



## HWMMT-X7

### Digital model with auto turret.

Digital type

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

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

Touch panel type / Turret : Auto

Data output type / Dwell time : 5~99sec

## HWMMT-X3

### Digital model with touch panel.

Digital type

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

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

Touch panel type / Turret : Manual

Data output type / Dwell time : 5~99sec

## HWMMT-X1

Economy model of manual operation. Analog type

## Specifications

### Hardness Tester Model

Item / Model			HWMMT-X7			HWMMT-X3			HWMMT-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												
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 400X)	Max.measuring length		250 $\mu\text{m}$												
	Min.scale		0.01 $\mu\text{m}$ (200X~1000X)						0.5 $\mu\text{m}$						
	Min.measuring unit		0.01 $\mu\text{m}$ (200X~1000X)						0.1 $\mu\text{m}$						
	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 W250xD520xH530mm 35kg												
Power supply			Single phase AC100V~240 50/60Hz												

# HWMMT-X

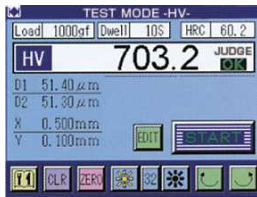
## DIGITAL MICRO HARDNESS TESTERS

### Operation Color LCD touch panel

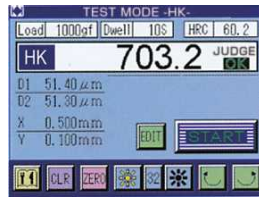
Visibility and operativity improve by color LCD touch panel. Equipped with the assist function that can identify the most suitable measurement condition.

(Correspondence model:X3,X7)

#### HV testing mode (Vickers Hardness)

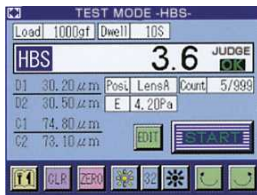


#### HK testing mode (Knoop Hardness)



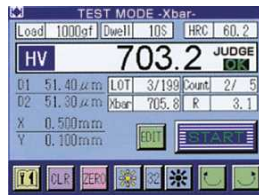
※Knoop indenter(option) is required.

#### Light-load brinell mode



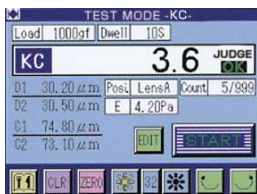
Ball indenter(option) is required.

#### Xbar mode

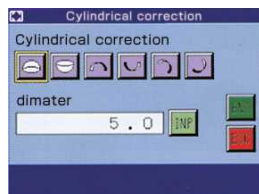


This mode can display the mean and difference immediately.

#### Fracture toughness KC testing mode.

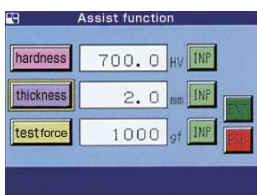


#### Cylindrical correction mode :



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 model correspondence)

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

(Correspondence model:X3,X7)

### Function

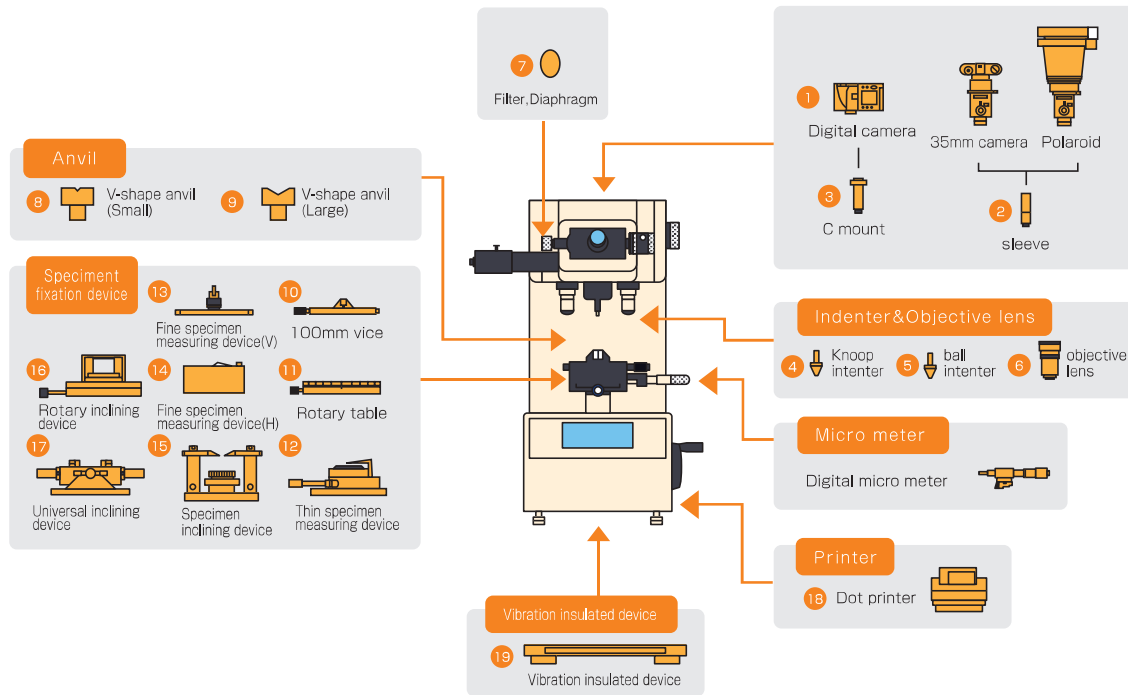
Testing area of industry maximum class.

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

(All model correspondence)



# 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	With HK indenter(1 pce)
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.

