

# NauMetrics

Precision Measuring Instruments



## Benchtap Hardness testers

**NauMetrics PMI**  
Postbus 540  
7550 AM Hengelo  
T: 0031 (0) 74 3490022  
F: 0031 (0) 84 0037042  
[info@naumetrics.nl](mailto:info@naumetrics.nl)  
[www.naumetrics.nl](http://www.naumetrics.nl)

**Inhoudsopgave:**

**Benchttop Hardnesstesters**

Digital Rockwell testers

KHR-450/500..... Pag. 3

KHR-300/310/320..... Pag. 6

Digital Brinell Hardness testers

KHB-3000A..... Pag. 9

KHB-3000E ..... Pag. 12

Digital Vickers Hardness testers

THV-5MD/..... Pag.14

THV-10MD

## Rockwell/Superficial Rockwell hardness tester



**Digital Superficial Hardness tester KHR-450**

**Digital Hardnesstester KHR-500**

**KHR-450** can be used directly to measure Rockwell Superficial hardness and plastic hardness, and it can change the value of Rockwell superficial hardness such as HR15N, HR30N, HR 45N, HR15T, HR30T and HR45T scale into HV, HB,  $\sigma_b$  and HK value.

**KHR-500** can be used directly to measure Rockwell hardness and plastic Rockwell hardness, and it can change the value of Rockwell hardness into HB, HV, HLD, HK and  $\sigma_b$  value.

**Provided with many features such as**

- High Measuring Precision
- Wide measuring range,
- Automatic test force
- Changing according the scales,
- Automatic main test force loading/unloading,
- Measuring results digitally display and automatic printing,
- Communicating with external computer and etc.,
- The tester is suitable for the hardness testing of carbon steel, alloy steel, cast iron, non-ferrous metal, engineering plastic and etc.

	KHR-500	KHR-450
<b>Preload</b>	98.1N (10kgf)	29.4N (3kgf)
<b>Test force</b>	588.4N(60kgf), 980.7N (100kgf), 1471N(150kgf)	147.1N(15kgf), 294.3N(30kgf), 441.3N(45kgf)
<b>Scales</b>	HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV	HR15N,HR30N,HR45N, HR15T,HR30T,HR45T, HR15W,HR30W,HR45W, HR15X,HR30X,HR45X, HR15Y,HR30Y,HR45Y
<b>Load cycle</b>	3~8s	3~8s
<b>Load dwell duration</b>	2~50s	2~50s
<b>Resolution</b>	0.1HR	0.1HR
<b>Display</b>	High definition backlight LCD	High definition backlightLCD
<b>Operation</b>	Menu selectable, Membrane keypad	Menu selectable, Membrane keypad
<b>Auxiliary functions</b>	Upper/lower limits setting& alarming, Data statistics, Avg., Max., Min., S, R, Scale conversion, HV, HB, $\sigma_b$ , Curved surface correcting automatically	Upper/lower limits setting& alarming, Data statistics, Avg., Max., Min., S, R, Scale conversion, HV, HB, $\sigma_b$ , Curved surface correcting automatically
<b>Data output</b>	RS-232/USB data output to printer or PC	RS-232/USB data output to printer or PC
<b>Memory</b>	Max 500 items of test results stored automatically	Max 500 items of test results stored automatically
<b>Testing Space</b>	200mm in vertical,165mm in horizontal	200mm in vertical,165mm in horizontal
<b>Dimensions</b>	550mm×200mm×720mm	550mm×200mm×720mm
<b>Power supply</b>	AC, 110V, 50~60Hz,4A	AC, 110V/220V, 50~60Hz,4A
<b>Net weight</b>	100kg	90kg

	KHR-500	KHR-450
	✓	✓
Host machine	✓	✓
Standard hardness block for A scale	✓	
Standard hardness block for B scale	✓	
Standard hardness block for C scale	✓	
Standard hardness block for HR30N scale		✓
Standard hardness block for HR30T scale		✓
1/16" steel ball indenter	✓	✓
120° cone diamond indenter	✓	✓
Mounting screw for indenter ×2	✓	✓
Round plane anvil	✓	✓
"V" shape anvil	✓	✓
Power supply wire	✓	✓
Screwdriver for indenter mounting	✓	✓
Dust cover	✓	✓

## Advanced Nose-Type Digital Rockwell Testers



**KHR-300 Rockwell hardnesstester**

**KHR-310 Superficial Rockwell hardnesstester**

**KHR-320 TWIN Rockwell hardnesstester**

- Horizontal Protruding Indenter Design, suitable also for internal and external testing.
- Testing on Surfaces difficult to reach. Testing internal surface of rings and tubes with diameters over 23mm.
- Modern design with Titanium metallic Silver finish
- Provided with many features such as high measuring precision, wide measuring range
- The tester is suitable for testing of carbon steel, alloy steel, cast iron, non-ferrous metal.
- Automatic load cycle. The loading, dwell, unloading process of the main test force are controlled exactly to meet standard.
- Measuring results digitally displaying and can be printed, or transmitted to external computer automatically by USB or RS-232 data output port.
- Test value can be transformed to the value of HB, HV, HK and ob value.
- The tester meets all following standards such as ISO 6508-2, ASTM E18.

