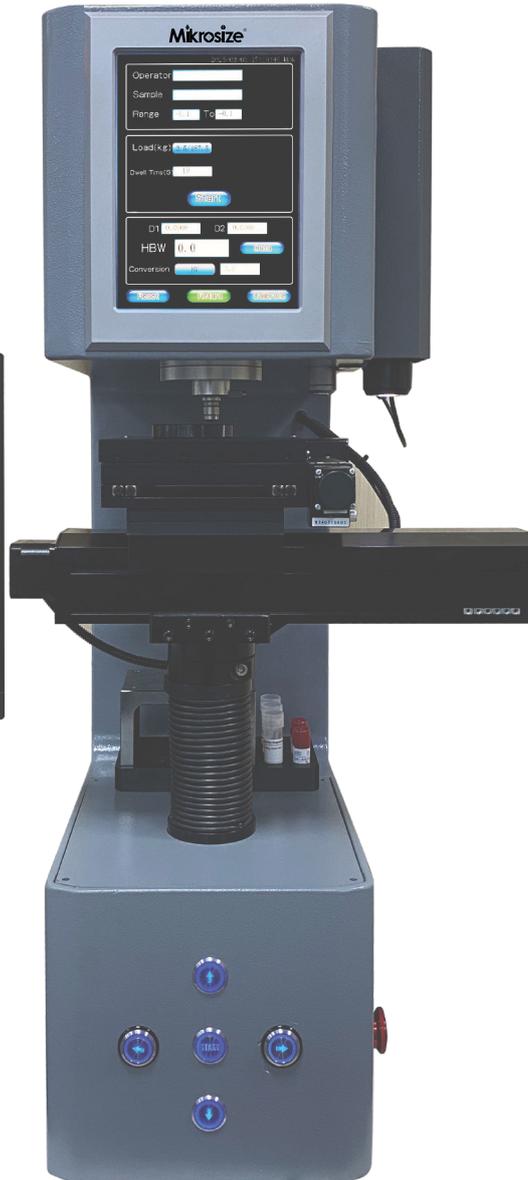
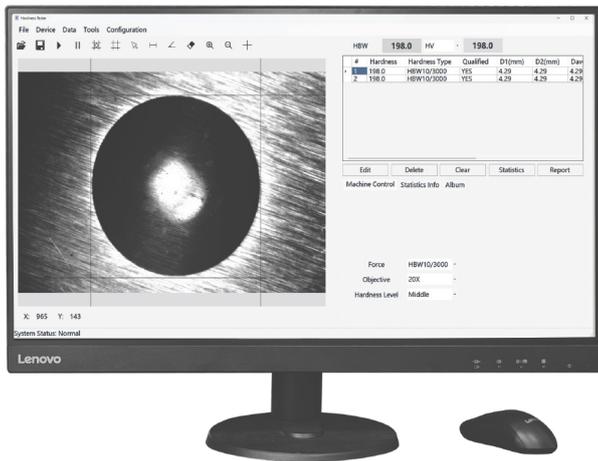


MIDLAND METROLOGY LTD

# MBRV-250A

## Intelligent Automatic Universal Hardness Tester



# Product Features and Application

## Product Features

- ~Three testing methods: Brinell, Vickers, and Rockwell.
- ~Brinell test force range: 5 kgf - 250 kgf.
- ~Vickers test force range: 3 kgf - 120 kgf.
- ~Automatically applies initial test force and main test force.
- ~8- inch touch screen for convenient operation.
- ~The test stage can be automatically lifted and also be manually fine-tuned. It is equipped with an anti - collision detection device and a Z - axis retraction system.
- ~Closed loop system with loading cell, equipped with a fully automatic high - precision sensor and a closed-loop feedback control system.
- ~An ultra - high - precision X/Y auto stage with a repeat positioning accuracy of 3 microns and a maximum travel of up to 200 mm (optional).
- ~Objective magnification: 2.5X, 5X (10X, 20X optional).
- ~Indenter specifications:
  - 120° Rockwell diamond indenter.
  - Φ1.5875 mm Rockwell ball indenter (Φ3.175 mm, Φ6.35 mm, Φ 12.7 mm are optional).
  - 136° Vickers diamond indenter.
  - Φ2.5 mm, Φ5 mm Brinell ball indenter (Φ1 mm, Φ10 mm are optional).
- ~Brinell and Vickers tests can be automatically positioned to the measurement and observation positions.
- ~5 - megapixel industrial camera.
- ~Supports hardness value conversion between multiple scales.
- ~Hardness measurement software supports automatic/manual measurement export, printing, and data statistics.
- ~Automatically calculates the uncertainty of the hardness value (optional).
- ~Automatically generates documents required for CNAS review (optional).
- ~Executive standards: GB/T230, GB/T231, GB/T4340, JJG144, GB/T18449, ISO 6508, ASTM E 10, ASTM E92, ASTM E18, ASTM E384, ASTM E103.

## Product Application

### ●Materials research:

It is used to evaluate the hardness characteristics of materials and provide data support for material selection, design, and development.

### ●Production quality control:

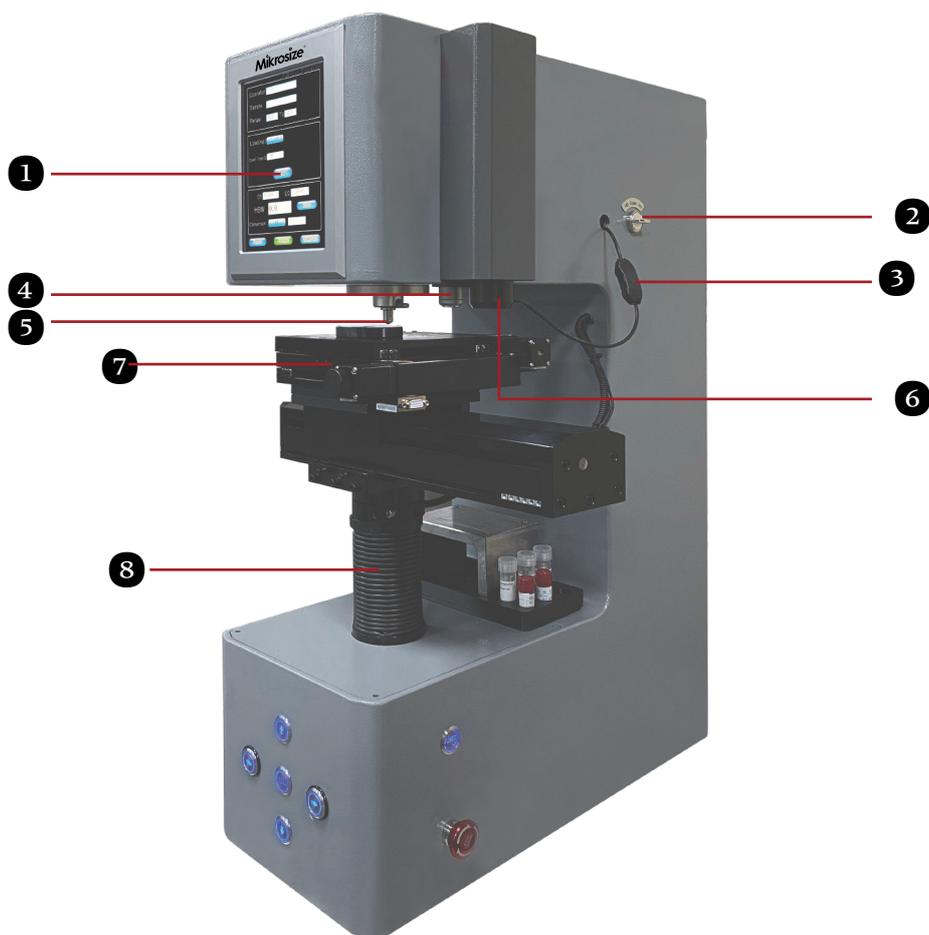
During the manufacturing process, it is used to detect whether the hardness of products meets the standards to ensure product quality.

