 HR30W	2 HR30W
HR45W	38~99 HR45W	±1 HR45W	2 HR45W
HR15X	89~100 HR15X	±1 HR15X	2 HR15X
HR30X	75~100 HR30X	±1 HR30X	2 HR30X
HR45X	63~99 HR45X	±1 HR45X	2 HR45X
HR15Y	80~100 HR15Y	±1 HR15Y	2 HR15Y
HR30Y	77~100 HR30Y	±1 HR30Y	2 HR30Y
HR45Y	64~100 HR45Y	±1 HR45Y	2 HR45Y

(H: average hardness value, *: select a larger value)

Model	HTRS 150
Technology	Weights - Load electronic controlled
Load selection	Right side handle
Pre-load	Superficial Rockwell: 3kg Rockwell: 10kg
Main loads	60kg, 100kg, 150kg
Dwell time	0~60s
Loading time	2s
Test force tolerance	±1.0%
Test cycle type	Semi-automatic type: Manual - pre-load with sound alarm brake Automatic - load, dwell, unload, show the hardness value
Hardness scales	HRA, HRD, HRC, HRF, HRB, HRG, HRH, HRE, HRK, HRL, HRM, HRP, HRR, HRS, HRV, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15Y, HR30Y, HR45Y
Hardness test ranges	Rockwell: HRA 20 - 88, HRB 20 - 100, HRC 20 - 70, HRD 40 - 77, HRF 60 - 100, HRG 30 - 94 Plastic Rockwell: HRE 70 - 100, HRH 80 - 100, HRK 40 - 100, HRL 100 - 120, HRM 85 - 100, HRP 72-130, HRR 114 - 125, HRS 99-122, HRV 78-115 Superficial Rockwell: HR15N 70 - 91, HR30N 42 - 80, HR45N 20 - 70, HR15T 73 - 93, HR30T 43 - 82, HR45T 12 - 72, HR15W 83 - 100, HR30W 60 - 99, HR45W 38 - 99, HR15X 89 - 100, HR30X 75 - 100, HR45X 63 - 99, HR15Y 80 - 100, HR30Y 77 - 100, HR45Y 64 - 100
Hardness resolution	0.1HR
Scale conversion	Automatic conversion: HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Indenters	Diamond Rockwell indenter, ø 1.588mm ball indenter
Nose bore diameter	6.35mm
Vertical test capacity	175mm
Horizontal test capacity	165mm
Anvils dimensions	Large plane test table ø 150mm Middle plane test table ø 60mm V-shaped test table ø 40mm
Max. sample weight	100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	Control panel keyboard
Displayed data	Scale, test force, dwell time, indenter, conversion scale, test number, date and time
Statistics or functions	Max, min, average value
Data storage	Internal storage, 216 tests
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	RS232
Safety devices	Emergency switch
Operation temperature	10-30°C
Operation rel. humidity	≤65%
Weight	80kg
Dimensions	520x215x700mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
RI-120	Diamond Rockwell indenter	1 pc
BI-15	ø 1.588mm ball indenter	1 pc
RTLTT150	Large plane test table ø 150mm	1 pc
RTMTT60	Middle plane test table ø 60mm	1 pc
RTVTT40	V-shaped test table ø 40mm	1 pc
HB-RC2030	Hardness block 20-30 HRC	1 pc
HB-RC6070	Hardness block 60-70 HRC	1 pc
HB-RB80100	Hardness block 80-100 HRB	1 pc
HB-R30N6580	Hardness block 65-80 HR30N	1 pc
HB-R30T7085	Hardness block 70-85 HR30T	1 pc
RT-5WS	Weight 1, 2, 3, 4, 5	5 pcs
RT-4RS	Horizontal regulating screw	4 pcs
RT-LV	Spirit level	1 pc
RT-PC	Power cable	1 pc
RT-SK	Service keys	1 set
RT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
RT-BI3.1	ø 3.175mm ball indenter
RT-BI6.3	ø 6.35mm ball indenter
RT-BI12.7	ø 12.7mm ball indenter
RT-WB	Work bench
RT-EXPR	External printer
RT-APP	Additional printer paper roll

Rockwell hardness blocks

Model	Range
HB-RA45-75	45-75 HRA
HB-RA80-84	80-84 HRA
HB-RB60-70	60-70 HRB
HB-RB88-100	88-100 HRB
HB-RC20-30	20-30 HRC
HB-RC35-55	35-55 HRC
HB-RC60-70	60-70 HRC
HB-RD40-47	40-47 HRD
HB-RD55-63	55-63 HRD
HB-RD70-75	70-75 HRD
HB-RF105-114	105-114 HRF
HB-RG80-94	80-94 HRG

Superficial Rockwell hardness blocks

Model	Range
HB-R15N70-77	70-77 HR15N
HB-R15N78-88	78-88 HR15N
HB-R15N89-91	89-91 HR15N
HB-R30N42-54	42-54 HR30N
HB-R30N55-73	55-73 HR30N
HB-R30N74-80	74-80 HR30N
HB-R45N20-31	20-31 HR45N
HB-R45N32-61	32-61 HR45N
HB-R45N63-70	63-70 HR45N
HB-R15T77-80	77-80 HR15T
HB-R15T80-83	80-83 HR15T
HB-R15T88-93	88-93 HR15T
HB-R30T49-56	49-56 HR30T
HB-R30T57-63	57-63 HR30T
HB-R30T73-82	73-82 HR30T
HB-R45T34-43	34-43 HR45T
HB-R45T58-72	58-72 HR45T

Optional accessories**Plastic Rockwell hardness blocks**

Model	Range
HB-RE95-100	95-100 HRE
HB-RE107-114	107-114 HRE
HB-RK91-100	91-100 HRK
HB-RH96-100	96-100 HRH
HB-RL110-115	110-115 HRL
HB-RM110-115	110-115 HRM
HB-RR110-115	110-115 HRR



HTR 150D**Digital Rockwell Hardness Tester**

- > Digital Rockwell hardness tester with high resolution color touch screen, high brightness display type adjustable with energy-saving mode.
- Control system allows the display and set the present scale, test force, test indenter, dwell time and hardness conversion;
- > Main functions: Rockwell scales selection; conversion scales; data can be saved and printed out, automatic calculation of maximum, minimum and average value.

**Application**

- > Quenched steel, tempered steel, annealed steel, cold and hard casting, malleable cast iron, hard alloy steel, aluminum alloy, copper alloy, bearing steel etc.

Reference standard

- > ISO 6508, ASTM E 18, JIS Z2245

Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRA	20~≤75 HRA	±2 HRA	≤0.02 (100-H) or 0.8 Rockwell unit*
	>75~≤88 HRA	±1.5 HRA	
HRB	20~≤45 HRB	±4 HRB	≤0.04 (130-H) or 1.2 Rockwell unit*
	>45~≤80 HRB	±3 HRB	
	>80~≤100 HRB	±2 HRB	
HRC	20~≤70 HRC	±1.5 HRC	≤0.02 (100-H) or 0.8 Rockwell unit*
HRD	40~≤70 HRD	±2 HRD	≤0.02 (100-H) or 0.8 Rockwell unit*
	>70~≤77 HRD	±1.5 HRD	
HRF	60~≤90 HRF	±3 HRF	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRF	±2 HRF	
HRG	30~≤50 HRG	±6 HRG	≤0.04 (130-H) or 1.2 Rockwell unit*
	>50~≤75 HRG	±4.5 HRG	
	>75~≤94 HRG	±3 HRG	

Plastic Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRH	80~≤100 HRH	±2 HRH	≤0.04 (130-H) or 1.2 Rockwell unit*
HRE	70~≤90 HRE	±2.5 HRE	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRE	±2 HRE	
HRK	40~60 HRK	±4 HRK	≤0.04 (130-H) or 1.2 Rockwell unit*
	>60~≤80 HRK	±3 HRK	
	>80~≤100 HRK	±2 HRK	
HRL	100~120 HRL	±1.2 HRL	1.5 HRL
HRM	85~110 HRM	±1.5 HRM	2 HRM
HRP	72~130 HRP	±1 HRP	2 HRP
HRR	114~125 HRR	±1.2 HRR	1.5 HRR
HRS	99~122 HRS	±1 HRS	2 HRS
HRV	78~115 HRV	±1 HRV	2 HRV

(H: average hardness value, *: select a larger value)



Model	HTR 150D
Technology	Weights - Load electronic controlled
Load selection	Right side handle
Pre-load	10kg
Main loads	60kg, 100kg, 150kg
Dwell time	0~60s
Loading time	2s
Test force tolerance	±1.0%
Test cycle type	Semi-automatic type: Manual - pre-load with sound alarm brake, Automatic - load, dwell, unload, show the hardness value
Hardness scales	HRA, HRD, HRC, HRF, HRB, HRG, HRH, HRE, HRK, HRL, HRM, HRP, HRR, HRS, HRV
Hardness test ranges	Rockwell: HRA 20~88, HRB 20~100, HRC 20~70, HRD 40~77, HRF 60~100, HRG 30~94 Plastic Rockwell: HRE 70~100, HRH 80~100, HRK 40~100, HRL 100 - 120, HRM 85 - 100, HRP 72-130, HRR 114 - 125, HRS 99-122, HRV 78-115
Hardness resolution	0.1HR
Scale conversion	Automatic conversion: HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Indenters	Diamond Rockwell indenter, ø 1.588mm ball indenter
Nose bore diameter	6.35mm
Vertical test capacity	175mm
Horizontal test capacity	165mm
Anvils dimensions	Large plane test table ø 150mm Middle plane test table ø 60mm V-shaped test table ø 40mm
Max. sample weight	100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	5.6"
Input mode	By tap touch
Displayed data	Scale, test force, dwell time, indenter, conversion scale, test number, date and time
Statistics or functions	Max, min, average value
Data storage	Internal storage, 192 tests
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	RS232
Safety devices	Emergency switch
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	78kg
Dimensions	520x215x700mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
RI-120	Diamond Rockwell indenter	1 pc
BI-15	ø 1.588mm ball indenter	1 pc
RTLT150	Large plane test table ø 150mm	1 pc
RTMTT60	Middle plane test table ø 60mm	1 pc
RTVTT40	V-shaped test table ø 40mm	1 pc
HB-RC2030	Hardness block 20~30 HRC	1 pc
HB-RC6070	Hardness block 60~70 HRC	1 pc
HB-RB80100	Hardness block 80~100 HRB	1 pc
RT-3WS	Weight A,B,C	3 pc
RT-4RS	Horizontal regulating screw	4 pc
RT-LV	Spirit level	1 pc
RT-PC	Power cable	1 pc
RT-SK	Service keys	1pc
RT-ADC	Anti-dust cover	1pc

Optional accessories

Model	Description
RT-BI3.1	ø 3.175mm ball indenter
RT-BI6.3	ø 6.35mm ball indenter
RT-BI12.7	ø 12.7mm ball indenter
RT-WB	Work bench
RT-APP	Additional printer paper roll

Rockwell hardness blocks

Model	Range
HB-RA45-75	45-75 HRA
HB-RA80-84	80-84 HRA
HB-RB60-70	60-70 HRB
HB-RB88-100	88-100 HRB
HB-RC20-30	20-30 HRC
HB-RC35-55	35-55 HRC
HB-RC60-70	60-70 HRC
HB-RD40-47	40-47 HRD
HB-RD55-63	55-63 HRD
HB-RD70-75	70-75 HRD
HB-RF105-114	105-114 HRF
HB-RG80-94	80-94 HRG

Plastic Rockwell hardness blocks

Model	Range
HB-RE95-100	95-100 HRE
HB-RE107-114	107-114 HRE
HB-RK91-100	91-100 HRK
HB-RH96-100	96-100 HRH
HB-RL110-115	110-115 HRL
HB-RM110-115	110-115 HRM
HB-RR110-115	110-115 HRR

HTR 150DL

Digital Rockwell Hardness Tester

- > Digital Rockwell Hardness Tester with high resolution color touch screen, high brightness Display type adjustable with energy-saving mode. Control system allows the display and set the scale, test force, test indenter, dwell time and hardness conversion;
- > Main functions: Rockwell scales selection; conversion scales; data save and print out, automatic calculation of maximum, minimum and average value.



Application

- > Quenched steel, tempered steel, annealed steel, cold and hard casting, malleable cast iron, hard alloy steel, aluminum alloy, copper alloy, bearing steel, surface quenched steel, surface heat treating and chemical treating materials, sheet, zinc, chrome and tin layers.

