

# Durometers for sponge, rubber, and plastic Hardmatic HH-300 Series

The Hardmatic HH-300 Series includes a slim and easy-to-handle long type and a compact type that fits easily in your hand. Both types have 2 types of display specifications, analog and digital.

Hardmatic HH-300 Series

**Long type**

811-333-10,334-10  
HH-333, 334  
811-337-10,338-10  
HH-337, 338

811-333-10,337-10  
HH-334, 338

**Compact type**

811-331-10,332-10  
HH-331, 332  
811-335-10,336-10  
HH-335, 336

811-329-10,330-10  
HH-329, 330

**HARD**

Plastics

811-019  
CTS-101  
811-332-10  
HH-332

Hard rubbers

General types of rubber  
Elastomers

811-013  
CTS-103  
811-336-10  
HH-336

**SOFT**

Hard sponges  
Soft foams





# Measuring hardness just requires pressing the hardness tester against the specimen and reading the indicated value.

Various kinds of sample can be tested for hardness, from soft sponge to hard plastic. Also, various measurement locations on the specimen can be used, such as a flat surface, a hole, or the bottom of a groove. The 10 models of hardness testers in the HH-300 Series support various hardness measurement standards.



## Long type HH-331, 332, 333, 334

The long type has a slender cylindrical shape ( $\phi 24 \times 85\text{mm}$ ). Hence, it can measure hardness at the bottom of grooves or holes as well as exposed surfaces. Also, hardness measurement can be performed while keeping your hands and face away from the specimen surface. This is essential when the surface temperature is high: for example immediately after molding.



## Compact type HH-329, 330, 335, 336, 337, 338

The compact body fits snugly into your palm for ease of measurement.

## Specifications

| Order No.                                  | 811-329-10  | 811-330-10   | 811-331-10 | 811-332-10   | 811-333-10   | 811-334-10  |
|--|---|--|------------|--|--|---|
| Model                                      | HH-329  | HH-330   | HH-331     | HH-332   | HH-333   | HH-334  |
| Type                                       | Compact type  |  |            | Long type  |  |   |
| Display specification                      | Analog  | Digital  | Analog     | Digital  | Analog   | Digital   |
| Measurement target                         | Soft rubber, sponge, felt, hard foam, winder                      |  |            | General rubber/soft plastic  |  | Hard rubber/hard plastic/ebonite  |
| Category in standards                      | Type E  |  |            | Type A   |  | Type D  |
| Applicable standard                        | JIS K 6253  |  |            | JIS K 6253, JIS K 7215, ASTM D 2240, ISO 868, ISO 7619, DIN 53 505                         |  |   |
| Needle shape                               | —   |  |            | $\phi 1.25\text{mm}$   |  |   |
| Shaft diameter                             | —   |  |            | $\phi 1.25\text{mm}$   |  |   |
| Tip shape                                  | Semi-sphere   |  |            | Circular truncated cone  |  | Cone  |
| Tip angle                                  | —   |  |            | 35°  |  | 30°   |
| Tip diameter                               | $\phi 5\text{mm}$   |  |            | $\phi 0.79\text{mm}$   |  | —   |
| Tip curvature                              | —   |  |            | —  |  | 0.1   |
| Pressure surface shape                     | 44×18mm   |  |            | $\phi 18\text{mm}$   |  |   |
| Protrusion of needle from pressure surface | 2.5mm   |  |            | 2.5mm  |  |   |
| Minimum graduation                         | 1° (HH-329, 331, 333, 335, 337) 0.1° (HH-330, 332, 334, 336, 338) |  |            |  |  |   |
| Loading device                             | Coil spring method  |  |            | Coil spring method   |  | Coil spring method  |
| $W_e, W_A, W_D$ , spring force (mN)        | $W_e=550+75H_e$<br>(10 scale 1300mN, 90 scale 7300mN)             |  |            | $W_e=550+75H_e$ (HA: 10 to 90)<br>(10 scale 1300mN, 90 scale 7300mN)                       |  | $W_e=444.5H_e$ (HD: 20 to 90)<br>(20° 8890mN, 90° 40005mN)  |
| $H_e, H_A, H_D$ hardness                   | —   |  |            | —  |  | —   |
| Accuracy of spring force                   | ±68.6mN   |  |            | ±68.6mN  |  | ±392.3mN  |
| Functions                                  | Peak hold   | Hold function<br>Output function: Digimatic interface for printer<br>Tolerance judgment<br>Function lock |            | Peak hold  | Hold function<br>Output function: Digimatic interface for printer<br>Tolerance judgment<br>Function lock | Peak hold<br>Hold function<br>Output function: Digimatic interface for printer<br>Tolerance judgment<br>Function lock |
| External dimensions                        | Approx. 68(W)×34(D)×146(H)mm                                      | Approx. 59(W)×40(D)×147(H)mm   |            | Analog long Approx. 68(W)×35(D)×188(H)mm<br>Digital long Approx. 59 (W) ×41 (D) ×190 (H)mm |  |   |
| Mass                                       | 300g  | 290g   |            | 320g   | 310g   | 320g<br>310g  |
| Power supply                               | —   | Button type silver oxide battery SR44  |            | —  | Button type silver oxide battery SR44  | —<br>Button type silver oxide battery SR44  |

