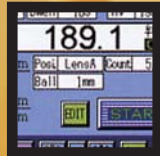
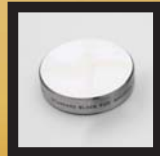
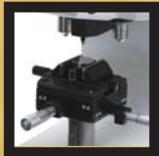


mmT-X

DIGITAL MICRO HARDNESS TESTERS



▶ MMT-X Feature

- The new function deploy, color LCD touch panel.
- The turret which mounted two indenter, four objective lenses.
- Testing area of industry maximum class.
- Wide test force range.
- Line up in LCD model.
- 0.01 μm measuring. (Magnification X200~X1000)
- LED light source.



MATSUZAWA

<http://www.matsuzawa-ht.com>

mmT-X

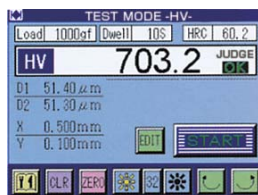
DIGITAL MICRO HARDNESS TESTERS

Operation Color LCD touch panel

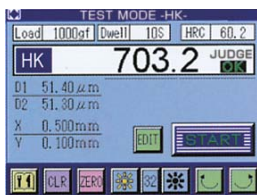
Visibility and operativity improve by color LCD touch panel. Equipped with the assist function that can identify the most suitable measurement condition.

(Correspondence model:X3,X7)

HV testing mode (Vickers Hardness)

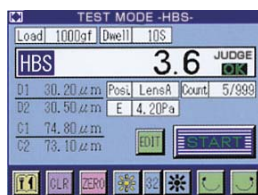


HK testing mode (Knoop Hardness)



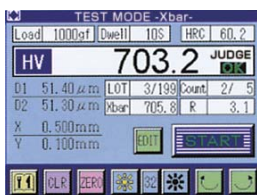
※Knoop indenter(option) is required.

Light-load brinell mode



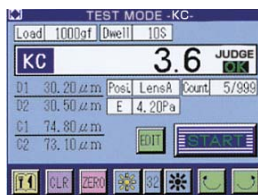
Ball indenter(option) is required.

Xbar mode

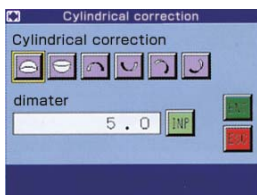


This mode can display the mean and difference immediately.

Fracture toughness KC testing mode.

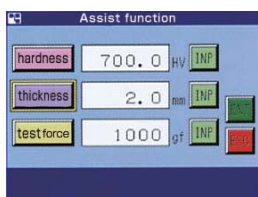


Cylindrical correction mode :



This mode can set spherical surface and cylindrical correction.

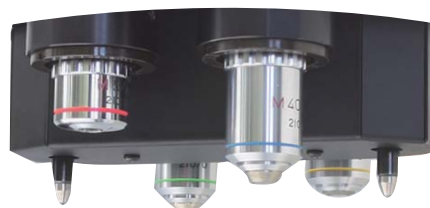
Assist function



This mode can identify the testing condition which is optimum is carried. The testing condition which is optimum can be confirmed by satisfying 2 from 3 condition of thickness, hardness, test load.

Function

The turret which mounted two indenter, four objective lenses.



Two indenter and four objective lenses are realized following conventional stable loading mechanism. The measuring that reliability is high can be done in various test condition.

(All mode correspondence)

Measuring unit 0.01 μm was realized by corresponding to high magnification of measuring. total magnification ×200×1000.

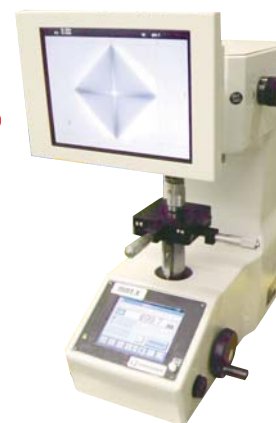
(Correspondence model:X3,X7)

Operation Line up in LCD model.

Clear specimen surface image magnified on TFT LCD monitor is displayed. Fatigue by the long operation is decreased. The integrated structure, there is no eye movement.

Because the Measurement knob is placed in the measurement panel, you can significantly reduce the fatigue of working long hours.

(Correspondence model:X3,X7)



Function

Testing area of industry maximum class.

By a new design, testing range of specimen height 120mm and specimen depth 160mm was secured.

