HR-100/200/300/400

PRE 1364

Rockwell Hardness Testing Machines

Mitutoyo

Economic Rockwell hardness testing machines series with plenty of functions. Lineup of 5 models answering your needs

HR-110MR Code No.963-210-20

Rockwell Hardness Testing Machines

Environmental friendly model without power supply.

Starting from weight changing (election of full test force), all basic handling operations are performed manually.

HR-210MR Code No.963-220

Rockwell Hardness Testing Machines

Changing of weights (selection of full test force) and handling of initial test force are done manually. The sequence of full test force is motor-driven.

Features

- No protrusion of the vertical axis (square screw) of the probe from the bottom of the device, due to new frame design. Mount for testing machine is flat and can therefore be used.
- Easy operation
  For the analog models (HR-110MR, HR-210MR), the operation of gauge presetting becomes obsolete, because an automatic preset dial gauge is applied.
- HR-110MR is an eco friendly testing machine type, requiring no electrical power supply.

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HR-100/200/300/400

HR-320MS Code No.963-231

Twin type (for both Rockwell/Superficial) hardness testing machine

Exchange of weights and handling of initial test force are done manually. Load sequence of full test force is motor-driven.

HR-430MR Code No.963-240

Rockwell hardness testing machine

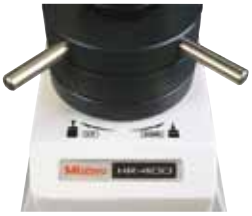
Although an economic model, a switching dial for full test force, or automatic handle brake for handle operation support and automatic start function are standard features. The load sequence for full test force is motor-driven.

HR-430MS Code No.963-241

Twin type (for both Rockwell/Superficial) hardness testing machine

Although an economic model, a switching dial for full test force, or automatic handle brake for handle operation support and automatic start function are standard features. The load sequence for full test force is motor-driven.

With digital types (HR-430MR, HR-430MS) testing can be done by easy handle operation, due to application of automatic handle brake and automatic load sequence



- Digital types (HR-320MS, HR-430MR, HR-430MS) are equipped with digital outputs, so printing to a digital processor (DP-1VR) or data transfer to a PC using an input tool (USB-ITN-E) can be utilised, like in our other digital equipment.

- Testing of Brinell hardness possible. With special accessories (sold separately) like Brinell weight set, indenter, measuring microscope, Brinell hardness can be tested.

Specifications

Code No.	963-210-20	963-220*1	963-231*1	963-240*1	963-241*1
Model	HR-110MR	HR-210MR	HR-320MS	HR-430MR	HR-430MS
Corresponding hardness	Rockwell hardness				
	—	—	Rockwell Superficial hardness	—	Rockwell Superficial hardness
Standard	JIS B 7726 ISO6508-2 (ASTM E18)				
Hardness display	Analog		Digital		
Min. display unit	0.5HR increments		0.1HR display		
Initial test force load (Handle operation support)	Automatic preset dial gauge		Loading navigator Display	Automatic handle brake	
Initial test force switching	—	—	Dial knob switching	—	Dial knob switching
Full test force switching	Weight exchange			Dial knob switching	
Full test force load operation	Manual Lever operation	Electrical (motor-driven) Start with button		Electrical (motor-driven) Automatic start	
Test force application time	Manual	Fixed 3-5.5s Manual operation possible		1-99s possible setting Manual operation possible	
Max height of workpiece	180 mm (100 mm with cover)				
Max. depth of workpiece	165 mm (testing machine body from indenter shaft)				
Functions	—	—	OK/not OK evaluation		
	—	—	Offset correction function		
	—	—	Hardness conversion function		
Data output	—	—	SPC, RS-232C		
Power supply	No power supply necessary	AC100-240V1.2A (adapter DC12V3.5A)			
Outer dimensions	ca. 296(W)× 512(D)×780(H) mm	ca. 235(W)× 512(D)×780(H) mm	ca. 235(W)×516(D)×780(H) mm		
Weight	ca. 49 kg	ca. 47 kg	ca. 47 kg	ca. 50 kg	

*1: Suffix letter D=Europe, except E=UK

Standard accessories (Using special accessories (sold separately) like weight set, indenter and measuring microscope for Brinell hardness testing allows you to carry out Brinell hardness tests.)

