



ARS-F

FULLY-AUTOMATIC MICROHARDNESS TESTING SYSTEM

More Innovated Micro/Macro Vickers Hardness Testing System

Sample's tilted surface tracing function

- Easy setting of tilt angle enables to control Z axis along the sample's tilted surface.
- This function enhances "Load applying accuracy", shortens "Auto-focus time" and protects a sample and lens/indenter from collision.

Measured Image Saving Function

- You can check the images of all the measured indents.
- By re-measuring the indent image, you can modify data easily.

X-Y Stage Control

- Center movement by double-clicking and fine movement by dragging.
- The sample origin can be easily aligned and the sample setting time can be shortened.

Various Measurement Patterns

A series of measurement operations: Continuous Indentation - Focusing - Reading - Data Record: Just by selecting a measurement pattern, all testing will be fully-automatic with high speed.

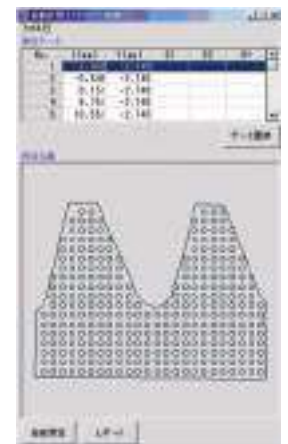
- Intelligent Sample Profile Memory Function allows complicated Random measurement or Teaching Measurement along with the edge of specimen. This is Standard Function.
- Various Patterns can meet customers' requirements: Straight Line/ Zigzag/ Circle/ Arc/ Line Set/ Random/Matrix/ Teaching, etc.



▲Teaching Pattern:
1 Line



▲Teaching Pattern:
3 Lines

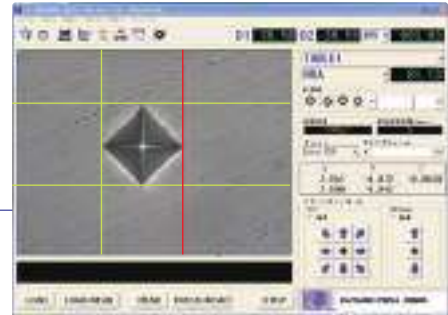


▲Matrix Pattern

- Most Advanced System with High-speed Sample Profile Memory Function
- High-speed, High-accuracy, High-repeatability, Easy-operation, Improved Read Power
- More Reliable for Large quantities of testing without human error

Data Processing Software

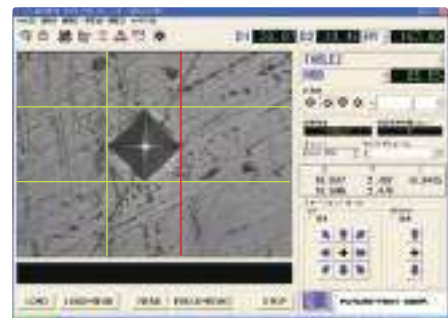
Capability of Reading unclear indents on un-mirror surface has been improved by more advanced Data Processing Software.



▲Mirror Surface



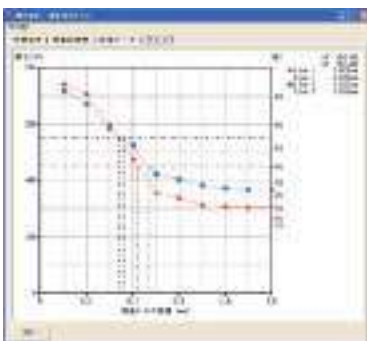
▲Etched Surface



▲Scratched Surface

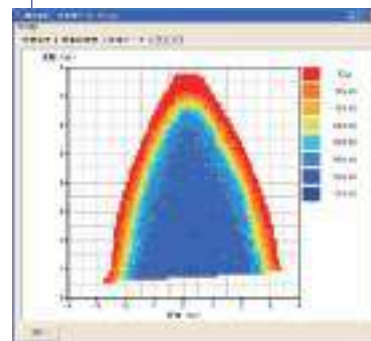
Various Data Output Format and Statistical Processing

- Case Depth of indicated HV Hardness can be displayed instantaneously on the Chart after continuous Measurements on Carbonized Layer.
- Various Data Output available - Measurement Data, Hardness Distribution Chart, Case Depth, Max. Value, Min. Value, Mean Value, Dispersion, Standard Deviation, Coefficient of Variation, OK-NG Criteria, Conversion Data, etc.
- Display and Output of Color Profile Picture linked with Hardness Values - Standard Function.



