

# SPECIFICATIONS

		FM-100 / 300series				FM-800series						
MODEL		FM-100e	FM-100	FM-300e	FM-300	FM-800e	FM-800					
TEST LOAD	TYPE A	mN : 49.03 gf : 5	98.07 10	245.2 25	490.3 50	980.7 100	1,961 200	2,942 300	4,903 500	9,807 1,000	19,614 2,000	
	TYPE B	mN : 9.807 gf : 1	29.42 3	49.03 5	98.07 10	245.2 25	490.3 50	980.7 100	1,961 200	2,942 300	4,903 500	9,807 1,000
	TYPE C	mN : 9.807 gf : 1		49.03 5	98.07 10	245.2 25	490.3 50	980.7 100	1,961 200	2,942 300	4,903 500	9,807 1,000
	TYPE D	mN : 9.807 gf : 1		49.03 5	98.07 10	245.2 25	490.3 50	980.7 100		2,942 300	4,903 500	9,807 1,000
	TYPE E	mN : 9.807 gf : 1	29.42 3	49.03 5	98.07 10	245.2 25	490.3 50	980.7 100		2,942 300	4,903 500	9,807 1,000
LOADING MECHANISM	Automatic Load and Release Method											
LOAD APPLYING SPEED	60μm/ sec											
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	2 Lenses (X 50 & X 10)										
	Option	Max. 3 Lenses (X 50 & X 10 plus 1 Lenses)		Max. 4 Lenses (X 50 & X 10 plus 2 Lenses)								
EYEPIECE	X 10											
MEASURING MICROSCOPE	Type	Mechanical					Electronic					
	Max. measurement length	In case of X 100: 850μm / In case of X 500: 170μm										
	Min. graduation	Micrometer : 0.5 μm					Digital : 0.01 μm (In case of X 500)					
	Min. measurement unit	Eye judgement : 0.1 μm					Digital : 0.01 μm (In case of X 500)					
X-Y STAGE	Type	Manual										
	Dimensions	100 x 100 mm										
	Max. movement	(X) 25 x (Y) 25 mm										
	Min. micro graduation	1/100 mm										
	Option	Digital microhead					Digital microhead (Panel display)					
PRECISION VISE	Max. opening	50 mm										
MAX. HEIGHT OF SPECIMEN	95 mm											
MAX. DEPTH OF SPECIMEN	115 mm											
TEST PARAMETER	-					HV / HK			HV / HK / HBS / HBW / Kc			
FRACTURE TOUGHNESS TEST (Kc)	Conform to JIS R1807 / IF Method											
HARDNESS CONVERSION	Conform to SAE (J-417b) & ASTM (E-140)											
OPERATION PANEL (SHEET SW for FM-100 / 300 Series & TOUCH PANEL SW for FM-800 Series)	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 FM-100 / 300 Series & LCD for FM-800 Series)	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) / CENTRONICS (D1/D2/HV-HK / HARDNESS VALUE / TEST LOAD / OK-NG)				RS232C / CENTRONICS (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	6V / 18W (Auto-iris mechanism)											
OPTICAL FUNCTION	Aperture diaphragm / Field aperture / Color filter : Replaceable											
ACCURACY	Conform to JIS B-7734/B-7725, ASTM E-384, and ISO/DIS 6507-2											
PHOTOGRAPHIC DEVICE	Capable to mount at anytime on top of the machine (Camera / Attachment : Option)											
DIMENSIONS	(W) 186 x (D) 450 x (H) 504 mm											
WEIGHT	Approx. 40 kg (Including Standard Accessories)											
POWER SUPPLY	Japan : Single phase AC 100V 50 / 60Hz Overseas : Single phase AC 100 ~ 240V 50 / 60Hz (Should be specified before shipment)											

# STANDARD ACCESSORIES

CODE NO.	ITEM	FM-100e	FM-100	FM-300e	FM-300	FM-800e	FM-800
M-026	X-Y STAGE	1	1	1	1	1	1
M-027	PRECISION VISE	1	1	1	1	1	1
M-037	STANDARD TEST BLOCK (HV700)	1	1	1	1	1	1
M-013	DIAMOND INDENTER	PYRAMID (BUILT-IN)					
M-041	MEASURING MICROSCOPE (WITH X 10 EYEPIECE)	MECHANICAL TYPE					
M-042		ELECTRONIC TYPE					
M-061	OBJECT LENS (BUILT-IN)	X 50					
M-018		X 10					
M-052	LEVEL ADJUSTING LEG	4	4	4	4	4	4
M-066	LEVEL	1	1	1	1	1	1
M-053	INDENTER COVER (BUILT-IN)	1	1	1	1	1	1
M-055	MACHINE COVER	1	1	1	1	1	1
M-044	SPARE LIGHT SOURCE BULB (6V 18W)	2	2	2	2	2	2
M-045	SPARE FUSE	100 ~ 120V 2A					
		200 ~ 240V 1A					
		200 ~ 240V 2A					
M-051	POWER CORD	1	1	1	1	1	1
M-039	AUXILIARY TOOLS (SCREW DRIVER : +1PC & -1PC & L WRENCH : 4 PCS)	1	1	1	1	1	1
	HARDNESS CALCULATION TABLE FOR VICKERS	1	1	-	-	-	-
M-039	HARDNESS CONVERSION TABLE	1	1	1	1	-	-
	INSTRUCTION & MAINTENANCE MANUAL	1	1	1	1	1	1
M-056	ACCESSORY BOX	1	1	1	1	1	1



