HR-100/200/300/400
SERIES 963 — Rockwell Hardness Testing Machines

An inspection certificate is supplied as standard.
Refer to page IX for details.

- This series is economy type Rockwell hardness testing machines.
  We have a lineup of 5 models consisting of a digital display type and an analog display type.

963-210
HR-110MR

963-220
HR-210MR

963-231
HR-320MS

963-240
HR-430MR

963-241
HR-430MS

SPECIFICATIONS

Order No.	963-210	963-220*	963-231*	963-240*	963-241*
Model	HR-110MR	HR-210MR	HR-320MS	HR-430MR	HR-430MS
Type of hardness test	Rockwell				
	—	—	Rockwell Superficial	—	Rockwell Superficial
Standards	JIS B 7726 ISO6508-2 (ASTM E18)				
Hardness display	Analog		Digital		
Preliminary test force (handling support)	Automatic pre-setting dial gage		Loading navigator indication	Automatic steering wheel brake	
Preliminary test force setting	—	—	Dial switching	—	Dial switching
Total test force setting	Weight change			Dial switching	
Total test force control	Manual	Motor drive - Button start		Motor drive - Automatic start	
Function	—	—	Pass or fail decision, Offset compensation, Hardness conversion		
Output	—	—	Digimatic interface, Serial interface (RS-232C)		
Power supply	No power required	100 to 240V AC, 1.2A (adapter 12V DC, 3.5A)			
External dimensions	Approx. 296(W)×512(D)×780(H)mm	Approx. 235(W)×512(D)×780(H)mm	Approx. 235(W)×516(D)×780(H)mm		
Mass	Approx. 49kg	Approx. 47kg	Approx. 47kg	Approx. 50kg	

*To denote your AC power cable add the following suffixes to the order No. :
A for UL/CSA, D for CEE, DC for CCC, E for BS, K for KC, C and No suffix are required for PSE.
Note: Using special accessories (optional), the Brinell indenter and measuring microscope, enables users to perform the Brinell hardness test.

Refer to the Hardness Testing Machines (Catalog No.E17001) for more details.

HARDMATIC HH-411
SERIES 810 — Rebound Type Portable Hardness Tester

An inspection certificate is supplied as standard.
Refer to page IX for details.

• Excellent operability that performs hardness tests with the touch of a key and a compact body allows users to measure hardness at any fields. This instrument is best suited for on-site hardness tests such as large molds, railroad track, and welded spots in structures.

SPECIFICATIONS

Order No.	810-299 (JIS), 810-298 (ASTM)
Model	HH-411
Detector	Impact hammer with integrated detector and carbide-ball tip (D type: conforming to ASTM A 956)
Display unit	7-segment LCD
Hardness display range	Leeb hardness: 1 to 999HL
Display range (This display range varies depending on the conversion table used.)	Vickers hardness: 43 to 950HV Brinell hardness: 20 to 894HB Rockwell hardness (C scale): 19.3 to 68.2HRC Rockwell hardness (B scale): 13.5 to 101.7HRB Shore hardness: 13.2 to 99.3HS Tensile strength: 499 to 1996MPa
Function	Automatic angle correction Offset Pass or fail decision function Data save: 1800 Points Conversion (details in display range) Statistical calculation function Auto-sleep Dotting count display
Specimen requirements	Min. specimen thickness of 5mm or more and mass of 5kg or more (However, a specimen of mass of 0.1 to 5kg is measurable by securing to a massive base) Testing point: 5mm or more from edge of specimen, 3mm or more between testing points Specimen surface roughness: Ra of 2µm or less
Output	Digimatic interface Serial interface (RS-232C)
Power supply	Alkaline AA battery 2pcs or optional AC adapter (battery life: 70 hours)
External dimensions/Mass	Detector: ø28×175mm in length, 120g Display: 70(W)×110(D)×35(H)mm, Approx. 200g

* For elastic materials such as rubber, measurement cannot be performed.
The principle behind the Leeb hardness test is that the hardness is obtained by the rebound behavior of an impact hammer after a light blow on the specimen.
Therefore be aware that the test results are susceptible to the effect of the size (especially thickness) and surface roughness of a workpiece.

Refer to the Hardness Testing Machines (Catalog No.E17001) for more details.