Micro-Vickers Hardness Testing Machines HM-210/220

Series 810

This is a high performance hardness testing machine that uses advanced technology and is ideal for quality control.
The manual line up of the HM-200 Series has the following benefits:

- 144 mm (5,7 inch) colored touchsreen display (Type A) with higher visibility, easy to operate user interface
- Digimatic output for report creation.
- USB stick data export
- Electromagnetic test force generation system for higher accuracy.
- A high performance optical system provides a high quality image of the indentation load.
- A long working distance greatly reduces the possibility of collision.
- A range of six different objectives: 2x, 5x, 10X, 20X, 50X and 100X for measuring the indentation images.
- LED lighting gives you an observation image in natural colour, with better contrast, as well as longer operation.
- You can set different kinds of conditions on a touch panel, and display test results for easy operation.
- Vickers, Knoop and KC fracture toughness measurement.
- Test force ranges from 0,05g to 2kg.

Specifications

Indenter / Objective turret	Motor driven and manual operation
Standard	ISO 6507-2, ISO 4545-2, JIS B 7725
Data output	RS-232C, Digimatic, USB 2 interface
XY stage [mm]	Travel range system A+B: 25 x 25 / 50 x 50 manual Travel range system C+D: 50 x 50 / 100 x 100 motorized
Arbitrary test force	1 type [Default: 245,2mN (25gf)]
Control panel	Built-in touch panel, 5,7" Color LCD (HM-210A/220A for System A), Control software (PC for System B/C/D)
External dimensions Main unit mass	System A: 315(W)×671(D)×595(H)mm/38,5kg System B/C/D: 315(W)×586(D)×741(H)mm/37,4kg
Functions	Calculation of Vickers / Knoop*2 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
Objective lens unit	Up to 4 pcs. mountable (one mounted 50X as standard)
Output	Digimatic, serial, USB2 series A (for memory)*1, USB2 B Type (for system communication)
Resolution of diagonal length of an indentation	Objective lens less than 50X: 0,1µm (Objective lens more than 50X: 0,01µm)
Specimen dimensions	System A/B: height 133mm, depth 160mm (when using manual XY stage 25X25) System C: height 112mm, depth 160mm, System D: height 72mm, depth 160mm
Test force control	Electromagnetic generation of force (force motor) and automatic control (load, duration, unload)
Turret drive	Motor-driven and manual operation

Hardness Testing Machines brochure on request

Touchscreen type **Software type**

HM-210 Testforce range

No.		Test force								
HM-210	V.S.*	HV0,01	HV0,02	HV0,03	HV0,05	HV0,1	HV0,2	HV0,3	HV0,5	HV1
	mN	98,07	196,1	294,2	490,3	980,7	1.961,0	2.942,0	4.903,0	9.807,0
	(gf)	10,0	20,0	30,0	50,0	100,0	200,0	300,0	500,0	1.000,0

*V.S. = Vickers scale

HM-220 Testforce range

No.		Test force									
HM-220	V.S.*	HV0,00005	HV0,0001	HV0,0002	HV0,0003	HV0,0005	HV0,001	HV0,002	HV0,003	HV0,005	HV0,01
	mN	0,4903	0,9807	1,961	2,942	4,903	9,807	19,61	29,42	49,03	98,07
	(gf)	0,05	0,1	0,2	0,3	0,5	1,0	2,0	3,0	5,0	10,0
	V.S.*	HV0,02	HV0,03	HV0,05	HV0,1	HV0,2	HV0,3	HV0,5	HV1	HV2	
	mN	196,1	294,2	490,3	980,7	1.961,0	2.942,0	4.903,0	9.807,0	19.610,0	
	(gf)	20,0	30,0	50,0	100,0	200,0	300,0	500,0	1.000,0	2.000,0	

*V.S. = Vickers scales

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Micro-Vickers Hardness Testing Machines HM-210/220

Manual or complete automatic testing

System A

HM-210A/HM-220A

Features:

- Touch-panel operation
- Measurement of indentation dimensions using a measuring microscope
- Positioning using a manual XY stage

System B

HM-210B/HM-220B
Automatic measurement by AVPAK-20 eliminates operator measurement errors.

Features:

- Operation using AVPAK-20
- Automatic measurement of indentations
- Positioning using a manual XY stage

System C

HM-210C/HM-220C

Features:

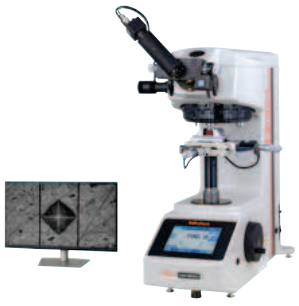
- Operated using AVPAK-20
- Automatic indentation reading
- Automatic positioning with motorized XY stage

System D

HM-210D/HM-220D
Top-end model with autofocus

Features:

- Operated using AVPAK-20
- Automatic identation reading
- Automatic positioning with motorized XY stage
- Autofocusing



Vickers HDMI camera system
(To be used with manual Vickers testing machines)
The 1/3" 1.2 Mpixel HDMI camera and a 24"standard monitor enables observation and measurement of indentations at high magnification, thereby reducing operator error. Additionally, images can be stored on the included 16GB SD card. No PC needed due to built in processor. Scope of delivery includes HDMI cable and wireless mouse. Please order 63AAA356, 11AAC729 and NEC EA21N for complete set.