▲Display for Case Depth

▲Display for Measurement Data



▲Display for Color Profile Picture linked with Hardness Values on Matrix Test Pattern



FULLY-AUTOMATIC MICROHARDNESS TESTING SYSTEM

FM-ARS-F

ITEM		FULLY-AUTOMATIC MICROHARDNESS TESTING SYSTEM FM-ARS-F	
STANDARD SYSTEM COMPONENT		Analog Microhardness Tester Model: FM-1 10S (OPTION : FM-310S, FM-810S available) Automatic X-Y Stage & Motor Drive Unit CCD Camera Complete set of PC: 23" TFT Wide LC Monitor, Mouse, Keyboard, and Joy-Stick with Controller Standard Software for System FT-ZERO PC: Compatible Model with OS Windows 10	
MICRO HARDNESS TESTER	MODEL TYPE	Model FM-1 10S : Stage Elevation Motor Built-in Analog Type : Controllable Loading Operation by External PC	
	TEST LOAD	Test load type(A~D) can be selected.(FM-1 10S/FM-310S series) Test load type(A~E) can be selected.(FM-810S series) Setting is different between models. For details, contact the sales department of our company.	
		LOADING MECHANISM	Automatic Load/Hold/Release Method
	FOCUS OPERATION	Automatic/Manual Operation available *Focusing Steps adjustable	
	AUTO-STAGE ELEVATION	Automatic: by Built-in Stepping Motor / Manual: by Standard Handle & Joy-Stick Operation *Safety Devices equipped for Overrun of Elevation	
	PRECISION VISE	Standard: Max. Opening: 50mm	
	TURRET ROTATION	Automatic/Manual changeable	
	LOAD APPLYING SPEED	60μm/sec	
	DWELL TIME	5-40sec	
	MANUAL OCULAR	OPTION : Analog Type	
	MANUAL MEASUREMENT	By Video Line on TFT available	
	OBJECT LENS	×10/×50 (Optical Parts for 3rd Lens Built-in)	
	AUTOMATIC MEASUREMENT SCALE	Vickers Hardness (HV)/Knoop Hardness (HK)	
MANUAL MEASUREMENT SCALE	Vickers Hardness (HV)/Knoop Hardness (HK) is measurable with the optional analog type ocular.		
AUTOMATIC X-Y STAGE	DRIVING MOTOR	Stepping Motor	
	DRIVE CONTROL	By icon : 2 Steps Speed available in X·Y·Z axis By Joy-Stick : Flexible Speed Changing in X·Y·Z axis	
		DIMENSIONS	110×110mm
	MAX. MOVEMENT	50×50mm	
	MIN. MOVEMENT	1μm	
	MOVING SPEED	1-25mm/sec adjustable	
	MOVEMENT PROGRAM PATTERN	Straight Line (Vertical & Horizontal) Zigzag Circle Arc Line Set for any Angle (8 Lines and Max. 998 indents on 1 Line/Total 49950 indents are measurable.) Random Teaching Matrix (Max. 9999 indents in a range are measurable.) Specificity of 2 Points Specificity of Angle	
		Sample Profile Memory Function & Measurement along with Profile Line	
		Start Position Setting for Straight Line and Position Setting for Random/Teaching Mode shall be performed by Mouse-Click. OS: Microsoft Windows 10	
		AVAILABLE HARDNESS SCALE	Vickers Hardness (HV)/Knoop Hardness (HK)
MEASUREMENT REPEATABILITY		±0.8% on Test Block 700HV/500gf	
AUTO-FOCUS TIME		Shortest 3 sec	
AUTO READING TIME	Approx. 0.2 sec/1 indent		
MEASURABLE MIN. INDENT	10μm		
MIN. MEASUREMENT UNIT	0.1μm		
MANUAL MEASUREMENT	By OPTIONAL Ocular or Video Line on TFT		
AVAILABLE LANGUAGES SUPPORT	Japanese/English		
AUTOMATIC READING	DATA OUTPUT FORMAT & EDITING FUNCTION	Hardness Value, Hardness Chart, Case Depth, Insertion of Picture, etc. and Flexible Data Editing on "EXCEL"	
	PRINTER	Standard: Color Ink-Jet Type	
	JOY-STICK	For X·Y·Z axis Movement/Standard: Digital Type	
	MANUAL OCULAR	OPTION : Analog Type	
	SAFETY DEVICE	Safety Devices equipped for Unmanned Operation *Turret Rotation stops instantaneously in case Object Lens or Indenter hits a specimen. *Upper & Lower Limit Stopper is equipped against Uncontrollable Stage Elevation.	
OTHER FEATURES			