### ●Failure analysis:

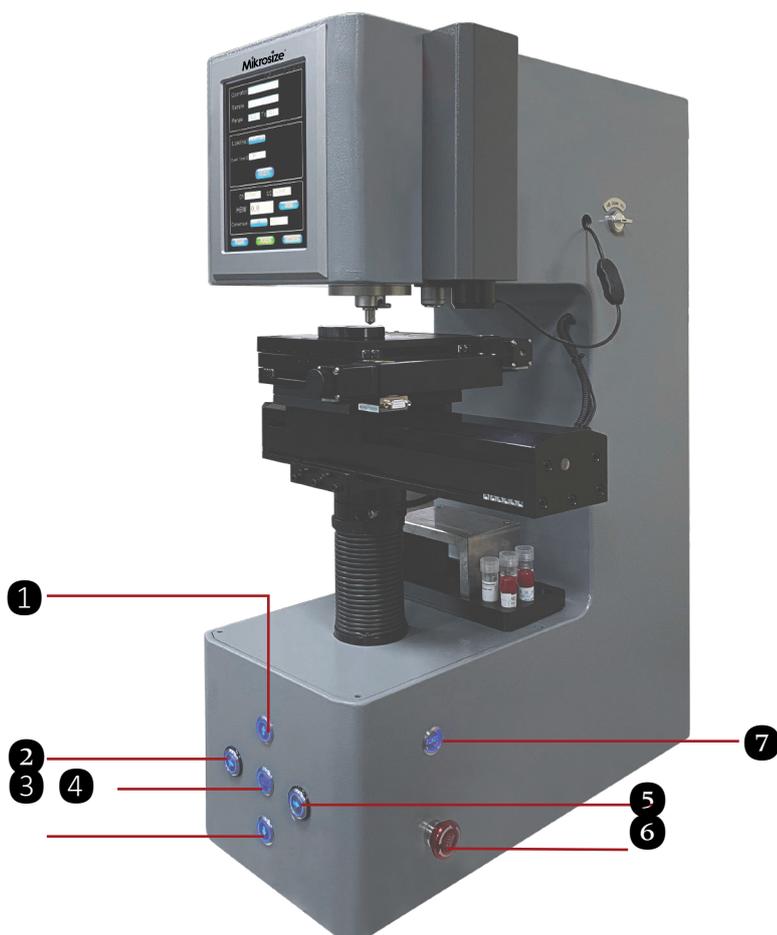
When equipment or parts fail, by analyzing the changes in their hardness, the causes and mechanisms of the failure can be inferred.



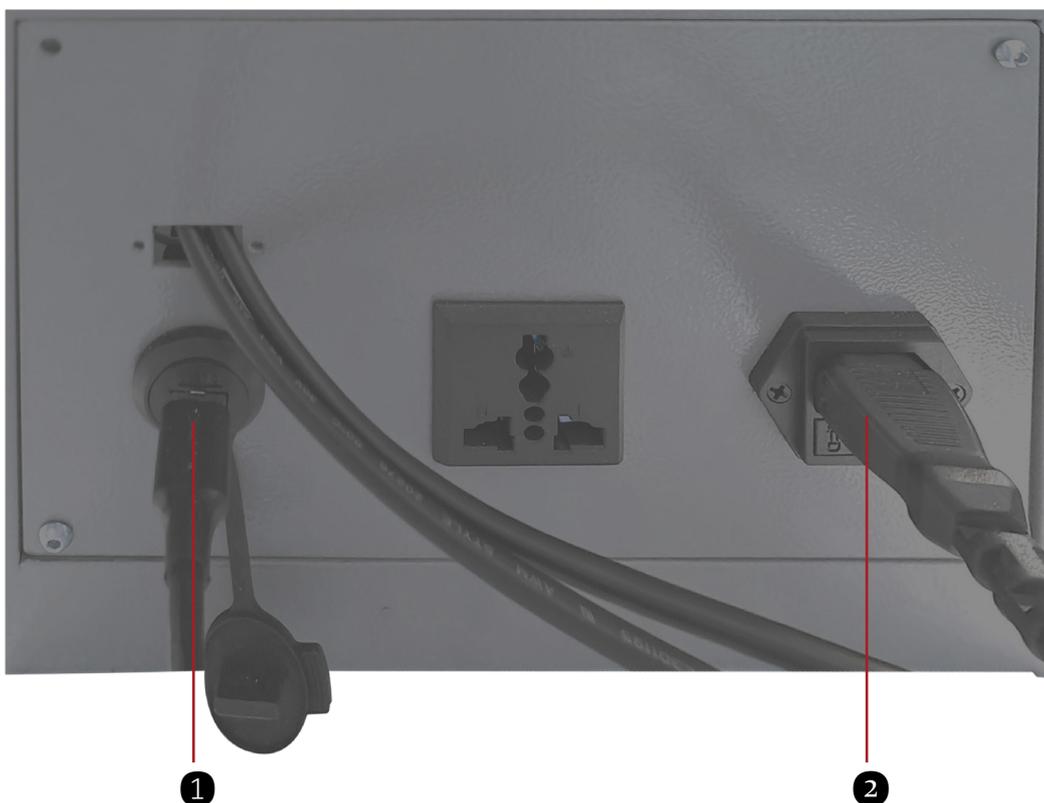
# Instrument Structure



1.Display Screen 2.HB/HV Optical Conversion 3.Illumination Adjusting 4.Vickers Lens 5.Indenter 6.Brinell Lens 7.Test Stage 8.Lifting Rod