<FM-300>  
Digital Microhardness Tester



<FM-100>  
Analog Microhardness Tester

\* Appearance and specifications are subject to change without prior notice.



## FUTURE-TECH CORP.

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# MICROHARDNESS TESTER

# FM-100 FM-300 FM-800



FM-800  
<Option : Digital microhead>

HV  
HK  
HBS  
HBW  
Kc

FUTURE-TECH CORP.



# MICROHARDNESS TESTER FM-100/FM-300/FM-800Series

Lab-friendly functions make FM Series Microhardness Testers ideal for materials labs.

FM-800e & FM-800 make precise Vickers (HV) / Knoop (HK) / Brinell (HB) / Fracture Toughness (Kc) measurements quick and easy.  
— One touch selection on touchpad —

## OUTSTANDING FEATURES

### ADVANCED COLOR LCD TOUCH PANEL OPERATION AND DISPLAY

- Color LCD touch panel/display coordinated with highly integrated PC board.
- Measuring procedures, conditions and data are displayed clearly. (FM-800 Series)

### NEW ECONOMICAL LED DIGITAL DISPLAY

- FM-300 Series as economical high quality Microhardness series with digital display.
- Wide Section: Analog Type / LED Digital Type / LCD Touch Panel Type. (FM-300 Series)

### BRINELL TESTING

- Accurate light load Brinell Testing is available as a standard function.
- Necessary additional optional item "Ball Indenter  $\phi$ 1mm". (FM-800 Series)

### FRACTURE TOUGHNESS TESTING, K<sub>c</sub>

- K<sub>c</sub> value can be measured as a standard function according to JIS R 1607/IF Method.
- Together with the value of Micro Vickers and Knoop, it is very effective to evaluate the quality of new material. (FM-800 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.
- Easily changeable color filter provides more resolution. (All Series)

### FINE AND CLEAR MEASURING LINE

- The newly designed measuring lines with 0.04 mm width can provide clear and accurate measurement. (All Series)

### AUTO-TURRET

- Auto turret mechanism provides quick and correct sequence without rotating the turret manually.
- Capable of manual operation (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 (Option/Negotiable)

### X-Y COORDINATE DISPLAY

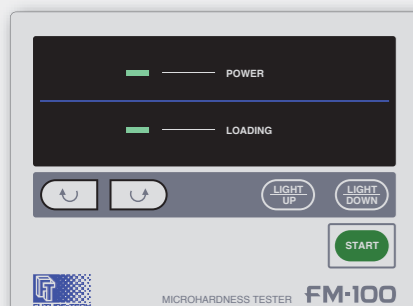
- Stage coordinate is indicated on the display in a link operation with the digital microhead (option).

### 4 OBJECT LENSES (OPTIONAL)

- The new turret mechanism enables to observe wide 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 (FM-800 Series)

### 2 INDENTERS FOR HV/HK MEASUREMENTS (OPTIONAL)

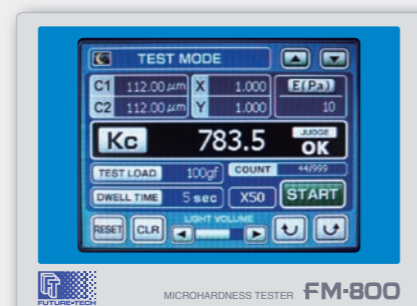
- The new turret mechanism enables to adapt 2 indenters simultaneously.
- It allows Vickers and Knoop tests without replacing the indenter. (FM-800 Series)