FULLY-AUTOMATIC VICKERS HARDNESS TESTING SYSTEM

FV-ARS-F

ITEM		FULLY-AUTOMATIC VICKERS HARDNESS TESTING SYSTEM FV-ARS-F
STANDARD SYSTEM COMPONENT		Analog Vickers Hardness Tester Model: FV-1 10S (OPTION : FV-310S, FV-810S available)
		Automatic X-Y Stage & Motor Drive Unit
		CCD Camera
		Complete set of PC : 23" Wide LC Monitor, Mouse, Keyboard, and Joy-Stick with Controller
		Standard Software for System FT-ZERO
		PC : DELL or IBM Compatible Model with OS Windows 10
		Model FV-1 10S : Stage Elevation Motor Built-in
HARDNESS TESTER	MODEL	Model FV-1 10S : Stage Elevation Motor Built-in
	TYPE	Analog Type : Controllable Loading Operation by External PC
	TEST LOAD	A: N: 9.807, 19.61, 29.42, 49.03, 98.07, 196.1, 294.2, 490.3 kgf: 1, 2, 3, 5, 10, 20, 30, 50
		B: N: 2.942, 4.903, 9.807, 29.42, 49.03, 98.07, 196.1, 294.2 kgf: 0.3, 0.5, 1, 3, 5, 10, 20, 30
	LOADING MECHANISM	Automatic Load/Hold/Release Method
	FOCUS OPERATION	Automatic/Manual Operation available(Manual operation is driven by motor.)
	AUTO-STAGE ELEVATION	Automatic: by Built-in Stepping Motor / Manual: by Joy-Stick Operation *Safety Devices equipped for Overrun of Elevation
	PRECISION VISE	Standard: Max. Opening: 50mm
	TURRET ROTATION	Automatic/Manual changeable
	LOAD APPLYING SPEED	First speed : 120μm/sec & Real load speed: 60μm/sec
	DWELL TIME	5-40sec
	MANUAL OCULAR	OPTION : Analog Type
	MANUAL MEASUREMENT	By Video Line on TFT available
	OBJECT LENS	×10 (Type A) / ×10 & ×20 (Optical Parts for 3rd Lens Built-in)(Type B)
AUTOMATIC MEASUREMENT SCALE	Vickers Hardness (HV)/Knoop Hardness (HK)	
MANUAL MEASUREMENT SCALE	Vickers Hardness (HV)/Knoop Hardness (HK) is measurable with the optional analog type ocular.	
AUTOMATIC X-Y STAGE	DRIVING MOTOR	Stepping Motor
	DRIVE CONTROL	By icon: 2 Steps Speed available in X·Y·Z axis
		By Joy-Stick: Flexible Speed Changing in X·Y·Z axis
	DIMENSIONS	110×110mm
	MAX. MOVEMENT	50×50mm
	MIN. MOVEMENT	1μm
	MOVING SPEED	1-25mm/sec adjustable
	MOVEMENT PROGRAM PATTERN	Straight Line (Vertical & Horizontal)
		Zigzag
		Circle
Arc		
Line Set for any Angle (8 Lines and Max. 998 indents on 1 Line/Total 49950 indents are measurable.) Random Teaching Matrix (Max. 9999 indents in a range are measurable.) Specificity of 2 Points Specificity of Angle Sample Profile Memory Function & Measurement along with Profile Line Start Position Setting for Straight Line and Position Setting for Random/Teaching Mode shall be performed by Mouse-Click.		
AUTOMATIC READING	PATTERN SETTING	OS: Microsoft Windows 10
	SOFTWARE	Vickers Hardness (HV)/Knoop Hardness (HK)
	AVAILABLE HARDNESS SCALE	±0.8% on Test Block 800HV/10kgf
	MEASUREMENT REPEATABILITY	Shortest 3 sec
	AUTO-FOCUS TIME	Approx. 0.2 sec/1 indent
	AUTO READING TIME	10μm
	MEASURABLE MIN. INDENT	0.1μm
	MIN. MEASUREMENT UNIT	By OPTIONAL Ocular or Video Line on TFT
	MANUAL MEASUREMENT	Japanese/English
AVAILABLE LANGUAGES SUPPORT	Hardness Value, Hardness Chart, Case Depth, Insertion of Picture, etc.	
OTHER FEATURES	DATA OUTPUT FORMAT & EDITING FUNCTION	and Flexible Data Editing on "EXCEL"
	PRINTER	Standard: Color Ink-Jet Type For X·Y·Z axis Movement/Standard: Digital Type
	JOY-STICK	OPTION : Analog Type
	MANUAL OCULAR	Safety Devices equipped for Unmanned Operation
	SAFETY DEVICE	*Turret Rotation stops instantaneously in case Object Lens or Indenter hits a Specimen. *Upper & Lower Limit Stopper is equipped against Uncontrollable Stage Elevation.

