Micro-Vickers
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Micro-Vickers Hardness Testing Machines HM-211/221

Series 810

- The latest electromagnetic force motor used in the loading mechanism enables the test force to be freely selected (see test force specifications over the wide range of 0.4903 mN to 19610 mN). It is also possible to freely set the time for loading and load dwell time. Now your desire for absolute control over the indentation size in Vickers hardness testing can be satisfied. The HM-200 series always offers the test force most appropriate for the specimen material and shape.
- It is possible to perform not only the Vickers hardness test but also a fracture toughness test (IF test : JIS R 1607-1995) on ceramics.
- The objectives used enable a very comfortable working distance between the objective and the specimen surface. This greatly reduces the possibility of collision between the specimen and the objective during focusing operations (e.g. 1.1 mm for 50X objective).
- The contrast that is most appropriate for the magnification of the objective can be obtained by manipulating the variable aperture stop in the illumination unit. This makes the indentations clearly visible, leading to less variation and reducing the chance of error when measuring the diagonal lengths.

810-353D
Sensor and monitor as optional accessories

Specifications

Test force generation	Electromagnetic
Load control	Automatic (load, dwell, unload)
Load dwell time	1-999 sec (1 sec increment)
Working distance	10X = 5,6 mm 50X = 1,1 mm 100X = 2,5 mm
XY stage	**Stage size** : 100 x 100 mm **Travel range :** 25 x 25 mm with digimatic micrometer heads **Resolution** : 0,001 mm
Max. specimen height	133 mm
Max. specimen depth	160 mm (from the centre of the indenter shaft)
Max. specimen weight	20 kg (table and vice included)
Indenter / Objective turret	Motor driven and manual operation
Indenter mounting	2 positions
Objective mounting	4 positions
Optical path	2-way (measurement / exposure)
Resolution	0.01 µm
Data output	RS-232C, Digimatic code (SPC) and Centronics
Power supply	100/120/220/240V AC, 50/60Hz
Dimensions (W x D x H)	400 x 640 x 600 mm
Mass	43 kg

Standard accessories

No.	Description
02DEA471	Dust cover
11BAA961	Rubber hood for eyepiece
19BAA058	Diamond indenter low force
19BAA059MPA	Diamond indenter
19BAA207	Halogen illumination lamp (12V/50W)
19BAA407	Objective 10X
19BAA440	100X Objective for HM-221
19BAA522	Camera mount adapter
810-016	Vice, max. 45mm groove width
810-074	XY Stage (digital type)
810-617	Objective 10X
938882	Battery SR44
938905	Optical filter - Green
HPHMV	Diamond Indenter for Vickers

Hardness test block 700 HV0.3 is standard accessory.
For a list of optional accessories, refer to the following page.

Power turret with 2 indenter mounts and 4 objective mounts (manual operation possible)

Touch-screen type control panel

Model	HM-211	HM-221
No.	**810-352D**	**810-353D**
No. UK only	**810-352E**	**810-353E**
Fixed test force	**98.07 ; 196.1 ; 294.2 ; 490.3 ; 980.7 ; 1961 ; 2942 ; 4903 ; 9807 mN**	**0.4903 ; 0.9807 ; 1.961 ; 2.942 ; 4.903 ; 9.807 ; 19.61 ; 29.42 ; 49.03 ; 98.07 ; 196.1 ; 294.2 ; 490.3 ; 980.7 ; 1961 ; 2942 ; 4903 ; 9807 ; 19610 mN**
Arbitrary test force (One type of setting can be saved)	- Test force of 980.7 mN or less can be set in increments of 9.807 mN - Test force of 980.7 mN or more can be set in increments of 98.07 mN	- Only a test force of 0.4903 mN is available below 0.9807 mN - Test force of 9.807 mN or more and below 980.7 mN can be set in increments of 9.807 mN - Test force of 980.7 mN or more can be set in increments of 98.07 mN
Positioning speed	2-60 µm/s (1 second steps)	60 µm/s (only from a test force of 294.32 x 10^{-3} N)
Control unit	Touch-screen type	Touch-screen type
Indenter mounts	2 (Vickers indenter is standard accessory)	2 (Vickers indenter is standard accessory)
Objective mounts	4 (10X and 50X are standard accessories)	4 (10X, 50X and 100X are standard accessories)

Micro-Vickers Hardness Testing Machines HM-211/221

Series 810

System Upgrade Possibilities for HM-211 and HM-221

Video camera unit

When integrated with the HM-200 series, this unit can reduce operator errors in measurement made by eye.

Auto-measuring unit

When integrated with the HM-200 series, this unit helps reduce operators errors in measurement as it automatically measures the indentation diagonal and calculates the hardness value.

Auto-position unit

When integrated with the HM-200 series combined with the automeasuring unit, this unit can achieve both enhanced measurement efficiency and reduced measurement variation due to operator errors at the same time, thanks to the automatic indentation reading function which is helpful for multiple point measurement of hardness.

Auto-measuring unit, Auto-position unit and Auto-focus unit (1)

When integrated with the HM-200 series, combined with the automeasuring unit and the auto-position unit, this unit allows all the necessary operations of hardness testing to be automatically and speedily performed.

(1) factory-installed option

No.	Model
810-354*	Video camera unit
810-355-1*	Auto-measuring unit
810-356*	Auto-positioning unit
810-357*	Auto-focusing unit
810-870*	Heated Specimen Table HST-250

Optional accessories

No.	Description
19BAA061	Knoop indenter for HM-211
19BAA062	Knoop indenter for HM-221
810-018	Rotary table
810-641	Vibration damping stand
Computer accessories	
11AAA002	EXPAK data processing program
936937	Data cable (1 m)
965014	Data cable (2 m)
264-504-5D	Digimatic Mini-Processor
264-504-5E	Digimatic Mini-Processor
810-312-12D	VLPAK2000 for Vickers Hardness
810-312-2D	VLPAK2000 for Micro-Vickers Hardness
Hardness Test Blocks	
19BAA001	Hardness test block (100HV)
19BAA002	Hardness test block (200HV)
19BAA003	Hardness test block (300HV)
19BAA004	Hardness test block (400HV)
19BAA005	Hardness test block (500HV)
19BAA006	Hardness test block (600HV)
19BAA007	Hardness test block (700HV)
19BAA008	Hardness test block (800HV)
19BAA009	Hardness test block (900HV)
19BAA010	Hardness test block (40HV)
Holders	
810-013	Thin plate holder
810-014	Wire holder horizontal
810-015	Wire/ball holder vertical
810-017	Vice, max. 100mm groove width
810-019	Special vice, swivelling groove width 37 mm
810-020	Universal specimen holder up to 30 mm
810-084	Rotary universal specimen holder
810-085	Adjustable thin plate holder, sheet metal length 56 mm
Objectives	
19BAA440	100X Objective for HM-221
810-616	Objective 5X
810-618	Objective 20X

Hardness Testing Machines brochure on request

Micro-Vickers Hardness Testing Machines HM-101/102/103/112/113

Series 810

- The load time can be set in 1 second increments between 5 and 99 seconds (HM-112 / 113).
- A measuring resolution of 0,01 µm is provided that allows small indentations to be measured with high precision.
- Hardness tester according to DIN EN ISO 6507 and JIS B7725.
- Micro-Vickers hardness tester with Vickers test from HV 0.01 - HV 1.
- Up to 3 objectives can be connected that can all be used for indent measurement (except HM-101).
- A Knoop indenter can also be connected.
- Manual lens system switch.