1.Up 2.Left 3.Start 4.Down 5.Right 6.Emergency Stop Button 7.Switch



1.USB Interface

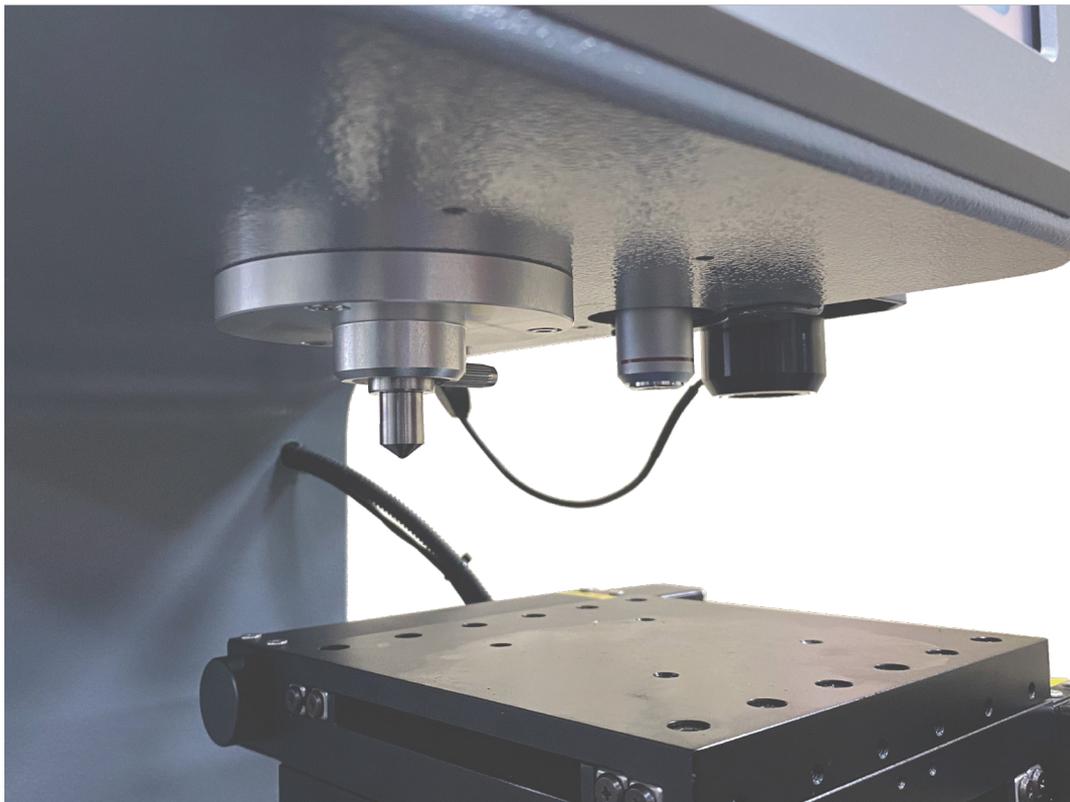
2.Power Cord Interface

# Details Display



## Test Stage

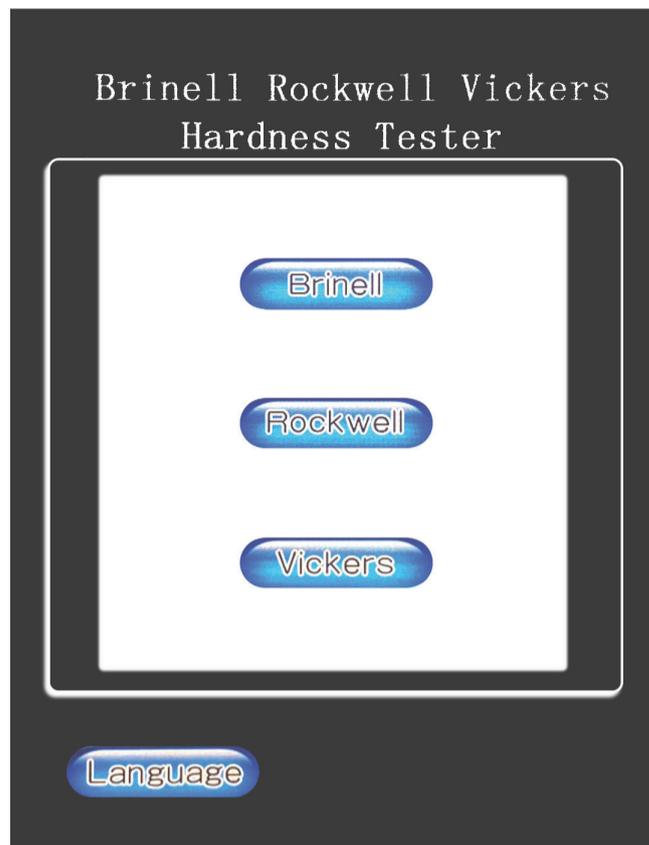
The test stage can be automatically lifted, and also be manually fine-tuned. It can automatically position to the observation and measurement positions of Vickers and Brinell lenses. The X-Y electric motorized test stage (optional) has a repeat positioning accuracy of 3 microns, and the maximum travel can reach to 200 mm.



## Indenter & Objective Lens

The indenter is replaceable.  
The Brinell lens and Vickers lens are integrally installed. Built-in optical system, and optical path can be switched.

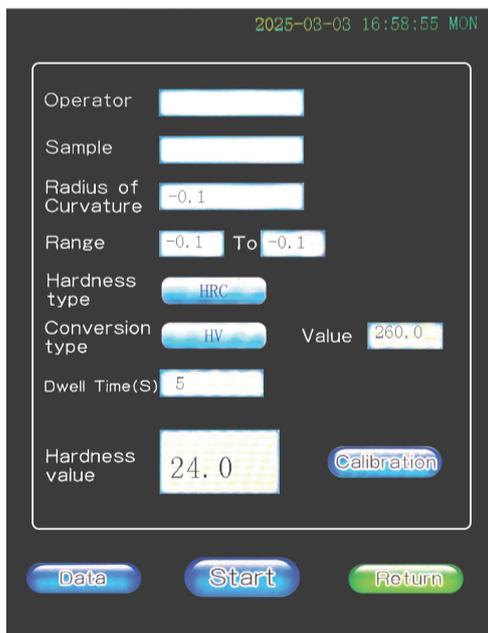
# Instrument Function



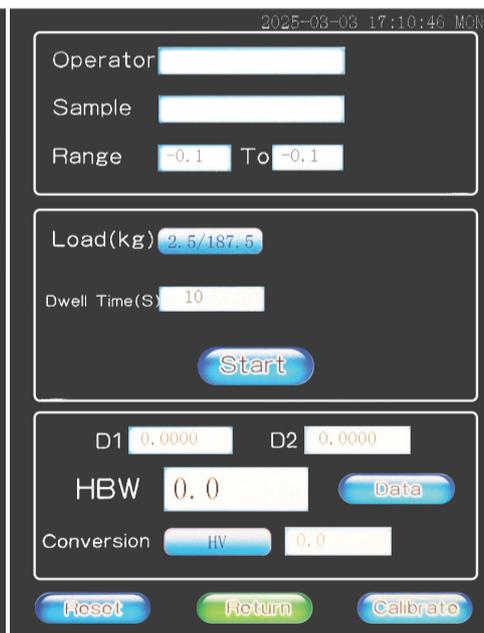
## Testing Mode

Test method selection: Brinell, Rockwell, and Vickers.