Code No.	Product name	Specification	Code No.	Product name	Specification
—*1	Diamond indenter	For R **(HR-***MR)**	—	Hardness block	65HR30N **(belonging only to HR-***MS)**
—*1	Diamond indenter	For R/S **(HR-***MS)**	—	Hardness block	70HR30T **(belonging only to HR-***MS)**
—	Steel ball indenter	1/16" steel ball indenter (Ø1.5875)	**357651**	AC adapter	AC100-240V1.2A DC12V3.5A
—	Spare steel ball	1/16" steel ball (Ø1.5875)		Manual	(Depending on model)
—	Flat anvil	Ø64 mm	**56AAK312**	Vinyl cover	
—	V-anvil (large)	Ø40, 120° V groove width 30	—	Accessories case	
—	Hardness block	60HRC	—	Water level	
—	Hardness block	30HRC			
—	Hardness block	90HRB			

*1: Belonging to either one, depending on model

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HR-100/200/300/400

Rockwell hardness scale

	Scale	Hardness Symbol *1	Indenter	Initial test force F0	Full test force F	Corresponding Hardness range	Application of standard
Rockwell hardness	A	HRA	Cone Diamond	98.07N (10 kgf)	588.4 N (60 kgf)	20-95HRA	ISO6508-1 JIS Z 2245 Applicable range
	D	HRD			980.7 N (100 kgf)	40-77HRD	
	C	HRC			1471 N (150 kgf)	10-70HRC	
	F	HRF	Ball Ø1.5875 mm (1/16")		588.4 N (60 kgf)	60-100HRF	
	B	HRB			980.7 N (100 kgf)	20-100HRB	
	G	HRG			1471 N (150 kgf)	30-94HRG	
	H	HRH	Ball Ø3.175 mm (1/8")		588.4 N (60 kgf)	80-100HRH	
	E	HRE			980.7 N (100 kgf)	70-100HRE	
	K	HRK			1471 N (150 kgf)	40-100HRK	
	L	HRL	Ball Ø6.35 mm (1/4")		588.4 N (60 kgf)		
	M	HRM			980.7 N (100 kgf)		
	P	HRP			1471 N (150 kgf)		
	R	HRR	Ball Ø12.7 mm (1/2")		588.4 N (60 kgf)		
	S	HRS			980.7 N (100 kgf)		
	V	HRV			1471 N (150 kgf)		

	Scale	Hardness Symbol *1	Indenter	Initial test force F0	Full test force F	Corresponding Hardness range	Application of standard
Superficial hardness Rockwell	15N	HR15N	Cone Diamond	29.42N (3 kgf)	147.1 N (15 kgf)	70-94HR15N	ISO6508-1 JIS Z 2245 Applicable range
	30N	HR30N			294.2 N (30 kgf)	42-86HR30N	
	45N	HR45N			441.3 N (45 kgf)	20-77HR45N	
	15T	HR15T	Ball Ø1.5875 mm (1/16")		147.1 N (15 kgf)	67-93HR15T	
	30T	HR30T*2			294.2 N (30 kgf)	29-82HR30T	
	45T	HR45T			441.3 N (45 kgf)	10-72HR45T	
	15W	HR15W	Ball Ø3.175 mm (1/8")		147.1 N (15 kgf)		
	30W	HR30W			294.2 N (30 kgf)		
	45W	HR45W			441.3 N (45 kgf)		
	15X	HR15X	Ball Ø6.35 mm (1/4")		147.1 N (15 kgf)		
	30X	HR30X			294.2 N (30 kgf)		
	45X	HR45X			441.3 N (45 kgf)		
	15Y	HR15Y	Ball Ø12.7 mm (1/2")		147.1 N (15 kgf)		
	30Y	HR30Y			294.2 N (30 kgf)		
	45Y	HR45Y			441.3 N (45 kgf)		

*1: When a scale with a ball indenter is used, "S" (for steel ball) or "W" (for super hard alloy ball) is added at the end to the hardness symbol. The measured values differ when a steel ball or a super hard alloy has been used for the ball indenter. Therefore, please pay attention to the selected indenter and the hardness symbol at the display.