Reference standard

- > ISO 6508, ASTM E 18, JIS Z2245

Rockwell			
Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRA	20~≤75 HRA	±2 HRA	≤0.02 (100-H) or 0.8 Rockwell unit*
	>75~≤88 HRA	±1.5 HRA	
HRB	20~≤45 HRB	±4 HRB	≤0.04 (130-H) or 1.2 Rockwell unit*
	>45~≤80 HRB	±3 HRB	
	>80~≤100 HRB	±2 HRB	
HRC	20~≤70 HRC	±1.5 HRC	≤0.02 (100-H) or 0.8 Rockwell unit*
HRD	40~≤70 HRD	±2 HRD	≤0.02 (100-H) or 0.8 Rockwell unit*
	>70~≤77 HRD	±1.5 HRD	
HRF	60~≤90 HRF	±3 HRF	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRF	±2 HRF	
HRG	30~≤50 HRG	±6 HRG	≤0.04 (130-H) or 1.2 Rockwell unit*
	>50~≤75 HRG	±4.5 HRG	
	>75~≤94 HRG	±3 HRG	

Plastic Rockwell			
Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRH	80~≤100 HRH	±2 HRH	≤0.04 (130-H) or 1.2 Rockwell unit*
HRE	70~≤90 HRE	±2.5 HRE	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRE	±2 HRE	
HRK	40~60 HRK	±4 HRK	≤0.04 (130-H) or 1.2 Rockwell unit*
	>60~≤80 HRK	±3 HRK	
	>80~≤100 HRK	±2 HRK	
HRL	100~120 HRL	±1.2 HRL	1.5 HRL
HRM	85~110 HRM	±1.5 HRM	2 HRM
HRP	72~130 HRP	±1 HRP	2 HRP
HRR	114~125 HRR	±1.2 HRR	1.5 HRR
HRS	99~122 HRS	±1 HRS	2 HRS
HRV	78~115 HRV	±1 HRV	2 HRV

(H: average hardness value, *: select a larger value)



Model	HTR 150DL
Technology	Weights - Load electronic controlled
Load selection	Right side handle
Pre-load	10kg
Main loads	60kg, 100kg, 150kg
Dwell time	0~60s
Loading time	2s
Test force tolerance	±1.0%
Test cycle type	Semi-automatic type: Manual - pre-load with sound alarm brake, Automatic - load, dwell, unload, show of the hardness value
Hardness scales	HRA, HRD, HRC, HRF, HRB, HRG, HRH, HRE, HRK, HRL, HRM, HRP, HRR, HRS, HRV Rockwell: HRA 20~88, HRB 20~100, HRC 20~70, HRD 40~77, HRF 60~100, HRG 30~94
Hardness test ranges	Plastic Rockwell: HRE 70~100, HRH 80~100, HRK 40~100, HRL 100 - 120, HRM 85 - 100, HRP 72~130, HRR 114 - 125, HRS 99~122, HRV 78~115
Hardness resolution	0.1HR
Scale conversion	Automatic conversion: HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Indenters	Diamond Rockwell indenter, ø 1.588mm ball indenter
Nose bore diameter	6.35mm
Vertical test capacity	400mm
Horizontal test capacity	165mm
Anvils dimensions	Large plane test table ø 150mm Middle plane test table ø 60mm V-shaped test table ø 40mm
Max. sample weight	100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	Control panel keyboard
Displayed data	Scale, test force, dwell time, indenter, conversion scale, test number, date and time
Statistics or functions	Max, min, average value
Data storage	Internal storage, 216 tests
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	RS232
Safety devices	Emergency switch
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	98kg
Dimensions	520x220x880mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
RI-120	Diamond Rockwell indenter	1 pc
BI-15	ø 1.588mm ball indenter	1 pc
RTLTT150	Large plane test table ø 150mm	1 pc
RTMTT60	Middle plane test table ø 60mm	1 pc
RTVTT40	V-shaped test table ø 40mm	1 pc
HB-RC2030	Hardness block 20~30 HRC	1 pc
HB-RC6070	Hardness block 60~70 HRC	1 pc
HB-RB80100	Hardness block 80~100 HRB	1 pc
RT-3WS	Weight A,B,C	3 pc
RT-4RS	Horizontal regulating screw	4 pc
RT-LV	Spirit level	1 pc
RT-PC	Power cable	1 pc
RT-SK	Service keys	1pc
RT-ADC	Anti-dust cover	1pc

Optional accessories

Model	Description
RT-BI3.1	ø 3.175mm ball indenter
RT-BI6.3	ø 6.35mm ball indenter
RT-BI12.7	ø 12.7mm ball indenter
RT-WB	Work bench
RT-APP	Additional printer paper roll

Rockwell hardness blocks

Model	Range
HB-RA45-75	45-75 HRA
HB-RA80-84	80-84 HRA
HB-RB60-70	60-70 HRB
HB-RB88-100	88-100 HRB
HB-RC20-30	20-30 HRC
HB-RC35-55	35-55 HRC
HB-RC60-70	60-70 HRC
HB-RD40-47	40-47 HRD
HB-RD55-63	55-63 HRD
HB-RD70-75	70-75 HRD
HB-RF105-114	105-114 HRF
HB-RG80-94	80-94 HRG

Plastic Rockwell hardness blocks

Model	Range
HB-RE95-100	95-100 HRE
HB-RE107-114	107-114 HRE
HB-RK91-100	91-100 HRK
HB-RH96-100	96-100 HRH
HB-RL110-115	110-115 HRL
HB-RM110-115	110-115 HRM
HB-RR110-115	110-115 HRR

HTR 150M**Motorized Rockwell Hardness Tester**

- Motorized Rockwell Hardness Tester, automatic test force load and unload, test force selected by side load-change hand wheel. Selectable dwell time and dial zero setting. High sensitivity and stability for accurate tests.

**Application**

- Quenched steel, tempered steel, annealed steel, cold and hard casting, malleable cast iron, hard alloy steel, aluminum alloy, copper alloy, bearing steel etc.

Reference standard

- ISO 6508, ASTM E 18, JIS Z2245

Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRA	20~≤75 HRA	±2 HRA	≤0.02 (100-H) or 0.8 Rockwell unit*
	>75~≤88 HRA	±1.5 HRA	
HRB	20~≤45 HRB	±4 HRB	≤0.04 (130-H) or 1.2 Rockwell unit*
	>45~≤80 HRB	±3 HRB	
	>80~≤100 HRB	±2 HRB	
HRC	>~≤70 HRC	±1.5 HRC	≤0.02 (100-H) or 0.8 Rockwell unit*
HRD	40~≤70 HRD	±2 HRD	≤0.02 (100-H) or 0.8 Rockwell unit*
	>70~≤77 HRD	±1.5 HRD	
HRF	60~≤90 HRF	±3 HRF	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRF	±2 HRF	
HRG	30~≤50 HRG	±6 HRG	≤0.04 (130-H) or 1.2 Rockwell unit*
	>50~≤75 HRG	±4.5 HRG	
	>75~≤94 HRG	±3 HRG	

(H: average hardness value, *: select a larger value)

Model	HTR 150M
Technology	Weights - Load electronic controlled
Load selection	Right side handle
Pre-load	10kg
Main loads	60kg, 100kg, 150kg
Dwell time	2~60s
Loading time	2s
Test force tolerance	±1.0%
Test cycle type	Semi-automatic type: Manual type - pre-load with physical brake Automatic: load, dwell, unload, read of the hardness value
Hardness scales	HRA, HRD, HRC, HRF, HRB, HRG
Hardness test ranges	Rockwell: HRA 20~88, HRB 20~100, HRC 20~70, HRD 40~77, HRF 60~100, HRG 30~94
Hardness resolution	0.5HR
Scale conversion	With table, according to ASTM E140
Indenters	Diamond Rockwell indenter, ø1.588mm ball indenter
Nose bore diameter	6.35mm
Vertical test capacity	175mm
Horizontal test capacity	165mm
Anvils dimensions	Large plane test table ø150mm Middle plane test table ø60mm V-shaped test table ø40mm
Max. sample weight	100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	Dial
Display dimensions	ø 110mm
Input mode	Control panel keyboard
Safety devices	Emergency switch
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	78kg
Dimensions	520x215x700mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
RI-120	Diamond Rockwell indenter	1 pc
BI-15	ø 1.588mm ball indenter	1 pc
RTLT150	Large plane test table ø 150mm	1 pc
RTMTT60	Middle plane test table ø 60mm	1 pc
RTVTT40	V-shaped test table ø 40mm	1 pc
HB-RC2030	Hardness block 20~30 HRC	1 pc
HB-RC6070	Hardness block 60~70 HRC	1 pc
HB-RB80100	Hardness block 80~100 HRB	1 pc
RT-3WS	Weight A,B,C	3 pc
RT-4RS	Horizontal regulating screw	4 pc
RT-LV	Spirit level	1 pc
RT-PC	Power cable	1 pc
RT-SK	Service keys	1pc
RT-ADC	Anti-dust cover	1pc

Optional accessories

Model	Description
RT-WB	Work bench
Rockwell hardness blocks	
Model	Range
HB-RA45-75	45-75 HRA
HB-RA80-84	80-84 HRA
HB-RB60-70	60-70 HRB
HB-RB88-100	88-100 HRB
HB-RC20-30	20-30 HRC
HB-RC35-55	35-55 HRC
HB-RC60-70	60-70 HRC
HB-RD40-47	40-47 HRD
HB-RD55-63	55-63 HRD
HB-RD70-75	70-75 HRD
HB-RF105-114	105-114 HRF
HB-RG80-94	80-94 HRG
Plastic Rockwell hardness blocks	
Model	Range
HB-RE95-100	95-100 HRE
HB-RE107-114	107-114 HRE
HB-RK91-100	91-100 HRK
HB-RH96-100	96-100 HRH

HTR 45D**Digital Superficial Rockwell Hardness Tester**

- > Digital Superficial Rockwell Hardness Tester with high resolution large screen. Control system allows the display and set the present scale, test force, test indenter, dwell time and hardness conversion;
- > Main functions: Superficial Rockwell scales selection; conversion scales; data save and print out, automatic calculation of maximum, minimum and average value.

Application

- > Surface quenched steel, surface heat treating and chemical treating materials, copper alloy, aluminum alloy, sheet, zinc, chrome and tin layers, bearing steel and cold and hard casting etc.

Reference standard

- > ISO 6508, ASTM E 18, JIS Z2245

Superficial Rockwell				
Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability	
HR15N	70~77 HR15N	±2 HR15N	≤0.04 (100-H) or 1.2 Rockwell unit*	
	78~88 HR15N			
	89~91 HR15N			
HR30N	42~54 HR30N	±2 HR30N		
	55~73 HR30N			
	74~80 HR30N			
HR45N	20~31 HR45N	±2 HR45N		
	32~61 HR45N			
	63~70 HR45N			
HR15T	73~80 HR15T	±3 HR15T	≤0.06 (100-H) or 2.4 Rockwell unit*	
	81~87 HR15T			
	88~93 HR15T			
HR30T	43~56 HR30T	±3 HR30T		
	57~69 HR30T			
	70~82 HR30T			
HR45T	12~33 HR45T	±3 HR45T		
	34~54 HR45T			
	55~72 HR45T			
HR15W	83~100 HR15W	±1 HR15W	2 HR15W	
HR30W	60~99 HR30W	±1 HR30W	2 HR30W	
HR45W	38~99 HR45W	±1 HR45W	2 HR45W	
HR15X	89~100 HR15X	±1 HR15X	2 HR15X	
HR30X	75~100 HR30X	±1 HR30X	2 HR30X	
HR45X	63~99 HR45X	±1 HR45X	2 HR45X	
HR15Y	80~100 HR15Y	±1 HR15Y	2 HR15Y	
HR30Y	77~100 HR30Y	±1 HR30Y	2 HR30Y	
HR45Y	64~100 HR45Y	±1 HR45Y	2 HR45Y	

01	89.3	10	19	28
02	11	20	29	
03	12	21	30	
04	13	22	31	
05	14	23	32	
06	15	24	33	
07	16	25	34	
08	17	26	35	
09	18	27	36	
MIN=	89.3	AU=	89.3	MAX=
			89.3	P=
			00	

Superficial Rockwell Hardness Tester 1.0			
Indenter	F= 15kg	F= 30kg	F= 45kg
Diamond	15N ■	30N	45N
d=1.588mm	15T	30T	45T
d=3.175mm	15W	30W	45W
d=6.350mm	15X	30X	45X
d=12.70mm	15Y	30Y	45Y
UP DOWN LEFT RIGHT OK KEY			

(H: average hardness value, *: select a larger value)