## 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 mesuring 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.
CO01	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	HWMMT-X7	HWMMT-X3	HWMMT-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	
M112	Level		1	
M094	Spare fuse(100~220V5A)		2	
C031	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

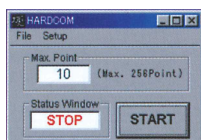
Hardness Data Communication Software(Optional)

## 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.

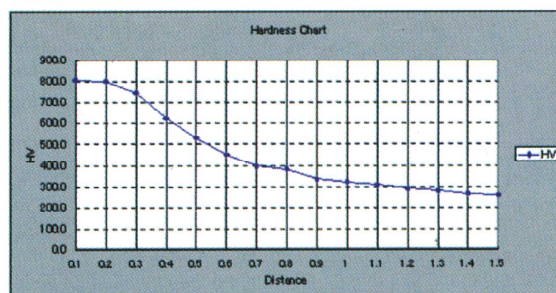
(Digital micro-meter is separately necessary.)

### 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:HWMMT-X3,X7 · HWDV-X3,X7 · HWDR-X1,X3

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

Condition	Date	Part No.	Material
	2008/7/7	000-002-123	S45C
Customer	USER	Prog. No.	194025
Name	Sample Test	Lot No.	ABC000
Other			



Point	Max	Min	R	Avg	Stdev	Limit(U)	Limit(L)	Cp	Cpk
15	8080	2582	5498	4631	196.7	9000	2000	0.89	0.60

NO	Position (mm)			Load gf/mN	Diagonal (μm)		Hardness HV	Conv. Scale	Conv. Hardness	Judge
	X	Y	Distance		D1	D2				
1	01	0	0.1	980.7	15.1	15.2	808.0	HV	808.0	OK
2	02	0	0.2	980.7	15.2	15.2	802.7	HV	802.7	OK
3	03	0	0.3	980.7	15.8	15.7	747.6	HV	747.6	OK
4	04	0	0.4	980.7	17.2	17.3	623.2	HV	623.2	OK
5	05	0	0.5	980.7	18.8	18.6	530.3	HV	530.3	OK
6	06	0	0.6	980.7	20.3	20.2	452.2	HV	452.2	OK
7	07	0	0.7	980.7	21.6	21.7	395.7	HV	395.7	OK
8	08	0	0.8	980.7	22.1	22.0	381.4	HV	381.4	OK
9	09	0	0.9	980.7	23.5	23.6	334.4	HV	334.4	OK
10	1	0	1	980.7	24.0	24.1	320.6	HV	320.6	OK
11	1.1	0	1.1	980.7	24.5	24.6	307.7	HV	307.7	OK
12	1.2	0	1.2	980.7	25.2	25.3	290.9	HV	290.9	OK
13	1.3	0	1.3	980.7	26.8	26.8	278.6	HV	278.6	OK
14	1.4	0	1.4	980.7	26.5	26.4	265.1	HV	265.1	OK
15	1.5	0	1.5	980.7	26.9	26.7	258.2	HV	258.2	OK

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

※Contents of this brochure is

. Specifications and appearance may change without notice.

### TV measuring device



**TVL**

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

### LCD model



**LCD**

The 10.1~12.1inch TFT LCD monitor is integrated.  
(Correspondence model:X3,X7)

### TV measuring device Set Model


Item / Model	HWMMT-X□-TVL
CCD camera	1/3"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	HWMMT-X□-LCD
CCD camera	1/3"CCD camera
Monitor	10.1~12.1" TFT LCD
Monitor magnification	≒ ×1600
Min.scale	0.1μm
Data display	Display on monitor/Display on touch panel


※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  
HWPMT 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  
HWAMT-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  
HWAMT-PS series**

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



**Automatic stage-reading-focus system  
HWAMT-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	HWPMT-X□	HWAMT-X□S	HWAMT-X□PS	HWAMT-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.

# HWAMT/HWAVT HWPMT/HWPVT SERIES LINE UP



## HWPMT/HWPVT

HWPMT/HWPVT SERIES

### Automatic reading system

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

\*Hardness tester models that can control is the only digital models.

## S

S SERIES

### Automatic stage system

Excellent measurement by the stage control box in the operation can be done.

### System configuration

Type	Name	Data handing	Automatic stage	Automatic reading	Automatic focus
HWPMT/HWPVT SERIES	Automatic reading system	○	—	○	—
HWAMT/HWAVT - S SERIES	Automatic stage system	○	○	—	—
HWAMT/HWAVT - PS SERIES	Automatic stage-reading system	○	○	○	—
HWAMT/HWAVT - FS SERIES	Automatic stage-reading-focus system	○	○	○	○

### List for each function

#### HARDNESS TESTERS

- HWMMT-X Series
- Old type vickers (Micro vickers)
- HWDV-X Series
- Other company hardness tester ※Please consult.



#### Automatic reading system

HWPMT/HWPVT System up

- CCD camera
- Software for HWPMT/HWPVT
- PC (With 19 inch display)



S series

#### Automatic X-Y stage system

- Auto X-Y stage
- Software for HWAMT/HWAVT
- PC (With 19 inch display)
- Stage control box



#### Auto focus

HWPMT/  
HWPVT  
Series

HWAMT/HWAVT  
PS  
Series

HWAMT/HWAVT  
FS  
Series

# HWAMT/HWAVT    HWPMT/HWPVT

AUTO HARDNESS TEST SYSTEM

AUTO-READING DEVICE SYSTEM



**PS** PS SERIES

Automatic stage-reading system

Various measuring patterns can be set.

**FS** FS SERIES

Automatic stage-reading-focus system

Serial operation of position move - Loading - auto focus -auto reading are done in all automatic.