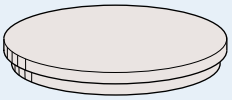
*2: For application to thin products with less than 0.6 mm, the test, which tolerates indents at the back side, is HR30Tm, and is according to JIS Z 2245, Appendix A.

Special Accessories and Instruction of other hardness testing machines

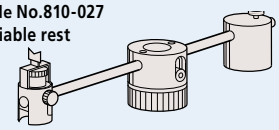
HR-110MR
HR-210MR
Excluded

Product name	Part No.
Standard block for hardness 32HRB	19BAA028
Standard block for hardness 42HRB	19BAA029
Standard block for hardness 52HRB	19BAA030
Standard block for hardness 62HRB	19BAA031
Standard block for hardness 72HRB	19BAA032
Standard block for hardness 82HRB	19BAA033
Standard block for hardness 92HRB	19BAA034
Standard block for hardness 10HRC	19BAA035
Standard block for hardness 20HRC	19BAA036
Standard block for hardness 30HRC	19BAA037
Standard block for hardness 40HRC	19BAA038
Standard block for hardness 50HRC	19BAA039
Standard block for hardness 60HRC	19BAA040
Standard block for hardness 70HRC	19BAA041
Standard block for hardness 41HR30N	19BAA042
Standard block for hardness 50HR30N	19BAA043
Standard block for hardness 60HR30N	19BAA044
Standard block for hardness 73HR30N	19BAA045
Standard block for hardness 83HR30N	19BAA046
Standard block for hardness 75HR15N	19BAA047
Standard block for hardness 85HR15N	19BAA048
Standard block for hardness 90HR15N	19BAA049
Standard block for hardness 32HR30T	19BAA050
Standard block for hardness 42HR30T	19BAA051
Standard block for hardness 52HR30T	19BAA052
Standard block for hardness 62HR30T	19BAA053
Standard block for hardness 72HR30T	19BAA054
Standard block for hardness 78HR15T	19BAA055
Standard block for hardness 82HR15T	19BAA056
Standard block for hardness 87HR15T	19BAA057
Standard block for hardness 40 to 50HRC	19BAA124
Standard block for hardness 30 to 35HRB	19BAA127
Standard block for hardness 64 to 69HR30N	19BAA128
Standard block for hardness 36 to 40HR30T	19BAA150
Diamond indenter	19BAA072MPA
1/16" wolfram carbide indenter (Ø1.5875)	56AAK475
1/8" wolfram carbide indenter (Ø3.175)	19BAA504
1/4" wolfram carbide indenter (Ø6.35)	19BAA505
1/2" wolfram carbide indenter (Ø12.7)	19BAA506

Code No.810-038
Round table OD Ø250 mm
For large probes like profiles

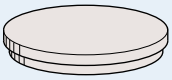


Code No.810-027
Variable rest

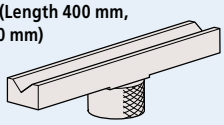


Test of long object probes (used together with anvil)

Code No.810-037
Round table OD Ø180 mm
For large probes like profiles

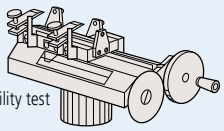


Code No.810-029
Special V-anvil (Length 400 mm, groove width 50 mm)
For shaft material (max. Ø100 mm)



Code No.810-040
V-anvil (large)
(OD Ø40 mm, groove width 30 mm)
For shaft material (max Ø60 mm)

Code No.810-026
Micromovement table for Jominy test
JIS G 0561
Steel hardenability test



Code No.810-043
Spot anvil
(OD Ø12 mm)