Specifications

Test force range	**98.07 / 245.2 / 490.3 / 980.7 / 1961 / 2942 / 4903 / 9807 mN**
Loading accuracy	1% (forces less than 9.807 mN are ignored)
Load control	Automatic (load, dwell, unload)
XY stage	**Stage size** : 100 x 100 mm **Travel range** : 25 x 25 mm, with micrometer heads **Resolution** : HM-101 / 102 / 103 = 0,01 mm HM-112 / 113 = 0,001 mm
Graduation	0,01 mm
Max. specimen height	95 mm
Max. specimen depth	150 mm (from the centre of the indenter shaft)
Observation by	Micrometer eyepiece
Indenter / Objective turret	Manual type
Lens system	10X, 50X
Magnification	100X, 500X
Optical path	2-way (measurement / exposure)
Data output	RS-232C, Digimatic code (SPC) and Centronics
Power supply	100/120/220/240V AC, 50/60Hz
Dimensions (W x D x H)	410 x 600 x 590 m
Mass (main unit)	42 kg

Standard accessories

No.	Description
19BAA058	Diamond indenter low force
19BAA109	Dust protection cover
810-011	Rotary table
810-016	Vice, max. 45mm groove width
810-074	XY Stage (digital type)
810-617	Objective 10X
810-619	Objective 50X

Hardness test block 700 HV0.3 is standard accessory.

Optional accessories

No.	Description
810-012	50 x 50 mm travel XY stage
810-013	Thin plate holder
810-014	Wire holder horizontal
810-015	Wire/ball holder vertical
810-017	Vice, max. 100mm groove width
810-018	Rotary table
810-019	Special vice, swivelling groove width 37 mm
810-020	Universal specimen holder up to 30 mm
810-084	Rotary universal specimen holder
810-085	Adjustable thin plate holder, sheet metal length 56 mm
810-641	Vibration damping stand
Objectives	
810-616	Objective 5X
810-618	Objective 20X
810-620	Objective 100X

For a list of available hardness testing blocks and computing tools, refer to the HM-211/221 page.

HM-101
Economical manual type

HM-112
Digital display of measurement results and a statistical calculation function

Model	HM-101	HM-102	HM-103	HM-112	HM-113
No.	**810-124D**	**810-125D***	**810-959D***	**810-126D**	**810-969D***
No. UK only	**810-124E**	**810-125E**	**810-859E**	**810-126E**	**810-969E**
Load dwell time	5-30 sec	5-60 sec	5-60 sec	5-99 sec	5-99 sec
Control unit	-	Membrane switch type	Membrane switch type	Touch-screen type	Touch-screen type
Video monitor	-	-	9" B&W	-	9" B&W
Indenter mounts	1	1	1	1	1
Objective mounts	1 (observation, 1 (measurement)	2 (measurement)	2 (measurement)	2 (measurement)	2 (measurement)
Resolution	0,2 µm	0,1 µm	0,1 µm	0,1 µm	0,1 µm
Reading of hardness values	at Vickers table	at Vickers table	at Vickers table	via "Touch Screen"	via "Touch Screen"

Hardness Testing Machines brochure on request

Vickers Hardness Testing AVK-C0

Series 810

- A range of test force from 9.807 N to 490.3 N is available for measuring various types of specimen.
- A measuring resolution of 1 µm is provided that allows small indentations to be measured with precision.

810-160D

Model	AVK-CO
No.	**810-160D***
No. UK only	**810-160E**
Test force range	**9.807 ; 49.03 ; 98.07 ; 196.1 ; 294.2 ; 490.3 N**
Indenter / Objective turret	Manual operation
Indenter mounts	1
Objective mounts	1 (measurement)

Specifications

Loading accuracy	±1%
Load control	Automatic (load, dwell, unload)
Load dwell time	5, 10, 15, 20, 30 seconds
Max. specimen height	205 mm
Max. specimen depth	165 mm (from the centre of the indenter shaft)
Observation by	Micrometer eyepiece
Lens system	10X
Magnification	100X
Optical path	Single way
Resolution	1 µm
Power supply	100/120/220/240V AC, 50/60Hz
Dimensions (W x D x H)	245 x 515 x 770 mm
Mass	45 kg

Standard accessories

No.	Description
19BAA110	Plastic cover
19BAA114	Power cord
19BAA134	Camera adapter
810-039	Flat table Ø64 mm
810-040	V-anvil ø40mm, 120°
810-041	V-anvil ø40 mm, 90°
810-064	Objective 10X

Hardness test block 700 HV, diamond indenter and split level are standard accessories.

Optional accessories

No.	Description
810-012	50 x 50 mm travel XY stage
810-037	Round table Ø180 mm
810-038	Round table Ø250 mm
810-640	Vibration damping stand
Hardness test blocks	
19BAA011	Hardness test block (200HV)
19BAA012	Hardness test block (300HV)
19BAA013	Hardness test block (400HV)
19BAA014	Hardness test block (500HV)
19BAA015	Hardness test block (600HV)
19BAA016	Hardness test block (700HV)
19BAA017	Hardness test block (800HV)
19BAA018	Hardness test block (900HV)
Indenters	
19BAA060MPA	Diamond indenter (incl. MPA certificate)
19BAA063	Knoop diamond indenter
Objectives	
810-063	Objective 5X
810-065	Objective 20X
810-066	Objective 40X
Vices	
810-016	Vice, max. 45mm groove width
810-017	Vice, max. 100mm groove width

Hardness Testing Machines brochure on request

Vickers Hardness Testing HV-112/113/114/115

Series 810

- A wide range of test force from 1.961 N to 490.3 N is available for measuring various types of specimen.
- The load dwell time can be set in 1 second increments between 5 and 99 seconds.
- A measuring resolution of 0,1 µm is provided that allows small indentations to be measured with high precision.

Specifications

Loading accuracy	±1%
Load control	Automatic (load, dwell, unload)
Load dwell time	5-99 s (1 s increments)
Max. specimen height	210 mm
Max. specimen depth	170 mm (from the centre of the indenter shaft)
Observation by	Micrometer eyepiece
Lens system	10X, 20X
Magnification	100X, 200X
Optical path	Split two ways for video monitoring and photography
Resolution	0,1 µm
Data output	RS-232C, Digimatic code (SPC) and Centronics
Power supply	100/120/220/240V AC, 50/60Hz
Dimensions (W x D x H)	**Main unit :** 245 x 515 x 770 mm **Control unit :** 165 x 260 x 105 mm
Mass	**Main unit** : 50 kg

Standard accessories

No.	Description
19BAA110	Plastic cover
19BAA114	Power cord
19BAA445	Camera-Adapter for CCD-Camera
810-039	Flat table Ø64 mm
810-040	V-anvil ø40mm, 120°
810-041	V-anvil ø40 mm, 90°
810-086	Digital microscope (for HV112-114)
810-617	Objective 10X
810-618	Objective 20X

Hardness test block 700 HV, diamond indenter and split level are standard accessories.

Optional accessories

No.	Description
810-012	50 x 50 mm travel XY stage
810-037	Round table Ø180 mm
810-038	Round table Ø250 mm
810-640	Vibration damping stand
HPHK	Diamond Knoop indenter
HPHV	Diamond indenter (UKAS certificate)
Objectives	
810-616	Objective 5X
810-619	Objective 50X
Vices	
810-016	Vice, max. 45mm groove width
810-017	Vice, max. 100mm groove width

Hardness test blocks 200 HV, 300 HV, 400 HV, 500 HV, 600 HV, 700 HV, 800 HV and 900 HV are optional accessories.
Diamond indenters are optional accessories.
For a list of computer accessories, refer to HM-211/221 series.

