Hardness Testing Machines

Start quality control from the material — Mitutoyo's hardness testing machines can handle it

MeasurLink® ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

Mitutoyo guarantees the product quality. PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard. Refer to page U-11 for details.

HM-200
SERIES 810 — Micro Vickers Hardness Testing Machines

- The latest electromagnetic force motor used in the loading mechanism enables the test force to be freely selected.
- In addition to Vickers hardness testing, Knoop (HK)* and Fracture toughness (Kc) tests can also be performed.

System A
(HM-210A/220A)

SPECIFICATIONS

Order No.	810-401, 810-404	810-406, 810-409
Model	HM-210	HM-220
Applicable standards	JIS B 7725, ISO 6507-2	
Test force mN (gf)	98.07 to 9807 (10 to 1000)	0.4903 to 19610 (0.05 to 2000)
Arbitrary test force	One setting can be saved, default is HV0.025.	
External dimensions (excluding protrusions and stage); Main unit mass	System **A**: 315(W)×671(D)×595(H) mm/38.5 kg System **B**/**C**/**D**: 315(W)×586(D)×741(H) mm/37.4 kg	
Power supply (main unit)	AC100 V 50/60 Hz System **A**: 31 W System B/C/D: 30 W	AC100 V 50/60 Hz System **A**: 44 W System B/C/D: 43 W

Note: **810-401, 810-406**: System A, **810-404, 810-409**: System B/C/D
* For Knoop hardness testing, Knoop indenter (optional) is required.

System A (HM-210A/220A)
All-in-one model with simple color touch-panel operation

System B (HM-210B/220B)
A system equipped with automatic reading function with AVPAK software

System C (HM-210C/220C)
In addition to the functions of System B, System C is equipped with an electric stage

System D (HM-210D/220D)
In addition to the functions of System B and System C, System D is equipped with the auto focus function

CAUTION: The **AVPAK-20** software package is not for use within, or export to, the United States of America
The **AVPAK-10** software package is for the United States of America

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Data Management Software by Mitutoyo

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HM-100
SERIES 810 — Micro Vickers Hardness Testing Machines

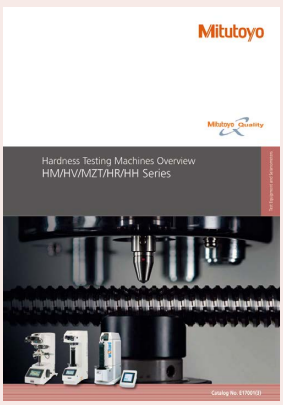
- This entry-level series of microhardness testers is suited for mechanical characteristic evaluation and quality control of electric/electronic components where test forces no smaller than 98.07 mN/10 gf are sufficient.

810-959-20
HM-103

SPECIFICATIONS

Order No.	810-124-20*	810-125-20	810-959-20
Model	HM-101	HM-102	HM-103
Applicable standards	JIS B 7725, ISO 6507-2		
Test force mN (gf)	98.07 - 9807 (10 - 1000)		
External dimensions (excluding protrusions and stage); Main unit mass	380×600×590 mm/42 kg		
	—	Control panel: 165×235×125 mm/1.5 kg	
	—	—	TV monitor: 232×227×415 mm/4.4 kg
Power supply (main unit)	AC100 V 50/60 Hz		
	Less than 20 W	Less than 60 W	Less than 90 W

* Models which can be connected to the MeasurLink measurement data network system are only **HM-102** and **HM-103**.



Refer to the Hardness Testing Machines Brochure (No. E17001) for more details.

MeasurLink ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

PROPRIETARY INSPECTION CERTIFICATE
Mitutoyo guarantees the product quality

An inspection certificate is supplied as standard. Refer to page U-11 for details.

HV-100
SERIES 810 — Vickers Hardness Testing Machines

MeasurLink® ENABLED
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- Vickers hardness testers have a wide application in testing metals, especially small heat-treated parts, and are also suitable for making special-purpose tests such as carburized case hardness, maximum hardness of spot welds, high-temperature hardness, and fracture toughness of ceramic materials.
- In addition to Vickers hardness testing, Knoop (HK)*1/Brinell (HB)*2/Fracture toughness (Kc) tests can also be performed.