	KHR-300	KHR-310	KHR-320
<b>Preload</b>	98.1N (10kgf)	29.4N (3kgf)	29.4N (3 kgf) 98.1N (10 kgf)
<b>Total test force</b>	588.4N (60kgf), 980.7N (100kgf), 1471N (150kgf)	147.1N(15kgf), 294.3N (30kgf), 441.3N(45kgf)	147.1N(15kgf), 294.3N (30kgf), 441.3N(45kgf), 588.4N (60kgf), 980.7N (100kgf), 1471N (150kgf)
<b>Scales</b>	HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV	HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15Y, HR30Y, HR45Y	HR15N, HR30N, HR45N, HR15T, HR30T, HR45T, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15Y, HR30Y, HR45Y HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV
<b>Load dwell duration</b>	2~50s, can be set and stored		
<b>Resolution</b>	0.1HR		

<b>Display</b>	High definition backlight LCD		
<b>Operation</b>	Menu selectable, Membrane keypad		
<b>Upper/lower limits setting &amp; alarming</b>	✓	✓	✓
<b>Data statistics</b>	Avg., Max., Min., S, R available		
<b>Curved surface correcting automatically</b>	✓	✓	✓
<b>Memory</b>	Max 500 items of test results stored automatically		
<b>Data output</b>	RS-232 to micro printer, USB port to external PC		
<b>Testing space</b>	240mm in vertical, 155mm in horizontal		
<b>Dimensions</b>	720mm×220mm×800mm		
<b>Power supply</b>	AC, 220V/110V, 50~60Hz, 4A		
<b>Net weight</b>	<b>120kg</b>	<b>110kg</b>	<b>130kg</b>



## Automatic Brinell Hardnesstester KHB-3000A



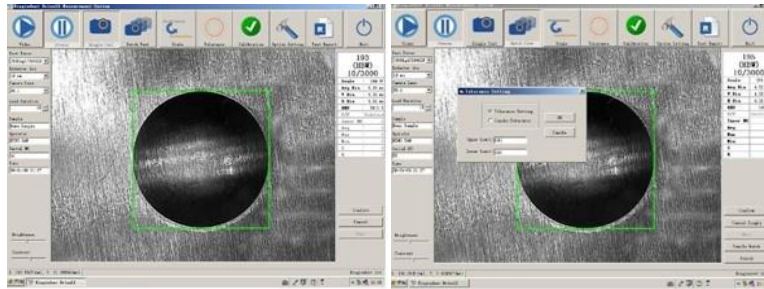
Contact to desktop PC or Contact to laptop PC.

The Brinell hardness testing creates the largest indentation comparing all other hardness testing methods. It is able to reflect the comprehensive features of the material, and is unaffected by the microstructure and Inhomogeneous of the specimen. So with its high precision it is widely used in industries such as metallurgy, forging, casting, unhardened steel and nonferrous metals, as well as in the laboratories, universities, and scientific research institutes. KHB-3000A Tester conforms to: ISO6506 Metallic Materials-Brinell Hardness Test ASTM E-10 Test Method for Brinell Hardness of Metallic Materials.

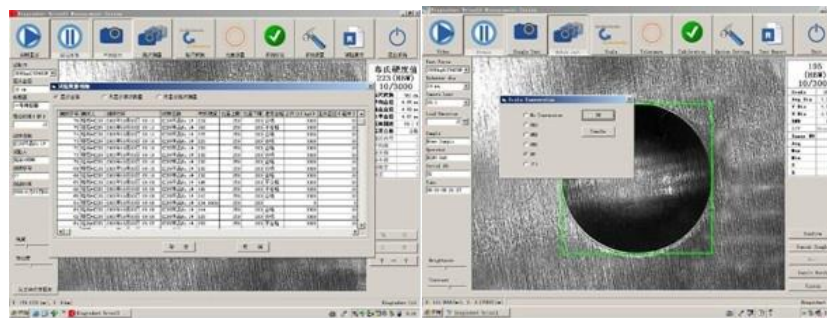
**Specification:** Innovative closed-loop technology. The tester incorporates the latest load cell technology. The test load is applied via a closed-loop control unit with a load cell, a DC motor and an electronic measurement and control unit. The result is highly accurate measurements at all test loads up to 0.5%. The common load overshoot or undershoot as known from traditional dead weight, or open-loop, systems is eliminated. The absence of mechanical weights not only eliminates friction problems but also makes the equipment less sensitive to misalignments caused by vibrations. The whole weight of the tester is 50% less than the traditional dead weights type tester. Test load selection by keyboard and LCD screen. No need of handling heavy weights or cleaning the messy oil. Fully automatic test cycles. The hardness Tester features a fully automatic test cycle, load application, holding, unloading, is performed fully automatically. This greatly improves reproducibility of test results since operator influence is eliminated. Selectable dwell times by screen. The indenter, load, and other test information are showing clearly on the large LCD screen. The directions for 0.102F/D<sup>2</sup> ratios selecting according to the materials and hardness range can be showing on the screen.



