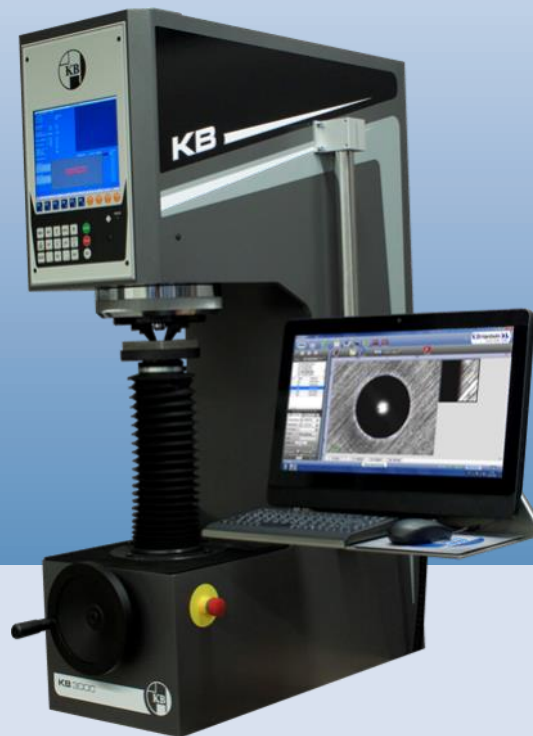




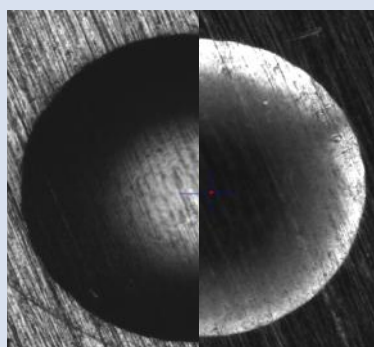
**KB 250-3000 Video, SA, FA
Hardness Testing from 0,2 kgf - 3000 kgf**



KB 750 FA



KB 3000



KB 250-3000

VIDEO, SA, FA

**Universal Hardness Testing
Machines**

KB 250

KB 750

KB 1000

KB 3000

Vickers




Knoop

Brinell

Rockwell

Super Rockwell

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

| VIDEO | SA (Semi Automatic) | FA (Fully Automatic) |
|---|---|---|
|  |  |  |
| Control via PC | Control via PC Motorized X/Y-table | Control via PC Motorized X/Y-table |
| 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 |

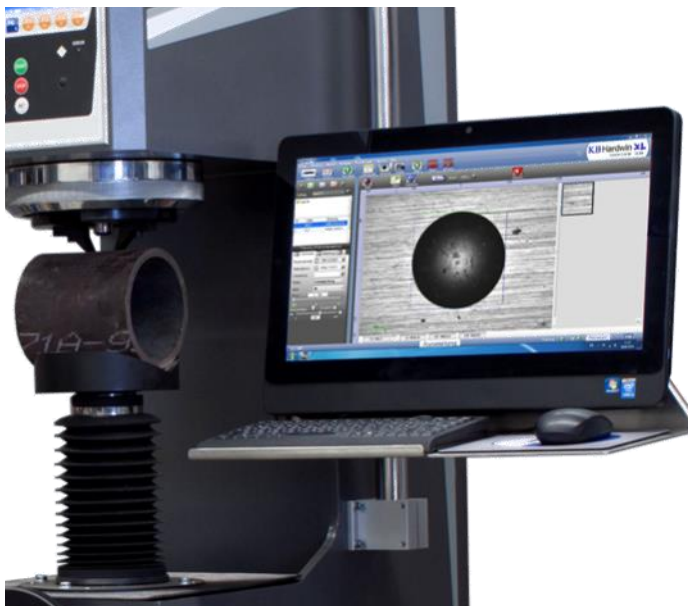
**KB Hardwin XL
BASIC**

**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



- 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
- Assistant for easy operation: Solve standard tasks quickly on your own
- Apply different magnifications and load steps in



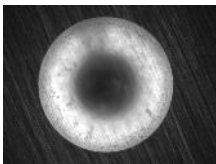
USB camera 5 Megapixels

The 5 Megapixels USB camera achieves high quality pictures which are needed for the auto measurement. The 5 Megapixels camera enlarges the optical measur-



