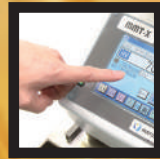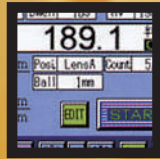# mMMT-X

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.

・0.01μm measuring.(Magnification X200~X1000)

・LED light source.

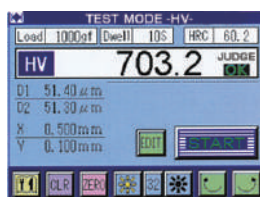MATSUZAWA

http://www.matsuzawa-ht.com

MMT-X

DIGITAL MICRO HARDNESS TESTERS

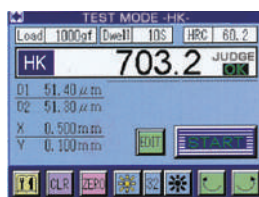### Operation — Color LCD touch panel

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

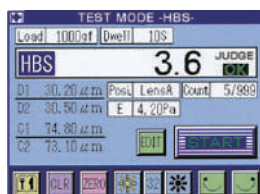(Correspondence model:X3,X7)

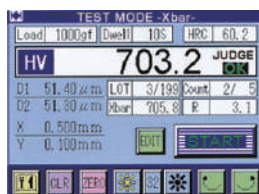**HV testing mode (Vickers Hardness)**

HK testing mode (Knoop Hardness)

※Knoop indenter(option) is required.

Light-load brinell mode

Xbar mode

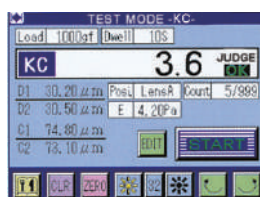Ball indenter(option) is required.

This mode can display the mean and difference immediately.

Fracture toughness KC testing mode.

Cylindrical correction mode :
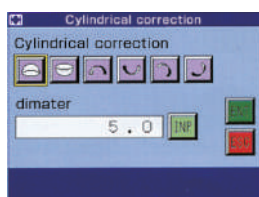
This mode can set spherical surface and cylindrical correction.

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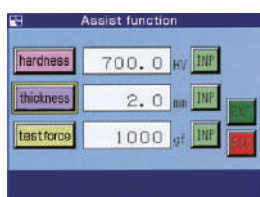
This mode can identify the testing condition which is optimum is carried.The testing condition which is optimum can be comfirmed by satisfying 2 from 3 condition of thickness,haedness,test load.

Function — The turret which mounted two indenter, four objective lenses.
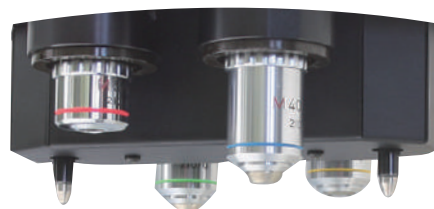
Two indenter and four objective lenses are realized following conventional stable loading mechanism.The measuring that reliability is high can be done in various test condition.
(All mode correspondence)

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)

120 mm
160mm

MMT-X7

Digital model with auto turret.

Digital type
Min.scale : 0.01μm(200×～1000×)
Min measuring unit : 0.01μm(200X～1000X)
Touch panel type／Turret : Auto
Data output type／Dwell time : 5～99sec

MMT-X3

Digital model with touch panel.
Digital type
Min.scale : 0.01μm(200×～1000×)
Min measuring unit : 0.01μm (200X～1000X)
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	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	19614 mN
			1	3	5	10	25	50	100	200	300	500	1000	2000 gf
Loading mechanism			Automatic loading and releasing method								
indenter approach speed			50μm/sec								
Dwell time			5～99sec							5～30sec	
Indenter			Standard:1(HV),Option:2(HV,HK)								
Objective lens			Standard:2(40X, 10X ※in case of AMT-PS/FS series : 40X, 5X), Option: Max.4(5X～100X)								
Eyepiece lens			Standard10× option15×								
Total magnification			Standard(400X,100X) Corresponding50×～1000×								
Measuring microscope (total 400×)	Max.measuring length		250μm								
	Min.scale		0.01μm(200X～1000X)							0.5μm	
	Min.measuring unit		0.01μm(200X～1000X)							0.1μm	
	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			Conform to ISO 6507-2 and JIS B7725 and JIS B7734 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			W250×D520×H530㎜ 35㎏								
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