System A (HV-110A/120A)

SPECIFICATIONS

Order No.	810-440, 810-443	810-445, 810-448
Model	HV-110	HV-120
Applicable standards	JIS B 7725, ISO 6507-2	
Test force N (kgf)	9.807 to 490.3 (1 to 50)	2.942 to 294.2 (0.3 to 30)
External dimensions (excluding protrusions and stage)	System **A**: 307×696×786 mm System **B**/**C**/**D**: 307×627×875 mm	
Main unit mass	**HV-110**: Approx. 60 kg **HV-120**: Approx. 58 kg	
Power supply (main unit)	AC100 V 50/60 Hz System **A**: 24 W System B/C/D: 22 W	

Note: **810-440, 810-445**: System **A**, **810-443, 810-448**: System **B**/**C**/**D**
*1 For Knoop hardness testing, Knoop indenter (optional) is required.
*2 For Brinell hardness testing a Brinell indenter (optional) and additional weight are required.

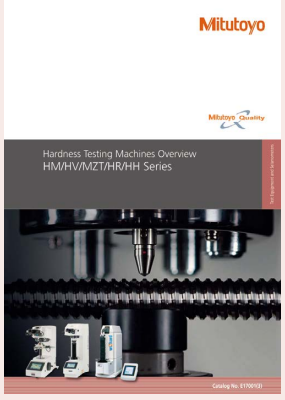
System A (HM-110A/120A)
All-in-one model with simple color touch-panel operation

System B (HM-110B/120B)
A system equipped with automatic reading function with **AVPAK** software

System C (HM-110C/120C)
In addition to the functions of System **B**, System **C** is equipped with an electric stage

System D (HM-110D/120D)
In addition to the functions of System **B** and System **C**, System D is equipped with the auto focus function

CAUTION: The **AVPAK-20** software package is not for use within, or export to, the United States of America
The **AVPAK-10** software package is for the United States of America



Refer to the Hardness Testing Machines Brochure (No. E17001) for more details.

M

Hardness Testing Machines

Start quality control from the material — Mitutoyo's hardness testing machines can handle it

MeasurLink ENABLED
Data Management Software by Mitutoyo

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An inspection certificate is supplied as standard. Refer to page U-11 for details.

HR-600
SERIES 810 — Rockwell Hardness Testing Machine

- A workpiece that cannot be placed on a tester due to its large size can be placed on the table of this product and tested as is. (Maximum loading mass 100 kg.)
- The motorized stage makes automatic multi-point testing at multiple places and of multiple workpieces possible.
- Plastic hardness testing is also available in addition to Rockwell/Brinell tests on metal. Brinell and Vickers indentation hardness tests which do not require vision measurement can also be performed.
- The **HR-610A/620A** main unit is operable with the touch panel display and the **HR-620B** is operable with the touch panel display and **AVPAK** software.
- Automatic testing with movement in the X-, Y- and Z-axis directions for a workpiece having uneven surfaces or steps becomes possible by adding an X axis stage and **AVPAK** software to **HR-620B**. Also, using **FORMEio** software makes possible easy communication with PLCs for automation purposes, such as control of handling devices and work cells.

810-510-11
HR-610A
(Motorized X-axis table is available)

810-525-11
HR-620B
(Equipped with motorized Y-axis table. Motorized X-axis table is also available.)