(All mode correspondence)





MMT-X7

Digital model with auto turret.

Digital type

Min.scale : $0.01\mu\text{m}$ (200 \times ~1000 \times)

Min measuring unit : $0.01\mu\text{m}$ (200 \times ~1000 \times)

Touch panel type / Turret : Auto

Data output type / Dwell time : 5~99sec

MMT-X3

Digital model with touch panel.

Digital type

Min.scale : $0.01\mu\text{m}$ (200 \times ~1000 \times)

Min measuring unit : $0.01\mu\text{m}$ (200 \times ~1000 \times)

Touch panel type / Turret : Manual

Data output type / Dwell time : 5~99sec

MMT-X1

order made

Economy model of manual operation. Analog type

Specifications

Hardness Tester Model

Item / Model		MMT-X7			MMT-X3				MMT-X1						
Test force	Standard	Type A	49.03	98.07	245.2	490.3	980.7	1961	2942	4903	9807	mN			
			5	10	25	50	100	200	300	500	1000	gf			
	Option	Type B	9.807	29.42	49.03	98.07	245.2	490.3	980.7	1961	2942	4903	9807	19614	mN
			1	3	5	10	25	50	100	200	300	500	1000	2000	gf
Loading mechanism		Automatic loading and releasing method													
Load applying speed		50 $\mu\text{m}/\text{sec}$													
Dwell time		5~99sec							5~30sec						
Indenter		Standard:1(HV),Option:2(HV,HK)													
Objective lens		Standard:2($\times 40,\times 10$),Option:Max.4($\times 5\sim\times 100$)													
Eyepiece lens		Standard $\times 10$ option $\times 15$													
Total magnification		Standard($\times 400,\times 100$) Corresponding $\times 50\sim\times 1000$													
Measuring microscope (total 400 \times)	Max.measuring length		250 μm												
	Min.scale		0.01 μm (200 \times ~1000 \times)							0.5 μm					
	Min.measuring unit		0.01 μm (200 \times ~1000 \times)							0.1 μm					
	Type		Electronic type							Mechanical type					
Light source		LED light source													
Turret		Auto					Manual								
LCD touch panel		Color LCD touch panel									-				
Testing mode		6 kinds of HV,HK,HBS,KC,Xbar,Cylindrical correction													
Data memory		999 data memory													
Hardness conversion		Possible in compliance with SAE(J-417B),ASTM(E-140)													
OK/NG criteria		Judging to the results by setting Max. and Min.													
Statistical caluation		Max.value,Min.value,dispersion(R),mean value,converted value.													
Max. height of specimen		120mm													
Max. depth of specimen		160mm													
Data output		①Centronics(Dot printer output)													
		②RS232C(Output for PC),Possible to change to printer output													
Accuracy		According to JIS B7725 and ASTM E-384													
Photo booth		The photo booth can be installed in the body tube in the upper part of the main body at any time.													
Dimensions and weight		Main body only W250 \times D520 \times H530mm 35kg													
Power supply		Single phase AC100V~240 50/60Hz available for Export models													

TV measuring device



TVL

The 10.4inch TFT LCD monitor is attached.
(All mode correspondence)

LCD model



LCD

The 10.4inch TFT LCD monitor is integrated.
(Correspondence model:X3,X7)

TV measuring device Set Model

Item / Model	MMT-X□-TVL
CCD camera	1/2"CCD camera
Monitor	10.4" TFT LCD
Monitor magnification	≒ ×1200
Min.scale	0.01μm
Data display	Display on touch panel ※1
Output	Monitor output(NTSC)

LCD integrated model

Item / Model	MMT-X□-LCD
CCD camera	1/3"CCD camera
Monitor	10.4" TFT LCD
Monitor magnification	≒ ×1600
Min.scale	0.1μm
Data display	Display on monitor/Display on touch panel
Output	Monitor output(RGB)

※Number of hardness tester is in a part of □ of a model name. LCD integrated model is only digital model.(X3,X7)
※1 X1 do not have a data display function.

Automatic System



**Automatic reading system
PMT series**

PC system of the automatic reading function deployment. In addition to automatic reading, data processing and operation of hardness testers* can be operated in the PC side.



**Automatic stage system
AMT-S series**

PC system of the automatic stage deployment. Excellent measurement by the stage control box in the operation can be done.