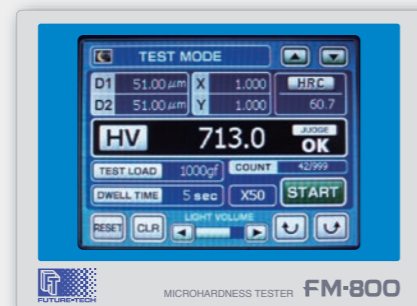
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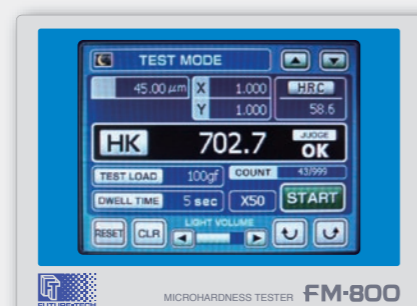
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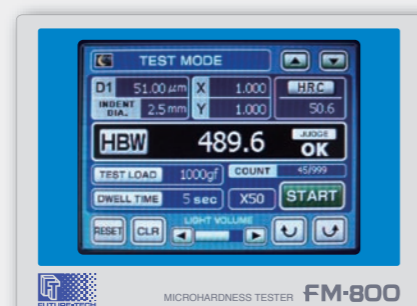
Kc <FM-800Series>