SPECIFICATIONS

Order No.		810-510-11	810-510-13	810-511-11	810-511-13	810-520-11	810-520-13	810-521-11	810-521-13	810-525-11	810-526-11
Model		HR-610A				HR-620A				HR-620B	
Unit (display unit)		metric	inch/mm	metric	inch/mm	metric	inch/mm	metric	inch/mm	metric	inch/mm
Indenter type*1		1/16" Steel ball		1/16" Tungsten carbide ball		1/16" Steel ball		1/16" Tungsten carbide ball		1/16" Steel ball	1/16" Tungsten carbide ball
Hardness testing methods	Rockwell	JIS B 7726, ISO 6508-2, ASTM E18 *2									
	Brinell*3	JIS B 7724, ISO 6506-2, ASTM E10									
	Plastic					ISO 2039-1					
		JIS K 7202-2, ISO 2039-2, ASTM D785									
	Indentation Brinell hardness	VDI/VDE 2616									
	Indentation Vickers hardness					VDI/VDE 2616					
Initial test force N (kgf)	Rockwell	29.42 (3) 98.07 (10)									
	Plastic					9.807 (1)					
		98.07 (10)									
	Indentation Brinell hardness	98.07 (10) 490.3 (50)									
	Indentation Vickers hardness					9.807 (1)					
Test force N (kgf)	Rockwell	147.1 (15) 294.2 (30) 441.3 (45) 588.4 (60) 980.7 (100) 1471 (150)									
	Brinell	49.03 (5) - 1839 (187.5)				9.807 (1) - 2452 (250)					
	Plastic					49.03 (5) 132.4 (13.5) 358.0 (36.5) 962.1 (98.1)					
		588.4 (60) 980.7 (100) 1471 (150)									
	Indentation Brinell hardness	612.9 (62.5) 1839 (187.5) 2452 (250)									
	Indentation Vickers hardness					294.2 (30) 490.4 (50)					
Power supply		AC100 - 200 V 50/60 Hz									
Mass		176 kg				181 kg				205 kg	

Note: Plastic testing may not be enabled depending on the material. For Brinell hardness, indentation Brinell hardness, and plastic hardness testing, and plastic hardness, other special accessories are required.
*1 Supplied as standard.
*2 Please contact us for information on ASTM standards.
*3 For Brinell hardness testing, an indenter (option) and a measurement microscope are required.

MeasurLink ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard. Refer to page U-11 for details.

HR-530
SERIES 810 — Rockwell Hardness Testing Machines

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- Unique electronic control makes the **HR-530** series of hardness testers extremely versatile by enabling Brinell hardness testing* as well as load-sequence hardness testing of plastics, plus Rockwell and Rockwell Superficial hardness testing.

* For Brinell hardness testing, an indenter (option) and a measurement microscope are required.

810-331 / 332 / 336 / 337
HR-530L

- This series can test the hardness of the inside wall of a ring, a test that is only possible using ordinary hardness testers by cutting the ring into pieces. (All models.)
- The touch-panel display unit can be mounted on top of the tester, providing significant convenience if the machine installation space is restricted. (All models.) Use the optional display mounting bracket to mount the unit.
- This series allows numeric display of statistical analysis results such as maximum and minimum values, mean value and graphic display of $\bar{X}$-R control charts and histograms required for hardness evaluation.

SPECIFICATIONS

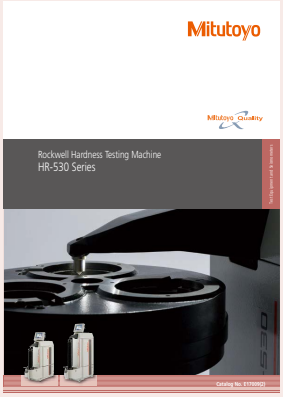
Metric

Order No.		810-231*1	810-236*2	810-331*1	810-336*2
Model		HR-530		HR-530L	
Applicable standards		JIS B 7726, ISO 6508-2			
Hardness testing methods		Rockwell/Rockwell Superficial/Brinell/Plastics hardness			
Initial test force	N (kgf)	29.42 (3) 98.07 (10)			
Test force N (kgf)	Rockwell Superficial	147.1 (15) 294.2 (30) 441.3 (45)			
	Rockwell	588.4 (60) 980.7 (100) 1471 (150)			
	Brinell	61.29 (6.25) 98.07 (10) 153.2 (15.625) 245.2 (25) 294.2 (30) 306.5 (31.25) 612.9 (62.5) 980.7 (100) 1226 (125) 1839 (187.5)			
Power supply		AC100/120/220/240 V Auto-selection			
External dimensions	Main unit	250(W)×667(D)×621(H) mm		300(W)×667(D)×766(H) mm	
	Touch-panel display unit	191(W)×147(D)×71(H) mm			
Mass		Main unit: Approx. 60 kg Display: Approx. 1.1 kg		Main unit: Approx. 69 kg Display: Approx. 1.1 kg	