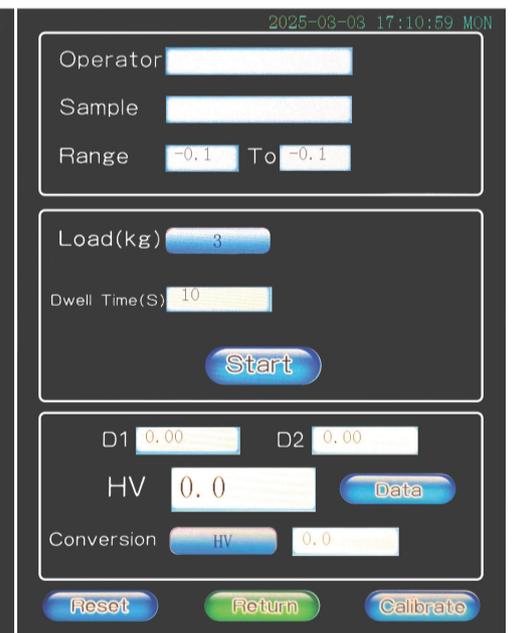
Language selection: Both Chinese and English are available. Customization of other languages is also supported.



**Rockwell Interface**



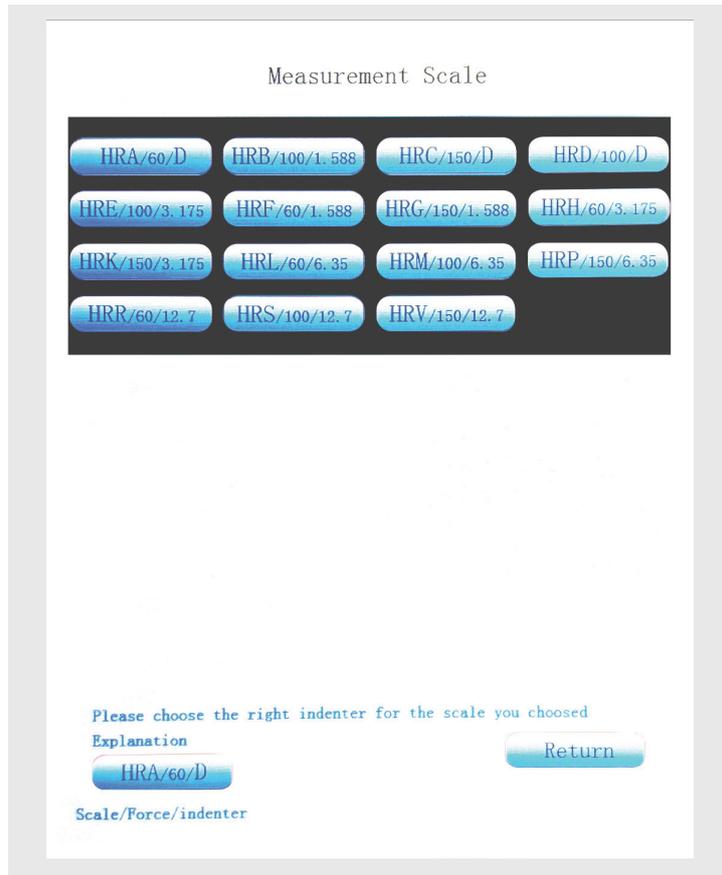
**Brinell Interface**



**Vickers Interface**

- Information such as operator details and sample names can be edited.
- It supports curved surface correction.
- The qualified range of hardness values can be set.
- Test stage can automatically move to the measurement position and the indentation position.
- It supports hardness value conversion.
- The loading time can be set.

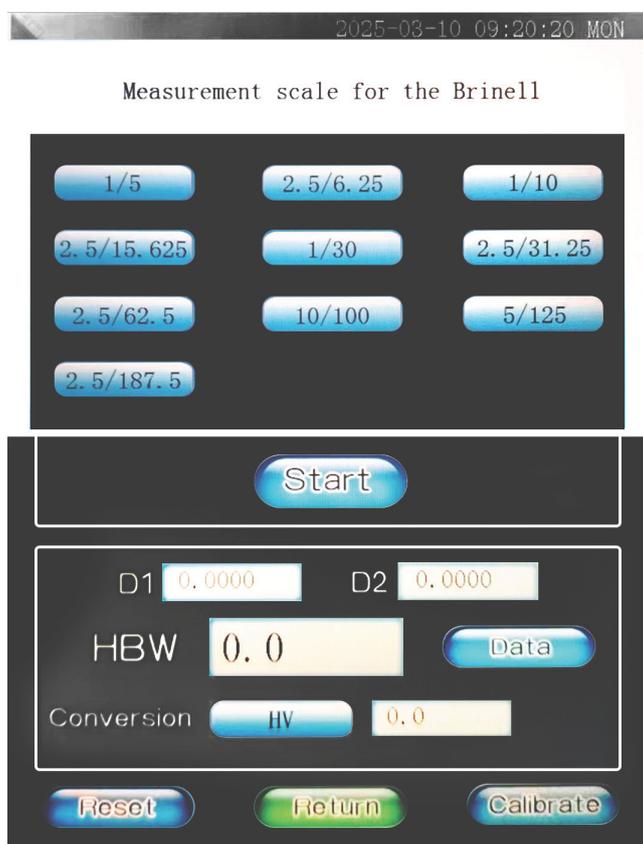
# Instrument Function



## Rockwell Scale

15 Rockwell scales, including common Rockwell scales and plastic Rockwell scales . The scale information includes test force and indenter specifications.

HRA~HRB~HRC~HRD~HRE~  
 HRF~HRG~HRH~HRK~HRL~  
 HRM~HRP~HRR~HRS~HRV



## Brinell Scale

4 indenter sizes, 2.5mm and 5 mm brinell indenters are standard configurations, while 1 mm and 10 mm brinell indenters are optional.

HBW1/5~HBW1/10~HBW1/30  
 HBW2.5/6.25~HBW2.5/15.625~HBW2.5/31.25~HBW2.5/62.5~  
 HBW2.5/187.5  
 HBW5/125  
 HBW10/100

# Instrument Function

2025-03-10 09:21:12 MON

Operator

Measurement Scale

3	5	10
20	30	40
50	60	80
100	120	

D1  D2

HV

Conversion

## Vickers Scale

Test Force: 3~120kgf

HV3~HV5~HV10~HV20~HV30~HV40~HV50~HV60~HV80~HV100~HV120

2025-03-10 09:20:42 1

Operator

HRA	HRB	HRC	HRD
HRF	HV	HBW	
HR15N	HR30N	HR45N	
HR15T	HR30T	HR45T	

Dwell Time(S)