HV <FM-800Series>

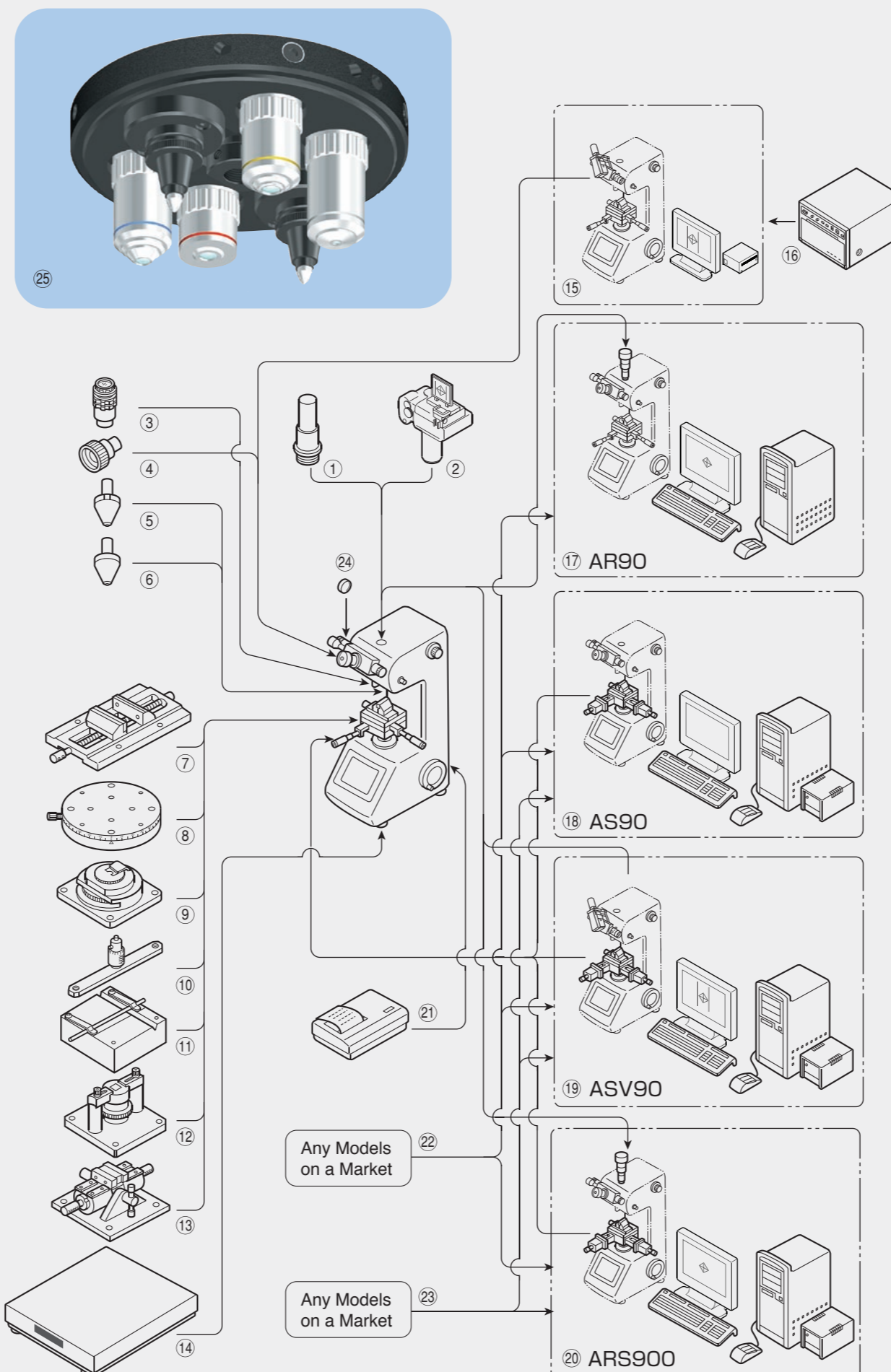


HK <FM-800Series>



HBW <FM-800Series>

## SYSTEM CHART <OPTIONAL COMPONENTS>



## OPTIONAL ACCESSORIES

CODE No.	ITEM	DESCRIPTION
M-014	KNOOP INDENTER	⑤ Rhombic diamond indenter for Knoop hardness
M-063	BRINELL TEST TUNGSTEN CARBIDE BALL INDENTER	⑥ $\phi$ 1mm
M-039	HARDNESS CALCULATION TABLE	FOR HV Standard for FM-100 Series and optional for FM-300 and FM-800 Series
M-040		FOR HK Optional for all models
M-015	OBJECT LENS	$\times$ 100
M-016		$\times$ 40
M-017		$\times$ 20
M-019		$\times$ 5
M-062	EYEPIECE	④ $\times$ 15
M-022	COLOR FILTER	$\phi$ 20 mm : Yellow & Blue (Standard : Green)
M-023	COLOR TEMPERATURE CONVERSION FILTER	For color TV measuring device
M-024	APERTURE DIAPHRAGM	$\phi$ 1~6 mm each selectable (6 kinds)
M-025	FIELD APERTURE	$\phi$ 1~7 mm each selectable(7 kinds)
M-054	CAMERA MOUNTING TUBE	① For adapting photographic camera & CCD camera
M-012	DIGITAL CAMERA ATTACHMENT	② C MOUNT ATTACHMENT(Digital camera is not included)
M-008	TV MEASURING DEVICE	Black & White B & W CCD camera + 8.4" LCD
M-009		Color Color CCD camera + 14" CRT Monitor
M-003	AUTOMATIC READING SYSTEM <AR90>	⑩ After focusing, tow diagonal lengths of indent shall be measured and displayed automatically in a moment. Measurement time : Approx. 0.3 sec / 1 indent Components : CCD camera (B & W) + PC + Printer + AR Software
M-002	AUTOMATIC X-Y STAGE & CONTROL UNIT <AS90>	⑪ Automatic X-Y stage : Max. movement : 50mm Min. micro inching : 1 $\mu$ m Dimensions : 110 x 110 mm Components : Auto-stage + Motor drive unit + PC + Printer + AS Software
M-000	SEMI-AUTOMATIC MEASURING SYSTEM WITH AUTO-STAGE <ASV90>	⑫ The combined system of AS and CCD camera. Operator can measure the indentation manually on the CRT by using two measuring lines. Components : Auto-stage + Motor drive unit + CCD camera(B & W) + PC + Printer + ASV Software
M-001	AUTOMATIC MEASURING SYSTEM WITH AUTO-STAGE <ARS900>	⑬ The combined system of AR and AS Components : Auto-stage + Motor drive unit + CCD camera(B & W) + PC + Printer + ARS Software
M-028	PRECISION VISE	⑦ Max. opening : 100mm
M-029	ROTARY TABLE	⑧ Graduation of rotary angle : 5 degree Table diameter : $\phi$ 128mm
M-030	THIN SPECIMEN MEASURING DEVICE	⑨ Specimen thickness : 5 mm max.
M-031	FINE SPECIMEN MEASURING DEVICE	VERTICAL TYPE ⑩ Specimen diameter : $\phi$ 5mm max. (For measuring the cross section)
M-032		HORIZONTAL TYPE ⑪ Specimen diameter : $\phi$ 5mm max. (For measuring the cylindrical surface)
M-033	SPECIMEN INCLINING DEVICE	⑫ Specimen height : 5~20 mm (For mounted specimen)
M-034	UNIVERSAL INCLINING VISE	⑬ Inclining device + Vise Max. opening : 45mm
M-004	DIGITAL PRINTER	⑭ RS232C type (For Hardness Tester)
		Bubble Jet type (For Automatic System)
M-006	LASER PRINTER	⑮ Any models on a market (For Automatic System)
M-007	VIDEO GRAPHIC PRINTER	⑯ By SONY or MITSUBISHI (For TV measuring System)
M-043	VIBRATION INSULATION STAND	⑰ MAGMATE-FT (Magnet floating type) / AIRMATE-FT (Air & Rubber type)
M-057	MECHANICAL PARTS FOR ADDITIONAL OBJECT LENS	Mechanical parts on turret for additional third and fourth object lenses. Additional lenses should be specified when placing order. Possible to install additional lenses only in our factory.
M-065	DUAL INDENTER TURRET <For Series FM-800 Series>	⑱ Specially designed turret could be available for adapting two indenters (HV + HK) simultaneously. Impossible to change a Single Indenter Turret to Dual Indenter Turret at customer's site. Please indicate when ordering.

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