Hardness Testing Machines brochure on request

810-163D

810-985D

Model	HV-112	HV-113	HV-114	HV-115
No.	**810-163D**	**810-981D**	**810-165D**	**810-985D**
No. UK only	**810-163E**	**810-981E**	**810-165E**	**810-985E**
Test force range	**1.961 ; 2.942 ; 4.903 ; 9.807 ; 24.51 ; 49.03 ; 98.07 ; 196.1 N**	**1.961 ; 2.942 ; 4.903 ; 9.807 ; 24.51 ; 49.03 ; 98.07 ; 196.1 N**	**9.807 ; 19.61 ; 29.42 ; 49.03 ; 98.07 ; 196.1 ; 294.2 ; 490.3 N**	**9.807 ; 19.61 ; 29.42 ; 49.03 ; 98.07 ; 196.1 ; 294.2 ; 490.3 N**
Control unit	Touch-screen type	Touch-screen type	Touch-screen type	Touch-screen type
Video monitor	-	9" B&W	-	9" B&W
Indenter / Objective turret	Motor driven	Motor driven	Motor driven	Motor driven
Indenter mounts	1	1	1	1
Objective mounts	2 (measurement)	2 (measurement)	2 (measurement)	2 (measurement)

Control unit

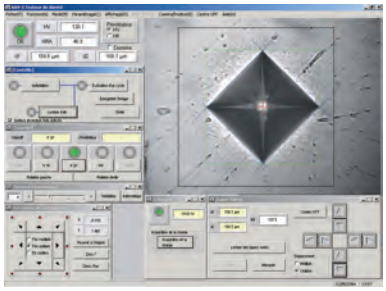
- Back-lit LCD graphic display for Indentation size (D1 and D2)
Hardness value and scale
Number of measurement points
Test conditions (HV/HK indenter type, test force, load dwell time),
GO/NG tolerance judgement,
Cylindrical and spherical surface compensation offset
- Remote control of power turret
- Conversion to other hardness scales
- Statistical processing

VLPAK2000 Software

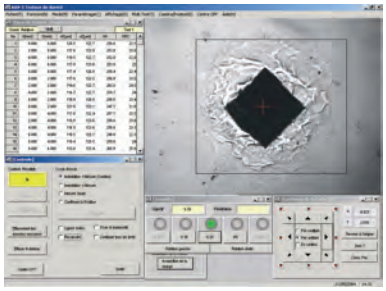
Series 810

Auto-Reading Measuring Program

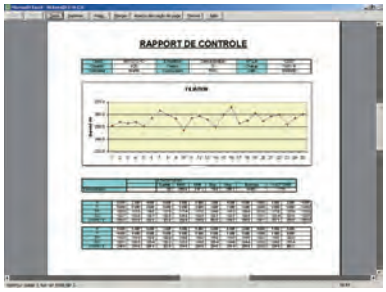
- In hardness measurement the diagonal lines of the indentations must be mesured on the TV monitor, which often results in varying measurements taken by different individuals. It also makes it difficult to save labour and increase efficiency.
- The high-speed auto-reader captures the indentation image and displays the hardness result in just 0.3 seconds, so the otherwise lengthy measuring work is performed quickly and more accurately.
- Complex, multi-point measurement is performed with ease.

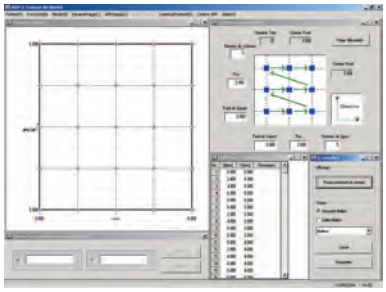


Setting measurement parameters



Results of measurement





No.	Model
810-312-12D	VLPAK2000 for Vickers Hardness
810-312-2D*	VLPAK2000 for Micro-Vickers Hardness

Specifications

Impression pattern generation	Line, zigzag, zigzag 3 points, matrix, arc of circle, random, training, compound.
Settings	Start position, angle correction, direction and position of edge
Automatic indentation measurement	**HV** (Vickers) and **HK** (Knoop)
Measurement method	Quadratic curve regression
Measurement time	0.3 seconds
Measurement repeatability	±0.5% (0,1 µm) (objective lens 50X, diagonal line 11-45 mm, 500 HV)
Automatic reading repetition	1-99 times
Manual measurement	By 4 filar lines superimposed on image
Manual measurement method	Video line measurement of HV (Vicker) and HK (Knoop), by clicking on displacement icons, by clicking on the lines.
Conversion	**Hard steel :** HV, HK, HS, TENS, HRA, HRC, HRD, HR15N, HR30N, HR45N **Soft metal :** HV, HK, TENS, HRA, HRF, HRB, HRG, HR15T, HR30T, HR45T **OK/NG judgement :** Calculated at measurement
Tolerance and Image storage	Specified individually
Calibration	To ISO 6507 and ASTM E92 calibration standard test blocks
Centre marker	Display function ON/OFF
Measurement data save	Saved in text format (CSV format), Can be processed with data processing macros
Password protection	On parameter setting
Functions	Power turret control, Test force dwell time control (5 to 99 seconds), Illumination level switch (15 levels), Loading speed level switch (4 levels), Indentation control.

AT-400

Series 810

Auto-Reading Hardness Testing System with automatic XY stage

- The VLPAK2000 auto-reading measuring program automatically reads the lengths of the indentation's diagonals and converts the result to a hardness value, thereby reducing operator-dependent measurement error. Moreover, this program's automatic high-speed reading function requires only 0.3 seconds to determine hardness, which significantly improves work efficiency in hardness measurement.
- The movement pattern of the XY stage can be set to line, zigzag, matrix, circle, random or combination.
- The learn function allows part programs to be easily created.
- Measurement conditions, positional data and evaluation curves can be displayed on the monitor.

Specifications

Automatic XY stage	**Movement range** 50.8 x 50.8 mm
	Minimum pitch 0,001 mm
	External dimensions 240 x 240 x 65 mm
	Measurement pattern Line, Staggered, 3-point staggered, Matrix, Circle / arc, Random pattern, Teaching pattern, Combination pattern.
	Setting point count Max. 1000 points
Auto-reading function	Refer to VLPAK2000 specifications

812-314-2D

Model	AT-400 (Micro-Vickers hardness)	AT-400 (Vickers hardness)
No.	**810-314-2D***	**810-314-12D**
No. UK only	**810-314-2E**	**810-314-12E**
For use with	Micro-Vickers hardness models	Vickers hardness models

AAV-500

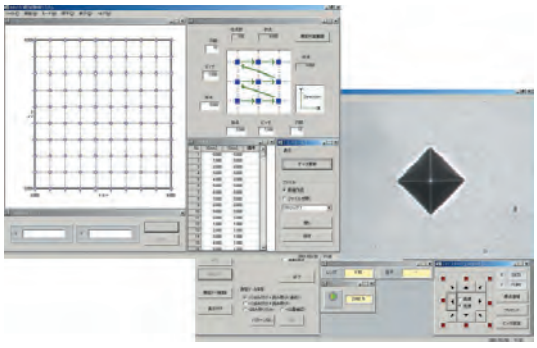
Series 810

Automatic Vickers Hardness Testing System

- This system can perform all operations required in the Vickers and Knoop hardness tests such as loading, turret indexing, focusing, indentation measurement, and measurement position movement in full automatic, so it is optimal for the labour-saving requirements of your test environment.
- An indentation-dimension automatic measuring time of 0.3 second is achieved (when a PC with recommended specifications is used), which dramatically improves operational efficiency.
- Measurement reproducibility of ±0.5% is achieved (for objective lens 50X, diagonal line 11 to 45 mm, and 500HV), which provides reliable and stable test results.
- All operations from test condition setting to test result analysis can be performed on a Windows PC. In addition, data processing for the test results can be performed by using spreadsheet software.
- The AAV-500 series reduces individual differences in indentation dimension measurement in the Vickers hardness test by adopting special image analysis technologies. In addition, improved precision and high speed have been realized with a measuring time of just 0.3 second.