Inch / Metric

Order No.		810-232*1	810-237*2	810-332*1	810-337*2
Model		HR-530		HR-530L	
Applicable standards		JIS B 7726, ISO 6508-2			
Hardness testing methods		Rockwell/Rockwell Superficial/Brinell/Plastics hardness			
Initial test force	N (kgf)	29.42 (3) 98.07 (10)			
Test force N (kgf)	Rockwell Superficial	147.1 (15) 294.2 (30) 441.3 (45)			
	Rockwell	588.4 (60) 980.7 (100) 1471 (150)			
	Brinell	61.29 (6.25) 98.07 (10) 153.2 (15.625) 245.2 (25) 294.2 (30) 306.5 (31.25) 612.9 (62.5) 980.7 (100) 1226 (125) 1839 (187.5)			
Power supply		AC100/120/220/240 V Auto-selection			
External dimensions	Main unit	250(W)×667(D)×621(H) mm		300(W)×667(D)×766(H) mm	
	Touch-panel display unit	191(W)×147(D)×71(H) mm			
Mass		Main unit: Approx. 60 kg Display: Approx. 1.1 kg		Main unit: Approx. 69 kg Display: Approx. 1.1 kg	

Note: Plastic testing may not be enabled depending on the material.
For Brinell hardness, indentation Brinell hardness, and plastic hardness testing, other special accessories are required.
*1 1/16 in steel ball indenter is equipped as a standard accessory.
*2 1/16 in carbide ball indenter is equipped as a standard accessory.



Refer to the **HR-530** Series Brochure (No. E17009) for more details.

Mitutoyo

Hardness Testing Machines

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MeasurLink ENABLED
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An inspection certificate is supplied as standard. Refer to page U-11 for details.

HR-100/200/300/400 SERIES 963 — Rockwell Hardness Testing Machines

- A series of economical Rockwell hardness testing machines. The lineup consists of 5 models including a digital display type and an analog display type.

963-210
HR-110MR

963-241
HR-430MS

SPECIFICATIONS

Order No.	963-210*	963-220*	963-240	963-231	963-241
Model	HR-110MR	HR-210MR	HR-430MR	HR-320MS	HR-430MS
Applicable standards	JIS B 7726, ISO 6508-2				
Supported hardnesses	Rockwell hardness				
	—			Rockwell Superficial hardness	
Preliminary test force N (kgf)	98.07 (10)			29.42 (3) 98.07 (10)	
Test force N (kgf) Rockwell	588.4 (60) 980.7 (100) 1471 (150)				
Test force N (kgf) Superficial	—			147.1 (15) 294.2 (30) 441.3 (45)	
External dimensions (excluding protrusions and stage)	296(W)×512(D)×780(H) mm	214(W)×512(D)×780(H) mm			
Main unit mass	49 kg	46 kg	49 kg	47 kg	50 kg
Power supply	No power required	AC100-240 V 1.2 A (DC adapter DC12 V 3.5 A)			

* Models which can be connected to the MeasurLink measurement data network system are only **HR-320MS**, **HR-430MR** and **HR-430MS**.

M

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Data Management Software by Mitutoyo

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PROPRIETARY INSPECTION CERTIFICATE

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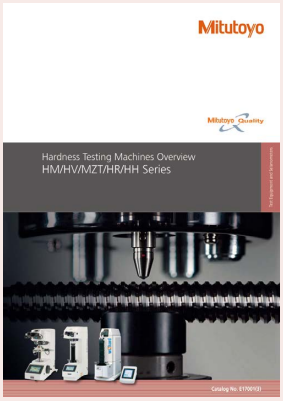


Refer to the Hardness Testing Machines Brochure (No. E17001) for more details.

MeasurLink ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

- Hardness measurement by durometer is simply performed by holding the instrument against the surface of a specimen and reading the indicated value. This type of hardness tester is most widely used for hardness testing of sponge, rubber, plastics and other soft materials.

HARDMATIC HH-411
SERIES 810 — Rebound Type Portable Hardness Tester

MeasurLink ENABLED
Data Management Software by Mitutoyo

- Excellent operability that performs hardness tests with the touch of a key and a compact body allows users to measure hardness in the field. This instrument is best suited for on-site hardness tests such as large molds, railroad track, and welded spots in structures.

