

Rockwell Hardness Testing Machines HR-200/300/400/500 Series

Bulletin No. 2025



Four economical Rockwell Hardness Testing Machines to



HR-210MR Order No. 963-220-10A

Rockwell Hardness Testing Machine

Motorized application of the total (Major) test force improves accuracy and repeatability and eliminates the problems of an oil dashpot controlled system.



HR-320MS Order No. 963-231-10A

Twin type (Rockwell/Rockwell Superficial) Hardness Testing Machine

Manually handles test force and preliminary test force selection. Motor drive controls loading sequence.

Features

- ◆ The newly designed frame provides maximum clearance for positioning the workpiece. A flat table is all that is needed for mounting these testing machines.
- ◆ Simple to operate
- ◆ The Dial Model HR-210 features an automatic preset function on the indicator to set the initial (Minor) test force to zero.



Mitutoyo

to suit practically every application...



HR-430MR Order No. 963-240-10A
Rockwell Hardness Testing Machine

- ◆ Economy type tester loaded with the features of a more expensive tester such as an Automatic Brake and Start system that stops the application of the initial (Minor) test force and starts the total (Major) test force cycle.
- ◆ Adjustable Dwell time.
- ◆ Dial Selection of total test force. MS model also feature easy dial change between Rockwell and Superficial Scales.



HR-430MS Order No. 963-241-10A
Twin type (Rockwell/Rockwell Superficial combined use) Hardness Test equipment

- ◆ The digital type (HR-430MR and HR-430MS), with the adoption of the automatic elevating screw brake & the automatic load sequence, with only simple handling test possibility.



- ◆ The digital type (HR-320MS, HR-430MR and HR-430MS) has a digimatic output and our Digimatic Mini-Processor (DP-1VR) to print and input tools (USB-ITN-E) to connect to a PC and use for data transfer.



- ◆ Light Force Brinell hardness tests can be performed by using the available optional accessories: a Brinell indenter, a weight set and a measurement microscope.

Specifications

Inch (mm)

| Order Number | 963-220-10A | 963-231-10A | 963-240-10A | 963-241-10A |
|--------------------------|---|--|---|--|
| Model | HR-210MR | HR-320MS | HR-430MR | HR-430MS |
| Test Scales | Rockwell | Rockwell and Rockwell Superficial | Rockwell | Rockwell and Rockwell Superficial |
| Standard | JIS B 7726 ISO 6508-2 ASTM E18-10 | | | |
| Preliminary Test Force | 98.07N (10kgf) | 98.07N (10kgf), 29.42 (3kgf) | 98.07N (10kgf), 29.42 (3kgf) | 98.07N (10kgf), 29.42 (3kgf) |
| Test Force Rockwell | 588.4N (60kgf), 980.7N (100kgf), 1471N (150kgf) | | | |
| Test Force Superficial | — | 147.1N (15kgf), 294.2N (30kgf), 441.3N (45kgf) | — | 147.1N (15kgf), 294.2N (30kgf), 441.3N (45kgf) |
| Display | Dial | Matrix Backlight LCD | | |
| Hardness Minimum Value | 0.5 HR | 0.1 HR | | |
| Scale Conversions | — | HRC, HRB, HV, HBW, HS, Mpa plus offset, OK/NG | | |
| Preliminary Test Force | Manual (with automatic zero set) | Manual (with Loading Navigator) | Manual (with automatic brake-start) | |
| Total Test Force Control | Automatic (loading, duration, unloading) | | | |
| Loading Method | Dead Weight | | | |
| Load Duration (Dwell) | Fixed (3s to 5.5s) or Manual | | Adjustable (1s to 99s) or Manual | |
| Maximum Specimen Ht. | 7.1" (180mm) | | | |
| Maximum Depth | 6.5" (165mm) | | | |
| Data Output | — | RS-232C, SPC | | |
| Power Supply | 120V AC (±10%), 60Hz | | | |
| Dimensions (D x W x H) | 20.15" (512mm) x 9.25" (235mm) x 30.7" (780mm) | 20.6" (523mm) x 9.25" (235mm) x 30.7" (780mm) | 20.6" (523mm) x 9.25" (235mm) x 30.7" (780mm) | 20.6" (523mm) x 9.25" (235mm) x 30.7" (780mm) |
| Mass | 100.53lb (45.6kg) | 102.07lb (46.3kg) | 108.69lb (49.3kg) | 110.01lb (49.9kg) |