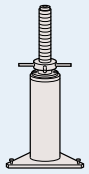
Code No.810-041
V-anvil (small)
(OD Ø 40 mm, groove width 6 mm)
For shaft material (max. Ø8.4 mm)

Code No.810-030
Diamond spot anvil
(OD Ø10 mm)
For plate material
Exclusive use for Rockwell superficial hardness test

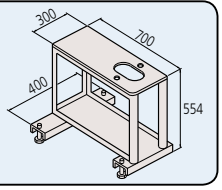
Code No.810-044
Spot anvil
(OD Ø5.5 mm)
For plate material

Code No.810-042
Small V-anvil
(OD Ø10 mm)
For shaft material (max. Ø16 mm)

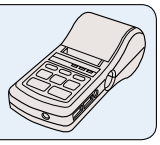
Code No.810-028
Jack rest
Testing of long object probes (used together with anvil or round table)



Code No.810-048
Mount for testing machine



Code No.264-504
Digimatic miniprocessor DP-1VR
Connecting cable not included (sold separately), please order separately. Connecting cable (1 m), part No. 937387



Code No.06ADV380E
USB input tool
Direct USB-ITN
Easy data input to PC

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HR-100/200/300/400

The Brinell retrofit kit for HR-Series:

HR-Series / Brinell Set	HR-110 MR	HR-210 MR	HR-320 MS	HR-430 MR	HR-430 MS
with microscope 100x	56AAK546 B	56AAK546 B	56AAK547 B	56AAK548 B	56AAK549 B
without microscope	56AAK550 B	56AAK550 B	56AAK551 B	56AAK552 B	56AAK553 B

Brinell Set:

- Brinell Loads
- Indenter wolfram carbide 2,5 mm and 5 mm
- Spare Ball 2,5 mm and 5 mm
- Test Block 300-400 HBW 2.5/187.5
- Test Block 100-200 HBW 5/125
- Brinell User Manual with Brinell Diameter Table
- (100x Microscope with measuring range: Ø 0,5-2 mm)

Optional accessories:

- indenter 1 mm wolfram carbide for HBW 10/100 – 19BAA277
- indenter 10 mm wolfram carbide for HBW 1/30 – 19BAA284

Available Brinell Measurements with HR-Series

Hardness	Test Ball Diameter (mm)	Hardness Tester
HBW 10/100	10 [optional indenter 19BAA277]	HR-110MR, HR-210MR, HR-320MS, HR-430MR, HR-430MS
HBW 5/125	5	HR-110MR, HR-210MR, HR-320MS, HR-430MR, HR-430MS
HBW 5/62,5	5	HR-110MR, HR-210MR, HR-320MS, HR-430MR, HR-430MS
HBW 2,5/187,5	2,5	HR-110MR, HR-210MR, HR-320MS, HR-430MR, HR-430MS
HBW 2,5/62,5	2,5	HR-110MR, HR-210MR, HR-320MS, HR-430MR, HR-430MS
HBW 2,5/31,25	2,5	HR-320MS, HR-430MS
HBW 1/30	10 [optional indenter 19BAA284]	HR-320MS, HR-430MS

Mitutoyo provides testing machines that can test the hardness of inside walls of cylindrical objects without having to cut them, and furthermore lines up a wide variety of hardness testing machines, starting with our high functional HR-500 series Rockwell hardness testing machines, where by just pushing one switch initial test force, test force and calculation of hardness can be done automatically, and also including Vickers hardness testing machines, microhardness testing machines, Brinell hardness testing machines and also Shore hardness testing machines.

wiZhard HR 500 series Rockwell hardness testing machines

810-208
HR-511

810-202
HR-521
810-203
HR-522

810-204
HR-523

Ask for our general brochure "Hardness Testing Equipment".
It provides you with a compact overview.

- Coordinate Measuring Machines
- Vision Measuring Systems
- Form Measurement
- Optical Measuring
- Sensor Systems
- Test Equipment and Seismometers
- Digital Scale and DRO Systems
- Small Tool Instruments and Data Management

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