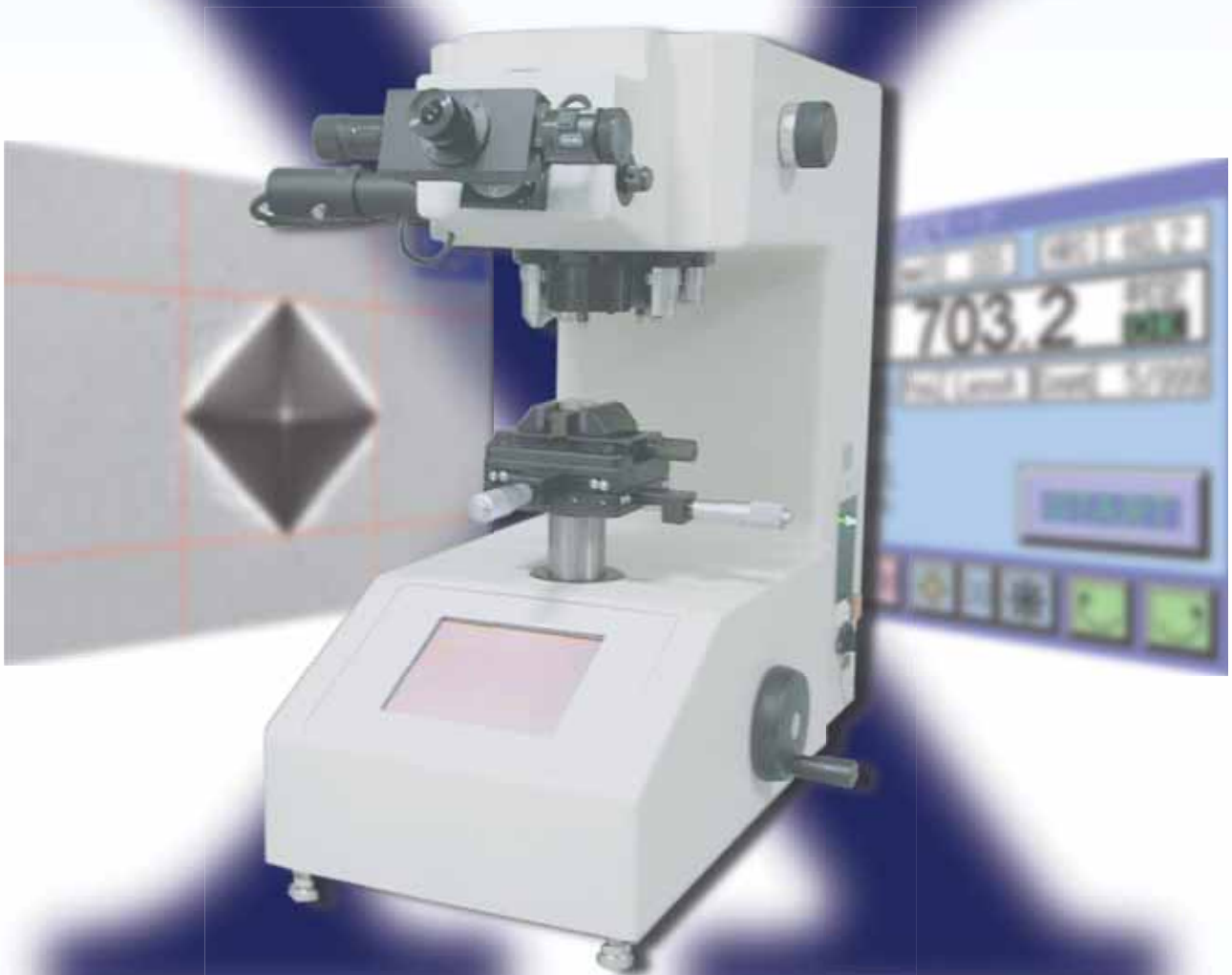


**DIGITAL MICRO HARDNESS TESTER**

# **MMT-X** SERIES



**MATSUZAWA CO., LTD.**

## Feature

### The new function deploy. LCD touch panel

Visibility and operativity improve by color LCD touch panel. In addition to conventional HV, HK measuring mode, four kinds of measuring mode(fracture toughness(KC), light-load brinell, Xbar, cylindrical correction) was carried.

In addition, the assist function which 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, testing force.



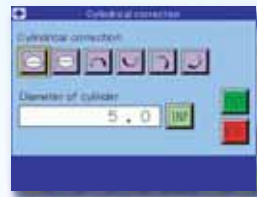
Fracture toughness mode



Light-load brinell mode



Xbar mode



Cylindrical correction mode



Assist 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 model correspondence)



### Measuring area of industry maximum class

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

(All model correspondence)

### Wide test load range

By wide test load range of 9 level(type A) and 12 levels(type B), testig of 1-2000gf can be done. (Automatic load changeover device is optional)

(All model correspondence)

### 0.01um measuring

Measuring unit 0.01um was realized by corresponding to high magnification of measuring, total magnification X200 - X1000. (Correspondence model: X3, X7)



### Line up in LCD model

It is line up in LCD model in TV measuring device.

