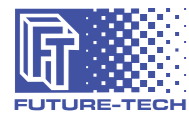


DIGITAL ROCKWELL TYPE HARDNESS TESTER

# FR-X Series

FR-X1, FR-X2, FR-X3, FR-X1L, FR-X2L, FR-X3L



**FUTURE-TECH CORP.**

<http://www.ft-hardness.com>

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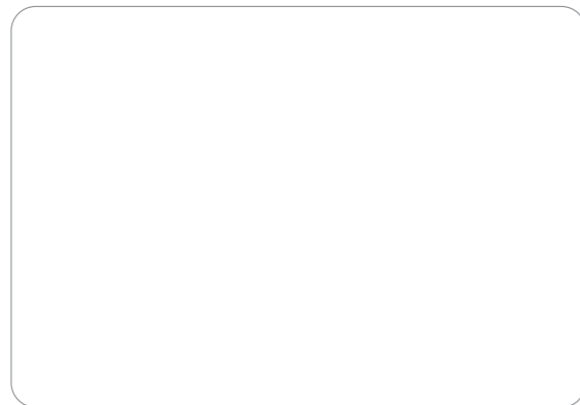
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当社は、認定標準として、ISO 17025 (ISO/IEC 17025) を用い、認定番号—JIS ISO/IEC 17011 に従って運営されているJCSSの下で認定されています。  
 JCSSを運営している認定機関 (AJJapan) は、アジア太平洋試験所認定能力機構 (APLAC) 及び国際試験所認定能力機構 (ILAC) の相互承認に署名しています。  
 当社は、国際MRA対応JCSS認定事業者です。  
 JCSS 0228は、当社の認定番号です。



# FR-X Series

**FR-X1, FR-X2, FR-X3**

**FR-X1L, FR-X2L, FR-X3L**

Obtained the supreme precision and overwhelming reliability by the adoption of entirely new designing and precision manufacturing with no compromise!

By the adoption of stealth type double information panel, improved the remarkable visibility and operation!



## Features

### EMPHASIZED HIGH PRECISION

Reviewed the popular FR-e series and achieved the supreme precision.

### STRENGTHENED BODY

Achieved the remarkable improvement of hardness measurement by the adoption of newly designed strong body. Prepared the maximum stroke of specimen of 255mm and long type of 405mm. (from the horizontal anvil to X3 and X3L)

### STABLE LOADING AXIS MECHANISM

Adopted highly sensitive load shaft to prevent the side shift by the introduction of ball guide at the top and bottom. The stable measurement of hardness has become possible for the cylindrical and spherical surface.

### STANDARD COMPENSATION FUNCTION

Low, middle, high compensation of multiple points to meet the each standard. Obtain the test result which is comply with the different standard for all hardness range.

### SHAPE COMPENSATION FUNCTION

Obtain the test result which is comply with the standard by entering the diameter of spherical surface & cylindrical specimen.

### DISPLAY OF MAX.DEPTH OF INDENTER

Display the max.depth of indenter together with test result. Be able to evaluate the elastic amount of different sample in hardness value.

### STEALTH TYPE DOUBLE INFORMATION PANEL

Display the various information of OK/NO judgement and conversion and at the same time, display the measurement results. (Load and release of the test road, and hardness indication are automatic)

### FUNCTION OF DATA JUDGEMENT

Display the judgement of measurement data (HI, OK, LO), if you set the maximum value and minimum one and the mean value, if you set measurement point on the sub-information panel.

### LED LIGHT

Obtained the supreme visibility of specimen in the dark environment and achieved the minute positioning.

### USB DATA OUTPUT

USB(B2.0) connector is equipped. USB data can be transferred to PC. Capable in compliance with all ASTM (E-140), SAE(J-417b).