STANDARD ACCESSORIES

| All Models | | MR Models | | MS Models | |
|-----------------------------|-------------|---------------------|-------------|---------------------|--------------------------|
| Item | Description | Item | Description | Item | Description |
| V Anvil (large) | 30mm | | | | |
| Flat Anvil | 64mm | Diamond Indenter | Rockwell | Diamond Indenter | Rockwell and Superficial |
| 1/16" Carbide Ball Indenter | | Hardness test Block | | Hardness test Block | 60 HRC |
| AC Adapter | | Hardness test Block | 60 HRC | Hardness test Block | 30 HRC |
| Users Manual | | Hardness test Block | 30 HRC | Hardness test Block | 90 HRBW |
| Vinyl Cover | | | 90 HRBW | Hardness test Block | 65 HR30N |
| Accessory Box | | | | Hardness test Block | 70 HR30TW |
| Level | | | | | |

ROCKWELL HARDNESS SCALES

| Scale | Hardness symbol*1 | Indenter | Preliminary test force | Total test force | Hardness range applicable |
|-------|-------------------|-----------------------------|------------------------|------------------|---------------------------|
| A | HRA | Conical diamond | 98.07N (10kgf) | 588.4N (60kgf) | 20-95HRA |
| D | HRD | | | 980.7N (100kgf) | 40-77HRD |
| C | HRC | | | 1471N (150kgf) | 10-70HRC |
| F | HRF | Sphere ø1.5875mm (1/16") | | 588.4N (60kgf) | 60-100HRF |
| B | HRB | | | 980.7N (100kgf) | 20-100HRB |
| G | HRG | Sphere ø3.175mm (1/8") | | 1471N (150kgf) | 30-94HRG |
| H | HRH | | | 588.4N (60kgf) | 80-100HRH |
| E | HRE | Sphere ø6.35mm (1/4") | | 980.7N (100kgf) | 70-100HRE |
| K | HRK | | | 1471N (150kgf) | 40-100HRK |
| L | HRL | Sphere ø6.35mm (1/4") | | 588.4N (60kgf) | |
| M | HRM | | 980.7N (100kgf) | | |
| P | HRP | Sphere ø12.7mm (1/2") | 1471N (150kgf) | | |
| R | HRR | | 588.4N (60kgf) | | |
| S | HRS | Sphere ø12.7mm (1/2") | 980.7N (100kgf) | | |
| V | HRV | | 1471N (150kgf) | | |

| Scale | Hardness symbol*1 | Indenter | Preliminary test force | Total test force | Hardness range applicable |
|-------|-------------------|-----------------------------|---------------------------|------------------|---------------------------|
| 15N | HR15N | Conical diamond | 29.42N (3kgf) Coverage | 147.1N (15kgf) | 70-94HR15N |
| 30N | HR30N | | | 294.2N (30kgf) | 42-86HR30N |
| 45N | HR45N | | | 441.3N (45kgf) | 20-77HR45N |
| 15T | HR15T | Sphere ø1.5875mm (1/16") | | 147.1N (15kgf) | 67-93HR15T |
| 30T | HR30T*2 | | | 294.2N (30kgf) | 29-82HR30T |
| 45T | HR45T | Sphere ø3.175mm (1/8") | | 441.3N (45kgf) | 10-72HR45T |
| 15W | HR15W | | | 147.1N (15kgf) | |
| 30W | HR30W | Sphere ø3.175mm (1/8") | | 294.2N (30kgf) | |
| 45W | HR45W | | | 441.3N (45kgf) | |
| 15X | HR15X | Sphere ø6.35mm (1/4") | | 147.1N (15kgf) | |
| 30X | HR30X | | 294.2N (30kgf) | | |
| 45X | HR45X | Sphere ø12.7mm (1/2") | 441.3N (45kgf) | | |
| 15Y | HR15Y | | 147.1N (15kgf) | | |
| 30Y | HR30Y | Sphere ø12.7mm (1/2") | 294.2N (30kgf) | | |
| 45Y | HR45Y | | 441.3N (45kgf) | | |

*1: In the case of scales which specify a spherical indenter, a letter should be appended to the hardness symbol ("S" for steel, "W" for tungsten carbide) when quoting the measurement result to show that it was obtained with an indenter made of the indicated material.