Ring Light

- Unique display of the Brinell and Vickers indentations in the darkfield illumination.
- Der Eindruck wird hell und die Oberfläche dunkel dargestellt, die Randkante ist klar erkennbar
- Schnelle Überprüfung der Eindringkörperqualität für Vickers und Rockwell



Load step change during one test procedure

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

| | | Nr. | Härte | Methode | Umgewerte |
|-----------|---|-----|-------|---------|-----------|
| Messwerte | 1 | 450 | HV 5 | --- | --- |
| | 2 | 450 | HV 5 | --- | --- |
| | 3 | 457 | HV 5 | --- | --- |
| | 4 | 842 | HV 1 | --- | --- |
| | 5 | 717 | HV 1 | --- | --- |

Operating system

KB Hardwin XL supports Windows XP, Vista (32 bit), 7 (32 bit/ 64 bit) and 8. The use of a personal computer makes KB Hardwin XL network compatible.



Conversion tables

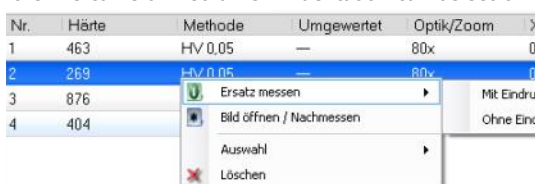
Conversion tables according to DIN 50150, DIN EN ISO 18265 (without copper conversion) and ASTM-140-T1-9

| | |
|-----|------------------|
| HB | Nmm ² |
| HRC | Nmm ² |
| HV | Nmm ² |

Post-editing and archive

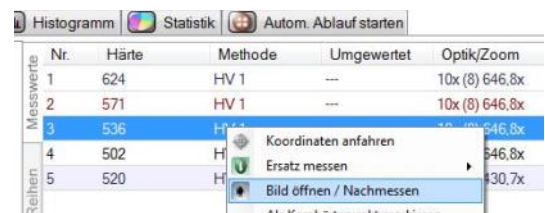
Measuring a substitution

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



Fast access on filed test orders

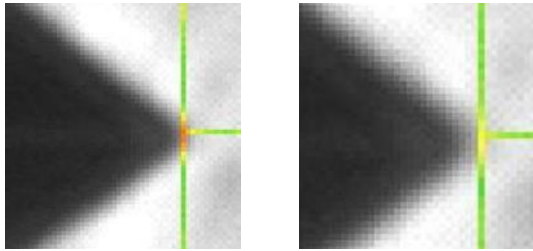
Pictures which belong to a previous test order can be re-addressed by one click.



Measurement

Operator independent manual measurement

Due to the pixel-precise display of the indentation picture and the coloured measuring marks each in-

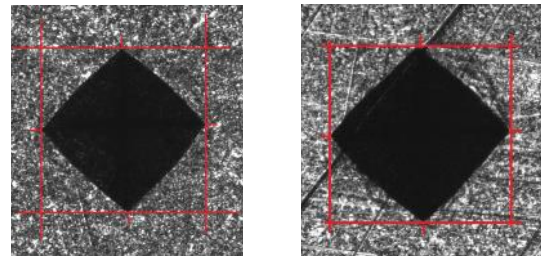


Red: too hard

Yellow: ok

The **improved automatic evaluation** is now even more precise especially on not good surfaces.

Etched, sintered or scratched samples cannot inter-

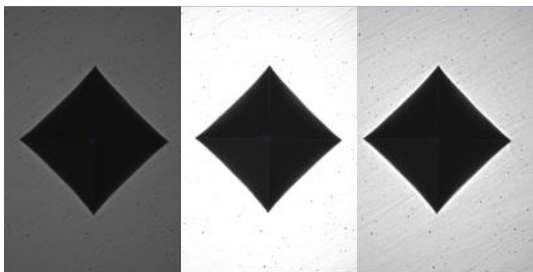


Etched surface

Scratched surface

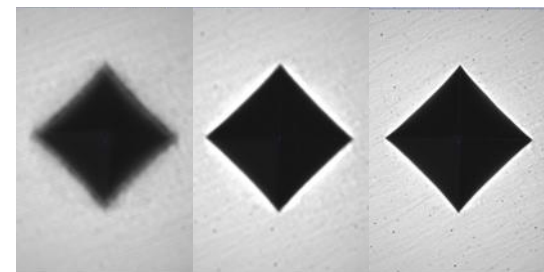
Automatic light control

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

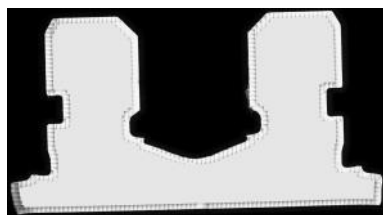
The KB auto focus works reliably, quickly and precisely. The correct position does not need to be set by the operator at first.