## STANDARD SPECIFICATION

MINOR LOAD POSITION SETTING	Automatic setting (Electronic sound monitoring )
LOAD CONTROL	Automatic (Application-holding-release)
START OPERATION	Automatic start / Manual start
LOADING SPEED	Approx. 2 sec (fixed)
DWELL TIME	1- 999 sec (Key entry in unit of 1 sec / Factory setting : 5 sec)
PLASTIC MEASUREMENT MODE	Standard function (Time up to hardness value display after release of test load : 1 to 999 sec)
HARDNESS CONVERSION	Capable in compliance with SAE (J -417b) & ASTM (E-140).
STANDARD CORRECTION	Low, middle, high (3levels) compensation of multiple points to meet the each standard.
SHAPE CORRECTION	Compensate and display the hardness value of cylindrical (CYL) and spherical (SPH) specimen. (Enter the radius of cylindrical specimen. Enter the diameter of spherical specimen.)
MAX.DEPTH OF INDENTER MEASURING FUNCTION	Display the value of max.depth of indenter.
AVERAGE VALUE CALCULATION FUNCTION	Calculate the average value. (Enter the number of measuring point)
OK / NG CRITERIA	Upper and lower limit setting, and HI / OK / LO display (HR 0 to 130, min. 0.1 hardness setting)
DATA TRANSFER FUNCTION	USB (B2.0) Connector (Option)
OUTPUT SIGNAL	RS232C (Baud rate : 9,600 bps)
RS-232C OUTPUT & PRINTOUT MODE	①Measurement data only ②Measurement data and evaluation results (Max. value, min. value & HI / OK / LO) ③Measurement data and conversion data ④Measurement data, conversion data and evaluation results (Max. value, min. value & HI / OK / LO) ⑤Measurement data and average value ⑥Max.depth of indenter and measurement data
ACCURACY	Conform to ASTM E18-15, JIS B-7726
POWER SUPPLY	Single phase AC 100V, 50 / 60HZ in Japan and AC 100 ~ 240V, 50 / 60HZ available for Export Model. (Rated power consumption 30w)

## STANDARD ACCESSORIES

CODE No.	ITEM	FR-X1	FR-X1L	FR-X2	FR-X2L	FR-X3	FR-X3L
R - 0 1 2	HARDNESS STANDARD BLOCK	HRC	1	—	—	1	—
R - 0 1 4		HRB	1	—	—	1	—
R - 0 1 5		HR30N	—	—	1	—	1
R - 0 1 6		HR30T	—	—	1	—	1
R - 0 0 2	DIAMOND INDENTER	For ROCKWELL Type	1	—	—	—	—
R - 0 0 3		For SUPERFICIAL & TWIN Type	—	—	1	—	1
R - 0 0 4	CARBIDE BALL INDENTER ( φ 1/ 16" / φ 1.588mm)	1	—	1	—	1	—
R - 0 0 8	SPARE CARBIDE BALL ( φ 1/ 16" / φ 1.588mm)	2	—	2	—	2	—
R - 0 2 1	ANVIL	FLAT ( φ 60mm)	1	—	1	—	1
R - 0 2 2		V-SHAPE (LARGE)	1	—	1	—	1
R - 0 4 2	POWER CABLE (3P-2.5mm)	1	—	1	—	1	—
R - 0 4 3	LEVEL ADJUSTING LEG	4	—	4	—	4	—
R - 0 4 4	MACHINE COVER	1	—	1	—	1	—
	INSTRUCTION AND MAINTENANCE MANUAL	1	—	1	—	1	—
R - 0 4 5	ACCESSORY BOX	1	—	1	—	1	—