AVPAK-20 software 11AAE270-DEE for automatic hardness testing systems.
Software that supports control, testing and report creation related to hardness testing. Supports parameter setting and automatic measurement.

High-functionality PC and TFT monitor
Compatible with Windows® 10 Professional. Supports a wide-screen TFT and provides improved operability.
*depending the version

Optional accessories

No.	Description
63ETB601	500HV0,1 Vickers Hardness Reference Material, with ASTM E92 DAkkS calibration certificate, 30x30x6mm, steel
63ETB606	750HV0,1 Vickers Hardness Reference Material, with ASTM E92 DAkkS calibration certificate, 30x30x6mm, steel
63ETB635	500HV0,3 Vickers Hardness Reference Material, with ISO 6507-3 DAkkS calibration certificate, 30x30x6mm, steel
63ETB640	750HV0,3 Vickers Hardness Reference Material, with ISO 6507-3 DAkkS calibration certificate, 30x30x6mm, steel
63ETB670	500HV1 Vickers Hardness Reference Material, with ISO 6507-3 DAkkS calibration certificate, 30x30x6mm, steel
63ETB675	750HV1 Vickers Hardness Reference Material, with ISO 6507-3 DAkkS calibration certificate, 30x30x6mm, steel
810-017	Special vise, (opening width 100mm)
810-013	Sheet specimen table
810-014	Thin specimen table, (horizontal type)
810-015	Thin specimen table, (vertical type)
810-019	Tilting specimen table
810-020	Adjustable specimen holder, Ø15-30mm
810-018	Rotary table, 360°
810-084	Rotatable adjustable specimen table, Ø15-30mm / 360°
810-085	Sheet specimen table
810-095	Rotary tilting specimen table, vise Ø15-50mm
810-650-1	Resin mold specimen table, Ø25.4 mm
810-650-2	Resin mold specimen table, Ø30 mm
810-650-3	Resin mold specimen table, Ø31.75 mm
810-650-4	Resin mold specimen table, Ø38.1 mm
810-650-5	Specimen holder f. resin molded specimen, 1 specimen Ø40 mm
810-641	Vibration Isolator, (for testing machine)

Code number	Description
63AAA602	HDMI camera
11AAC729	C-mount
NEC EA241WM	24" monitor

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Micro-Vickers Hardness Testing Machines HM-210/220

Single indenter configuration for HM-200 Series

A-Type*

B-Type*

C-Type*

D-Type*

*Please order AVPAK-20 Software **11AAE270-DEE** and the PC additionally!

All items listed below the set code number are included in the scope of delivery.

A-Type set

No.	Code No.:	Description	Content of Set
HM-210 A-Type set	810-401-13-ASET1	Single indenter configuration	**810-401-13** - Manual main unit HM-210 **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **810-420** - Manual XY stage 25x25mm
HM-220 A-Type set	810-406-13-ASET1	Single indenter configuration	**810-406-13** - Manual main unit HM-210 **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens, Standard lens **11AAE669** - 100x Objective lens **810-420** - Manual XY stage 25x25mm

B-Type set

No.	Code No.:	Description	Content of Set
HM-210 B-Type set	810-404-11-BSET1	Single indenter configuration	**810-404-11** - System main unit HM-210 **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **810-420** - Manual XY stage 25x25mm
HM-220 B-Type set	810-409-11-BSET1	Single indenter configuration	**810-409-11** - System main unit HM-220 **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **11AAE669** - 100x Objective lens **810-420** - Manual XY stage 25x25mm

C-Type set

No.	Code No.:	Description	Content of Set
HM-210 C-Type set	810-404-11-CSET1	Single indenter configuration	**810-404-11** - Systemmain unit HM-210 **11AAE665** - 2x Objective lens **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **810-462-10** - Motorized XY stage 100x100mm
HM-220 C-Type set	810-409-13-CSET1	Single indenter configuration	**810-409-11** - System main unit HM-220 **11AAE665** - 2x Objective lens **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **11AAE669** - 100x Objective lens **810-462-10** - Motorized XY stage 100x100mm