Equipped with the special Brinell indentation measure system, which can measure the Brinell indentation accurate, quick and reliable. It is a new measuring method by using CCD camera to capture the indentation image, instead of reading diameter from optical microscope by operator then calculating the test value. The KHB-3000A tester can connect any PC with USB port and run the SPC software, then the special software supplies an easy operation as following.



Both single testing and batch testing mode are available with tolerance setting, distinguishing and alarming statistic values such as Max, Min, Avg, R and S are available to convert test result to other scales, such as HRC,HRB,HRA,HV, mb.



Loads : 3000kgf (29400N), 1500Kgf (14700N), 1000Kgf (9800N), 750Kgf (7355N) , 500Kgf (4900N), 250Kgf (2452N), 187.5Kgf (1839N), 125Kgf (1226N), 100Kgf (980N), 62.5Kgf (612.9N)		
Load dwell duration: 2s~99s, can be set and stored		
Tungsten Carbide Ball indenter: 10mm		
Measuring range: 3.18HBW~658HBW		
Accuracy of indentation measuring: $\pm 0.5\%$		
Accuracy of Brinell Hardness Value:		
Hardness Range(HBW)	Error (%)	Repeatability(%)
$\leq 125$	$\pm 2.5$	$\leq 3.0$
$125 < \text{HBW} \leq 225$	$\pm 2.0$	$\leq 2.5$
$> 225$	$\pm 1.5$	$\leq 2.0$
Max measurable height: 200 mm		
Max measurable depth: 140 mm		
Dimensions: 530mm×260mm×750mm		
Power supply: 220/110 V, 50/60 Hz, 4A		
Weight: 120kg		
Standard blocks: 125-350HBW10/3000, 125-350HBW10/1000		

Standard configuration			
Host machine	1	Software disc	1
Standard block125-350HBW10/3000	1	USB Key	1
Standard block125-350HBW10/1000	1	USB Cable	1
Φ10mm Tungsten Carbide Ball indenter	1	Power supply wire	1
Mounting screws for indenter	1	Dust cover	1
Screwdriver for indenter mounting	1	Flat anvil, 80mm×185mm	1
Optional accessories:			
"V" shape anvil, 80mm×185mm		Standard blocks of other value	
Φ5mm Tungsten Carbide Ball indenter		Φ2.5mm Tungsten Carbide Ball indenter	
Φ10mm Tungsten Carbide Ball		Φ5mm Tungsten Carbide Ball	
Φ2.5mm Tungsten Carbide Ball			

## Electronic Brinell Hardnesstester KHB-3000E



The Brinell hardness testing creates the largest indentation comparing all other hardness testing methods. It is able to reflect the comprehensive features of the material, and is unaffected by the microstructure and inhomogeneous of the specimen. So with its high precision it is widely used in industries such as metallurgy, forging, casting, unhardened steel and nonferrous metals, as well as in the laboratories, universities, and scientific research institutes.

KHB-3000E Tester conforms to:

- ISO6506 Metallic Materials-Brinell Hardness Test
- ASTM E-10 Test Method for Brinell Hardness of Metallic Materials

Specification:

- Innovative closed-loop technology. The tester incorporates the latest load cell technology. The test load is applied via a closed-loop control unit with a load cell, a DC motor and an electronic measurement and control unit. The result is highly accurate measurements at all test loads up to 0.5%. The common load overshoot or undershoot as known from traditional dead weight, or open-loop, systems is eliminated. The absence of mechanical weights not only eliminates friction problems but also makes the equipment less sensitive to misalignments caused by vibrations.
- The whole weight of the tester is 50% less than the traditional dead weights type tester.
- Test load selection by keyboard and LCD screen. No need of handling heavy weights or cleaning the messy oil.
- Fully automatic test cycles. The hardness Tester features a fully automatic test cycle, load application, holding, unloading, is performed fully automatically. This greatly improves reproducibility of test results since operator influence is eliminated.
- Selectable dwell times by screen. The indenter, load, and other test information are shown clearly on the large LCD screen.
- The directions for  $0.102F/D^2$  ratios selecting according to the materials and hardness range can be showing on the screen.
- 20X Microscope with LED lighting source make the indentation more distinguishable and improving the measure accurate.