SPECIFICATIONS

Order No.	810-299-10, 810-299-11, 810-298-10, 810-298-11
Model	HH-411
Detector	Impact hammer with integrated detector and carbide-ball tip (D type: conforming to ASTM A 956)
Display unit	7-segment LCD
Hardness display range	Leeb hardness: 1 to 999 HL
Display range (This display range varies depending on the conversion table used.)	Vickers hardness: 43 to 950 HV Brinell hardness: 20 to 894 HB Rockwell hardness (C scale): 19.3 to 68.2 HRC Rockwell hardness (B scale): 13.5 to 101.7 HRB Shore hardness: 13.2 to 99.3 HS Tensile strength: 499 to 1996 MPa
Power supply	Alkaline AA battery 2 pcs or optional AC adapter (battery life: 70 hours)
External dimensions/Mass	Detector: ø28×175 mm in length, 120 g Display: 70(W)×110(D)×35(H) mm, Approx. 100 g

Note: Order No. **810-298-10/810-299-10** includes two AA alkaline batteries and Order No. **810-298-11/810-299-11** excludes these batteries.

HARDMATIC HH-300
SERIES 811 — Durometers for Sponge, Rubber, and Plastics

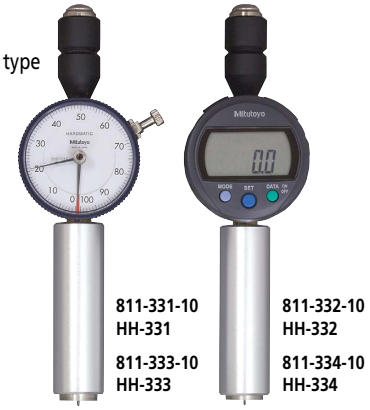
MeasurLink ENABLED
Data Management Software by Mitutoyo

Compact type

811-329-10 HH-329
811-335-10 HH-335
811-337-10 HH-337

811-330-10 HH-330
811-336-10 HH-336
811-338-10 HH-338

Long type



811-331-10 HH-331
811-333-10 HH-333

811-332-10 HH-332
811-334-10 HH-334

SPECIFICATIONS

Order No.		811-329-10	811-330-10	811-331-10	811-332-10	811-333-10	811-334-10	811-335-10	811-336-10	811-337-10	811-338-10
Model No.		HH-329*	HH-330	HH-331*	HH-332	HH-333*	HH-334	HH-335*	HH-336	HH-337*	HH-338
Type		Compact		Long				Compact			
Display specification		Analog	Digital	Analog	Digital	Analog	Digital	Analog	Digital	Analog	Digital
Measurement target		Soft rubber, sponge, felt, hard film, winder		General rubber, soft plastic		hard rubber, hard plastic, ebonite		General rubber, soft plastic		hard rubber, hard plastic, ebonite	
Classification by specification		Type E		Type A		Type D		Type A		Type D	
Needle shape	Shaft diameter	—		ø1.25 mm							
	Tip shape	Semi-sphere		Circular truncated cone		Cone		Circular truncated cone		Cone	
	Tip angle	—		35°		30°		35°		30°	
	Tip diameter	ø5 mm		ø0.79 mm		—		ø0.79 mm		—	
	Tip curvature	—		—		0.1 mm		—		0.1 mm	
Power supply		—	Button silver oxide battery SR44	—	Button silver oxide battery SR44	—	Button silver oxide battery SR44	—	Button silver oxide battery SR44	—	Button silver oxide battery SR44
External dimensions (W×D×H)		68×34×146 mm	59×40×147 mm	Analog, long type : 68×35×188 mm Digital, compact type: 59×41×1907 mm				Analog, long type : 68×34×146 mm Digital, compact type: 59×40×147 mm			
Mass		300 g	290 g	320 g	310 g	320 g	310 g	300 g	290 g	300 g	290 g

* Models which can be connected to the MeasurLink measurement data network system are only Digital types.

Optional Accessories for Dual-purpose Stand CTS Series

Order No.	811-019	811-012	811-013
Model	CTS-101	CTS-102	CTS-103
Applicable models	HH-331/32	HH-333/34/37/38	HH-335/36

M