Clear specimen surface image magnified on TFT LCD monitor is displayed.

Fatigue by the long operation is decreased.

- Measurement dial installed on the measurement panel.
- There is no annoyance like usual monitor measurement by one structure.

(Correspondence model: X3, X7)

### Halogen lamp deployment

High brightness Halogen light source can be chosen with an option.

Power is shown in measuring by high magnification and specimen measuring of low contrast.

(Correspondence model: X3, X7)

### Digital micrometer connection function

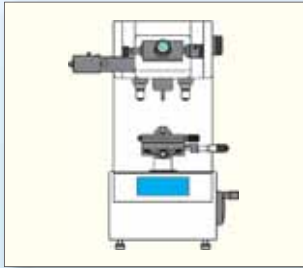
Measuring position of manual X-Y stage is displayed by a digital micrometer connection function and it can be output. (Digital micrometer is optional)

(Correspondence model: X3, X7)



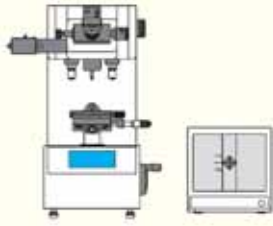
MMT-X7  
 LCD model

## Hardness Tester Model



Machine Type	Model	Contents
MMT-X1	Analog model	Economy model of manual operation.
MMT-X3	Digital model	Digital model of the LCD touch panel deployment.
MMT-X7	Digital Auto turret model	MMT-X3 of auto-turret deployment.


## TV Measuring Device Set Model



**CRT model**

Economy model equipped with 9 inch monitor.

Correspondence : All  
 CRT1 : Vertical type attachment  
 CRT2 : Horizontal type attachment



**LCD model**

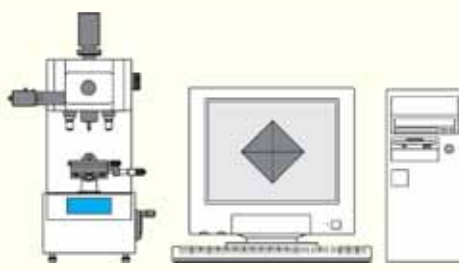
High grade model equipped with 10.4 inch LCD. The hardness value can be displayed on a monitor and measuring of outside monitor is possible, too.

Correspondence : X3, X7

※ Please specify with CRT or LCD after a model name in order. (EX. MMT-X-LCD)


## 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.

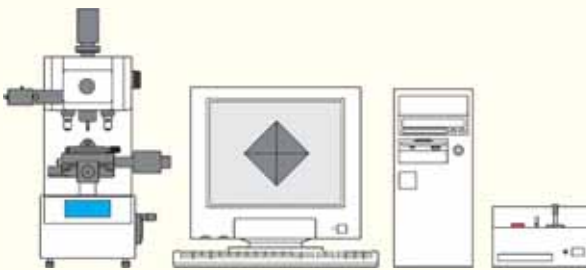
**Automatic stage system AMT-S series**



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

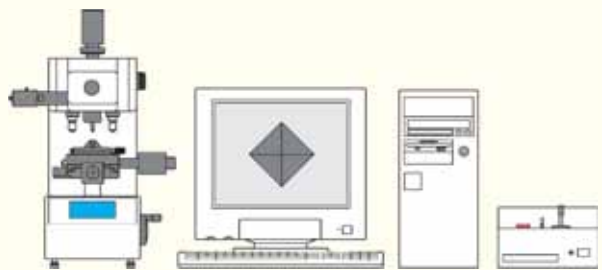
※ The model that hardness tester operation is possible in the PC side.