*2: Applied to a specimen of less than 0.6mm thickness a special test, which takes account of the influence of the impression made by the test sphere on such a thin specimen, may be designated as HR30Tm and is defined in JIS Z 2245 appendix A.

Advanced Rockwell Type Hardness Testing Machines

HR-521/523

Advanced Rockwell Hardness Testing Machines

Features

- ◆ Multiple test force generation for Rockwell, Rockwell Superficial and optional Brinell hardness.
- ◆ Projected-nose indenter arm for easy reach of interior (min. $\phi 1.6"$ (40mm)/ $\phi 0.86"$ (22mm)*) and exterior surfaces.
*When using an optional diamond indenter (19BAA292).
- ◆ Closed Loop electronic test force control for accurate loading.
- ◆ Auto-stop elevation table and automatic preliminary test force loading provide consistent test force generation.



Specifications

Inch (mm)

| Order Number | 810-202-03A | 810-205-03A | 810-204-03A | 810-207-03A |
|---|---|---|---|---|
| Model | HR-521 | HR-521L | HR-523 | HR-523L |
| Test Scales | Rockwell and Rockwell Superficial | | | |
| Standard | JIS B 7726 ISO 6508-2 ASTM E18-10 | | | |
| Preliminary Test Force | 98.07N (10kgf), 29.42 (3kgf) | | | |
| Test Force Rockwell | 588.4N (60kgf), 980.7N (100kgf), 1471N (150kgf) | | | |
| Test Force Superficial | 147.1N (15kgf), 294.2N (30kgf), 441.3N (45kgf) | | | |
| Touch Screen LCD Showing: Hardness value, Converted hardness value, Test conditions, OK/NG tolerance judgement, statistical processing result. Cylindrical/spherical surface compensation, data offset, Hardness conversion (HV, HK, HRA/B/C/D/F/G/15T/30T/45T/15N/30N/45N, HS, HB, HBW, tensile strength), OK/ \pm NG tolerance judgement, measured data editing, data memory (max 1024 data), SPC calculation (No. of data, max/min/mean values, range, upper/lower limit values, standard deviation, No. of passing/defective) Histogram, \bar{x} -R chart. | | | | |
| Hardness Minimum Value | 0.1 HR | | | |
| Scale Conversions | Advanced with corrections | | | |
| Preliminary Test Force | Manual (with automatic brake-start) | | Fully Motorized Power Elevating Screw | |
| Total Test Force Load Control | Automatic (loading, duration, unloading) | | | |
| Loading Method | Closed Loop Electronic Force | | | |
| Load Duration (Dwell) | Adjustable (0s to 120s) or manual | | | |
| Maximum Specimen Height | 8.1" (205mm) | 15.5" (395mm) | 8.1" (205mm) | 15.5" (395mm) |
| Maximum Depth | 5.9" (150mm) | | | |
| Data Output | RS-232C, SPC and Centronics | | | |
| Power Supply | 120V AC ($\pm 10\%$), 60Hz | | | |
| Dimensions (D x W x H) | 26.4" (670mm) x 9.8" (250mm) x 23.8" (605mm) | 26.4" (670mm) x 9.8" (250mm) x 29.5" (750mm) | 26.4" (670mm) x 9.8" (250mm) x 23.8" (605mm) | 26.4" (670mm) x 9.8" (250mm) x 29.5" (750mm) |
| Mass | 132.28lb (60kg) | 154.32lb (70kg) | 132.28lb (60kg) | 154.32lb (70kg) |

Optional Accessories for Rockwell/Rockwell Superficial

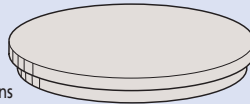


Calibration Set

| Order No. | Order No. |
|-----------------|-----------------|
| 64BAA241 | 64BAA242 |
| C Scale Set | B Scale Set |
| Test Blocks | Test Blocks |
| 64BAA125 | 64BAA126 |
| 64BAA124 | 64BAA132 |
| 64BAA158 | 64BAA135 |
| Indenter | Indenter |
| 64BAA072 | 64BAA078 |
| Order No. | Order No. |
| 64BAA243 | 64BAA244 |
| 30N Scale Set | 30T Scale Set |
| Test Blocks | Test Blocks |
| 64BAA128 | 64BAA129 |
| 64BAA165 | 64BAA140 |
| 64BAA167 | 64BAA130 |
| Indenter | Indenter |
| 64BAA073 | 64BAA078 |