EX-TYPE



Wafer measurement system



Full automatic vickers hardness test system

This system perform specimen import,polishing,a hardness testing.specimen ejection on full automatic.And also it perform results judgement,and you can choose a point to eject specimen.



Automatic vickers large stage system

In response to a demand of a customer,we meet needs for the specimen shape recognizer,the device of polishing specimen,the specimen supply device and completely full automatic system. Please inquire to our company any time.

Go into detail in Web site.  
[http://www.matsuzawa-ht.com/item/h\\_system.htm](http://www.matsuzawa-ht.com/item/h_system.htm)

# HWAMT/HWAVT HWPMT/HWPVT SPECIFICATION

FS series	PS series	HWPMT/ HWPVT	Automatic reading function	Test Mode	Automatic mode(HWAMT/HWAVT Series only · Two or more dents are stricken by setting the pattern of an automatic stage · Dents continuous reading) Single-action mode. (The dent is stricken to one point · Dent reading )
				OS Support	For Windows7
				Test scale	Vickers hardness (HV) · Knoop hardness (HK) · Fracture toughness (KC) (Manual measurements only) · Cylinder correction (Option)
				CCD camera	Inter line method 1/3inch 80 Megapixel Monochrome (Correspondence to the your preferred pixel count:Option)
				Reading speed	Shortest 0.5 sec/1point(Depending on the sample surface)
				Reading reproducibility	±0.5%(Test force:9807mN,700HV,For 40x object lens)
				Unit of minimum measurement	0.1 μm
				Minimum indentation reading	10 μm ( For 40x object lens)
				Manual measuring	Manual measurement in PC monitor by mouse operation · Measuring with measurement microscope(Optional) · PC transfer function of measurement data with measurement microscope(Optional)
				Display magnification	About 1600 x ( For 40 x object lens ) · About 800 x ( For 20 x object lens ) · About 400 x ( For 10 x object lens ) · About 200 x ( For 5 x object lens )
				Measurement view	About70 μm( For 40 x object lens ) · About 140 μm( For 20x object lens ) · About280 μm( For 10x object lens ) · About560 μm( For 5x object lens )
				Languages	Japanese · English(Choice when ordering)
				Test data preservation form	Special format · XLS format
				Graph Display	Hardened layer depth · Maximum value · Minimum value · X and Y axis single distance display · Parameter setting
				Print output	Three standard format selection(Graph only,Data only,Graph and Data), corresponding to special format ( Option )
FS series	PS series	S series	Automatic operation X-Y axis stage	Other function	Judgment function by diagonal length ratio · Flexible reading function(Four automatic reading setting values arbitrarily set are easily selected.) · Confirmation mode function(HWAMT-X/HWAVT-X only)
				Drive system	Stepping motor
				Stage operation	Stage control box operation(An arbitrary speed can change.) or Icon operation in software(The speed can change by two stages.)
				Stage size	X · Y 110×110mm for each ( Will correspond to your desired size:Option )
				Movement	X · Y 50×50mm for each ( Will correspond to your desired size:Option )
				Least command increment	1 μm
				Movement speed	0.05 ~ 5mm/sec Possible to change voluntarily within the range.
				Movement program pattern	Straight line (Specify starting and ending points · Pitch specification, Pitch changeability specification ※All plover can be set.) Circular arc Circle Teaching Trace Coordinates rotation Auto trace(Following of shape · Line starting point setting)
				Test points	Max 12,000 points ( Max 2,000 points in one line · Up to 6 lines can be set )
				Other function	Real-time graphical display of test position.Click movement function,Dry run function, Offset function of indentation position when replacing the indenter ※Corresponding to exclusive pattern setting program (option), please consult.
HWPMT/HWPVT, HWMT/HWAVT Series	S series	S series	Automatic Z axis stage	Drive system	Stepping motor(Built-in tester body)
				Autofocus speed	Shortest 3sec/1point(Depending on the sample surface) ※Auto/manual switchable
				Movement speed	0.05 ~ 5mm/sec Possible to change voluntarily within the range.
				Least command increment	HWAMT-X Series:0.05 μm, HWAVT-X Series:0.5 μm
				Other function	Stage evasion function when turret lathe rotates, Automatic focus optional function (Four automatic reading setting values arbitrarily set are easily selected.)
HWPMT/HWPVT, HWMT/HWAVT Series	S series	S series	Other	Measurement microscope (Option)	For measuring with measurement microscope
				Safeguard against malfunction	XY automatic stage immediate end with emergency stop button(Standard Specifications) Operation immediate end by auto turret lathe rotation, collision in auto focus, and overrunning.(Option)

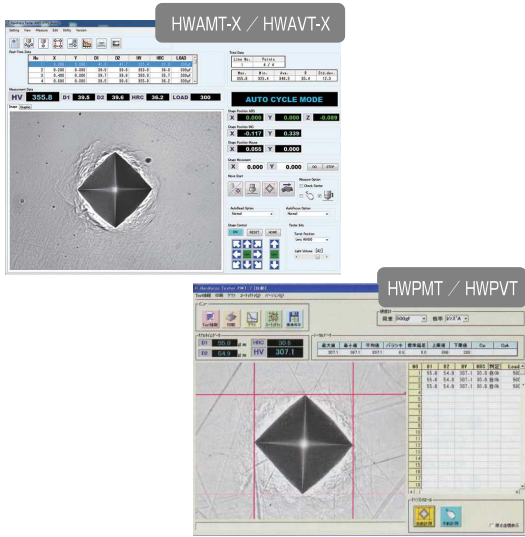
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Function

Flexible Auto-focus and Auto-reading function.