D1  D2

HBW

Conversion

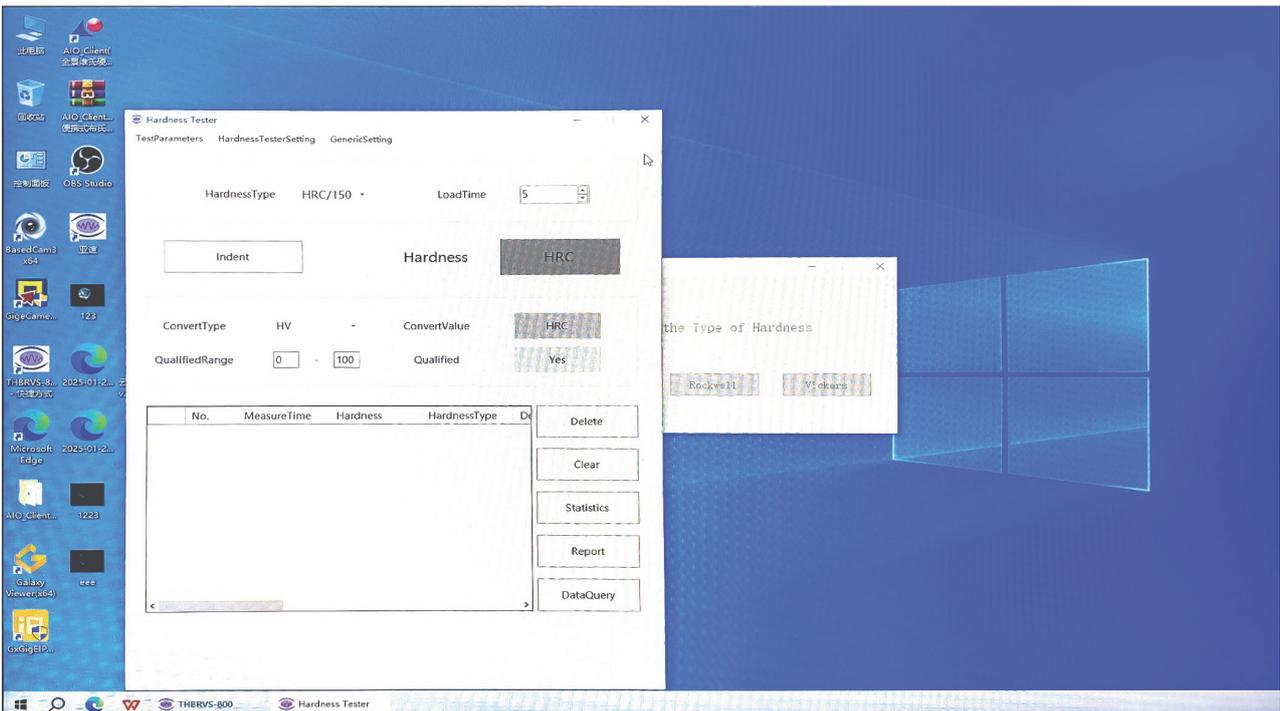
## Conversion Scale

Hardness can be converted into other hardness values according to International standards and ASTM (American Society for Testing and Materials) standards.

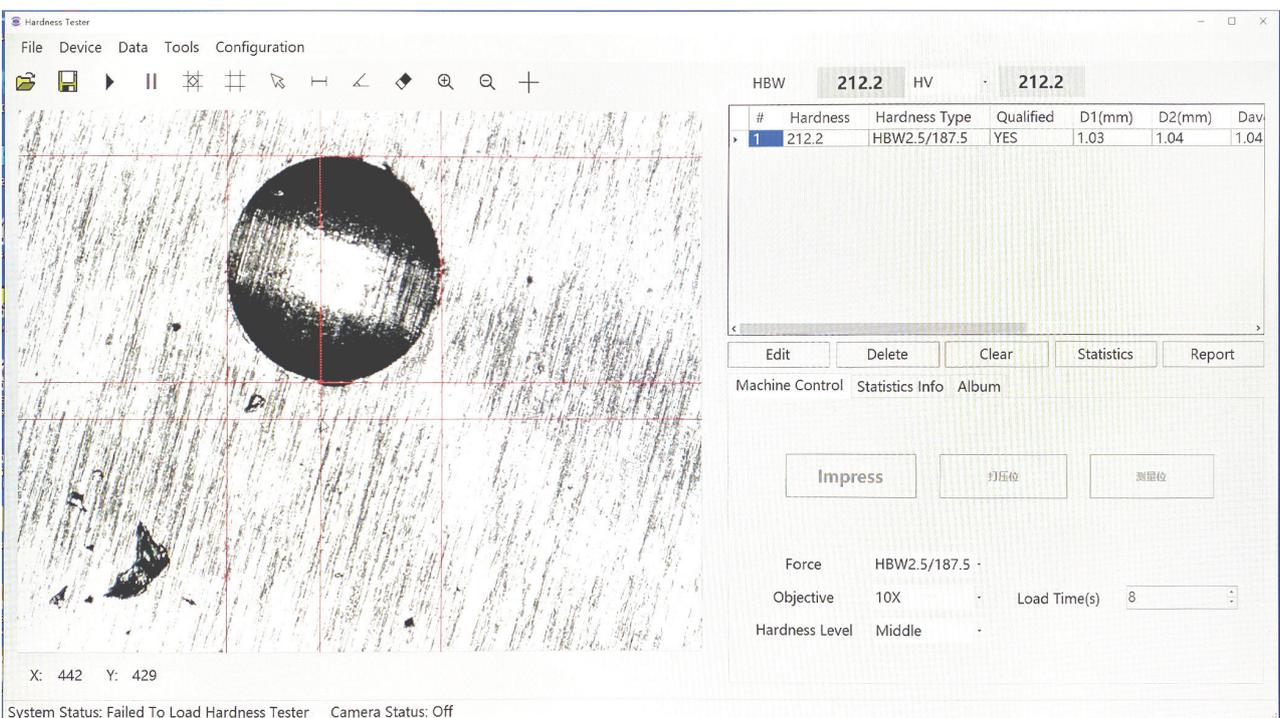
HRA~HRB~HRC~HRD~HRF~HV~HBW~HR15N~HR30N~HR45N~HR15T~HR30T~HR45T