810-727D

Model	AAV-503	AAV-504
No.	**810-727D***	**810-728D***
No. UK only	**810-727E**	**810-728E**
Test force range	**1.961-196.1 N**	**9.807-490.3 N**
Test force switching	Manual	Manual



Specifications

Objectives	10X, 20X
Measurable indentation size	40-400 / 20-100 µm
Automatic indentation measurement	**- Measurement reproducibility** ±0.5% (0,1 µm) **- Measurement method** Quadratic curve regression **- Measuring time** 0.3 second **- Resolution** 0,1 µm
Manual measurement function	Measurement method with video line
Automatic XY stage	**- Stage area** 130 x 130 mm **- Movement range** 50 x 50 mm **- Minimum step** 1 µm
Software functions	**- Measurement pattern** Line, Staggered, 3-point staggered, Matrix, Circle / arc, Random **- Teaching measurement pattern setting** **- Hardness calculation function** **- Hardness conversion function** **- OK/NG judgement**
Analysis software functions	Device condition display, Measurement data display, Statistical calculation, Graph display
Dimensions (W x D x H)	665 x 516 x 1000 mm
Mass	91 kg
Standard accessories	Hardness testing machine, PC-AT drive, PC, Power Turret, XY automatic stage, Auto Focus (AF) stage, Control/Analysis software; Joystick box, Keyboard, Mouse.

Wizhard Rockwell, Rockwell Superficial, Brinell Hardness Testers HR-500 Series

Series 810

- Multiple test force generation for Rockwell, Rockwell Superficial and Brinell hardness.
- Dolphin-nose indenter arm for easy reach of interior (min. ø40 mm / ø22 mm, when using an optional diamond indenter) and exterior surfaces.
- Real-time electronic test force control for accurate loading. This perfectly eliminates load force overshoot.
- Indenter escape function for continuous testing at fixed table position. This eliminates instability caused by table retraction.
- Auto-stop table elevation and automatic preloading provide stable test force generation.

Specifications

Preload force	29.42 N, 98.07 N
Test force	**Rockwell Superficial** 147.1 / 294.2 / 441.3 N **Rockwell** 588.4 / 980.7 / 153.2 / 245.2 / 294.2 N **Brinell** (1) 61.29 / 98.07 / 153.2 / 245.2 / 294.2 / 306.5 / 612.9 / 980.7 / 1226 / 1839 N (1) HR-511, HR-522 : 1839 N only
Test force setting	By control unit
Load control	Automatic (load, dwell, unload)
Load dwell time	0-120 s (1 s increments)
Max. specimen height	205 mm (for standard flat anvil)
Max. speciment depth	150 mm (from the centre of the indenter shaft)
Internal diameter	Minimal bore diameter : 35 mm (22 mm with a special indenter)
Measurement Conversion to other hardness scales (2)	HV, HK, HRA, HRB, HRC, HRD, HRF, HRG, HR15T, HR30T, HR45T, HR15N, HR30N, HR45N, HS, HB, HBS, tensile strength (2) except HR-511
Statistical functions	**All models :** Number of values, Max., Min., Average value, Range, Upper and lower limit, Standard deviation, Number of GO/NG evaluations, Storage of 1024 values, OFFSET, Hardness value, Test condition, Continuous measurement. **HR-521/2/3 :** X-R control card, Editing of 1024 values, Hardness conversion value, Statistical results, Cylindrical, spherical and multipoint correction.
Data output	RS-232C, Digimatic code (SPC) and Centronics
Power supply	100/120/220/240V AC, 50/60Hz
Dimensions (W x D x H)	**Main unit** 250 x 670 x 605 mm **Control unit** 165 x 260 x 105 mm
Mass (main unit)	65 kg
Accessories	For a detailed list of standard and optional accessories, refer to the following page.

HR-511

HR-521

HR-523

Model	HR-511	HR-521	HR-522	HR-523
No.	**810-208D**	**810-202D**	**810-203D**	**810-204D**
No. UK only	**810-208-01E**	**810-202-01E**	**810-203-01E**	**810-204-01E**
Control unit	Membrane switch type	Touch-screen type	Touch-screen type	Touch-screen type
Stage elevation	Manual (with automatic brake)	Manual (with automatic brake)	Manual (with automatic brake)	Power drive
Table movement	Manual	Manual	Fully automatic	Fully automatic
Tolerance evaluation	●	-	-	-

Wizhard Rockwell, Rockwell Superficial, Brinell Hardness Testers HR-500 Series

Series 810

Additional product description and accessories for HR-500 series

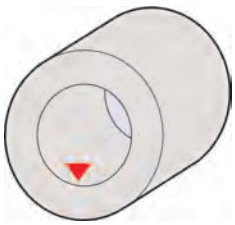
Control units

Membrane-switch type

- Membrane-switch operation with LED display.
- Remote selection of the test force linked to the hardness scale selection.
- Powerful statistical processing and 1024 data memory.
- Data offset.
- OK/NG tolerance judgement.
- Statistical processing

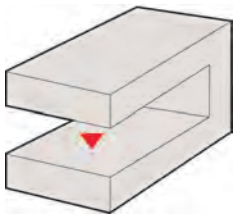
Touch-screen type

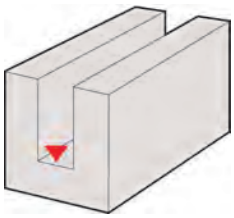
- Touch-screen operation with a back-lit LCD graphic display.
- Remote selection of the test force linked to the hardness scale selection.
- Choice of message language in English, French, German, Italian, Japanese and Spanish for user-friendly operation.
- Cylindrical and spherical surface compensation.
- Data offset.
- Conversion to other hardness scales.
- Powerful statistical processing with flexible data point editing and 1024 data memory.
- Measurement data editing.



Various shapes of specimen can be tested (a dolphin-nose type indenter mechanism has been adopted).

The dolphin-nose indenter mechanism allows internal measurement of pipe samples as well as the top surface of a flat sample.





Standard accessories

No.	Description
19BAA517	Dust protection cover
810-039	Flat table Ø64 mm
810-040	V-anvil ø40mm, 120°

Hardness test blocks, Diamond indenter, steel balls and split level are standard accessories.

Optional accessories

No.	Description
Anvils	
810-029	V-anvil length 400 mm, groove width 50 mm, 120°
810-030	Point anvil (diamond tipped for Rockwell Superficial)
810-037	Round table Ø180 mm
810-038	Round table Ø250 mm
810-040	V-anvil ø40mm, 120°
810-041	V-anvil ø40 mm, 90°
810-042	V-anvil Ø10 mm, 120°
810-043	Point anvil (Ø12 mm)
810-044	Point anvil (Ø5,5 mm)
Computer accessories	
11AAA001	EXPAK data processing program
264-504-5D	Digimatic Mini-Processor
264-504-5E	Digimatic Mini-Processor
Fixed microscopes for Brinell testing	
19BAA161D	Microscope 20X
19BAA318D	Microscope 40X
19BAA319D	Microscope 100X
Indenters	
HPHR	Diamond indenter (UKAS certificate)
HPHRWIZ	Diamond indenter (ø22 mm min.)
HPB1/8	Steel ball indenter (UKAS certificate)
19BAA072	Diamond indenter
19BAA072MPA	Diamond indenter, with MPA certificate
19BAA075	Steel ball indenter 1/8"
19BAA292	Diamond indenter, min. hole : ø22 mm
19BAA292MPA	Diamond indenter, min. hole : ø22 mm, with MPA certificate

Additional accessories are available for Brinell hardness testing. Refer to the Hardness Testing Machines brochure.

The dolphin-nose indenter arm

Hardness Testing Machines brochure on request

Rockwell HR-100/200/300/400

Series 963

Five economical Rockwell hardness testing machines to suit practically every application.