Model	HTR 45D
Technology	Weights - Load electronic controlled
Load selection	Right side handle
Pre-load	3kg
Main loads	15kg, 30kg, 45kg
Dwell time	0~60s
Loading time	2s
Test force tolerance	±1.0%
Test cycle type	Semi-automatic type: Manual - pre-load with sound alarm brake, Automatic - load, dwell, unload, show the hardness value
Hardness scales	HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15Y, HR30Y, HR45Y
Hardness test ranges	Superficial Rockwell: HR15N 70 - 91, HR30N 42 - 80, HR45N 20 - 70, HR15T 73 - 93, HR30T 43 - 82, HR45T 12 - 72, HR15W 83 - 100, HR30W 60 - 99, HR45W 38 - 99, HR15X 89 - 100, HR30X 75 - 100, HR45X 63 - 99, HR15Y 80 - 100, HR30Y 77 - 100, HR45Y 64 - 100
Hardness resolution	0.1HR
Scale conversion	Automatic conversion: HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Indenters	Diamond Rockwell indenter, ø 1.588mm ball indenter
Nose bore diameter	6.35mm
Vertical test capacity	175mm
Horizontal test capacity	165mm
Anvils dimensions	Large plane test table ø 150mm Middle plane test table ø 60mm V-shaped test table ø 40mm
Max. sample weight	100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	Control panel keyboard
Displayed data	Scale, test force, dwell time, indenter, conversion scale, test number, date and time
Statistics or functions	Max, min, average value
Data storage	Internal storage, 216 tests
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	RS232
Safety devices	Emergency switch
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	73kg
Dimensions	520x215x700mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
RI-120	Diamond Rockwell indenter	1 pc
BI-15	ø 1.588mm ball indenter	1 pc
RTLT150	Large plane test table ø 150mm	1 pc
RTMTT60	Middle plane test table ø 60mm	1 pc
RTVTT40	V-shaped test table ø 40mm	1 pc
RHB-R15N8090	Hardness block 80~90 HR15N	1 pc
RHB-R30T7085	Hardness block 70~85 HR30T	1 pc
RHB-R30N6580	Hardness block 65~80 HR30N	1 pc
RT-3WS	Weight A,B,C	3 pc
RT-4RS	Horizontal regulating screw	4 pc
RT-LV	Spirit level	1 pc
RT-SK	Service keys	1 set
RT-PC	Power cable	1 pc
RT-ADC	Anti-dust cover	1pc

Optional accessories

Model	Description
RT-BI3.1	ø 3.175mm ball indenter
RT-BI6.3	ø 6.35mm ball indenter
RT-BI12.7	ø 12.7mm ball indenter
RT-WB	Work bench
RT-APP	Additional printer paper roll
Superficial Rockwell hardness blocks	
Model	Range
HB-R15N70-77	70-77 HR15N
HB-R15N78-88	78-88 HR15N
HB-R15N89-91	89-91 HR15N
HB-R30N42-54	42-54 HR30N
HB-R30N55-73	55-73 HR30N
HB-R30N74-80	74-80 HR30N
HB-R45N20-31	20-31 HR45N
HB-R45N32-61	32-61 HR45N
HB-R45N63-70	63-70 HR45N
HB-R15T77-80	77-80 HR15T
HB-R15T80-83	80-83 HR15T
HB-R15T88-93	88-93 HR15T
HB-R30T49-56	49-56 HR30T
HB-R30T57-63	57-63 HR30T
HB-R30T73-82	73-82 HR30T
HB-R45T34-43	34-43 HR45T
HB-R45T58-72	58-72 HR45T



HTR 45M**Motorized Superficial Rockwell Hardness Tester**

- > Motorized Superficial Rockwell Hardness Tester, automatic test force load and unload, test force is selected by side load-change hand wheel. Selectable dwell time and dial zero setting. High sensitivity and stability accurate tests.

**Application**

- > Surface quenched steel, surface heat treating and chemical treating materials, copper alloy, aluminum alloy, sheet, zinc, chrome and tin layers, bearing steel and cold and hard casting etc.

Reference standard

- > ISO 6508, ASTM E 18, JIS Z2245

**Superficial Rockwell**

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HR15N	70~77 HR15N	± 2 HR15N	≤ 0.04 (100-H) or 1.2 Rockwell unit*
	78~88 HR15N		
	89~91 HR15N		
HR30N	42~54 HR30N	± 2 HR30N	≤ 0.04 (100-H) or 1.2 Rockwell unit*
	55~73 HR30N		
	74~80 HR30N		
HR45N	20~31 HR45N	± 2 HR45N	≤ 0.06 (100-H) or 2.4 Rockwell unit*
	32~61 HR45N		
	63~70 HR45N		
HR15T	73~80 HR15T	± 3 HR15T	≤ 0.06 (100-H) or 2.4 Rockwell unit*
	81~87 HR15T		
	88~93 HR15T		
HR30T	43~56 HR30T	± 3 HR30T	≤ 0.06 (100-H) or 2.4 Rockwell unit*
	57~69 HR30T		
	70~82 HR30T		
HR45T	12~33 HR45T	± 3 HR45T	≤ 0.06 (100-H) or 2.4 Rockwell unit*
	34~54 HR45T		
	55~72 HR45T		

(H: average hardness value, *: select a larger value)

HTR 45M		Standard accessories
		Model Description Q.ty
Technology	Weights - Load electronic controlled	RI-120 Diamond Rockwell indenter 1 pc
Load selection	Right side handle	BI-15 ø 1.588mm ball indenter 1 pc
Pre-load	3kg	RTLT150 Large plane test table ø 150mm 1 pc
Main loads	15kg, 30kg, 45kg	RTMTT60 Middle plane test table ø 60mm 1 pc
Dwell time	2~60s	RTVTT40 V-shaped test table ø 40mm 1 pc
Loading time	2s	HB-R15N8090 Hardness block 80~90 HR15N 1 pc
Test force tolerance	±1.0%	HB-R30T7085 Hardness block 70~85 HR30T 1 pc
Semi-automatic:		HB-R30N6580 Hardness block 65~80 HR30N 1 pc
Test cycle type	Manual type - pre-load with physical brake	RT-3WS Weight A,B,C 3 pc
Automatic - load, dwell, unload, read the hardness value		RT-4RS Horizontal regulating screw 4 pcs
Hardness scales	HR15N, HR30N, HR45N, HR15T, HR30T, HR45T	RT-LV Spirit level 1 pc
Hardness test ranges	Superficial Rockwell: HR15N 70 - 91, HR30N 42 - 80, HR45N 20 - 70, HR15T 73 - 93, HR30T 43 - 82, HR45T 12 - 72	RT-PC Power cable 1 pc
Hardness resolution	0.5HR	RT-SK Service keys 1 set
Scale conversion	With table, according to ASTM E140	RT-ADC Anti-dust cover 1pc
Indenters	Diamond Rockwell indenter, ø 1.588mm ball indenter	
Nose bore diameter	6.35mm	
Vertical test capacity	175mm	
Horizontal test capacity	165mm	
Anvils dimensions		Large plane test table ø 150mm
		Middle plane test table ø 60mm
		V-shaped test table ø 40mm
Max. sample weight	100kg	Superficial Rockwell hardness blocks
Z axis movement	Manual	Model Range
Z axis speed	Manual	HB-R15N70-77 70-77 HR15N
Display type	Dial	HB-R15N78-88 78-88 HR15N
Display dimensions	ø 110mm	HB-R15N89-91 89-91 HR15N
Input mode	Control panel keyboard	HB-R30N42-54 42-54 HR30N
Safety devices	Emergency switch	HB-R30N55-73 55-73 HR30N
Operation temperature	10~30°C	HB-R30N74-80 74-80 HR30N
Operation rel. humidity	≤65%	HB-R45N20-31 20-31 HR45N
Weight	73kg	HB-R45N32-61 32-61 HR45N
Dimensions	520x215x700mm	HB-R45N63-70 63-70 HR45N
Power supply	230V, 50Hz	HB-R15T77-80 77-80HR15T
Voltage variance	±10%	HB-R15T80-83 80-83HR15T
Absorbed power	500W	HB-R15T88-93 88-93HR15T
		HB-R30T49-56 49-56 HR30T
		HB-R30T57-63 57-63 HR30T
		HB-R30T73-82 73-82 HR30T
		HB-R45T34-43 34-43 HR45T
		HB-R45T58-72 58-72 HR45T

HTRP 150D

Digital Plastics Rockwell Hardness Tester

- > Digital Plastic Rockwell Hardness Tester with high resolution large screen. Control system allows the display and set the scale, test force, test indenter, dwell time and hardness conversion;
- > Main functions: Plastic Rockwell scales selection; conversion scales; data save and print out, automatic calculation of maximum, minimum and average value.

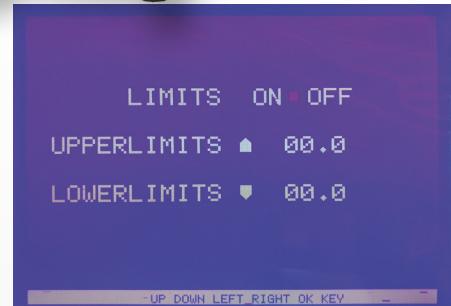
PLASTIC MATERIALS

Application

- > Hard plastics, hard rubbers, aluminum, tin, copper, soft steel, synthetic resins, etc.

Reference standard

- > ISO 6508, ASTM E 18, JIS Z2245



Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRA	20~≤75 HRA	±2 HRA	≤0.02 (100-H) or 0.8 Rockwell unit*
	>75~≤88 HRA	±1.5 HRA	
HRB	20~≤45 HRB	±4 HRB	≤0.04 (130-H) or 1.2 Rockwell unit*
	>45~≤80 HRB	±3 HRB	
	>80~≤100 HRB	±2 HRB	
HRC	20~≤70 HRC	±1.5 HRC	≤0.02 (100-H) or 0.8 Rockwell unit*
HRD	40~≤70 HRD	±2 HRD	≤0.02 (100-H) or 0.8 Rockwell unit*
	>70~≤77 HRD	±1.5 HRD	
HRF	60~≤90 HRF	±3 HRF	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRF	±2 HRF	
HRG	30~≤50 HRG	±6 HRG	≤0.04 (130-H) or 1.2 Rockwell unit*
	>50~≤75 HRG	±4.5 HRG	
	>75~≤94 HRG	±3 HRG	

Plastic Rockwell

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRH	80~≤100 HRH	±2 HRH	≤0.04 (130-H) or 1.2 Rockwell unit*
HRE	70~≤90 HRE	±2.5 HRE	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRE	±2 HRE	
HRK	40~60 HRK	±4 HRK	≤0.04 (130-H) or 1.2 Rockwell unit*
	>60~≤80 HRK	±3 HRK	
	>80~≤100 HRK	±2 HRK	
HRL	100~120 HRL	±1.2 HRL	1.5 HRL
HRM	85~110 HRM	±1.5 HRM	2 HRM
HRP	72~130 HRP	±1 HRP	2 HRP
HRR	114~125 HRR	±1.2 HRR	1.5 HRR
HRS	99~122 HRS	±1 HRS	2 HRS
HRV	78~115 HRV	±1 HRV	2 HRV

(H: average hardness value, *: select a larger value)

Model	HTRP 150D
Technology	Weights - Load electronic controlled
Load selection	Right side handle
Pre-load	10kg
Main loads	60kg, 100kg, 150kg
Dwell time	0~60s
Loading time	2s
Test force tolerance	±1.0%
Test cycle type	Semi-automatic type: Manual - pre-load with sound alarm brake Automatic - load, dwell, unload
Hardness scales	HRA, HRD, HRC, HRF, HRB, HRG, HRH, HRE, HRK, HRL, HRM, HRP, HRR, HRS, HRV
	Rockwell: HRA 20 - 88, HRB 20 - 100, HRC 20 - 70, HRD 40 - 77, HRF 60 - 100, HRG
Hardness test ranges	30 - 94 Plastic Rockwell: HRE 70 - 100, HRH 80 - 100, HRK 40 - 100, HRL 100 - 120, HRM 85 - 100, HRP 72-130, HRR 114 - 125, HRS 99-122, HRV 78-115
Hardness resolution	0.1HR
Scale conversion	Automatic conversion: HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW - According to ASTM E140
Indenters	ø 3.175mm, ø 6.35mm, ø 12.7mm ball indenter
Nose bore diameter	6.35mm
Vertical test capacity	175mm
Horizontal test capacity	165mm
Anvils dimensions	Large plane test table ø 150mm Middle plane test table ø 60mm V-shaped test table ø 40mm
Max. sample weight	100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	Control panel keyboard
Displayed data	Scale, test force, dwell time, indenter, conversion scale, test number, date and time
Statistics or functions	Max, min, average value
Data storage	Internal storage, 216 tests
Data output	Hyperterminal session format (.HT)
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	RS232
Safety devices	Emergency switch
Operation temperature	10-30°C
Operation rel. humidity	≤65%
Weight	78kg
Dimensions	520x215x700mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
RT-BI3.1	ø 3.175mm ball indenter	1 pc
RT-BI6.3	ø 6.35mm ball indenter	1 pc
RT-BI12.7	ø 12.7mm ball indenter	1 pc
RTLTT150	Large plane test table ø 150mm	1 pc
RTMTT60	Middle plane test table ø 60mm	1 pc
RTVTT40	V-shaped test table ø 40mm	1 pc
HB-RE7585	Hardness block ±75-85 HRE	1 pc
HB-RM100110	Hardness block ±100-110 HRM	1 pc
HB-RL110120	Hardness block ±110-120 HRL	1 pc
HB-RR115125	Hardness block ±115-125 HRR	1 pc
RT-3WS	Weight A,B,C	3 pc
RT-4RS	Horizontal regulating screw	4 pc
RT-LV	Spirit level	1 pc
RT-PC	Power cable	1 pc
RT-SK	Service keys	1 set
RT-ADC	Anti-dust cover	1pc

Optional accessories

Model	Description
RT-120	Diamond Rockwell indenter
BI-15	ø 1.588mm ball indenter
RT-WB	Work bench
RT-APP	Additional printer paper roll

Rockwell hardness blocks

Model	Range
HB-RA45-75	45-75 HRA
HB-RA80-84	80-84 HRA
HB-RB60-70	60-70 HRB
HB-RB88-100	88-100 HRB
HB-RC20-30	20-30 HRC
HB-RC35-55	35-55 HRC
HB-RC60-70	60-70 HRC
HB-RD40-47	40-47 HRD
HB-RD55-63	55-63 HRD
HB-RD70-75	70-75 HRD
HB-RF105-114	105-114 HRF
HB-RG80-94	80-94 HRG

Plastic Rockwell hardness blocks

Model	Range
HB-RE95-100	95-100 HRE
HB-RE107-114	107-114 HRE
HB-RK91-100	91-100 HRK
HB-RH96-100	96-100 HRH
HB-RL110-115	110-115 HRL
HB-RM110-115	110-115 HRM
HB-RR110-115	110-115 HRR



HTRP 150M**Plastics Rockwell Hardness Tester**

› Plastic Rockwell Hardness Tester, automatic test force load and unload, the test force is selected by side load-change hand wheel. Selectable dwell time and dial zero setting. High sensitivity and stability for accurate tests.