**Automatic stage-reading system
AMT-PS series**

PC system of the automatic reading and stage function deployment. Various measuring patterns can be set.



**Automatic stage-reading-focus system
AMT-FS series**

PC system of the reading, automatic stage, auto focus. Serial operation of position move - Loading - auto focus - auto reading are done in all automatic.

Automatic focus

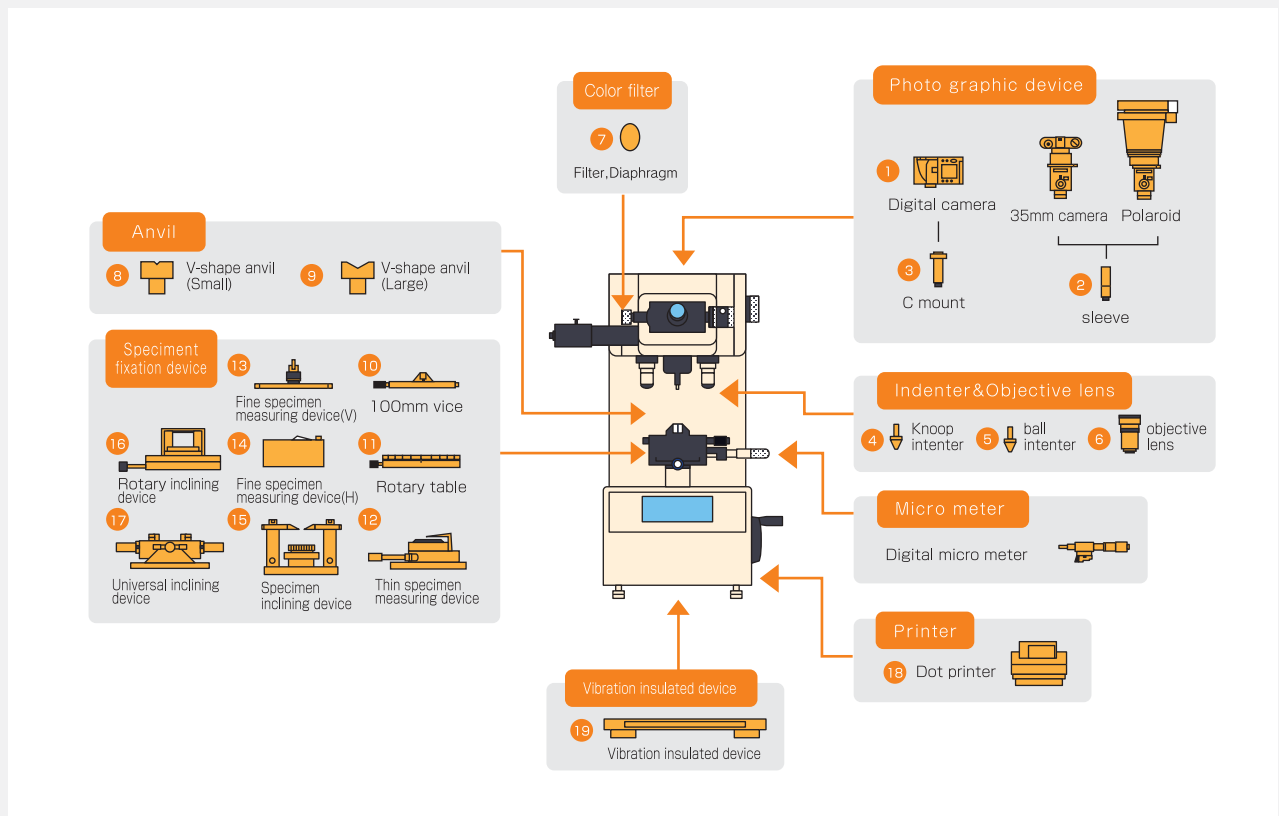
※Hardness tester models that can control is the only digital models.

Automatic System

Item / Model	PMT-X□	AMT-X□S	AMT-X□PS	AMT-X□FS
Correspondence model	X1, X3, X7	X3, X7	X3, X7	X7
Auto reading	○	—	○	○
Data processing	○	○	○	○
Auto stage	—	○	○	○
Auto focus	—	—	—	○
Stage control box	—	○	○	○
PC	PC/AT convertible			
Monitor	19" TFT monitor			
OS	Windows XP professional SP3(Corresponding windows7 in the future.)			
Other	X-Y data input option	Corresponding exclusive fully automatic system ※please consult		

※Number of hardness tester is in a part of □ of a model name. Please use an exclusive catalog on the details.
※Windows is a registered trademark by Microsoft USA in USA and other countries.