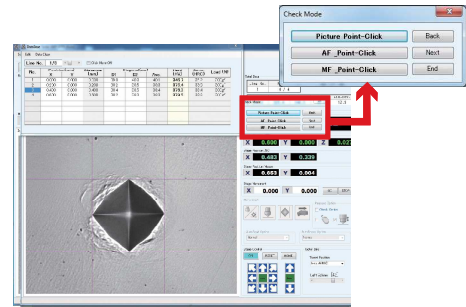
Function

Flexible measurement function.

After completing the measurements, this function can promptly follow up the work and once again measure images (if needed) on the data edit screen.

(For HWAMT/HWAVT-PS,FS)

Since all the indentation measurement images have been temporarily preserved by the internal PC, it can be reconfirmed promptly. The positive proof of hardness can therefore be more effective.



Auto-focus

(For HWAMT/HWAVT-FS)

Auto-reading option

(For HWPMT/HWPVT,HWAMT/HWAVT-PS,FS)

This function sets four kinds of detailed set values of an automatic focus and reading beforehand; those calls those set values easily on software.

(For HWAMT/HWAVT and HWPMT/HWPVT)

An automatic focus and reading can be done more smoothly and accurately. In the measurement of the sample with rough surfaces like etching, a very high effect is demonstrated.

Even if some of the samples with a rough surface are mixed, they can be measured smoothly and accurately by only selecting set values.

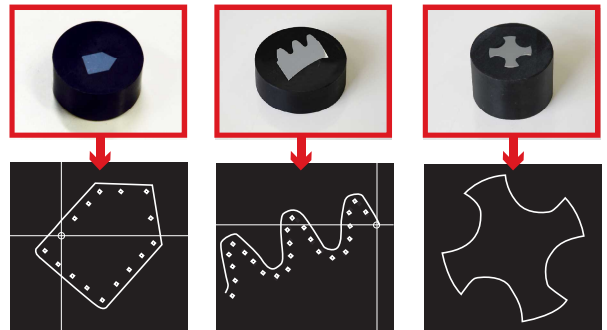
Please prepare several kinds of samples with a significantly different state on the surface.

Function

Auto trace function.

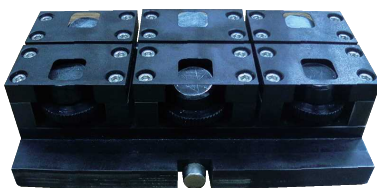
The shape of the specimen is traced by the automatic operation.

(For HWAMT/HWAVT-PS,FS)



Function

Customize



We have a In-house production of software for corresponding to various user-needs.

We will respond fast and flexible customization.

And, a special treatment device and a special stage also do the design production from one goods.

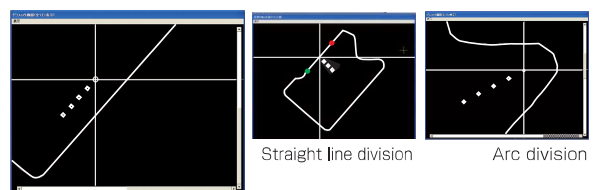
First of all, please contact us.

Function

The line origin function.

The starting point of the measurement line can be set by the shape trace based on the image.

(straight line division/arc divisio/straight line trace)



Straight line trace

(For HWAMT/HWAVT-PS,FS)



## HWDV-X7(S)

Digital model with autoturrets.  
 Min measuring unit : 0.01  $\mu\text{m}$  (200X~1000X)  
 Touch panel type / Turret : Automatic  
 Data output type / Dwell time : 5~99sec

## HWDV-X3(S)

Digital model with touch panel.  
 Min measuring unit : 0.01  $\mu\text{m}$  (200X~1000X)  
 Touch panel type / Turret : Manual  
 Data output type / Dwell time : 5~99sec

## HWDV-X1(S)

Economy model of manual operation.

### TV measuring device set model

Clear specimen surface image magnified on TV monitor is displayed. This model suppresses fatigue of the eyes and can let a measurement error reduce. You can train a measurement way while watching a monitor, so you can let a personal error reduce.



**TVL**

10.4 inch "TFT LCD Monitor

### Automatic system

This automatic-system can dissolve a personal error in reading of indentation by the latest image processing software and reduce hardness measurement cost time. We can provide making exclusive immobilize for a specimen of a customer. So you can reduce hardness measurement cost time still more. (Please ask as for more information.)

\*Please see more details by each catalogue.



### AVT-X Series PVT Series

AVT-X Series  
Auto hardness test system.  
 PVT Series  
Auto-reading device system.

### Exclusive full-auto test system

We will provide the exclusive fully automatic system which we was able to meeting the various user needs that it is possible for to be Matsuzawa who led the industry by automation of a hardness test from Matsuzawa's antecedent cost cost time of a hardness test willing to our company.



The fully automatic system which included supply of specimen, ejection, polishing.



[http://www.matsuzawa-ht.com/item/h\\_system.htm](http://www.matsuzawa-ht.com/item/h_system.htm)

# HWDV-X

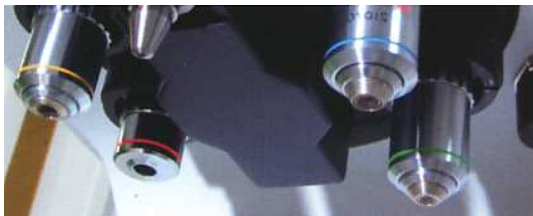
DIGITAL VICKERS HARDNESS TESTERS

High-resolution evaluation measurement.  
[0.01 μm]

Measuring unit 0.01 μm was realized by corresponding to high magnification of measuring, Total magnification X200 - X1000.  
(Correspondence model:HWDV-X3,X3S・HWDV-X7,X7S)

D1 = 51.5 D2 = 51.2	} 717.2HV
▼	
D1 = 51.59 D2 = 51.21	} 715.7HV

The turret which mounted four objective lenses. (option)



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.)