Tablet PC 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	1/2" CMOS camera
Monitor	Tablet PC
Monitor magnification	≒ 1600×
Min.scale	0.1μm
Data display	Display on monitor

※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
PMTseries

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-Sseries

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-PSseries

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

Automatic stage-reading-focus system
AMT-FSseries

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.
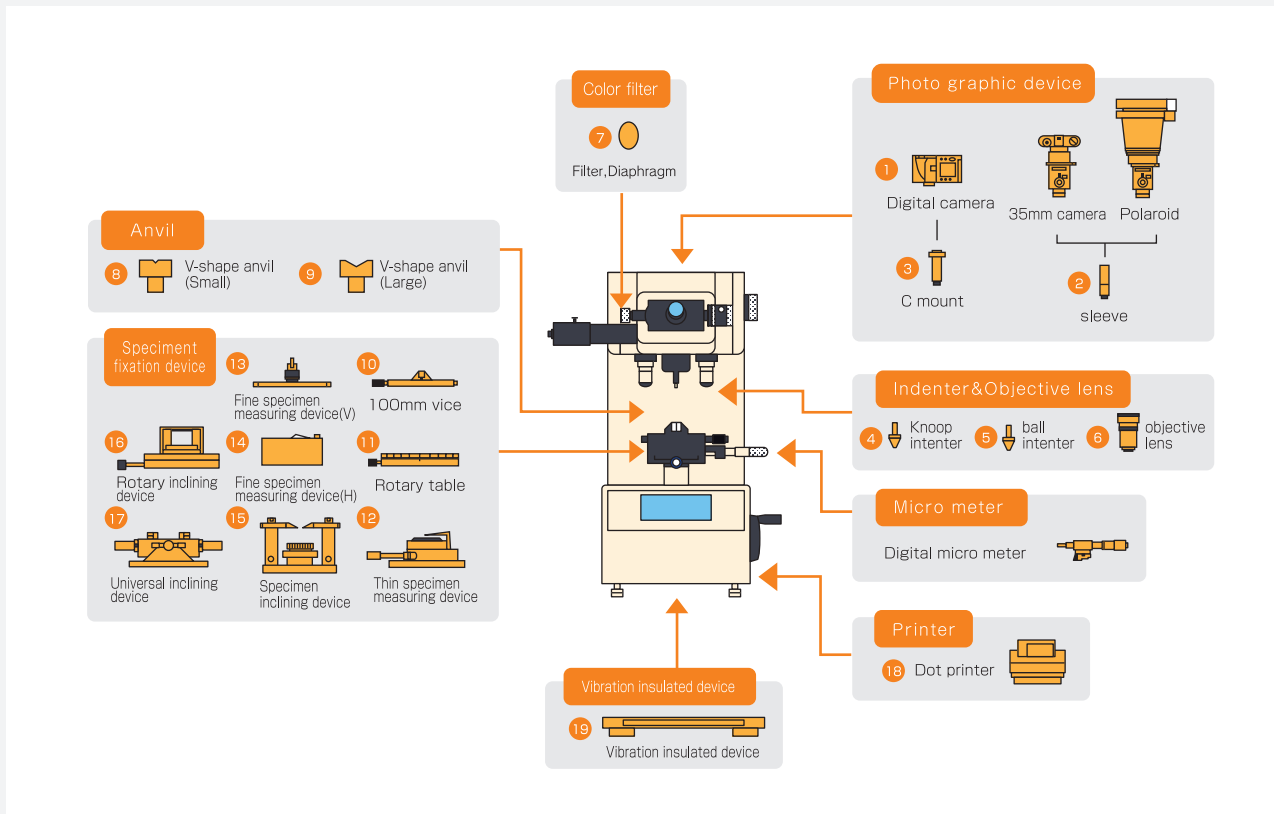
Automatic System

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 10 Pro (64bit) later			
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

Color filter
7 Filter,Diaphragm

Photo graphic device
1 Digital camera
35mm camera   Polaroid
3 C mount
2 sleeve

Anvil
8 V-shape anvil (Small)
9 V-shape anvil (Large)