- The newly designed frame provides maximum clearance for positioning the workpiece. A flat table is all that is needed for mounting these testing machines.
- Simple to operate : the analogue types HR-110/HR-210 use an automatic presetting dial gauge.
- HR-110MR does not require a power source, and is considered to be environmentally friendly.
- Digital models HR-430MR/MS use automatic steering wheel braking and load sequencing for easy handling.
- Digital models HR-320MS and HR-430MR/MS can use our Digimatic Mini-processor (DP-1VR) for printing results, and an input tool (USB-ITN-E) for connecting to a PC to enable data transfer, analysis and storage.
- Brinell hardness tests can be performed by using the following optional accessories: a Brinell indenter, a weight set and a measurement microscope.

HR-110MR
Rockwell hardness testing machine
An environmentally friendly energy-saving model.
The basic operation is all manual, including weight-changing (total test force selection).

HR-210MR
Rockwell hardness testing machine
Manual weight changing (with total test force selected) and handling of preload force. Motor drive controls loading sequence.

HR-110MR and HR-210MR gauge

Specifications

Standard	JIS B 7726, ISO 6508-2 (ASTM E18)
Max. height Max. depth	180 mm (100 mm if cover is attached) 165 mm (from the centre of the indenter axis)
Functions	HR-320MS, HR-430MR, HR-430MS : GO/NG, Offset revision, Hardness conversion
Power supply	AC100-240V, 1.2A (HR-110MR : no power required)
Standard Accessories	Diamond indenter for R and R/S, Steel ball indenter 1/16", Flat anvil, large V-anvil, Hardness test blocks, AC adapter, cover, Accessory box, level.

Optional accessories

No.	Description
56AAK286B	Set of weight HR-110MR, 210MR 62.5, 125, 187.5
56AAK287B	Set of weight HR-320MS 31.25, 62.5, 125, 187.5
56AAK288B	Set of weight HR-430MR 62.5, 125, 187.5
56AAK289B	Set of weight HR-430MS 31.25, 62.5, 125, 187.5
56AAK541B	Microscope 20x
Anvils	
810-026	Fine adjustment table for jominy test
810-027	Vari-rest
810-028	Jack rest
810-029	V-anvil length 400 mm, groove width 50 mm, 120°
810-030	Point anvil (diamond tipped for Rockwell Superficial)
810-037	Round table Ø180 mm
810-038	Round table Ø250 mm
810-040	V-anvil ø40mm, 120°
810-041	V-anvil ø40 mm, 90°
810-042	V-anvil Ø10 mm, 120°
810-043	Point anvil (Ø12 mm)
810-044	Point anvil (Ø5,5 mm)
810-048	Console table
Computer accessories	
264-504-5D	Digimatic Mini-Processor
264-504-5E	Digimatic Mini-Processor
06ADV380E	Signal cable 2 m USB
Indenters	
19BAA072	Diamond indenter
19BAA073	Diamond indenter, min. hole : ø40 mm
19BAA074	Steel ball indenter 1/16"
19BAA075	Steel ball indenter 1/8"
19BAA077	Steel ball indenter 1/2"

19BAA072 for HR-xxxMR models only
19BAA073 for HR-xxxMS models only

HR-100/200/300/400 Series brochure on request

Model	HR-110MR	HR-210MR	HR-320MS	HR-430MR	HR-430MS
No.	**963-210-20***	**963-220D**	**963-231D**	**963-240D**	**963-241D**
Hardness testing	Rockwell	Rockwell	Rockwell Superficial	Rockwell	Rockwell Superficial
Display	Analog	Analog	Digital	Digital	Digital
Minimum reading	0.5 HR graduation	0.5 HR graduation	0.1 HR indication	0.1 HR indication	0.1 HR indication
Preload force (handling support)	Automatic pre-setting dial gauge	Automatic pre-setting dial gauge	Loading navigator indication	Automatic steering wheel brake	Automatic steering wheel brake
Preload force setting	-	-	Dial switching	-	Dial switching
Total test force setting	Weight change	Weight change	Weight change	Dial switching	Dial switching
Total test force control	Manual	Motor drive Button start	Motor drive Button start	Motor drive Automatic start	Motor drive Automatic start
Test force duration	Manual	Fixed 3-5.5 sec or manual	Fixed 3-5.5 sec or manual	3-60 sec or manual	3-60 sec or manual
Data ouptut	-	-	Digimatic (SPC), RS-232C	Digimatic (SPC), RS-232C	Digimatic (SPC), RS-232C
Dimensions (W x D x H) (Approx.)	296 x 512 x 780 mm	235 x 512 x 780 mm	235 x 516 x 780 mm	235 x 516 x 780 mm	235 x 516 x 780 mm
Mass (approx.)	49 kg	47 kg	47 kg	50 kg	50 kg

Mitutoyo

Rockwell HR-100/200/300/400

Series 963

Additional product description and accessories for HR-100/200/300/400 Series

HR-320MS

Dual type (Rockwell / Rockwell Superficial) hardness testing machine
Manually handles test force and preload force selection.
Motor drive controls loading sequence.

HR-430MR

Rockwell hardness testing machine
Economy type, but supports dial switching, power steering and support of all test standards and is equipped with automatic brake handle auto start feature.
Motor drive controls loading sequence.

HR-430MS

Dual type (Rockwell / Rockwell Superficial) hardness testing machine
Economy type, but supports dial switching, power steering and support of all test standards and is equipped with automatic brake handle auto start feature.
Motor drive controls loading sequence.

Features preload force selection

Automatic steering wheel brake

SPC Digimatic and RS-232C interface

Optional accessories

No.	Description
19BAA028	Hardness test block 32HRB
19BAA029	Hardness test block 42HRB
19BAA030	Hardness test block 52HRB
19BAA031	Hardness test block 62HRB
19BAA032	Hardness test block 72HRB
19BAA033	Hardness test block 82HRB
19BAA034	Hardness test block 92HRB
19BAA035	Hardness test block 10HRC
19BAA036	Hardness test block 20HRC
19BAA037	Hardness test block 30HRC
19BAA038	Hardness test block 40HRC
19BAA039	Hardness test block 50HRC
19BAA040	Hardness test block 60HRC
19BAA041	Hardness test block 70HRC
19BAA042	Hardness test block 41HR 30N
19BAA043	Hardness test block 50HR 30N
19BAA044	Hardness test block 60HR 30N
19BAA045	Hardness test block 73HR 30N
19BAA046	Hardness test block 83HR 30N
19BAA047	Hardness test block 75HR 15N
19BAA048	Hardness test block 85HR 15N
19BAA049	Hardness test block 90HR 15N
19BAA050	Hardness test block 32HR 30T
19BAA051	Hardness test block 42HR 30T
19BAA052	Hardness test block 52HR 30T
19BAA053	Hardness test block 62HR 30T
19BAA054	Hardness test block 72HR 30T
19BAA055	Hardness test block 78HR 15T
19BAA056	Hardness test block 82HR 15T
19BAA057	Hardness test block 87HR 15T
19BAA124	Hardness test block 40-50HRC
19BAA127	Hardness test block 30-35HRB
19BAA128	Hardness test block 64-69HR 30N
19BAA150	Hardness test block 36-40HR 30T

For Brinell weight sets, refer to the Hardness Testing Machines brochure (on request).

Micro Zone Test System MZT-500

Series 810

- When it comes to evaluating mechanical properties of ultra-small regions of ultra-fine specimens, the MZT-500 Series are exceptionally powerful tools in the fields of research, development and quality control. The MZT-500 can evaluate mechanical properties that conventional hardness testing machines cannot measure, such as hardness of ultra-fine cross-sections, mechanical bonding properties and wear properties of carbon fibres, glass fibres, etc., on specimens such as CVD- and PVD-deposited or generated films, including ion-plated films.