Application

› Hard plastics, hard rubbers, aluminum, tin, copper, soft steel, synthetic resins and frictative materials etc.

Reference standard

› ISO 6508, ASTM E 18, JIS Z2245

**Plastic Rockwell**

Hardness scale	Standard block hardness range	Displayed value allowed tolerance	Displayed value allowed repeatability
HRH	80~≤100 HRH	±2 HRH	≤0.04 (130-H) or 1.2 Rockwell unit*
HRE	70~≤90 HRE	±2.5 HRE	≤0.04 (130-H) or 1.2 Rockwell unit*
	>90~≤100 HRE	±2 HRE	≤0.04 (130-H) or 1.2 Rockwell unit*
HRK	40~60 HRK	±4 HRK	≤0.04 (130-H) or 1.2 Rockwell unit*
	>60~≤80 HRK	±3 HRK	≤0.04 (130-H) or 1.2 Rockwell unit*
	>80~≤100 HRK	±2 HRK	≤0.04 (130-H) or 1.2 Rockwell unit*
HRL	100~120 HRL	±1.2 HRL	1.5 HRL
HRM	85~110 HRM	±1.5 HRM	2 HRM
HRP	72~130 HRP	±1 HRP	2 HRP
HRR	114~125 HRR	±1.2 HRR	1.5 HRR
HRS	99~122 HRS	±1 HRS	2 HRS
HRV	78~115 HRV	±1 HRV	2 HRV

(H: average hardness value, *: select a larger value)

Model	HTRP 150M
Technology	Weights - Load electronic controlled
Load selection	Right side handle
Pre-load	10kg
Main loads	60kg, 100kg, 150kg
Dwell time	2~60s
Loading time	2s
Test force tolerance	±1.0%
Test cycle type	Semi-automatic type: Manual type - pre-load with physical brake Automatic - load, dwell, unload
Hardness scales	HRE, HRL, HRM, HRR, HRH, HRK, HRP, HRS, HRV
Hardness test ranges	Plastic Rockwell: HRE 70 - 100, HRH 80 - 100, HRK 40 - 100, HRL 100 - 120, HRM 85 - 100, HRP 72-130, HRR 114 - 125, HRS 99-122, HRV 78-115
Hardness resolution	0.5HR
Scale conversion	With table, according to ASTM E140
Indenters	Diamond Rockwell indenter, ø 1.588mm ball indenter
Nose bore diameter	6.35mm
Vertical test capacity	175mm
Horizontal test capacity	165mm
Anvils dimensions	Large plane test table ø 150mm Middle plane test table ø 60mm V-shaped test table ø 40mm
Max. sample weight	100kg
Z axis movement	Manual
Z axis speed	Manual
Display type	Dial
Display dimensions	ø 110mm
Input mode	Control panel keyboard
Safety devices	Emergency switch
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	78kg
Dimensions	520x215x700mm
Power supply	230V, 50Hz
Voltage variance	±10%
Absorbed power	500W

Standard accessories

Model	Description	Q.ty
RT-BI3.1	ø 3.175mm ball indenter	1 pc
RT-BI6.3	ø 6.35mm ball indenter	1 pc
RT-BI12.7	ø 12.7mm ball indenter	1 pc
RTLTT150	Large plane test table ø 150mm	1 pc
RTMTT60	Middle plane test table ø 60mm	1 pc
RTVTT40	V-shaped test table ø 40mm	1 pc
HB-RE7585	Hardness block 75~85 HRE	1 pc
HB-RL110120	Hardness block 110~120 HRL	1 pc
HB-RM100110	Hardness block 100~110 HRM	1 pc
HB-RR115125	Hardness block 115~125 HRR	1 pc
RT-3WS	Weight A,B,C	3 pc
RT-4RS	Horizontal regulating screw	4 pc
RT-LV	Spirit level	1 pc
RT-PC	Power cable	1 pc
RT-SK	Service keys	1 pc
RT-ADC	Anti-dust cover	1 pc

Optional accessories

Model	Description
RT-WB	Work bench
Plastic Rockwell hardness blocks	
Model	Range
HB-RE95-100	95-100 HRE
HB-RE107-114	107-114 HRE
HB-RK91-100	91-100 HRK
HB-RH96-100	96-100 HRH
HB-RL110-115	110-115 HRL
HB-RM110-115	110-115 HRM
HB-RR110-115	110-115 HRR

Rockwell Accessories

Indenters

Code	Description	
RI-120	Diamond Rockwell indenter	
RT-BI1.5	ø 1.588mm ball indenter	
RT-BI3.1	ø 3.175mm ball indenter	
RT-BI6.3	ø 6.35mm ball indenter	
RT-BI12.7	ø 12.7mm ball indenter	
RT-IB1.5	ø 1.588mm hard alloy steel ball	
RT-IB3.1	ø 3.175mm steel ball	
RT-IB6.3	ø 6.35mm steel ball	
RT-IB12.7	ø 12.7mm steel ball	 

Test tables

Code	Description	
RTLTT150	Large plane test table 150mm	
RTMTT60	Middle plane test table 60mm	
RTVTT40	V-shaped test table 40mm	

Additional options

Code	Description	
RT-APP	Additional printer paper roll	
RT-WB	Work bench	

Rockwell hardness test blocks

Model	Description	Range
HB-RA45-75	HRA	45-75
HB-RA80-84	HRA	80-84
HB-RB60-70	HRB	60-70
HB-RB88-100	HRB	88-100
HB-RC20-30	HRC	20-30
HB-RC35-55	HRC	35-55
HB-RC60-70	HRC	60-70
HB-RD40-47	HRD	40-47
HB-RD55-63	HRD	55-63
HB-RD70-75	HRD	70-75
HB-RF105-114	HRF	105-114
HB-RG80-94	HRG	80-94

Plastic Rockwell hardness test blocks

Model	Description	Range
HB-RE95-100	HRE	95-100
HB-RE107-114	HRE	107-114
HB-RK91-100	HRK	91-100
HB-RH96-100	HRH	96-100
HB-RL110-115	HRL	110-115
HB-RM110-115	HRM	110-115
HB-RR110-115	HRR	110-115

Superficial Rockwell hardness test blocks

Model	Description	Range
HB-R15N70-77	HR15N	70-77
HB-R15N78-88	HR15N	78-88
HB-R15N89-91	HR15N	89-91
HB-R30N42-54	HR30N	42-54
HB-R30N55-73	HR30N	55-73
HB-R30N74-80	HR30N	74-80
HB-R45N20-31	HR45N	20-31
HB-R45N32-61	HR45N	32-61
HB-R45N63-70	HR45N	63-70
HB-R15T77-80	HR15T	77-80
HB-R15T80-83	HR15T	80-83
HB-R15T88-93	HR15T	88-93
HB-R30T49-56	HR30T	49-56
HB-R30T57-63	HR30T	57-63
HB-R30T73-82	HR30T	73-82
HB-R45T34-43	HR45T	34-43
HB-R45T58-72	HR45T	58-72

Hardness Testers

UNIVERSAL



Universal Hardness

Universal hardness Testers are multi-function instruments for the determination of Rockwell, Brinell and Vickers hardness.

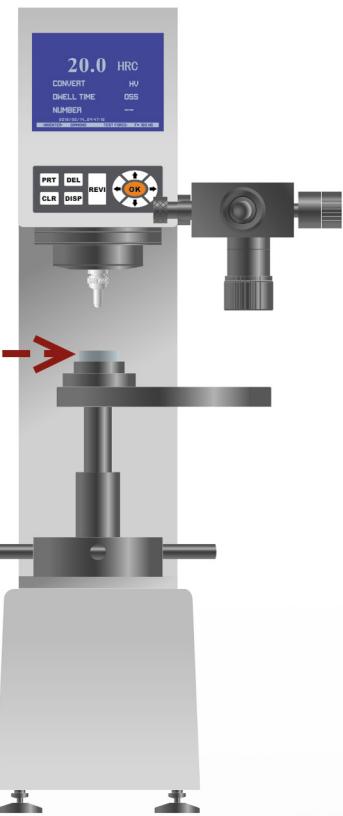
As an all-in-one equipment they allow the user to concentrate the measurement, the calibration and the maintenance in one single unit.

Mostly used when all kinds of hardness have to be tested with specific ranges.

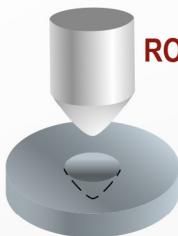
Always applying the international standards ASTM, ISO and JIS this solution grants performance and versatility.

LOADING

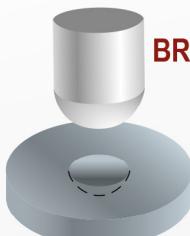
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2 INDENTATION



ROCKWELL



BRINELL

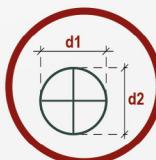


VICKERS

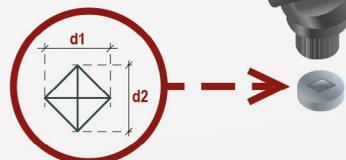
ROCKWELL



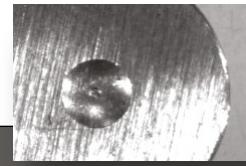
BRINELL



VICKERS



3 MEASURING

**Rockwell**

Scale	Indenter	Pre-load	Load	Indentation time	Sample preparation	Application
HRA	Spheroconical diamond	98.07 N (10 kgf)	588.4 N (60 kgf)	2 to 6 seconds	No surface preparation	Cemented carbides, thin steel, and shallow case hardened steel.
HRB	Ball, 1.588mm ($\frac{1}{16}$)	98.07 N (10 kgf)	980.7 N (100 kgf)	2 to 6 seconds	No surface preparation	Copper alloys, soft steels, aluminum alloys, malleable iron, etc.
HRC	Spheroconical diamond	98.07 N (10 kgf)	1471 N (150 kgf)	2 to 6 seconds	No surface preparation	Steel, hard cast irons, pearlitic malleable iron, titanium, deep case hardened steel, and other materials harder than 100 on the Rockwell B scale.
HRD	Spheroconical diamond	98.07 N (10 kgf)	980.7 N (100 kgf)	2 to 6 seconds	No surface preparation	Thin steel and medium case hardened steel, and pearlitic malleable iron.

Applicable standard ASTM E18, ISO 6508, JIS Z2245

**Brinell**

Method	Indenter	Indentation time	Sample preparation	Application
HBW 1/30	Tungsten carbide 1mm sphere	10 to 15 seconds	Ground, polished	Steel / Iron
HBW 2.5/187.5	Tungsten carbide 2.5mm sphere	10 to 15 seconds	Ground, polished	Steel / Iron
HBW2.5/62.5	Tungsten carbide 2.5mm sphere	10 to 15 seconds	Ground, polished	Light metals, copper, aluminium, copper alloys, aluminium alloys
HBW2.5/31.25	Tungsten carbide 2.5mm sphere	10 to 15 seconds	Ground, polished	Light metals, copper, aluminium, copper alloys or heat treated
HBW 5/62.5	Tungsten carbide 5mm sphere	10 to 15 seconds	Ground, polished	Light metals
HBW 10/100	Tungsten carbide 10mm sphere	10 to 15 seconds	Ground, polished	Light metals, lead, tin

Applicable standard ASTM E10, ISO 6506, JIS Z2243

**Vickers**

Scale	Indenter	Indentation time	Sample preparation	Application
HV30	Pyramidal diamond	10 to 15 seconds	Ground	Jominy, surface hardness testing
HV100	Pyramidal diamond	10 to 15 seconds	Ground	Jominy, surface hardness testing

Applicable standard ASTM E384 for Micro and Macro ranges, ISO 6507 for Micro and Macro ranges, JIS Z2244

HTU 200BVR D

Digital Brinell, Rockwell & Vickers Hardness Tester

- > Digital Brinell, Rockwell & Vickers hardness tester equipped with large displaying screen. Three test modes and 7 level of test forces, test force loading, dwell, unload adopts automatic shifting. Present scale, test force, test indenter, dwell time and hardness conversion displayed. With RS232 interface for computer connection.



