VICKERS HARDNESS TESTER

FV Series

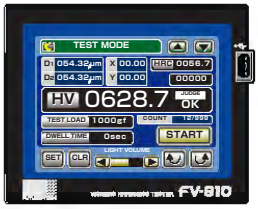
FV-110/ FV-310/ FV-810

FV Series

FV-110, FV-310, FV-810

Lab-friendly functions make FV Series Vickers Hardness Testers ideal for materials labs.

FV-810 Series make precise Vickers (HV) / Knoop (HK) / Brinell (HBS & HBW) Fracture Toughness (Kc) measurements quick and easy.
— One touch selection on touch panel —



〈FV-810 Series〉

〈FV-110 Series〉

〈FV-310 Series〉

Features

■ ADVANCED TOUCH PANEL OPERATION AND DISPLAY

Color LCD touch panel/display coordinated with highly integrated PC board.
Measuring procedures, conditions and data are displayed clearly . (FV-810 Series)

■ BRINELL TESTING

Accurate light load Brinell Testing is available as a standard fun ction.
Required optional item “Ball Indenter φ1～5mm” . (FV-810 Series)

■ FRACTURE TOUGHNESS TESTING, Kc

Kc value can be measured as a standard function according to JIS R1607/ IF Method.
Together with the value of Micro Vickers and Knoop, it is very effective to evaluate the quality of new material. (FV-810 Series)

■ CLEAR VIEW AND EASY MEASURING

The changeable aperture diaphragm and field aperture with a newly developed light source mechanism provides more resolution at both high and low magnifications.
Easy to change color filter provides more resolution. (All Series)

■ A VARIETY OF SELECTABLE LOADS

Type of test load is selectable. You can select from an abundance of loads and have own load combination.（FV-810 Series)

■ X-Y COORDINATE DISPLAY

Stage coordinate is indicated on the display in a link operation with the digital microhead (option).（FV-810 Series)

■ 4 OBJECT LENSES (OPTIONAL)

The new turret mechanism enables to observe wide are of specimen area with up to 4 object lenses.
Various magnifications easily available by rotating the correct objective into position.
Placement of an indentation and its reading is more accurate and repeatable by choice of proper objective.(FV-810 Series)

■ 2 INDENTERS FOR HV/HK MEASUREMENTS (OPTIONAL)

The new turret mechanism enables to adapt 2 indenters simultaneously.
It allows Vickers and Knoop tests without replacing the indenter. (FV-810 Series)

■ USB PORT OUTPUT

■ EQUIPPED WITH THE CYLINDRICAL/SPHERICAL OFFSET FUNCTION AND THE SPECIMEN THICKNESS CALCULATION FUNCTION.

■ HARDENED LAYER DEPTH CALCULATION FUNCTION

The hardened layer depth can be automatically calculated by a simple operation.（FV-810 Series)

