KB PRÜFTECHNIK

KB 250-3000 VIDEO, SA, FA

HARDNESS TESTING 0,2 kg - 3000 kg

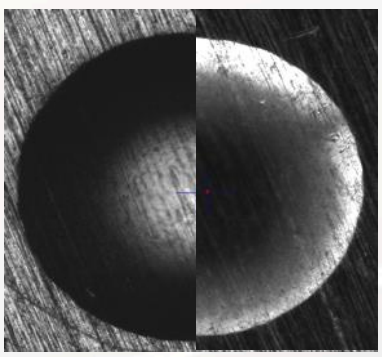


KB 750 FA Fully Automatic



KB 3000 Video







KB 250-3000
VIDEO, SA, FA
Universal Hardness Testing Machines

KB 250
KB 750
KB 1000
KB 3000

Vickers
Knoop
Brinell
Rockwell

KB PRÜFTECHNIK

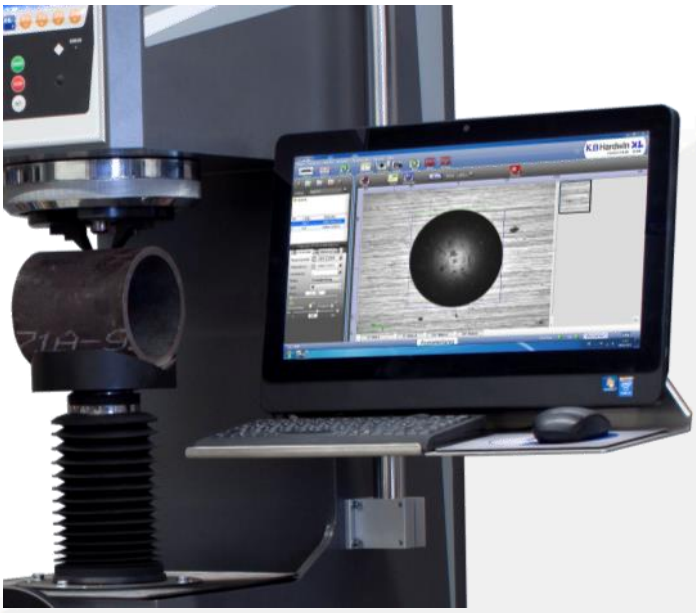
Universal Hardness Testing Machine KB 250-3000 Video, SA, FA

VIDEO	SA (Semi Automatic)	FA (Fully Automatic)
		
Control via PC	Control via PC	Control via PC
Software KB Hardwin XL Video	Software KB Hardwin XL SA semi automat	Software KB Hardwin XL FA fully automat
5 MPs USB camera	5 MPs USB camera	5 MPs USB camera
7x optical zoom optional	7x optical zoom optional	7x optical zoom optional

KB Hardwin XL BASIC → KB Hardwin XL SEMI → KB Hardwin XL FULLY

The new generation of hardness testing machines from KB Prüftechnik GmbH convince by **extraordinary precision and reproducibility.** The user enters a whole new world of hardness testing by the use of the new hardness testing software KB Hardwin XL. The KB hardness testing machines can superiorly test **Brinell, Vickers, Rockwell and Knoop.**

New innovative developments allow new possibilities of automation which combines the function of a fully automatic machine and a universal hardness tester in one machine. The configuration levels combined with numerous additional options suit the KB hardness testing machines optimally to the operator‘s individual needs.