Application

- > Suitable for hardened and surface hardened steel, hard alloy steel, casting parts, non-ferrous metals, various kinds of hardening and tempering steel and tempered steel, carburized steel sheet, soft metals, surface heat treating and chemical treating materials etc.

Reference Standard

- > ISO 6508, ASTM E-18, JIS Z2245
- > ISO 6506, ASTM E10-12, JIS Z2243
- > ISO 6507, ASTM E92, JIS Z2244

Rockwell table

Hardness Scale	Hardness ranges of standard Block	Allowed Tolerance of Displaying value	Allowed Repeatability of Displaying value (H: average hardness value, b: select a larger value)
HRA	20~≤75 HRA	±2 HRA	≤0.02 (100-H) or 0.8 Rockwell unit ^b
	>75~≤88 HRA	±1.5 HRA	
HRB	20~≤45 HRB	±4 HRB	≤0.04 (130-H) or 1.2 Rockwell unit ^b
	>45~≤80 HRB	±3 HRB	
	>80~≤100 HRB	±2 HRB	
HRC	20~≤70 HRC	±1.5 HRC	≤0.02 (100-H) or 0.8 Rockwell unit ^b
HRD	40~≤70 HRD	±2 HRD	≤0.02 (100-H) or 0.8 Rockwell unit ^b
	>70~≤77 HRD	±1.5 HRD	

Brinell table

Hardness ranges of standard Block	Allowed Tolerance of Displaying value%	Allowed Repeatability of Displaying value%
≤125	±3	3
125<HBW≤225	±2.5	2,5
>225	±2	2

Vickers table 1

Hardness	Displayed value tolerance %															
	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 30	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
HV 100		3	2	2	2	2	2	2	2	2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.

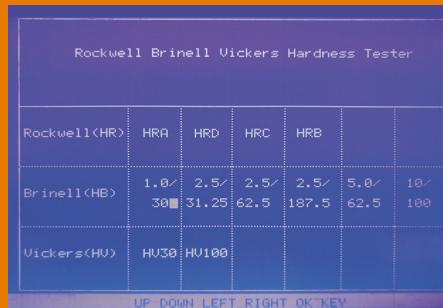
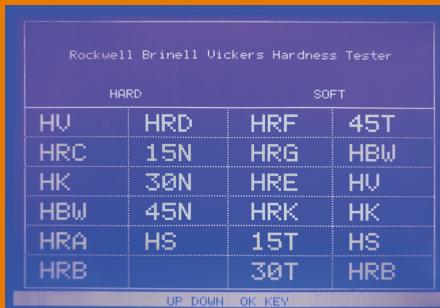
Vickers table 2

Standard hardness range	Displayed value repeatability %
≤225HV	≤3
>225HV	≤2

Model	HTU 200BVR D
Test force control	Weights - Load electronically controlled
Load selection	By right side handle
Pre-Load	10kgf (Rockwell only)
Main loads	Available loads: 30kgf, 31.25kgf, 60kgf, 62.5kgf, 100kgf, 150kgf, 187.5kgf, Rockwell: 60kgf, 100kgf, 150kgf Brinell: 30kgf, 31.25kgf, 62.5kgf, 100kgf, 187.5kgf Vickers: 30kgf, 100kgf
Test force selection	HRA (60kg), HRB (100kg), HRC (150kg), HRD (100kg), HBW1/30 (30kg), HBW2.5/31.25 (31.25kg), HBW2.5/62.5 (62.5kg), HBW2.5/187.5 (187.5kg), HBW5/62.5 (62.5kg), HBW10/100 (100kg), HV30 (30kg), HV100 (100kg)
Dwell time	0~60s
Loading time	2s
Test force tolerance	±1%
Test cycle type	Rockwell: semi-automatic Manual - Pre-load with sound alarm brake Automatic - Load, dwell, unload, show of the hardness value Brinell & Vickers: semi-automatic Manual - Pre-load with sound alarm brake, measure of indentation Automatic - Load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HRA, HRB, HRC, HRD, HBW1/30, HBW2.5/31.25, HBW2.5/62.5, HBW2.5/187.5, HBW5/62.5, HBW10/100, HV30, HV100
Hardness test range	Rockwell: 20~88 HRA, 20~100HRB, 20~70HRC, 40~77HRD Brinell: 3.18~653HBW Vickers: 1~2967HV
Hardness resolution	Rockwell: 0.1HR (Valid for all the available Rockwell scales) Brinell: 0.1HBW Vickers: 0.1HV
Repeatability hef/%	Refer to the scales table
Scale conversion	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW
Turret type	Fixed
Eyepiece microscope	15x
Objectives	2.5x, 5x
Microscope min. measuring unit	0.5µm (2.5x objective) - 0.25µm (5x objective)
Microscope max. measurement length	2mm (2.5x objective) - 1mm (5x objective)
Measurable min. indent/indentation	Brinell: 0.24mm - Vickers: 0.01mm
Optical path	1
Illumination	LED
Indenters	Diamond Rockwell indenter, diamond Vickers indenter, ø 1.588mm Rockwell ball indenter, hard alloy steel ø 2.5mm ball indenter, hard alloy steel ø 5mm ball indenter
N. of indenters	1
Nose cone bore	6.35mm
Vertical test capacity	Rockwell: 175mm, Brinell: 100mm, Vickers: 115mm
Horizontal test capacity	165mm
Anvils dimensions	Large plane test table (size: ø 150mm), middle plane test table (size: ø 74mm), V-shaped test table (size: ø 40mm), sliding test table (size: ø 74mm)
Max. weight on anvil	100kg
Z axis movement	Manual
Z axis movement resolution	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Operation method o input mode	Control panel keyboard
Displayed data	Hardness value(HR-HB-HV), conversion scale, D1, D2, dwell time, date and time, test number, indenter needed, test force
Statistics or functions	Max, min, average value
Data storage	Temporary session memory: Brinell and Vickers: 108 tests Rockwell: 216 tests
Data output	Hyperterminal session format file .HT
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	1xRS232
Safety device	Emergency stop button
Operation temperature	10~30° C
Operation rel. humidity	≤65%
Weight	80kg
Dimensions	520x240x740mm
Power supply	220V, 50Hz
Voltage variance	±10%
Absorbed power (stand-by and working)	500W

HTU 200BVR D





Code	Standard accessories	Q.ty
UHT-DE15X	15x digital measuring eyepiece	1 pc
UHT-MSIOL	Microscope system	1 set
UHT-2.5XOB	2.5x objective	1 pc
UHT-5XOB	5x objective	1 pc
UHT-RI120	Diamond Rockwell indenter	1 pc
UHT-BI15	ø 1.588mm Rockwell ball indenter	1 pc
UHT-BI25	Hard alloy steel ø 2,5mm ball indenter	1 pc
UHT-BI5	Hard alloy steel ø 5mm ball indenter	1 pc
UHT-VI136	Diamond Vickers indenter	1 pc
UHT-STT74	Sliding test table ø 74mm	1 pc
UHT-MPTT74	Middle plane test table ø 74mm	1 pc
UHT-LTT150	Large plane test table ø 150mm	1 pc
UHT-VTT40	V-shaped test table ø 40mm	1 pc
HB-RC2030	Hardness block 20~30 HRC	1 pc
HB-RC6070	Hardness block 60~70 HRC	1 pc
HB-RB80100	Hardness block 80~100 HRB	1 pc
HB-150250HBW2.5187.5	Hardness block 150~250 HBW 2.5/187.5	1 pc
HB-700800HV30	Hardness block 700~800 HV30	1 pc
UHT-4RS	Horizontal regulating screw	4 pcs
UHT-LV	Level	1 pc
UHT-PC	Power cable	1 pc
UHT-SK	Service keys	1 set
UHT-5WS	Weights	5 pcs
UHT-ADC	Anti-dust cover	1 pc

Optional accessories	
UHT-BI1	Hard alloy steel ø1mm ball indenter
UHT-WB	Work bench
MVT-APP	Additional printer paper roll
Hardness blocks	
HB-RA45-75	45-75 HRA
HB-RA80-84	80-84 HRA
HB-RB60-70	60-70 HRB
HB-RB80-100	80-100 HRB
HB-RC20-30	20-30 HRC
HB-RC35-55	35-55 HRC
HB-RC60-70	60-70 HRC
HB-RD40-47	40-47 HRD
HB-RD55-63	55-63 HRD
HB-RD70-75	70-75 HRD
HB-BW2.5/187.5	180-650 HBW 2.5/187.5
HB-BW2.5/62.5	90-450 HBW 2.5/62.5
HB-BW1/30	150-250 HBW 1/30
HB-V100/175-750	175-750 HV100
HB-V30/175-750	175-750 HV30



HTU 200BVR DL

Digital Brinell, Rockwell & Vickers Hardness Tester

- > Digital Brinell, Rockwell & Vickers hardness tester equipped with large displaying screen. Three test modes and 7 level of test forces, test force loading, dwell, unload adopts automatic shifting. Present scale, test force, test indenter, dwell time and hardness conversion displayed. With RS232 interface for computer connection. Increased test space for large samples.



Application

- > Suitable for hardened and surface hardened steel, hard alloy steel, casting parts, non-ferrous metals, various kinds of hardening and tempering steel and tempered steel, carburized steel sheet, soft metals, surface heat treating and chemical treating materials etc.

Reference Standard

- > ISO 6508, ASTM E-18, JIS Z2245
- > ISO 6506, ASTM E10-12, JIS Z2243
- > ISO 6507, ASTM E92, JIS Z2244

Rockwell table

Hardness Scale	Hardness ranges of standard Block	Allowed Tolerance of Displaying value	Allowed Repeatability of Displaying value (H: average hardness value, b: select a larger value)
HRA	20~≤75 HRA	±2 HRA	≤0.02 (100-H) or 0.8 Rockwell unit ^b
	>75~≤88 HRA	±1.5 HRA	
HRB	20~≤45 HRB	±4 HRB	≤0.04 (130-H) or 1.2 Rockwell unit ^b
	>45~≤80 HRB	±3 HRB	
	>80~≤100 HRB	±2 HRB	
HRC	20~≤70 HRC	±1.5 HRC	≤0.02 (100-H) or 0.8 Rockwell unit ^b
HRD	40~≤70 HRD	±2 HRD	≤0.02 (100-H) or 0.8 Rockwell unit ^b
	>70~≤77 HRD	±1.5 HRD	

Brinell table

Hardness ranges of standard Block	Allowed Tolerance of Displaying value%	Allowed Repeatability of Displaying value%
≤125	±3	3
125<HBW≤225	±2.5	2,5
>225	±2	2

Vickers table 1

Hardness	Displayed value tolerance %															
	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 30	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
HV 100		3	2	2	2	2	2	2	2	2	2	2	2	2	2	2

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

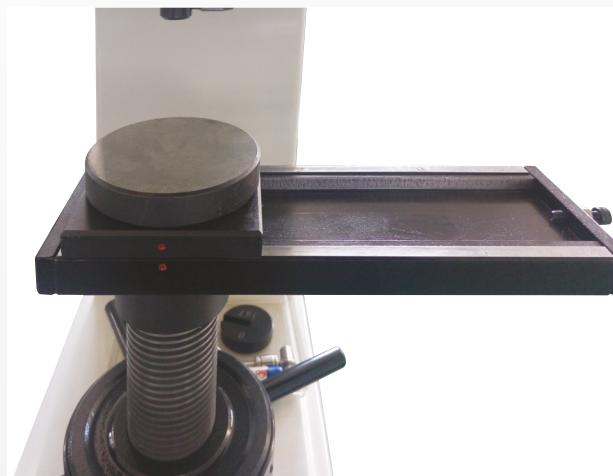
3) About the Micro hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.