FV Series

SYSTEM CHART

〈OPTIONAL COMPONENTS〉

OPTIONAL ACCESSORIES

CODE No.	ITEM			DESCRIPTION
V-014	KNOOP INDENTER		⑤	Rhombic diamond indenter for Knoop hardness
V-041	HARDNESS CALCULATION TABLE	FOR HV		5gf ～ 50kgf (This is standard accessory for FV-110/FV-110e.)
V-042		FOR HK		5gf ～ 50kgf
V-061	OBJECT LENS		③	×50
V-016				×40
V-017				×20 (Standard accessory for TYPE B.)
V-019				×5
V-022	COLOR FILTER		㉗	φ20mm: Yellow & Blue "(Green" is standard accessory.)
V-023	COLOR TEMPERATURE CONVERSION FILTER			For the color monitor measuring device
V-024	NUMERICAL APERTURE			φ1 ～ 6 mm each selectable (6 kinds)
V-025	FIELD APERTURE			φ1 ～ 7 mm each selectable (7 kinds)
V-055	CAMERA MOUNTING TUBE		①	For adapting photographic camera & CMOS camera
V-009	MONITOR MEASURING DEVICE		⑲	Color CMOS camera + 20.7" LCD + L-type attachment + Image saving function (with 4 GB USB memory)
V-003	AUTOMATIC READING SYSTEM 〈AR〉 **Automatically measures indentation**		㉑	**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 repeatabil ity exceeding any skilled technician. **System configuration :** 1.3M CMOS camera, camera attachment, personal computer, 23" LCD, connecting cable and exclusive control/data processing software. **Minimum unit :** 0.1 μm **Measurement method :** Shading image processing method **Measurement scale :** HV,HK **Repeat accuracy :** ±0.5% / HV500 500gf
V-001	AUTOMATIC X-Y STAGE & CONTROL UNIT 〈ARS〉 **Automatically measures indentation** **Automate stage control**		㉒	**Indentation measurement is automated / Stage control is automated** Reduced reading errors by operators and greatly reduced work time. **System configuration:** 1.3M CMOS camera, camera attachment, automatic X-Y stage, control box, personal computer,23" LCD, connecting cable and exclusive control/data processing software. **Minimum unit :** 0.1 μm **Measurement scale :** HV,HK **Measurement method :** Shading image processing method **Repeat accuracy :** ±0.5% / HV500 500gf **Stage dimensions :** 110mm×110mm **Stage movement :** X50mm×Y50mm
V-202A	AUTOMATIC MEASURING SYSTEM WITH AUTO-READ & STAGE & FOCUS 〈ARS-F〉 **Automatic focus, automatic indentation measurement, automatic stage**		㉓	**Fully automatic system** All processes of indentation formation, focus adjustment and indentation measurement after the sample setting are performed unattended. **System configuration :** 1.3M CMOS camera, camera attachment, automatic X-Y stage, control box, personal computer,23" LCD, connecting cable, joystick controller, sample contact prevention safety mechanism, and exclusive control/data processing software. **Minimum unit :** 0.1 μm **Measurement scale :** HV,HK **Measurement method :** Shading image processing method **Repeat accuracy :** ±0.5% / HV500 500gf **Stage dimensions :** 110mm×110mm **Stage movement :** X50mm×Y50mm
V-038	ROUND TABLE		⑨	φ200mm
V-026	MANUAL X-Y STAGE		⑩	Max. movement : 50 x 50 mm Min. micro inching : 1 / 100 mm Dimensions : 110 x 110 mm
V-027	PRECISION VISE		⑪	Max. opening : 50mm
V-028			⑫	Max. opening : 100mm
V-029	ROTARY TABLE		⑬	Graduation of rotary angle : 5 degree Table diameter : φ128mm (Use by attaching to X-Y stage)
V-030	THIN SPECIMEN MEASURING DEVICE		⑭	Specimen thickness : 5 mm max.
V-031	FINE SPECIMEN MEASURING DEVICE	VERTICAL TYPE	⑮	Specimen diameter : φ5mm max. (For measuring the cross section)
V-032		HORIZONTAL TYPE	⑯	Specimen diameter : φ5mm max. (For measuring the cylindrical surface)
V-033	SPECIMEN INCLINING DEVICE		⑰	Specimen height : 5 ～ 20mm (For mounted specimen)
V-034	UNIVERSAL INCLINING VISE		⑱	Inclining device + Vise Max. opening : 45mm
V-035	ANVIL	V-SHAPE (LARGE)	⑦	Specimen diameter : φ13 ～ φ40mm (For measuring the cylindrical surface)
V-036		V-SHAPE (SMALL)	⑧	Specimen diameter : φ2 ～ φ6mm (For measuring the cylindrical surface)
V-004	DIGITAL PRINTER		㉔	RS232C type or CENTRONICS type (For Hardness Tester)
			㉕	Ink-jet type (A4 size) (For automatic system)
V-063～V-066	BRINELL HARDNESS TEST (For FV-810 Series)	TUNGSTEN CARBIDE BALL INDENTER	⑥	φ 1、2.5、5mm
V-067～V-078		TEST WEIGHT		N 12.26 24.52 39.23 61.29 76.61 153.2 245.2 kgf 1.25 2.5 4 6.25 7.8125 15.625 25 N 306.5 392.3 612.9 980.7 1226 kgf 31.25 40 62.5 100 125
V-058	MECHANICAL PARTS FOR ADDITIONAL OBJECT LENS			Turret internal parts for installing the second, third and fourth object lenses. The second object lens of TYPE B is supplied as standard accessory.
V-079	DUAL INDENTER TURRET (For FV-810 Series)		㉘	Used when installing two HV/HK indenters at the same time. (Please specify it when ordering the product.)
V-080	EXCEL DATA TRANSFER SOFTWARE FOR FV		㉙	Excel data transfer software (CD-R), RS232C cable for PC connection.
V-081	FOR EXCEL DATA TRANSFER SOFTWARE RS232C→USB CONVERSION CABLE		㉚	RS232C→USB conversion cable * Required when the PC side cable outlet is a USB port instead of RS232C