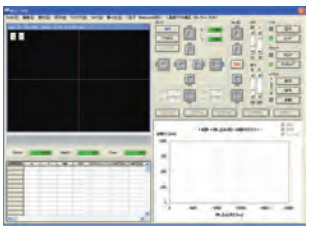
- The indentation factor can be obtained, which is related to the hardness value (partially) shown in Martens hardness test (ISO14577) and Young's modulus. Deformation characteristics in the load, dwell, and unload phases are also obtainable for use in determining properties of the specimen material.

Specifications

Test force generation	Electrical
Test force range	**0.1-1000 mN**
Hardness test	(HV) Vickers and (HK) Knoop
Control resolution	0.916 µN
Loading speed	0.01-100 mN/s
Indentation depth measurement	**Range :** 0-20 µm **Resolution :** 0,1 nm
Indenter type	Bercovici triangular pyramid indenter
Sample surface observation method	**- Camera** 1/3 inch B&W (410,000 pixels) **- Objective (monitor magnification)** 100X (2500X) **- Optional** 10X (250X) ; 40X (1000X)
XY stage travel range	**Manual Type** : 25 x 25 mm **Automatic** : 50 x 50 mm
Max. specimen height	90 mm
Max. specimen depth	90 mm (from the centre of the indenter shaft)
Test type	- Indentation test (with and without preload force) - Indentation depth setting test - Continuous indentation test - Repeated indentation test
Vibration isolation	The balance-lever vibration isolation mechanism reduces the effect of external vibrations on measurements.
Protection	Field-compatible form with cover for protection against dust and wind.

810-813D

Model	MZT-500L	MZT-500P
No.	**810-813D***	**810-814D***
No. UK only	**810-813E**	**810-814E**
Basic system	●	●
Data analysis / control device	●	●
Manual type XY stage	●	-
Automatic XY stage	-	●



Hydraulic Brinell Hardness Testing Machine ABK-1

Series 810

- The ABK-1 is a hydraulic Brinell hardness testing machine that is simple to operate and has high precision.
- This machine is suitable for hardness testing of raw materials, cast/forged components, and special steels.
- The anvil height adjusting handle uses a thrust bearing, providing smooth up/down operation.
- A large impression can create a smooth surface even when measuring on rough surfaces.
- A selection of loading weights is provided so that a force from 4903 N to 29420 N can be applied to the indenter by means of a hydraulic balance. Two sizes of steel indenter, 10 mm and 5 mm, can be used according to the test requirements.

810-265-1

No.	Model	Test force range
810-265-1	ABK-1	**4903 ; 7355 ; 9807 ; 14710 ; 19614 ; 24517 ; 29420 N**

Hardness Testing Machines brochure on request

Specifications

Test force application	Manual
Test force control	Manual (load, dwell, unload)
Test force dwell time	Manual (arbitrary)
Max. specimen height	200 mm
Max. specimen depth	155 mm (from the centre of the indenter shaft)
Dimensions (W x D x H)	430 x 510 x 1100 mm
Mass	180 kg

Standard accessories

No.	Description
19BAA159	Flat table, ø68 mm
19BAA160	V-Anvil, ø68 mm, groove 50 mm
19BAA161D	Microscope 20X

Weights and indenters are standard accessories.

Optional accessories

No.	Description
19BAA071	Replacement steel ball, ø5 mm (10 pce.)
19BAA098	Split level
19BAA162	Replacement carbide ball indenter Ø5 mm (1 pce.)
19BAA163	Replacement carbide ball indenter Ø10 mm (1 pce.)
19BAA165	Replacement steel ball (Ø10 mm - 5 pce.)
19BAA166D	Hardness test block (200HB)

Impact Type Hardness Testing Unit HARDMATIC HH-411

Series 810

- Hardmatic HH-411 is a lightweight, digital-reading portable hardness testing instrument for metal workpieces.
- Operates on the rebound hardness principle (standardised according to ASTM A 956).
- Measurement is conducted with hardness value L (Leeb-value), however, conversion to any desired hardness scale can be performed.
- Display automatically shows GO/±NO GO with the tolerance function set and selected.
- Memory function for 1800 measured values, automatic measuring direction angle-compensation.

810-298

Sample application

Specifications

Impactor	Impact hammer with integrated carbide-ball tip, D type (ASTM A 956)
Data output	RS-232C, SPC
Power supply	Battery LR6 (2 pcs.) or AC adapter (optional)
Functions	Auto angle compensation, Offset, OK/NG judgement, Hardness scale conversion, Data storage (1800 data entries), Statistical analysis (Average value, Max. value, Min. value, Dispersion), Auto sleep function, Impact counter display function

Standard accessories

No.	Description
19BAA258	Cleaning brush
19BAA450-01	Display unit
19BAA451	Support ring ø22 mm
19BAA452	Support ring ø14 mm for HH-411
19BAA457	Carbide ball indenter
19BAA460	Cable detector for HH-411
810-287	UD-411 impactor

Optional accessories

No.	Description
19BAA458	Impact device for type DL
526688D	AC adapter
526688UK	AC adapter 220 V (UK only)
Computer accessories	
11AAA003	EXPAK data processing program
937387	Signal cable 1 m
19BAA263	RS-232C cable
264-504-5D	Digimatic Mini-Processor
264-504-5E	Digimatic Mini-Processor
Hardness test blocks (all blocks are 115 mm diameter, 33 mm thick, 3.7 kg mass)	
19BAA243	Hardness test block 880 HLD
19BAA244	Hardness test block 830 HLD
19BAA245	Hardness test block 730 HLD
19BAA246	Hardness test block 620 HLD
19BAA247	Hardness test block 520 HLD
Indenters	
810-288	UD-412 impactor
810-289	UD-413 impactor
810-290	UD-414 impactor
Support rings	
19BAA248	Cylinder support ring R10-20 mm (Types D/DC)
19BAA249	Hollow cylinder support ring R14-20 mm (Types D/DC)
19BAA250	Spherical support ring R10-27.5 mm (Types D/DC)
19BAA251	Support ring for hollow sphere R13.5-20 mm (Types D/DC)

Hardness Testing Machines brochure on request

Model	HH-411
No.	**810-298**
Accuracy	±12 HL (800 HL +/- 1.5%)
Display unit	7-segment LCD
Resolution	1-999 HL
	Conversion range / Increment
Vickers	43-650 HV / 1 HV
Brinell	20-894 HB / 1 HB
Rockwell C	19.3-68.2 HRC / 0.1 HRC
Rockwell B	13.5-101.7 HRB / 0.1 HRB
Shore	13.2-99.3 HS / 0.1 HS
Tensile strength	499-1996 MPa / 1 MPa
Specimen Thickness	Min. 5 mm
Specimen Mass	5 kg or more
Dimensions	
Measuring/Display unit	ø28 x 175 mm / 70 x 110 x 35 mm
Mass	320 g

UD-412 Detector
Use for inner walls of cylinders. The grip is short to allow positioning within a cylinder.

UD-414 Detector
Use for gear teeth, welded corners, etc.

UD-413 Detector
Use for concave workpieces such as gear teeth, ball bearings, etc.

Digital and Analogue Durometers HARDMATIC HH-300

Series 811

Long-leg models

- Digital/Dial Durometers are suitable for testing the hardness of the following materials : natural rubber, neoprene, polyesters, PVC, leather, Thiokol, nitrite rubber, wax, vinyl, cellulose acetates, glass polystyrene, etc.
- Shore hardness "A" and "D".