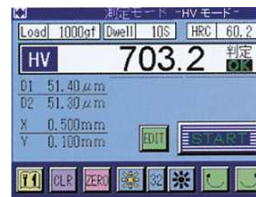
LED light source.

LED light source is prepared as standard accessory. This is useful for observing the sample surface at high magnification, is also useful to observe the surface of a sample of low contrast. (All model correspondence.)

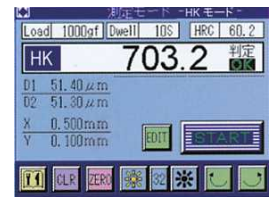


The new function deploy. Color LCD touch panel.

Visibility and operativity improve by color LCD touch panel.  
(Correspondence model:HWDV-X3,X3S・HWDV-X7,X7S)

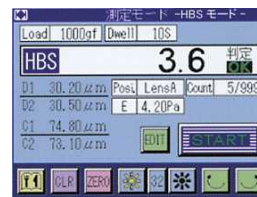


HV testing mode  
(Vickers Hardness)

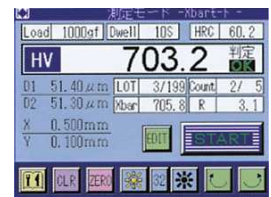


HK testing mode  
(Knoop Hardness)

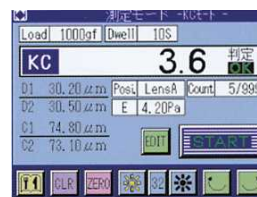
\*Knoop indenter(option) is required.



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.

# SPECIFICATION

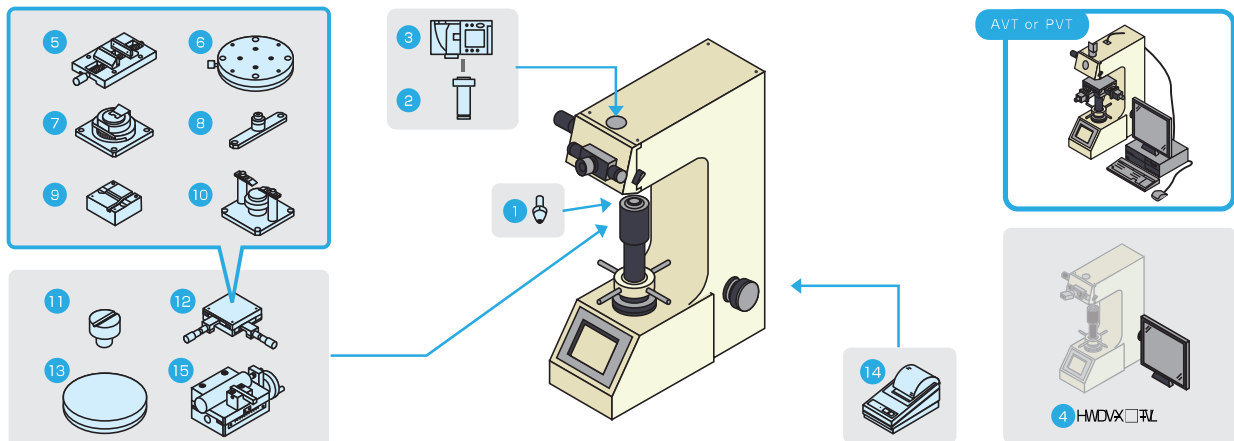
ITEM		HWDV-X7			HWDV-X3			HWDV-X1		
Test force	—	9,807 1	19,61 2	29,42 3	49,03 5	98,07 10	196,1 20	294,2 30	490,3 50	N kgf
	S	2,942 0.3	4,903 0.5	9,807 1	29,42 3	49,03 5	98,07 10	196,1 20	294,2 30	N kgf
Loading mechanism		Automatic loading and releasing method.								
Turret		Automatic			Manual					
Load applying speed		85 μm/sec								
Dwell time		5~99sec						5~40sec		
Min.measuring unit		0.01 μm(200×~1000×), 0.02 μm(100×)						0.1 μm		
objective lens	—	10×								
	S	10×, 20×						20×		
Eyepiece lens		10×								
Measuring microscope	Max.measuring length	100×:999,9 μm(200×:600,0 μm)								
	Magnification	100×(200×)								
	Measuring type	Electronic						Machine		
Data output		① Centronics(standard) ② Output selectable RS232C or Serial.						—		
Data memory		Max.999 test data						—		
Hardness conversion		Possible in compliance with ASTM(E-140),JIS.						—		
OK/NG criteria		Upper and lower limits setting,and HI/OK/LOW display.						—		
Statistical calculation		Data output and display:Max.value,min.value, dispersion(R),mean value,standard deviation.						—		
RS232C communication line		Baud rate select :1200/2400/4800/9600 bps Error detection,Parity select:even/none						—		
Accuracy		Conform to ISO 6507-2,JIS B7725,ASTM(E-92)								
Max.specimen height		250mm								
Max.specimen depth		150mm								
Dimensions		W230×D580×H770mm								
Weight		Test force standard Type:about 55kg · S Type:about 52kg								
Power supply		Single phase AC100~240V 50/60Hz								