- High precision $^{1}/_{2,5}$“ 5 Megapixels camera 2500 x 2000
- Standard 4x digital zoom with 3 steps
- Clamping cap with flexible holding-down devices
- Automatic change of objective and indenter
- Magnetic indenter holder for the easy change of test tools
- Hardness testing software KB Hardwin XL
- Flexible configuration from single tests to fully automatic test procedures
- Data export to txt, Word, Excel, PDF
- Hierarchically structured user management
- Individually designable test reports
- Network capable
- Automatic load change

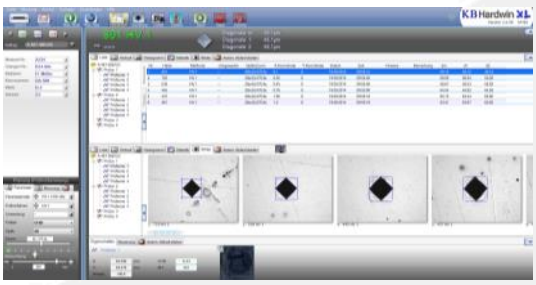
Options:

- Huge automatic X/Y-stage travel distance 300x200 mm for KB 250-1000 Semi and Fully
- Optional 7x optical zoom with 10 steps
- Optional auto turret with 6 positions for 2 objectives and 4 indenters
- Huge variety of indenters, test tables and sample supports (example see picture)

Planning and operation

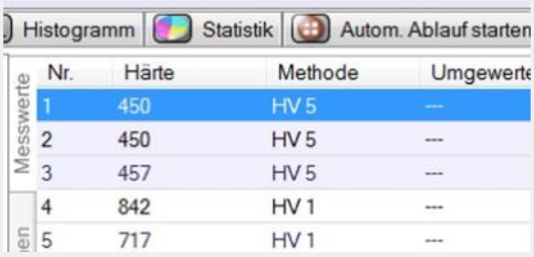
Menu navigation

- Perfect test process by a clearly arranged and user-oriented menu navigation
- Apply different magnifications and load steps in one test procedure



Load step change during one test procedure

Different load steps and magnifications can be applied during one test procedure without breaking into the test process.



USB camera 5 Megapixels

The 5 Megapixels USB camera achieves high quality pictures which are essential for auto measurement. The 5 Megapixels camera enlarges the optical measuring range due to more picture information.

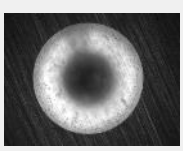


Operating system

KB Hardwin XL supports Windows XP, Vista (32 bit), 7 (32 bit/ 64 bit) and 10. The use of a personal computer makes KB Hardwin XL network compatible.

Ring Light

- Unique display of the Brinell and Vickers indentations in the darkfield illumination.
- The indentation looks white, the surface black. The edge is clearly displayed.
- Quick check of the indenter quality of Vickers and Rockwell indenters



Conversion tables

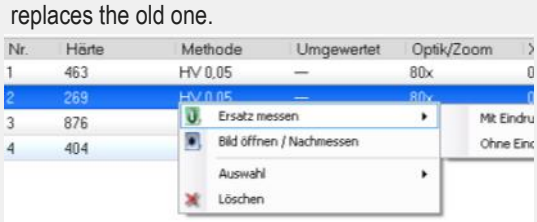
Conversion tables according to DIN 50150, DIN EN ISO 18265 (without copper conversion) and ASTM-140-T1-9-2007 are basically included.

HB	Nmm²
HRC	Nmm²
HV	Nmm²

Post-editing and archive

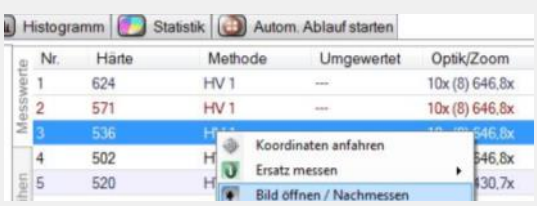
Measuring a substitution

There are three possibilities to re-measure an already existing indentation. Primarily, the image will be re-opened and then can be measured. The second possibility is to do a new picture of the old indentation on the live camera. Also a new indentation can be set on the sample. The new value replaces the old one.



Fast access on filed test orders

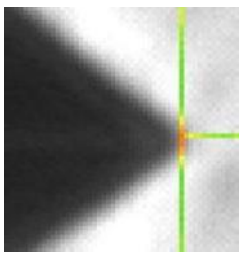
Pictures which belong to a previous test order can be re-addressed by one click.