## Hold function HH-330/332/334/336/338

Holds the display value at any time during measurement so that you can easily check the measurement result.



## Peak hold function HH-329/331/333/335/337

The peak hold indicator attached to the analog display is very useful for peak value measurement.



## Output zero set function HH-330/332/334/336/338

A Digimatic output interface is standard, so they can be connected to the DP-1VR (special accessory) and measurement system. By using the ZERO switch, which also serves as the power switch, you can correct any small shift of the zero position due to a quantization error.

Hardmatic HH-300 Series

## Specifications

| Order No.   | 811-335-10  | 811-335-11        | 811-336-10   | 811-336-11        | 811-337-10  | 811-337-11        | 811-338-10   | 811-338-11        |
|---|---|-------------------|--|-------------------|---|-------------------|--|-------------------|
| Model   | HH-335  | HH-335-01         | HH-336   | HH-336-01         | HH-337  | HH-337-01         | HH-338   | HH-338-01         |
| Type  | Compact type  |                   |  |                   |   |                   |  |                   |
| Display specification   | Analog  |                   |  | Digital           |   | Analog            |  | Digital           |
| Measurement target  | General rubber / soft plastic   |                   |  |                   | Hard rubber/hard plastic/ebonite  |                   |  |                   |
| Category in standards   | Type A  |                   |  |                   | Type D  |                   |  |                   |
| Applicable standard   | JIS K 6253, JIS K 7215, ASTM D 2240   |                   |  |                   |   |                   |  |                   |
| Applicable standard   | —   | ISO 868, ISO 7619 | —  | ISO 868, ISO 7619 | —   | ISO 868, ISO 7619 | —  | ISO 868, ISO 7619 |
| Needle shape  | Shaft diameter ISO 868, ISO 7619 bei -11 Modellen   |                   |  |                   |   |                   |  |                   |
|   | ø1.25   |                   |  |                   |   |                   |  |                   |
|   | Circular truncated cone   |                   |  |                   | Cone  |                   |  |                   |
|   | 35°   |                   |  |                   | 30°   |                   |  |                   |
|   | ø0.79mm   |                   |  |                   | —   |                   |  |                   |
| Tip curvature   | —   |                   |  |                   | 0.1mm   |                   |  |                   |
| Pressure surface shape  | 44x18mm   | ø18mm             | 44x18mm  | ø18mm             | 44x18mm   | ø18mm             | 44x18mm  | ø18mm             |
| Protrusion of needle from pressure surface  | 2.5mm   |                   |  |                   |   |                   |  |                   |
| Minimum graduation  | 1° (HH-331, 333, 335, 337) 0.1° (HH-332, 334, 336, 338)   |                   |  |                   |   |                   |  |                   |
| Loading device<br>W <sub>A</sub> , W <sub>0.5</sub> , spring force (mN)<br>H <sub>A</sub> , H <sub>0.5</sub> hardness | Coil spring method<br>W <sub>A</sub> =550+75H <sub>A</sub> (HA: 10 to 90)<br>(10 scale 1300mN, 90 scale 7300mN) |                   |  |                   | Coil spring method<br>W <sub>0.5</sub> =444.5H <sub>0.5</sub> (HD: 20 to 90)<br>(20 scale 8890mN, 90 scale 40005mN) |                   |  |                   |
|   | ±68.6mN   |                   |  |                   | ±392.3mN  |                   |  |                   |
| Functions   | Peak hold   |                   | Hold function<br>Output function: Digimatic interface for printer<br>Tolerance judgment<br>Function lock |                   | Peak hold   |                   | Hold function<br>Output function: Digimatic interface for printer<br>Tolerance judgment<br>Function lock |                   |
|   | External dimensions   |                   |  |                   |   |                   |  |                   |
| Mass  | 300g  |                   | 290g   |                   | 300g  |                   | 290g   |                   |
| Power supply  | —   |                   | Button type silver oxide battery SR44  |                   | —   |                   | Button type silver oxide battery SR44  |                   |