D-Type set

No.	Code No.:	Description	Content of Set
HM-210 D-Type set	810-404-11-DSET1	Single indenter configuration	**810-404-11** - System main unit HM-210 **11AAE665** - 2x Objective lens **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **810-462-10** - Motorized XY stage 100x100mm **810-465** - Auto Focus unit
HM-220 D-Type set	810-409-13-DSET1	Single indenter configuration	**810-409-11** - System main unit HM-220 **11AAE665** - 2x Objective lens **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **11AAE669** - 100x Objective lens **810-462-10** - Motorized XY stage 100x100mm **810-465** - Auto Focus unit

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Micro-Vickers Hardness Testing Machines HM-210/220

Double indenter configuration HM-200 Series

A-Type set

No.	Code No.:	Description	Content of Set
HM-210 A-Type set 2	810-401-13-ASET2	Double indenter configuration	**810-401-13** - Manual main unit HM-210 **11AAB997** - Second indentershaft for Knoop test **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **810-420** - Manual XY stage 25x25mm
HM-220 A-Type set 2	810-406-13-ASET2	Double indenter configuration	**810-406-13** - Manual main unit HM-210 **11AAB998** - Second indentershaft for Knoop test **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **11AAE669** - 100x Objective lens **810-420** - Manual XY stage 25x25mm

B-Type set

No.	Code No.:	Description	Content of Set
HM-210 B-Type set 2	810-404-11-BSET2	Double indenter configuration	**810-404-11** - System main unit HM-210 **11AAB997** - Second indentershaft for Knoop test **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **810-420** - Manual XY stage 25x25mm
HM-220 B-Type set 2	810-409-11-BSET2	Double indenter configuration	**810-409-11** - System main unit HM-220 **11AAB998** - Second indentershaft for Knoop test **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **11AAE669** - 100x Objective lens **810-420** - Manual XY stage 25x25mm

C-Type set

No.	Code No.:	Description	Content of Set
HM-210 C-Type set 2	810-404-11-CSET2	Double indenter configuration	**810-404-11** - System main unit HM-210 **11AAB997** - Second indentershaft for Knoop test **11AAE665** - 2x Objective lens **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **810-462-10** - Motorized XY stage 100x100mm
HM-220 C-Type set 2	810-409D-CSET2	Double indenter configuration	**810-409-11** - System main unit HM-220 **11AAB998** - Second indentershaft for Knoop test **11AAE665** - 2x Objective lens **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **11AAE669** - 100x Objective lens **810-462-10** - Motorized XY stage 100x100mm

D-Type set

No.	Code No.:	Description	Content of Set
HM-210 D-Type set 2	810-404-11-DSET2	Double indenter configuration	**810-404-11** - System main unit HM-210 **11AAB997** - Second indentershaft for Knoop test **11AAE665** - 2x Objective lens **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **810-462-10** - Motorized XY stage 100x100mm **810-465** - Autofocus unit
HM-220 D-Type set 2	810-409-11-DSET2	Double indenter configuration	**810-409-11** - System main unit HM-220 **11AAB998** - Second indentershaft for Knoop test **11AAE665** - 2x Objective lens **2ALP300**- 10x Objective lens **2ALP500** - 50x Objective lens **11AAE669** - 100x Objective lens **810-462-10** - Motorized XY stage 100x100mm **810-465** - Autofocus unit

A-Type*

B-Type*

C-Type*

D-Type*

*Please order AVPAK-20 Software **11AAE270-DEE** and the PC additionally!

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Configuration

Up to three additional objective lenses can be added

Observation image of the indentation (5
Stray light reduction around the indentat

Objectives	Vickers-Scale		
	HV 0,00005 - 0,02	HV 0,2 - 1	HV 1-2
2x	Use this objectives only for probe overview		
5x	Use this objectives only for probe overview		
10x			
20x			
50x			
100x			
10x objective for easy focus			
Use this table for first orientation			

Wide range of lenses available for different magr
cati

TOUCH SCREEN MODELS — SYSTEM A

Minimum system configuration			In addition selectable FACTORY OPTIONS		Remarks
HM-210 SYSTEM A	Main unit standard test force	810-401D	Video camera unit	810-454D	
	Manual XY stage 25 x 25mm	810-420	Objective lens 2X	11AAC104	
HM-210 SYSTEM A	Main unit standard test force	810-401D	Objective lens 5X	11AAC105	
	Manual XY stage 50 x 50mm	810-423	Objective lens 10X	11AAC106	
			Objective lens 20X	11AAC107	
			Objective lens 100X	11AAC108	
			Indenter shaft unit	11AAC109	with 19BAA061 Knoop indenter
HM-220 SYSTEM A	Main unit low test force	810-406D	Video camera unit	810-454D	
	Manual XY stage 25 x 25mm	810-420	Objective lens 2X	11AAC104	
HM-220 SYSTEM A	Main unit low test force	810-406D	Objective lens 5X	11AAC105	
	Manual XY stage 50 x 50mm	810-423	Objective lens 10X	11AAC106	
			Objective lens 20X	11AAC107	
			Objective lens 100X	11AAC108	
			Indenter shaft unit	11AAC110	with 19BAA062 Knoop indenter