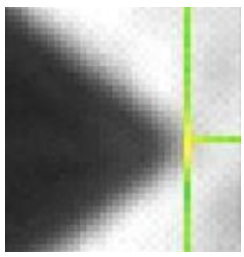
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Measurement

Operator independent manual measurement
Due to the pixel-precise display of the indentation picture and the coloured measuring marks each indentation is evaluated the same by each operator.

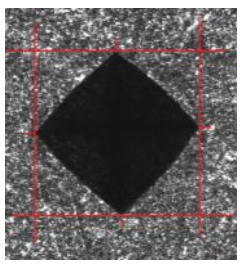


Red: too hard

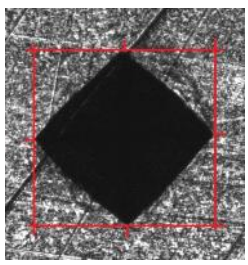


Yellow: ok

The improved automatic evaluation is now even more precise especially on not good surfaces.
Etched, sintered or scratched samples cannot interfere the automatic test procedure.

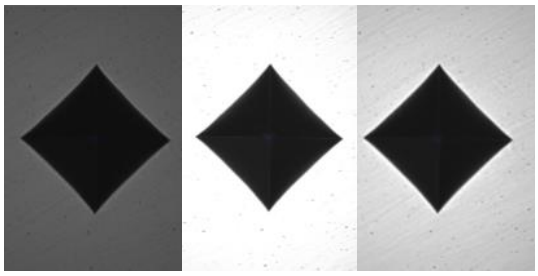


Etched surface

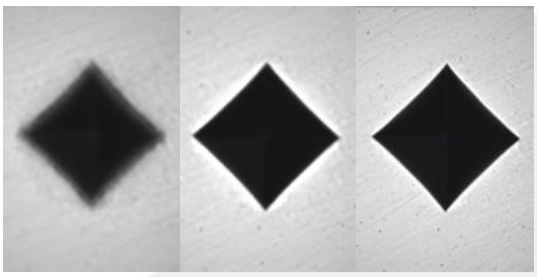


Scratched surface

Automatic light control
High reproducibility and precision with the KB light control since the optimal illumination is achieved without operator influence. This is especially important at automatic test procedure when the sample surface or the magnifications are changing.

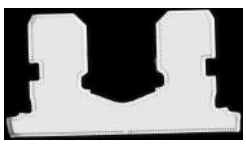


Unique auto focus
The KB auto focus works reliably, quickly and precisely. The correct position does not need to be set by the operator at first.



Scanning with KB Hardwin XL and the KB X/Y auto stage

Contour scan with the microscope camera:
Just the outline contour of the sample will be scanned with the microscope camera. The single pictures will be assembled.



Area scan with the microscope camera:
The complete sample will be scanned with the microscope camera. The size of the scan area can be freely chosen. The single pictures will be assembled.



Data management

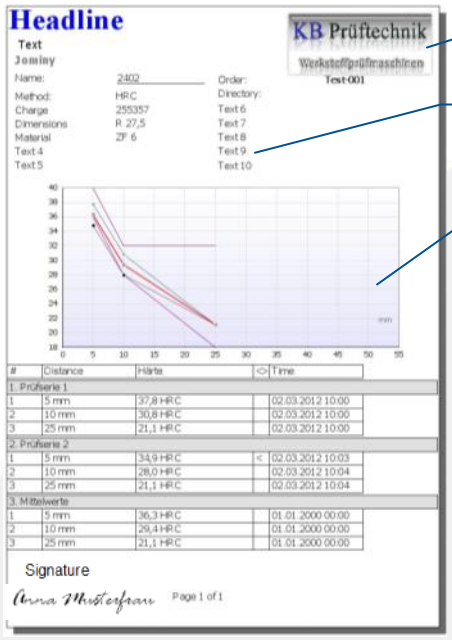
Data export
The data export is supported by **html, pdf, Excel, Word or txt.**



Scanner
KB Hardwin XL supports bar code scanner as well as QR code scanner.
Thus, the sample data can be easily downloaded.