## One unit for 3 applications

### Optional accessories

#### Measurement/test dual purpose stand CTS Series (all models)

The CTS Series can be combined with the HH-300 Series for (1) hardness measurement, and (2) spring force testing of the HH-300 Series hardness tester main unit. (3) By connecting the attached weight directly to the hardness tester to perform hardness measurement results in better repeatability than can be obtained compared to hardness measurement made by directly pressing the hardness tester against the workpiece by hand. This measurement method with a weight directly connected to the hardness tester is useful for measuring the hardness of large samples for which the stand cannot be used, as well as hardness measurement in the field. The CTS Series includes 3 models for different hardness tester types. All 3 models can be used for (1), (2), and (3) above with one stand by adding a separately available accessory.



### Specifications

| Order No.                                 | 811-019   | 811-012  | 811-013                               |
|---|---|--|---------------------------------------|
| Model                                     | CTS-101   | CTS-102  | CTS-103                               |
| Applicable model                          | HH-331, 332   | HH-333, 334, 337, 338                                      | HH-335, 336                           |
| Application                               | 1.Fixed force hardness measurement  |  |                                       |
| Measurement force                         | 9.81N   | 49.05N   | 9.81N                                 |
| Weight used                               | (1)   | (1)+(3)+(4)  | (1)                                   |
| 2.Manual fixed force hardness measurement |   |  |                                       |
| Measurement force                         | 9.81N   | 49.05N   | 9.81N                                 |
| Weights used                              | (1)+(6)   | (1)+(3)+(6)  | (1)+(6)                               |
| 3.Loading test                            |   |  |                                       |
| Weight used                               | L:— / H:(1)   | L:(1)+(5) / H+(3)  | L:— / H+(1)+(2)                       |
| Weights                                   |   |  |                                       |
| Weight application                        | (1)CTS-101, 102, 103 Measurement / testing (2)103 Measurement (3)CTS-102 Measurement / testing (4)CTS-102 Measurement (5)CTS-102 Measurement / testing (6)CTS-101, 102, 103 Measurement |  |                                       |
| Outside diameter (Unit: mm)               | (1)ø64×23.5<br>(6)ø40×13  | (1)ø64×23.5 (3)ø78×110<br>(4)ø20×25 (5)ø40×25<br>(6)ø40×13 | (1)ø64×23.5<br>(2)ø20×19<br>(6)ø40×13 |
| Body mass                                 | (1)580g (2)34.8g (3)3950g (4)50g (5)197.4g (6)130g  |  |                                       |
| Stand overview                            |   |  |                                       |
| External dimensions                       | ø148 x Height (Max.) 420mm  |  |                                       |
| Up/down stroke                            | 12mm  |  |                                       |
| Maximum specimen thickness                | Approx. 90mm  |  |                                       |
| Specimen table dimension                  | ø90mm   |  |                                       |
| Total mass                                | Approx. 9kg   | Approx. 13kg   | Approx. 9kg                           |