Loads : 3000kgf (29400N), 1500Kgf (14700N), 1000Kgf (9800N), 750Kgf (7355N) , 500Kgf (4900N), 250Kgf (2452N), 187.5Kgf (1839N), 125Kgf (1226N), 100Kgf (980N), 62.5Kgf (612.9N)		
Load dwell duration: 2s~99s, can be set and stored		
Tungsten Carbide Ball indenter: 10mm		
Measuring range: 3.18HBW~658HBW		
Magnification of the microscope: 20X		
Resolution capability of the microscope: 0.005mm		
Accuracy of Brinell Hardness Value:		
Hardness Range(HBW)	Error (%)	Repeatability(%)
≤ 125	± 3.0	≤3.0
125 < HBW ≤ 225	± 2.5	≤2.5
> 225	±2.0	≤2.0
Max measurable height: 230 mm		
Max measurable depth: 140 mm		
Dimensions: 530mm×260mm×750mm		
Power supply: 220/110 V, 50/60 Hz, 4A		
Weight: 120kg		
Standard blocks: 125-350HBW10/3000, 125-350HBW10/1000		

### Standard configuration

Host machine	1	Flat anvil	1
Standard block 125-350HBW10/3000	1	"V" shape anvil	1
Standard block 125-350HBW10/1000	1	20X microscope	1
Φ10mm Tungsten Carbide Ball indenter	1	Power supply wire	1
Mounting screws for indenter	1	Dust cover	1
Screwdriver for indenter mounting	1	☺	☺
<b>Optional accessories:</b>			
Standard blocks of other value		Φ2.5mm Tungsten Carbide Ball	
Φ5mm Tungsten Carbide Ball indenter		Φ2.5mm Tungsten Carbide Ball indenter	
Φ10mm Tungsten Carbide Ball		Φ5mm Tungsten Carbide Ball	

## Digital Automatic Turret Vickers Hardnesstester



**THV-5MD**

**THV-10MD**

**Model THV-5MD/-10MD Digital Automatic Turret Vickers hardness tester** with large screen LCD display, use the menu interface type structure, can be in operation panel choose hardness HV or rod HK, test of hardness value, automatic input, automatic display. For all kinds of hardness value mutual conversion, and the testing result is automatic storage, processing, printing, with RS-232 interface, and computer online. The machine is digital, with a high degree of automation. Hardness value error can be modified through software input; hardness value more accurate meets the requirement.

**Model THV-5MD/-10MD Digital Automatic Turret Vickers hardness tester** with digital display when the pressure head and the objective to switch to each other, the test point to be automatic positioning precision.

### Technical Specifications:

Model	THV-5MD
Min measuring unit	0.0625 $\mu$ m
Test force	0.3Kgf(2.94N) 、 0.5Kgf(4.9N) 、 1.0Kgf(9.8N) 、 2.0Kgf(19.6N) 、 3.0Kgf(29.4N)、 5Kgf(49.0N)
Max Height of Specimen	160mm
Distance of Indenter to outer wall	135mm
Hardness measuring range	8~2900HV
method of testing force applied	Automatic loading, unloading testing force
Test microscope magnification	200X(Measuring), 100X (observation)
Duration time	0~60s
Overall Dimension	520*190*650mm
Power supply	AC220V+5%, 50-60Hz
Net weight	About 40Kg

**Technical Specifications:**

Model	THV-10MD
Min measuring unit	0.0625μm
Test force	0.3Kgf(2.94N) 、 0.5Kgf(4.9N) 、 1.0Kgf(9.8N) 、 2.0Kgf(19.6N) 、 3.0Kgf(29.4N)、 5Kgf(49.0N), 10Kgf(98.0)
Max Height of Specimen	160mm
Distance of Indenter to outer wall	135mm
Net weight	About 40Kg
Power supply	AC220V+5%, 50-60Hz
Net weight	About 40Kg
Overall Dimension	520*190*650mm
Hardness measuring range	8~2900HV
method of testing force applied	Automatic loading, unloading testing force
Test microscope magnification	200X(Measuring), 100X (observation)
Duration time	0~60s

**Standard Accessories:**

Item	Quantity	Item	Quantity
Weight	3	Vickers hardness block	2
"V" shaped Testing Table	1	Fuse(2A)	2
Circular testing table	1	Power cable	1
Large Testing Table	1	Product Certificate	1
Objective 10X	1	Printer manual, Manual	Each 1