



Rebound type portable hardness tester

HARDMATIC HH-411

HH-411 is a rebound type portable hardness tester for metal with a compact body and high operability. It allows anyone to perform hardness testing easily at the touch of a key, so it can be used widely on various components in the field.



810-299
HH-411

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Rich variety of detectors available

In addition to the general-purpose detector (D type) supplied as standard equipment, the detector lineup includes rich variations (sold separately) to support special applications. The DC type is provided for hardness testing of internal walls of pipes with diameters that cannot be tested with the D type, the D+15 type for bearings and gears, and the DL type for small areas such as the bottom of small gears and weld corners.

Equipped with automatic orientation correction

For the rebound type hardness tester, gravity affects the measurement result depending on the orientation of the detector relative to the vertical when pressed against the specimen surface. The HH-411 is equipped with the latest measurement technology that automatically detects the orientation of the detector to automatically correct for this effect, so maximum accuracy is always achieved.

Hardness testing of small surfaces is possible

Only a small surface (standard D type: $\phi 22\text{mm}$, separately sold DL type: $\phi 4\text{mm}$) area is required for hardness testing. Therefore the HH-411 can be used for testing of various specimen shapes such as around grooves and gear teeth.

Equipped with a data save function

Up to 1800 hardness test results can be saved, which is useful for patrol tests in the field.

Hardness scale can be selected for your own individual purpose

Based on the hardness HL value (L value: according to ASTM A 956), conversion can be performed to Vickers, Brinell, Rockwell C, Rockwell B, and Shore hardness as well as tensile strength.

Conversion can be performed after the test, or hardness value display in the conversion mode is also available.

Great operability

The basic operation is to press the detector against the sample surface and push the detector button by your finger, just like clicking a ballpoint pen, so it is easy for anyone to do.

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■ Application examples for each detector type



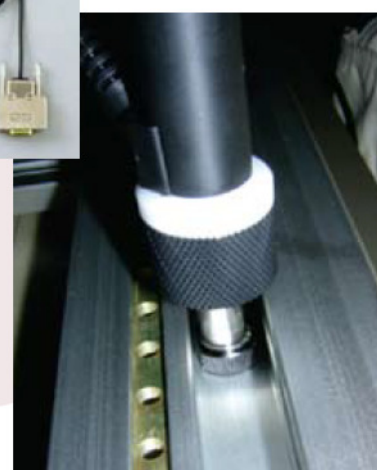
● DC Type : UD-412



● Hardness testing of internal walls of pipes and tight spaces



● D+15 Type : UD-413



● Hardness testing in gaps and grooves and with slightly uneven surfaces



● DL Type : UD-414



● Small surfaces such as bottom lands of gears and weld corners



Specifications

Order No.	810-298(ASTM) 810-299(JIS)	
Model	HH-411	
Detector	Carbide ball is used at the tip of the impact hammer (D type: ASTM A956 specification)	
Display	7 segments, LCD display	
Hardness display range	Leeb hardness	:1 to 999HL
Measuring accuracy	800±12HL	
	For measurements performed using a testing method described in the user's manual with a Mitutoyo-recommended test block firmly mounted on a granite surface base	
Display range (The 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 failure decision function	
	Data save: 1800 Points	
	Conversion (details in display range)	
	Statistical calculation function (mean, maximum, minimum, variation, standard deviation)	
	Auto-sleep	
Specimen requirements	Dotting count display	
	Min. thickness: 5mm; mass: 5kg or more (However, specimens with a mass between 0.1 and 5kg can be tested if fixed to a strong support.)	
	Test points: At least 5mm from specimen edges and at intervals of at least 3mm	
External connector interface	Surface roughness: up to Ra 2µm	
Power supply	For printer: Serial interface (compatible with the RS-232C standard), Digimatic interface (1 each; simultaneous output is available)	
Operating environment	Two AA alkaline batteries (battery life: Approx. 70 hours in continuous use), AC adapter (special accessory)	
External dimensions	Temperature: 0 to 50°C	Humidity: 95% (No condensation)
Mass	Display: Approx. 70(W)×110(D)×35(H)mm	Approx. 200g
	Detector: Approx. ø28×175mm	120g