MICRO/VICKERS HARDNESS TESTER AUTOMATION SYSTEM

AUTOMATIC INDENTATION MEASURING SYSTEM



AR

Indentation measurement is automated!

Light-and-dark image processing protects this system against the influence of metals or damage.

Automatic measurement can be done with high accurate repeatability exceeding any skilled technician.



ITEM	AUTOMATIC INDENT MEASUREMENT SYSTEM AR
SYSTEM CONFIGURATION	CCD camera, CCD camera attachment, personal computer, printer, 23-inch LC monitor, image board, connecting cable, exclusive control, and data processing software
MIN. MEASUREMENT UNIT	0.1 μm
MEASUREMENT SCALE	HV (Vickers), HK (Knoop)
MEASURING METHOD	Light-and-dark image processing system
REPEATABILITY	$\pm 0.5\%$ / approx. HV500 Load: 500gf
MANUAL MEASUREMENT	Video line system
AUTOMATIC READING TIME	Approx. 0.3 sec / 1 indentation
MIN. READ INDENTATION DIAMETER	10 μm (diagonal length)
DATA PROCESSING	Graph display, color conversion data, maximum value, minimum value, average, conversion, hardened layer depth, etc.

● Applicable models

- FM-110 ● FM-110e ● FM-310 ● FM-310e ● FM-810 ● FM-810e
- FV-110 ● FV-110e ● FV-310 ● FV-310e ● FV-810 ● FV-810e
- etc.

AUTOMATIC INDENTATION MEASUREMENT / AUTOMATIC X-Y STAGE SYSTEM



ARS

Indentation measurement is automated! Stage control is automated!

Light-and-dark image processing realizes the automation of indentation measurement and stage movement!



ITEM	AUTOMATIC X-Y STAGE SYSTEM ARS
SYSTEM CONFIGURATION	CCD camera, CCD camera attachment, automatic X-Y stage, control box, personal computer, printer, 23-inch LC monitor, image board, connecting cable, exclusive control, and data processing software
MIN. MEASUREMENT UNIT	0.1 μm
MEASUREMENT SCALE	HV (Vickers) / HK (Knoop)
MEASURING METHOD	Light-and-dark image processing system
REPEATABILITY	$\pm 0.5\%$ / approx. HV500 Load: 500gf
MANUAL MEASUREMENT	Video line system
AUTOMATIC READING TIME	Approx. 0.3 sec / 1 indentation
MIN. READ INDENTATION DIAMETER	10 μm (diagonal length)
AGE DIMENSION	110 x 110
STAGE MOVEMENT	X50 x Y50
MIN. STAGE MOVEMENT UNIT	1 μm
DATA PROCESSING	Graph display, color conversion data, maximum value, minimum value, average, conversion, hardened layer depth, etc.