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

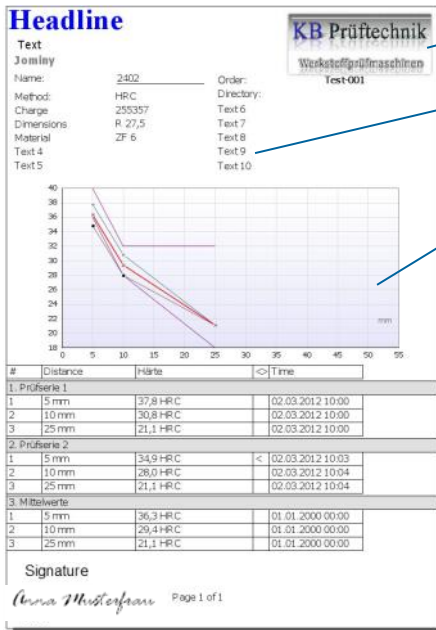
KB Hardwin XL supports bar code scanner as well as QR code scanner.

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

Diagrams and patterns can be integrated into the

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

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.

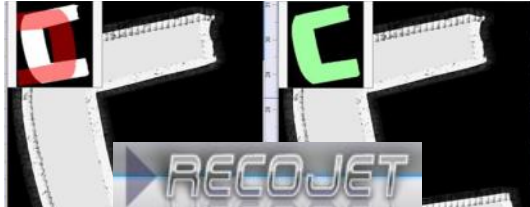


The measuring results will be exported and saved on the ERP server.



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


Magazine

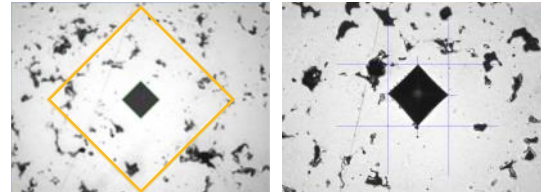
Customized magazine patterns can be programmed to test several samples of one kind.


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.


Sinter testing

- CHD tests on sinter material
- Average-values curve is supported
- Automatic elimination of minimum and maximum values
- Interactive elimination of disadvantageously set indentations
- Indentation coordinates will be interactively checked and can be corrected
- Visualisation of the expected indentation size and

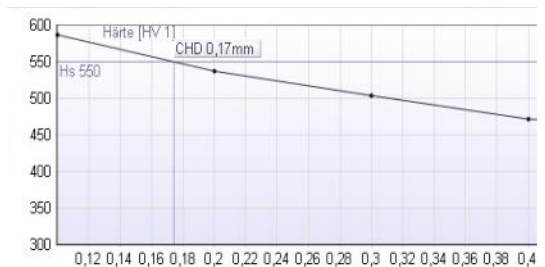

Quicklink

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


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.



Heat Exchanger

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



Supports

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



Automatischer Revolver

- 6 Positionen für 4 Eindringkörper und 2 Objektive
- Automatischer Wechsel von Eindringkörpern und Objektiven
- Spannkappe optional



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,

Indenters

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

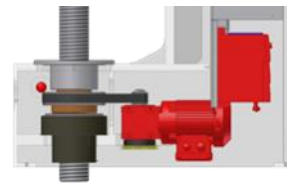


Test Room Extension

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

Motor Driven Spindle

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



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

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 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| KB 750 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| KB 1000 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| KB 3000 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |



Knoop acc. to DIN EN ISO 6505

| 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 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| KB 750 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| KB 1000 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| KB 3000 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |



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 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| KB 750 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| KB 1000 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| KB 3000 | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |

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

| |
|--------------------------|
| 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

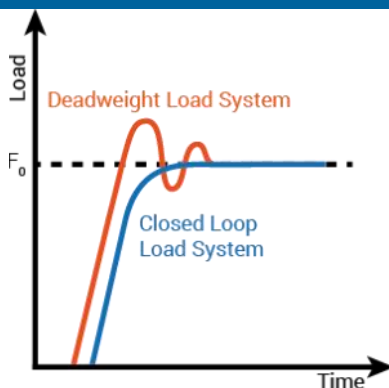
| | |
|---|-----------------|
| HRA- HRB- HRC- HRD- HRE- HRF- HRG- HRH- HRK- HRL- HRM- HRP- HRR- HRS- HRV | HR 15/ 30/ 45 W |
|---|-----------------|



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

| | |
|-----------------|-----------------|
| 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

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.