Vickers table 2

Standard hardness range	Displayed value repeatability %
≤225HV	≤3
>225HV	≤2

Model	HTU 200BVR DL
Test force control	Weights - Load electronically controlled
Load selection	By right side handle
Pre-Load	10kgf (Rockwell only)
Main loads	Available loads: 30kgf, 31.25kgf, 60kgf, 62.5kgf, 100kgf, 150kgf, 187.5kgf, Rockwell: 60kgf, 100kgf, 150kgf Brinell: 30kgf, 31.25kgf, 62.5kgf, 100kgf, 187.5kgf Vickers: 30kgf, 100kgf
Test force selection	HRA (60kg), HRB (100kg), HRC (150kg), HRD (100kg), HBW1/30 (30kg), HBW2.5/31.25 (31.25kg), HBW2.5/62.5 (62.5kg), HBW2.5/187.5 (187.5kg), HBW5/62.5 (62.5kg), HBW10/100 (100kg), HV30 (30kg), HV100 (100kg)
Dwell time	0~60s
Loading time	2s
Test force tolerance	±1%
Test cycle type	Rockwell: semi-automatic Manual - Pre-load with sound alarm brake Automatic - Load, dwell, unload, show of the hardness value Brinell & Vickers: semi-automatic Manual - Pre-load with sound alarm brake, measure of indentation Automatic - Load, dwell, unload, show of the hardness value (after measure step)
Hardness scales	HRA, HRB, HRC, HRD, HBW1/30, HBW2.5/31.25, HBW2.5/62.5, HBW2.5/187.5, HBW5/62.5, HBW10/100, HV30, HV100
Hardness test range	Rockwell: 20~88 HRA, 20~100HRB, 20~70HRC, 40~77HRD Brinell: 3.18~653HBW Vickers: 1~2967HV
Hardness resolution	Rockwell: 0.1HR (Valid for all the available Rockwell scales) Brinell: 0.1HBW Vickers: 0.1HV
Repeatability hef/%	Refer to the scales table
Scale conversions	HV, HK, HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRK, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HS, HBW
Turret type	Fixed
Eyepiece microscope	15x
Objectives	2.5x, 5x
Microscope min. measuring unit	0.5µm (2.5x objective) - 0.25µm (5x objective)
Microscope max. measurement length	2mm (2.5x objective) - 1mm (5x objective)
Measurable min. indent/indentation	Brinell: 0.24mm - Vickers: 0.01mm
Optical path	1
Illumination	LED
Indenters	Diamond Rockwell indenter, ø 1.588mm Rockwell ball indenter, hard alloy steel ø 2.5mm ball indenter, hard alloy steel ø 5mm ball indenter, diamond Vickers indenter
N. of indenters	1
Nose cone bore	6.35mm
Vertical test capacity	Rockwell: 400mm, Brinell: 330mm, Vickers: 345mm
Horizontal test capacity	165mm
Anvils dimensions	Large plane test table (size: ø 150mm), middle plane test table (size: ø 74mm), V-shaped test table (size: ø 40mm), sliding test table (size: ø 74mm)
Max. weight on anvil	100kg
Z axis movement	Manual
Z axis movement resolution	Manual
Z axis speed	Manual
Display type	LCD
Display dimensions	4.3"
Input mode	Control panel keyboard
Displayed data	Hardness value, conversion scale, D1, D2, dwell time, date and time, Test number, indenter needed, Test force
Statistics or functions	Max, min, average value
Data storage	Temporary session memory: Brinell and Vickers: 108 tests Rockwell: 216 tests
Data output	Hyperterminal session format file .HT
Energy saving mode	Yes
Printer	Built-in printer
Interfaces	RS232
Safety device	Emergency stop button
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	100kg
Dimensions	500x225x880mm
Power supply	220V, 50Hz
Voltage variance	±10%
Absorbed power	500W

HTU 200BVR DL





Code	Standard accessories	Q.ty
UHT-DE15X	15x digital measuring eyepiece	1 pc
UHT-MSIOL	Microscope system	1 set
UHT-2.5XOB	2.5x objective	1 pc
UHT-5XOB	5x objective	1 pc
UHT-RI120	Diamond Rockwell indenter	1 pc
UHT-BI15	ø 1.588mm Rockwell ball indenter	1 pc
UHT-BI25	Hard alloy steel ø 2,5mm ball indenter	1 pc
UHT-BI5	Hard alloy steel ø 5mm ball indenter	1 pc
UHT-VI136	Diamond Vickers indenter	1 pc
UHT-STT74	Sliding test table ø 74mm	1 pc
UHT-MPTT74	Middle plane test table ø 74mm	1 pc
UHT-LTT150	Large plane test table ø 150mm	1 pc
UHT-VTT40	V-shaped test table ø 40mm	1 pc
HB-RC2030	Hardness block 20~30 HRC	1 pc
HB-RC6070	Hardness block 60~70 HRC	1 pc
HB-RB80100	Hardness block 80~100 HRB	1 pc
HB-150250HBW2.5/187.5	Hardness block 150~250 HBW 2.5/187.5	1 pc
HB-700800HV30	Hardness block 700~800 HV30	1 pc
UHT-4RS	Horizontal regulating screw	4 pcs
UHT-LV	Level	1 pc
UHT-PC	Power cable	1 pc
UHT-SK	Service keys	1 set
UHT-5WS	Weights	5 pcs
UHT-ADC	Anti-dust cover	1 pc

Optional accessories	
UHT-BI1	Hard alloy steel ø1mm ball indenter
UHT-WB	Work bench
MVT-APP	Additional printer paper roll
Hardness blocks	
Model	Range
HB-RA45-75	45-75 HRA
HB-RA80-84	80-84 HRA
HB-RB60-70	60-70 HRB
HB-RB80-100	80-100 HRB
HB-RC20-30	20-30 HRC
HB-RC35-55	35-55 HRC
HB-RC60-70	60-70 HRC
HB-RD40-47	40-47 HRD
HB-RD55-63	55-63 HRD
HB-RD70-75	70-75 HRD
HB-BW2.5/187.5	180-650 HBW 2.5/187.5
HB-BW2.5/62.5	90-450 HBW 2.5/62.5
HB-BW1/30	150-250 HBW 1/30
HB-V100/175-750	175-750 HV100
HB-V30/175-750	175-750 HV30



Rockwell Brinell Vickers Hardness Tester			
HARD		SOFT	
HV	HRD	HRF	45T
HRC	15N	HRG	HBW
HK	30N	HRE	HV
HBW	45N	HRK	HK
HRA	HS	15T	HS
HRB	30T	HRB	

HTU 200BVR

Motorized Brinell Rockwell & Vickers Hardness Tester

- > Brinell Rockwell & Vickers hardness tester multi-functional three test modes and 7 level of test forces. Test force loading, dwell, unload adopts automatic system, widely and easy to be used.



Application

- > Suitable for hardened and surface hardened steel, hard alloy steel, casting parts, non-ferrous metals, various kinds of hardening and tempering steel and tempered steel, carburized steel sheet, soft metals, surface heat treating and chemical treating materials etc.

Reference Standar

- > ISO 6508, ASTM E-18, JIS Z2245
- > ISO 6506, ASTM E10-12, JIS Z2243
- > ISO 6507, ASTM E92, JIS Z2244

Rockwell table

Hardness Scale	Hardness ranges of standard Block	Allowed Tolerance of Displaying value	Allowed Repeatability of Displaying value (H: average hardness value, b: select a larger value)
HRA	20~≤75 HRA	±2 HRA	≤0.02 (100-H) or 0.8 Rockwell unit ^b
	>75~≤88 HRA	±1.5 HRA	
HRB	20~≤45 HRB	±4 HRB	≤0.04 (130-H) or 1.2 Rockwell unit ^b
	>45~≤80 HRB	±3 HRB	
	>80~≤100 HRB	±2 HRB	
HRC	20~≤70 HRC	±1.5 HRC	≤0.02 (100-H) or 0.8 Rockwell unit ^b
HRD	40~≤70 HRD	±2 HRD	≤0.02 (100-H) or 0.8 Rockwell unit ^b
	>70~≤77 HRD	±1.5 HRD	

Brinell table

Hardness ranges of standard Block	Allowed Tolerance of Displaying value%	Allowed Repeatability of Displaying value%
≤125	±3	3
125<HBW≤225	±2.5	2.5
>225	±2	2

Vickers table 1

Hardness	Displayed value tolerance %															
	Hardness HV															
	50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1500
HV 30	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
HV 100			3	2	2											

1) When the indentation diagonal length is less than 0.020 mm, the table does not display the value.

2) For intermediate values, the maximum allowable error can be obtained by interpolation.

3) About the Micro hardness Tester value in the table is 0.001mm or indentation diagonal length of the average of 2% of the maximum permissible error given, please select the bigger.



Vickers table 2

Standard hardness range	Displayed value repeatability %
HV5~HV100	≤3
>225HV	≤2

Model	HTU 200BVR
Test force control	Weights - Load electronically controlled
Load selection	By right side handle
Pre-Load	10kgf (Rockwell only)
Main-Load	Available loads: 30kgf, 31.25kgf, 60kgf, 62.5kgf, 100kgf, 150kgf, 187.5kgf Rockwell: 60kgf, 100kgf, 150kgf Brinell: 30kgf, 31.25kgf, 62.5kgf, 100kgf, 187.5kgf Vickers: 30kgf, 100kgf
Dwell time	2~60s
Loading time	2s
Test force tollerance	±1%
Test cycle type	Rockwell: semi-automatic Manual - Pre-load with physical brake Automatic - Load, dwell, unload, show of the hardness value Brinell and Vickers: semi-automatic Manual - Pre-load with physical brake, measure of indentation, check the hardness value from the hardness table Automatic - Load, dwell, unload
Hardness scales	HRA, HRB, HRC, HRD, HBW1/30, HBW2.5/31.25, HBW2.5/62.5, HBW2.5/187.5, HBW5/62.5, HBW10/100, HV30, HV100
Hardness test range	Rockwell: 20~88 HRA, 20~100HRB, 20~70HRC, 40~77HRD Brinell: 3.18~653HBW Vickers: 1~2967HV
Hardness resolution	Rockwell = 0.5HR Brinell = hardness table Vickers = hardness table
Repeatability hef/%	Refer to the scales table
Conversion scales	With table, according to ASTM E140
Turret type	Fixed
Microscope eyepiece	15x
Objectives	2.5x, 5x
Microscope min. measuring unit	4µm (2.5x objective) 2µm (5x objective)
Microscope max. measurement length	2mm (2.5x objective) 1mm (5x objective)
Measurable min. indent/indentation	Brinell: 0.24mm Vickers: 0.01mm
Optical path	1
Illumination	LED
Indenters	Diamond Rockwell indenter, diamond Vickers indenter, ø1.588mm Rockwell ball indenter, hard alloy steel ø 2,5mm ball indenter, hard alloy steel ø 5mm ball indenter
N. of indenters	1
Nose cone bore	6.35mm
Vertical test capacity	Rockwell: 175mm, Brinell: 100mm, Vickers: 115mm
Horizontal test capacity	165mm
Anvils dimensions	Large plane test table (size: ø150mm), middle plane test table (size: ø74mm), V-shaped test table (size: ø40mm), sliding test table (size: ø74mm)
Max. weight on anvil	100kg
Z axis movement	Manual
Z axis movement resolution	Manual
Z axis speed	Manual
Display type	Dial
Display dimensions	110mm
Input mode	Control panel keyboard
Displayed data	HR value
Safety devices	Emergency stop button
Operation temperature	10~30°C
Operation rel. humidity	≤65%
Weight	80kg
Dimensions	520×240×700mm
Power supply	220V, 50Hz
Voltage variance	±10%
Absorbed power	500W

HTU 200BVR





Code	Standard accessories	Q.ty
UHT-DE15X	15x digital measuring eyepiece	1 pc
UHT-MSIOL	Microscope system	1 set
UHT-2.5XOB	2.5x objective	1 pc
UHT-5XOB	5x objective	1 pc
UHT-RI120	Diamond Rockwell indenter	1 pc
UHT-BI15	ø 1.588mm Rockwell ball indenter	1 pc
UHT-BI25	Hard alloy steel ø 2,5mm ball indenter	1 pc
UHT-BI5	Hard alloy steel ø 5mm ball indenter	1 pc
UHT-VI136	Diamond Vickers indenter	1 pc
UHT-STT74	Sliding test table ø 74mm	1pc
UHT-MPTT74	Middle plane test table ø 74mm	1 pc
UHT-LTT150	Large plane test table ø 150mm	1 pc
UHT-VTT40	V-shaped test table ø 40mm	1 pc
HB-RC2030	Hardness block 20~30 HRC	1pc
HB-RC6070	Hardness block 60~70 HRC	1 pc
HB-RB80100	Hardness block 80~100 HRB	1 pc
HB-150250HBW2.5187.5	Hardness block 150~250 HBW 2.5/187.5	1 pc
HB-700800HV30	Hardness block 700~800 HV30	1 pc
UHT-4RS	Horizontal Regulating Screw	4 pcs
UHT-LV	Level	1 pc
UHT-PC	Power cable	1 pc
UHT-SK	Service keys	1 set
UHT-5WS	Weights	5 pcs
UHT-ADC	Anti-Dust cover	1 pc

Optional accessories	
UHT-BI1	Hard alloy steel ø1mm ball indenter
UHT-WB	Work bench
MVT-APP	Additional printer paper roll
Hardness blocks	
HB-RA45-75	45-75 HRA
HB-RA80-84	80-84 HRA
HB-RB60-70	60-70 HRB
HB-RB80-100	80-100 HRB
HB-RC20-30	20-30 HRC
HB-RC35-55	35-55 HRC
HB-RC60-70	60-70 HRC
HB-RD40-47	40-47 HRD
HB-RD55-63	55-63 HRD
HB-RD70-75	70-75 HRD
HB-BW2.5/187.5	180-650 HBW 2.5/187.5
HB-BW2.5/62.5	90-450 HBW 2.5/62.5
HB-BW1/30	150-250 HBW 1/30
HB-V100/175-750	175-750 HV100
HB-V30/175-750	175-750 HV30



UNIVERSAL ACCESSORIES

Indenters

Code	Description	
UHT-RI120	Diamond Rockwell indenter	
UHT-BI15	Ø 1.588mm Rockwell ball indenter	
UHT-BI25	Hard alloy steel Ø 2,5mm ball indenter	
UHT-BI5	Hard alloy steel Ø 5mm ball indenter	
UHT-VI136	Diamond Vickers indenter	

Additional options

Code	Description	
UHT-WB	Work bench	
MVT-APP	Additional printer paper roll	

Test tables

Code	Description	
UHT-STT74	Sliding test table ø 74mm	
UHT-MPTT74	Middle plane test table ø 74mm	
UHT-LTT150	Large plane test table ø 150mm	
UHT-VTT40	V-shaped test table ø 40mm	

Hardness blocks

Code		Description
HB-RA45-75	HRA	45-75
HB-RA80-84	HRA	80-84
HB-RB60-70	HRB(w)	60-70
HB-RB80-100	HRB(w)	80-100
HB-RC20-30	HRC	20-30
HB-RC35-55	HRC	35-55
HB-RC60-70	HRC	60-70
HB-RD40-47	HRD	40-47
HB-RD55-63	HRD	55-63
HB-RD70-75	HRD	70-75
HB-BW2.5/187.5	HBW 2.5/187.5	180-650
HB-BW2.5/62.5	HBW 2.5/62.5	90-450
HB-BW1/30	HBW 1/30	150-250
HB-V100/175-750	HV100	175-750
HB-V30/175-750	HV30	175-750

Hardness Testers

PORTABLE



PHL 960

- For measuring hardness values of various materials. LCD display with indication of values and battery status. Hardness conversion in HV, HB, HRC, HRB, HRA, HS scales.
- Equipped with USB interface. Suitable for hardness measurements on cast iron and steel rollers.