Test Report

Example for a possible test report



Customized logos can be embedded

Number and content of the property labels are freely adjustable.

Diagrams and patterns can be integrated into the report.

The test reports can be freely adjusted by the report generator.
KB includes the generator in each software packet with standard report types. Special test report types can be programmed on request.
The test reports can also be programmed by the operator if required.
The file format of the report can be chosen between PDF, Excel, RTF, JPEG, PNG, EMF, TTY, CSV XML etc.

Automated Data Management



Sample with bar or QR code on the lot slip

The code will be scanned and the saved order information and parameters will be downloaded of the ERP server.



The test order will be processed.



The measuring results will be exported and saved on the ERP server.



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Software Options

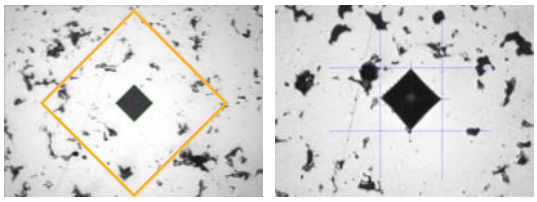
Part Recognition Reco Jet

- After the scanning the right previously saved counter line with pattern will be recognized.
- Position and angle will be identified accurately
- The pattern will be applied automatically on the right sample coordinates
- Extensive time saving since the pattern of samples has to be generated only one time.



Sinter testing

- Average-values curve is supported
- Automatic elimination of min and max values
- Interactive elimination of disadvantageously set indentations
- Indentation coordinates will be interactively checked and can be corrected
- Visualisation of the expected indentation size and the acc. to standards allowed distance to the neighbour indentation



Magazine

Customized magazine patterns can be programmed to test several samples of one kind.



Quicklink

Adjust all test series of one pattern with one click. Orientation on significant points such as symmetry points, reference points, bench marks or pivotal points.



Jominy - end quench test

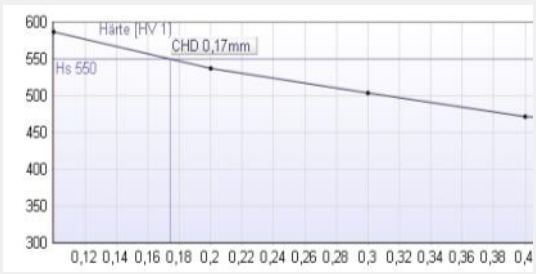
The sample will be slightly grinded in longitudinal direction. Afterwards it will be positioned in the special sample holder and will be clamped. The hardness is measured alongside the test area. The hardenability follows of the hardness tests and the diagram which shows the hardening progress.



Pattern test

Fully automatic pattern test without any operator influence.

Time saving: The core hardness can be defined. If this value is reached, an adjustable number of indentations will be set before the test procedure will be completed.



Accessories

Heat Exchanger

- For surrounding temperatures over 30°C
- For dirty enviroment
- Mounted on the backside of the machine



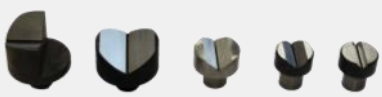
Indenters

We do offer a huge variation of indenters. Please contact our sales or service department for any help.



Supports

Please contact our sales or service department concerning your special projects. We would like to help to find the perfect solution.



Test Room Extension

Test room extension to 560 mm
Test room extension to 700 mm
Test room extension to 800 mm

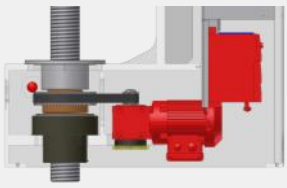
Automatic Turret 6-fold

- 6 positions for 4 indenters and 2 objectives
- Automatic change of indenters and objectives
- Optional clamping cap with flexible holding down device for testing without clamping



Motor Driven Spindle

- Comfortable lifting, even of heavy samples
- No manual hand drive
- Auto stop by clamping device



Manual X/Y stages

- Manual X/Y stage for KB 250, 25x25mm movement
- Manual X/Y stage for KB 250-750, 50x50mm movement
- Manual X/Y stage for KB 3000, 100x100mm movement