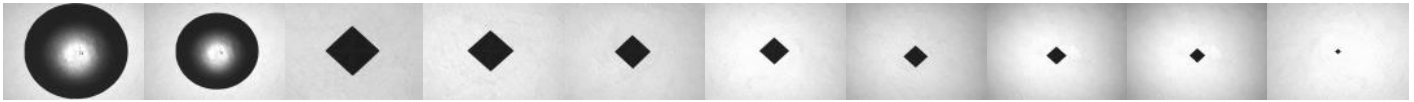
Load application time: Flexible and according to the standard

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 con-

KB optical zoom



Optical magnification

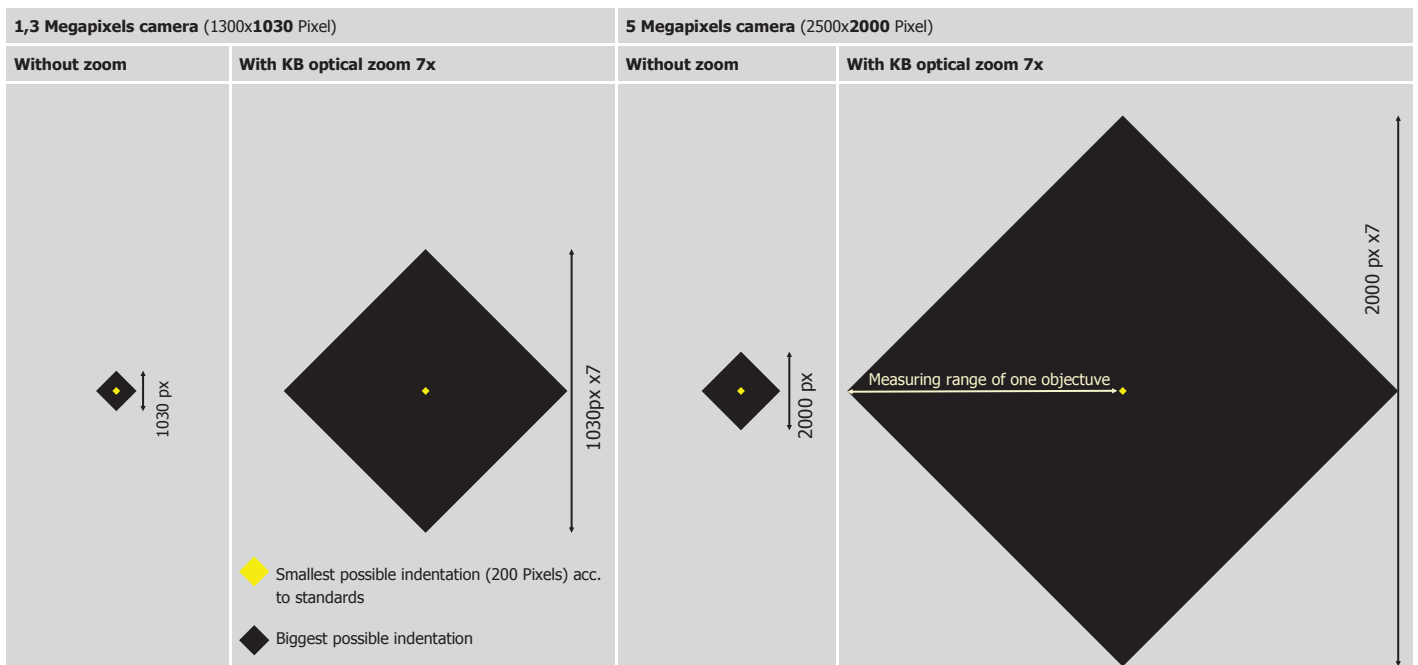
The KB 250 MSHR is optionally equipped with the **KB optical zoom** (1:7 magnification in 10 steps). The optical zoom enlarges optically, not digitally. This allows a high picture quality, even in big magnifications.