SPECIFICATIONS

MODEL		FV-110e	FV-110	FV-310e	FV-310	FV-810e	FV-810
TEST LOAD	TYPE 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					
	TYPE 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 and Release Method					
LOAD APPLYING SPEED		Initial loading speed : 120 μm / sec Actual loading speed : 60 μm / sec (Automatic speed changing)					
DWELL TIME		5 ~ 40 sec		5 ~ 99 sec			
TURRET MECHANISM		Manual	Automatic	Manual	Automatic	Manual	Automatic
DIAMOND INDENTER	Standard	Vickers Indenter (HV)					
	Option	—				Knoop Indenter (HK) / Two Indenters (HV + HK) are available on the special Dual Indenter Turret simultaneously	
OBJECT LENS	Standard	Type A : X10 / Type B : X10 & X 20					
	Option	Max. 3 Lenses				Max. 4 Lenses	
EYEPIECE		X10					
MEASURING MICROSCOPE	Type	Mechanical		Electronic			
	Max. measurement length	800 μm (In case of X 100) / 400 μm (In case of X 200)					
	Min. Graduation	Micrometer : 0.5 μm		Digital : 0.1 μm (In case of X 100 & X 200) / 0.01 μm (In caseof over X 400)			
	Min. measurement unit	Eye judgment : 0.1 μm		Digital : 0.1 μm (In case of X 100 & X 200) / 0.01 μm (In caseof over X 400)			
MAX. HEIGHT OF SPECIMEN		210mm					
MAX. DEPTH OF SPECIMEN		165mm					
AVAILABLE TEST PARAMETER		HV / HK				HV / HK / HBS / HBW / Kc	
BRINELL HARDNESS TEST		—				HBS & HBW available Option : Ball indenter & Light load	
FRACTURE TOUGHNESS TEST (Kc)		—				Conform to JIS R1607 / IF Method	
HARDNESS CONVERSION		—				Conform to SAE (J-417b) & ASTM (E-140)	
DATA MEMORY		—				Max. 999 Data	
OPERATION PANEL SHEET SW for Type 110 / 310 & TOUCH PANEL SW for Type 810		START/ LIGHT UP-DOWN/ TURRET ROTATION (for Auto-Turret Type)		START/ RESET / DWELL TIME/ LIGHT UP-DOWN/ TURRET ROTATION (for Auto-Turret Type)		START/ RESET/ DWELL TIME / LIGHT UP-DOWN/ TEST LOAD / CONVERSION SCALE/ TURRET ROTATION (for Auto-Turret Type) / CLEAR	
DATA DISPLAY LED for Type 110 / 310 & LCD for Type 810		POWER / LOADING (Pilot Lamp)		D1/ D2 / HV-HK/ HARDNESS VALUE / LOADING / OK-NG CRITERIA		D1/D2 /HV-HK / HARDNESS VALUE / CONVERSION DATA / OK-NG CRITERIA/ START (Blinking for Loading)/ TEST TIMES/etc.	
DATA OUTPUT & PRINT OUT		–		RS232C (HV-HK/ HARDNESS VALUE/ OK-NG) USB (D1/ D2 / HV-HK / HARDNESS VALUE/ TEST LOAD/ OK-NG)		RS232C / USB (D1/D2/HV-HK/ HARDNESS VALUE / TEST LOAD / OK-NG/CONVERSION SCALE / CONVERSION DATA / STATISTIC DATA / etc.)	
OK / NG CRITERIA		–		Limit setting and HI/ OK/ LO Display			
SELF DIAGNOSIS		–				Display troubles with motors and switches	
LIGHT SOURCE		LED					
OPTICAL FUNCTION		Aperture diaphram/ Field apperture / Color filter : Replaceable					
COMPLIANT STANDARD		Conform to JIS B-7725, ASTM E-92 and ISO 6507-2					
PHOTOGRAPHIC DEVICE		Capable to mount at anytime on top of the machine (Camera/ Attachment : Option)					
DIMENSIONS		W215 x D517 x H690mm					
WEIGHT		Approx. 55 kg (Including Standard Accessories)					
POWER SUPPLY		Japan : Single phase AC100V 50/ 60Hz Overseas : Single phase AC100 ~ 240V 50/ 60Hz (Should be specified before shipment)					