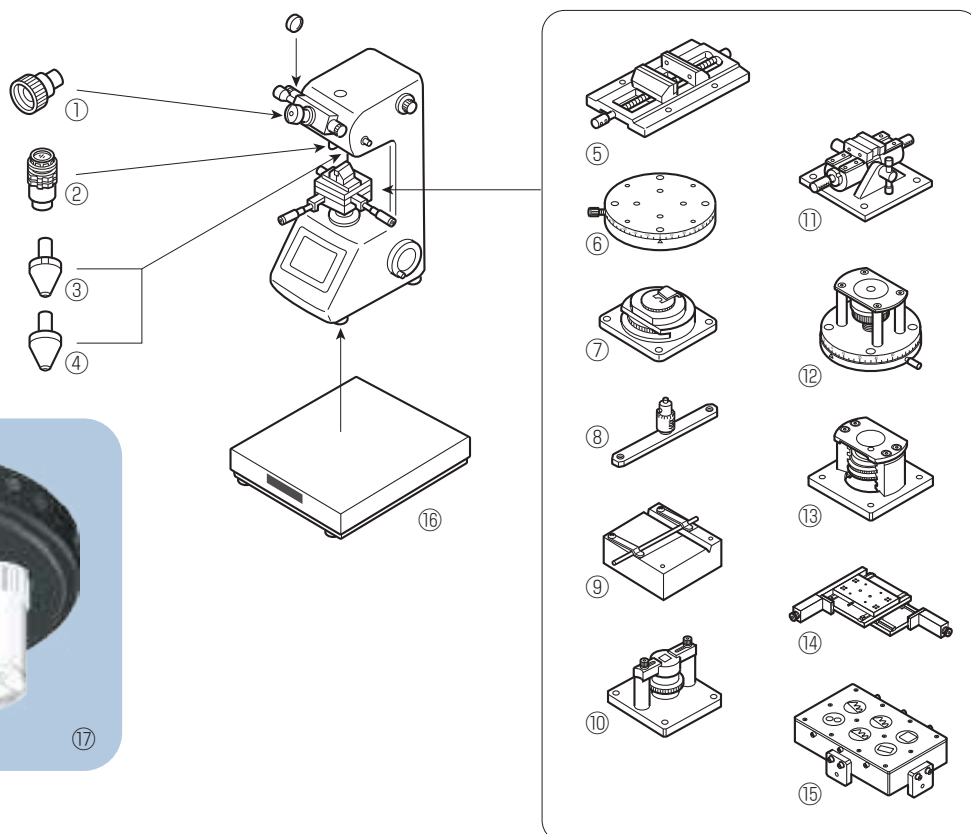
● Applicable models

- FM-310 ● FM-310e ● FM-810 ● FM-810e
- FV-310 ● FV-310e ● FV-810 ● FV-810e
- etc.

- By combining with Hardness Tester, stage control is automated in indent/multi-point measurement to reduce the dispersion caused by each operator.
- This system is very effective for large-scale rationalization and energy saving.

OPTIONAL ACCESSORIES

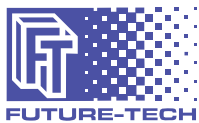
CODE No.	ITEM	MODEL / CONTENTS
M-062	Eyepiece	① × 15
M-015	Object Lens	× 100
M-016		× 40
M-017		× 20
M-019		× 5
M-014	Knoop Indenter	③ Rhombic diamond indenter for Knoop Hardness (HK)
M-063	For Brinell Hardness Test Tungsten Carbide Ball Indenter	④ Φ 1 mm
M-028	Precision Vise	⑤ Max. Opening : 100mm
M-029	Rotary Table	⑥ Graduation of rotary angle : 5° Table dia : 128mm (Mounted onto X-Y stage)
M-030	Thin Specimen Measuring Device	⑦ Specimen thickness : 5mm max.
M-031	Fine Specimen Measuring Device Vertical Type	⑧ Specimen dia : Φ 5mm max. (For measuring cross section)
M-032	Measuring Device Horizontal Type	⑨ Specimen dia : Φ 5mm max. (For measuring cylindrical surface)
M-033	Specimen Inclining Device	⑩ Specimen height : 5~20mm (For measuring mounted specimen)
M-034	Universal Specimen Vise	⑪ Max. Opening : 45mm
—	Rotary Mounted Specimen Inclining Device	⑫ Specimen height : 5~30mm
—	Mounted Specimen Inclining Device	⑬ Specimen height : 5~30mm
M-090	Automatic X-Y Stage	⑭ Movement : X150mm × Y80mm
M-091	Fixing Jig for Six Mounted Specimens	⑮ For 32 ϕ , 38 ϕ and 40 ϕ
M-043	Vibration Insulation Stage	⑯ Vibration-proof rubber type
M-065	Dual Indenter Turret	⑰ Used when two HV/HK indenters are mounted at the same time. Specify this turret when ordering. Replacement is permitted only in our company's factory.