### Standard configuration

| Item          | Usage                 | Quantity | 811-019<br>CTS-101 | 811-012<br>CTS-102 | 811-013<br>CTS-103 |
|---------------|-----------------------|----------|--------------------|--------------------|--------------------|
| Main unit     | —                     | 1        | ✓                  | ✓                  | ✓                  |
| Tool set      | —                     | 1        | ✓                  | ✓                  | ✓                  |
| Weight (1)    | Measurement / testing | 1        | ✓                  | ✓                  | ✓                  |
| Weight (2)    | Testing               | 1        | —                  | —                  | ✓                  |
| Weight (3)    | Measurement / testing | 1        | —                  | ✓                  | —                  |
| Weight (4)    | Measurement / testing | 1        | —                  | ✓                  | —                  |
| Weight (5)    | Testing               | 1        | —                  | ✓                  | —                  |
| Weight (6)    | Testing               | 2        | ✓                  | ✓                  | ✓                  |
| User's manual | —                     | 1        | ✓                  | ✓                  | ✓                  |
| Warranty card | —                     | 1        | ✓                  | ✓                  | ✓                  |



(1)Hardness measurement



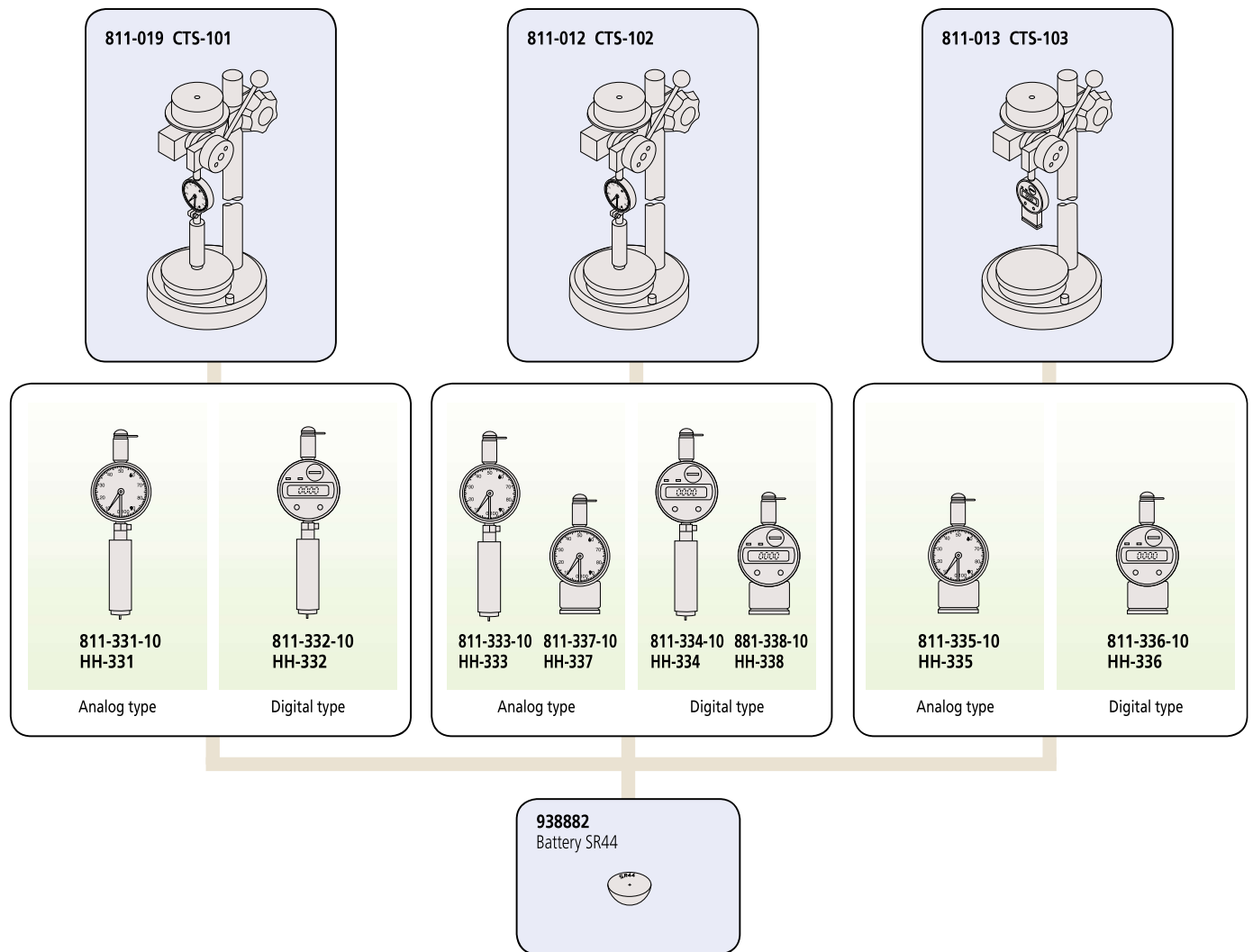
(2)Spring force testing



(3)Direct application of weight

## System configuration

The HH-300 Series can be used more effectively by combining them with various special accessories (sold separately).



Hardmatic HH-300 Series

## Examples of hardness measurement performance in various standards

| Standard               | Designation | Description  |
|------------------------|-------------|--|
| JIS K 6253<br>ISO 7619 | A45/15      | Hardness measurement is performed with the Type A hardness tester. It indicates that a hardness measurement of 45 is obtained 15 seconds after starting the measurement. |
|                        | D70/10      | Hardness measurement is performed with the Type D hardness tester. It indicates that a hardness measurement of 70 is obtained 10 seconds after starting the measurement. |