Auto X/Y stages

- Auto X/Y stage for KB 150- 250, 180x180 movement
- Auto X/Y stage for KB 250, 300x200mm movement
- Auto X/Y stage for KB 250–1000, 300x200mm movement
- Auto X/Y stage for KB 3000, 300x200mm movement

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Load Steps (controlled by **one** load cell)

Vickers acc. to DIN EN ISO 6507 and ASTM E 384

Load steps	0,2	0,3	0,5	1	2	3	5	10	20	30	40	50	60	80	100	120
KB 250																
KB 750																
KB 1000																
KB 3000																

Knoop acc. to DIN EN ISO 4545 and ASTM A 384

Load steps	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1	2	3	5	10
KB 250													
KB 750													
KB 1000													
KB 3000													

Brinell acc. to DIN EN ISO 6506 and ASTM E 10

Load steps	1/ 1	1/ 1,25	1/ 2,5	1/ 5	1/ 10	1/ 30	2,5/ 6,25	2,5/ 15,625	2,5/ 31,25	2,5/ 62,5	2,5/ 187,5	5/25	5/ 62,5	5/125	5/250
KB 250															
KB 750															
KB 1000															
KB 3000															

Load steps	5/ 750	10/ 100	10/ 125	10/ 250	10/ 500	10/ 1000	10/ 1500	10/ 3000
KB 250								
KB 750								
KB 1000								
KB 3000								

	Standard
	Including option XL Load
	Not acc. to standards

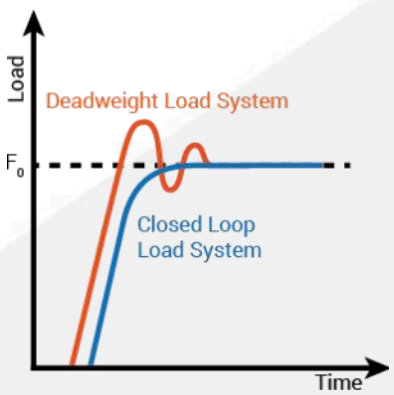
Further load steps on request.

Rockwell (optional) acc. to DIN EN ISO 6508, ASTM D 785 and ASTM E 18
Super Rockwell

Ball indentation hardness acc.to DIN ISO 2039 T1 for plastics

HRA- HRB- HRC- HRD- HRE- HRF- HRG- HRH- HRK- HRL- HRM- HRP- HRR- HRS- HRV	HR 15/ 30/ 45 W
HR 15/ 30/ 45 N	HR 15/ 30/ 45 X
HR 15/ 30/ 45 T	HR 15/ 30/ 45 Y

Closed Loop Load Application

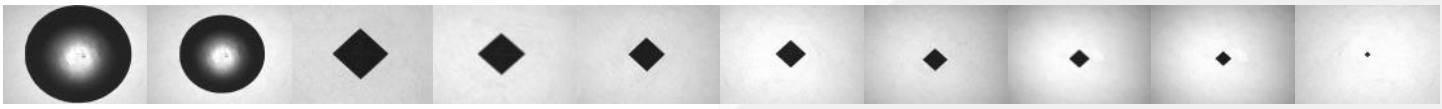


Systematically comparison
deadweight to load controlled system

Due to the closed loop system the KB 250-3000 Video, SA, FA product range achieves a high precision test load range from 0,2 - 250 kgf without load variation.

Maximum precision:
The KB hardness testing machines apply the load controlled by a closed loop system. The **controlled load application** provides more accurate loads compared to a position controlled load application because the load will be supervised during the complete test procedure.
Load application time: Flexible and according to the standard
The application and the dwell time can be individually adjusted.
Advantages compared to the deadweight system:
In the closed loop system the test load which is applied on the indenter will be constantly measured and adjusted. The load overshoot behaviour is eliminated since the closed loop system controls the load application.

