

# NEW PRODUCT INFORMATION

## HH-411 Impact Type Hardness Testing Unit

### Easy to use hardness tester

The HH-411 Portable Hardness Tester is designed for ease of use. Just one touch of a button performs non-destructive testing. And the HH-411 is compact and portable — ideal for on-site applications.



### Automatically converts Unit of Hardness to various, selectable standards

The HH-411 produces HL hardness scale results (L hardness: conforming to ASTM A 956), which can be converted into Vickers, Brinell, Rockwell C, Rockwell B, Shore and tensile strength, as required. And it not only converts after the tests, it also displays the converted value while testing.

### One-button testing

Pressing just one button performs the test.

### Features

#### A choice of impactor

D type: Standard, general purpose type.  
DC type: For inner walls of pipes.  
D+15 type: For bearings and gears.  
DL type: For narrow features such as small gear teeth and welded corners.

#### Equipped with Auto Angle Compensation Function

Impact-type hardness measurement results are influenced by the effect of gravitational forces on the impactor mechanism which, in turn, depends upon the relative orientation of the impactor to the earth. HH-411 is equipped with the latest measuring technology that automatically recognizes impactor orientation, at the moment of testing, and compensates for this effect so maximum accuracy is realized in every measurement.

#### Hardness test extremely small surfaces

The HH-411 can perform hardness testing on very small surface areas ( $\varnothing 22\text{mm}$  for the standard type D impactor,  $\varnothing 4\text{mm}$  for the optional type DL impactor). This feature makes the HH-411 ideal for surface hardness testing of small features such as gear teeth, structural members and similar items.

#### Data Storage Function

The HH-411 can store up to 1800 surface hardness test data entries — ideal for on-site applications.

## Specifications

Order No.	810-283-01
Model	HH-411
Impactor	Impact hammer with integrated detector and carbide-ball tip (D type: conforming to ASTM A 956)
Display unit	7-segments LCD
Display range	Leeb: 1-999HL Resolution 1HL Vickers: 43-950HV Resolution 1HV Brinell: 20-894HB Resolution 1HB Rockwell C: 19.3-68.2HRC Resolution 0.1HRC Rockwell B: 13.5-101.7HRB Resolution 0.1HRB Shore: 13.2-99.3HS Resolution 0.1 HS Tensile strength: 499-1996Mpa Resolution 1MPa (Display range depends on conversion table.)
Functions	Auto Angle Compensation Function, Offset function GO/NG judgment function, Conversion function Data storage function: 1800 data entries Statistical analysis (Average, Maximum, Minimum, Dispersion) Auto sleep function, Impact counter display function
Testable workpiece limits	Minimum 5mm or more in thickness and 5kg or more in mass (When the sample mass is 0.1kg or more and less than 5kg, fix it on a firm supporting stand to make it testable.) Test points: 5mm or more from the edge of the sample, 3mm or more to each of the tested points. Surface roughness of samples: Ra 10µm or less
Output	RS-232C, SPC (each 1 output, simultaneous output is possible)
Power supply	Alkaline AA battery 2pcs (battery life: approx. 70 hours) AC adapter (optional accessory)
Operating environment	Temperature: 0°C to 50°C Humidity: less than 95% without condensation
Size / Mass	Display unit: approx. 70 x 110 x 35 mm, 200g Impactor: approx. ø28 x 175 mm, 120g

## Optional accessories

Order No.	Description	Remarks	Q'ty
264-504-05A	Digimatic Mini-Processor	DP-1VR	1
937387	Connecting cable	For DP-1VR and display unit	1
09EAA082	Printer paper	For DP-1VR 10 rolls / set	1
810-622	Thermal printer	With a connecting cable for DPU-414	1
19BAA157	Printer paper	For DPU-414 (TP411-28CL)	1
19BAA238	Connecting cable	For PC and the display unit RS-232C (for DOS / V PC)	1
526688A	AC adapter	For the display unit (AD908N)	1
19BAA243	Hardness test block	880HLD (ø115mm, t33mm, 3.7kg)	1
19BAA244	Hardness test block	830HLD (ø115mm, t33mm, 3.7kg)	1
19BAA245	Hardness test block	730HLD (ø115mm, t33mm, 3.7kg)	1
19BAA246	Hardness test block	620HLD (ø115mm, t33mm, 3.7kg)	1
19BAA247	Hardness test block	520HLD (ø115mm, t33mm, 3.7kg)	1
19BAA248	Support ring	For convex surface of cylinder (R10-R20)	1
19BAA249	Support ring	For convex surface of cylinder (R14-R20)	1
19BAA250	Support ring	For convex surface of sphere (R10-R27.5)	1
19BAA251	Support ring	For concave surface of sphere (R13.5-R20)	1
19BAA457	Carbide ball	For D, DC, D+15 type impactors	1
19BAA458	Ball shaft	For DL type impactor	1
810-287	Impactor UD-411	D : approx. ø28 x 175mm, 120g (tip: ø22mm)	1
810-288	Impactor UD-412	DC : approx. ø22 x 85mm, 50g (tip: ø22mm)	1
810-289	Impactor UD-413	D+15 : approx. ø28 x 190mm, 130g (tip width 11mm)	1
810-290	Impactor UD-414	DL: approx. ø28 x 230mm, 140g (tip: ø4 mm)	1

Note: All information regarding our products, and in particular the illustrations, drawings, dimensional and performance data contained in this pamphlet, as well as other technical data are to be regarded as approximate average values. We therefore reserve the right to make illustrations of the responding designs, dimensions and weights. The stated standards, similar technical regulations, descriptions and illustrations of the products were valid at the time of printing. In addition, the latest applicable version of our General Trading Conditions will apply. Only quotations submitted by ourselves may be regarded as definitive.

## Standard configuration

Order No.	Description	Remarks	Q'ty
19BAA450-01	Display unit UD-410		1
-	Alkaline AA battery		2
-	User's manual		1
810-287	Detector UD-411	D type, approx. ø28 x 175mm, 120g (tip: ø22mm)	1
-	Impact hammer		1
19BAA457	Carbide ball	Built-in to the impact hammer	1
19BAA459	Wrench		1
19BAA460	Cable for detector		1
19BAA451	Support ring	ø22mm	1
19BAA452	Support ring (small)	ø14mm	1
19BAA258	Brush		1
-	Case	For the display unit and detector	1
19BAA265	Hardness specimen		1
-	Case	For hardness specimen	1

Note:

- This hardness tester cannot test elastic materials such as rubber.
- The inertia of the workpiece tested may affect the measurement results. Please keep this fact in mind, especially when measuring thin objects. In some cases it may be necessary to use a more massive object backing the workpiece to provide sufficient inertia at the point of test for an accurate result to be obtained.

## Impactors (Optional accessories)

Various impactors can be connected to the display unit UD-410

Order No. 810-289  
Model : UD-413

Use for concave workpieces such as gear teeth, ball bearing races, etc.



Order No. 810-288

Model : UD-412

Use for innerwalls of cylinders.  
The grip is short to allow easy positioning within a cylinder.



Order No. 810-290

Model : UD-414

Use for gear teeth, welded corners, etc.

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