Option



Factory Setting Option

ID Code	Item	Specification	Model	Note
LB	Test Force type	Type B(1~2000gf 12step)	All	Standard:Type A
AP	Test Force change device	Automatic change(Panel operation)	X3,X7	
ID	Indenter	Two simultaneous installation(HV,HK)	All	
T3,T4	Objective lens	T3:3 objective lens / T4:4 objective lens	All	Standard:2 lens
DM	Micrometer	Digital micrometer	X3,X7	Displaying a coordinate value on touch panel & cable accessory

※Specify the above option at the time of the order. An exchange becomes possible only in our company factory later.

Optional Accessories

Code No.	Item	Contents
M203	Photographic device:Digital camera ①	Nikon Microsystem(Digital camera,relay lens,accessory)
M211	Camera sleeve ②	For polaroid camera or 35mm camera.
M213	C mount ③	For digital camera or automatic system.
M002	Knoop indenter(HK) ④	Effectively measures thin material.
M003	Ball indenter(HB) ⑤	For light-load brinell test.(ϕ 1mm steel ball)
M071~075	Objective lens ⑥	X100(M071), X40(M072), X20(M073), X10(M074), X5(M075)
M076	Eyepiece	X15
M081	Color filter ⑦	ϕ 20mm yellow,blue,red(standard:green)
M082	Aperture diaphragm ⑦	1mm~6mm(1mm pitch,6 size)
M020	V-shape anvil(Small) ⑧	For measuring the cylindrical surface together with vice. ϕ 2mm~ ϕ 6mm
M021	V-shape anvil(Large) ⑨	For measuring the cylindrical surface together with vice. ϕ 8mm~ ϕ 50mm
M012	Precision vice ⑩	Max. opening:100mm
M013	Rotary table ⑪	360° rotation.This table is usually on the micro test table with precision vice.
M014	Thin specimen measuring device ⑫	Specimen thickness:0.05~5mm
M015	Fine specimen measuring device(V) ⑬	Vertical type.Specimen diameter:0.1~4mm
M016	Fine specimen measuring device(H) ⑭	Horizontal type.Specimen diameter:0.5~4mm
M017	Specimen inclining device ⑮	The measuring surface always shows a horizontal level.Specimen height:5~21mm
M018	Rotary inclining device ⑯	Special use for mounted specimen.Specimen diameter:25,31.5,37.5mm 3 size
M019	Universal inclining device ⑰	When the specimen is inclined or curved,this device is effective to get the correct level.
C001	Dot printer ⑱	From CBM-910 II hardness tester adding up results to data output.
M171~M175	Vibration insulated device ⑲	On the desk type(Rubber cushion type:M171,Manual air type:M172, Auto air type:M173,Compound mount type:M175),Desk type(M174)

Standard Accessories

Code No.	Item / Model	MMT-X7	MMT-X3	MMT-X1
MO31	Manual X-Y stage(Built in/Max.movement:25mm/Min scale:0.01mm)		1	
MO11	Precision vice(Max.opening:50mm)		1	
MO61	Standard test block(700HVM0.2)		1	
MO01	Diamond indenter		1	
MO41	Measuring microscope:Electronic type	1		—
MO42	Measuring microscope:Mechanical type	—		1
MO72	Object lens 40×(Built in)		1	
MO74	Object lens 10×(Built in)		1	
M111	Level adjusting leg		4	
M112	Level		1	
MO94	Spare fuse(100~220V5A)		2	
CO31	Power cord(3P 2.5m)		1	
M161	Machine cover		1	
—	Auxiliary tool kit		1	
—	Instruction manual(Basic&Application)		1	
—	Inspection sheet		1	
—	Table for Vickers hardness number	—		1

Data processing software

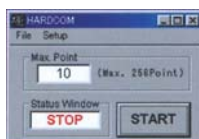
Hardness Data Communication Software(Optional)

HARDCOM SERIES

Testing data are transmitted to Microsoft Excel directly.

Testing data can be managed if software is installed in the personal computer.

(Microsoft Excel is separately necessary.)