KB optical zoom



Optical magnification

The KB 250 MSHR is optionally equipped with the **KB optical zoom** (1:7 magnification in 10 steps). The optical zoom enlarges optically, not digitally. This allows a high picture quality, even in big magnifications.

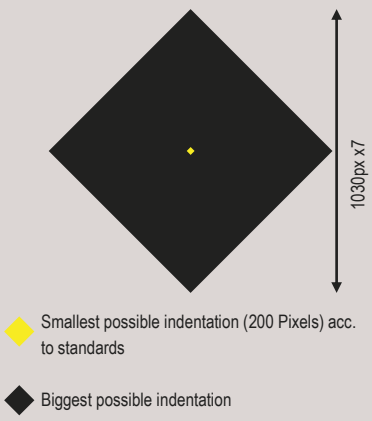
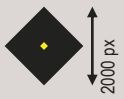
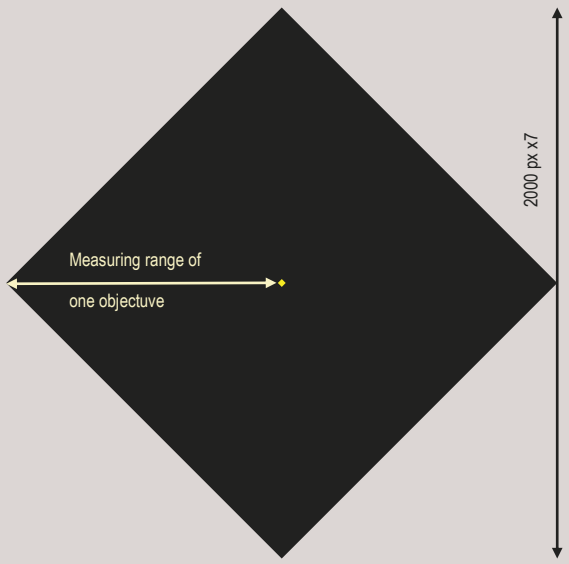
Time and cost saving

The KB optical zoom reduces costs since it can **replace up to 4 objectives.**

Testing according to standards DIN EN ISO and ASTM

The KB optical zoom allows testing acc.to standards of a **huge test load range.** The objective change falls away. By the use of the KB optical zoom a picture confirming to standards is always guaranteed.

Systematical display of the measuring ranges of the different cameras

1,3 Megapixels camera (1300x**1030** Pixel)		**5 Megapixels camera** (2500x**2000** Pixel)	
Without zoom	**With KB optical zoom 7x**	**Without zoom**	**With KB optical zoom 7x**
			

Overview optical measuring range with the 5 Megapixels camera

Hardness tester:	250		750		1000		3000	
	Min	Max	Min	Max	Min	Max	Min	Max
Optical measuring range **with digital zoom**								
4x objective Standard KB 750, 1000, 3000	HV 20 (100µm)	HB 5/250 (3800µm)	HV 20 (100µm)	HB 5/250 (3800µm)	HV 30 (140µm)	HB 10/1000 (5300µm)	HV 30 (140µm)	HB 10/3000 (5300µm)
10x objective Standard KB 250	HV 2 (60µm)	HB 2,5/187,5 (1500µm)	HV 2 (60µm)	HB 2,5/187,5 (1500µm)	HV 3 (56µm)	HB 5/750 (2100µm)	HV 5 (56µm)	HB 5/750 (2100µm)
20x objective	HV 0,5 (20µm)	HV 50 (750µm)	HV 0,5 (20µm)	HV 50 (750µm)	-	-	-	-
Optical measuring range **with optical zoom**								
4x objective Standard KB 1000, Standard 3000	800 HV 3 (85µm)	HB 5/250 (5000µm)	1200 HV 10 (120µm)	HB 5/750 (6000µm)	1200 HV 10 (120µm)	35 HB 10/1000 (6000µm)	1200 HV 10 (120µm)	95 HB 10/3000 (6000µm)
10x objective Standard KB 250, 750	750 HV 0,5 (35µm)	80 HB 5/250 (2500µm)	740 HV 1 (50µm)	143 HB 5/750 (2500µm)	740 HV 1 (50µm)	143 HB 5/750 (2500µm)	740 HV 1 (50µm)	143 HB 5/750 (2500µm)
20x objective	2000 HV 0,5 (17µm)	100 HV 50 (970µm)	1500 HV 0,5 (25µm)	140 HB 2,5/187,5 (1250µm)	1500 HV 0,5 (25µm)	140 HB 2,5/187,5 (1250µm)	1500 HV 0,5 (25µm)	140 HB 2,5/187,5 (1250µm)

