

# Hardness Testing Machines

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



An inspection certificate is supplied as standard. Refer to page X for details.

## HV-100

### SERIES 810 — Vickers Hardness Testing Machines

- 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.
- Objective lenses specifically developed for hardness testing are supplied. A clear and natural view of an indentation is achieved by changing the light source of the illumination from halogen to LED.
- A new 2X lens for wide-angle observation has been added to the range. Now, magnifications of 10X, 20X, 50X and 100X for observation and gaging; and 5X and 2X for observation are available. Also, the working distance is doubled (5.9 to 11.8mm) for the 10X objective lens (in-house comparison) to minimize the risk of collision between the workpiece and the lens.

- In addition to Vickers hardness testing, fracture toughness tests (IF Method: JIS R 1607) and other tests can be performed with optional accessories such as a Knoop indenter and additional indenters and a weight for Micro Brinell testing.
- Four systems are available: Basic model A; model B equipped with automatic indentation reading function; model C equipped with automatic indentation reading function and automatic XY stage; model D equipped with automatic indentation reading function, automatic XY stage, and auto-focus stage.



System A (HV-110A/120A)

### Optional Accessories

- 810-037:** Round table (Diameter: 180mm)
- 810-038:** Round table (Diameter: 250mm)
- 810-040:** V-anvil (large) (Diameter:40mm, Groove width:30mm)
- 810-041:** V-anvil (small) (Diameter:40mm, Groove width:6mm)
- 810-423:** Manual XY stage 50x50mm
- 19BAA011:** Hardness standard block 200HV
- 19BAA012:** Hardness standard block 300HV
- 19BAA013:** Hardness standard block 400HV
- 19BAA014:** Hardness standard block 500HV
- 19BAA015:** Hardness standard block 600HV
- 19BAA016:** Hardness standard block 700HV
- 19BAA017:** Hardness standard block 800HV
- 19BAA018:** Hardness standard block 900HV
- 11AAC702:** Stand for testing machine
- 11AAC719:** Vibration isolator
- 810-644:** Wing for vibration isolator (11AAC719)
- 998923:** System rack (vertical)

## SPECIFICATIONS

Order No.	810-440, 810-443				810-445, 810-448				810-160				
Model	HV-110				HV-120				AVK-C0				
Applicable standards	JIS B 7725, ISO 6507-2												
Test force	N	9.807	19.61	29.42	49.03	2.942	4.903	9.807	24.51	9.807	49.03	98.07	245.2
	(kgf)	1	2	3	5	0.3	0.5	1	2.5	1	5	10	25
	N	98.07	196.1	294.2	490.3	49.03	98.07	196.1	294.2	490.3	—	—	—
	(kgf)	10	20	30	50	5	10	20	30	50	—	—	—
Test force control	Lever method and automatic control (load, duration, unload)								Lever method and automatic control (load, duration, unload)				
Objective lens	Up to 3 pcs. mountable (one standard lens 10X mounted as standard)								10X for measurement				
Resolution of diagonal length of an indentation	Objective lens less than 50X: 0.1µm (Objective lens more than 50X: 0.01µm)								1µm				
Turret drive	Motor driven and manual operation								Manual switching				
Specimen dimensions	System A: height 210mm, depth 170mm (when using flat anvil) System B: height 181mm, depth 170mm (when using manual XY stage 50X50mm) System C: height 172mm, depth 170mm, System D: height 132mm, depth 170mm								Height 205mm, depth 165mm (when using flat anvil)				
Control panel	Built-in touch panel, 5.7" Color LCD (HM-110A/120A for System A), Control software (PC for System B/C/D)												
Functions*1	Calculation of Vickers/Knoop <sup>*2</sup> /Brinell <sup>*3</sup> hardness, and ceramic fracture toughness based on IF method (JIS R1697), 3 display format (standard, list, simple), GO/NG judgment, test condition guide, curve and user correction, hardness corresponding value, statistics calculation												
Output	Digimatic, serial, USB2.0 series A (for memory)*1, USB2.0 B Type (for system communication)												
External dimensions (excluding protrusions and stage)	System A: 307(W)×696(D)×786(H)mm System B/C/D: 307(W)×627(D)×875(H)mm								210(W)×580(D)×705(H)mm				
Main unit mass	HV-110: Approx. 60kg, HV-120: Approx. 58kg								Approx. 49kg				
Power supply (main unit)	AC100V 50/60Hz System A: 24W System B/C/D: 22W												
Power supply*4 (Control unit)	AC100V 50/60Hz 67W												

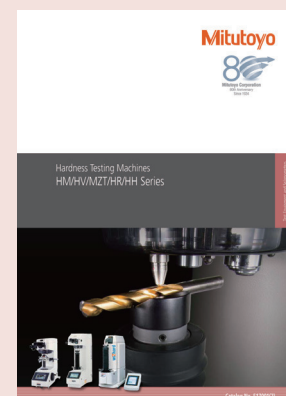
\*810-440, 810-445: System A, 810-443, 810-448: System B/C/D

\*1: Functions for System A.

\*2: For Knoop hardness test, Knoop indenter (optional) is required.

\*3: For Brinell hardness test, Brinell indenter (optional) and additional weight is required.

\*4: Supplied only for System C/D.



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



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Refer to page X for details.

### System A (HV-110A/HV-120A)

All-in-one model with simple color touch-panel operation for test force motorized switching and motorized turret mount.

\*Camera and monitor are optional accessories.



### System B (HV-110B/HV-120B)

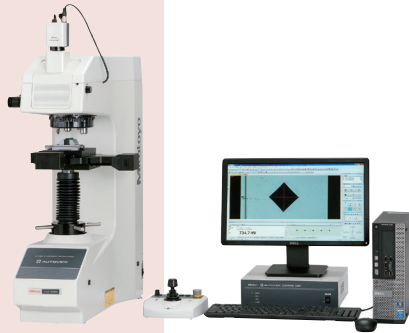
System B is equipped with **AVPAK-20**, a the software package for automatic hardness testing systems that automatically measures the diagonal length of an indentation and calculates the corresponding hardness value. This means that measurement error caused by variation in operator interpretation is eliminated, so reducing costs.

Automatic measurement of indentation

### System C (HV-110C/HV-120C)

In addition to the functions of System B, System C is equipped with motorized XY stage. This system is useful for improving the efficiency of operations such as multi-point hardness testing.

Automatic measurement of indentation / motorized XY stage



### System D (HV-110D/HV-120D)

In addition to the functions of System B and System C, System D is equipped with the autofocus function. This function allows for automatic hardness testing, thereby increasing efficiency and reducing labor costs.

Automatic measurement of indentation / motorized XY stage / Autofocusing

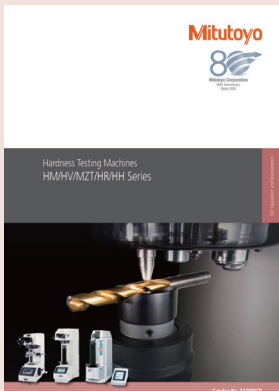


CAUTION: The **AVPAK-20** software package is not for use and/or export to the United States of America. The **AVPAK-10** software package is for the United States of America.

## AVK-C0 SERIES 810 — Vickers Hardness Testing Machines

- A basic Vickers hardness testing machine that is easy to use and economical.

\*Refer to the table on page M-5 for specifications.



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