# STANDARD ACCESSORIES

Code No.	ITEM		HWDV-X7S	HWDV-X7	HWDV-X3S	HWDV-X3	HWDV-X1S	HWDV-X1
V061	(800HV30) Hardness standard block		1					
V001	Diamond indenter(Built in)		1					
M041	Measuring microscope : Electronic type		1				-	
V043	Measuring microscope : Mechanical type		-				1	
M074	Objective lens 10X (Built in)		1				-	1
M073	Objective lens 20X (Built in)		1	-	1	-	1	-
R101	Anvil	φ60mm flat	1					
R105		V-shape(Large)	1					
M112	Small level		1					
M091	Light source bulb(12V18W)		2					
M094	Spare fuse (5A)		2					
C031	Power code(3P-2.5m)		1					
M111	Level adjusting leg		4					
-	Auxiliary tools		1					
-	Attachment for preventv the machine fall		2					
V161	Machine cover		1					
-	Instruction manual(Basic&Application)		1					
-	Inspection sheet		1					
M101	Table for Vickers hardness number		-				1	

# OPTIONAL ACCESSORIES

Code No.	ITEM	CONTENTS
V002	Knoop indenter ①	For knoop hardness test.
M212	C Mount ②	Adapter for a camera.
M202	Photographic device ③	Digital camera
TVL	TV monitor measuring device ④	By mounting CCD camera on ocular, measuring the indentation enlarged on monitor display by measuring line of ocular. Display the diagonal lengths and hardness values on LCD screen of tester.
M011	Precision vice(50mm)	Max.Opening : 50mm
M012	Precision vice(100mm)	Max.Opening : 100mm
M013	Rotary table ⑥	This table is usually used on the manual x-y stage with the precision vice.
M014	Thin specimen measuring device ⑦	Specimen thickness : 0~5mm
M015	Fine specimen measuring device vertical type ⑧	Specimen diameter : 0.1~4mm
M016	Fine specimen measuring device horizontal type ⑨	Specimen diameter : 0.5~4mm
M017	Specimen inclining device type II ⑩	The testing surface always shows a horizontal level and causes an extremely efficient measuring operation. Specimen height : 5~21mm
R104	V-shape anvil small ⑪	For testing the cylindrical surface together with the vice.
V032 V033	Manual X-Y stage ⑫	Max.movement : X and Y axis 25mm ( withstand load 20kg : V032 ) or 50mm ( : V033 )
R111	Round table ⑬	φ200 not tempered
C001 C002	Printer CBM-910II ⑭	From hardness tester adding up results to data output. for AC100V : C001 for AC120/230V : C002
R121	Micro test table for jominy test ⑮	Max.movement:Approx.55mm Min.micro graduation : 1/10mm or 1/160"
S001	Data Communication Software (HARDCOM)	Data of Hardness tester are transmittde to Microsoft Excel directly. ( Excel version : corresponds up to 2010/OS : Windows2000,XP,Vista,7 )





# HWD R-X1

Rockwell hardness tester

Preliminary test force: Only 10kgf

# HWD R-X3

Rockwell hardness test & superficial hardness tester

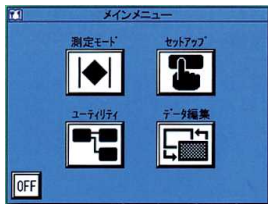
Preliminary test force: 3 & 10kgf

## Main menu display introduction



Test mode screen

Preliminary test force can be easily set by displaying a bar graph display.



Main menu

Menu that came to become color and to see easily. From the test mode screen, you can now immediately display frequently used items.



Test data display

You can easily check and edit the data on the screen.



Total data display

Indispensable process capability index for the quality control in the line can be confirmed on the total data screen.

## Product Line-up

### ART Series / Automatic Rockwell hardness testing system



Automatic Rockwell Hardness Testing System is that does the Preliminary test and test force automatically after you set the location of testing. The data output is supplied to the PC, you can edit various.

### Fully-automatic system



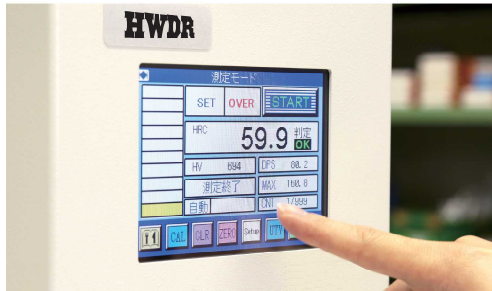
This is a fully automated system to sample loading, Rockwell hardness test, sample unloading. The custom-made for the various needs of users. Production and performance information is available at our website.

# HWDR-X

DIGITAL ROCKWELL HARDNESS TESTERS

## Color LCD touch-panel

Loaded with a LCD display with backlight.The hardness tester secures very clear and high visibility.



## Auto start

After setting the preliminary test force the test load is applied automatically.(Manual start is also possible)

## Easy setting

preliminary test force can be easily set with a bar graph display on the bright screen and electronic sound.More over,an error-preventing device is also mounted.

## Testing method for plastic

Specific testing method for plastic in compliance with ASTM and JIS is activated by one-touch easy operation.Time for reading the value after unloading the test load can be set freely.

## Various data processing function

It makes acceptance and rejection judgement,conversion to other tabulation and computing for data memory(256 data),maximum value, minimum value,variation,average,standard deviation etc.

## Applicable to ce and safety

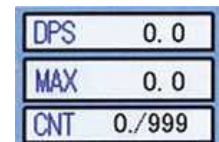
Safety design applicable to EU low voltage command,EMC command and machine command.In addition to high-rigidity body,overturn-preventive metal fittings are attached as standard to prevent overturning by earthquakes etc.

## Traditinal dial change-over system

Dial change-over system make change the test load easily by turning the dial.Accordingly the design is dust-proof including the weights for test load.

## Display depth

You can easily confirm depth on a measuring mode display.