STANDARD ACCESSORIES

CODE NO.	ITEM			FV-110e	FV-110	FV-310e	FV-310	FV-810e	FV-810
V - 0 3 9	STANDARD TEST BLOCK (HV 800)			1	1	1	1	1	1
V - 0 1 3	DIAMOND INDENTER	FOR HV (BUILT- IN)		1	1	1	1	1	1
V - 0 4 3	MEASURING MICROSCOPE (WITH X 10 EYEPIECE)	MECHANICAL TYPE		1	1	—	—	—	—
V - 0 4 4		ELECTRONIC TYPE		—	—	1	1	1	1
V - 0 1 8	OBJECT LENS (BUILT- IN)	X 10	TYPE A & B	1	1	1	1	1	1
V - 0 1 7		X 20	TYPE A	—	—	—	—	—	—
			TYPE B	1	1	1	1	1	1
V - 0 3 7	ANVIL	φ60 mm FLAT		1	1	1	1	1	1
V - 0 3 5		V-SHAPE (LARGE)		1	1	1	1	1	1
V - 0 3 6		V-SHAPE (SMALL)		1	1	1	1	1	1
V - 0 5 3	LEVEL ADJUSTING LEG			4	4	4	4	4	4
V - 0 5 4	INDENTER COVER (BUILT-IN FOR TESTING)			1	1	1	1	1	1
V - 0 8 0	INDENTER SHAFT FIXTURE (FOR TRANSPORTATION)			1	1	1	1	1	1
V - 0 5 2	POWER CORD			1	1	1	1	1	1
	AUXILIARY TOOLS (SCREW DRIVER : 1pc / SPANNER : 1pc / L TYPE WRENCH : 5 pcs)			1	1	1	1	1	1
V - 0 4 1	HARDNESS CALCULATION TABLE FOR HV			1	1	—	—	—	—
V - 0 5 6	MACHINE COVER			1	1	1	1	1	1
	HARDNESS CONVERSION TABLE			1	1	1	1	—	—
	INSTRUCTION & MAINTENANCE MANUAL			1	1	1	1	1	1
V - 0 5 7	ACCESSORY BOX			1	1	1	1	1	1
	WEIGHT SET FOR TEST LOAD			1	1	1	1	1	1

〈FV-310〉
Digital Vickers Hardness Tester

〈FV-110〉
Analog Vickers Hardness Tester

※Appearance and specifications are subject to change without prior notice for the product improvement.

FUTURE-TECH CORP.

We are based on JIS Q 17025 (ISO/IEC 17025) as accredited standards, and accredited by JCSS who manages the recognition scheme according to ISO/IEC 17011. IA Japan (accreditation organization who has managed JCSS) who is signatory to the Mutual Recognition Arrangement (MRA) of International Laboratory Accreditation Cooperation (ILAC) and Asia Pacific Accreditation Cooperation (APAC).
We are accredited as MRA Calibration Laboratory of JCSS.
Our accreditation number is JCSS 0228.

2022.10