Note: For Shore hardness value measurements in Japan, please use item with order no. 810-299

Standard components

Order No.	Item	Description	Quantity
810-292	Display UD-410	—	1
—	AA alkaline battery	—	2
—	User's manual	—	1
—	Strap	—	1
810-287	Detector UD-411	D type Approx. ø28 x 175mm, Approx. 120g (tip diameter ø22mm)	1
—	Impact hammer	—	1
19BAA457	Carbide ball	Installed in the impact hammer	1
19BAA459	Wrench	For replacement of carbide ball	1
19BAA451	Support ring	ø22mm	1
19BAA452	Support ring (Small)	ø14mm	1
19BAA258	Cleaning brush	—	1
—	Storage case for testing machine	For display and detector	1
19BAA265	Hardness standard block	800HLD-equivalent (ø90mm, t55mm, 2.7kg)	1
—	Storage case for standard blocks	—	1

Note: The HH411 cannot be used for hardness measurement of elastic materials such as rubber. Stiffness of the measurement target may affect the measurement result. Particularly avoid the measurement of sheets.

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Optional accessories

Order No.	Item	Description	Quantity
264-504	Digimatic mini processor	Printing of measurement data, various statistical calculations, etc.	1
937387	Connection cable	For connection of DP-1VR and display (1m)	1
09EAA082	Recording paper	For DP-1VR (10 rolls)	1
810-622	Thermal printer DPU-414	Printing, such as the statistical calculation and a variety of measurement data	1
19BAA285	Connection cable (for DPU-414)	With connection cable for display	1
19BAA157	Recording paper	For DPU-414 (TP411-28CL) (10 rolls)	1
19BAA238	Connection cable	For connection of the PC and display RS-232C (For DOS/V PC)	1
526688	AC adapter	For display AD908N	1
19BAA243	Hardness standard block	880HLD (ø115mm, t33mm, 3.7kg)	1
19BAA244	Hardness standard block	830HLD (ø115mm, t33mm, 3.7kg)	1
19BAA245	Hardness standard block	730HLD (ø115mm, t33mm, 3.7kg)	1
19BAA246	Hardness standard block	620HLD (ø115mm, t33mm, 3.7kg)	1
19BAA247	Hardness standard block	520HLD (ø115mm, t33mm, 3.7kg)	1
19BAA248	Support ring cylinder (3)	For measurement of convex surfaces (R10 to 20mm): For D and DC types	1
19BAA249	Support ring hollow cylinder (4)	For measurement of concave surfaces (R14 to 20mm): For D and DC types	1
19BAA250	Support ring sphere (5)	For measurement of convex surfaces (R10 to 27.5mm): For D and DC types	1
19BAA251	Support ring hollow sphere (6)	For measurement of concave surfaces (R13.5 to 20mm): For D and DC types	1
19BAA457	Carbide ball	For D, DC, and D+15 types	1
19BAA458	Replacement ball shaft	For DL type	1
810-287	Detector UD-411	D type Approx. ø28 x 175mm, Approx. 120g (tip ø22mm)	1
810-288	Detector UD-412	DC type Approx. ø22 x 85mm, Approx. 50g (tip ø22mm)	1
810-289	Detector UD-413	D+15 type Approx. ø28 x 190mm, Approx. 130g (tip width ø11mm)	1
810-290	Detector UD-414	DL type Approx. ø28 x 230mm, Approx. 140g (tip width ø4mm)	1

Interchangeable detectors (special accessories)

- One display (UD-410) can be used in combination with various detectors.

810-290 UD-414

Application: Suitable for measuring in grooves and crevices such as are found on gears and weld corners.



810-289 UD-413

Application: Suitable for the measurement of concave parts.



810-288 UD-412

Application: Suitable for the measurement of internal walls of cylinders. The grip is short, which is desirable for maintaining stability in the measurement position.