Speciment fixation device
13 Fine specimen measuring device(V)
10 100mm vice
16 Rotary inclining device
14 Fine specimen measuring device(H)
11 Rotary table
17 Universal inclining device
15 Specimen inclining device
12 Thin specimen measuring device

Indenter&Objective lens
4 Knoop intenter
5 ball intenter
6 objective lens

Micro meter
Digital micro meter

Printer
18 Dot printer

Vibration insulated device
19 Vibration insulated device

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
M201	Photographic device:Digital camera	①	Nikon Microsystem(Digital camera,relay lens,accessory)
M211	Camera sleeve	②	For polaroid camera or 35mm camera.
M212	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.(φ1mm cemented carbide steel ball)
M071～075	Objective lens	⑥	100X(M071)、40X(M072)、50X(M080)、20X(M073)、10X(M074)、5X(M075)
M076	Eyepiece		15X
M081	Color filter	⑦	φ20mm 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. φ2mm～φ6mm
M021	V-shape anvil(Large)	⑨	For measuring the cylindrical surface together with vice. φ8mm～φ50mm
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 mesuring surface always shows a horizontal level.Specimen height:5～21mm
M018	Rotary inclining device	⑯	Specimen diameter : 1inch, 1 1/4inch, 1 1/2inch select one size as you want
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-910Ⅱ 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)
M102	Table for Knoop hardness number		For HK 5gf～50kgf

Standard Accessories

Code No.	Item / Model	MMT-X7	MMT-X3	MMT-X1
M031	Manual X-Y stage(Built in/Max.movement:25mm/Min scale:0.01mm)		1	
M011	Precision vice(Max.opening:50mm)		1	
M061	Standard test block(700HMV0.2)		1	
M001	Diamond indenter		1	
M041	Measuring microscope:Electronic type	1		−
M042	Measuring microscope:Mechanical type	−		1
M072	Object lens 40×(Built in)		1	
M074	Object lens 10×(Built in)		1	
M111	Level adjusting leg		4	
M300	Level		1	
M094	Spare fuse(100～220V5A)		2	
C031	Power code(3P-2.0m)		1	
M161	Machine cover		1	
−	Auxiliary tool kit		1	
−	Instruction manual(Basic&Application)		1	
−	Inspection sheet		1	
M101	Table for Vickers hardness number(5gf～50kgf)	−		1

Data processing software

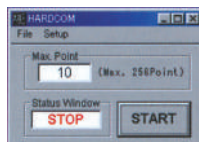**Hardness Data Communication Software(Option)**

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.

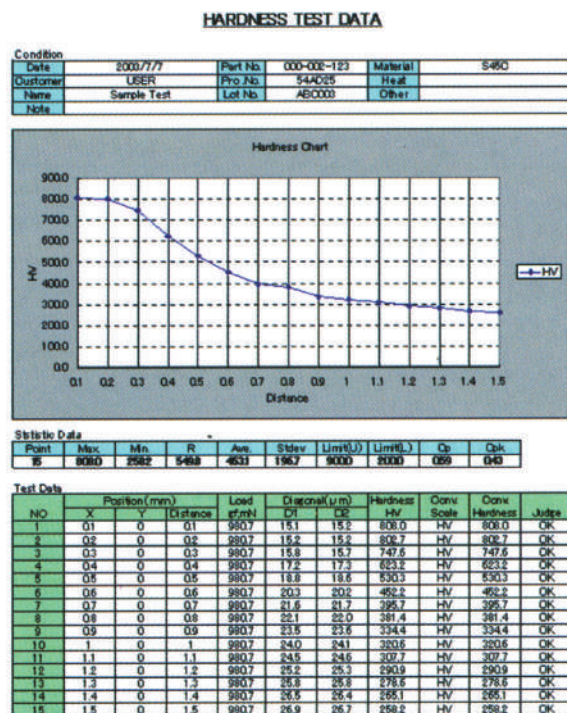The input part of the testing condition is freely revokable.
Our company will produce it if there is hope by a special form.
Code No. S001 Standard Software
Code No. S002 Software with the position data input function.
Corresponding model:MMT-X3,X7・VMT-X3,X7・RMT-1,3

※RMT series does not have the functionality of a data entry position.

HARDNESS TEST DATA

※Microsoft and Windows are registered trademark by Microsoft USA in USA and other details.
※Contents of this brochure June 2018. Specifications and appearance may change without notice.