# SPECIFICATION

ITEM		HWDR-X3			HWDR-X1			
Preliminary test force		29.42 3	98.07 10	N kgf	98.07 10	N kgf		
Test force	HWDRX1				588.4 60	980.7 100	1471 150	N kgf
	HWDRX3	147.1 15	294.2 30	441.3 45	588.4 60	980.7 100	1471 150	N kgf
Preliminary test force setting		Automatic setting.(LCD graph and electronic signal monitoring fine adjustment is unnecessary.)						
Test force control		Automatic>Loading→Holding→Release)						
Start operation		Automatic start/Manual start selection						
Test force dwell time		3~99 sec.						
Plastic test function		Standard function,time up to hardness value display after release:3 to 99 sec.						
Test scale		15N 30N 45N 15T 30T 45T 15W 30W 45W 15X 30X 45X 15Y 30Y 45Y C D A G B F K E H P M L V S R			C D A G B F K E H P M L V S R			
Data output		① Centronics(standard) ② RS232C or Serial output selectable.(Factory setting:RS232C)						
Data memory		Max.999 test data						
Hardness conversion		Based on SAE J417B. ASTM E 140.						
OK/NG criteria		Upper and lower limits setting and HI/OK/LOW display.						
Statistical calculation		Batch conversion of memorized data.(Max.value,Min.value,dispersion(R),mean value) Converted value,same too.						
RS232C communication line		Baud rate:1200/2400/4800/9600 bps selectable Error detection,Parity even/Parity none selectable						
Accuracy		Conform to JIS B7726 and ASTM E-18						
Max.Specimen height		200mm						
Max.Specimen depth		165mm						
Dimensions		W220×D540×H830mm						
Weight		100kg						
Power supply		Single phase AC100~240V 50/60Hz						

Specifications:Subject to change without prior notice.



## Hardness standard block

Hardness standard block(standard or optional accessories)



## Diamond Anvil

(optional accessories; code# R106)



## Anvil

(standard accessories; code# R101,105)  
(optional accessories; code# R102,103,104,106)



## Indenter

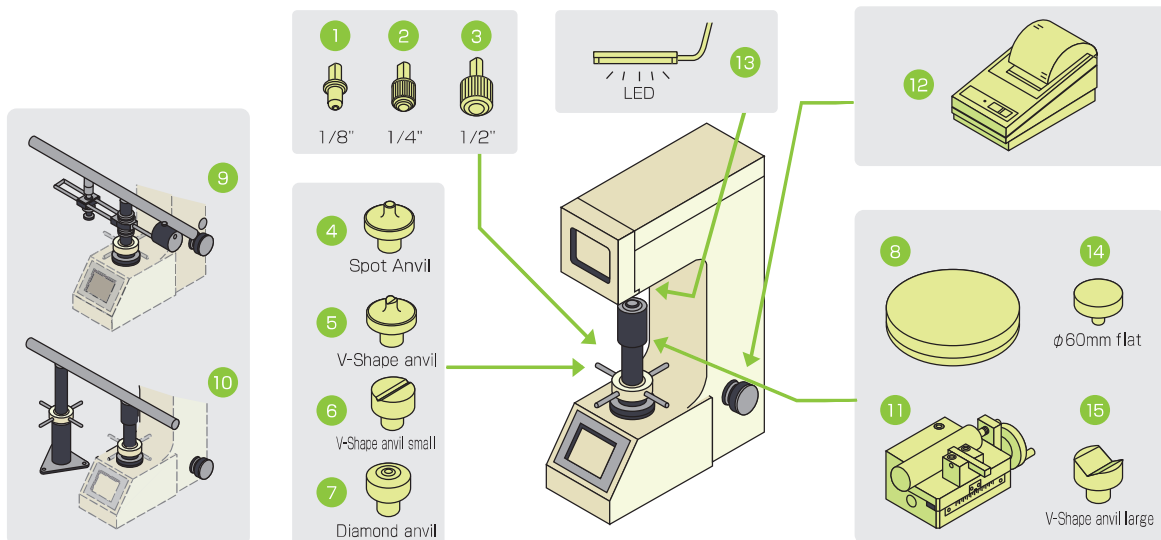
(standard accessories; code# R001,R002,R011)  
(optional accessories; code# R012,013,014)

# STANDARD ACCESSORIES

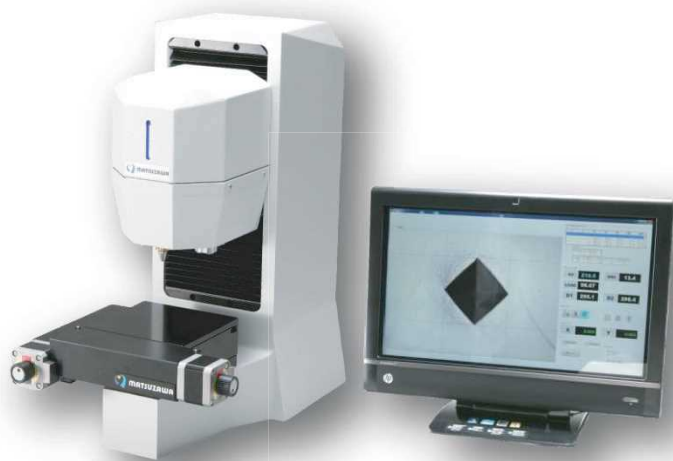
Code No.	ITEM		HWDR-X3	HWDR-X1
-	Hardness standard block	60~70HRC		1
-		85~100HRB		1
-		74~80HR30N	1	-
-		70~82HR30T	1	-
R001	Diamond indenter(Built in/for Rockwell)		-	1
R011	Diamond indenter(Built in/for Twin)		1	-
R002	Steel ball indenter(1/16"φ)			1
R021	Spare steel ball(1/16"φ)			10
R101	Anvil	φ60mm flat ⑭	1	
R105		V-shape large ⑮	1	
-	Spare fuse 100~120 5A,200~240 5A			2
C031	Power cord (3P-2.5m)			1
-	Level adjusting leg			4
-	Auxiliary tools			1
-	Attachment for prevent the machine fall			2
V161	Machine cover			1
-	Instruction manual(Basic&Application)			1
-	Inspection sheet			1