SOFTWARE MODELS — SYSTEM B

Minimum system configuration			In addition selectable FACTORY OPTIONS		Remarks
HM-210 SYSTEM B	Main unit standard test force	810-404D	Objective lens 2X	11AAC104	
	Manual XY stage 25 x 25mm	810-420	Objective lens 5X	11AAC105	
	AVPAK-20*	11AAC666	Objective lens 10X	11AAC106	
HM-210 SYSTEM B	Main unit standard test force	810-404D	Objective lens 20X	11AAC107	
	Manual XY stage 50 x 50mm	810-423	Objective lens 100X	11AAC108	
	AVPAK-20*	11AAC666	Indenter shaft unit	11AAC109	with 19BAA061 Knoop indenter
HM-220 SYSTEM B	Main unit low test force	810-409D	Measuring microscope	11AAC129	
	Manual XY stage 25 x 25mm	810-420	Objective lens 2X	11AAC104	
	AVPAK-20*	11AAC666	Objective lens 5X	11AAC105	
HM-220 SYSTEM B	Main unit low test force	810-409D	Objective lens 10X	11AAC106	
	Manual XY stage 50 x 50mm	810-423	Objective lens 20X	11AAC107	
	AVPAK-20*	11AAC666	Objective lens 100X	11AAC108	
			Indenter shaft unit	11AAC110	with 19BAA062 Knoop indenter
			Measuring microscope	11AAC129	

SOFTWARE MODELS — SYSTEM C

Minimum system configuration			In addition selectable FACTORY OPTIONS		Remarks
HM-210 SYSTEM C	Main unit standard test force	810-404D	Objective lens 2X	11AAC104	
	Motorized XY stage 50 x 50mm	810-461D	Objective lens 5X	11AAC105	
	AVPAK-20*	11AAC666	Objective lens 10X	11AAC106	
HM-210 SYSTEM C	Main unit standard test force	810-404D	Objective lens 20X	11AAC107	
	Motorized XY stage 100 x 100mm	810-462D	Objective lens 100X	11AAC108	
	AVPAK-20*	11AAC666	Indenter shaft unit	11AAC109	with 19BAA061 Knoop indenter
HM-220 SYSTEM C	Main unit low test force	810-409D	Measuring microscope	11AAC129	
	Motorized XY stage 50 x 50mm	810-461D	Objective lens 2X	11AAC104	
	AVPAK-20*	11AAC666	Objective lens 5X	11AAC105	
HM-220 SYSTEM C	Main unit low test force	810-409D	Objective lens 10X	11AAC106	
	Motorized XY stage 100 x 100mm	810-462D	Objective lens 20X	11AAC107	
	AVPAK-20*	11AAC666	Objective lens 100X	11AAC108	
			Indenter shaft unit	11AAC110	with 19BAA062 Knoop indenter
			Measuring microscope	11AAC129	

SOFTWARE MODELS — SYSTEM D

Minimum system configuration			In addition selectable FACTORY OPTIONS		Remarks
HM-210 SYSTEM D	Main unit standard test force	810-404D	Objective lens 2X	11AAC104	
	Motorized XY stage 50 x 50mm	810-461D	Objective lens 5X	11AAC105	
	Auto Focus stage unit	810-465	Objective lens 10X	11AAC106	
	AVPAK-20*	11AAC666	Objective lens 20X	11AAC107	
HM-210 SYSTEM D	Main unit standard test force	810-404D	Objective lens 100X	11AAC108	
	Motorized XY stage 100 x 100mm	810-462D	Indenter shaft unit	11AAC109	with 19BAA061 Knoop indenter
	Auto Focus stage unit	810-465	Measuring microscope	11AAC129	
	AVPAK-20*	11AAC666			
HM-220 SYSTEM D	Main unit low test force	810-409D	Objective lens 2X	11AAC104	
	Motorized XY stage 50 x 50mm	810-461D	Objective lens 5X	11AAC105	
	Auto Focus stage unit	810-465	Objective lens 10X	11AAC106	
	AVPAK-20*	11AAC666	Objective lens 20X	11AAC107	
HM-220 SYSTEM D	Main unit low test force	810-409D	Objective lens 100X	11AAC108	
	Motorized XY stage 100 x 100mm	810-462D	Indenter shaft unit	11AAC110	with 19BAA062 Knoop indenter
	Auto Focus stage unit	810-465	Measuring microscope	11AAC129	
	AVPAK-20*	11AAC666			

* The above set does not include PC.

For all systems: 50 x objective as standard.

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