Standard Equipment

- Rebound probe (D type), calibration wedge, probe cable, software, carrying case and user manual.

	PHL 960
Testable materials	Steel, tool steel, stainless steel, cast iron, nodular cast iron, aluminium, brass, bronze
Measuring range	HLD(170-960), (19-651)HB, (13-100)HRB, (17-68.5)HRC, (59-85)HRA, (80-976)HV, (30-110)HS
Measurement scales	HL, HB, HRB, HRC, HRA, HV, HS
Impact direction	360°
Display	128x64 LCD digital display
Memory	Max. 600 groups (32 for each group)
Interface	USB 2.0
Electrical supply	2 x 1.5V AA Battery
Dimensions	130x85x35 mm
Weight	600 g

PHL 960P

- For measuring hardness values of various materials. LCD display with indication of values and battery status. Equipped with USB interface and integrated printed.

Standard Equipment

- Rebound probe (D type), calibration wedge, probe cable, software, carrying case and user manual.

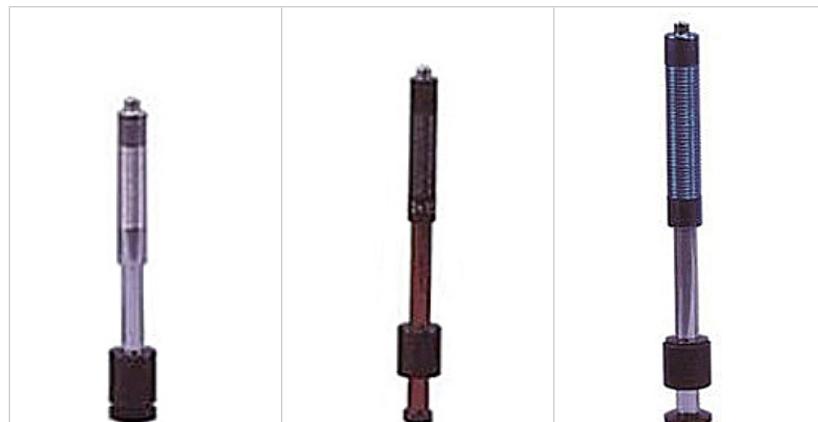
	PHL 960P
Testable materials	Steel, tool steel, stainless steel, cast iron, nodular cast iron, aluminium, brass, bronze
Measuring range	HLD (170-960), HRC (17.9-69.5), HB (19-683), HV (80-1042), HS (30.6-102.6), HRA (59.1-88), HRB (13.5-101.7)
Measurement scales	HL, HB, HRB, HRC, HRA, HV, HS
Impact direction	360°
Display	320x240 TFT digital display
Memory	Max. 500 groups (32 for each group)
Print roll dimensions	Width (57.5±0.5)mm, diameter 30mm
Battery autonomy	150 hours (print and backlight off)
Interface	USB 2.0
Electrical supply	1 x 7,5V rechargeable
Dimensions	210x85x45
Weight	600g

Rebound probes



Model	RP 86D	PP 147DC	RP 75DL
Type	D	DC	DL
Impact energy	mJ 11	11	11
Impact body mass	g 5.5	5.5	7.2
Impact body hardness	HV 1600	1600	1600
Impact body diameter	mm 3	3	3
Impact body material	Tungsten carbide	Tungsten carbide	Tungsten carbide
Probe diameter	mm 20	20	20
Probe length	mm 86	147	75
Probe weight	g 50	50	50
Max. block hardness	HV 940	940	940
Block surface roughness	µm 1.6	1.6	1.6
Minimum block weight	kg >5	>5	>5
Minimum block weight on solid body	kg 2 ÷ 5	2 ÷ 5	2 ÷ 5
Minimum coupled block weight on plate	kg 0.05 ÷ 2	0.05 ÷ 2	0.05 ÷ 2
Minimum coupled block thickness	mm 5	5	5
Block surface layer thickness	mm ≥0.8	≥0.8	≥0.8
Indenting dimensions with 300HV	Ø mm 0.54	0.54	0.54
Indenting dimensions with 300HV - Depth	µm 24	24	24
Indenting dimensions with 600HV	Ø mm 0.54	0.54	0.54
Indenting dimensions with 600HV - Depth	µm 17	17	17
Indenting dimensions with 800HV	Ø mm 0.35	0.35	0.35
Indenting dimensions with 800HV - Depth	µm 10	10	10
Application	Used for routine measurements	Used for holes and cylinder interior	Used for long and narrow holes

Rebound probes



Model	RP 141C	RP 162D	RP 254G	
Type	C	D+15	G	
Impact energy	mJ	2.7	11	90
Impact body mass	g	3	7.8	20
Impact body hardness	HV	1600	1600	1600
Impact body diameter	mm	3	3	5
Impact body material		Tungsten carbide	Tungsten carbide	Tungsten carbide
Probe diameter	mm	20	20	30
Probe length	mm	141	162	254
Probe weight	g	75	80	250
Max. block hardness	HV	1000	940	650
Block surface roughness	µm	0.4	1.6	6.3
Minimum block weight	kg	>1.5	>5	>15
Minimum block weight on solid body	kg	0.5 ÷ 1.5	2 ÷ 5	5 ÷ 15
Minimum coupled block weight on plate	kg	0.02 ÷ 0.5	0.05 ÷ 2	0.5 ÷ 5
Minimum coupled block thickness	mm	1	5	10
Block surface layer thickness	mm	≥0.2	≥0.8	≥1.2
Indenting dimensions with 300HV	Ø mm	0.38	0.54	1.03
Indenting dimensions with 300HV - Depth	µm	12	24	53
Indenting dimensions with 600HV	Ø mm	0.32	0.54	0.9
Indenting dimensions with 600HV - Depth	µm	8	17	41
Indenting dimensions with 800HV	Ø mm	0.35	0.35	-
Indenting dimensions with 800HV - Depth	µm	7	10	-
Application		Used for thin or hard surfaces	Used for measuring hollow surfaces	Used for heavy or rough and forged materials

PHL RBC

Cable for portable hardness tester probes



PHL-SP

Supports for portable Hardness Testers



Quantity	Type	Description
1		For measurements on cylindrical surfaces - external R 10 ÷ R15
1		For measurements on cylindrical surfaces - external R 14.5 ÷ R30
1		For measurements on cylindrical surfaces - external R 25 ÷ R50
1		For measurements on cylindrical surfaces - internal R 11 ÷ R13
1		For measurements on cylindrical surfaces - internal R 12.5 ÷ R17
1		For measurements on cylindrical surfaces - internal R 16.5 ÷ R30
1		For measurements on spherical surfaces - external SR 10 ÷ SR15
1		For measurements on spherical surfaces - external SR 14.5 ÷ SR30
1		For measurements on spherical surfaces - internal SR 11 ÷ SR13
1		For measurements on spherical surfaces - internal SR 12.5 ÷ SR17
1		For measurements on spherical surfaces - internal SR 16.5 ÷ SR30
1		For measurements on cylindrical surfaces - external R variable from min. R10

DSH100 series

Digital Shore Hardness Tester



Application

- Soft rubber, elastomers, natural rubber, neoprene, resin, polyester, soft PVC, leather, etc.

Reference Standard

- ISO 7619, ASTM D2240, JIS K7215

Model	DSH100A
Range	0-100HA
Indenter	0.79mm Truncated (Frustum) Cone
Hardness deviation	<1%HA
Display type	4 digit LCD
Display resolution	0.1
Input mode	By buttons
Displayed data	Hardness result, average value, max value, low battery indicator
Data storage	Internal storage
Energy saving mode	Yes
Interfaces	RS232, Bluetooth (optional)
Operation temperature	0~40°C
Weight	175g
Dimensions	65x38x162mm
Power supply	4x1.5V AAA batteries

Standard accessories

Standard accessories	Quantity
Carrying case	1 pc

Optional accessories

Code	Accessories
SHS-D	Test stand
USB-D	RS232 to USB cable and software
BTH-D10	Bluetooth 10m and software
BTH-D100	Bluetooth 100m and software
HB-SH-A	Hardness block set HA

Application

- Middle-hard rubber, rubber rollers, etc.

Reference Standard

- ISO 7619, ASTM D2240, JIS K7215

Application

- Plastics and middle-hard rubber

Reference Standard

- ISO 7619, ASTM D2240, JIS K7215

Model	DSH100B
Range	0-100HB
Indenter	R 0.1 Cone
Hardness deviation	<1%HB
Display type	4 digit LCD
Display resolution	0.1
Input mode	By buttons
Displayed data	Hardness result, average value, max value, low battery indicator
Data storage	Internal storage
Energy saving mode	Yes
Interfaces	RS232, Bluetooth (optional)
Operation temperature	0~40°C
Weight	175g
Dimensions	65x38x162mm
Power supply	4x1.5V AAA batteries

Model	DSH100C
Range	0-100HC
Indenter	0.79mm Truncated (Frustum) Cone
Hardness deviation	<1%HC
Display type	4 digit LCD
Display resolution	0.1
Input mode	By buttons
Displayed data	Hardness result, average value, max value, low battery indicator
Data storage	Internal storage
Energy saving mode	Yes
Interfaces	RS232, Bluetooth (optional)
Operation temperature	0~40°C
Weight	175g
Dimensions	65x38x162mm
Power supply	4x1.5V AAA batteries

Optional accessories

Code	Accessories
SHS-D	Test stand
USB-D	RS232 to USB cable and software
BTH-D10	Bluetooth 10m and software
BTH-D100	Bluetooth 100m and software

Optional accessories

Code	Accessories
SHS-D-1	Test stand
USB-D	RS232 to USB cable and software
BTH-D10	Bluetooth 10m and software
BTH-D100	Bluetooth 100m and software

Application

> Soft elastic materials, rubber rollers, textile fabrics, nylon, rayon, etc.

Reference Standard

> ISO 7619, ASTM D2240, JIS K7215

Model	DSH100O
Range	0-100HO
Indenter	R 1.2 Spherical Radius
Hardness deviation	<1%HO
Display type	4 digit LCD
Display resolution	0.1
Input mode	By buttons
Displayed data	Hardness result, average value, max value, low battery indicator
Data storage	Internal storage
Energy saving mode	Yes
Interfaces	RS232, Bluetooth (optional)
Operation temperature	0~40°C
Weight	175g
Dimensions	65x38x162mm
Power supply	4x1.5V AAA batteries

Application

> Middle-hard rubber, rubber rollers, etc.