810-038-7
Round table $\phi 9.85"$ (250mm)

For large specimens



810-037-7
Round table $\phi 7.09"$ (180mm)

For large specimens



810-040-7
V anvil (large)
 $\phi 1.6"$ (40mm), groove width 1.18" (30mm)
For large specimens



810-043
Spot anvil
 $\phi .47"$ (12mm)
For sheet specimens



810-041-7
V anvil (small)
 $\phi 1.6"$ (40mm), groove width 6mm
For cylindrical specimens

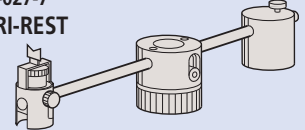


810-044-7
Spot anvil
 $\phi .22"$ (5.5mm)
For sheet specimens



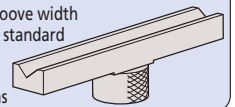
810-027-7
VARI-REST

For testing long specimens using anvil



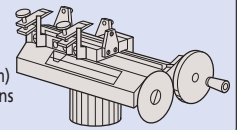
810-029
Special V anvil

Length 16" (400mm), groove width 2" (50mm) Supports the standard hardenability test for steel
For cylindrical specimens



810-026
Fine adjustment table for Jominy test

Fine adjustment table for Jominy test
Length 16" (400mm)
groove width 2" (50mm)
For cylindrical specimens

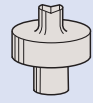


810-030-7
Diamond spot anvil
.39" (10mm)
For sheet specimens



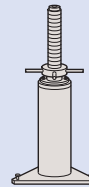
810-042-7
Small V anvil

$\phi .39"$ (10mm)
For cylindrical specimens

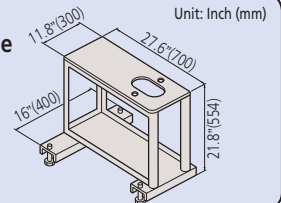


810-028-7
Jack rest

For testing long specimens using table or anvil



810-048
Console table



264-504-5A
Digimatic mini-processor DP-1VR

* No connection cable supplied.
(Should be ordered separately)
Connection cable (1m) 937387



06ADV380E
USB Direct Input Tool

The USB plug is connected to a computer

Type Hardness Testing Machines

Test Blocks*

| Order No. | Hardness |
|-----------|--------------------------------|
| 64BAA159 | HRA81/86 Rockwell Test Block |
| 64BAA160 | HRA75/79 Rockwell Test Block |
| 64BAA161 | HRA70/73 Rockwell Test Block |
| 64BAA162 | HRA65/68 Rockwell Test Block |
| 64BAA163 | HRA60/62 Rockwell Test Block |
| | |
| 64BAA249 | HRBW95/100 Rockwell Test Block |
| 64BAA126 | HRBW90/95 Rockwell Test Block |
| 64BAA131 | HRBW80/85 Rockwell Test Block |
| 64BAA132 | HRBW70/75 Rockwell Test Block |
| 64BAA133 | HRBW60/65 Rockwell Test Block |
| 64BAA134 | HRBW50/55 Rockwell Test Block |
| 64BAA135 | HRBW40/45 Rockwell Test Block |
| 64BAA127 | HRBW30/35 Rockwell Test Block |
| 64BAA136 | HRBW20/25 Rockwell Test Block |
| 64BAA137 | HRBW10/15 Rockwell Test Block |
| 64BAA138 | HRBW0/5 Rockwell Test Block |
| | |
| 64BAA125 | HRC60/65 Rockwell Test Block |
| 64BAA157 | HRC50/55 Rockwell Test Block |
| 64BAA124 | HRC40/45 Rockwell Test Block |
| 64BAA123 | HRC30/35 Rockwell Test Block |
| 64BAA158 | HRC20/25 Rockwell Test Block |