# Software

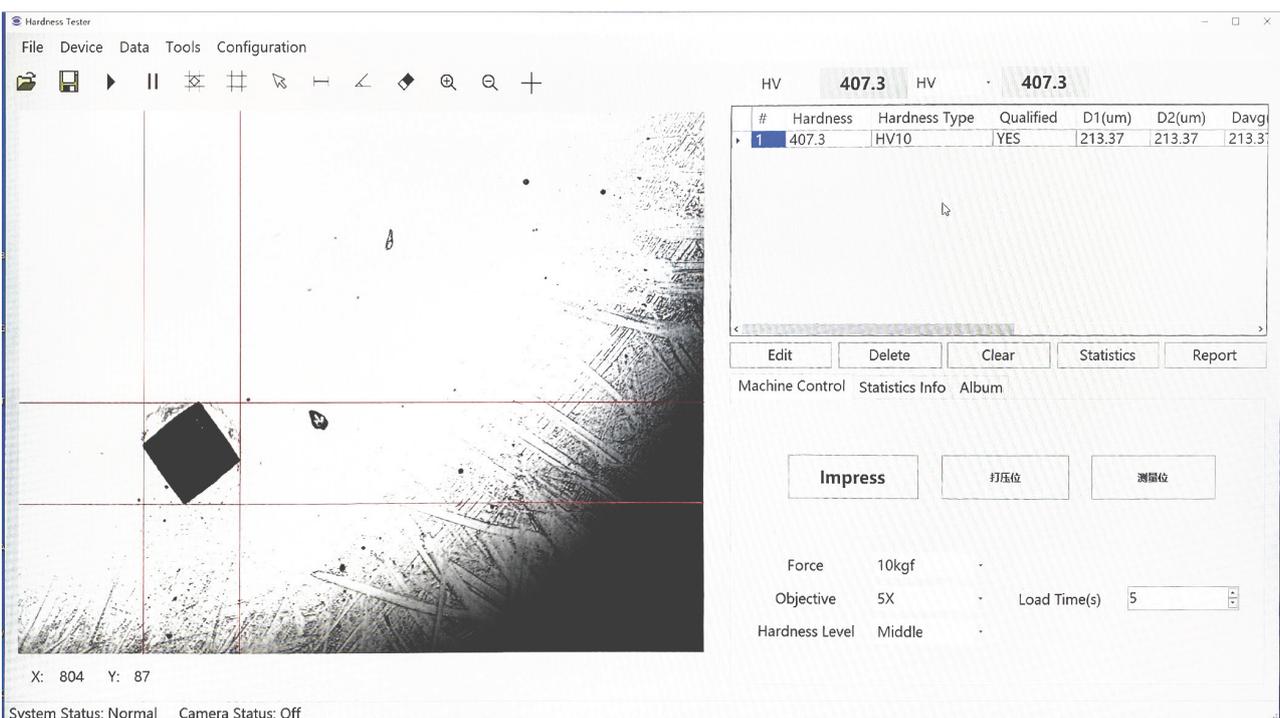
## Rockwell



## Brinell



## Vickers



The software supports three testing methods: Brinell, Rockwell, and Vickers. The hardness tester main unit can be controlled through the software for testing. The testing scales and objective lens magnifications of the software can be selected. The indentation images support both manual and automatic measurement.

# Software

The screenshot shows a software interface for hardness measurement. At the top, there are two input fields for 'HV' with the value '744.3'. Below this is a table with columns: #, X(mm), Y(mm), Hardness Type, Qualified, and D1(um). The first row is selected, showing #1, X=0.0000, Y=0.0000, Hardness Type HV1, Qualified YES, and D1(um) 49.56. A dropdown menu is open over the 'Hardness Type' column, listing various scales: HV, HK, HBW, HRA, HRB, HRC, HRD, HRF, HR15N, HR30N, HR45N, HR15T, HR30T, and HR45T. At the bottom, there are buttons for 'Edit', 'Delete', 'Clear', 'Statistics', and 'Report'.

## Conversion Scales

The hardness value can be converted into the hardness of other scales according to the International standard and ASTM.

The 'Edit Record' dialog box contains the following fields and values:

Index	2	Hardness Type	HV2
Measure Time	00:45:49	Hardness	736.9
D1(um)	70.682	Qualified	YES
D2(um)	71.211	Convert Type	HV
Davg(um)	70.946	Convert Value	736.9
Depth(mm)	0		

Buttons: Confirm, Cancel

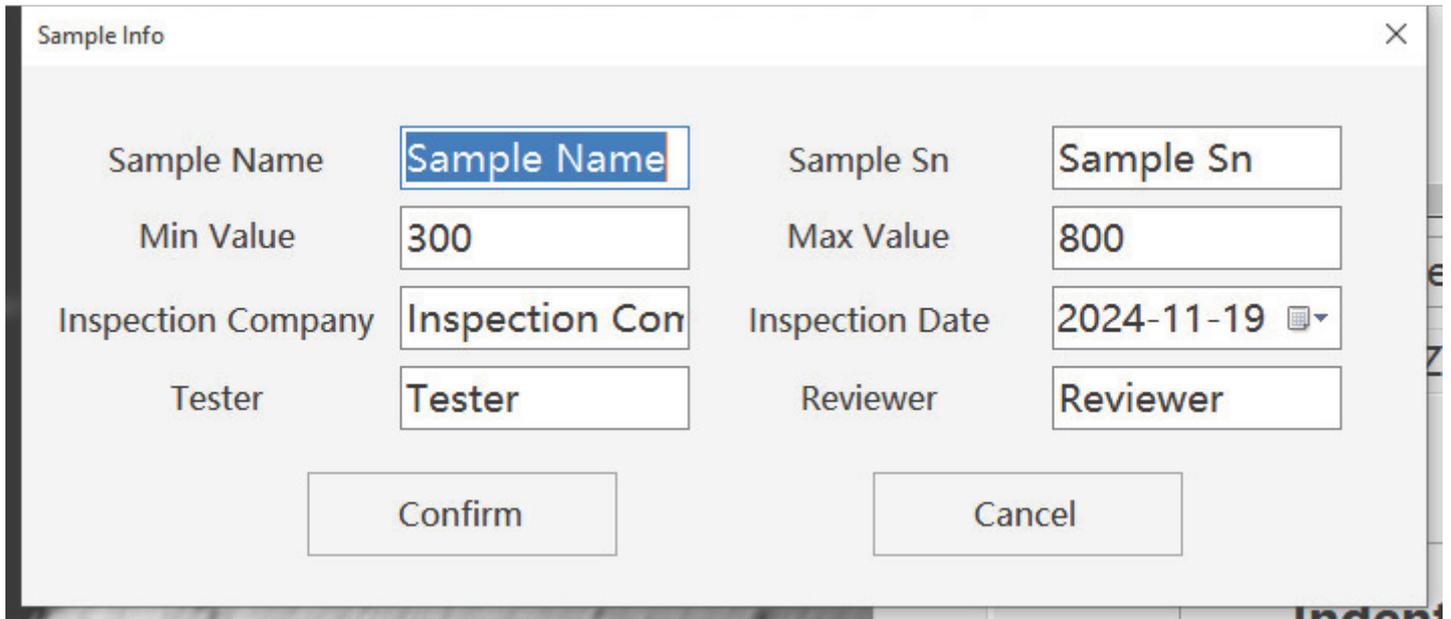
## Data Editing

Number	4	Variance	102.35
Min	709.30	StdDev	10.12
Max	736.90	CP	8.24
Average	724.68	CPK	2.48

## Data Statistics

When a certain measurement record is selected, the measurement result can be edited and modified. For the results of multiple tests, the software will statistically calculate the maximum value, minimum value, average value, and standard deviation of the data.