Reference Standard

> ISO 7619, ASTM D2240, JIS K7215

Model	DSH100D
Range	0-100HD
Indenter	R 0.1 Cone
Hardness deviation	<1%HD
Display type	4 digit LCD
Display resolution	0.1
Input mode	By buttons
Displayed data	Hardness result, average value, max value, low battery indicator
Data storage	Internal storage
Energy saving mode	Yes
Interfaces	RS232, Bluetooth (optional)
Operation temperature	0~40°C
Weight	175g
Dimensions	65x38x162mm
Power supply	4x1.5V AAA batteries

Optional accessories

Code	Accessories
SHS-D	Test stand
USB-D	RS232 to USB cable and software
BTH-D10	Bluetooth 10m and software
BTH-D100	Bluetooth 100m and software

Optional accessories

Code	Accessories
SHS-D-1	Test stand
USB-D	RS232 to USB cable and software
BTH-D10	Bluetooth 10m and software
BTH-D100	Bluetooth 100m and software
HB-SH-D	Hardness block set HD

Application

> Hard Sponge, EVA

Reference Standard

> ISO 7619, ASTM D2240, JIS K7215

Model	DSH100DO
Range	0-100HDO
Indenter	R 1.2 Spherical Radius
Hardness deviation	<1%HDO
Display type	4 digit LCD
Display resolution	0.1
Input mode	By buttons
Displayed data	Hardness result, average value, max value, low battery indicator
Data storage	Internal storage
Energy saving mode	Yes
Interfaces	RS232, Bluetooth (optional)
Operation temperature	0~40°C
Weight	175g
Dimensions	65x38x162mm
Power supply	4x1.5V AAA batteries

Application

> Plastics and middle-hard up to hard rubber materials

Reference Standard

> ISO 7619, ASTM D2240, JIS K7215

Model	DSH100E
Range	0-100HE
Indenter	R 2.5 Spherical Radius
Hardness deviation	<1%HE
Display type	4 digit LCD
Display resolution	0.1
Input mode	By buttons
Displayed data	Hardness result, average value, max value, low battery indicator
Data storage	Internal storage
Energy saving mode	Yes
Interfaces	RS232, Bluetooth (optional)
Operation temperature	0~40°C
Weight	175g
Dimensions	65x38x162mm
Power supply	4x1.5V AAA batteries

Optional accessories

Code	Accessories
SHS-D-1	Test stand
USB-D	RS232 to USB cable and software
BTH-D10	Bluetooth 10m and software
BTH-D100	Bluetooth 100m and software

Optional accessories

Code	Accessories
SHS-D	Test stand
USB-D	RS232 to USB cable and software
BTH-D10	Bluetooth 10m and software
BTH-D100	Bluetooth 100m and software

DSH100OO

Digital Shore OO Hardness Tester



Standard accessories

Code	Standard accessories	Quantity
DSOO-CC	Carrying case	1 pc

Application

- › Sponge and cellular rubber, foam rubber, silicone, gel-like materials
- › Reference Standard
- › ISO 7619, ASTM D2240, JIS K7215

Model	DSH100OO
Range	0-100HOO
Indenter	R 1.2 Spherical Radius
Hardness deviation	<1%HOO
Display type	4 digit LCD
Display resolution	0.1
Input mode	By buttons
Displayed data	Hardness result, average value, max value, low battery indicator
Data storage	Internal storage
Energy saving mode	Yes
Interfaces	RS232, Bluetooth (optional)
Operation temperature	0~40°C
Weight	175g
Dimensions	65x38x162mm
Power supply	4x1.5V AAA batteries

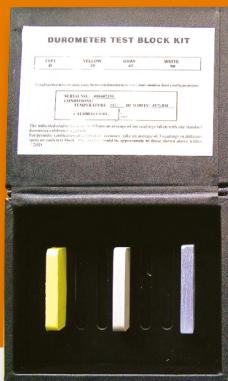
Optional accessories

Code	Accessories
SHS-D-2	Test stand
USB-D	RS232 to USB cable and software
BTH-D10	Bluetooth 10m and software
BTH-D100	Bluetooth 100m and software

Hardness Block set HD



Hardness block set HA



Hardness block set HD

HB-SH-A Hardness block set HA

Scale	Shore A
Ranges	Colour
33	Purple
38	Brown
52	Green
61	Orange
71	Red
82	Yellow
91	Black

Supplied with univocal serial number in storage box

HB-SH-D Hardness block set HD

Scale	Shore D
Ranges	Colour
29	Yellow
47	Gray
90	White

Supplied with univocal serial number in storage box

ASH100 series

Shore Hardness Tester



Application

› Soft rubber, elastomers, natural rubber, neoprene, resin, polyester, soft PVC, leather, etc.

Reference Standard

› ISO 7619, ASTM D2240, JIS K7215

Model	ASH100A
Range	0-100HA
Measurement range	10-90HA
Indenter	SR0.1mm
Stroke	2.5mm
Display type	Dial
Display dimensions	57mm
Display resolution	1
N° of pointers	2, peak hold
Operation temperature	0~40°C
Weight	150g
Dimensions	60x25x115mm

Optional accessories

Code	Accessories
SHS-A-AC	Test stand

Application

› Plastics and middle-hard rubber

Reference Standard

› ISO 7619, ASTM D2240, JIS K7215

Model	ASH100C
Range	0-100HC
Measurement range	10-90HC
Indenter	SR2.5mm
Stroke	2.5mm
Display type	Dial
Display dimensions	57mm
Display resolution	1
N° of pointers	2, peak hold
Operation temperature	0~40°C
Weight	150g
Dimensions	60x25x115mm

Optional accessories

Code	Accessories
SHS-A-AC	Test stand

Application

› Fibre Plastics, hard rubber, hard plastic, plexiglas, thermo plastics, formica, rubber rollers, vinyl-plate, cellulose acetate, etc

Reference Standard

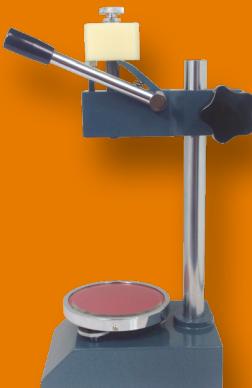
› ISO 7619, ASTM D2240, JIS K7215

Model	ASH100D
Range	0-100HD
Measurement range	10-90HD
Indenter	SR0.1mm
Stroke	2.5mm
Display type	Dial
Display dimensions	57mm
Display resolution	1
N° of pointers	2, peak hold
Operation temperature	0~40°C
Weight	150g
Dimensions	60x25x115mm

Optional accessories

Code	Accessories
SHS-A-D	Test stand

Accessories for digital Shore Testers



SHS-D-2 Test stand



SHS-D Test stand



SHS-D-1 Test stand

Test stands for digital Shore Hardness Testers

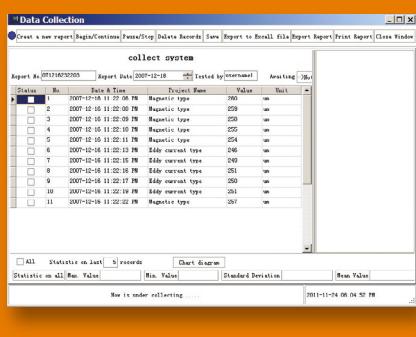
Base	Glass
Load application	Manual
Dimensions	100x212x250mm
Suitable for	SHS-D: DSH100A, DSH100B, DSH100E, DSH1000
	SHS-D-1: DSH100C, DSH100D, DSH100DO
	SHS-D-2: DSH100OO

USB-D RS232 to USB Cable and software

Connection cable for Computer connection, allow data trasfer and storage thanks to the included software



Accessories for analog Shore Testers



Bluetooth and software

BTH-D10 Bluetooth 10m and software

Bluetooth function for 10m range, complete with receiver, allow data trasfer and storage thanks to the included software.

This option must be ordered together with digital hardness tester

BTH-D100 Bluetooth 100m and software

Bluetooth function for 100m range, complete with receiver, allow data trasfer and storage thanks to the included software.

This option must be ordered together with digital hardness tester

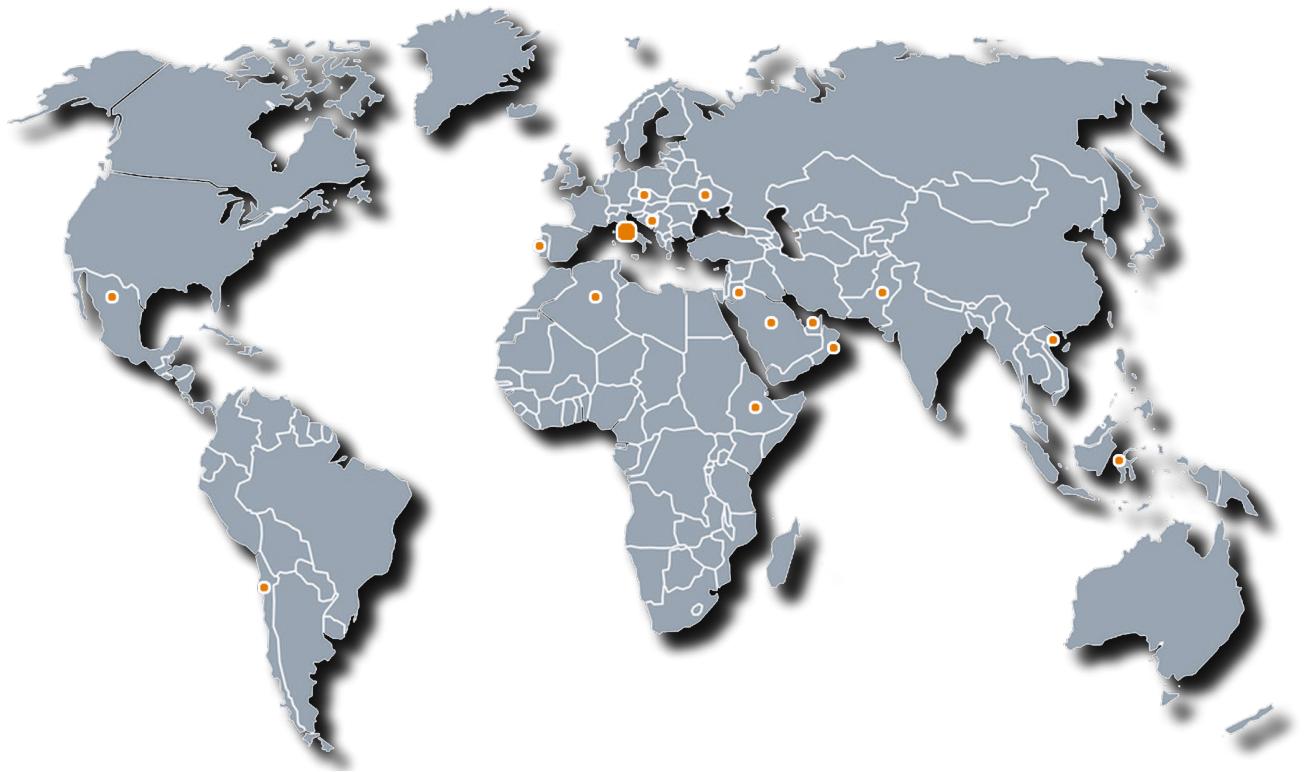
**Accessories for
analog Shore Testers****SHS-A-AC Test stand****SHS-A-AC Test stand for Shore Hardness Tester**

Base	Round
Load application	Manual
Dimensions	100x212x250mm
Suitable for:	Shore A, Shore C Hardness Testers

SHS-A-D Test stand**SHS-A-D Test stand for Shore Hardness Tester**

Base	Round
Load application	Manual
Dimensions	100x212x250mm
Suitable for:	Shore D Hardness Testers

Code	Description	Page
Vickers Hardness Testers		
HTV 10DT / HTV 50DT V3.0	Fully Automatic Vickers Hardness Tester	12
HTV 10D / HTV 50D V2.0	Automatic Vickers Hardness Tester	14
HTV 10DT / HTV 50DT	Semi-Automatic Digital Vickers Hardness Tester	18
HTV 50D	Digital Vickers Hardness Tester	20
HTV 10D	Digital Vickers Hardness Tester	22
HTV 50Z	Digital Vickers Hardness Tester	24
HTV 10Z	Digital Vickers Hardness Tester	26
Micro Vickers Hardness Testers		
HTMV 1000MDT V3.0	Fully Automatic Micro-Vickers Hardness Tester	34
HTMV 1000MD V2.0	Automatic Micro-Vickers Hardness Tester	38
HTMV 1000MDT	Digital Micro-Vickers Hardness Tester	42
HTMV 1000K	Digital Micro-Vickers & Knoop Hardness Tester	44
HTMV 2000M	Digital Micro-Vickers Hardness Tester	46
HTMV 1000MD	Digital Micro-Vickers Hardness Tester	48
HTMV I1000M	Digital Micro-Vickers Hardness Tester	50
Brinell Hardness Testers		
HTB 3000A	Fully Automatic Digital Brinell Hardness Tester	60
HTB 3000Z	Automatic Digital Brinell Hardness Tester	62
HTB 3000D	Digital Brinell Hardness Tester	64
HTB 625Z	Low Load Digital Brinell Hardness Tester	66
Rockwell Hardness Testers		
HTRS 150A V3.0	Fully Automatic Rockwell and Superficial Rockwell Hardness Tester	78
HTRS 150A	Automatic Rockwell and Superficial Rockwell Hardness Tester	82
HTRS 150	Digital Rockwell and Superficial Rockwell Hardness Tester	84
HTR 150D	Digital Rockwell Hardness Tester	86
HTR 150DL	Digital Vickers Hardness Tester	88
HTR 150M	Motorized Rockwell Hardness Tester	90
HTR 45D	Digital Superficial Rockwell Hardness Tester	92
HTR 45M	Motorized Superficial Rockwell Hardness Tester	94
HTRP 150D	Digital Plastics Rockwell Hardness Tester	96
HTRP 150M	Plastics Rockwell Hardness Tester	98
Universal Hardness Testers		
HTU 200BVR D	Digital Brinell, Rockwell & Vickers Hardness Tester	106
HTU 200BVR DL	Digital Brinell, Rockwell & Vickers Hardness Tester	110
HTU 200BVR	Motorized Brinell, Rockwell & Vickers Hardness Tester	114
Portable Hardness Testers		
PHL 960	Portable Hardness Tester	122
PHL 960P	Portable Hardness Tester	122
DSH100A	Digital Shore A Hardness Tester	126
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ASH100D	Shore D Hardness Tester	129



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