# OPTIONAL ACCESSORIES

Code No.	ITEM	CONTENTS
R012	1/8 Steel ball indenter ①	For K,K.E,H,45W,30W,15W scale
R013	1/4 Steel ball indenter ②	For P,M,L,45X,30X,15X scale
R014	1/2 Steel ball indenter ③	For V,S,M,45Y,30Y,15Y scale
—	Tungsten carbide ball indeter	1/16",1/8",1/4",1/2"
R022	1/8 Steel ball (10pacs)	Steel ball 1/8" for spare
R023	1/4 Steel ball (10pacs)	Steel ball 1/4" for spare
R024	1/2 Steel ball (10pacs)	Steel ball 1/2" for spare
R102	Anvil ④	Spot Anvil
R103	Anvil ⑤	V-shape anvil
R104	Anvil ⑥	V-shape anvil small
R106	Anvil ⑦	Diamond anvil
R111	Round table ⑧	Φ200mm (No heat - treatment)
R131	Long specimen testing fixture ⑨	Vari-rest ( With V-shape anvil large)
R132	Long specimen testing fixture ⑩	Jack-rest ( With V-shape anvil large)
R121	Micro test table for jominy test ⑪	Max.Movement:Approx.55mm Min.micrograduation:1/10mm or 1/60"
C001 C002	Printer CBM-910 II ⑫	From hardness tester adding up results to data output. 100V : C001      120/230V : C002 for AC100V : C001      for AC120/230V : C002
—	(LED) Lighting device ⑬	For testing position confirmation
—	Hardness standardized blocks	Various*ask for details
S001	Data Communication Software (HARDCOM)	Data of hardness tester are transmitted to Microsoft Excel directly. (Excel version:corresponds up to 2010 / OS:Windows2000,XP,Vista,7)



Vickers innovative automatic tester



## Via Feature

- Wide range Vickers hardness testing (980.7mN to 490.3N)
- Closed-loop test force control (with load cell)
- Test methods
- Auto focus and auto reading function
- LED indicator
- Light weight & Compact
- Windows 7 PC

## Specifications

Item / Model		Via - F	Via - S
Test load	Vickers	0.9807, 1.9614, 2.942, 4.903, 9.807, 19.61, 29.42, 98.07, 196.1, 294.2, 490.3N	
		0.1, 0.2, 0.3, 0.5, 1, 2, 3, 5, 10, 20, 30, 50kgf	
	Knoop	0.9807, 1.9614, 2.942, 4.903, 9.807, 19.61N	
		0.1, 0.2, 0.3, 0.5, 1, 2kgf	
Brinell	1/9.807, 1/24.52, 1/49.03, 1/98.07, 1/294.2, 2/39.23, 2/98.07, 2/196.1, 2/392.3, 2.5/61.29, 2.5/153.2, 2.5/306.5 (N)		
	1/1, 1/2.5, 1/5, 1/10, 1/30, 2/4, 2/10, 2/20, 2/40, 2.5/6.25, 2.5/15.625, 2.5/31.25 (kgf)		
Load apply speed		0.9807 to 4.903N 50um/sec, 9.807 to 490.3N 100um/sec	
Indenter		Standard: Vickers(HV), Option: Knoop(HK) Brinell(HBW 1, 2, 2.5mm)	
Objective		Infinity-corrected objective lens Standard: 10X, 20X, Option: 2.5X, 5X, 50X, 100X	
Indent measurement		Automatic / manual, Auto focus	
Camera		1/2"1.3M BW USB2.0 Camera	
Stage / anvil		50x50mm stroke XY auto stage	D60mm flat anvil
Controller		3-axis controller	1-axis controller
Operation panel		20"monitor PC (Windows7)	12.1 " touch panel PC(Windows7)
Max. specimen height		140mm	
Max. specimen depth		100mm	
Dimensions		W170 x D370 x H500	
Weight		29kg	
Accuracy		ISO 6507-2, JIS B7725 JISB7734, ASTM E-92, ASTM-E384	
Power supply		AC 100 to 240V 50/60Hz	

Rockwell innovative automatic tester



## RiaFeature

- One touch, easy hardness measurement
- Closed-loop test force control (with load cell)
- Test methods
- Variable test load
- Top surface based measurement
- LED indicator
- Light weight & Compact
- Windows 7 Tablet PC

## Specifications

Item / Model		Ria - F	Ria - S
Pre. Load	Superficial	29.42N (3kgf)	
	Rockwell	98.07N(10kgf)	
Test load	Superficial	147.1, 294.2, 441.3N (15, 30, 45kgf)	
	Rockwell	588.4, 980.7, 1471N (60, 100, 150kgf)	
Test cycle	Brinell	61.29, 98.07, 153.2, 245.2, 294.2, 306.5, 612.9, 980.7, 1226, 1839N (6.25, 10, 15.625, 25, 30, 31.25, 62.5, 100, 125, 187.5kgf)	
		Automatic ( Pre. Load - Test load - Release load)	
Test Load dwell time		0 to 999 sec	
Stage / anvil		50x50mm stroke XY auto stage	D60mm flat anvil
Controller		3-axis controller	1-axis controller
Operation panel		10.1"touch panel PC (Windo7)	
Max. specimen height		140mm	
Max. specimen depth		100mm	
Dimensions		W170 x D370 x H500	
Weight		29kg	
Accuracy		ISO 6508, JIS B7726, ASTM E-18	
Power supply		AC 100 to 240V 50/60Hz	