# Software

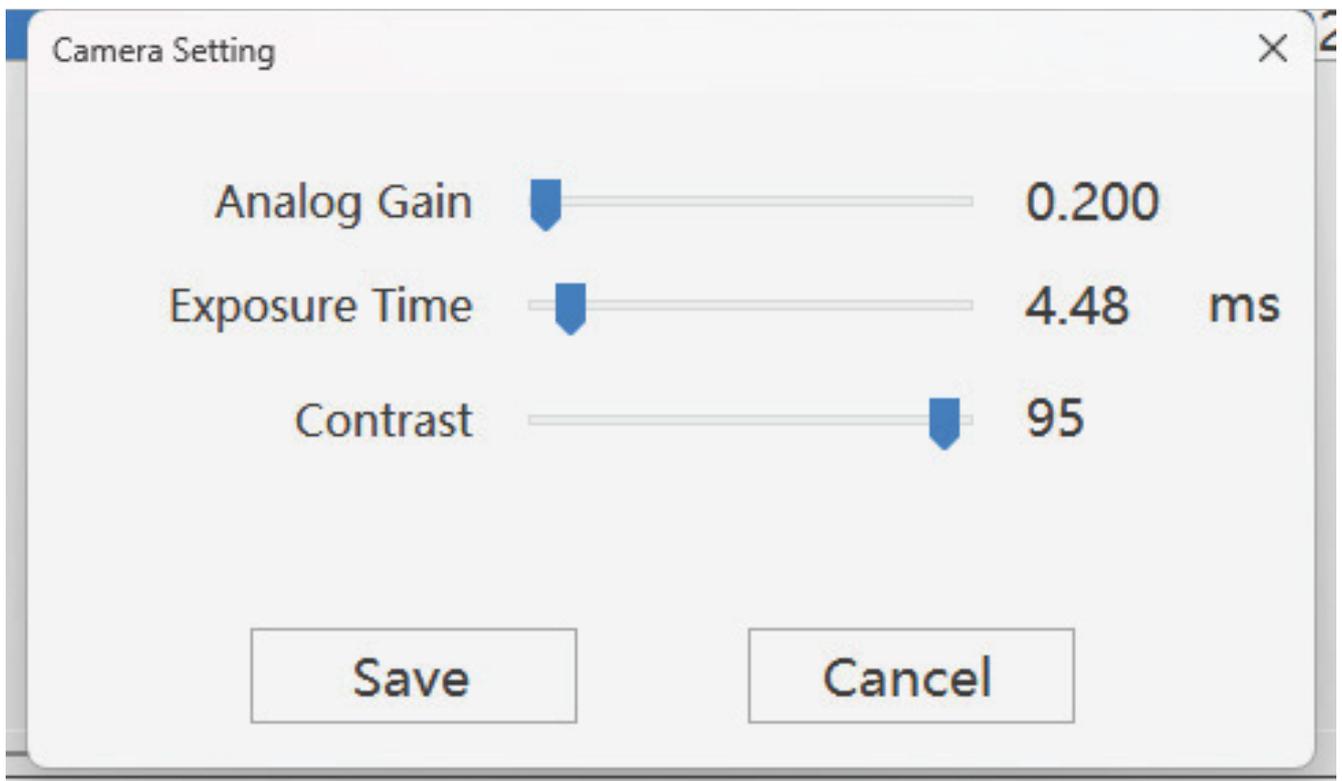


Sample Info

Sample Name	<input type="text" value="Sample Name"/>	Sample Sn	<input type="text" value="Sample Sn"/>
Min Value	<input type="text" value="300"/>	Max Value	<input type="text" value="800"/>
Inspection Company	<input type="text" value="Inspection Con"/>	Inspection Date	<input type="text" value="2024-11-19"/>
Tester	<input type="text" value="Tester"/>	Reviewer	<input type="text" value="Reviewer"/>

## Sample Information

Users can edit the information of the test samples, including the sample name, hardness range, tester, test date and other information, which is convenient for later management and query.



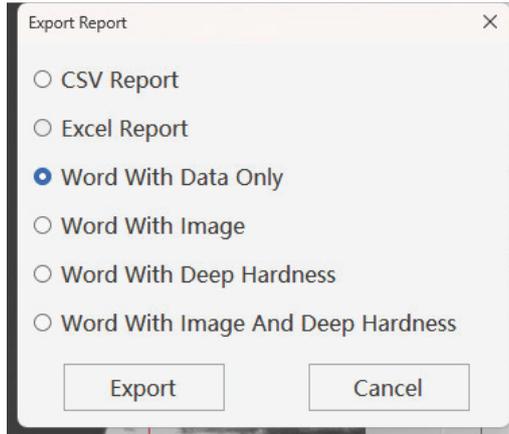
Camera Setting

Analog Gain	<input type="range" value="0.200"/>	0.200
Exposure Time	<input type="range" value="4.48"/>	4.48 ms
Contrast	<input type="range" value="95"/>	95

## Camera Setting

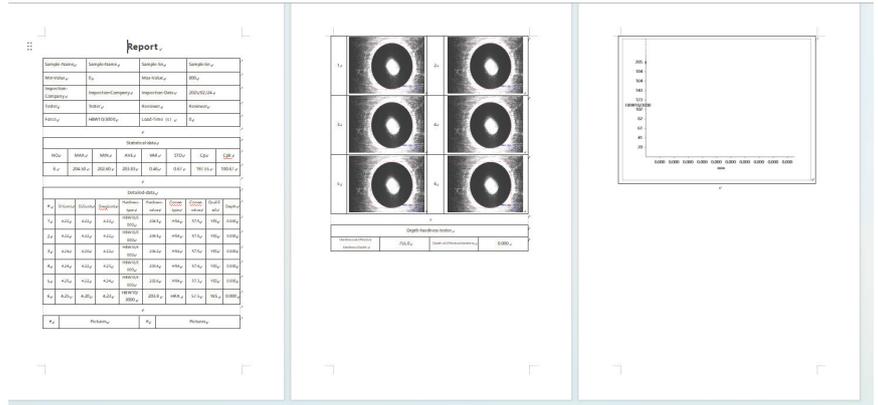
Adjust the camera settings parameters to improve the quality of the indentation image.

# Software



## Report Format

Report											
Sample Info											
Sample Name	Sample Name	Sample Sn	Sample Sn	Inspection Company	Inspection Company						
Lower Limit	0	Upper Limit	800	Inspection Date	2025/1/17						
Tester	Tester	Reviewer	Reviewer	Force	HBW10/3000						
Statistic Info											
Number	2	Max	206.1	MIN	202.6						
Average	204.95	Variance	3.06	StdDev	1.75						
CP	76.19	CPK	38.92								
Detailed data											
#	X(mm)	Y(mm)	Depth	D1(um)	D2(um)	Davg(um)	Hardness Type	Hardness	Convert Type	Convert value	Qualified
1	0	0	0	4.25	4.22	4.24	HBW10/3000	202.6	HRA	57.3	YES
2	0	0	0	4.2	4.2	4.2	HBW10/3000	206.1	HRA	57.8	YES