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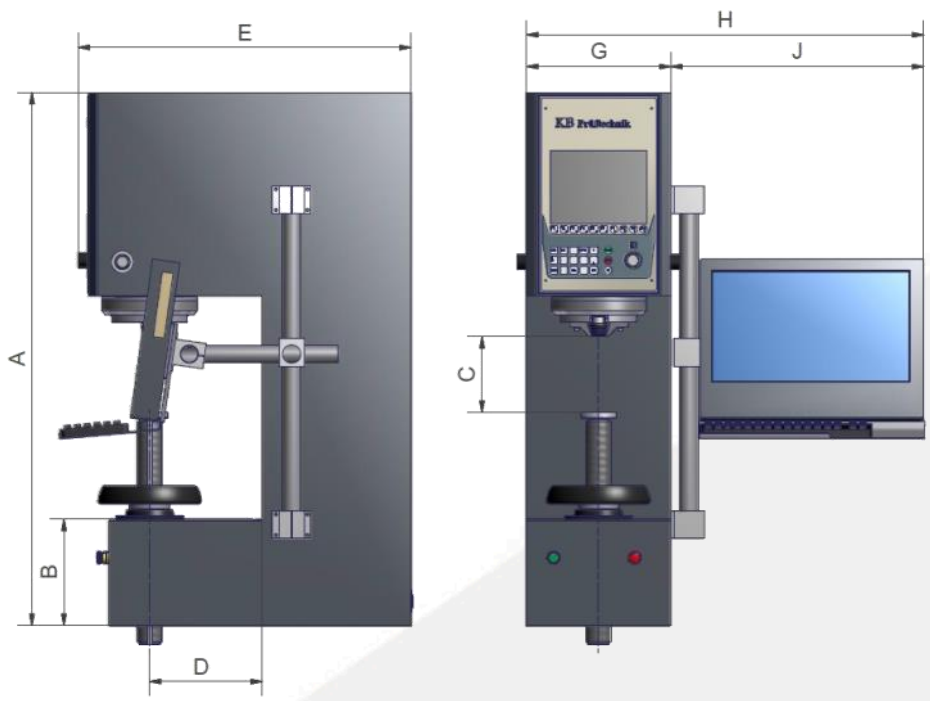
Machine Dimensions - Indication in [mm]

	KB 250 KB 750 KB 1000 Standard	KB 250 KB 750 KB 1000 Art. Nr.: 1228	KB 250 KB 750 KB 1000 Art. Nr.: 1630	KB 250 KB 750 KB 1000 Art. Nr.: 1394	KB 3000 Standard	KB 3000 Art. Nr.: 1254
A	1180	1430	1638	1738	1290	1645
B	232	232	232	232	282	282
C Test room height	**320*** **(270)**	**560*** **(510)**	**700*** **(650)**	**800*** **(750)**	**350*** **(295)**	**700*** **(645)**
D	250	250	250	250	250	250
E	736	736	735	735	797	797
G	320	320	320	320	334	334
H (flexible)	880-950	880-950	880-950	880-950	880-950	880-950
Weight	225 kg	240 kg	250 kg	255 kg	418 kg	443 kg

*Test room height C without spindle protection and X/Y stage, special dimensions on request.

Test room height C including standard test table.

() C including spindle protection.