Connection method

Hardness meter output(RS232C)-PC input(RS232C or USB)

*USB serial converters standard attachment·Corresponds to USB2.0

Data processing function

Testing data, test condition, statistics data and graph drawing are equipped.

Measurement position data can be input.

Testing position data are indicated by connecting a digital micro-meter.

(Digital micro-meter is separately necessary.)

Support an exclusive format.

The input part of the testing condition is freely revokable.

Our company will produce it if there is hope by a special form.

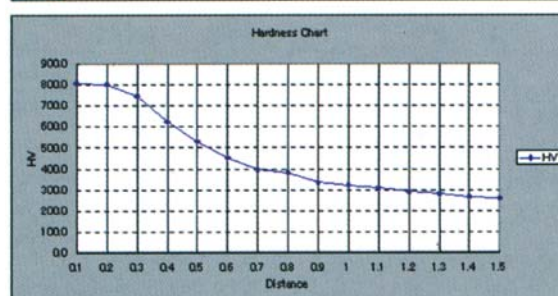
Code No. S001 Standard Software

Code No. S002 Software with the position data input function.

Corresponding model:MMT-X3,X7 · VMT-X3,X7 · RMT-1,3

*RMT series does not have the functionality of a data entry position.
OS:Windows2000,XP,Vista,7 Excel Version:corresponds up to 2010

HARDNESS TEST DATA					
Condition	2009/7/7	Part No.	000-000-123	Material	S-460
Customer	USER	Pro.No.	540025	Heat	
Name	Sample Test	Lot No.	460000	Other	
Note					



Statistic Data									
Point	Max.	Min.	R	Ave.	Stdev	Limit(U)	Limit(L)	Cp	Cpk
8	8060	2562	5498	4631	1967	9000	2000	0.69	0.40

Test Data										
NO	X	Y	Distance	Load (gf/mN)	Diagonal D1	Diagonal D2	Hardness HV	Conv. Scale	Conv. Hardness	Judge
1	0.1	0	0.1	9807	15.1	15.2	806.0	HV	806.0	OK
2	0.2	0	0.2	9807	15.2	15.2	802.7	HV	802.7	OK
3	0.3	0	0.3	9807	15.8	15.7	747.6	HV	747.6	OK
4	0.4	0	0.4	9807	17.2	17.3	623.2	HV	623.2	OK
5	0.5	0	0.5	9807	18.8	18.8	530.3	HV	530.3	OK
6	0.6	0	0.6	9807	20.3	20.2	462.2	HV	462.2	OK
7	0.7	0	0.7	9807	21.6	21.7	395.7	HV	395.7	OK
8	0.8	0	0.8	9807	22.1	22.0	381.4	HV	381.4	OK
9	0.9	0	0.9	9807	23.5	23.5	324.4	HV	324.4	OK
10	1	0	1	9807	24.0	24.1	283.6	HV	283.6	OK
11	1.1	0	1.1	9807	24.5	24.6	207.7	HV	207.7	OK
12	1.2	0	1.2	9807	25.2	25.3	200.9	HV	200.9	OK
13	1.3	0	1.3	9807	25.8	25.8	278.6	HV	278.6	OK
14	1.4	0	1.4	9807	26.5	26.4	265.1	HV	265.1	OK
15	1.5	0	1.5	9807	26.9	26.7	259.2	HV	259.2	OK

*Microsoft and Windows are registered trademark by Microsoft USA in USA and other details.

*Contents of this brochure is July 2012. Specifications and appearance may change without notice.



MATSUZAWA MATSUZAWA CO.,LTD

120-10, Aza-Nanamagaridai, Toshima, Kawabe,
Akita-shi, Akita Pref, 019-2611, Japan

TEL.+81-18-882-4580 FAX.+81-18-882-4584

E-MAIL:support@matsuzawa-ht.com URL:http://www.matsuzawa-ht.com

●Tokyo Office 2-43-1-506, Tagara, Nerima-ku, Tokyo, 179-0073, Japan TEL/FAX.+81-3-3975-9216

●West JAPAN Office 2-9-17, Koinokubo, Nara-shi, Nara Pref, 630-8136, Japan TEL.+81-742-32-5641 FAX.+81-742-34-7772

●Sakae Office 288-11, Horiage-chou, Naka-ku, Sakai city, 599-8261, Japan