811-332

811-331

Long-leg

Model	HH-331	HH-332	HH-333	HH-334
No.	**811-331**	**811-332**	**811-333**	**811-334**
Type	Dial	Digital	Dial	Digital
Scale	0-100 Shore A	0-100 Shore A	0-100 Shore D	0-100 Shore D
Range	10-90 Shore A	10-90 Shore A	20-90 Shore D	20-90 Shore D
Spring force (mN)	550 + 75 H (Hardness reading : 10-90)	550 + 75 H (Hardness reading : 10-90)	444.5 H (Hardness reading : 20-90)	444.5 H (hardness reading : 20-90)
Tip form	Cut cone	Cut cone	Cone	Cone
Tip angle	35° (±0.25°)	35° (±0.25°)	35° (±0.25°)	35° (±0.25°)
Tip radius	-	-	0.1 (±0.012 mm)	0.1 (±0.01 mm)
Tip diameter	ø0.79 mm (±0.01 mm)	ø0.79 mm (±0.01 mm)	-	-
Power supply	-	SR44 Battery	-	SR44 Battery
Dimensions (W x D x H)	56 x 33.5 x 144 mm	60 x 28.5 x 193 mm	56 x 33.5 x 186 mm	60 x 28.5 x 193 mm
Mass	320 g	310 g	320 g	310 g

64AAA964

Specifications

Standards	ASTM D 2240 ; ISO 868 ; ISO 7619 ; DIN 83 505 ; JIS K 6253 : JIS K 7215
Indenter diameter	ø1,25 (±0,15 mm)
Pressure foot	ø18 mm
Resolution	**Dial models** : 1° **Digital models** : 0.5°
Indenter protrusion	2,5 mm
Functions	**Digital models** : Data hold, Zero-setting, SPC output, ON/OFF **Dial models :** Maximum reading hand

Optional accessories

No.	Description
Auxiliary weights	
811-017	Auxiliary weights (Shore A)
811-018	Auxiliary weights (Shore D)
Computer accessories	
905693	Signal cable 1 m left type
905694	Signal cable 2 m left type
264-504-5D	Digimatic Mini-Processor
264-504-5E	Digimatic Mini-Processor
Hardness testing block sets	
64AAA590	Test block set (rubber) Hardness 20, 40, 80 Shore D
64AAA964	Test block set (rubber) Hardness 30, 60, 90 Shore A
Measuring stands	
19BAA180	Chuckbar
811-012	Measuring stand for 811-333 / 811-334
811-019	Measuring stand for 811-331 / 811-332

Measuring stand

- Workstage dimension : ø90 mm
- Max. specimen height : 90 mm

Digital and Analogue Durometers HARDMATIC HH-300

Series 811

Compact models

- Digital/Dial Durometers are suitable for testing the hardness of the following materials : natural rubber, neoprene, polyesters, PVC, leather, Thiokol, nitrite rubber, wax, vinyl, cellulose acetates, glass polystyrene, etc.
- Shore hardness "A" and "D".

Specifications

Standards	ASTM D 2240 ; ISO 868 ; ISO 7619 ; DIN 83 505 ; JIS K 6253 : JIS K 7215
Indenter diameter	ø1,25 (±0,15 mm)
Pressure foot	44 x 18 mm
Resolution	**Dial models** : 1° **Digital models** : 0.5°
Indenter protrusion	2,5 mm
Functions	**Digital models** : Data hold, Zero-setting, SPC output, ON/OFF **Dial models :** Peak retaining hand

Optional accessories

No.	Description
Auxiliary weights	
811-017	Auxiliary weights (Shore A)
811-018	Auxiliary weights (Shore D)
Computer accessories	
905693	Signal cable 1 m left type
905694	Signal cable 2 m left type
264-504-5D	Digimatic Mini-Processor
264-504-5E	Digimatic Mini-Processor
Hardness testing block sets	
64AAA590	Test block set (rubber) Hardness 20, 40, 80 Shore D
64AAA964	Test block set (rubber) Hardness 30, 60, 90 Shore A
Measuring stands	
19BAA180	Chuckbar
811-013	Measuring stand for 811-335-01 / 811-336-01
811-014	Measuring stand for 811-337-01 / 811-338-01

Measuring stand

- Workstage dimension : ø90 mm
- Max. specimen height : 90 mm

Hardness Testing Machines brochure on request

811-336-01

811-335-01

Compact digital model

Compact dial model

Compact

Model	HH-335	HH-336	HH-337	HH-338
No.	**811-335-01**	**811-336-01**	**811-337-01**	**811-338-01**
Type	Dial	Digital	Dial	Digital
Scale	0-100 Shore A	0-100 Shore A	0-100 Shore D	0-100 Shore D
Range	10-90 Shore A	10-90 Shore A	20-90 Shore D	20-90 Shore D
Spring force (mN)	550 + 75 H (Hardness reading : 10-90)	550 + 75 H (Hardness reading : 10-90)	444.5 H (Hardness reading : 20-90)	444.5 H (Hardness reading : 20-90)
Tip form	Cut cone	Cut cone	Cone	Cone
Tip angle	35° (±0.25°)	35° (±0.25°)	30° (±0.5°)	30° (±0.5°)
Tip radius	-	-	0.1 (±0.01 mm)	0.1 (±0.01 mm)
Tip diameter	ø0.79 (±0.01 mm)	ø0.79 (±0.01 mm)	-	-
Power supply	-	SR44 Battery	-	SR44 Battery
Dimensions (W x D x H)	56 x 33.5 x 144 mm	60 x 28.5 x 151 mm	56 x 33.5 x 144 mm	60 x 28.5 x 151 mm
Mass	300 g	290 g	300 g	290 g

64AAA964

UKAS Certified Calibration Blocks

Calibration Blocks

Test force Rockwell and Rockwell Superficial hardness

No.		Rockwell hardness			RockWell Superficial hardness		
Preliminary test force	N	98,07			29,42		
	kgf	10			3		
Test force	N	588,4	980,7	1471	147,1	294,2	441,3
	kgf	60	100	150	15	30	45
Diamond indenter		A	D	C	15N	30N	45N
Inch ball	Ø 1/16"	F	B	G	15T	30T	45T
	Ø 1/8"	H	E	K	15W	30W	45W
	Ø 1/4"	L	M	P	15X	30X	45X
	Ø 1/2"	R	S	V	15Y	30Y	45Y

All calibration blocks are supplied within a hardness tolerance of ±2 HR.

Price and ordering data	Price and ordering data	Price and ordering data	Price and ordering data	Price and ordering data
H20HRC*	H60HRA*	H69HR15N*	H41HR30N*	H19HR45N*
H25HRC*	H63HRA*	H72HR15N*	H46HR30N*	H25HR45N*
H30HRC*	H65HRA*	H75HR15N*	H50HR30N*	H31HR45N*
H35HRC*	H68HRA*	H78HR15N*	H55HR30N*	H37HR45N*
H40HRC*	H70HRA*	H81HR15N*	H59HR30N*	H43HR45N*
H45HRC*	H73HRA*	H83HR15N*	H64HR30N*	H49HR45N*
H50HRC*	H76HRA*	H85HR15N*	H68HR30N*	H55HR45N*
H55HRC*	H78HRA*	H88HR15N*	H73HR30N*	H61HR45N*
H60HRC*	H81HRA*	H90HR15N*	H77HR30N*	H66HR45N*
H63HRC*	H83HRA*	H91HR15N*	H80HR30N*	H70HR45N*
H65HRC*	H84HRA*	H92HR15N*	H82HR30N*	H72HR45N*
H67HRC*	H85HRA*	H93HR15N*	H83HR30N*	H74HR45N*

:

Calibration blocks Rockwell and Rockwell Superficial with UKAS certification.

All calibration blocks are supplied within a hardness tolerance of ±4 HR. Rockwell calibration blocks are 64 mm diameter x 15 mm thick.