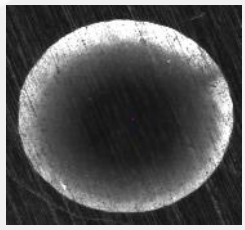
Technical Data

Hardness testing machine:	KB 250	KB 750	KB 1000	KB 3000
Max. sample weight	100 kg	100 kg	100 kg	250 kg
Max. sample weight incl. X/Y stage	25 kg	50 kg	25 kg	25 kg
Throat depth	250 mm	250 mm	250 mm	250 mm
Durability of the LED light	> 10 years	> 10 years	> 10 years	> 10 years
Magnification optical zoom	1:7 in 10 steps	1:7 in 10 steps	1:7 in 10 steps	1:7 in 10 steps
Weight without auto X/Y stage	ca. 235 kg	ca. 245 kg	ca. 250 kg	ca. 440 kg
Weight with auto X/Y stage	ca. 244 kg	ca. 268 kg	ca. 305 kg	ca. 495 kg
Supply voltage	230 VAC, 3 A	230 VAC, 3 A	230 VAC, 3 A	230 VAC, 3 A

Configuration levels and options

Legend	
Symbol	Meaning
-	Not applicable
X	Including
O	Option







	Video		SA		FA Basic		FA	
	KB 250-750	KB 1000-3000	KB 250-750	KB 1000-3000	KB 250-750	KB 1000-3000	KB 250-750	KB 1000-3000
Hardware								
5 Megapixels USB camera	X	X	X	X	X	X	X	X
Test table	Diameter 80 mm	Diameter 148 mm	Auto X/Y stage 180x180 mm movement	Auto X/Y stage 300x200 mm movement	Auto X/Y stage 180x180 mm movement	Auto X/Y stage 300x200 mm mo-	Auto X/Y stage 180x180 mm mo-	Auto X/Y stage 300x200 mm movement
Load range [kgf]	0,5 - 250 1 - 750	3 - 1000 5 - 3000	0,5 - 250 1 - 750	3 - 1000 5 - 3000	0,5 - 250 1 - 750	3 - 1000 5 - 3000	0,5 - 250 1 - 750	3 - 1000 5 - 3000
Optional load range (XL Last) [kgf]	0,2 - 187,5 0,3 - 250	-	0,2 - 187,5 0,3 - 250	-	0,2 - 187,5 0,3 - 250	-	0,2 - 187,5 0,3 - 250	-
Load step exten- sion	O	-	O	-	O	-	O	-
Option Rockwell	O	O	O	O	O	O	O	O
Software								
Auto measurement for Vickers and Knoop incl. light control and auto focus	O	O	O	O	X	X	X	X
Auto measurement for Brinell incl. light control and auto	O	X	O	X	X	X	X	X
Multi Sampling	-	-	O	O	O	O	X	X
Part recognition	-	-	O + Scanning	O + Scanning	O + Scanning	O + Scanning	X	X
Scanning	-	-	O + Auto focus	O + Auto focus	O	O	X	X
Auto focus	O	O	O	O	X	X	X	X
Manual CHD Test	O	O	-	-	-	-	-	-
Graphical Editor	-	-	X	X	X	X	X	X
Quick Link	-	-	O + Scanning	O + Scanning	O + Scanning	O + Scanning	X	X
Light Control	O	O	O	O	X	X	X	X
Welding Option	-	-	O + Scanning	O + Scanning	O + Scanning	O + Scanning	X	X
Geometrical Tools	-	-	O + Scanning	O + Scanning	O + Scanning	O + Scanning	X	X
Sinter	-	-	-	-	O	O	O	O
AMS interface	O	O	O	O	O	O	O	O

PRÜFTECHNIK

KB Prüftechnik GmbH - Your partner in matters of testing technology

The company KB Prüftechnik was founded in November 1997 by the former Wolpert development engineers Claus Keßler and Peter Beisel.

The acquisition of the hardness testing and pendulum department of the company Karl Frank happened in the year 1999.

The following years numerous modernizations of testing machines and new developments of hardness and spring testing machines with own machine control electronic and software were realized.

Since 2011 KB Prüftechnik GmbH receives its DAkkS certification ISO 17025.



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