**Semi automatic hardness test system AMT-PS series**



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

**Automatic hardness test system AMT-7FS**



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

## Hardness Tester Model

Item / Model			MMT-X1				MMT-X3				MMT-X7			
Test load	Standard	Type A	49.03	98.07	245.2	490.3	980.7	1961	2942	4903	9807mN			
			5	10	25	50	100	200	300	500	1000gf			
	Option	Type B	9.807	29.42	49.03	98.07	245.2	490.3	980.7	1961	2942	4903	9807	19614mN
			1	3	5	10	25	50	100	200	300	500	1000	2000gf
Loading mechanism			Automatic loading and releasing method											
Load applying speed			50 um/sec											
Dwell time			5 - 40sec				5 - 99sec							
Indenter			Standard : 1 (HV) , Option : 2 (HV, HK)											
Objective lens			Standard : 2 (X40, X10) , Option : Max. 4 (X5 - X100)											
Eyepiece lens			Standard X10											
Total magnification			Standard (X400, X100) Corresponding X50 - X1000											
Measuring microscope (total 400X)	Max. measuring length		250 um											
	Min. graduation		0.5 um				0.01 um (X200 - X1000)							
	Min. measuring unit		0.1um				0.01 um (X200 - X1000)							
Turret			Manual				Manual				Auto			
LCD touch panel			-				Color LCD touch panel							
Measuring mode			-				5 kinds of HV, HK, HB, KC, Xbar							
Data memory			-				999 data memory							
Hardness conversion			-				Possible in compliance with JIS, SAE, ASTM							
OK/NG criteria			-				Judging to the results by setting Max. and Min.							
Data editing			-				Data display, Edit, Output, Retry, Assist function							
Max. height of specimen			120mm											
Max. depth of specimen			160mm											
Data output			-				Centronics (Dot printer output) RS232C (Output for PC) , Possible to change to printer output							
Accuracy			According to JIS B7725 and ASTM E-384											
Photographic device			Possible to mount at anytime (Optional)											
Dimensions and weight			Main body only W250 X D520 X H530mm 35kg											
Power supply			Single phase AC100 - 240V 50/60Hz available for Export models											

## TV Measuring Device Set Model

Item / Model	MMT-X□-CRT1	MMT-X□-CRT2	MMT-X□-LCD
Attachment	Vertical type	Horizontal type	-
CCD camera			
Monitor	9" B/W CRT		10.4" TFT LCD
Monitor magnification	≒ X1200		≒ X1600
Min. graduation	0.01 um		0.1 um
Data display	- (Tester operation panel)		Display on monitor
Output	Monitor output (NTSC)		Monitor output (RGB)

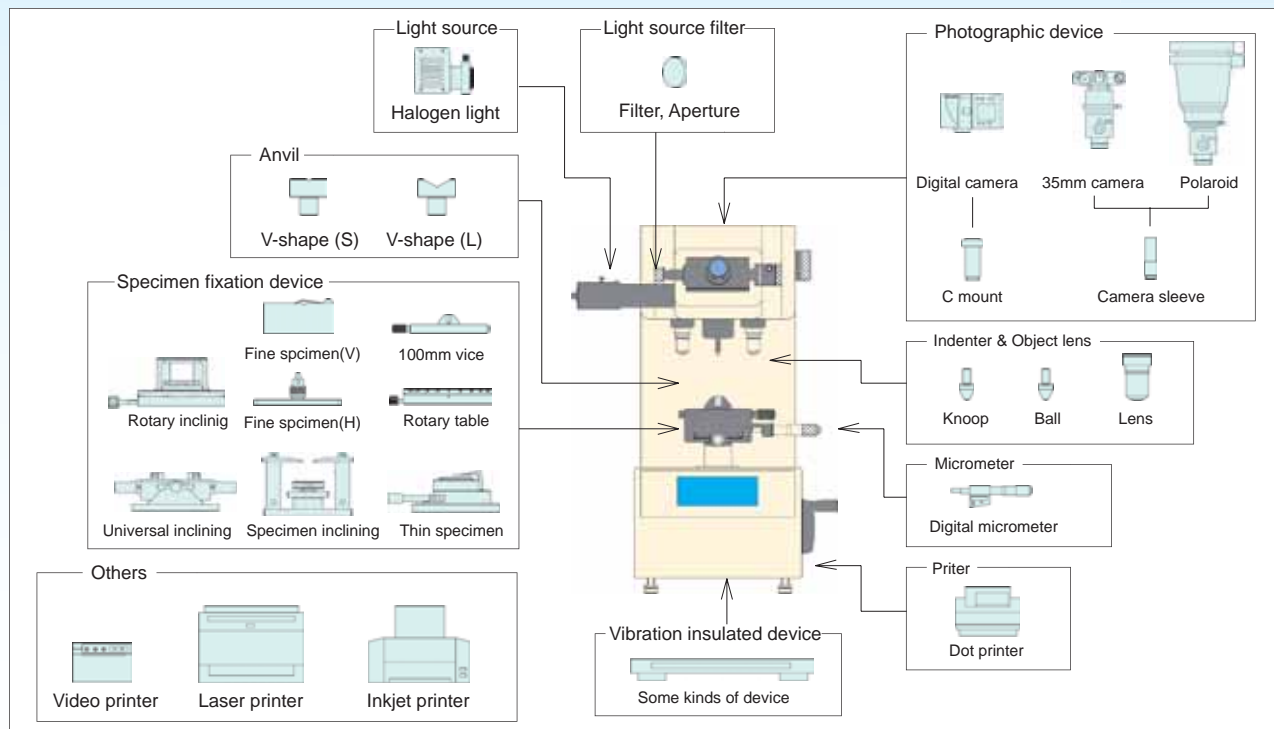
※ Number of hardness tester is in a part of □ of a model name. LCD model is only digital model. (X3, X7)

## 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	-	-	-	○
JOG controller	-	○	○	○
PC	PC/AT convertible			
Monitor	15" TFT monitor			
Printer	-	-	-	B/W Laser or Inkjet printer
OS	Window98、2000		Windows NT、2000	
others	X-Y data input option			

※ 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.