Price and ordering data	Price and ordering data	Price and ordering data	Price and ordering data	Price and ordering data
H40HRD*	H91HRK*	H74HRF*	H33HRG*	H123HRR*
H44HRD*	H100HRK*	H80HRF*	H51HRG*	H126HRR*
H49HRD*	H75HRE*	H83HRF*	H69HRG*	H67HR30W*
H52HRD*	H81HRE*	H85HRF*	H83HRG*	H73HR30W*
H56HRD*	H84HRE*	H88HRF*	H86HRP*	H87HR30W*
H60HRD*	H87HRE*	H93HRF*	H94HRP*	H72HR45X*
H64HRD*	H90HRE*	H100HRF*	H112HRP*	H76HR45X*
H67HRD*	H93HRE*	H67HRM*	H84HR15W*	H85HR45X*
H71HRD*	H100HRE*	H107HRM*	H87HR15W*	H95HR15Y*
H73HRD*	H92HRL*	H118HRM*	H94HR15W*	H96HR15Y*
H74HRD*	H118HRL*	H107HRV*	H82HR30X*	H98HR15Y*
H77HRD*	H123HRL*	H109HRV*	H84HR30X*	H90HR30Y*
H47HRK*	H115HRS*	H120HRV*	H92HR30X*	H91HR30Y*
H56HRK*	H117HRS*	H92HR15X*	H100HRH*	H95HR30Y*
H60HRK*	H123HRS*	H93HR15X*	H106HRH*	H85HR45Y*
H65HRK*	H50HR45W*	H96HR15X*	H118HRH*	H87HR45Y*
H72HRK*	H59HR45W*	H3HRG*	H105HRR*	H94HR45Y*
H81HRK*	H80HR45W*	H16HRG*		

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UKAS Certified Calibration Blocks

Calibration blocks Rockwell and Rockwell Superficial with UKAS certification.

All calibration blocks are supplied within a hardness tolerance of ±4 HR.

Price and ordering data	Price and ordering data	Price and ordering data	Price and ordering data	Price and ordering data
H30HRB*	H26HRA*	H70HR15T*	H36HR30T*	H2HR45T*
H40HRB*	H31HRA*	H73HR15T*	H43HR30T*	H12HR45T*
H50HRB*	H35HRA*	H77HR15T*	H49HR30T*	H22HR45T*
H60HRB*	H40HRA*	H80HR15T*	H56HR30T*	H32HR45T*
H70HRB*	H45HRA*	H83HR15T*	H63HR30T*	H43HR45T*
H80HRB*	H50HRA*	H86HR15T*	H69HR30T*	H53HR45T*
H85HRB*	H53HRA*	H88HR15T*	H73HR30T*	H58HR45T*
H90HRB*	H55HRA*	H90HR15T*	H76HR30T*	H63HR45T*
H95HRB*	H59HRA*	H91HR15T*	H80HR30T*	H68HR45T*
H100HRB*	H62HRA*	H93HR15T*	H83HR30T*	H73HR45T*

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Calibration Blocks Brinell high force with UKAS certification

These calibration blocks are valid for the following hardness values: 100 – 150 – 200 – 250 – 300 – 350 – 370 – 400 – 450 – 550 – 600.
Brinell high force calibration blocks are 150 mm x 153 mm x 16 mm thick.
All calibration blocks are supplied within a hardness tolerance of ±15 HB.
For all orders, the reference of the calibration blocks is to be quoted as follows : Example, for an HBW 10/3000 block with a hardness value of 450, the reference is H450HBW10/3000 (10 = ball diameter in mm, 3000 = load applied in kgf).

No.	ball (mm)	Ratio 0.102F/D2
HBW 10/3000	10	30
HBW 10/1500	10	15
HBW 10/1000	10	10
HBW 10/500	10	5
HBW 10/250	10	2.5
HBW 5/750	5	30
HBW 5/250	5	10

Calibration Blocks Brinell low force with UKAS certification

These calibration blocks are valid for all the following hardness values: 40 - 70 -100 – 150 – 200 – 250 – 300 – 350 – 370 – 400 – 450 – 550 – 600.
Brinell low force calibration blocks are 64 mm diameter x 15 mm thick.
For all orders, the reference of the calibration blocks is to be quoted as follows :
Example : for an HBW2/40 with a hardness value of 450, the reference is H450HBW2/40 (2 = ball diameter in mm, 40 = load applied in kgf).

No.	ball (mm)	Ratio 0.102F/D2
HBW 10/100	10	1
HBW 5/125	5	5
HBW 5/62.5	5	2.5
HBW 2.5/187.5	2,5	30
HBW 2.5/62.5	2,5	10
HBW 2.5/31.25	2,5	5
HBW 2.5/15.625	2,5	2.5
HBW 2.5/6.25	2,5	1
HBW 2/120	2	30
HBW 2/40	2	10
HBW 2/20	2	5
HBW 2/10	2	2.5
HBW 2/4	2	1
HBW 1/30	1	30
HBW 1/10	1	10
HBW 1/5	1	5
HBW 1/2.5	1	2.5
HBW 1/1	1	1

UKAS Certified Calibration Blocks

Calibration blocks Micro-Vickers with UKAS certification

Micro-Vickers calibration blocks are 30 mm diameter x 15 mm thick.
For all orders, the reference of the calibration blocks is to be quoted as follows : Example : for an HV5 block with a hardness value of 350, the reference is H350HMV0.1
These calibration blocks are valid for all the following hardness value : 40 – 70 – 100 –150 – 200 – 250 – 300 – 350 – 400 – 450 – 500 – 550 – 600 – 700 – 750 – 800 – 850 – 900.
All calibration blocks are supplied within a hardness tolerance of ±25 HV.

No.
HMV0.010*
HMV0.025*
HMV0.05*
HMV0.1*

Calibration blocks Vickers with UKAS certification

Vickers calibration blocks are the follwing size : ø64 mm x 15 mm (thickness).
For all orders, the reference of the calibration blocks is to be quoted as follows :
Example : for an HV5 block with a hardness value of 350, the reference is H350HV5
These calibration blocks are valid for all the following hardness value : 40 – 70 – 100 – 150 – 200 – 250 – 300 – 350 – 400 – 450 – 500 – 550 – 600 – 700 – 750 – 800 – 850 – 900.
All calibration blocks are supplied within a hardness tolerance of ±25 HV.

No.
HV0.2*
HV0.3*
HV0.5*
HV1*
HV2*
HV3*
HV5*
HV10*
HV20*
HV30*
HV50*
HV100*

Penetrators

No.	Designation
HPHR*	Standard Rockwell penetrator, 120° diamond cone
HPHRWIZ*	Rockwell penetrator, 120° diamond cone (special H: 5 mm for Wizhard)
HPB1/16*	Rockwell penetrator, steel ball, diameter 1/16"
HPB1/8*	Rockwell penetrator, steel ball, diameter 1/8"
HPB1/4*	Rockwell penetrator, steel ball, diameter 1/4"
HPBW5*	Brinell penetrator, carbide ball, diameter 5 mm
HPB1/2*	Rockwell penetrator, steel ball, diameter 1/2"
HB1/16*	Set of 10 steel balls, diameter 1/16"
HB1/8*	Set of 10 steel balls, diameter 1/8"
HB1/4*	Set of 10 steel balls, diameter 1/4"
HB1/2*	Set of 10 steel balls, diameter 1/2"
HBW1*	Replacement carbide ball, diameter 1 mm
HPBW1*	Brinell penetrator, carbide ball, diameter 1 mm
HBW2.5*	Replacement carbide ball, diameter 2,5 mm
HBW10*	Replacement carbide ball, diameter 10 mm
HPBW10*	Brinell penetrator, carbide ball, diameter 10 mm
HPBW2.5*	Brinell penetrator, carbide ball, diameter 2,5 mm
HBW5*	Replacement carbide ball, diameter 5 mm
HBW1/16*	Rockwell penetrator, carbide ball, diameter 1/16"
HBW1/8*	Rockwell penetrator, carbide ball, diameter 1/8"
HBW1/4*	Rockwell penetrator, carbide ball, diameter 1/4"
HBW1/2*	Rockwell penetrator, carbide ball, diameter 1/2"
HPHK*	Knoop identer
HPHV*	Vickers identer