# FR-X Series



## FR-X1



## FR-X2



## FR-X3



## FR-X1L



## FR-X2L

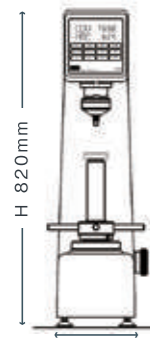


## FR-X3L



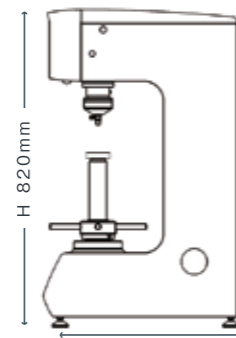
### SPECIFICATIONS

	FR-X1	FR-X2	FR-X3
MINOR LOAD	N: 98.07 kgf: 10	N: 29.42 kgf: 3	N: 29.42 & 98.07 kgf: 3 & 10
TEST LOAD	N: 588.4 980.7 1471 kgf: 60 100 150	N: 147.1 294.2 441.3 kgf: 15 30 45	N: 147.1 294.2 441.3 kgf: 15 30 45 N: 588.4 980.7 1471 kgf: 60 100 150
MAX.SPECIMEN HEIGHT	255mm	255mm	225mm
MAX.SPECIMEN DEPTH	165mm		
DINENSIONS	W196×D487×H820mm		
WEIGHT	82kg	80kg	83kg



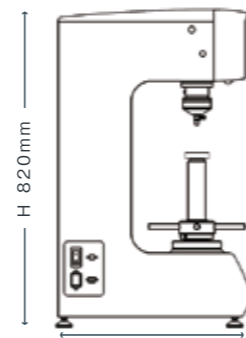
W 196mm

□ Front view



D 487mm

□ Right view



D 487mm

□ Left view

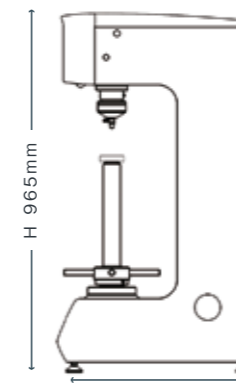
### SPECIFICATIONS

	FR-X1L	FR-X2L	FR-X3L
MINOR LOAD	N: 98.07 kgf: 10	N: 29.42 kgf: 3	N: 29.42 & 98.07 kgf: 3 & 10
TEST LOAD	N: 588.4 980.7 1471 kgf: 60 100 150	N: 147.1 294.2 441.3 kgf: 15 30 45	N: 147.1 294.2 441.3 kgf: 15 30 45 N: 588.4 980.7 1471 kgf: 60 100 150
MAX.SPECIMEN HEIGHT	435mm	435mm	405mm
MAX.SPECIMEN DEPTH	165mm		
DINENSIONS	W196×D487×H965mm		
WEIGHT	87kg	85kg	88kg



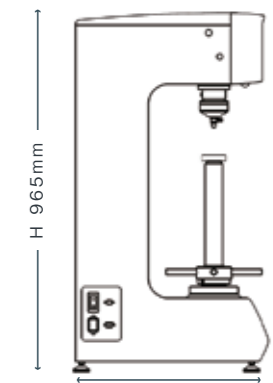
H 965mm

□ Front view



H 965mm

□ Right view



H 965mm

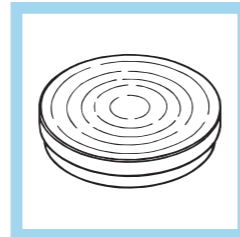
□ Left view



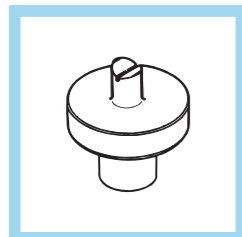
**OPTIONAL ACCESSORIES**



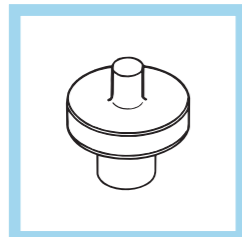
R-001  
DIGITAL PRINTER



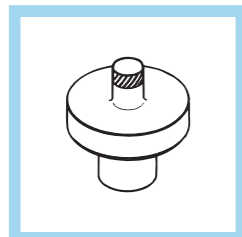
R-028  
ROUND TABLE  $\phi$ 200mm



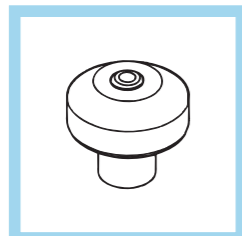
R-023  
ANVIL V-SHAPE (Small)