## Excel Format

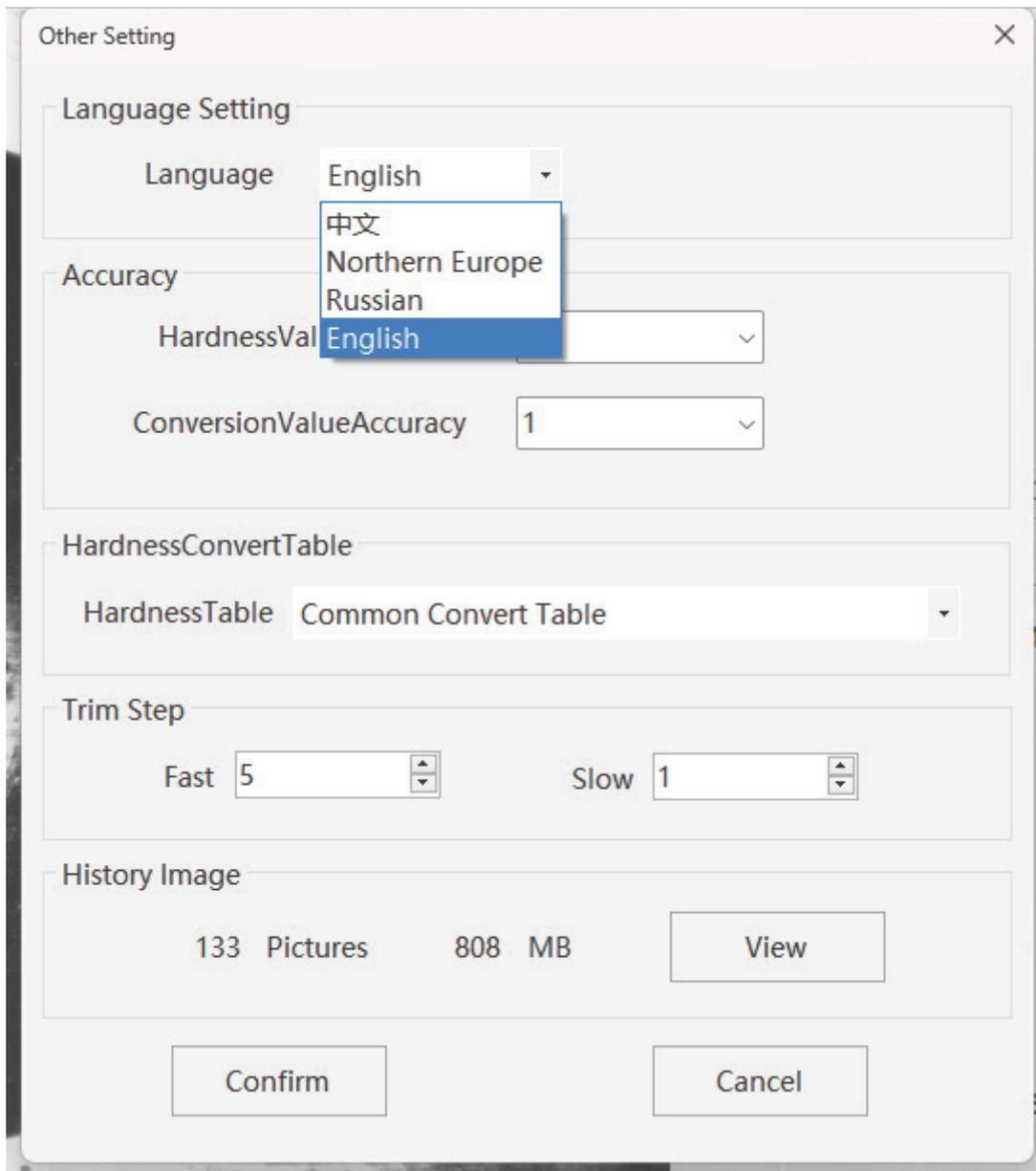
## Word Format

#	Hardness	Hardness	Qualific	cD1 (mm)	D2 (mm)	Davg (mm)	Convert	Convert	vMeasure	Time
1	204.5	HBW10/300	YES	4.22	4.22	4.22	HRA	57.5	#####	
2	204.5	HBW10/300	YES	4.22	4.22	4.22	HRA	57.5	#####	
3	204.2	HBW10/300	YES	4.24	4.2	4.22	HRA	57.5	#####	
4	203.4	HBW10/300	YES	4.24	4.22	4.23	HRA	57.4	#####	
5	202.6	HBW10/300	YES	4.25	4.22	4.24	HRA	57.3	#####	
6	203.8	HBW10/300	YES	4.25	4.2	4.23	HRA	57.5	#####	

## CSV Format

It can export reports in three formats: Word, Excel, and CSV.

# Software



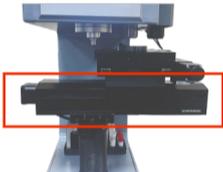
## Language Selection

Multiple languages are available, and customization of other languages is supported.

# Technical Specification

<b>Model</b>	MBRV-250A
<b>Name</b>	Intelligent Automatic Universal Hardness Tester
<b>Hardness Scale</b>	Brinell, Rockwell, Vickers
<b>Test Force</b>	3~250kgf HBW1/: 5、
<b>Brinell Scale</b>	10、 30kgf HBW2.5/: 6.25、 15.625、 31.25、 62.5、 187.5kgf HBW5/: 125kgf HBW10/: 100kgf
<b>Rockwell Scale</b>	HRA, HRB,HRC, HRD,HRE,HRF,HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV
<b>Vickers Scale</b>	HV3、 HV5、 HV10、 HV20、 HV30、 HV50、 HV100、 HV120kgf
<b>Conversion Scale</b>	HRA、 HRB、 HRC、 HRD HRF、 HV、 HBW HR15N、 HR30N、 HR45N HR15T、 HR15T、 HR15T
<b>Measuring System</b>	Automatic
	2.5X、 5X (Optional 10X、 20X)
<b>Camera</b>	5 Megapixel
<b>Data Display</b>	Computer Screen
<b>Loading Method</b>	Auto Loading/Dwelling/Unloading
<b>Indenter</b>	Diamond Rockwell Indenter:120° Rockwell Ball Indenter:Φ1.5875mm,(Optional Φ3.175mm, Φ6.35mm, Φ12.7mm) Diamond Vickers Indenter:136° Brinell Ball Indenter Φ2.5mm, Φ5mm (OptionalΦ1mm, Φ10mm)
<b>Illumination</b>	LED
<b>Executive Standards</b>	GB/T230、 GB/T231、 GB/T4340、 JJG144、 GB/T18449、 ISO 6508、 ASTM E 10、 ASTM E92、 ASTM E18、 ASTM E384、 ASTM E103
	1 - 99 s
<b>Test Sample</b>	Test Space: 220x200mm(HxD) Cylindrical Specimen: The Minimum Diameter of The Uter Surface of The Cylindrical Specimen is 4 mm.
<b>Test Height</b>	Rockwell : 220mm Brinell/Vickers:150mm
<b>Test Throat</b>	200mm
<b>Machine Size L*W*H (mm)</b>	500*260*750
<b>Net Weight (kg)</b>	70
<b>Power Supply</b>	AC220V+5%, 50-60Hz
<b>Package Size L*W*H</b>	710*430*980 (mm)
<b>Gross Weight (kg)</b>	102

# Standard Delivery

Name	Qty	
Machine Mainframe	1 pc	
USB Flash Drive ( Measurement Software Included)	1 pc	
Dell Computer	1 pc	
5-megapixel Industrial Camera	1 pc	
Dongle	1 pc	
Lighting Source	1 set	
Electric Motorized Sliding Test Stage	1 pc	
Objective Lens (2.5X、5X)	Each 1 pc	
Rockwell Diamond Indenter	1 pc	
Rockwell Ball Indenter Φ1.5875mm	1 pc	
Vickers Diamond Indenter	1 pc	
Brinell Ball Indenter Φ2.5mm	1 pc	
Brinell Ball Indenter Φ5mm	1 pc	
Test Anvil Φ150mm	1 pc	

# Optional Delivery

Optional Delivery

10X、 20X Objective Lens

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1/8"、 1/4"、 1/2" Rockwell Ball Indenter

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Φ1mm、 Φ10mm Brinell Indenter

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X-Y Auto Test Stage

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Other Test Anvil

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Other Hardness Block

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