## Factory Setting Option

ID Code	Item	Specification	Model	Note
LB	Load type	Type B (1 - 2000gf 12step)	All	Standard: Type A
AP	Load change device	Automatic change (Panel operation)	X3, X7	
ID	Indenter	Two simultaneous installation (HV, HK)	All	
T3, T4	Object lens	Max. 4 (5 - 100X)	All	Standard: 2
HL	Light source	Halogen light source	X3, X7	
DM	Micrometer	Digital micrometer	X3, X7	XY stage & 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
M201	Photographic device: Polaroid camera	Nikon P III -P
M202	Photographic device: 35mm camera	Nikon P III -FM10
M203	Photographic device: Digital camera	Nikon Microsystem (Digital camera, relay lens, accessory)
M211	Camera sleeve	For polaroid camera or 35mm camera.
M213	Camera sleeve (C mount)	For digital camera or automatic system.
M002	Knoop indenter (HK)	Effectively measures thin material.
M003	Ball indenter (HB)	For light-load brinell test ( $\phi$ 1mm steel ball)
M071 - 075	Objective lens	100X(M071), 40X(M072), 20X(M073), 10X(M074), 5X(M075)
M076	Eyepiece	15X
M081	Color filter	$\phi$ 20mm yellow, blue, red (standard: green)
M082	Aperture diaphragm	1mm - 6mm (1mm pitch, 6 size)
M020	V-shape anvil (Small)	For measuring the cylindrical surface together with vice. $\phi$ 2mm - $\phi$ 6mm
M021	V-shape anvil (Large)	For measuring the cylindrical surface together with vice. $\phi$ 8mm - $\phi$ 50mm
M012	Precision vice	Max. opening: 100mm
M013	Rotary table	360° rotation. This table is usually on the micro test table with precision vice.
M014	Thin specimen measuring device	Specimen thickness: 0.05 - 5mm
M015	Fine specimen measuring device (V)	Vertical type. Specimen diameter: 0.1 - 4mm
M016	Fine specimen measuring device (H)	Horizontal type. Specimen diameter: 0.5 - 4mm
M017	Specimen inclining device	The measuring surface always shows a horizontal level. specimen height: 5 - 21mm
M018	Rotary inclining device	Special use for mounted specimen. Specimen diameter: 25, 31.5, 37.5mm 3 size
M019	Universal inclining vice	When the specimen is inclined or curved, this device is effective to get the correct level.
C001	Dot printer	From iDP-3110 hardness tester adding up results to data output.
M171 - 174	Vibration insulated device	On the desk type (Maintenance free type, Air type), Desk type (Coil spring type)
M211	Video graphic printer	Used for TV measuring device.
M212	Laser printer	For the automatic system and the computer connection.
M213	Inkjet printer	For the automatic system and the computer connection.

## Standard Accessories

Code No.	Item / Model	MMT-X1	MMT-X3	MMT-X7
M031	Manual X-Y stage (Built in)	1	1	1
M011	Precision vice (Max. opening: 50mm)	1	1	1
M061	Standard test block (HMV700)	1	1	1
M001	Diamond indenter	1	1	1
M041	Measuring microscope: Electronic type	-	1	1
M042	Measuring microscope: Mechanical type	1	-	-
M072	Object lens 40X (Built in)	1	1	1
M074	Object lens 10X (Built in)	1	1	1
M111	Level adjusting leg	1	1	1
M112	Level	1	1	1
M091	Light source bulb (12V18W)	1	1	1
M094	Spare fuse (100 - 120 3A, 200 - 240 2A)	2	2	2
C031	Power cord (3P 2.5m)	1	1	1
M161	Machine cover	1	1	1
	Auxiliary tools	1	1	1

## Data Processing Software for Windows

Hardness Data Communication Software (Option)

# HARDCOM SERIES



**Measurement data are transmitted to Microsoft Excel directly.**

Measurement data can be managed if software is installed in the personal computer. (Microsoft Excel is separately necessary.)

**Data processing function**

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

**Measurement position data can be input.**

Measurement position data are indicated by connecting a digital micro-meter. (Digital micro-meter is separately necessary.)

Code No. S001 Standard Software  
Code No. S002 Software with the position data input function. (X3,X7)  
OS Windows98, Me, 2000, XP



※ Microsoft and Windows are registered trademark by Microsoft USA in USA and other details.  
※ Specifications: Subject to change without prior notice.

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