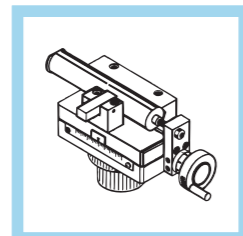
R-025  
ANVIL SPOT



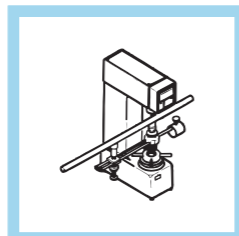
R-026  
ANVIL CARBIDE SPOT



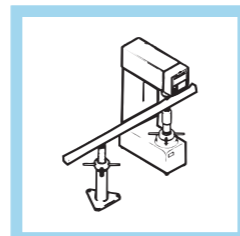
R-027  
ANVIL DIAMOND SPOT



R-029  
MICRO TEST TABLE  
FOR JOMINY TEST



R-030  
LONG SPECIMEN  
TESTING JIG VARI-REST



R-031  
LONG SPECIMEN  
TESTING JIG JACK-REST



**ROCKWELL HARDNESS SCALE AND ITS INFORMATION**

SCALE	HARDNESS	INDENTER	PRE FORCE F <sub>0</sub> (N)	TEST FORCE F (N)	CONSTANT S (mm)	EACH SCALE CONSTANT N	FIELD OF APPLICATION
A	HRA	DIAMOND CONE	98.07	588.4	0.002	100	20 ~ 95 HRA
B	HRB	BALL 1/16 inch	98.07	980.7	0.002	130	10 ~ 100 HRB
C	HRC	DIAMOND CONE	98.07	1 471	0.002	100	20 <sup>a)</sup> ~ 70 HRC
D	HRD	DIAMOND CONE	98.07	980.7	0.002	100	40 ~ 77 HRD
E	HRE	BALL 1/8 inch	98.07	980.7	0.002	130	70 ~ 100 HRE
F	HRF	BALL 1/16 inch	98.07	588.4	0.002	130	60 ~ 100 HRF
G	HRG	BALL 1/16 inch	98.07	1 471	0.002	130	30 ~ 94 HRG
H	HRH	BALL 1/8 inch	98.07	588.4	0.002	130	80 ~ 100 HRH
K	HRK	BALL 1/8 inch	98.07	1 471	0.002	130	40 ~ 100 HRK

Note) The field of application can be extended to 10 HRC if the indenter possesses the appropriate dimensions.

**ROCKWELL SUPERFICIAL SCALE AND ITS INFORMATION**

SCALE	HARDNESS	INDENTER	PRE FORCE F <sub>0</sub> (N)	TEST FORCE F (N)	CONSTANT S (mm)	EACH SCALE CONSTANT N	FIELD OF APPLICATION
15N	HR15N	DIAMOND CONE	29.42	147.1	0.001	100	70 ~ 95 HR15N
30N	HR30N	DIAMOND CONE	29.42	294.2	0.001	100	42 ~ 86 HR30N
45N	HR45N	DIAMOND CONE	29.42	441.3	0.001	100	20 ~ 77 HR45N
15T	HR15T	BALL 1/16 inch	29.42	147.1	0.001	100	67 ~ 93 HR15T
30T	HR30T	BALL 1/16 inch	29.42	294.2	0.001	100	29 ~ 82 HR30T
45T	HR45T	BALL 1/16 inch	29.42	441.3	0.001	100	10 ~ 72 HR45T

**OTHER HARDNESS TESTERS**



<FM-810>  
Digital Microhardness Tester



<FV-810>  
Digital Vickers Hardness Tester



<FM-ARS 9000>  
Fully-Automatic Microhardness Testing System