Microhardness testers

HMV-GSeries

The new generation of HMV-G microhardness testers is designed for standardized and universal hardness measurements of thin metal samples and brittle materials. SHIMADZU offers reliable and durable equipment for simple and effective use in any production laboratory and testing center.

Possibilities:

- Automatic load switching mechanism
- High measurement accuracy
- Ergonomic design - G-shaped frame designed to accommodate long specimens
- Direct data export function to USB flash drive
- Possibility of equipping with a multi-turret containing 2 indenters and 4 lenses of the optical system
- Set test conditions and display results using color LCD display
- Possibility of conducting hardness tests according to Vickers, Knoop (optional), Brinell (optional)
- Possibility of automatic conversion of Vickers measurements into other units

- Indenter fingerprint recognition in 0.3 seconds
- Improved fingerprint recognition algorithm on scratched surfaces
- Easy sample positioning with a dedicated stage

- Possibility of equipping with a built-in CCD camera
- Wide choice of sample holders
- Connecting to a printer and printing information (optional)
- "Assistance" system that determines the optimal test load
- Possibility of supplying a fully automatic micro-hardness tester with a sample shape recognition system

Application areas:

- Microstructures of all types of metallic materials
- Welds, paint layers and metal cladding
- Machine parts (e.g. camshafts and gears)
- Fine ceramics and structural materials
- Electronic components (including chips and boards)

- Small parts of high-precision devices (e.g. watches, photo and video cameras, etc.)
- Thin samples (razors, metal strips, foil, etc.)
- Medical products (artificial teeth and bones)

Specification. [Models HMV-G].

1. Model name	HMV-G21S	HMV-G21ST	HMV-G21D	HMV-G21DT	HMV-G-XY-S	HMV-G-XY-D	HMV-G-FA-S	HMV-G-FA-D	HMV-G20S	HMV-G20ST	HMV-G20D	HMV-G20DT
2. Management method	Via PC								Autonomous			
3. Max. number of indenters	1		2		1	2	1	2	1		2	
4. Standard indenter	Vickers indenter											
5. Max. number of objective lenses	2		4		2	4	2	4	2		4	
6. Standard objective lenses	40×		40×10×		40×	40×10×	40× (with extended focal length)		40×		40×10×	
7. Electric turret *1	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes
8. Load	Automatic switching to any of 9 load types: 98.07 mN; 245.2 mN; 490.3 mN; 980.7 mN; 1.961 N; 2.942 N; 4.903 N; 9.807 N and 19.61 N (HV0.01; 0.025; 0.05; 0.1; 0.2; 0.3; 0.5; 1 and 2) and four arbitrary values. *2 When equipped with the low load function, three more values are added: 9.807 mN; 19.61 mN and 49.04 mN (HV0.001; HV0.002 and HV0.005). *3											
9. Accuracy	In the load range from 9.807 mN to 1.951 N, accuracy: ±1.5% max.; in the load range from 1.961 N to 19.61 N accuracy: ±1% max.											
10. Load block	Automatic loading and automatic load change system											
11. Duration of the exercise program *4	From 0 to 999 seconds											
12. Fingerprint reading method	Automatic fingerprint recognition based on the image received from the built-in digital CCD camera, or by manual settings with indication of measurement lines using PC								Measuring the print manually using an optical microscope.			
13. Eyepiece	Obtaining an image of the print using the built-in CCD camera.						Obtaining a fingerprint image using a built-in CCD camera with autofocus		10×			
14. Effective measuring range	120 mm×90 mm (at 40×)								250 microns×250 µm (at 40×)			
15. Resolution	0.09 µm auto; 0.18 µm manual (at 40×)								0.01 µm (at 40×)			
16. XY-object stage *5	Manual drive: surface area: 100×100 mm; Stroke: ±12.5 mm; Max. Height above Stage: 100 mm; Max. Depth for Specimen Width 120 mm or More: 200 mm; for Specimen Width 120 mm or Less: Unlimited Z-Axis: Stroke 60 mm				Electric drive: surface area: 125 mm×125 mm; stroke: ±25 mm; max. height above sample table: 65 mm; max. depth for sample width 120 mm or more: 200 mm; for sample width 120 mm or less: unlimited Z-axis: 45mm stroke				Manual drive: surface area: 100×100 mm; stroke: ±12.5 mm; max. height above sample stage: 100 mm; max. depth for sample width 120 mm or more: 200 mm; for sample width 120 mm or less: unlimited Z-axis: 60mm stroke			
17. Data processing	Measurement modes: 1) Vickers hardness HV; 2) Knoop hardness HK; 3) Brinell hardness HB; 4) hardness when indented with a triangular pyramid HT;*65) measurement of length L (µm); 6) crack resistance Kc *7											
18. Statistical calculation												
Max. number of values	5000								999			
Elements of statistics	Mean value, standard deviation, coefficient of variation, maximum value, minimum value, conversion of values (HK, HBW, HS, MPa, HRA, HRB, HRC, HRD, HR15N, HR30N, HR45N)											
Graphic display	Deviation graphs, hardening depth ·*8movements								Deviation and depth graphs			
19. Displaying results									hardening,*8histogram			
Displayed values	Result number, diagonal length, hardness, recalculated value, mean, standard deviation, coefficient of variation, max and min values, result with pass/fail condition											
Graphic display	Hardening Deviation and Depth Graphs *8								Deviation and depth graphs hardening,*8histogram			
20. External outputs USB	PC connection (one CCD camera port and one device connection port)								Saving test results to an external USB flash drive in CSV format			
Printers	Dot, thermal and laser printers											
21. Overall dimensions	Approx: (W) 350mm x (D) 570mm x (H) 540mm											
22. Weight	Approximately 44 kg.				Approximately 48 kg.				Approximately 44 kg.			
23. Power requirements	Single phase AC 100-115V; 1A; AC 230V; 0.5A; grounding required. (Grounding resistance: max. 100 ohms)											
24. Compatibility with PC	Operating system: Windows 7 (32-bit version), *9 CPU (Intel®Core TM2Duo or more powerful), at least two USB 2.0 ports											

* 1   The electric turret is installed at the factory. The microhardness tester cannot be retrofitted with an electric turret.
* 2   In the range from 98.07 mN to 19.61 N, it is possible to set arbitrary loads with a step of 9.807 mN (HV 0.001)
* 3   The low load option is installed at the factory. The microhardness tester cannot be retrofitted with this option. There are 3 initial values of low loads: 9.807 mN; 19.61 million; 49.04 mN
When using the arbitrary load function, small loads can be set in 9.807 mN (HV 0.001) steps within the range of 9.807 mN to 88.26 mN (HV 0.001 – HV 0.009)
* 4   If the test requires indentation for more than 60 seconds, wait 30 minutes after turning on the instrument.
* 5   Make sure the shape of the specimen allows the use of an XY stage.
* 6   Knupp, Brinell and triangular pyramid intenters are optional.
* 7   Identification of the presence of a crack is performed by the operator.
* 8   Hardening depth graphs are only displayed when using the digital micrometer (optional)
* 9   Not compatible with 64-bit operating systems. PC requirements may vary

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