STANDARD ACCESSORIES

MODEL	FULLY-AUTOMATIC MICROHARDNESS TESTING SYSTEM FM-ARS-F			FULLY-AUTOMATIC VICKERS HARDNESS TESTING SYSTEM FV-ARS-F		
ITEM	CODE No.	SPECIFICATIONS	No.	CODE No.	SPECIFICATIONS	No.
HARDNESS STANDARD BLOCK	M-037	700HV	1	V-039	800HV	1
PRECISION VISE	M-027	Max.Opening : 50mm	1	V-027	Max.Opening : 50mm	1
DIAMOND INDENTER (BUILT-IN)	M-013	For Vickers (HV)	1	V-013	For Vickers (HV)	1
OBJECT LENS (BUILT-IN)	M-061	×50	1	V-017	×20 (For Type B)	1
	M-018	×10	1	V-018	×10	1
LEVEL ADJUSTING LEG	M-052	For Hardness Tester	4	V-053	For Hardness Tester	4
LEVEL	M-066	—	1	—	—	—
INDENTER COVER (BUILT-IN)	M-053	—	1	V-054	—	1
CAMERA MOUNTING TUBE	M-054	For adapting CCD Camera	1	V-055	For adapting CCD Camera	1
MACHINE COVER	M-055	For Hardness Tester	1	V-056	For Hardness Tester	1
POWER CORD	M-051	For Hardness Tester	1	V-052	For Hardness Tester	1
SYSTEM CONNECTING CABLE	—	—	1	—	—	1
AUXILIARY TOOLS	—	Screwdriver, Wrench, etc.	1	—	Screwdriver, Wrench, etc.	1
ACCESSORY BOX	M-056	For Hardness Tester	1	V-057	For Hardness Tester	1
INSTRUCTION MANUAL	—	—	1	—	—	1

※ Appearance and specifications are subject to change without prior notice.



FUTURE-TECH CORP.

HEAD OFFICE : TALKPIER KAWASAKI BLDG., NO. 5-1, 3-CHOME, FUJISAKI, KAWASAKI-KU, KAWASAKI, KANAGAWA, 210-0804 JAPAN
 TEL +81-44-270-5789 FAX +81-44-266-6779
 E-mail: info@ft-hardness.com
 URL: http://www.ft-hardness.com

EUROPEAN REPRESENTATIVE OFFICE :
 VIA MATTEOTTI 23/E, 20090 ASSAGO(MILAN), ITALY
 TEL/FAX: +39-02-91669470 MOBILE:+39-335-1803592
 E-mail: cantoni.fte@gmail.com

FUTURE-TECH (ASIA) CO., LTD. :
 777/11 MOO 9, BANGPLA, BANGPLEE,
 SAMUTPRAKARN 10540, THAILAND
 TEL : +66-2-136-6281 FAX : +66-2-136-6282
 E-mail : siripong@ft-hardness.com

Agent :

NHAT VIET INDUSTRIAL CO., LTD.
 35 Nguyen Ba Tuyen, Ward 12, Tan Binh District,
 Ho Chi Minh City, Vietnam

Tel: ++84-38134068
 Hotline: ++84-903955820

Email: sales@nhatvietindustry.com.vn

www.nhatvietindustry.com.vn



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