| JIS K 7215             | HDA83       | Hardness measurement is performed with the Type A hardness tester. It indicates that a hardness measurement of 83 is obtained.   |
|                        | HDD56       | Hardness measurement is performed with the Type D hardness tester. It indicates that a hardness measurement of 56 is obtained.   |
| ASTM D 2240            | A/45/15     | Hardness measurement is performed with the Type A hardness tester. It indicates that a hardness measurement of 45 is obtained 15 seconds after starting the measurement. |
|                        | D/60/1      | Hardness measurement is performed with the Type D hardness tester. It indicates that a hardness measurement of 60 is obtained 1 second after starting the measurement.   |
| ISO 868                | A/15:45     | Hardness measurement is performed with the Type A hardness tester. It indicates that a hardness measurement of 45 is obtained 15 seconds after starting the measurement. |
|                        | D/1:60      | Hardness measurement is performed with the Type D hardness tester. It indicates that a hardness measurement of 60 is obtained 1 second after starting the measurement.   |
| DIN 53 505             | 75Shore A   | Hardness measurement is performed with the Shore A hardness tester. It indicates that a hardness measurement of 75 is obtained.  |

## Domestic and overseas standards

|              |   |
|--------------|---|
| JIS K 6253-3 | "Hardness testing methods for rubber, vulcanized or thermoplastic"                                    |
| JIS K 7215   | "Testing Methods for Durometer Hardness of Plastics"  |
| JIS S 6050   | "Plastics erasers"  |
| ISO 7619     | "Rubber-Determination of indentation hardness by means of pocket hardness meters"                     |
| ISO 68       | "Plastics and ebonite-Determination of indentation hardness by means of a durometer (Shore hardness)" |
| ASTM D 2240  | "Standard Test Method for Rubber property-Durometer Hardness"   |
| DIN 53 505   | "Testing of rubber and plastics; shore A and shore D hardness test"                                   |
| SRIS 0101    | "Physical testing methods for expanded rubber"  |

## Reference material

| Order No. | Description |
|-----------|-------------|
| 64AAA590  | Shore A     |
| 64AAA964  | Shore A     |