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

Systematical display of the measuring ranges of the different cameras



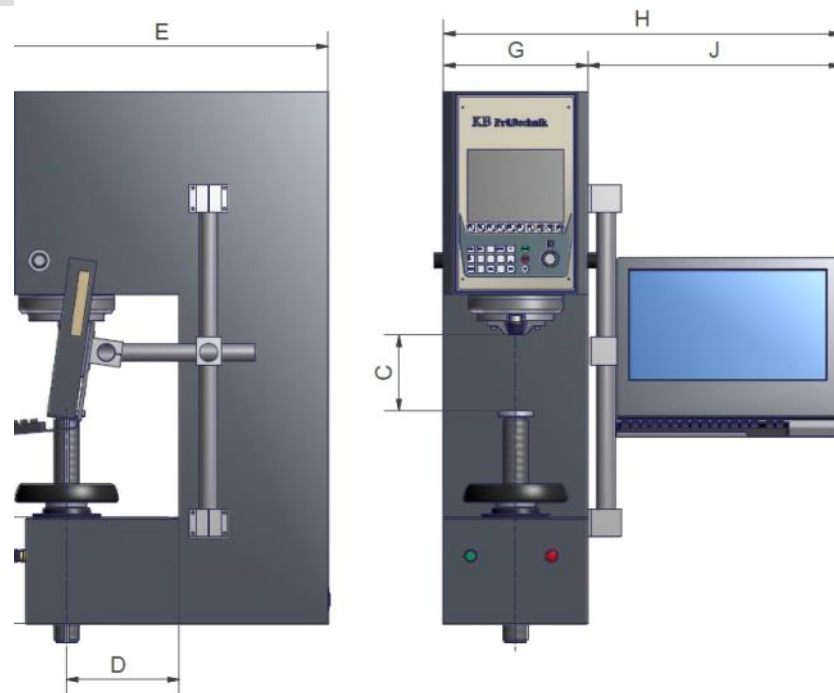
Overview optical measuring range with the 5 Megapixels camera

| 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, 3000 | HV 10 (120µm) | HB 5/250 (6000µm) | HV 10 (120µm) | HB 5/750 (6000µm) | HV 10 (120µm) | HB 10/1000 (6000µm) | HV 10 (120µm) | HB 10/3000 (6500µm) |
| 10x objective Standard KB 250, 750 | HV 1 (48µm) | HB 5/250 (2547µm) | HV 1 (48µm) | HB 5/250 (2547µm) | HV 1 (48µm) | HB 5/250 (2547µm) | HV 1 (48µm) | HB 5/250 (2547µm) |
| 20x objective | HV 0,2 (24µm) | HB 2,5/187,5 (1273µm) | HV 0,2 (24µm) | HB 2,5/187,5 (1273µm) | HV 0,2 (24µm) | HB 2,5/187,5 (1273µm) | HV 0,2 (24µm) | HB 2,5/187,5 (1273µm) |

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 | 1180 | 1180 | 1180 | 1285 | 1285 |
| B | 232 | 232 | 232 | 232 | 270 | 270 |
| C Test room height | 320* | 560* | 700 | 800* | 350* | 700* |
| D | 250 | 250 | 250 | 250 | 250 | 250 |
| E | 735 | 735 | 735 | 735 | 765 | 765 |
| 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 |

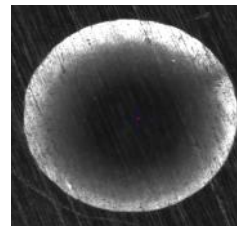
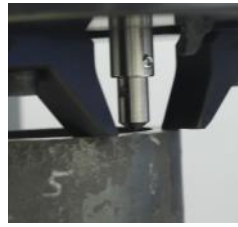
*Test room height C without spindle protection and X/Y stage, special dimensions on request.
Test room height C including standard test table.


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 | 10 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. 360 kg |
| Supply voltage | 230 VAC, 3 A | 230 VAC, 3 A | 230 VAC, 3 A | 230 VAC, 3 A |

Ausstattungsvarianten und Optionen

| 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 movement | Auto X/Y stage 180x180 mm movement | 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 | 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 extension | 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 focus | 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 |

Your Representative



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KB 250-3000 Video, SA, FA-eng-10-2016

Information under reserve.