| Order No. | Hardness |
|-----------|--------------------------------|
| 64BAA129 | HR30T74/79 Rockwell Test Block |
| 64BAA139 | HR30T70/73 Rockwell Test Block |
| 64BAA140 | HR30T63/67 Rockwell Test Block |
| 64BAA141 | HR30T56/60 Rockwell Test Block |
| 64BAA142 | HR30T49/53 Rockwell Test Block |
| 64BAA130 | HR30T43/47 Rockwell Test Block |
| 64BAA143 | HR30T36/39 Rockwell Test Block |
| 64BAA144 | HR30T29/33 Rockwell Test Block |
| 64BAA145 | HR30T22/26 Rockwell Test Block |
| 64BAA146 | HR30T15/18 Rockwell Test Block |
| | |
| 64BAA147 | HR15T90/92 Rockwell Test Block |
| 64BAA148 | HR15T86/69 Rockwell Test Block |
| 64BAA149 | HR15T83/85 Rockwell Test Block |
| 64BAA150 | HR15T80/82 Rockwell Test Block |
| 64BAA151 | HR15T77/79 Rockwell Test Block |
| 64BAA152 | HR15T72/74 Rockwell Test Block |
| 64BAA153 | HR15T70/72 Rockwell Test Block |
| 64BAA154 | HR15T68/69 Rockwell Test Block |
| 64BAA155 | HR15T64/66 Rockwell Test Block |
| 64BAA156 | HR15T61/63 Rockwell Test Block |

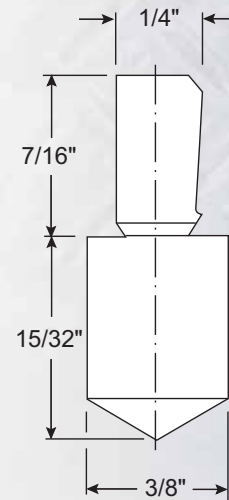
| Order No. | Hardness |
|-----------|--------------------------------|
| 64BAA222 | HR45N65/70 Rockwell Test Block |
| 64BAA223 | HR45N55/60 Rockwell Test Block |
| 64BAA224 | HR45N45/50 Rockwell Test Block |
| 64BAA225 | HR45N35/40 Rockwell Test Block |
| 64BAA226 | HR45N25/30 Rockwell Test Block |
| | |
| 64BAA128 | HR30N77/82 Rockwell Test Block |
| 64BAA164 | HR30N68/73 Rockwell Test Block |
| 64BAA165 | HR30N59/64 Rockwell Test Block |
| 64BAA166 | HR30N50/55 Rockwell Test Block |
| 64BAA167 | HR30N40/45 Rockwell Test Block |
| | |
| 64BAA168 | HR15N90/93 Rockwell Test Block |
| 64BAA169 | HR15N85/88 Rockwell Test Block |
| 64BAA170 | HR15N80/83 Rockwell Test Block |
| 64BAA171 | HR15N75/77 Rockwell Test Block |
| 64BAA172 | HR15N69/72 Rockwell Test Block |

| Order No. | Description |
|-----------|-------------------------------|
| 64BAA118 | HRE 50/55 Rockwell Test Block |
| 64BAA119 | HRE 60/65 Rockwell Test Block |
| 64BAA120 | HRE 70/75 Rockwell Test Block |
| 64BAA121 | HRE 80/85 Rockwell Test Block |
| 64BAA122 | HRE 90/95 Rockwell Test Block |

Carbide Ball Indenters

| Order No. | Description |
|-----------|-----------------------------|
| 19BAA515 | 1/16" Carbide ball indenter |
| 19BAA504 | 1/8" Carbide ball indenter |
| 19BAA505 | 1/4" Carbide ball indenter |
| 19BAA506 | 1/2" Carbide ball indenter |
| 19BAA507 | 1/16" Carbide ball (1pc.) |
| 19BAA508 | 1/8" Carbide ball (1pc.) |
| 19BAA509 | 1/4" Carbide ball (1pc.) |
| 19BAA510 | 1/2" Carbide ball (1pc.) |

Rockwell Type Diamond Indenters



| Order No. | Scale |
|-----------|-------|
| 64BAA072 | C |
| 64BAA073 | N |
| 64BAA086 | A |
| 64BAA071 | C & N |

* Please inquire for other hardness ranges

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